

**Features and Design Guide**

Specifically Designed for Design and Build Projects.

Complete package including Waterside Control Fan Coil Unit / Controls / Flexible Ducting / Plenum Box / Diffusers.

Choice of Linear Slot Diffusers or 4 Way Throw Louvred-Faced Diffusers.

Available in three thermal outputs 2kW / 3kW / 4kW sensible cooling and heating.

Fully acoustically and thermally tested.

Quick and simple design selection.

Customer friendly installation and commissioning.

Competitive priced solutions with fasttrack delivery.

# Systempac

Fan Coil Unit / Acoustic Flex / Diffuser System Package



*action*air  
**Air Diffusion**

# Product Specification

## Fan Coil Unit

### Waterside Control 230mm deep horizontal draw through chassis type Fan Coil Units.

Chassis constructed from 1.2mm galvanised sheet steel, with 1.6mm fan deck and back plates. The flush external finish prevents exposure to bare edges and incorporates recessed, reinforced slotted mounting points for ease of installation.

Access to fans/motors is via an insulated bottom panel with keyslots for accurate positioning and easy removal.

The thermal and acoustic insulation is 100 kg/m<sup>3</sup> density, class 'O' CFC and HFC free open cell foam and complies with 'Section 20' requirements. External condensate tray insulation is similar in specification, but closed cell type.

Fans are double inlet, resiliently mounted direct driven, forward curved centrifugal type and are mounted on an easily removable deck.

The motors are permanent split capacitor type external rotor, totally enclosed, speed controllable.

A ventilated controls housing mounted on the same side as the control valves, includes a hinged removable cover, three speed selector switch and illuminated on/off switch.

Coil matrix blocks are manufactured from seamless copper tube mechanically expanded into aluminium fins having die formed collars, providing a tight bond to optimise heat transfer. Vents and drains are fitted as standard with easily accessible slotted / hexagonal plugs.

Coils are pressure tested using dry air under water to 15 bar.

Filters are washable EU3 continuous filament filter media to Eurovent 4/5, with F1 fire resistance to DIN 53438 and a dust holding capacity of 380g/m<sup>2</sup>.

Condensate trays are one piece, welded, galvanised sheet steel, synthetically treated, foam insulated and extended to cover the entire coil and valve assembly and can be easily removed for cleaning / maintenance. The tray has a positive fall to drain with a BSP female connection fitted at the lowest point, on the underside.

## Controls

The controller is a Honeywell T8078B1027 24 Volt non-addressable

digital unit, mounted on the outside of the fan coil controls enclosure. The T8078B1027 is designed for individual zone temperature management, but can accept remote set point adjustment from a BMS. The unit provides proportional plus integral (P+I) control of valve/actuators to regulate heating and cooling output. The control has a self calibrating and commissioning function to ensure correct synchronisation of valve/actuators is always maintained. (9 minute test cycle). A remote sensor (encapsulated silicon type) is fitted to the inlet of the fancoil unit after the filter and wired to the T8078B with a 1.5m flying lead.

Honeywell 4 port valves with 24 Volt modulating actuators are fitted and wired to both the heating and cooling coils with compression fitting and hydraulically tested to 10 bar.

Optional remote temperature sensor and setpoint adjuster are also available.

## Acoustic Flex

1 metre of 200mm diameter Sonodec25 acoustic flexible ducting is supplied for each outlet spigot. Sonodec25 is insulated both acoustically and thermally. The inner duct is micro-perforated aluminium / polyester flexible with steel spring coil. This is insulated with 25mm fibreglass having a density of 16 kg/m<sup>3</sup>. It is completely enclosed in a seamless fibreglass reinforced aluminium outer duct. A polyester barrier is applied between the micro-perforated inner duct and the fibreglass, to prevent ingress of the fibreglass into the airstream. The flex conforms to BS476 parts 6, 7 and 20. Two 'Zip tie' clips are supplied for each discharge duct.

## Diffusers

### Linear Slot Diffusers (LS) and Plenum Boxes

The 3 slot linear diffuser offers both unobtrusive good looks with functional efficiency and are fully adjustable giving both horizontal and vertical projection. Slot diffusers are manufactured from high quality extruded aluminium sections and come with RAL9010 Eggshell White powder coat frames and Black internal components/blades as standard.

### Flexibility

Each diffuser is 1195mm x 179mm overall size including end flanges, which can either lay-in or fit below a grid, or be second fixed into a plaster margin.

### Plenum Box

Each diffuser is supplied with a galvanised sheet steel plenum box complete with both 198mm diameter side entry spigot and cord operated damper allowing adjustment from the diffuser face.

### Easy Fixing

Each diffuser is complete with 'U' bracket fixings which enable the installer to simply second fix the diffuser within the ceiling. This method is particularly useful when diffusers have to be installed in a ceiling with limited access.

### Louvred-Faced (LF) Diffusers and Plenum Boxes

The louvred-faced diffusers are manufactured from extruded aluminium profiles and offer exceptional performance from a 4 way removable core.

All diffusers are finished in RAL9010 Eggshell White power coat.

### Flexibility

The 373mm x 373mm overall size square diffuser can be accommodated within almost all types of ceiling systems.

### Installation Option

Should the installer prefer not to cut a diffuser into a tile, then a 595mm x 595mm overall diffuser can be ordered which simply lays within the ceiling grid.

### Plenum Box

Each diffuser is supplied with a galvanised sheet steel plenum box complete with both 198mm diameter side entry spigot and cord operated damper allowing adjustment from the diffuser face.

### Easy Fixing

Both the 373mm and 595mm overall diffusers are complete with removable cores, which enable the installer to secretly fix by means of either rivet or PK screw.

# Unit Selection Data

Package Reference	Speed Setting	Room NR	Total Air Volume (l/s)	Sensible Cooling (kW)	Total Cooling (kW)	Air Off (°C DB)	CHW Flowrate (l/s)	Coil + Valve (kPa)	Heating Duty (kW)	Air Off (°C)	LTHW Flowrate (l/s)	Coil + Valve (kPa)	Input Watts	Numbers of Outlets
SP2-LS/LF	I	35	150	1.5	1.6	14.6	0.08	12.4	1.5	28.3	0.03	3.3	70	2
<b>SP2-LS/LF</b>	<b>II</b>	<b>38</b>	<b>170</b>	<b>2.0</b>	<b>2.2</b>	<b>13.2</b>	<b>0.10</b>	<b>19.6</b>	<b>2.0</b>	<b>29.8</b>	<b>0.04</b>	<b>4.4</b>	<b>90</b>	<b>2</b>
SP2-LS/LF	III	40	190	2.4	2.4	12.7	0.12	27.9	2.5	31.0	0.06	9.2	110	2
SP3-LS/LF	I	35	205	2.5	2.8	12.8	0.13	14.8	2.5	30.2	0.06	2.9	110	3
<b>SP3-LS/LF</b>	<b>II</b>	<b>38</b>	<b>225</b>	<b>3.0</b>	<b>3.6</b>	<b>12.0</b>	<b>0.17</b>	<b>33.8</b>	<b>3.0</b>	<b>32.1</b>	<b>0.07</b>	<b>4.3</b>	<b>160</b>	<b>3</b>
SP3-LS/LF	III	40	250	3.3	3.8	12.1	0.18	36.3	3.5	32.7	0.08	5.1	180	3
SP4X-LS/LF	I	35	270	3.6	3.9	12.2	0.19	31.0	3.5	30.8	0.08	5.2	200	4
<b>SP4X-LS/LF</b>	<b>II</b>	<b>38</b>	<b>305</b>	<b>4.0</b>	<b>4.5</b>	<b>12.3</b>	<b>0.21</b>	<b>42.0</b>	<b>4.0</b>	<b>30.7</b>	<b>0.09</b>	<b>6.6</b>	<b>220</b>	<b>4</b>
SP4X-LS/LF	III	40	340	4.3	4.7	12.6	0.22	43.0	4.3	31.3	0.10	8.3	240	4

The Fan Coil selections are based on:

#### Cooling:

Summer On-coil air 23 °C Dry Bulb,  
16 °C Wet Bulb.  
Chilled Water flow temperature 6 °C.  
Chilled Water return temperature 11 °C.

#### Heating:

Winter On-coil air temperature  
20 °C Dry Bulb.  
LTHW flow temperature 82 °C.  
LTHW return temperature 71 °C.

**General:** External Resistance 15pa. Electrical Supply 230 Volts/ 1 phase /50 Hz.

The following refers to specific diffuser performance:-

**Type LS – Linear Slot Diffuser** Fully adjustable Linear Slot Diffusers with both horizontal and vertical projection. Throw data is based upon a temperature differential of 10 °C cooling to terminal velocity of 0.25 m/s for 1150mm active length with a room height of 2.7m, when mounted flush with an unobstructed flat ceiling.

Package Reference	Speed Setting	Total Air Volume per Package (l/s)	Slot Diffusers Supplied as Standard	Plenum Boxes Supplied as Standard	Volumetric Flow Rate (l/s per m)	Throw (m)
SP2-LS	I	150	2 x 1195 long	2 x 1145 long	66	3.0
	<b>II</b>	<b>170</b>			<b>74</b>	<b>3.4</b>
	III	190			83	4.3
SP3-LS	I	205	3 x 1195 long	3 x 1145 long	60	2.2
	<b>II</b>	<b>225</b>			<b>66</b>	<b>3.0</b>
	III	250			73	3.4
SP4X-LS	I	270	4 x 1195 long	4 x 1145 long	59	2.2
	<b>II</b>	<b>305</b>			<b>66</b>	<b>3.0</b>
	III	340			74	3.4

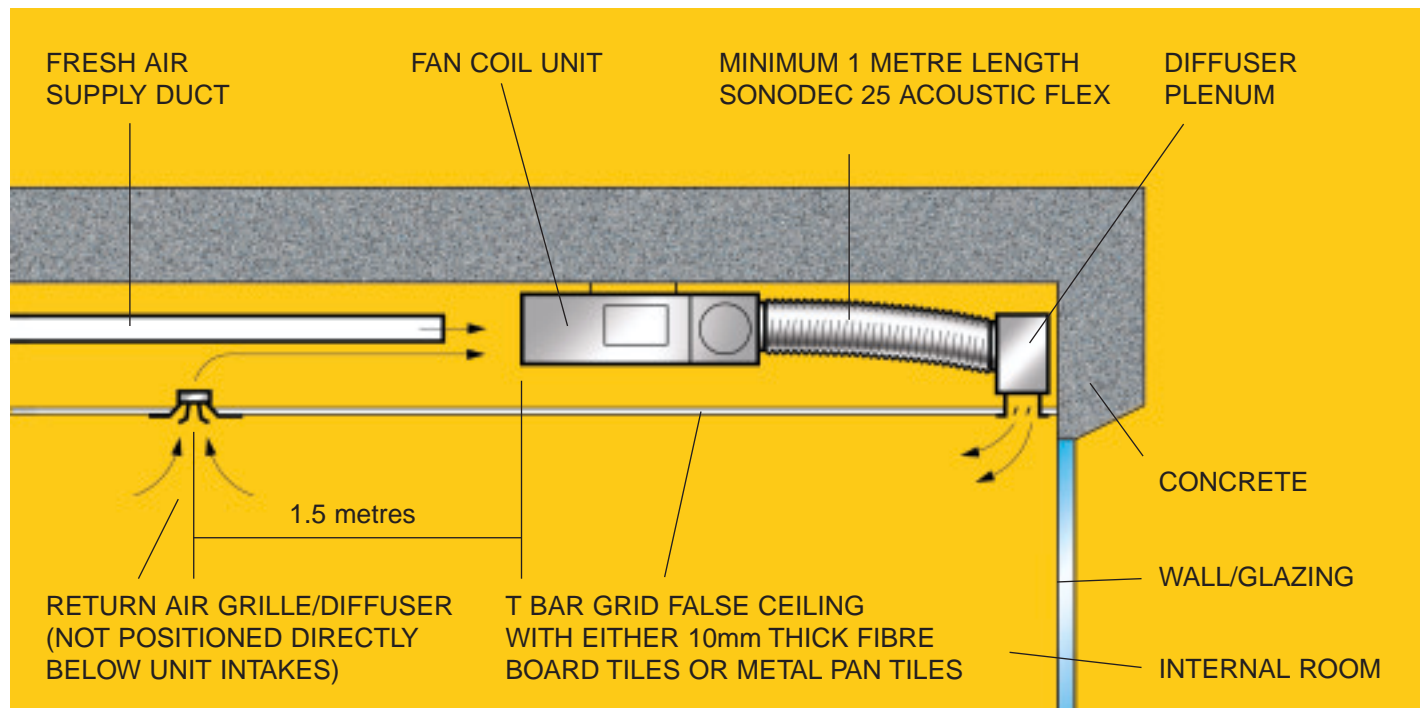
**Type LF – Louvre-Faced Diffuser** 4 Way Louvre-Faced Diffuser (horizontal diffusion), 225mm x 225mm neck size.

Throw data is based on a temperature differential of 10 °C cooling to a terminal velocity of 0.5 m/s to give average room velocity of 0.18 m/s with a room height of 2.7m, when mounted flush with an unobstructed flat ceiling.

Package Reference	Speed Setting	Total Air Volume per Package (l/s)	Number of Diffusers per Package	Air Volume per Diffuser (l/s)	Throw Based upon 4 Way Diffuser (m)
SP2-LF	I	150	2	75	1.8
	<b>II</b>	<b>170</b>		<b>85</b>	<b>2.0</b>
	III	190		95	2.2
SP3-LF	I	205	3	68	1.6
	<b>II</b>	<b>225</b>		<b>75</b>	<b>1.8</b>
	III	250		92	2.1
SP4X-LF	I	270	4	68	1.6
	<b>II</b>	<b>305</b>		<b>76</b>	<b>1.8</b>
	III	340		85	2.0

# Acoustic Performance Data

## Typical Horizontal Fan Coil Unit Arrangement



All associated components have to be mounted in accordance with manufacturer instructions. The fan coil units must be mounted within a false ceiling void of not less than 300mm deep. The false ceiling should be constructed of standard 10mm thick fibre tiles or metal pan tiles with a 15mm acoustic backing. Rooms of open plan or partitioned design have to be furnished, carpeted and have no more than 20% glass area with no highly

reflective surfaces such as ceramic tiles etc. Where a single package is serving a room the dimensions should be based upon a cooling load of 0.12 kW per m<sup>2</sup>. In an open plan area units should be mounted at a minimum of 4.5m centres and no closer than 1.5m from a corner.

Return air grilles / diffusers (not included within the package, but can be supplied as an optional extra cost item) should be positioned at least 1.5m from the fan coil unit

intake. A 1m active length of Sonodec25 acoustic flexible ducting is supplied and must be fitted to each fan coil outlet.

The remainder of interconnecting ductwork can comprise up to 3m of rigid spiral ductwork (including one – 90 degree bend) or up to 2m additional flexible ducting, on each spigot (supplied by others).

For further information a full acoustic report is available on request.

## Installation

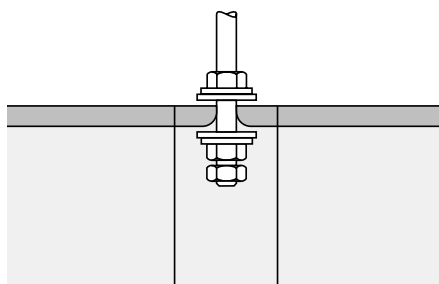
Units should be positioned so that access is available for routine maintenance and removal of coils, fans, filters and to open the controls enclosure.

All units must be installed in accordance with good engineering standards and due care and attention to eliminate any possible damage. The installation must ensure level positioning to facilitate correct operation and condensate removal.

The recommended method of unit

suspension (see below) is by means of M10 studding (supplied by others).

The accessory pack includes 3mm rubber washers and large supporting washers.

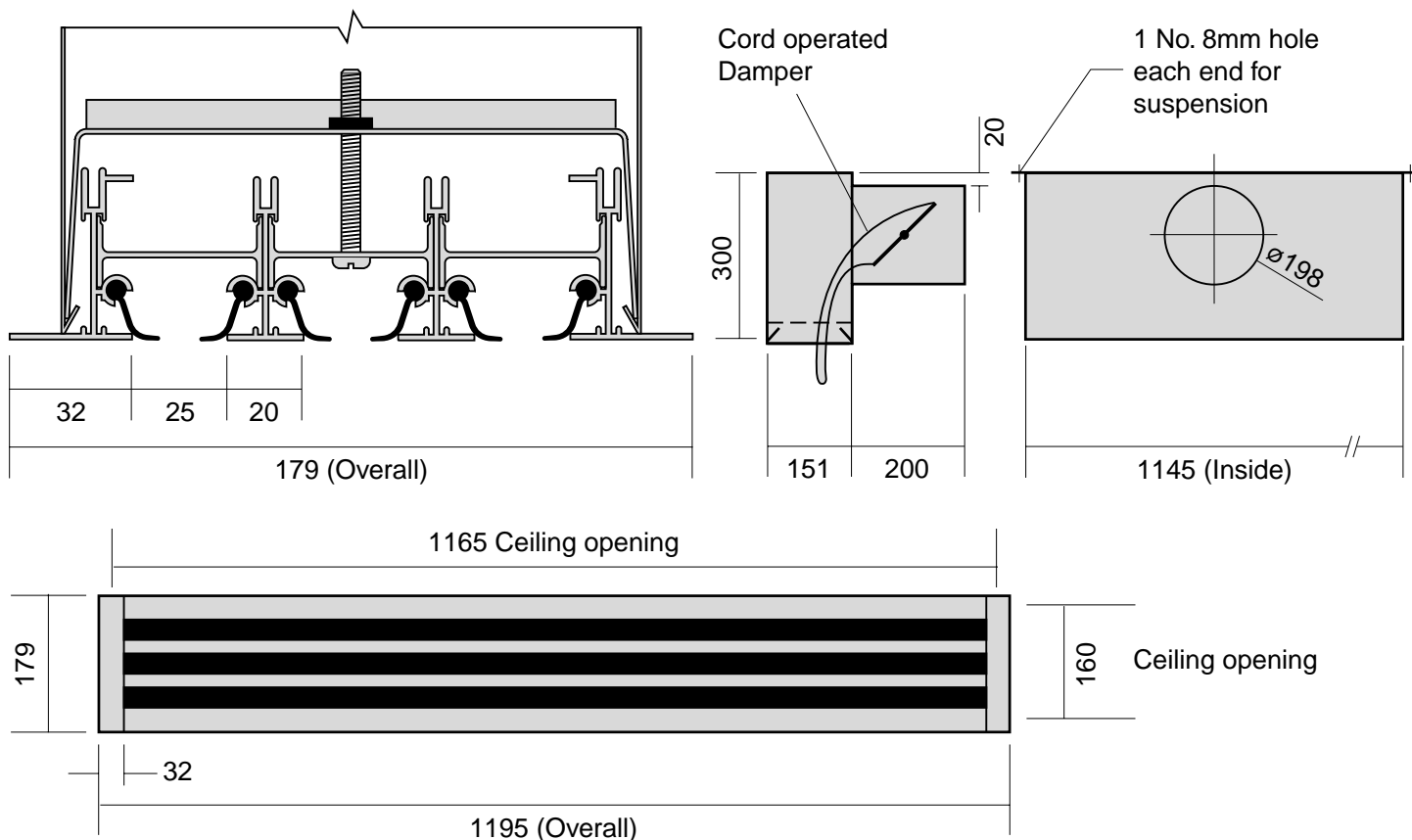


All connecting metal ductwork must be supported independently of the fan coil unit spigot connections, in accordance with DW 144.

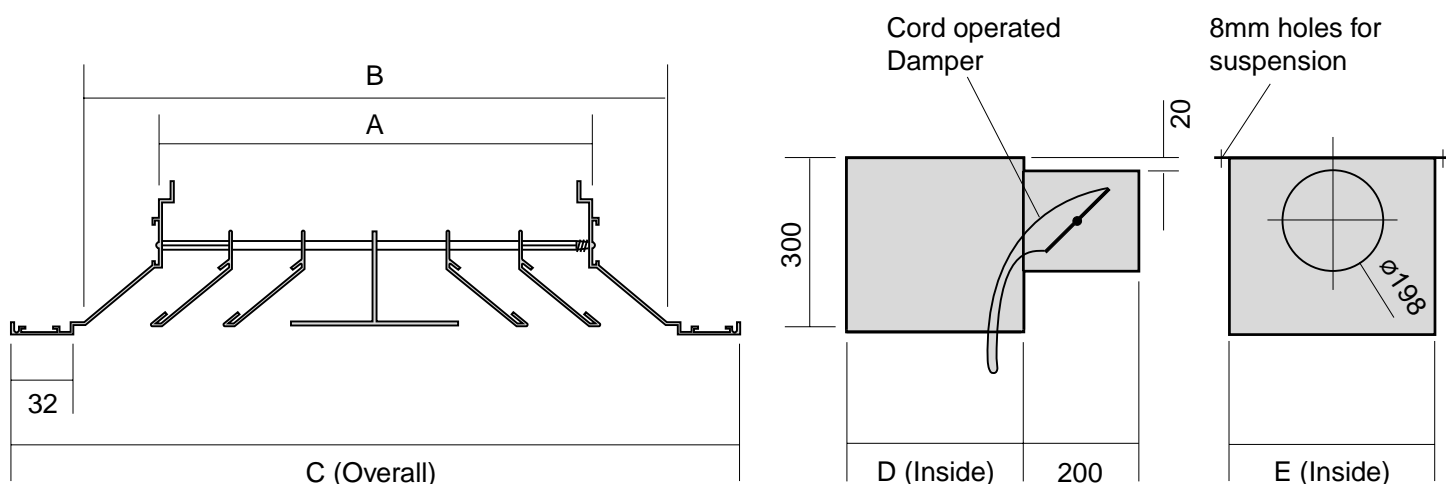
All wiring must comply with all relevant British Standard Codes of Practice and good engineering principles. Drain tray connection fittings should not protrude above the level of the tray to avoid condensate to be held back in the tray.

Please refer to the full operation and maintenance instructions prior to installation.

## Type LS Linear Slot Diffuser Option



## Type LF Louvred-Faced Diffuser Option



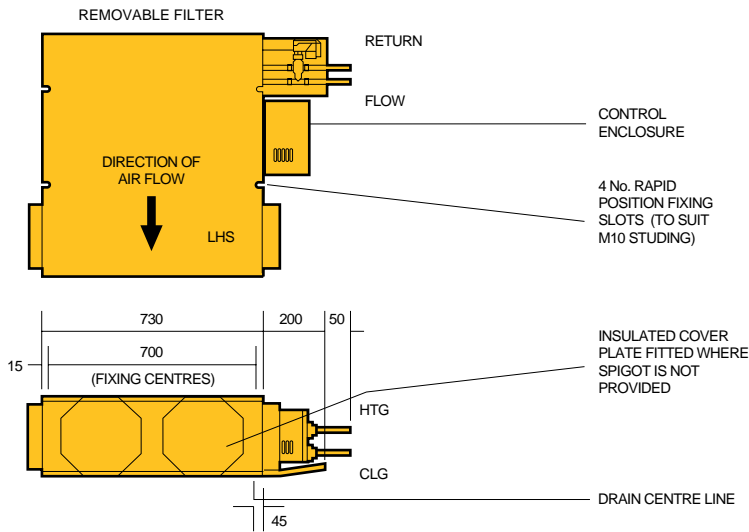
### Dimensions

Type	A	B	C	D	E
LF3	225	298	373	225	225
LF6	447	520	595	447	447

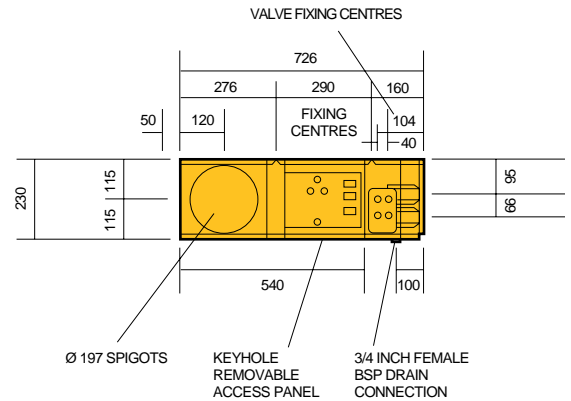
All dimensions shown are in mm.

# Fan Coil Dimensions

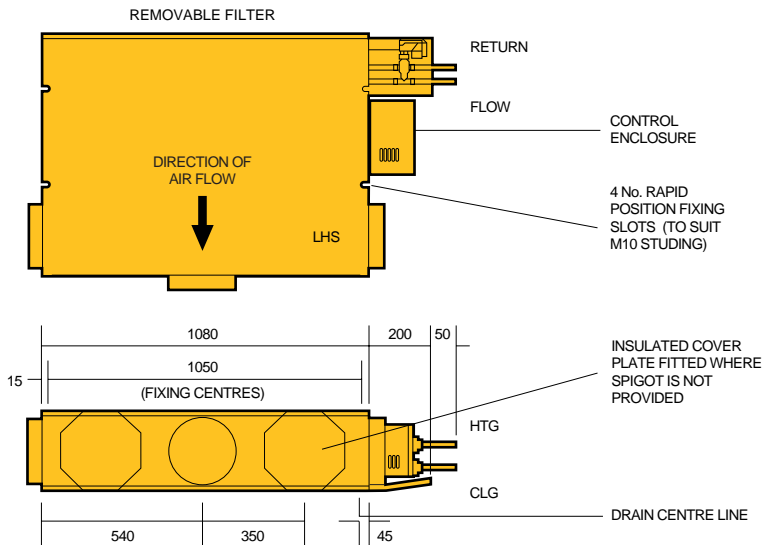
## SP2



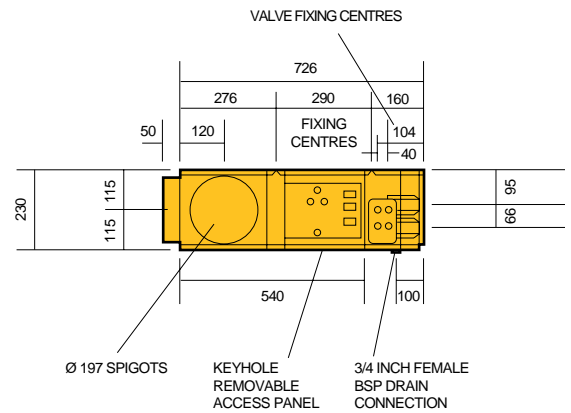
Unit	Weight	HTG Conns	CLG Conns
SP2	35kg	ø15mm	ø15mm



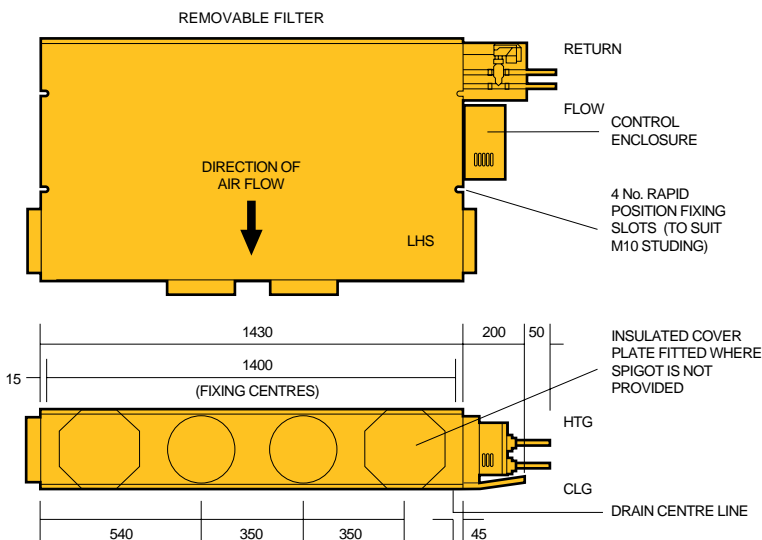
## SP3



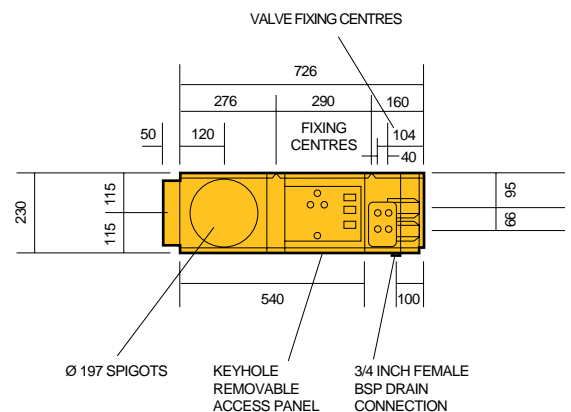
Unit	Weight	HTG Conns	CLG Conns
SP3	50kg	ø15mm	ø22mm



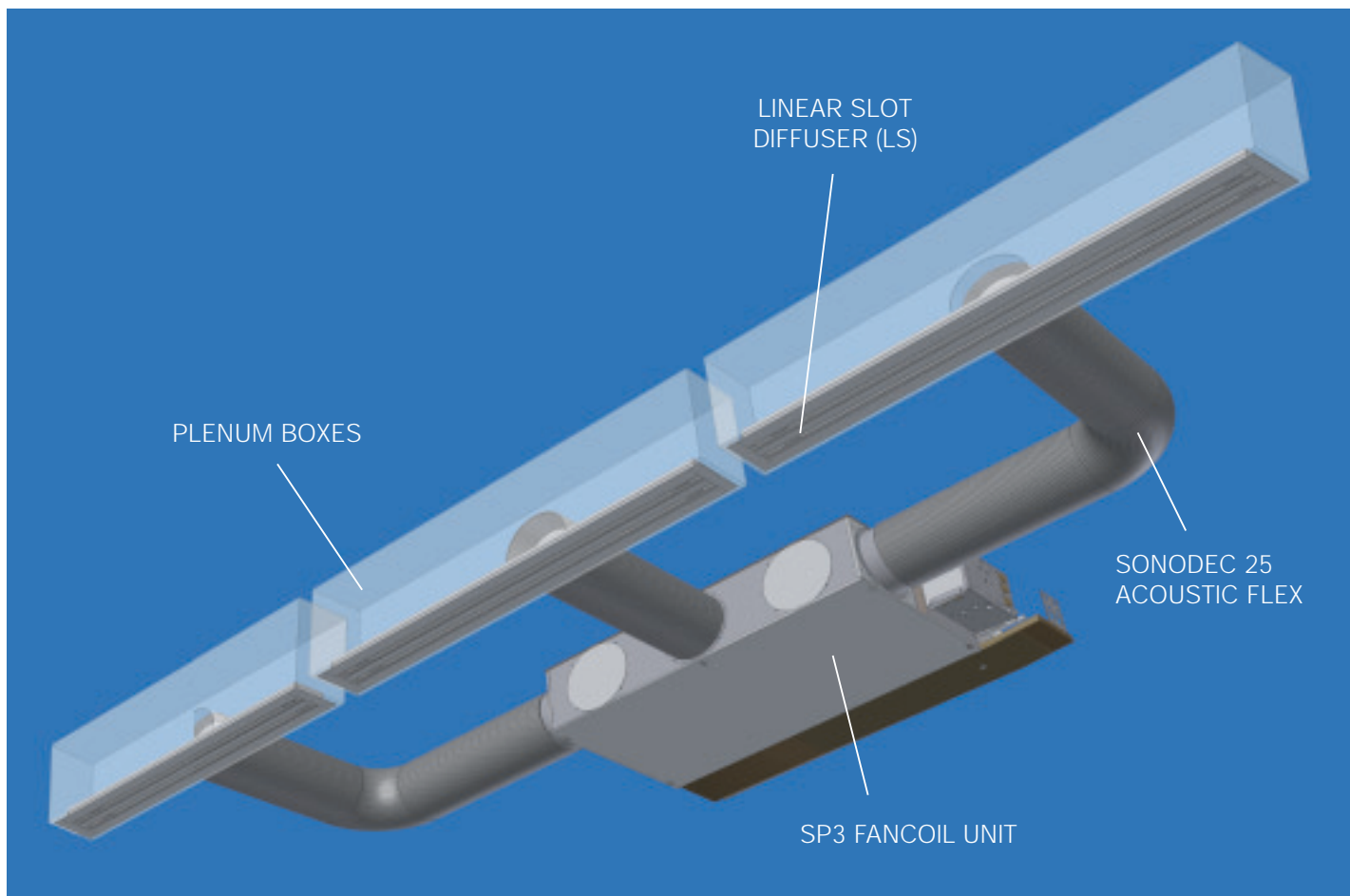
## SP4X



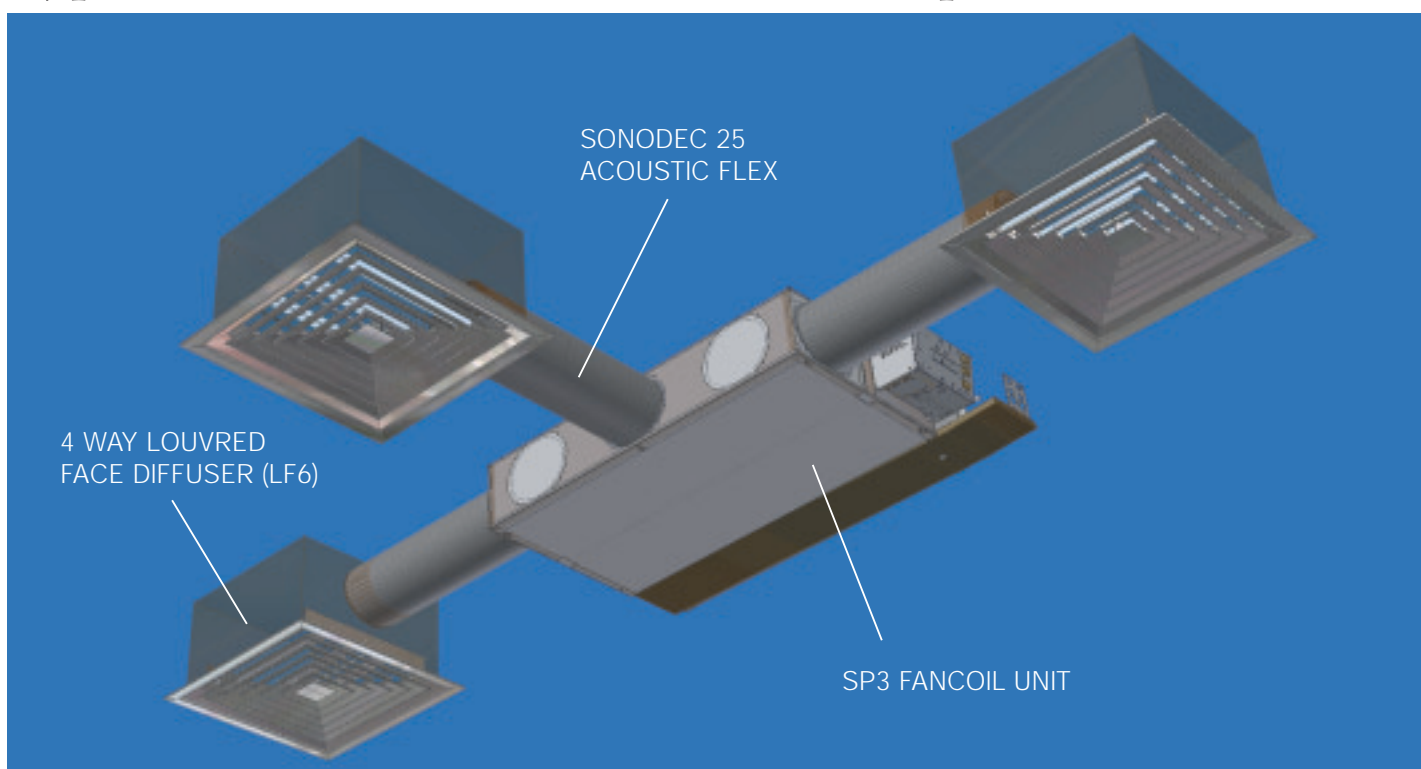
Unit	Weight	HTG Conns	CLG Conns
SP4X	70kg	ø15mm	ø22mm



## Type LS Linear Slot Diffuser Option



## Type LF Louvred-Faced Diffuser Option



# Ordering Procedure **Systempac is available in 9 packages**

## LS Range

**Reference - SP2-LS**      **2kW Thermal Output:** 1 Size 2 Fan Coil Unit including:-  
2 – 3 Slot Linear Diffusers (1195mm long), 2 – Plenum Boxes  
1 – 2m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

**Reference - SP3-LS**      **3kW Thermal Output:** 1 Size 3 Fan Coil Unit including:-  
3 – 3 Slot Linear Diffusers (1195mm long), 3 – Plenum Boxes  
1 – 3m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

**Reference - SP4X-LS**      **4kW Thermal Output:** 1 Size 4x Fan Coil Unit including:-  
4 – 3 Slot Linear Diffusers (1195mm Long), 4 – Plenum Boxes  
1 – 4m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

## LF3 Range

**Reference - SP2-LF3**      **2kW Thermal Output:** 1 Size 2 Fan Coil Unit including:-  
2 – 4 Way Louvred-Faced Diffusers (373 x 373mm O/A), 2 – Plenum Boxes  
1 – 2m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

**Reference - SP3-LF3**      **3kW Thermal Output:** 1 Size 3 Fan Coil Unit including:-  
3 – 4 Way Louvred-Faced Diffusers (373 x 373mm O/A), 3 – Plenum Boxes  
1 – 3m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

**Reference - SP4X-LF3**      **4kW Thermal Output:** 1 Size 4X Fan Coil Unit including:-  
4 – 4 Way Louvred-Faced Diffusers (373 x 373mm O/A), 4 – Plenum Boxes  
1 – 4m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

## LF6 Range

**Reference - SP2-LF6**      **2kW Thermal Output:** 1 Size 2 Fan Coil Unit including:-  
2 – 4 Way Louvred-Faced Diffusers (595 x 595mm Overall\*), 2 – Plenum Boxes  
1 – 2m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

**Reference - SP3-LF6**      **3kW Thermal Output / 1 Size 3 Fan Coil Unit including:-**  
3 – 4 Way Louvred-Faced Diffusers (595 x 595mm Overall\*), 3 – Plenum Boxes  
1 – 3m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

**Reference - SP4X-LF6**      **4kW Thermal Output / 1 Size 4X Fan Coil Unit including:-**  
4 – 4 Way Louvred-Faced Diffusers (595 x 595mm Overall\*), 4 – Plenum Boxes  
1 – 4m minimum length of Acoustic Flexible Ducting (200mm diameter)  
1 - Accessory pack

\*225 x 225 active

## Optional Extras

**A.** Remote room mounted set point adjuster / temperature sensor ( fitted by others).

**B.** Additional 10m lengths of Sonodec25 acoustic flex.

**C.** Return air packages using any of the diffusers shown above.

### Please Note:

All handings for pipework / controls are left hand only.  
Packages detailed include components as listed, refer to individual product specifications

as detailed on page 2.  
Systempac data is based upon the design data as detailed on pages 3 and 4.  
Any deviation will result in differing thermal / volumetric / acoustic performance

characteristics.  
Please specify Systempac reference (e.g. SP4X-LS) and package quantity required.  
Optional extra cost items are available, please contact our Customer Service Offices.

**Please refer to our websites for current prices or contact either Customer Service Office**

# actionair

Actionair, South Street, Whitstable, Kent CT5 3DU  
England  
Tel: (01227) 276100 Fax: (01227) 264262  
International Code: +441227  
Email: sales@actionair.co.uk  
Website: www.actionair.co.uk

# Air Diffusion

Unit 10 Sutherland Court, Brownfields  
Welwyn Garden City, Herts, AL7 1AN  
Tel: 0845 095 1212 Fax: (01707) 294170  
International Code: +441707  
Email: sales@air-diffusion.co.uk  
Website: www.air-diffusion.co.uk

CE

