

VIBRATION ISOLATION

Product Selection Guide

for HVAC Equipment

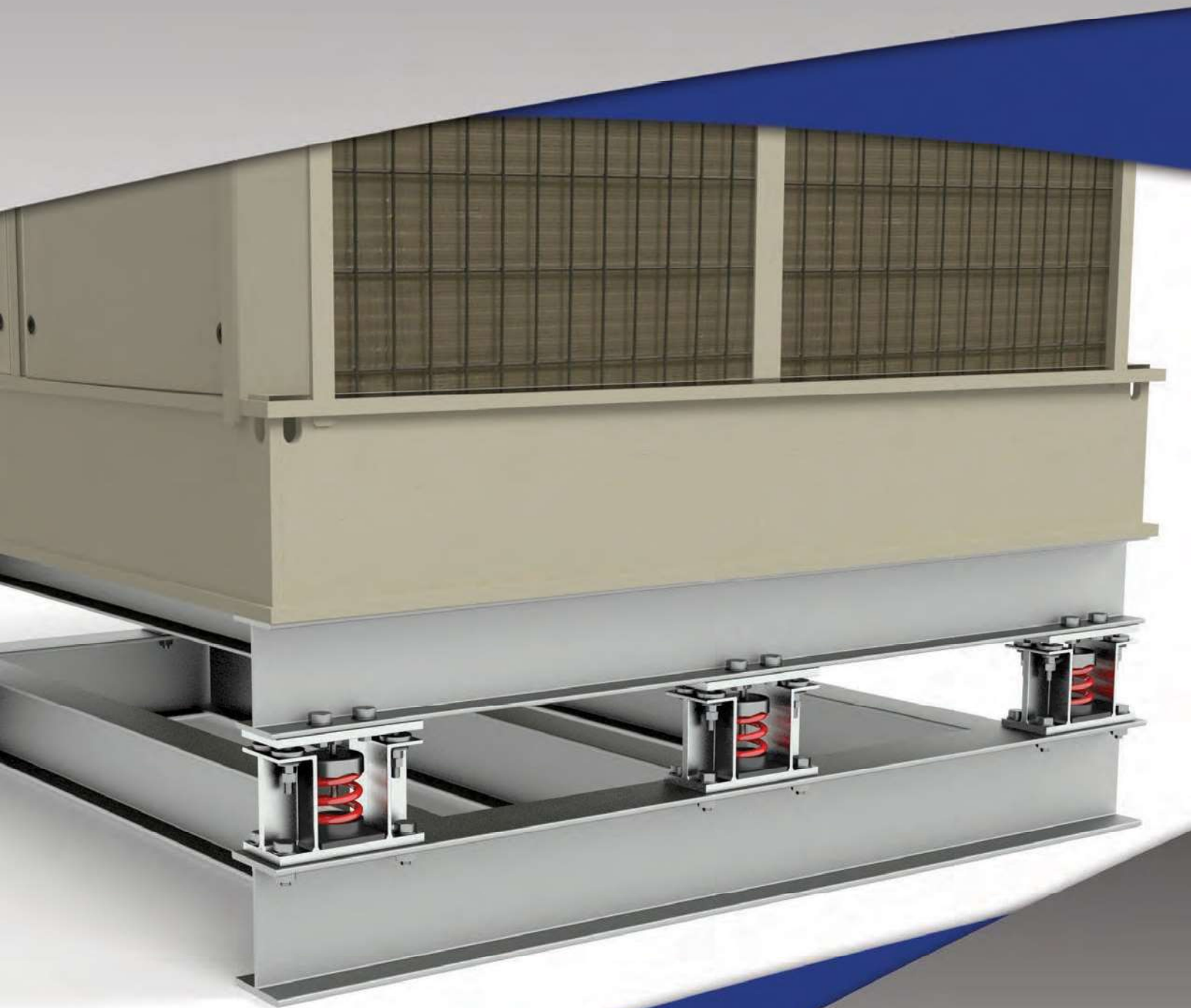


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Vibration Isolation and Seismic Control Basics:

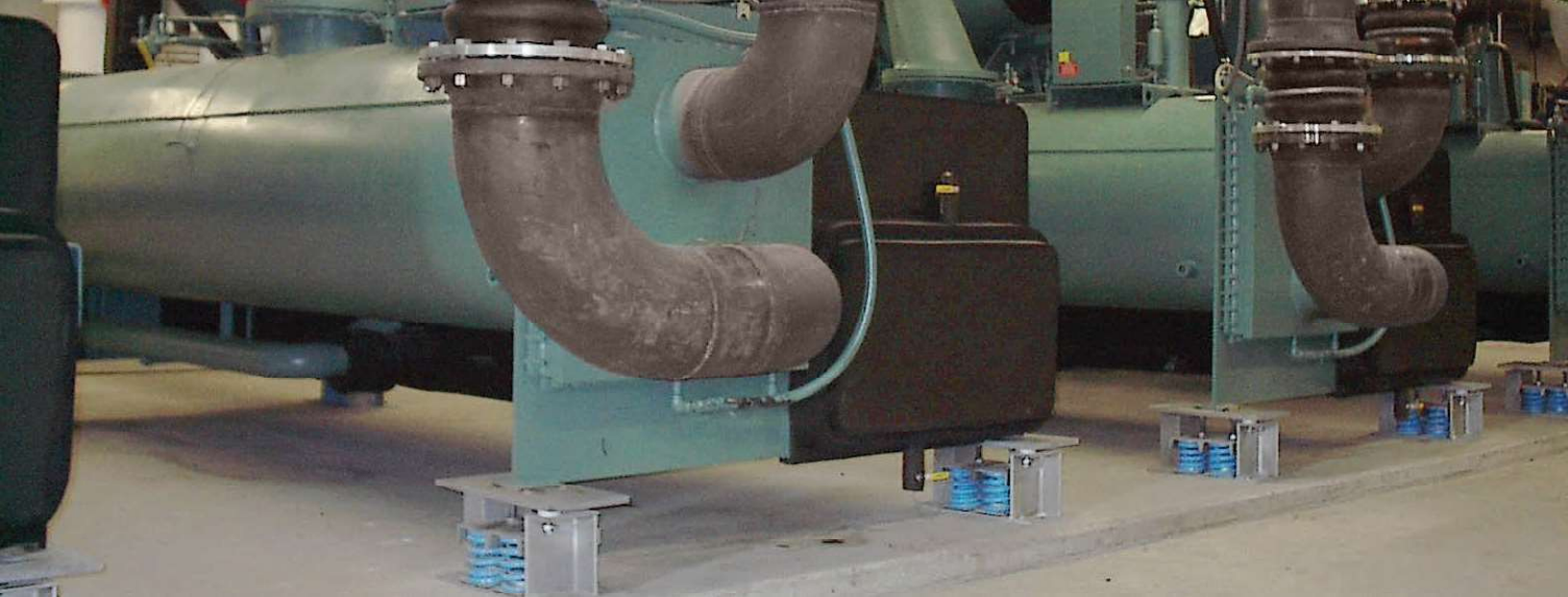
Mechanical vibration and vibration-induced noise are common sources of occupant complaints in modern buildings. Vibration is caused by reciprocating motion from rotating components within mechanical equipment. All reciprocating, or rotating equipment should be isolated to reduce transmission of vibration into the structure. Kinetics Noise Control provides technical assistance in the selection and specification of tailor-made isolation systems and vibration isolation products that enable building owners to install complex heating, ventilation and air-conditioning systems without the worry of vibration problems.

If you have a Vibration Issue:

Isolator deflections shown in the following pages are based on the data published in the 2015 ASHRAE Handbook. Recommended isolator type, base type, and minimum static deflection are reasonable and safe recommendations for most HVAC equipment installations. Additional assistance from one of our many qualified representatives or acoustical consultants can also be very useful in resolving these problems.

Engineering Expertise:

Building codes are constantly updated with stricter requirements for seismic, wind and blast protection. Kinetics offers a complete line of restrained vibration isolators to satisfy current building code requirements as well as complete engineering support. Our highly skilled engineering staff focus on labor savings and constructability in line with current directions in mechanical construction. We offer streamlined and cost effective engineered solutions along with professional and structural engineering stamps to meet any specification requirements in all 50 states. Kinetics' unsurpassed expertise will ensure success with highly complex hospital, government and military projects as well as the unique challenges of design/build projects.



Equipment Type:

Refrigeration Machines and Chillers*

Equipment Category	Equipment Location											
	Floor Span											
	Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)		
	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.
Reciprocating	A	2	0.25" (6)	A	4	0.75" (19)	A	4	1.50" (38)	A	4	2.50" (64)
Centrifugal, scroll	A	1	0.25" (6)	A	4	0.75" (19)	A	4	1.50" (38)	A	4	1.50" (38)
Screw	A	1	1.00" (25)	A	4	1.50" (38)	A	4	2.50" (64)	A	4	2.50" (64)
Absorption	A	4	0.25" (6)	A	4	0.75" (19)	A	4	1.50" (38)	A	4	1.50" (38)
Air-cooled recip., scroll	A	1	0.25" (6)	A	4	1.50" (38)	A	4	1.50" (38)	A	4	2.50" (64)
Air-cooled screw	A	4	1.00" (25)	A	4	1.50" (38)	B	4	2.50" (64)	B	4	2.50" (64)

*Data from 2015 ASHRAE Handbook. See back cover for additional notes on Refrigeration Machines.



KIP



RSP



RDS



FH



TITAN

ASHRAE TYPE 1:
Fiberglass or Neoprene Pad
See page 12 for more details

KINETICS KIP Fiberglass Pad
KINETICS NP Neoprene Pad
KINETICS NG Neoprene Pad
KINETICS RSP Neoprene Pad

ASHRAE TYPE 2:
Floor Isolator or Hanger
See page 13 for more details

KINETICS AC Fiberglass Mount
KINETICS RDS Neoprene Mount
KINETICS RQ Neoprene Mount
KINETICS FH Fiberglass Hanger
KINETICS RH Neoprene Hanger

ASHRAE TYPE 4:
Restrained Spring Isolator
See page 15 for more details

KINETICS TITAN
KINETICS FMS
KINETICS FLS
KINETICS FLSS

BASE TYPE A:
Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE B:
Structural Steel Rails or Base
See page 17 for more details

KINETICS SBB Structural Rail Base
KINETICS SFB Structural Beam Base



Equipment Type:

Air Compressors and Vacuum Pumps*

Equipment Category	Equipment Location											
	Floor Span											
	Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)		
	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.
Tank-mounted horizontal												
≤10 HP	A	3	0.75" (19)	A	3	0.75" (19)	A	3	1.50" (38)	A	3	1.50" (38)
≥10 HP	C	3	0.75" (19)	C	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)
Tank-mounted vertical	C	3	0.75" (19)	C	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)
Base-Mounted	C	3	0.75" (19)	C	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)
Large Reciprocating	C	3	0.75" (19)	C	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)

*Data from 2015 ASHRAE Handbook. See back cover for additional notes on **Compressors**.

**For seismic & wind applications, use ASHRAE TYPE 4



FDS



SFH



TITAN

ASHRAE TYPE 3: Spring Floor Isolator or Hanger

See page 14 for more details

KINETICS FDS Free-Standing Isolator

KINETICS SL Housed Isolator

KINETICS SM Housed Isolator

KINETICS SFH Fiberglass Hanger

KINETICS SRH Neoprene Hanger

KINETICS SH Hanger

ASHRAE TYPE 4: Restrained Spring Isolator

See page 15 for more details

KINETICS TITAN

KINETICS FMS

KINETICS FLS

KINETICS FLSS

KINETICS FHS

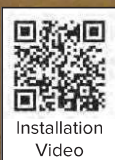
BASE TYPE A: Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE C: Concrete Inertia Base

See page 17 for more details

KINETICS CIB



Equipment Type:

Pumps*

Equipment Location												
Equipment Category	Floor Span											
	Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)		
	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.
Close-Coupled												
≤7.5 HP	B	2	0.25" (6)	C	3	0.75" (19)	C	3	0.75" (19)	C	3	0.75" (19)
≥7.5 HP	C	3	0.75" (19)	C	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)
Large Inline												
5 to 25 HP	A	3	0.75" (19)	A	3	1.50" (38)	A	3	1.50" (38)	A	3	1.50" (38)
≥25 HP	A	3	1.50" (38)	A	3	1.50" (38)	A	3	1.50" (38)	A	3	2.50" (64)
End Suction/Split Case												
≤40 HP	C	3	0.75" (19)	C	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)
50 to 125 HP	C	3	0.75" (19)	C	3	0.75" (19)	C	3	1.50" (38)	C	3	2.50" (64)
≥150 HP	C	3	0.75" (19)	C	3	1.50" (38)	C	3	2.50" (64)	C	3	3.50" (89)
Packaged Pump Systems	A	3	0.75" (19)	A	3	0.75" (19)	A	3	1.50" (38)	C	3	2.50" (64)

*Data from 2015 ASHRAE Handbook. See back cover for additional notes on **Pumps**.

**For seismic & wind applications, use ASHRAE TYPE 4



RQ



FH

ASHRAE TYPE 2: Floor Isolator or Hanger

See page 13 for more details

KINETICS AC Fiberglass Mount
KINETICS RD Neoprene Mount
KINETICS RQ Neoprene Mount
KINETICS FH Fiberglass Hanger
KINETICS RH Neoprene Hanger



FDS



SFH

ASHRAE TYPE 3: Spring Floor Isolator or Hanger

See page 14 for more details

KINETICS FDS Free-Standing Isolator
KINETICS SL Houed Isolator
KINETICS SM Houed Isolator
KINETICS SFH Fiberglass Hanger
KINETICS SRH Neoprene Hanger
KINETICS SH Hanger



FHS



Inline Pump Stand

ASHRAE TYPE 4: Restrained Spring Isolator

See page 15 for more details

KINETICS Inline Pump Stands
KINETICS FMS
KINETICS FLS
KINETICS FLSS
KINETICS FHS
KINETICS TITAN

BASE TYPE A: Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE B: Structural Steel Rails or Base

KINETICS SBB Structural Rail Base
KINETICS SFB Structural Beam Base
KINETICS Inline Pump Stands

BASE TYPE C: Concrete Inertia Base

See page 17 for more details

KINETICS CIB



Equipment Type:

Axial, Plenum, Cabinet, and Centrifugal Inline Fans*

Equipment Location													
Equipment Category	Floor Span												
	Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)			
	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	
Up to 22 in. diameter	A	2	0.25" (6)	A	3	0.75" (19)	A	3	0.75" (19)	C	3	0.75" (19)	
24 in. diameter and up													
≤2.0 in. SP													
RPM	Up to 300	B	3	2.50" (64)	C	3	3.50" (89)	C	3	3.50" (89)	C	3	3.50" (89)
	301 to 500	B	3	0.75" (19)	B	3	1.50" (38)	C	3	2.50" (64)	C	3	2.50" (64)
	500 and up	B	3	0.75" (19)	B	3	1.50" (38)	B	3	1.50" (38)	B	3	1.50" (38)
≥2.1 in. SP													
RPM	Up to 300	C	3	2.50" (64)	C	3	3.50" (89)	C	3	3.50" (89)	C	3	3.50" (89)
	301 to 500	C	3	1.50" (38)	C	3	1.50" (38)	C	3	2.50" (64)	C	3	2.50" (64)
	500 and up	C	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)	C	3	2.50" (64)

*Data from 2015 ASHRAE Handbook.

**For seismic & wind applications, use ASHRAE TYPE 4



RDS



FH



FDS



SFH



HSR

ASHRAE TYPE 2:

Floor Isolator or Hanger

See page 13 for more details

KINETICS AC Fiberglass Mount
KINETICS RD Neoprene Mount
KINETICS RDS Neoprene Mount
KINETICS RQ Neoprene Mount
KINETICS FH Fiberglass Hanger
KINETICS RH Neoprene Hanger

ASHRAE TYPE 3:

Spring Floor Isolator or Hanger

See page 14 for more details

KINETICS FDS Free-Standing Isolator
KINETICS SL Housed Isolator
KINETICS SM Housed Isolator
KINETICS SFH Fiberglass Hanger
KINETICS SRH Neoprene Hanger
KINETICS SH Hanger

ASHRAE TYPE 4/TYPE 5:

Restrained Spring Isolator

See page 15 for more details

KINETICS TITAN
KINETICS FMS
KINETICS FLS
KINETICS FLSS
KINETICS FHS
KINETICS HSR (TYPE 5)

BASE TYPE A:

Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE B:

Structural Steel Rails or Base

See page 17 for more details

KINETICS SBB Structural Rail Base
KINETICS SFB Structural Beam Base

BASE TYPE C:

Concrete Inertia Base

See page 17 for more details

KINETICS CIB



Equipment Type:

Centrifugal Fans*

Equipment Location													
Equipment Category	Floor Span												
	Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)			
	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	
Up to 22 in. diameter	B	2	0.25" (6)	B	3	0.75" (19)	B	3	0.75" (19)	B	3	1.50" (38)	
24 in. diameter and up													
≤40 HP													
RPM	Up to 300	B	3	2.50" (64)	B	3	3.50" (89)	B	3	3.50" (89)	B	3	3.50" (89)
	301 to 500	B	3	1.50" (38)	B	3	1.50" (38)	B	3	2.50" (64)	B	3	2.50" (64)
	501 and up	B	3	0.75" (19)	B	3	0.75" (19)	B	3	0.75" (19)	B	3	1.50" (38)
≥50 HP													
RPM	Up to 300	C	3	2.50" (64)	C	3	3.50" (89)	C	3	3.50" (89)	C	3	3.50" (89)
	301 to 500	C	3	1.50" (38)	C	3	1.50" (38)	C	3	2.50" (64)	C	3	2.50" (64)
	501 and up	C	3	1.00" (25)	C	3	1.50" (38)	C	3	1.50" (38)	C	3	2.50" (64)

*Data from 2015 ASHRAE Handbook. See back cover for additional notes on **Fans**.

**For seismic & wind applications, use ASHRAE TYPE 4

***For curb mounted fans see BASE TYPE D



RQ



FH

ASHRAE TYPE 2:

Floor Isolator or Hanger

See page 13 for more details

KINETICS AC Fiberglass Mount
KINETICS RD Neoprene Mount
KINETICS RQ Neoprene Mount
KINETICS FH Fiberglass Hanger
KINETICS RH Neoprene Hanger



FDS



SFH

ASHRAE TYPE 3:

Spring Floor Isolator or Hanger

See page 14 for more details

KINETICS FDS Free-Standing Isolator
KINETICS SL Housed Isolator
KINETICS SM Housed Isolator
KINETICS SFH Fiberglass Hanger
KINETICS SRH Neoprene Hanger
KINETICS SH Hanger



FHS

ASHRAE TYPE 4:

Restrained Spring Isolator

See page 15 for more details

KINETICS TITAN
KINETICS FMS
KINETICS FLS
KINETICS FLSS
KINETICS FHS
KINETICS LDR

BASE TYPE B:

Structural Steel Rails or Base

See page 17 for more details

KINETICS SBB Structural Rail Base
KINETICS SFB Structural Beam Base

BASE TYPE C:

Concrete Inertia Base

See page 17 for more details

KINETICS CIB-L
KINETICS CIB-H
KINETICS CIB-SS

BASE TYPE D:

Curb-Mounted Base

See page 18 for more details

KINETICS KSR Isolation Rail
KINETICS KSCR Isolation Curb
KINETICS ESR Isolation Curb



Installation
Video

Equipment Type:

Cooling Towers and Boilers*

Equipment Location													
Cooling Towers		Floor Span											
		Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)		
		Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.
RPM	Up to 300	A	1	0.25" (6)	A	4	3.50" (89)	A	4	3.50" (89)	A	4	3.50" (89)
	301 to 500	A	1	0.25" (6)	A	4	2.50" (64)	A	4	2.50" (64)	A	4	2.50" (64)
	501 and up	A	1	0.25" (6)	A	4	0.75" (19)	A	4	0.75" (19)	A	4	0.75" (19)
Boiler Type													
	Fire-tube	A	1	0.25" (6)	B	4	0.75" (19)	B	4	1.50" (38)	B	4	2.50" (64)
	Water-tube, copper fin	A	1	0.12" (3)	A	1	0.12" (3)	A	1	0.12" (3)	B	4	0.25" (6)

*Data from 2015 ASHRAE Handbook. See back cover for additional notes on **Cooling Towers**.



KIP



RSP



TITAN



ASHRAE TYPE 1:
Fiberglass or Neoprene Pad
See page 12 for more details

KINETICS KIP Fiberglass Pad
KINETICS NP Neoprene Pad
KINETICS NG Neoprene Pad
KINETICS RSP Neoprene Pad

ASHRAE TYPE 4:
Restrained Spring Isolator
See page 15 for more details

KINETICS TITAN
KINETICS FMS
KINETICS FLS
KINETICS FLSS
KINETICS FHS

KINETICS CTR
Cooling Tower Rails

Designed to fit between the cooling tower and the support structure, CTR significantly reduces vibration transmitted from the cooling tower to the structure below.

BASE TYPE A:
Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE B:
Structural Steel Rails or Base
See page 17 for more details

KINETICS SBB Structural Rail Base
KINETICS SFB Structural Beam Base



Equipment Type:

Propeller Fans and Ducted Rotating Equipment*

Equipment Location													
Propeller Fans		Floor Span											
		Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)		
		Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.
		Wall-Mounted	A	1	0.25" (6)	A	1	0.25" (6)	A	1	0.25" (6)	A	1
Roof-Mounted	A	1	0.25" (6)	A	1	0.25" (6)	B	4	1.50" (38)	D	4	1.50" (38)	
Ducted Rotating Equip.													
Small fans, fan-powered boxes	≤600 cfm	A	3	0.50" (13)	A	3	0.50" (13)	A	3	0.50" (13)	A	3	0.50" (13)
	≥601 cfm	A	3	0.75" (19)	A	3	0.75" (19)	A	3	0.75" (19)	A	3	0.75" (19)

*Data from 2015 ASHRAE Handbook.



KIP



RSP



FDS



SFH



TITAN

ASHRAE TYPE 1:
Fiberglass or Neoprene Pad
See page 12 for more details

KINETICS KIP Fiberglass Pad
KINETICS NP Neoprene Pad
KINETICS NG Neoprene Pad
KINETICS RSP Neoprene Pad

ASHRAE TYPE 3:
Spring Floor Isolator or Hanger
See page 14 for more details

KINETICS FDS Free-Standing Isolator
KINETICS SL Housed Isolator
KINETICS SM Housed Isolator
KINETICS SFH Fiberglass Hanger
KINETICS SRH Neoprene Hanger
KINETICS SH Hanger

ASHRAE TYPE 4:
Restrained Spring Isolator
See page 15 for more details

KINETICS TITAN
KINETICS FMS
KINETICS FLS
KINETICS FLSS
KINETICS FHS

BASE TYPE A:
Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE D:
Curb-Mounted Base
See page 18 for more details

KINETICS KSR Isolation Rail
KINETICS KSCR Isolation Curb
KINETICS ESR Isolation Curb



Equipment Type:

Packaged AH, AC, H and V Units; Engine-Driven Generators*

Equipment Location													
Packaged AH, AC, H, and V Units		Floor Span											
		Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)		
Horsepower and Other	RPM	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.
≤10 HP	All	A	3	0.75" (19)	A	3	0.75" (19)	A	3	0.75" (19)	A	3	0.75" (19)
≥15 HP	Up to 300	A	3	0.75" (19)	A	3	3.50" (89)	A	3	3.50" (89)	C	3	3.50" (89)
≤4 in. SP	301 to 500	A	3	0.75" (19)	A	3	2.50" (64)	A	3	2.50" (64)	A	3	2.50" (64)
	500 and up	A	3	0.75" (19)	A	3	1.50" (38)	A	3	1.50" (38)	A	3	1.50" (38)
>15	Up to 300	B	3	0.75" (19)	C	3	3.50" (89)	C	3	3.50" (89)	C	3	3.50" (89)
>4 in. SP	301 to 500	B	3	0.75" (19)	C	3	1.50" (38)	C	3	2.50" (64)	C	3	2.50" (64)
	500 and up	B	3	0.75" (19)	C	3	1.50" (38)	C	3	1.50" (38)	C	3	2.50" (64)

*Data from 2015 ASHRAE Handbook. See Back for additional notes on **Air-Handling Equipment**.

**For seismic & wind applications, use ASHRAE TYPE 4

***For rooftop mounted equipment use BASE TYPE D



FDS



SFH



TITAN

ASHRAE TYPE 3:
Spring Floor Isolator or Hanger
 See page 14 for more details

KINETICS FDS Free-Standing Isolator
KINETICS SL Housed Isolator
KINETICS SM Housed Isolator
KINETICS SFH Fiberglass Hanger
KINETICS SRH Neoprene Hanger
KINETICS SH Hanger

ASHRAE TYPE 4:
Restrained Spring Isolator
 See page 15 for more details

KINETICS TITAN
KINETICS FMS
KINETICS FLS
KINETICS FLSS
KINETICS FHS

BASE TYPE A:
Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE B:
Structural Steel Rails or Base
 See page 17 for more details

KINETICS SBB Structural Rail Base
KINETICS SFB Structural Beam Base

BASE TYPE C:
Concrete Inertia Base
 See page 17 for more details

KINETICS CIB



Equipment Type:

Heat Pumps, Fan-Coils, Computer Room Units; Condensing Units; Packaged Rooftop Equipment*

Equipment Type	Equipment Location											
	Floor Span											
	Slab on Grade			Up to 20 ft (6 m)			20 to 30 ft (6 - 9 m)			30 to 40 ft (9-12 m)		
	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.	Base Type	ASHRAE Type	Isolator Defl.
Heat Pumps, Fan-Coils, Computer Room Units	A	3	0.75" (19)	A	3	0.75" (19)	A	3	0.75" (19)	A/D	3	1.50" (38)
Condensing Units	A	1	0.25" (6)	A	4	0.75" (19)	A	4	1.50" (38)	A/D	4	1.50" (38)
Packaged Rooftop Equipment	A/D	1	0.25" (6)	D	3	0.75" (19)	N/A	N/A	N/A	N/A	N/A	N/A

*Data from 2015 ASHRAE Handbook. See back for additional notes on **Packaged Rooftop Equipment**.



KIP



RSP



FDS



SFH



LDR

ASHRAE TYPE 1:
Fiberglass or Neoprene Pad
See page 12 for more details

KINETICS KIP Fiberglass Pad
KINETICS NP Neoprene Pad
KINETICS NG Neoprene Pad
KINETICS RSP Neoprene Pad

ASHRAE TYPE 3:
Spring Floor Isolator or Hanger
See page 14 for more details

KINETICS FDS Free-Standing Isolator
KINETICS SL Housed Isolator
KINETICS SM Housed Isolator
KINETICS SFH Fiberglass Hanger
KINETICS SRH Neoprene Hanger
KINETICS SH Hanger

ASHRAE TYPE 4:
Restrained Spring Isolator
See page 15 for more details

KINETICS LDR
KINETICS FHS
KINETICS FHSL
KINETICS CRAC

BASE TYPE A: Direct Isolation

No base, isolators attached directly to equipment.

BASE TYPE D: Curb-Mounted Base See page 18 for more details

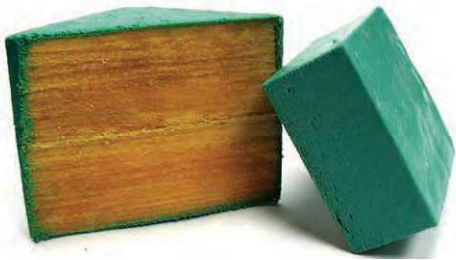
KINETICS KSR Isolation Rail
KINETICS KSCR Isolation Curb
KINETICS ESR Isolation Curb

The Fiberglass Advantage

Kinetics Noise Control manufactures both fiberglass and neoprene isolators. Fiberglass isolators offer the following advantages:

- UV resistant for outdoor use
- Constant location performance through seasonal temperature changes
- Varying densities and sizes to suit a variety of load requirements
- Constant pad performance, unaffected by age or high temperatures
- Ask local rep for fiberglass advantage demonstration

ASHRAE TYPE 1: Fiberglass and Neoprene Pads



KINETICS KIP Fiberglass Isolation Pad

Description: A high-density matrix of compressed molded fiberglass; individually coated with a flexible, moisture-imperious elastomeric membrane, designed to allow controlled air movement in the fiber media.

Application: Recommended as support mounts for high speed fans, pumps, and chillers, on grade, having operating speeds of 1750 RPM and higher.

Capacity: Provide load-bearing capacities from 5 to 500 PSI (0.35 to 35 kg per sq. cm) of pad surface area.

KINETICS KIP-RT Isolation Rails

Description: Elastomeric-coated, molded and precompressed fiber glass isolation strips

Application: Packaged Rooftop Equipment

Dimensions: 1.75" wide x 0.5" thick x 48" long



KINETICS NP / NG, RSP Neoprene Isolation Pads

Description: Single ribbed or crossed, double ribbed elastomer-in-shear pads, in combination with steel shims when required, having minimum static deflections as tabulated.

Application: Isolate noise, shock, and high frequency vibration, generated by mechanical equipment and industrial machinery located on a grade-supported structural slab.

Capacity: NP/NG: Designed to permit 60 or 120 PSI (4.2 or 8.4 kg/cm²) loading at maximum rated deflections. RSP: Designed to permit 60 psi (4.2 kg/cm²) loading at a maximum rated deflection of 0.15" (4 mm)

Dimensions: NP/NG pads are available in 4", 6", or 9" (102, 152, 228 mm) squares with capacities from 400 to 9,700 lbs. (181 to 4400 kg), or in full 18" (457 mm) square sheets which can be cut or drilled to meet field requirements. RSP: 18" x 18" x 3/4" (457 mm x 457 mm x 19 mm) thick sheets, scored into 2" x 2" x 3/4" (51 mm x 51 mm x 19 mm) thick pads

Deflection: NP Pads 0.04" to 0.09" (1 mm to 2 mm)
NG Pads 0.13" to 0.19" (3 mm to 5 mm)

ASHRAE TYPE 2: Floor Isolator or Hanger

KINETICS AC

Fiberglass Isolation Mount

Description: A molded inorganic fiberglass isolation pad bonded to a steel load transfer plate and to a formed steel bolt-down bracket and include an equipment anchor bolt with a neoprene grommet to prevent metal-to-metal contact.

Application: Recommended for the isolation of vibration produced by utility ventilating fans, vane axial fans, high speed motors, roof-mounted exhaust fans, and similar mechanical equipment.

Capacity: 40 to 900 lbs. (18 kg to 409 kg)

Deflection: 0.18 in. to 0.70 in. (4 mm to 18 mm)



KINETICS RD, RDS and RQ

Neoprene Isolation Mounts

Description: One-piece molded neoprene mounts with encapsulated metal inserts. Available in a housed seismic version.

Application: Recommended for the isolation of vibration produced by small pumps, vent sets, and low pressure packaged air-handling units.

Capacity: 55 lbs. to 4,000 lbs. (25 kg to 1814 kg)

Deflection: RD up to 0.5" (13 mm)
RQ up to 0.13" (3 mm)



RDS



RD



RQ

KINETICS FH

Fiberglass Isolation Hanger

Description: A coded, molded, inorganic fiberglass isolation pad attached to a steel load transfer plate and to a stamped or welded hanger bracket.

Application: Recommended for the isolation of vibration produced by suspended mechanical or electrical equipment, in-line and exhaust fans, ductwork, or piping.

Capacity: 250 lbs. to 900 lbs. (18 kg to 409 kg)

Deflection: 0.18" to 0.27" (4 mm to 7 mm)



KINETICS RH

Neoprene Isolation Hanger

Description: A coded elastomer in-shear insert with a load plate, assembled into a stamped or welded hanger bracket.

Application: Recommended for the isolation of vibration produced by suspended mechanical or electrical equipment, in-line and exhaust fans, ductwork, or piping.

Capacity: up to 2,000 lbs (907 kg)

Deflection: 0.20" to 0.57" (5mm to 15 mm)



ASHRAE TYPE 3: Spring Floor Isolator or Hanger

KINETICS SFH, SRH, SH Spring Isolation Hangers



Description: Free-standing, laterally stable steel spring in series with a pre-compressed molded fiberglass insert (SFH), elastomer-in-shear insert (SRH), or elastomeric washer (SH) complete with a load plate (SFH/SRH only) and assembled in a stamped or welded steel bracket.

Hangers will allow support rod misalignment through a 30° arc without short-circuiting. Isolation brackets will carry a 500% overload without failure.

Application: Recommended for the isolation of vibration produced by suspended mechanical equipment, in-line fans, exhaust fans, cabinet fans, pumps, ductwork, and piping.

Capacity: 35 lbs. to 3,850 lbs. (16 kg to 1,747 kg)

Deflection: 1" to 2.40" (25 mm to 61 mm), and 4.05" to 4.75" (104 mm to 112 mm)



KINETICS FDS Free-Standing Spring Isolator

Description: A high deflection, free-standing, unboxed, large diameter, laterally stable steel springs assembled into an upper load plate and leveling assembly.

Application: Recommended for control of both high and low frequency vibration produced by reciprocating air or refrigeration compressors, pumps, packaged air-handling and air-conditioning equipment, centrifugal and axial fans, and internal combustion engines.

Capacity: 35 lbs. to 23,200 lbs. (16 kg to 10,523 kg)

Deflection: 1" to 4" (25 mm to 102 mm)



Patented No-Short Self-Centering Cap:

Featured on 1" and 2" spring isolation hangers. Indexed steps in spring cap keep the washer and rod centered in the cap.

KINETICS LDR

Light Duty Rail System

Description: A low-cost solution designed to isolate residential style condensing units and other light weight equipment.

Application: Recommended for the isolation of rooftop condensing units to eliminate vibration from penetrating into the structure below and disturbing the occupants.

Capacity: up to 810 lbs. (10,523 kg)

Deflection: 1" (25 mm)



ASHRAE TYPE 4: Restrained Spring Isolator

KINETICS FMS

(U.S. Patent No. 7,028,969)

Modular Restraint/Isolator

Description: The unit is comprised of a restraint module and an optional vibration isolation module. This modular design allows the engineer to design for seismic or wind forces independent of the load and deflection requirements of the vibration isolator.

Application: Ideal for cooling towers, chillers, boilers or other equipment where the potential for wide weight variations during service is anticipated.

Capacity: up to 23,200 lbs. (10,523 kg)

Deflection: up to 4" (102 mm)



KINETICS FHS

Restrained Spring Isolator

Description: FHS Free-Standing Isolator with a steel housing assembly to limit lateral and vertical movement of the supported equipment during an earthquake without degrading the vibration isolation of the spring during normal equipment operating conditions.

Application: Recommended for mechanical equipment located near critically quiet areas when there is a possibility that the equipment to be isolated will be subjected to the external forces associated with an earthquake.

Capacity: up to 5,800 lbs. (2,631 kg)

Deflection: up to 4" (102 mm)



KINETICS TITAN

(U.S. Patent No. 9,316,279)

Vibration Isolator/Restraint

Description: Comprised of two interfacing but independent elements; two or more high deflection, free-standing, housed, large diameter, laterally stable steel springs, and a seismically rated housing.

The steel springs and elastomeric snubber element are each replaceable without having to lift or otherwise remove the supported equipment.

Application: Recommended for equipment mounted on a structural frame or concrete inertia base where the top plate of the isolator can be fully utilized.

Capacity: up to 23,200 lbs. (10,523 kg)

Deflection: up to 4" (102 mm)



KINETICS FLS/FLSS

Restrained Spring Isolators

Description: FLS/FLSS Free-standing, large diameter, laterally stable steel springs assembled into welded steel housing assemblies fabricated to limit vertical movement of the isolated equipment. The housings provide a constant free and operating height to facilitate installation.

Application: Recommended for the isolation of vibration produced by equipment carrying a large fluid load which may be drained, such as boilers and chillers, and for the isolation of outdoor components such as cooling towers and air-cooled condensers.

Capacity: up to 23,200 lbs. (10,523 kg)

Deflection: up to 4" (102 mm)



ASHRAE TYPE 5: Thrust Restraint

KINETICS HSR Thrust Restraint



Description: A high deflection, large diameter, laterally stable steel coil spring assembled into a threaded rod and bracket assembly.

Application: Used to counteract the discharge force created by fans during operation. Recommended for all fan heads, suspended fans, and all base-mounted and suspended air-handling equipment operating at 2 inches or greater total static pressure (TSP). HSR Thrust Restraints are always installed in pairs and often work in conjunction with inertia bases for floor-mounted fans to counteract fan thrust.

Capacity: 35 lbs to 1,975 lbs. (16 to 896 kg)

Deflection: 1" to 2" (25 mm to 51 mm)

ASHRAE TYPE 6: Air Springs

KINETICS KAM and CAM Air Vibration Isolation Mounts



Description: Pneumatic, elastomeric vibration mounts. The CAM is available in four (4) sizes supporting loads up to 7,500 lbs. The KAM is available in seven (7) sizes with capacities from 500 to 22,000 lbs. per mount.

Application: Recommended for mechanical equipment and industrial process equipment requiring low natural frequency isolation, as well as protecting sensitive equipment from disturbing floor-borne vibration.

KINETICS KINFLEX Flexible Connectors

Description: Prevent stresses due to expansion and contraction, isolate against the transfer of noise and vibration, and compensate for misalignment.

Application: Used on both hot and chilled water circulation lines, suction and discharge sides of pumps, and header connections.



KINFLEX Seismic V-Loops solve the problems of pipe motion caused by thermal pipe growth and the movements associated with seismic activity. Seismic V-loops limit amount of space required for installation and hold in more heat than to traditional large pipe loops.

BASE TYPE A: Direct Isolation

Used when equipment is unitary and rigid and does not require additional support. Direct isolation can be used with large chillers, some fans, packaged air-handling units, and air-cooled condensers. If there is any doubt that the equipment can be supported directly on isolators, use structural bases (type B) or inertia bases (type C), or consult the equipment manufacturer.

BASE TYPE B: Structural Rails

KINETICS SBB

Structural Beam Base

Description: Structural steel beam sections, with welded-on isolator support brackets, and pre-located and drilled anchor bolt holes for bolting to equipment to be supported.

Application: Recommended for support and isolation of absorption chillers, hermetic centrifugal chillers, package boilers, cooling towers, and similar types of equipment.

KINETICS SFB

Structural Frame Base

Description: Welded structural frame bases with channels, angles, or WF beams, which are complete with outboard height-saving isolator brackets and prelocated equipment anchor bolts.

Application: Recommended for support and isolation of reciprocating chillers, close coupled pumps, vent sets, packaged air handling units, centrifugal fans, evaporative condensers, and similar types of equipment.

BASE TYPE C: Concrete Inertia Base



KINETICS CIB

Concrete Inertia Base

Description: A unique structural design which integrates perimeter channels, isolator support brackets, reinforcing rods, anchor bolts and concrete fill into a controlled load transfer system, utilizing steel in tension and concrete in compression, resulting in high strength and stiffness with minimum steel frame weight.

Application: Recommended for use with open-type centrifugal chillers, reciprocating air and refrigeration compressors, chillers, and heat pumps, close-coupled and base-mounted pumps, centrifugal fans, internal combustion engines, and similar types of equipment.

BASE TYPE D: Curb-Mounted Base



KINETICS KSR Roof Curb Rail

Description: Noise and vibration control roof curb rail featuring horizontal and vertical seismic and wind restraints, multiple spring deflection options, custom tailored fit (compatible with most curb-mounted equipment), and continuous air- and water-tight seal.

Application: Recommended for support and isolation for unitary-packaged air-handling and refrigeration equipment, and exhaust fans, ordinarily mounted directly on non-isolated roof curb systems.

KINETICS KSCR and ESR Vibration Isolation Curbs

Description: Complete assemblies designed to resiliently support equipment at the specified elevation and which constitute a fully enclosed air and weather-tight system.

Standard Features

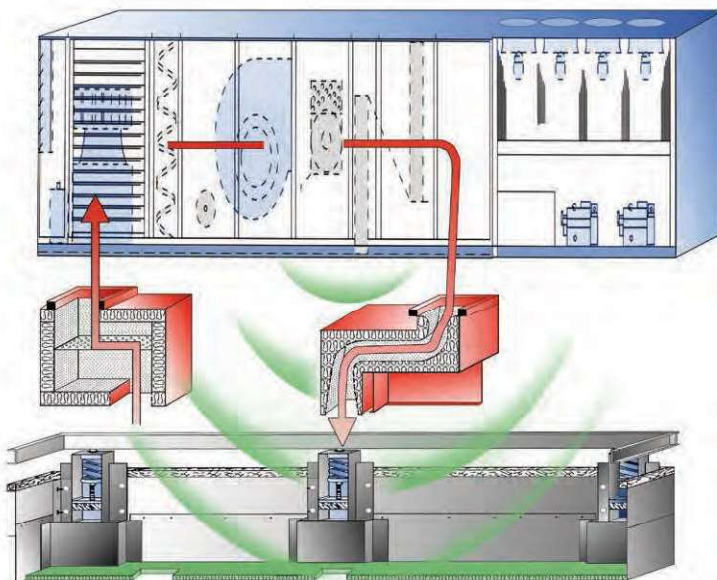
- Seismic and wind restraint
- Up to 4" (102 mm) deflection, powder-coated steel springs with 50% overload capacity
- Supply and return flexible connector support
- Environmentally inert elastomeric seal for an air and water-tight closure between the curb and rail
- High profile, non-interference aluminum rail (only KSCR)
- Accessible ports for each isolator to inspect, level, or change springs after equipment placement (only ESR)

Options

- Deflections over 4" (102 mm)
- Interface for sloped or multi-pitched roofs
- Additional height for plenums & silencers
- Exterior thermal insulation
- Acoustical treatments
- Certification of seismic and wind load engineering

KINETICS ESSR Sound and Vibration Isolation Curb

ESSR is the only isolated curb system that addresses all four noise sources associated with packaged rooftop equipment. The ESSR incorporates all the features of our ESR vibration isolation curb with our aerodynamic acoustical silencers; return air plenums and **NOISEBLOCK™** STL panels. This gives you a noise control system that addresses all the noise and vibration concerns of your packaged rooftop equipment: vibration from the rotating equipment and casing radiation, duct-borne noise from supply and return fans, and breakout noise from the fans and compressors into the space below.



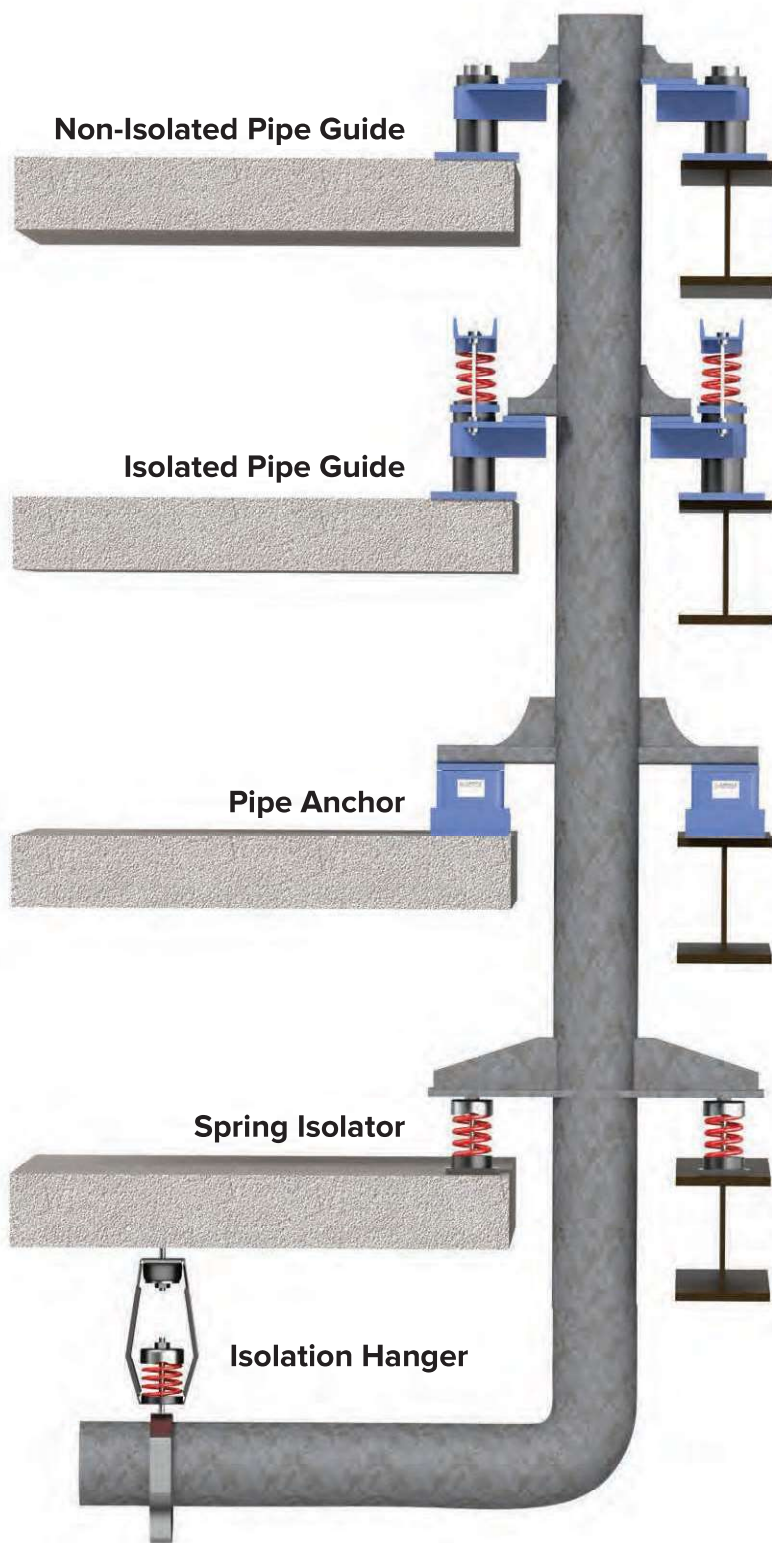
Vibration from fans and compressors (source 1) and vibration from casing- radiated noise caused by duct turbulence and the airborne noise of the fans and compressors (source 2) are controlled with high deflection, laterally stable coil spring isolators and high frequency neoprene noise pads.

Duct-borne noise from the supply and return air fans (source 3) are controlled using an aerodynamic acoustical silencer on the supply fan and an acoustical plenum on the return air side both with minimal pressure drop.

Breakout noise through the bottom of the rooftop unit (source 4) is controlled by the NOISEBLOCK™ STL acoustical panel located in the floor of the ESSR.

Riser Supports, Anchors, and Guides

KINETICS® riser supports, anchors, and guides isolate the pipe from the structure to minimize noise and vibration transmission, while also allowing the pipe to expand and contract with minimal change in the support forces. Kinetics offers custom engineering services to assist in the design of your riser system. Please see Kinetics Pipe Riser Selection Guide for details.



Seismic Restraint

Seismic restraint systems limit movement and keep equipment captive during a seismic event. Proper utilization of these systems can reduce the threat to life and minimize long-term costs due to equipment damage and associated loss of service. Additional seismic restraint products can be found within ASHRAE Type 4 (page 15) and Base Type D (page 18).



KINETICS QuakeLoc™ Seismic Cable Restraint Kits

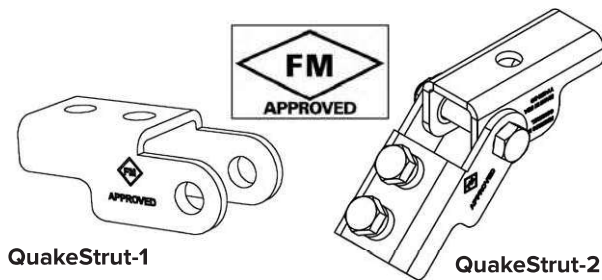
Piping, duct, electrical cable trays, and suspended equipment

- Reduces Installation Time and Cost
- Contractor Friendly Design
- IBC Code Compliant

Accessories

KHRC Adjustable Angle Rod Stiffeners: Securely attach a length of steel angle to a conventional hanging threaded rod.

KSBC Seismic Beam Clamp: Attach seismic restraints to roof or floor support I-beams.



KINETICS QuakeStrut™ Rigid Seismic Bracing

FM Approved Class 1950

QuakeStrut-1 is used when you are through bolting to strut and offers an economical rigid bracing options. QuakeStrut-2 is the full assembly with all of the hardware to connect to strut.



KINETICS HS Series Seismic Snubbers

Description: Heavy structural steel assemblies designed to minimize equipment motion within the product's design capabilities without failing.

Seismic Snubbers are designed to be used in pairs and serve to keep supported equipment contained when the equipment is subjected to lateral or vertical forces along any axis.

Seismic Mounting Brackets

KINETICS KSMS: Solid-mount equipment to the building structure

KINETICS KSMG: Resiliently mount and restrain equipment to the building structure

KINETICS KSMF: Solid-mount mushroom fans to the curb

PIPING/HANGER SELECTION DATA (U.S.)

Piping Weight and Spacing - Water

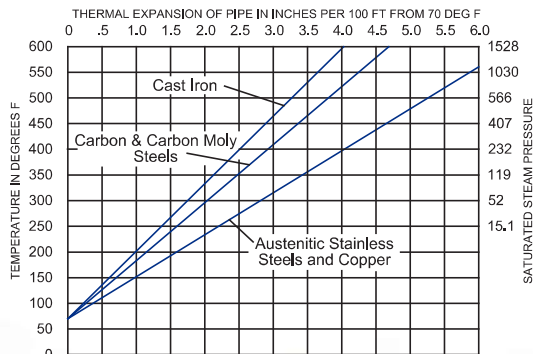
Pipe Size (in.)	1	1.25	1.5	2	2.5	3	4	5	6	8	10	12	14	16	18	20	24
Pipe Schedule	40	40	40	40	40	40	40	40	40	40	40	40	30	30	30	20	20
Max. Spacing (ft.)	7	7	9	10	11	12	14	16	17	19	20	23	25	27	28	30	32
Insulation (in.)*	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Wt. per Lin. Ft. (lb.)																	
Pipe	1.7	2.3	2.7	3.7	5.8	7.6	10.8	14.7	19.0	28.6	40.6	53.7	54.7	62.7	82.2	78.8	94.9
Water	0.4	0.6	0.9	1.5	2.1	3.2	5.5	8.7	12.5	21.7	34.2	48.5	59.8	79.2	99.8	126.1	184.0
Insulation	0.6	0.7	0.8	0.9	1.1	1.3	1.5	3.0	3.4	4.2	5.1	6.0	6.5	7.3	8.2	9.0	10.7
Total	2.7	3.6	4.4	6.1	9.0	12.1	17.8	26.4	34.9	54.5	79.9	108.2	121.0	149.2	190.2	213.9	289.6
Wt. @ 10 ft. Spacing (lb.)	-	-	-	61	90	121	178	264	349	545	799	1082	1210	1492	1902	2139	2896
KNC Hanger Model No.																	
SH/SRH/SFH -1	-	-	-	70	125	125	245	370	370	600	800	1250	1250	1700	2200	2200	3500
SH/SRH/SFH -2	-	-	-	70	120	120	220	465	465	720	850	1025	1200	2000	2000	2500	-
SH/SRH/SFH -4	-	-	-	100	100	100	250	250	500	500	750	1000	1250	1600	2250	2250	3000
Recommended Rod Size (in.)**	-	-	-	0.38	0.38	0.38	0.50	0.50	0.50	0.50	0.62	0.62	0.75	0.75	0.88	0.88	1.00
Wt. @ 20 ft. Spacing (lb.)	-	-	-	-	-	-	-	-	-	-	1598	2163	2419	2984	-	-	-
KNC Hanger Model No.																	
SH/SRH/SFH -1	-	-	-	-	-	-	-	-	-	-	1700	2200	2465	3500	-	-	-
SH/SRH/SFH -2	-	-	-	-	-	-	-	-	-	-	2000	2500	2500	-	-	-	-
SH/SRH/SFH -4	-	-	-	-	-	-	-	-	-	-	1600	2250	2500	3000	-	-	-
Recommended Rod Size (in.)**	-	-	-	-	-	-	-	-	-	-	0.75	0.88	0.88	1.00	-	-	-
Max. Spacing (ft.)	7	7	9	10	11	12	14	16	17	19	20	23	25	27	28	30	32
Wt. @ Max. Spacing (lb.)	19	26	40	61	99	145	250	421	594	1036	1598	2487	3024	-	-	-	-
KNC Hanger Model No.																	
SH/SRH/SFH -1	35	35	70	70	125	245	370	500	600	1000	1700	2865	3500	-	-	-	-
SH/SRH/SFH -2	35	35	70	70	120	220	465	465	720	1200	2000	2500	-	-	-	-	-
SH/SRH/SFH -4	-	-	-	100	100	250	250	500	750	1250	1600	2500	3500	-	-	-	-
Recommended Rod Size (in.)**	0.25	0.38	0.38	0.38	0.38	0.38	0.50	0.50	0.50	0.62	0.75	0.88	1.00	-	-	-	-

Piping Weight and Spacing - Steam

Pipe Size (in.)	1	1.25	1.5	2	2.5	3	4	5	6	8	10	12	14	16	18	20	24
Pipe Schedule	40	40	40	40	40	40	40	40	40	40	40	40	30	30	30	20	20
Insulation (in.)*	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Wt. per Ft. (lbs.)																	
Pipe	1.7	2.3	2.7	3.7	5.8	7.6	10.8	14.7	19.0	28.6	40.6	53.7	54.7	62.7	82.2	78.8	94.9
Insulation	1.2	1.3	1.4	1.6	1.8	2.1	2.5	4.2	4.8	5.9	7.1	8.2	8.9	10.1	11.2	12.3	14.5
Total	2.9	3.6	4.1	5.3	7.6	9.7	13.3	18.9	23.8	34.6	47.7	61.9	63.6	72.8	93.4	91.1	109.4
Wt. @ 10 ft. Spacing (lb.)	-	36	41	53	76	97	133	189	238	346	477	619	636	728	934	911	1094
KNC Hanger Model No.																	
SH/SRH/SFH -1	-	35	35	70	70	125	125	245	245	370	500	625	625	800	1000	1000	1250
SH/SRH/SFH -2	-	35	35	70	70	120	120	220	220	465	720	720	720	720	1025	1025	1200
SH/SRH/SFH -4	-	-	-	100	100	100	100	250	250	500	500	750	750	750	1000	1000	1250
Recommended Rod Size (in.)**	-	0.38	0.38	0.38	0.38	0.38	0.38	0.50	0.50	0.50	0.50	0.62	0.62	0.62	0.62	0.62	0.62
Wt. @ 20 ft. Spacing (lb.)	-	-	-	-	-	-	-	-	477	691	954	1238	1273	1456	1867	1822	2187
KNC Hanger Model No.									500	625	1000	1250	1250	1700	2200	2200	2200
SH/SRH/SFH -1	-	-	-	-	-	-	-	-	720	720	1025	2000	2000	2000	2000	2000	2500
SH/SRH/SFH -2	-	-	-	-	-	-	-	-	720	720	1025	2000	2000	2000	2000	2000	2500
SH/SRH/SFH -4	-	-	-	-	-	-	-	-	500	750	1000	1250	1600	1600	2250	2250	2250
Recommended Rod Size (in.)**	-	-	-	-	-	-	-	-	0.50	0.62	0.62	0.75	0.75	0.75	0.88	0.88	1.00
Max. Spacing (ft.)	9	10	12	13	14	15	17	19	21	24	26	30	32	35	37	39	39
Wt. @ Max. Spacing (lb.)	26	36	50	69	107	145	227	359	501	829	1240	1857	2036	2548	3454	3552	4266
KNC Hanger Model No.																	
SH/SRH/SFH -1	35	35	70	70	125	245	245	370	500	1000	1250	2200	2200	2865	-	-	-
SH/SRH/SFH -2	35	35	70	70	120	220	220	465	720	850	2000	2000	2000	2500	-	-	-
SH/SRH/SFH -4	-	-	-	100	100	100	250	500	500	1000	1250	2250	2250	2750	-	-	-
Recommended Rod Size (in.)**	0.25	0.38	0.38	0.38	0.38	0.38	0.50	0.50	0.50	0.62	0.75	0.88	1.00	1.00	-	-	-

*Insulation weight based on industry standard insulation.

**Rod size recommendation and max. hanger spacing based on MSS SP-69



Approximate Flanged Fitting Weights (lb.)

Pipe Size (in.)	Bonnet Check Valve	Bonnet Gate Valve	Elbow	Tee	Flange
1	-	9	8	11	4
1.5	-	27	12	18	4
2	26	37	18	24	5
2.5	36	50	27	35	7
3	46	66	33	40	9
4	80	109	56	74	15
5	120	140	78	91	19
6	155	170	97	117	23
8	300	250	160	182	32
10	450	470	260	290	52
12	675	690	390	400	70
14	900	950	520	600	93
16	1200	1250	725	750	120
18	1371	1650	980	930	140
20	1772	2000	1300	1100	175
24	3000	3100	1850	1850	250

PIPING/HANGER SELECTION DATA (SI)

Piping Weight and Spacing - Water

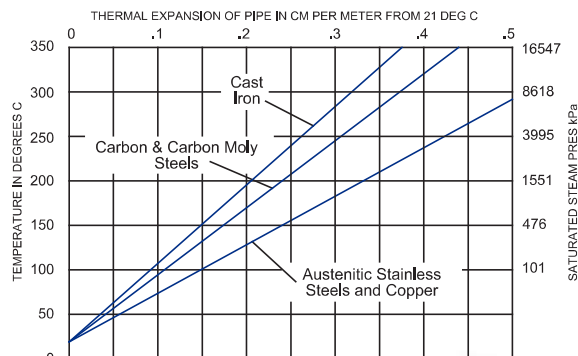
Pipe Size (mm)	25	32	38	51	64	76	102	127	152	203	254	305	356	406	457	508	610
Pipe Schedule	40	40	40	40	40	40	40	40	40	40	40	40	30	30	30	20	20
Max. Spacing (m)	2.1	2.1	2.7	3.0	3.4	3.7	4.3	4.9	5.2	5.8	6.1	7.0	7.6	8.2	8.5	9.1	9.8
Insulation (mm)*	25	25	25	25	25	25	25	38	38	38	38	38	38	38	38	38	38
Wt. per M (kg)																	
Pipe	2.5	3.4	4.0	5.5	8.6	11.3	16.1	21.9	28.3	42.6	60.5	80.0	81.4	93.3	122.4	117.3	141.3
Water	0.6	0.9	1.3	2.2	3.1	4.8	8.2	12.9	18.6	32.3	50.9	72.1	89.0	117.9	148.6	187.8	274.0
Insulation	0.9	1.0	1.2	1.3	1.6	1.9	2.2	4.5	5.1	6.2	7.6	9.0	9.7	10.9	12.2	13.4	15.9
Total	4.0	5.3	6.5	9.0	13.3	18.0	26.5	39.3	52.0	81.1	119.0	161.1	180.1	222.1	283.2	318.5	431.2
Wt. @ 3 m Spacing (kg)	-	-	-	27	40	54	80	118	156	243	357	483	540	666	850	955	1294
KNC Hanger Model No.																	
SH/SRH/SFH -1	-	-	-	70	125	125	245	370	370	600	800	1250	1250	1700	2200	2200	3500
SH/SRH/SFH -2	-	-	-	70	120	120	220	465	465	720	850	1025	1200	2000	2000	2500	-
SH/SRH/SFH -4	-	-	-	100	100	100	250	250	500	500	750	1000	1250	1600	2250	2250	3000
Recommended Rod Size (mm)**	-	-	-	10	10	10	13	13	13	13	16	16	19	19	22	22	25
Wt. @ 6 m Spacing (kg)	-	-	-	-	-	-	-	-	-	-	714	966	1080	1332	-	-	-
KNC Hanger Model No.																	
SH/SRH/SFH -1	-	-	-	-	-	-	-	-	-	-	1700	2200	2465	3500	-	-	-
SH/SRH/SFH -2	-	-	-	-	-	-	-	-	-	-	2000	2500	2500	-	-	-	-
SH/SRH/SFH -4	-	-	-	-	-	-	-	-	-	-	1600	2250	2500	3000	-	-	-
Recommended Rod Size (mm)**	-	-	-	-	-	-	-	-	-	-	19	22	22	25	-	-	-
Max. Spacing (m)	2.1	2.1	2.7	3.0	3.4	3.7	4.3	4.9	5.2	5.8	6.1	7.0	7.6	8.2	8.5	9.1	9.8
Wt. @ Max. Spacing (kg)	8.6	11.8	18.1	27.7	44.9	65.8	113.4	190.9	269.4	469.9	724.8	1128.1	1371.7	-	-	-	-
KNC Hanger Model No.																	
SH/SRH/SFH -1	35	35	70	70	125	245	370	500	600	1000	1700	2865	3500	-	-	-	-
SH/SRH/SFH -2	35	35	70	70	120	220	465	465	720	1200	2000	2500	-	-	-	-	-
SH/SRH/SFH -4	-	-	-	100	100	250	250	500	750	1250	1600	2500	3500	-	-	-	-
Recommended Rod Size (mm)**	6	10	10	10	10	10	13	13	13	16	19	22	25	-	-	-	-

Piping Weight and Spacing - Steam

Pipe Size (mm)	25	32	38	51	64	76	102	127	152	203	254	305	356	406	457	508	610
Pipe Schedule	40	40	40	40	40	40	40	40	40	40	40	40	30	30	30	20	20
Insulation (mm)*	38	38	38	38	38	38	38	51	51	51	51	51	51	51	51	51	51
Wt. per m (kg)																	
Pipe	2.5	3.4	4.0	5.5	8.6	11.3	16.1	21.9	28.3	42.6	60.5	80.0	81.4	93.4	122.4	117.3	141.3
Insulation	1.8	1.9	2.1	2.4	2.7	3.1	3.7	6.2	7.1	8.8	10.5	12.2	13.3	15.0	16.7	18.3	21.6
Total	4.3	5.3	6.1	7.9	11.3	14.4	19.8	28.1	35.4	51.4	71.0	92.2	94.7	108.4	139.1	135.6	162.9
Wt. @ 3 m Spacing (kg)	-	16	18	24	34	43	59	84	106	154	213	277	284	325	417	407	489
KNC Hanger Model No.																	
SH/SRH/SFH -1	-	35	35	70	70	125	125	245	245	370	500	625	625	800	1000	1000	1250
SH/SRH/SFH -2	-	35	35	70	70	120	120	220	220	465	720	720	720	720	1025	1025	1200
SH/SRH/SFH -4	-	-	-	100	100	100	100	250	250	500	500	750	750	750	1000	1000	1250
Recommended Rod Size (mm)**	-	10	10	10	10	10	10	13	13	13	13	16	16	16	16	16	16
Wt. @ 6 m Spacing (kg)	-	-	-	-	-	-	-	-	212	308	426	554	568	650	834	814	978
KNC Hanger Model No.																	
SH/SRH/SFH -1	-	-	-	-	-	-	-	-	500	625	1000	1250	1250	1700	2200	2200	2200
SH/SRH/SFH -2	-	-	-	-	-	-	-	-	720	720	1025	2000	2000	2000	2000	2000	2500
SH/SRH/SFH -4	-	-	-	-	-	-	-	-	500	750	1000	1250	1600	1600	2250	2250	2250
Recommended Rod Size (mm)**	-	-	-	-	-	-	-	-	13	16	16	19	19	19	22	22	25
Max. Spacing (m)	2.7	3.0	3.7	4.0	4.3	4.6	5.2	5.8	6.4	7.3	8.0	9.1	9.8	10.7	11.3	11.9	11.9
Wt. @ Max. Spacing (kg)	12	16	23	31	49	66	103	163	227	376	562	842	924	1156	1567	1611	1935
KNC Hanger Model No.																	
SH/SRH/SFH -1	35	35	70	70	125	245	245	370	500	1000	1250	2200	2200	2865	-	-	-
SH/SRH/SFH -2	35	35	70	70	120	220	220	465	720	850	2000	2000	2000	2500	-	-	-
SH/SRH/SFH -4	-	-	-	100	100	100	250	500	500	1000	1250	2250	2250	2750	-	-	-
Recommended Rod Size (mm)*	6	10	10	10	10	10	13	13	13	16	19	22	25	25	-	-	-

*Insulation weight based on industry standard insulation.

**Rod size recommendation and max. hanger spacing based on MSS SP-69



Approximate Flanged Fitting Weights (kg)

Pipe Size (mm)	Bonnet Check Valve	Bonnet Gate Valve	Elbow	Tee	Flange
25	-	4.1	3.6	5.0	1.8
38	-	12.2	5.4	8.2	1.8
51	11.8	16.8	8.2	10.1	2.3
64	16.3	22.7	12.2	15.9	3.2
76	20.1	30.0	15.0	18.1	4.1
102	36.3	49.4	25.4	33.6	6.8
127	54.4	63.5	35.4	41.3	8.6
152	70.3	77.1	44.0	53.1	10.4
203	136.1	113.4	72.6	82.6	14.5
254	204.1	213.2	117.9	131.5	23.6
305	306.2	313.0	176.9	181.4	31.8
356	408.2	430.9	235.9	272.2	42.2
406	544.3	567.0	328.9	340.2	54.4
457	621.9	748.4	444.5	421.8	63.5
508	803.8	907.2	589.7	499.0	79.4
610	1360.8	1406.1	839.1	839.1	113.4

Isolation Notes for Specific Equipment*

Kinetics Noise Control strongly recommends 2015 ASHRAE Handbook, Chapter 48 Noise and Vibration Control as a companion to this product selection guide.

Refrigeration Machines

Large centrifugal, screw, and reciprocating refrigeration machines may generate very high noise levels; special attention is required when such equipment is installed in upper-story locations or near noise-sensitive areas. If equipment is located near extremely noise-sensitive areas, follow the recommendations of an acoustical consultant.

Compressors

The two basic reciprocating compressors are duct structures. (1) single- and double-cylinder vertical, horizontal or L-head, which are usually air compressors; and (2) Y, W, and multi-head or multi-cylinder air and refrigeration compressors. Single- and double-cylinder compressors generate high vibratory forces requiring large inertia bases (type C) and are generally not suitable for upper-story locations. If this equipment must be installed in an upper-story location or at-grade location near noise-sensitive areas, the expected maximum unbalanced force data must be obtained from the equipment manufacturer and a vibration specialist consulted for design of the isolation system.

When using Y, W, and multi-head and multi-cylinder compressors, obtain the magnitude of unbalanced forces from the equipment manufacturer so the need for an inertia base can be evaluated.

Base-mounted compressors through 5 hp and horizontal tank-type air compressors through 10 hp can be installed directly on spring isolators (type 3) with structural bases (type B) if required, and compressors 15 to 100 hp on spring isolators (type 3) with inertia bases (type C) with a mass 1 to 2 times the compressor mass.

Pumps

Concrete inertia bases (type C) are preferred for all flexible-coupled pumps and are desirable for most close-coupled pumps, although steel bases (type B) can be used. Close-coupled pumps should not be installed directly on individual isolators (type A) because the impeller usually overhangs the motor support base, causing the rear mounting to be in tension. The primary requirements for type C bases are strength and shape to accommodate base elbow supports. Mass is not usually a factor, except for pumps over 75 hp, where extra mass helps limit excess movement due to starting torque and forces. Concrete bases (type C) should be designed for a thickness of one-tenth the longest dimension with minimum thickness as follows: (1) for up to 30 hp, 6 in; (2) for 40 to 75 hp, 8 in; and (3) for 100 hp and up, 12 in.

Pumps over 75 hp and multistage pumps may exhibit excessive motion at start-up ("heaving"); supplemental restraining devices can be installed if necessary. Pumps over 125 hp may generate high starting forces; a vibration specialist should be consulted.

Cooling Towers

These are normally isolated with restrained spring isolators (type 4) directly under the tower or tower dunnage. High deflection isolators proposed for use directly under the motor-fan assembly must be used with extreme caution to ensure stability and safety

under all weather conditions.

Packaged Rooftop Air-Conditioning Equipment

This equipment is usually installed on lightweight structures that are susceptible to sound and vibration transmission problems. The noise problems are compounded further by curb-mounted equipment, which requires large roof openings for supply and return air.

Type D vibration isolators are shown for all spans up to 20 ft, but extreme care must be taken for equipment located on spans of over 20 ft, especially if construction is open web joists or thin, lightweight slabs. The recommended procedure is to determine the additional deflection caused by equipment in the roof. If additional roof deflection is 0.25 in. or less, the isolator should be selected for 10 times the additional roof deflection. If additional roof deflection is over 0.25 in, supplemental roof stiffening should be installed to bring the roof deflection down below 0.25 in, or the unit should be relocated to a stiffer roof position.

For mechanical units capable of generating high noise levels, mount the unit on a platform above the roof deck to provide an air gap (buffer zone) and locate the unit away from the associated roof penetration to allow acoustical treatment of ducts before they enter the building.

Some rooftop equipment has compressors, fans, and other equipment isolated internally. This isolation is not always reliable because of internal short-circuiting, inadequate static deflection, or panel resonances. It is recommended that rooftop equipment over 300 lb be isolated externally, as if internal isolation was not used.

Fans and Air-Handling Equipment

Consider the following in selecting isolation systems for fans and air-handling equipment:

1. Fans with wheel diameters of 22 in. and less and all fans operating at speeds up to 300 rpm do not generate large vibratory forces. For fans operating under 300 rpm, select isolator deflection so the isolator natural frequency is 40% or less than the fan speed. For example, for a fan operating at 275 rpm, $0.4 \times 275 = 110$ rpm. Therefore, an isolator natural frequency of 110 rpm or lower is required. This can be accomplished with a 3 in. deflection isolator (type 3).
2. Flexible duct connectors should be installed at the intake and discharge of all fans and air-handling equipment to reduce vibration transmission to air duct structures.
3. Inertia bases (type C) are recommended for all class 2 and 3 fans and air-handling equipment because extra mass allows the use of stiffer springs, which limit heaving movements.
4. Thrust restraints (type 5) that incorporate the same deflection as isolators should be used for all fan heads, all suspended fans, and all base-mounted and suspended air-handling equipment operating at 2 in. or more total static pressure. Restraint movement adjustment must be made under normal operational static pressures.

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