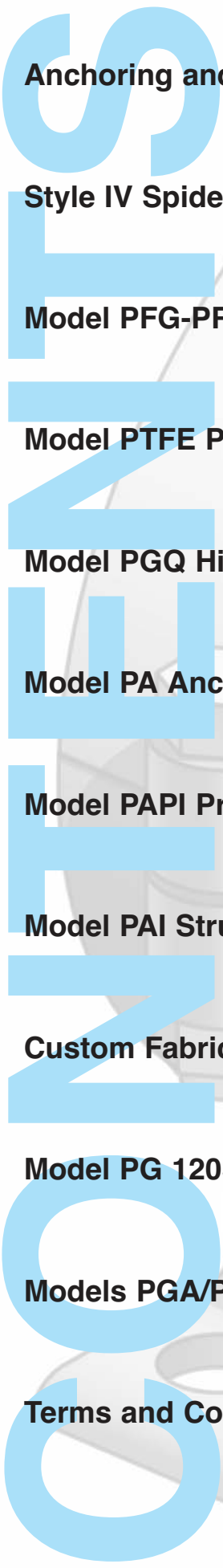


**Your guide to
selecting pipe
guides, slides
and anchors**



Anchoring and Guiding InstructionsPage 3

Style IV Spider Type GuidePages 4 – 5

Model PFG-PRE Spider Type Pre-Insulated SeriesPages 6 – 7

Model PTFE Pre-Insulated Series Teflon Slide GuidesPage 8

Model PGQ Hi Rise GuidePage 9

Model PA Anchor ClampsPage 10

Model PAPI Pre-Insulated AnchorsPage 11

Model PAI Structural I-Beam AnchorsPage 12

Custom Fabricated Guides for Difficult ApplicationsPage 12

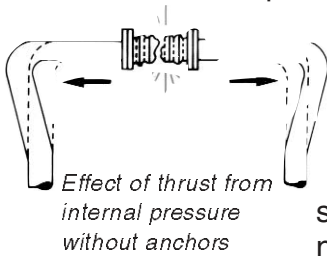
Model PG 120S Slide Seals for Fire Rated Floors or WallsPage 13

Models PGA/PGN Baseboard Guides & AnchorsPage 13

Terms and ConditionsPage 15

ANCHORING AND GUIDING

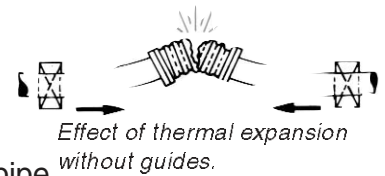
Proper guiding and anchoring is essential to an installation of expansion joints or pipe loops. They will prevent the pipe from squirming or buckling and are required to ensure the manufacturer's warranty.



Anchors at each end of the pipe run must be stronger than the force needed to compress the joint. Depending upon system pressure, this force may be many thousands of pounds.

Guides permit axial movement of the pipe while restraining both lateral and angular movement.

The quantity and location of the guides is dependent upon the natural flexibility of the pipe and the pressure rating of the system. Guides should be installed per the following chart.



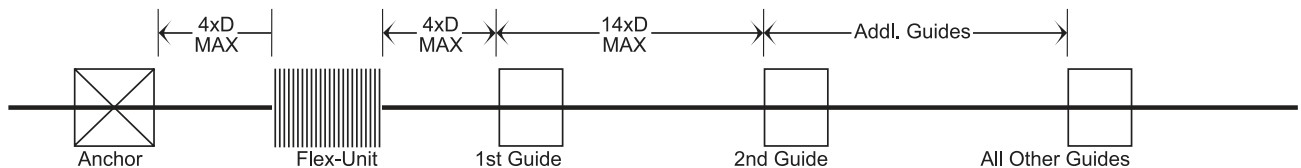
Proper Alignment of Anchors and Guides

The location of the expansion joint also determines proper location of guides and anchors. The illustration below shows 2 guides on each side of



the joint because the joint is installed in the middle of the run.

Concentric Pipe Guide Spacing*



Pipe Size	Max distance from bellows to 1st guide/anchor	Approx. distance from 1st to 2nd guide	Approximate distance between additional pipe guides (in feet)			
			@ 50 PSI	@ 100 PSI	@ 150 PSI	@ 300 PSI
1"	4"	1'4"	21'	15'	12'	10'
1-1/4"	5"	1'5"	23'	17'	13'	12'
1-1/2"	6"	1'9"	28'	20'	17'	13'
2"	8"	2'4"	32'	23'	18'	15'
2-1/2"	10"	2'11"	35'	28'	22'	20'
3"	1'	3'6"	38'	28'	23'	17'
3-1/2"	1'2"	4'1"	45'	35'	27'	19'
4"	1'4"	4'8"	52'	38'	31'	22'
5"	1'8"	5'8"	63'	45'	38'	25'
6"	2'	7'	68'	48'	40'	28'
8"	2'8"	9'4"	87'	62'	45'	38'
10"	3'4"	11'8"	107'	75'	60'	48'
12"	4'	14'	118'	85'	70'	50'
14"	4'8"	16'4"	122'	88'	72'	55'
16"	5'4"	18'8"	137'	96'	80'	60'
18"	6'	21'	145'	105'	85'	65'
20"	6'8"	23'4"	160'	118'	90'	70'
24"	8'	28'	181'	125'	105'	75'

*Data Per Expansion Joint Manufacturers Association.

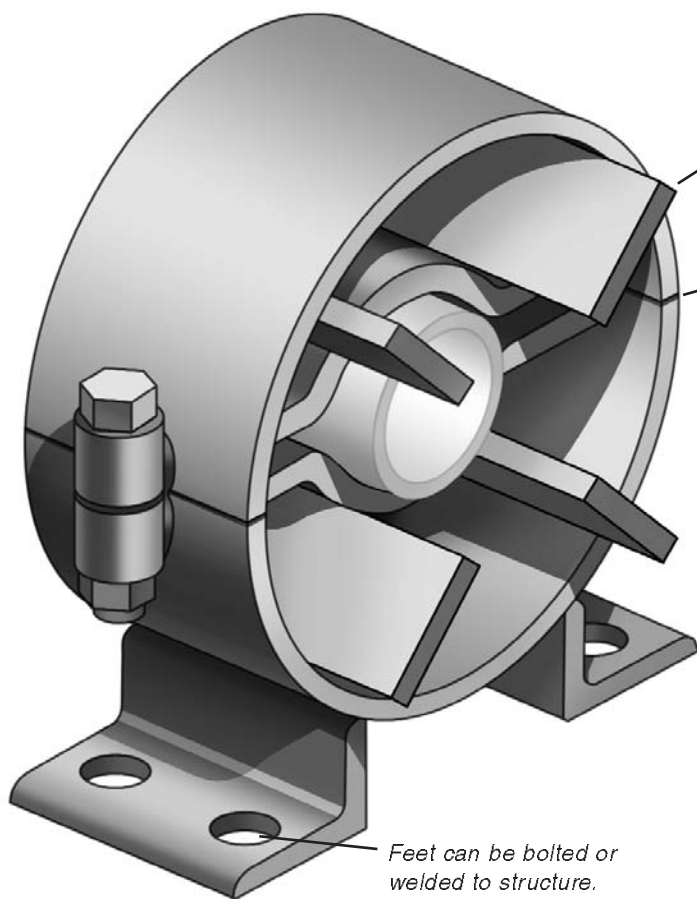
Copper Tube Guide Spacing

Tube Size†	Max distance from bellows to 1st guide/anchor	Approx. distance from 1st to 2nd guide	Maximum Spacing for Intermediate Guides for Copper Tube (Feet)		
			25 PSI	50 PSI	70 PSI
1/2"	2"	7"	5'	4'	3'
3/4"	3"	10-1/2"	7'	6'	5'
1"	4"	1'2"	9'	8'	6'
1-1/4"	5"	1'5-1/2"	14'	11'	9'
1-1/2"	6"	1'9"	14'	11'	9'
2"	8"	2'4"	19'	14'	12'
2-1/2"	10"	2'11"	23'	17'	15'
3"	1'	3'6"	27'	20'	18'
4"	1'4"	4'8"	31'	23'	21'

†Note: For type "M" tubing.

For type "L" tubing spacing may be increased by 10%.

For type "K" tubing spacing may be increased by 20%.



"Spider" spacers center pipe in housing and are sized to allow insulation to be packed around pipe.

Split housing for easy installation.

Feet can be bolted or welded to structure.

Style IV Spider Type guide

Matched to pipe size and insulation thickness, the spider guide provides lateral stability to the pipe to prevent "bowing" and to ensure axial pipe movement in and out of the expansion joint. Extended spiders are available. These guides are not designed to support the weight of the pipe. The Metraflex style IV guides are available for pipe 1 inch to 24 inch diameter, insulation thicknesses 0 to 4 inches are standard, larger thicknesses are available, and axial movement up to 12 inches of travel. Add die-electric spacer for copper pipe.

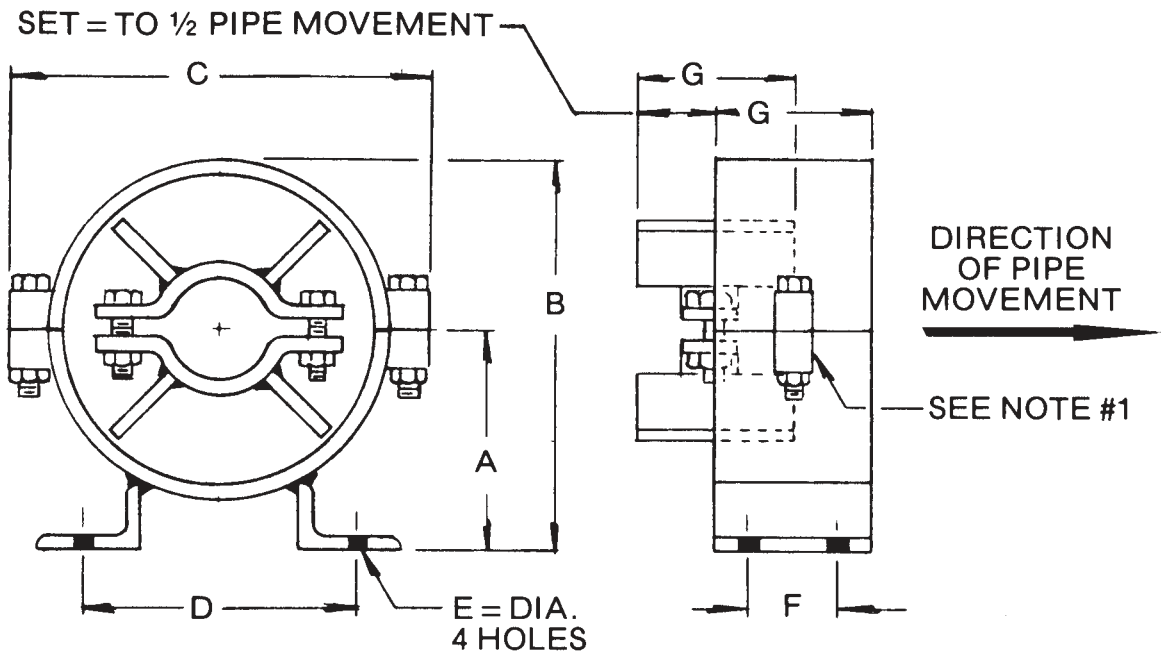
Model Selection Chart For Style IV Guides

Using insulation thickness, choose the Model # from this chart and note on drawing on the following page. Die-electric spacers recommended for copper pipe.

PIPE SIZE	INSULATION THICKNESS						
	1"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"
1/2"	23	23	24	26	26	26	27
3/4"	23	24	25	26	26	27	27
1"	23	24	25	26	26	27	27
1-1/4"	23	24	25	26	26	27	27
1-1/2"	24	24	25	26	26	27	27
2"	24	25	26	26	27	27	28
2-1/2"	25	25	26	26	27	27	28
3"	25	26	26	27	27	28	28
4"	26	26	27	27	28	28	29
5"	27	27	27	28	28	29	30
6"	27	27	28	28	29	30	30
8"	28	28	29	30	30	31	31
10"	30	30	30	31	31	32	32
12"	31	31	31	32	32	33	33
14"	32	32	32	32	33	33	34
16"	33	33	33	33	34	34	35
18"	34	34	34	34	35	35	-
20"	35	35	35	35	36	36	36
24"	36	36	36	36	-	-	-

When ordering Style IV guides, specify insulation thickness.

Style IV available for Copper Tubing. Contact factory for pricing.



TOTAL QTY	PIPE SIZE	MODEL	A	B	C	D	E	F	G	MAX MOVE	Weight (LBS.)
		23	3-1/2"	5-7/8"	6-1/8"	4-1/8"	5/8"	1-3/4"	3"	4"	7
		24	4"	6-3/4"	7-1/8"	4-3/8"	5/8"	1-3/4"	3"	4"	8
		25	4-3/8"	7-5/8"	8-1/8"	5-1/8"	5/8"	1-3/4"	3"	4"	9
		26	5-1/4"	9-1/4"	10-1/8"	6-1/8"	5/8"	1-3/4"	3"	4"	11
		27	6-1/4"	11-5/8"	12-1/8"	7"	5/8"	2-3/4"	4"	6"	17
		28	7"	13-3/8"	14-1/8"	8-1/4"	5/8"	2-3/4"	4"	6"	20
		29	7-7/8"	15-1/8"	16-1/8"	9-7/8"	3/4"	4"	6"	8"	40
		30	8-7/8"	17"	18-1/8"	10-7/8"	3/4"	4"	6"	8"	48
		31	9-3/4"	18-3/4"	20-1/8"	11-7/8"	3/4"	4"	6"	8"	54
		32	10-7/8"	21"	22-1/8"	11-3/4"	3/4"	6"	8"	8"	61
		33	12-1/8"	23-1/8"	24-1/8"	14-1/2"	7/8"	6"	8"	8"	89
		34	13"	25"	26-1/8"	15-1/2"	7/8"	6"	8"	8"	102
		35	14-3/4"	27-3/4"	28-1/8"	17-1/8"	1-1/8"	6"	8"	12"	110
		36	16-1/2"	31-1/2"	32-1/8"	19-1/4"	1-1/8"	6"	8"	12"	150

Notes: #1 - Models 29 to 36 (4) bolts; Models 23 to 28 (2) bolts
#2 - Material: Carbon Steel. Finish: One coat of paint.

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

PRO. OR P.O. NO _____

Metraflex
for pipes in motion
Chicago, IL

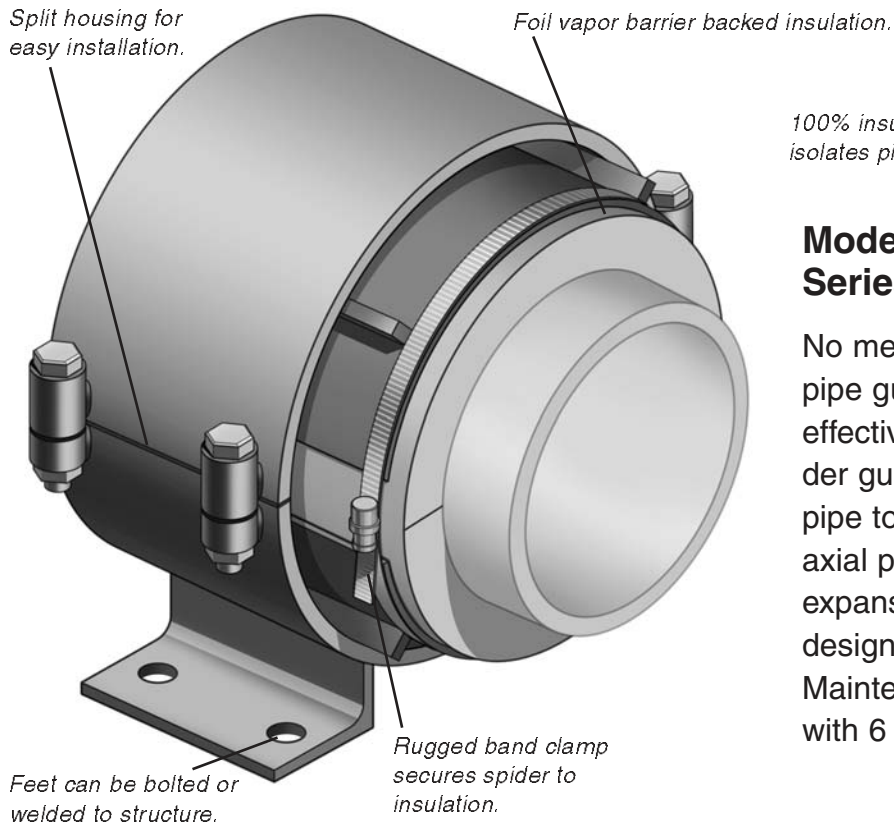
DESCRIPTION:

PIPE GUIDE STYLE IV

DRAWN BY:
JRR

DATE:
1/05

DRAWING NO:
PG IV



100% insulation coverage completely isolates pipe. No pipe to metal contact.

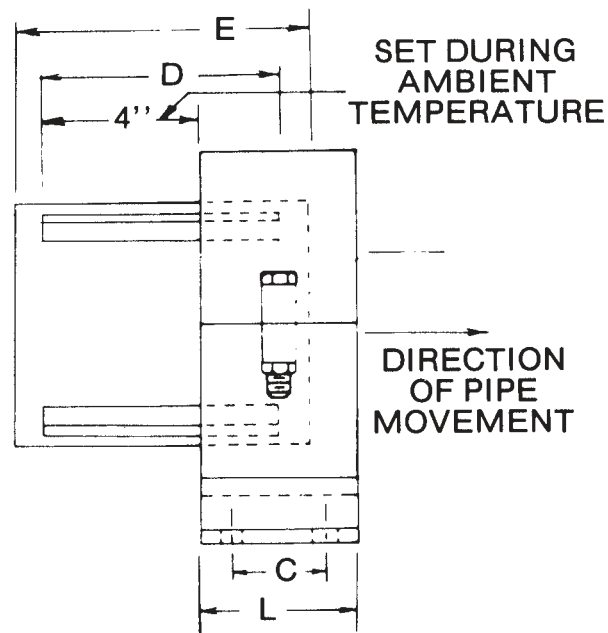
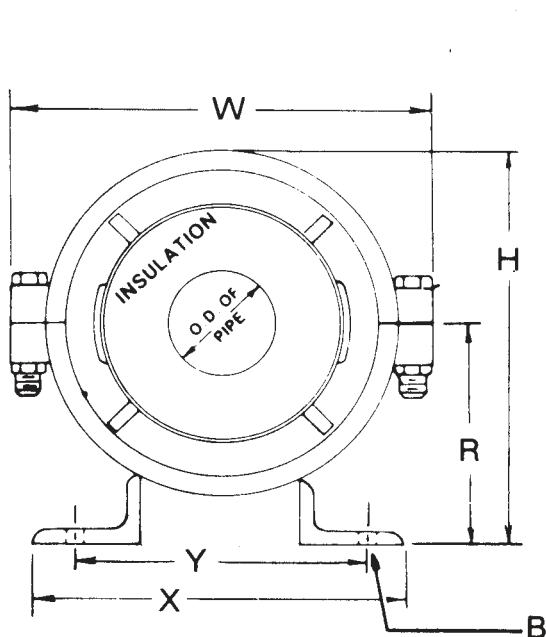
Model PG-PRE Pre-Insulated Series

No metal to metal contact. Pre-insulated pipe guides deliver maximum insulation effectiveness and energy savings. The spider guide provides lateral stability to the pipe to prevent “bowing” and to ensure axial pipe movement in and out of the expansion joint. These guides are not designed to support the weight of the pipe. Maintenance free. Sizes up to 24 inch pipe with 6 inch axial movement.

Pre-Insulated Series Model Selection Chart

PIPE SIZE	INSULATION THICKNESS			
	1-1/2"	2"	3"	4"
1/2"	25	26	27	28
3/4"	25	26	27	28
1"	25	26	27	28
1-1/4"	26	26	27	28
1-1/2"	26	27	28	29
2"	26	27	28	29
2-1/2"	27	27	28	30
3"	27	27	28	30
4"	27	28	29	30
5"	28	28	30	31
6"	28	29	30	31
8"	30	30	31	32
10"	31	31	32	33
12"	32	32	33	34
14"	32	33	34	35
16"	33	34	35	-
18"	34	35	36	36

Using the desired insulation thickness and pipe size, choose the model number from this chart and note it on the pre-insulated pipe guide drawing on the following page.



TOTAL QTY	PIPE SIZE	MODEL	H	R	W	X	Y	B	C	L	MAX. MOVE	WT. (LBS.)
		25	7-5/8"	4-1/2"	8-1/8"	6-11/16"	5-1/8"	5/8"	1-3/4"	3"	6"	
		26	9-1/4"	5-1/4"	10-1/8"	7-1/2"	6-1/8"	5/8"	1-3/4"	3"	6"	
		27	11-5/8"	6-1/4"	12-1/8"	8-9/16"	7"	5/8"	2-3/4"	4"	6"	
		28	13-3/8"	7"	14-1/8"	9-11/16"	8-1/4"	5/8"	2-3/4"	4"	6"	
		29	15-1/8"	7-7/8"	16-1/8"	12"	9-7/8"	3/4"	4"	6"	6"	
		30	17"	8-7/8"	19-1/8"	13"	10-7/8"	3/4"	4"	6"	6"	
		31	18-3/4"	9-3/4"	20-1/8"	14"	11-7/8"	3/4"	4"	6"	6"	
		32	21"	10-7/8"	22-1/8"	14"	11-3/4"	3/4"	4"	6"	6"	
		33	23-1/8"	12-1/8"	24-1/8"	16-7/8"	14-1/2"	7/8"	6"	8"	6"	
		34	25"	13"	26-1/8"	18"	15-1/2"	7/8"	6"	8"	6"	
		35	27-3/4"	14-3/4"	28-1/8"	19-1/4"	17-1/8"	1-1/8"	6"	8"	6"	
		36	31-1/2"	16-1/2"	32-1/8"	21-1/4"	19-1/4"	1-1/8"	6"	8"	6"	

Compressibility is 100 P.S.I. Vapor barrier is part of the insulation.

Note: Factory insulation is a hydrous calcium silicate, maximum temperature is 1200°F.

To order: Specify pipe size and maximum insulation thickness.

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

PRO. OR P.O. NO _____

Metraflex
for pipes in motion
Chicago, IL

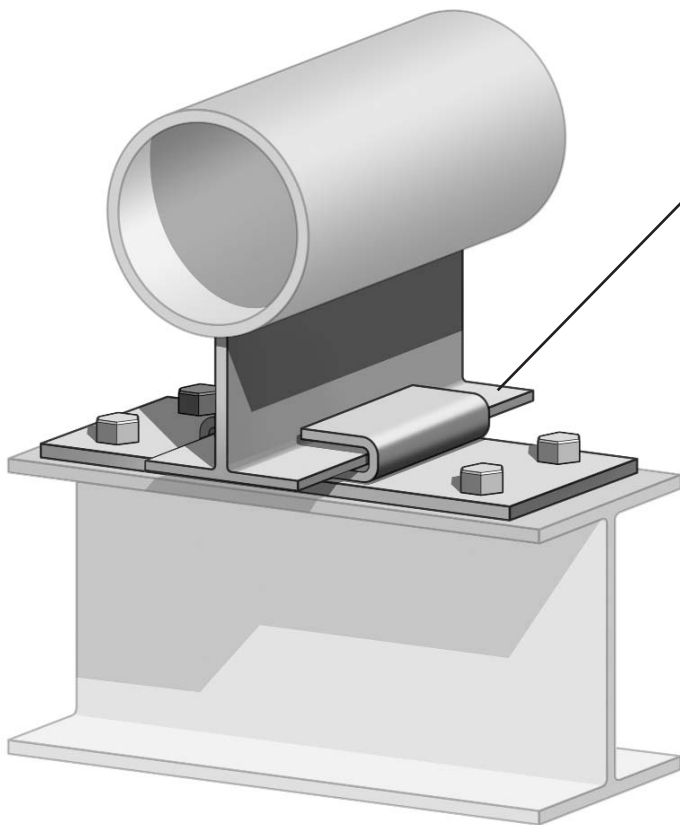
DESCRIPTION:

PRE-INSULATED SERIES

DRAWN BY:
JRR

DATE:
1/05

DRAWING NO:
PG -PRE



Slide guide for 1-4" pipe. Slide welded to pipe with bolt down axial guide base.

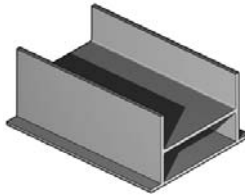
MODEL PTFE SLIDE GUIDE STANDARD AND PRE-INSULATED

Slide guides can come in a variety of configurations. Listed below are various options for PTFE slide supports, pre-insulated PTFE slide supports, and base options.

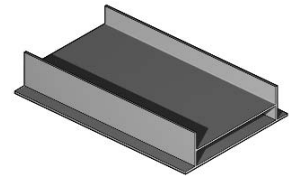
PTFE Slide Support Options



1-4" pipe diameter
Maximum 2" insulation



5-8" pipe diameter
Maximum 3-1/2" insulation

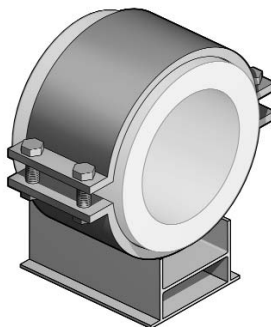


10-24" pipe diameter
Maximum 3-1/2" insulation

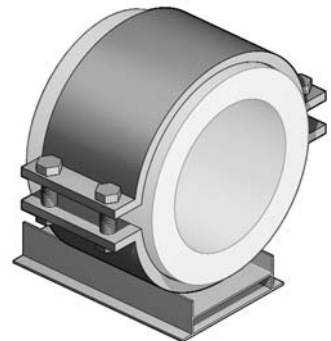
Pre-Insulated PTFE Slide Support Options



1-4" pipe diameter
1" - 4" insulation

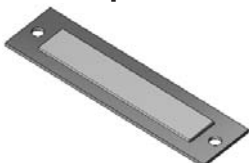


5-8" pipe diameter
1" - 4" insulation



10-24" pipe diameter
1" - 4" insulation

Base Options



Lateral slide base
Bolt down



Axial guide base
Weld down



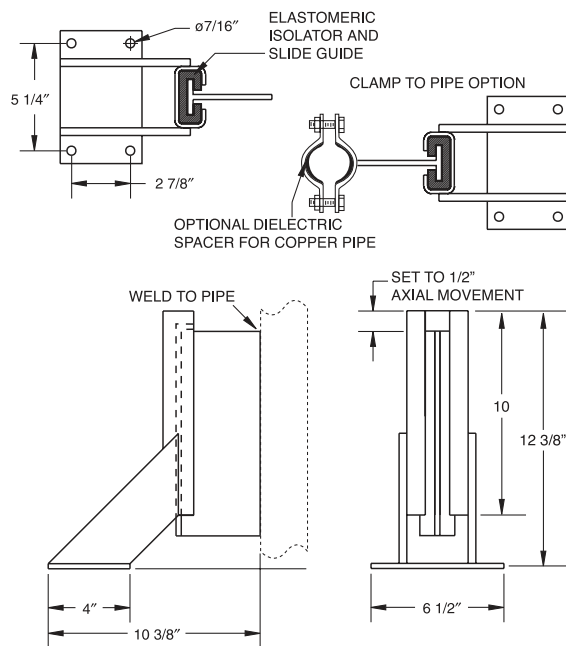
Axial guide base
Bolt down





VIBRATION ISOLATING RISER GUIDE MODEL PGQ

Specifically designed for high rise building applications where mounting guides is difficult. The enhanced lateral stability of the PGQ allows fewer guides to be used and still meet the EJMA guide spacing recommendations. Sound isolating slide bearing with no metal to metal contact between riser pipes and building attachments. Self lubricating and maintenance free. Maximum temperature 250°F. Stock sizes up to 8 inch pipe with 0 to 10 inch axial movement.



QTY	ATTACHMENT WELD CLAMP	DIELECTRIC	NOTES

CUSTOMER _____
 PROJECT _____
 ENGINEER _____
 ARCHITECT _____
 PRO. OR P.O. NO _____

Metraflex[®]
for pipes in motion
 Chicago, IL

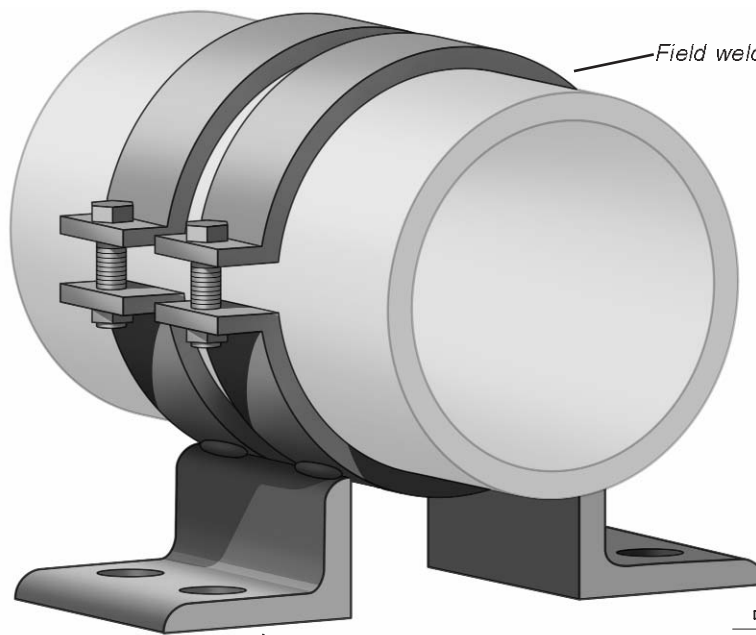
DESCRIPTION:

VIBRATION ISOLATING RISER GUIDE

DRAWN BY:
JRR

DATE:
1/05

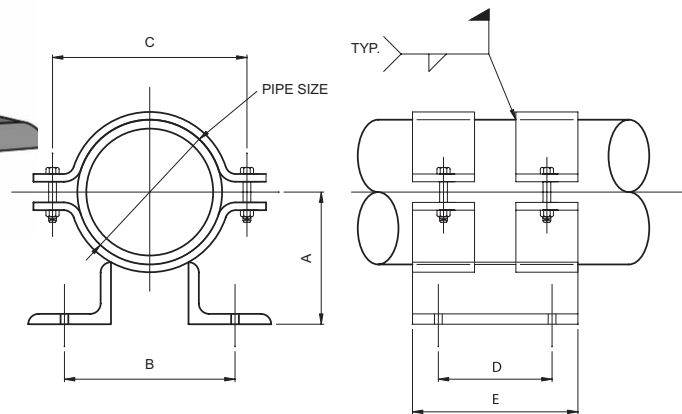
DRAWING NO:
PGQ



Model PA Anchor Clamp

Light weight anchor for low load.
This anchor is ideal for the
Metraloop expansion joint or other
“no thrust” expansion joints.
Clamps to pipe.

Feet can be bolted or
welded to structure.



TOTAL QTY.	PIPE SIZE	A	B	C	D	E	BOLT HOLE	WEIGHT (LBS.)
	3/4"	2-1/8"	3-3/8"	3-5/8"	2-3/4"	4	5/8"	3
	1"	2-1/8"	3-3/8"	3-5/8"	2-3/4"	4	5/8"	3
	1-1/4"	2-3/8"	3-3/8"	3-5/8"	2-3/4"	4	5/8"	3
	1-1/2"	2-1/2"	3-3/8"	4-5/8"	2-3/4"	4	5/8"	4
	2"	2-3/4"	3-3/8"	4-5/8"	2-3/4"	4	5/8"	4
	2-1/2"	3"	3-3/8"	5-5/8"	2-3/4"	4	5/8"	4
	3"	3-1/4"	4-1/8"	5-5/8"	2-3/4"	4	5/8"	4
	4"	3-1/2"	5-1/8"	7-1/4"	2-3/4"	4	5/8"	5
	5"	4-1/2"	5-7/8"	8-1/2"	4	6	3/4"	7
	6"	5"	6-1/4"	8-1/2"	4	6	3/4"	8
	8"	6"	6-3/4"	10-7/8"	4	6	3/4"	9
	10"	7"	7-3/4"	12-5/8"	4	6	3/4"	14
	12"	8"	8-1/8"	14-3/4"	4	6	3/4"	16

Notes: Material - Carbon Steel. Finish - One Coat of Paint.

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

PRO. OR P.O. NO _____

Metraflex
for pipes in motion
Chicago, IL

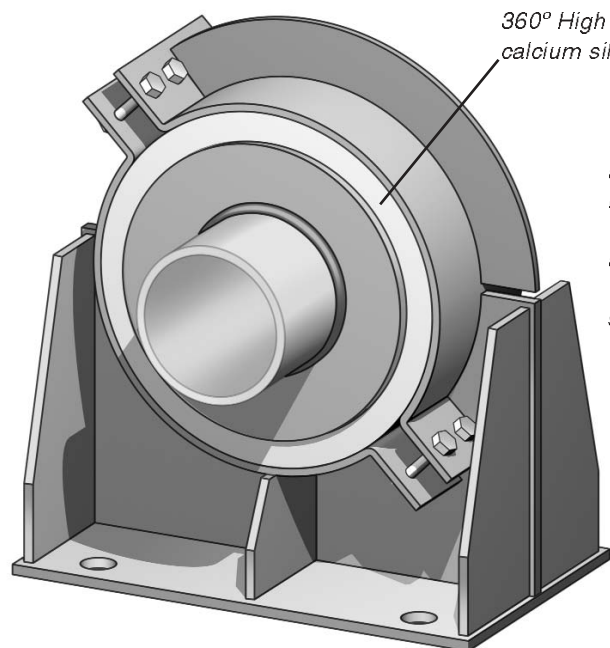
DESCRIPTION:

ANCHOR CLAMP

DRAWN BY:
KL

DATE:
1/05

DRAWING NO:
ACA5

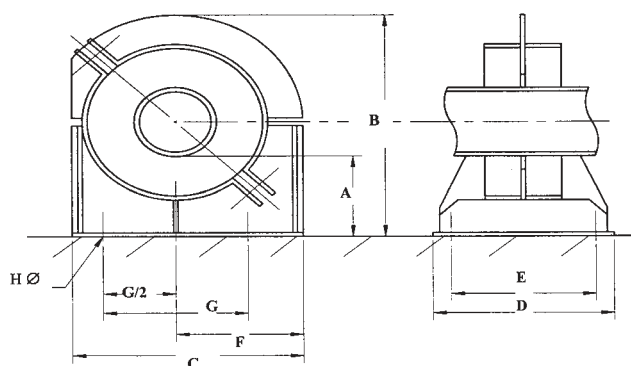


360° High compressive strength
calcium silicate insulation.

Completely
assembled.
Ready to be
welded to pipe
and bolted or
welded to
structure.

Model PAPI Pre-Insulated Anchor

High anchor loads. No metal to metal contact. Pre-insulated anchors deliver maximum insulation effectiveness and energy savings. Unique design and high compressive strength insulation allows this anchor to support working loads of up to 17,500 lbs. and test loads of up to 26,250 lbs.



Anchor Hardware

- Available materials: Carbon Steel or Stainless Steel
- Power-coated finish (carbon steel only 2 mil)

Insulation insert

- 360° asbestos-free Xonolite Calcium Silicate - 900 PSI compressive strength
- K-Factor: .61 @ 400°F
- Meets ASTM C-533, C-585, C795, E-72 and E-84. Flame Spread -0-, Smoke developed -0-.
- All units include a vapor barrier jacket meeting ASTM D-744 and protection shield of galvanized or stainless steel

TOTAL QTY	PIPE SIZE	ANCHOR DIMENSIONS (INCHES)								WORKING LOADS LBS	NOTES
		A	B	C	D	E	F	G	H		
	1-1/2"	5.25	11.82	10.00	8.00	6.00	5.62	5	0.62	5,750	
	2"	5.12	11.93	10.00	8.00	6.00	5.62	5	0.62	5,750	
	2-1/2"	5.38	13.43	12.00	8.00	6.00	6.62	7	0.62	5,750	
	3"	5.12	13.49	12.00	8.00	6.00	6.62	7	0.62	5,750	
	4"	5.25	14.62	13.00	10.00	8.00	7.12	8	0.88	7,150	
	5"	5.25	15.72	14.00	10.00	8.00	7.69	10	0.88	9,100	
	6"	5.25	17.26	16.00	12.00	10.00	8.70	11	1.12	12,800	
	8"	6.50	20.64	18.50	12.00	10.00	9.83	13	1.12	17,500	

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

PRO. OR P.O. NO _____

Metraflex
for pipes in motion

Chicago, IL

DESCRIPTION:

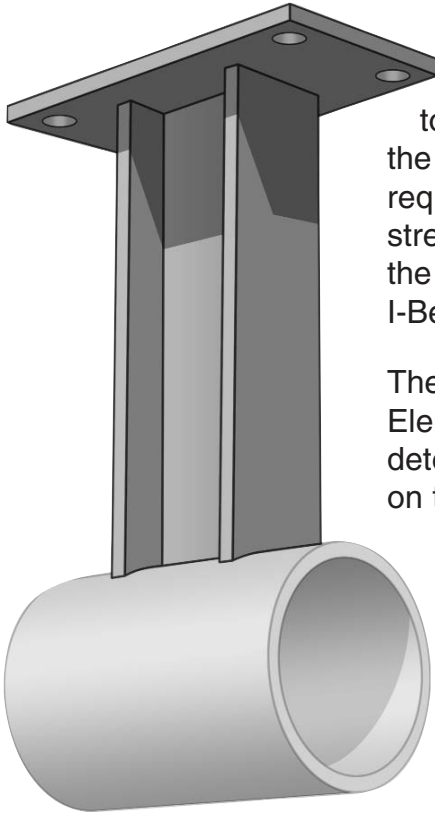
PRE-INSULATED ANCHOR

DRAWN BY:
JRR

DATE:
1/05

DRAWING NO:
PAPI

STRUCTURAL I-BEAM ANCHORS



Design Analysis:

Von Mises stress was used to calculate the safety factor of the anchor with various load requirements. The highest stressed point was the base of the weld at the front edge of the I-Beam.

The Pro/MECHANICA® Finite Element Model was used to determine the high stress areas on the anchor and calculate the

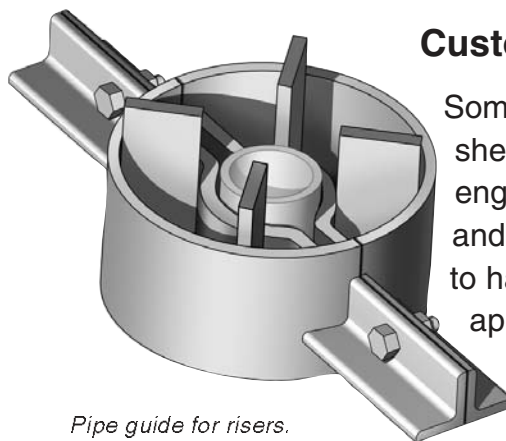
safety factor. The model was constrained along the edges of the base plate to simulate the welding of the anchor to the existing structure. This method of constraint was chosen because of the unknown factors in the bolting of the anchor to different structures. All edges of the base plate were constrained in XYZ translation. The model was meshed with "P" elements, which also included the weld geometry.

MIN PIPE DIA.	ANCHOR MODEL #	MAX. ANCHOR FORCE (KIPS)				
		BASE/STRUCTURE TO CENTER OF PIPE				
		12"	18"	24"	36"	48"
2	PAI-1	1.397	0.951	0.732	0.497	0.371
2.5	PAI-2	2.338	1.545	1.149	0.76	0.565
3	PAI-3	3.211	2.15	1.617	1.08	0.812
3	PAI-4	4.256	2.945	2.293	1.586	1.229
4	PAI-5	5.143	3.404	2.535	1.678	1.249
4	PAI-6	10.183	7.089	5.596	3.919	3.072
6	PAI-7	7.467	4.887	3.6	2.357	1.733
6	PAI-8	13.388	9.371	7.366	5.137	4.015
6	PAI-9	18.846	13.178	10.341	7.189	5.629
8	PAI-10	24.545	16.444	12.393	8.388	6.385
8	PAI-11	30.912	21.165	16.289	11.135	8.558
10	PAI-12	31.101	22.319	17.928	12.745	10.153
10	PAI-13	42.936	30.298	23.979	16.823	13.245
10	PAI-14	52.225	36.957	29.319	20.595	16.236
10	PAI-15	62.308	41.328	30.838	20.453	15.261
16	PAI-16	63.399	53.456	37.304	23.703	16.802

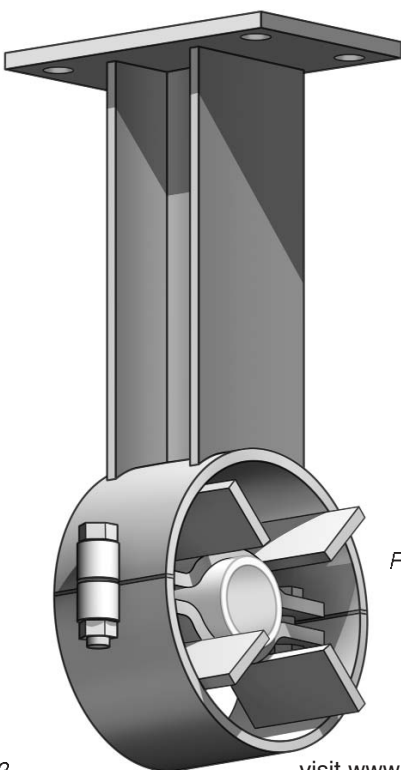


Custom Fabricated Guides

Some applications defy off-the-shelf solutions. Metraflex engineers can help you design and engineer custom guides to handle even the most difficult applications. Contact Metraflex today for technical assistance.

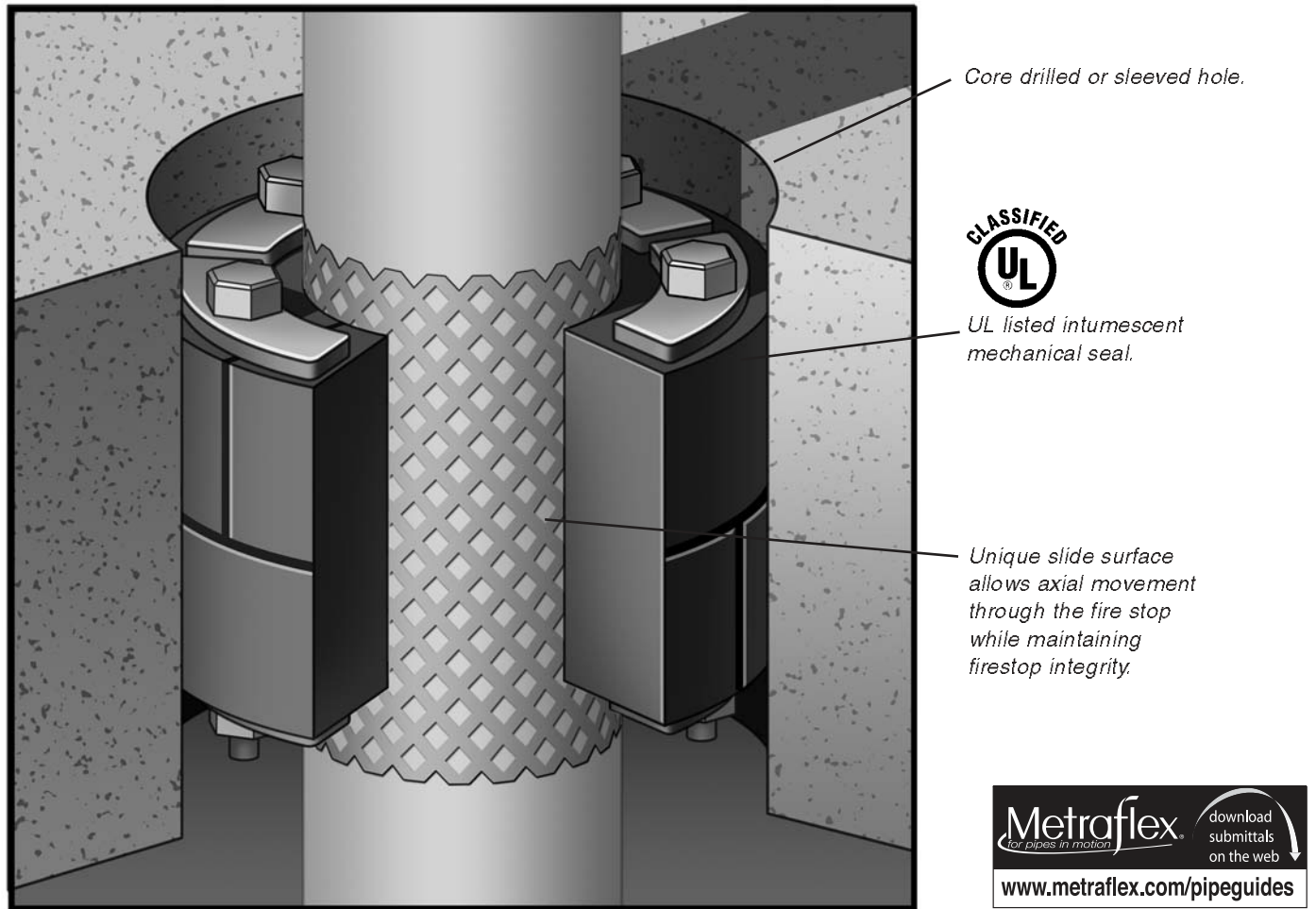


Pipe guide for risers.



Pipe guide with I-Beam.





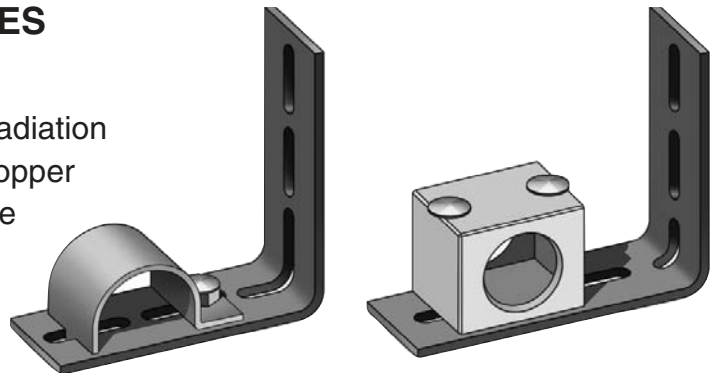
FIREWALKER™ FIRESTOP AND PIPE GUIDE ALLOWS PIPE MOVEMENT

The FireWalker™ Firestop is an Underwriter Laboratory (UL) listed sliding fire seal that allows unlimited axial pipe movement through a fire rated wall or floor.

The FireWalker is an intumescent mechanical seal with a unique slide surface. The pipe is guided as it moves through the riser hole.

BASEBOARD FIN TUBE GUIDES AND ANCHORS

Adjustable and designed to fit most radiation base board tube enclosures, these copper tube guides and anchors are available for 3/4", 1" and 1-1/4" copper tube. Maximum temperature for guides is 240°F.



NOTES

Terms and Conditions

1. All quotations are subject to approval, acceptance and correction at the home office. Any errors in quotations resulting in orders will be corrected and re-submitted to the customer for their acceptance or refusal.

No prices may be made up from information other than that shown in the tables.

2. All prices are F.O.B. factory, Chicago, Illinois, and are quoted exclusive of any taxes.

Shipments boxed for trans-ocean export add 10% to total trade price.

Terms: Net 30 days from date of invoice.

3. Cancellation or alteration of an order or return of any product by Buyer may not be made without advance written consent of manufacturer and shall be subject to a cancellation charge.

A 35% minimum restocking charge shall be placed on any returned goods.

4. We will not be responsible for delays in shipping due to conditions beyond our control such as strikes, fires or accidents.

5. Any claims for shortages or damaged products must be made in writing 10 days after receipt of shipment.

6. Prices subject to change without notice.

Design and Dimensional Specifications

The products illustrated reflect the design characteristics at time of printing.

Metraflex reserves the right to change dimensions, materials or methods of construction without notice. Please contact the factory for certified prints (exact dimensions) when necessary.

Limited Warranty

All products are warranted to be free of defects in material and workmanship for a period of one year from the date of shipment, subject to the limitations below.

If the purchaser believes a product is defective the purchaser shall: (a) Notify the manufacturer, state the alleged defect and request permission to return the product. (b) If permission given, return the product with transportation prepaid. If the product is accepted for return and found to be defective, the manufacturer will, at its discretion, either repair or replace the product F.O.B. factory, within 60 days of receipt or refund the purchase price. Other than repair, replace or refund as described above, purchaser agrees that manufacturer shall not be liable for any

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