



Inertia Base Selection Report

Project : Cultural Center Project

Date : 2022-12-01

Customer Name : Sound & Spaces

Kind Attention : Mohammed Zaid

Total BOQ

Tag Number	Inertia base Model	Qty	Isolaror Model	Qty
CHW Pump	EFIB 1600 X 900 X 200	1	EFOS 25/400	6

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Pump Make : TACO

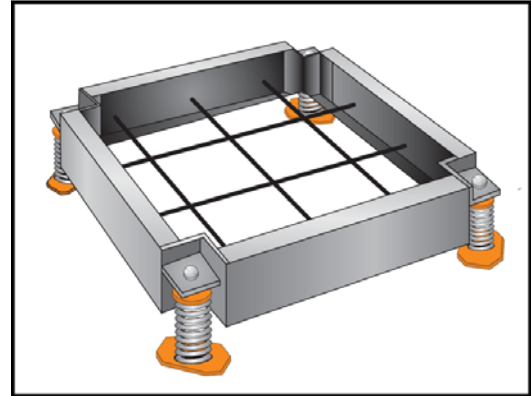
Pump Model : GTA12521-5.5kw

Tag No : CHW Pump

[View Equipment GAD](#)

Requirements Details

Qty	1 Nos
Dy. Weight of Pump (Kg)	401 Kg
Rotational Speed (RPM)	1450 RPM
Number of mounting points	6 Nos
Length of inertia Block (mm)	1600 mm
Width of inertia block (mm)	900 mm
Enter Inertia base thickness (mm)	200 mm
Required Deflection (mm)	25 mm



Product Details

Total weight of Inertia base	71.83 Kg
Density (Kg/m3) of Concrete	2400 Kg/m3
Weight of Concrete Filled(Kg)	691.2 Kg
Total Wt of Inertia Block with conc.(Kg)	763.03 Kg
Total system weight including pump and inertia base (Kg)	1892.68 Kg
Point load at each restraint location(Kg)	315.45 Kg
Est. Deflection, mm	19.72 mm
Natural Frequency, f_n , Hz	3.55 Hz
Disturbing Frequency, f_d , Hz	24.17 Hz
Vibration Isolation Efficiency %	97.8 %

Inertia base model	Qty	Spring Model	Qty
EFIB 1600 X 900 X 200	1	EFOS 25/400	6

Important Note

The equipment should be located on the base such that the load is evenly distributed over the 4 mountings.

Equipment and ancillary parts should not overhang frame and hold down bolts must not be at a distance less than 100 mm from the outer edge of the base.

All the connections to the equipment should incorporate flexible sections and pipework etc. must be independently supported.

Concrete Plinth if any, should be at least 200mm more than the size of base in all directions. In case of installation of rubbers it should be increased to 300mm.

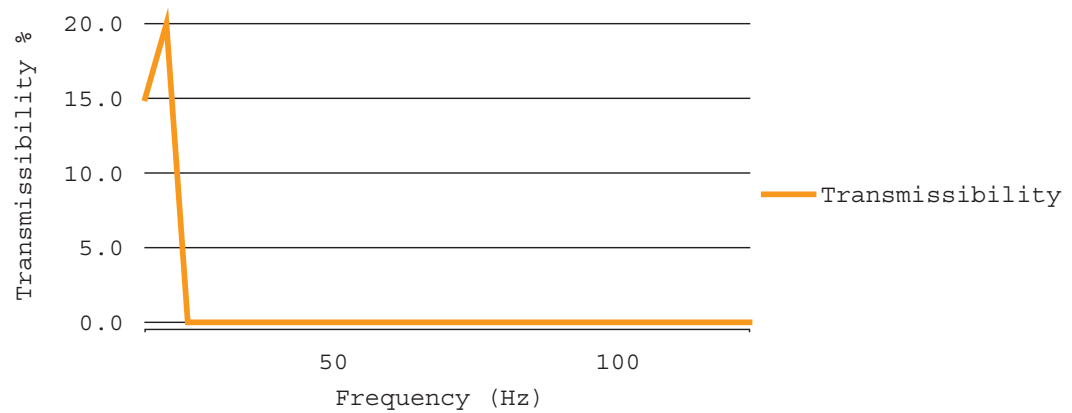
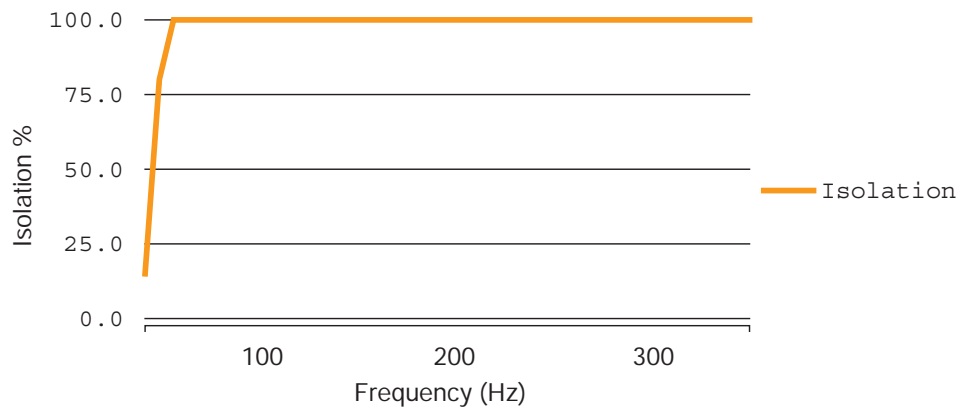
Pump Make : TACO

Pump Model : GTA12521-5.5kw

Tag No : CHW Pump

[View Equipment GAD](#)

Frequency (Hz)	Isolation (%)
10 Hz	80
15 Hz	97.14
20 Hz	99.21
25 Hz	99.62
35 Hz	99.85
50 Hz	99.95
75 Hz	99.98
100 Hz	99.99
200 Hz	100
300 Hz	100



F	8	7	6	5	4	3	2	1
E								
D								
C								
B								
A								

TOTAL NO. OF ROWS - X
TOTAL NO. OF COLUMNS- Y

1 - Inertia base - CHW Pump-GTA12521-5.5kwX1No

TECHNICAL TERMS:

- Prices quoted are without concrete.
- Height saving brackets are employed in 6 mounting locations to provide a base clearance of at least 50 mm.
- The metal reinforcement consists of 12 mm. bar, welded in layers running both ways 40 mm. from the bottom.
- Spring Isolators will have a deflection of 25 mm.
- Frame weight includes concrete density of 2400 Kg/m³
- All dimensions are in mm.
- Concrete plinth, if any should be made at least 200 mm. more than the size of the inertia base in all directions.

Client Name:-

TITLE:- Easy Flex Brand Inertia Base With OS Mounts

	Software generated	DRAWING NO. KIC/IB/VK-001	DATE 2022-12-01	Rev - 0

OWNER :
KANWAL INDUSTRIAL CORPORATION
B - 168 , PHASE II ,
NOIDA - 201305, U.P. INDIA

INERTIA BASE FOUNDATION DETAILS

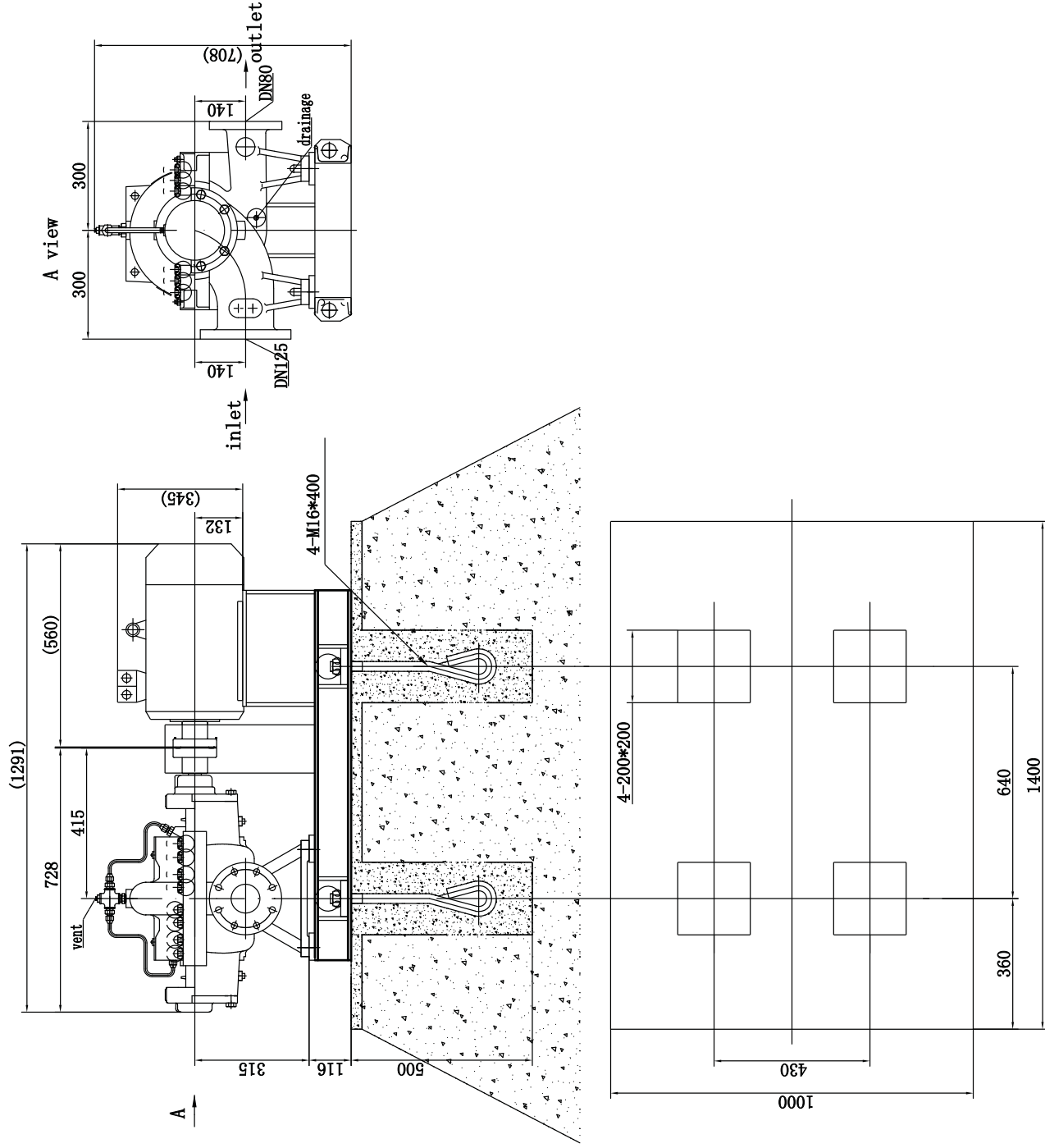
Size (A XB)	1600 X 900 mm
CHANNEL HEIGHT (W)	200 mm
PUMP WEIGHT (Dynamic)	401 Kg
EFIB + CrWt.	763.03 Kg
X -ROWS	10 Nos
Y- COLUMNS	6 Nos
SPRING SIZE	EFOS 25/400
QUANTITY	6 Nos

SPACE FOR CLIENT APPROVAL

SEAL AND SIGNATURE

4	PLATE	IS 2062 Gr. II	6 Nos.
3	SPRING (EFOS)	As Per Catalogue	6 Nos.
2	BAR (Ø 12)	IS 2062 Gr. II	As Per Above Table
1	CHANNEL - WX50	IS 2062 Gr. II	6Nos
ITEM	ITEM	MATERIAL	QTY

GTA12521 pump drawing (4P, 5.5KW)



pump:241KG
base:69KG
motor:66KG
other:25KG
total:401KG

Introduction

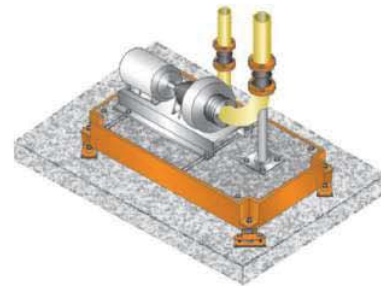
Inertia bases and vibration mountings are designed to reduce the transmission of noise and vibration from equipment to building structures and associated pipework. When installed with rubber bellows or stainless steel hose & pump connectors they provide an ideal vibration and noise isolation solution. Inertia bases are designed to support reciprocating equipment such as pumps, chillers, generators and air handling equipment. The inertia base is manufactured from a fully welded carbon steel zinc frame fitted with vibration mounts. The inertia base are specifically designed and engineered to receive poured concrete which can be supplied empty, pre-filled with concrete or pre-filled with Pumps fitted. It is by adding this mass and by lowering equipment centre of gravity it is installed under that enables the inertia base to provide a stable support. This is particularly important for equipment which exhibits high out-of-balance forces and are top-heavy such as pumps. The concrete base enables a reduction in motion from pump start up and minimises the effect of unequal load distribution. Inertia bases are not only manufactured to suit the equipment for which it's designed to support but can also be sized to suit site conditions. This is particularly advantageous in tight restrictive areas such as building services plant rooms. All Bases are supplied with Anti-Vibration Mounts designed to support the combined load of Pump, Concrete Base and Water and retain a 50% overcapacity. When installing rubber bellows to a pump that is supported by inertia base the rubber bellows should be supplied with tie bars. Tied units are designed to stop the bellows from elongating and prevent the pressure thrust being transmitted on to the pumps and associated pipework. Easyflex rubber flexible connectors are supplied with threaded tie rods whose primary function is to maintain the supplied length of the rubber bellows under pressure while permitting only lateral deflection.



Easyflex Inertia Base come in several standard sizes as listed in our catalogue. However, these bases can also be manufactured to any size and specifications, even for heavier and more complex vibration isolation problems, where viscous damping may also be required. For frame lengths greater than 2400 mm we would normally recommend 6 isolators or more for exceptionally large bases.

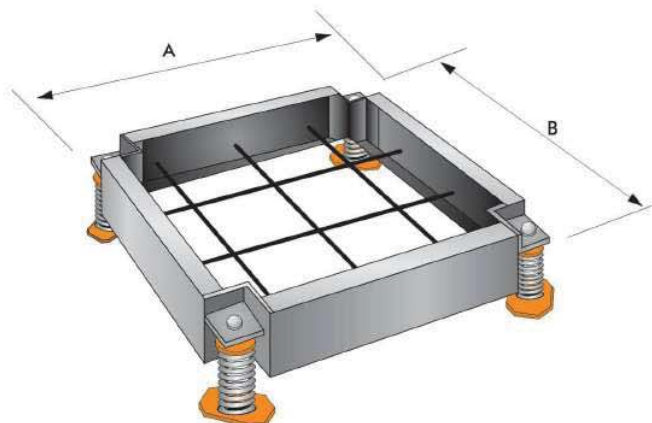
Examples of equipment requiring Inertia Base are as follows:

- Reciprocating Compressors
- Diesel Generating Sets
- Engine / Dynamometer Test Rigs
- Refrigeration Plants
- Pumps (Particularly Belt Driven Types)



Features

- Fully welded steel construction with integral concrete reinforcement fixed at 40 mm above bottom of frame.
- Recessed height reducing corner brackets designed to accept standard Easyflex type EFOS open spring mountings or EFESI Mounts.
- Range of standard size frames available in three thicknesses 150, 200, 300 & 350 mm. Frame thickness not less than $L/12$ where "L" is the longest side of the frame as per ASHRAE.
- Finished with a single coat of red oxide primer on external surface only.
- Fabricated using formed steel channel (EFIB). Optionally available in structural steel channel construction.
- Available for any equipment dimension. Rectangular shape supplied as standard. T-shape offered where it is required to support elbows of horizontal split casing pumps on the base itself.
- Reinforced with 12mm OD welded-in steel rebar each way, at approximately 150mm spacing.
- Provided with height saving isolator fixing brackets. External brackets are supplied as standard. Recessed brackets are offered in case of space constraints.
- Supplied together with Easyflex isolator, Selection of mount type/models forms part of the EFIB design process, to provide a complete vibration isolation solution. Frames are compatible with Open, Cased and Restrained mounts.



Notes

Frame weights include concrete density at 2400 Kg/m³ and mounting selections are based on 4 mountings per base allowing 50% additional weight for the equipment to be supported. Nominal 25 mm deflection type EFOS (Open Spring Isolators) have been listed, however the exact deflection will vary depending on the applied load.

When ordering, bases should be specified as follows: EFIB 150 - 600 x 900 Other Size. Type and Thickness required and plan dimensions commencing with smallest length. Mountings should also be listed e.g. "EFOS25/100-BLUE"

Important

The equipment should be located on the base such that the load is evenly distributed over the 4 mountings.

Equipment and ancillary parts should not overhang frame and hold down bolts must not be at a distance less than 100 mm from the outer edge of the base.

All the connections to the equipment should incorporate flexible sections and pipework etc. must be independently supported.

Concrete Plinth if any, should be at least 200mm more than the size of base in all directions. In case of installation of snubbers it should be increased to 300mm.

Compliance - Easyflex Inertia Bases are designed according to ASHRAE guidelines.

Ordering Information Required

- Equipment Model / Make
- HP / RPM of Motor
- Static Weight of equipment
- Operating / Dynamic weight of equipment
- Outside Dimensions L x B x H
- Concrete Plinth Y/N
- Height / Space Constraint if any
- Required Deflection of Spring (25mm / 50mm)
- Location - Ground | Roof | Basement

Standard Base Sizes & Mounting Selection

FRAME SIZE A X B (mm)	150mm THICK WT(Kg)	MOUNT PART NO.	200mm THICK WT(Kg)	MOUNT PART NO.	300mm THICK WT(Kg)	MOUNT PART NO.
600 x 600	147	EFOS25/60 Green				
600 x 750	180	EFOS25/100 Blue				
600 x 900	211	EFOS25/100 Blue				
600 x 1200	277	EFOS25/160 White				
600 x 1500	341	EFOS25/160 White				
750 x 750	219	EFOS25/100 Blue	288	EFOS25/160 White		
750 x 900	259	EFOS25/100 Blue	342	EFOS25/160 White		
750 x 1200	339	EFOS25/160 White	448	EFOS25/250 Red		
750 x 1500	420	EFOS25/160 White	554	EFOS25/250 Red		
750 x 1800	500	EFOS25/250 Red	660	EFOS25/300 Purple		
900 x 900	307	EFOS25/160 White	404	EFOS25/160 White	600	EFOS25/300 Purple
900 x 1200	402	EFOS25/160 White	531	EFOS25/250 Red	788	EFOS25/300 Purple
900 x 1500	498	EFOS25/250 Red	658	EFOS25/300 Purple	977	EFOS25/400 Grey
900 x 1800	594	EFOS25/250 Red	785	EFOS25/300 Purple	1166	EFOS25/500 Orange
900 x 2100			911	EFOS25/400 Grey	1353	EFOS25/500 Orange
1050 x 1050	465	EFOS25/250 Red	542	EFOS25/250 Red	804	EFOS25/300 Purple
1500 x 1500	575	EFOS25/250 Red	761	EFOS25/300 Purple	1121	EFOS25/500 Orange
1050 x 1800	687	EFOS25/300 Purple	908	EFOS25/400 Grey	1350	EFOS25/500 Orange
1050 x 2100			1055	EFOS25/400 Grey	1570	EFOS25/600 Brown
1050 x 2400			1201	EFOS25/500 Orange	1788	EFOS25/800 Green
1200 x 1200			699	EFOS25/300 Purple	1038	EFOS25/40 Grey
1200 x 1500			865	EFOS25/400 Grey	1286	EFOS25/50 Orange
1200 x 1800			1032	EFOS25/400 Grey	1536	EFOS25/60 Brown
1200 x 2100			1199	EFOS25/500 Orange	1785	EFOS25/80 Green
1200 x 2400			1369	EFOS25/600 Brown	2038	EFOS25/80 Green
1400 x 1400					1397	EFOS25/600 Brown
1400 x 1800					1783	EFOS25/800 Green
1400 x 2100					12074	EFOS25/800 Green

- Due to policy of continual improvement, the specifications are subject to change without prior notice.
- Measurements are subject to 5% tolerance.
- To achieve good results do not over load fitting more than designed parameters as per drawing / catalogue.



Design Features

- Unique expanding rubber and fixing of spring which also provides high frequency attenuation.
- Nominal 20, 25 & 50 mm deflection colour coded springs with 50% overload capacity.
- Can be bolted to supporting structure or free standing on 6mm thick ribbed rubber pad.
- Fully height adjustable.
- Zinc plated metals.
- No snubbing gives maximum efficiency.

Isolation Efficiency at Typical Machine Speeds

M/C Speed (rpm)	EFFICIENCY %		
	15mm DEFL	25mm DEFL	50mm DEFL
300	do not use	34.0	75.2
500	68.7	83.3	92.3
750	88.1	93.2	96.7
1000	93.7	96.3	98.2
1200	95.5	97.4	98.7
1500	97.3	98.4	99.2
1750	98.0	99.8	99.4
2000	98.5	99.1	99.5

This unique range of open spring mounting uses an integral rubber end fixing of the spring which sets them apart from all other designs. Loose springs and plates are now history and high frequency and noise attenuation is provided regardless of whether rubber seating pad is used or not.

Originally designed for use with type IPF Inertia Pouring Frames, the EFOS Mountings are now widely used to isolate vibration from every conceivable type of rotating and reciprocating machine. Some examples being air handling units, axial and centrifugal fans, low level pipe work, ductwork, condensing units, pumps, generating sets, chillers, etc. Where control of transient motion is required open spring mountings can be used in conjunction with our Viscous Dampers Type EFVD.

Size	LOAD RANGE (kg)	NOMINAL DEFLECTION (mm)
EFOSB	10-100	20
EFOS25	30-2300	25
EFOS50	100-1300	50

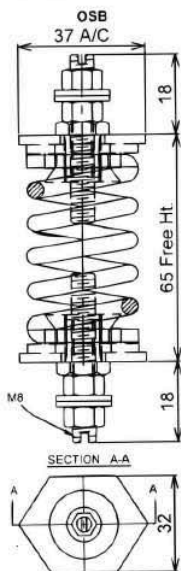
This above figures are theoretical values only based on the vertical natural frequency of the spring system assuming in infinitely stiff structural supports. The effects of high frequency spring coil resonances on low frequency performance are also ignored.

Compliance - Springs designed according to BS 1726 (Part 1) and recommendations made by SAE (US) and ASHRAE

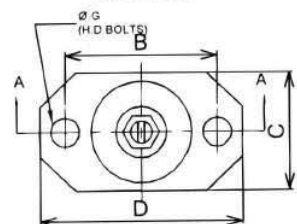
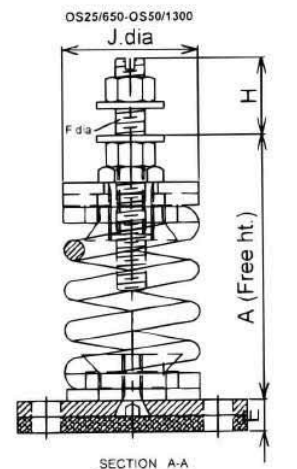
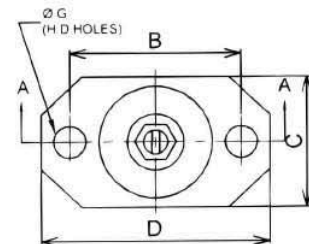
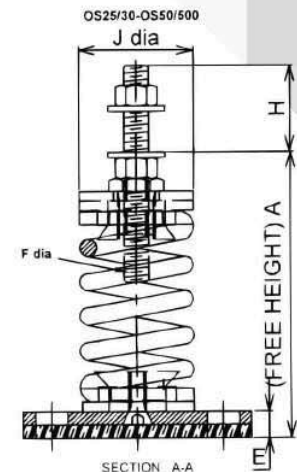
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- Measurements are subject to 5% tolerance, Load and Deflection subject to 10% tolerance.
- To achieve good sound suppression do not over load fitting.

PART NO.	COLOUR CODE	RATED LOAD (KG)	DEFLECTION AT RATED	DIMENSIONS (mm)							
				A	B	C	D	E	F	G	H
EFOS25/30	Yellow	30	25								
EFOS25/60	Green	60	25	115	85	70	110	10	M10	10	55
EFOS25/100	Blue	100	25								
EFOS25/160	White	160	25								
EFOS25/250	Red	250	25								
EFOS25/200	Red	200	25								
EFOS25/300	Purple	300	25								
EFOS25/400	Grey	400	25								
EFOS25/500	Orange	500	25	160	110	100	140	11	M16	12	75
EFOS25/600	Brown	600	25								
EFOS25/700	Orange	700	25								
EFOS25/800	Black	800	25								
EFOS50/100	Yellow	100	50								
EFOS50/200	Green	200	50								
EFOS50/300	Blue	300	50	188	110	100	140	11	M16	12	75
EFOS50/400	White	400	50								
EFOS50/500	Black	500	50								
EFOS25/650	Yellow	650	26								
EFOS25/850	Green	850	27	182	110	100	140	11	M16	12	75
EFOS25/1050	Blue	1050	26								
EFOS25/1250	White	1250	26								
EFOS25/1300	Red	1300	27								
EFOS25/1600	Purple	1600	25	225	210	150	250	18	M24	16	75
EFOS25/2000	Grey	2000	26								
EFOS25/2300	Brown	2300	29								
EFOS50/510	Black/Purple	510	51								
EFOS50/760	Black/Grey	760	51								
EFOS50/1000	Black/Orange	1000	50	240	210	150	250	18	M20	16	80
EFOS50/1300	Black/Brown	1300	53								

Spring Stiffness is linear over its working range.



PART NO.	COLOUR CODE	RATED LOAD (KG)	DEFLECTION AT RATED LOAD (MM)
EFOSB20/10	Purple	10	20
EFOSB20/15	Yellow	15	20
EFOSB20/20	Grey	20	20
EFOSB20/40	Green	40	20
EFOSB20/70	Red	70	20
EFOSB20/100	Blue	100	20



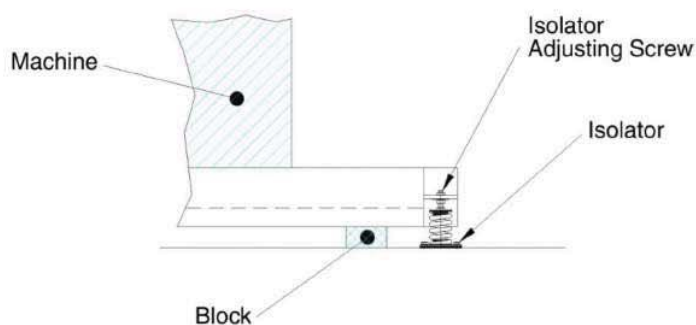
Compliance - Springs designed according to BS 1726 (Part 1) and recommendations made by SAE (US) and ASHRAE

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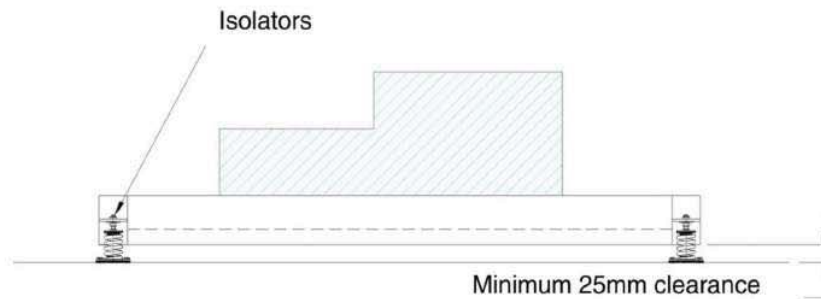
1. The inertia base frame without isolators should be laid with the internal mesh closest to the floor on a polythene sheet or similar material. This should be a minimum of 100 mm larger on all sides than the inertia base frame with a thickness of 500 to 1000 microns, in order to facilitate base separation once the concrete has been poured and cured. It is important that the frame be positioned on a level surface in order that the polythene provides an effective seal around the perimeter of the frame preventing percolation of concrete when being poured. Concrete plinth or Housekeeping Pad if any should be at least 150mm more than the size of inertia base in all directions so that isolators can be easily installed.



2. The concrete mix infill with a compressive strength of at least 16 to 20 N/mm² C16/20) can then be poured into the frame. It is important the reinforcement mesh is not damaged and no air pockets exist around corners and edges. Water to be poured on Concrete at least 4 times in a day to ensure strong curing.
3. When the concrete has cured sufficiently (minimum of 72 hours) the equipment or machine can then be securely fixed to the upper surface using suitable expanding bolt type fixings. Note: it is important that the centre of gravity of the equipment or machine is positioned vertically above the centre of gravity of the inertia Base frame.
4. The frame should now be lifted using a minimum of four hydraulic jacks (more are required for large sectional frames) positioned under each frame bracket and intermediate positions if required. The jacks must be raised simultaneously to ensure that the frame remains as level as possible during the lift. Once clear of the floor the polythene sheeting must be removed and the frame lifted to a height so that the selected isolators can be positioned under the supporting brackets as shown. Wood or steel blocks correctly sized to fit the gap under the frame must then be positioned evenly around the frame to provide a level and solid support. Once this has been achieved the jacks can be removed.



5. The selected isolators can now be installed and the top screws adjusted or shimmed to the underside of the supporting brackets. The hydraulic jacks can now be repositioned and raised sufficiently only to remove the blocks. The jacks can then be lowered and removed, whereupon the isolators will take the full load of the equipment and inertia base weight. Further adjustment of the isolators may be necessary in order to achieve a level installation and required clearance beneath the frame (see relative isolator installation instructions). It is important that all connections to the isolated equipment be flexible in order to prevent a short circuit or transmission of vibration to the surrounding equipment or structure.



Please contact our Technical Department at the address below if you have any problems relating to installation or selection.