



**EHV ALUMINUM BUS-SUPPORT FITTINGS FOR ALUMINUM TUBING**

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## EHV BUS-SUPPORT AND PEDESTAL ASSEMBLY

For EHV substations, it is suggested that the ideal method of purchasing bus supports is to buy bus-support clamp, insulator and support pedestal as a complete unit. Both the insulator and the conductor clamp can contribute to radio noise; the only way the purchaser can expect a guaranteed RIV value on the assembly is to purchase both from the same supplier. Likewise, the design of the support pedestal and the clamp can influence the switching surge withstand voltage of the insulator; therefore, the complete assembly can be given guaranteed withstand values only if purchased from the same supplier. Dielectric and RIV tests, if required, should be conducted on the complete assembly, and not on individual parts, if test results are to have any value.

I-T-E is prepared to supply complete assemblies as described above and as illustrated in Fig. 1. The support pedestal is of bolted latticed construction, using galvanized-steel angles, and is computer-designed for optimum dimensions, combining adequate strength with economy. Insulators may be cap-and-pin, station post, or I-T-E Multicone\*. Bus-support clamps may be selected from the following pages.

### Ordering Information

The following information is needed to process EHV bus-support orders or to offer a complete and accurate quotation:

1. Conductor size and material.
2. Type of clamp.
3. Bus height above concrete foundations.
4. Span lengths or, better yet, substation plan drawing.
5. Phase spacing.
6. Nominal voltage.
7. BIL.
8. Type of insulator.
9. Switching surge withstand rating — and acceptable probability of flashover at withstand rating specified (500 kV and above.)
10. System fault capacity in amperes or MVA.

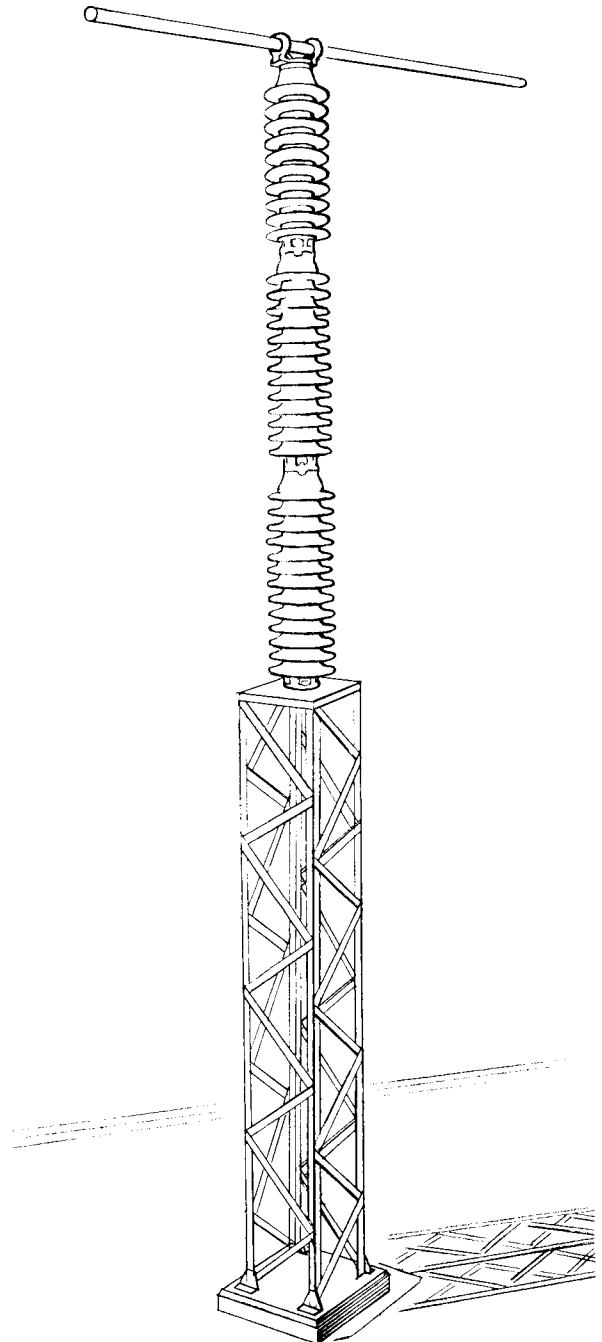


Fig. 1

\*Trade Mark



**EHV ALUMINUM BUS-SUPPORT CLAMPS**

**AUP BOLTED TYPE — 5-INCH BOLT CIRCLE**

Recommended for Voltages up to 345 kV

**FOR TUBULAR ALUMINUM CONDUCTOR**

AUP bus-support clamps may be used as either fixed (clamp) type or slide type by merely reversing the top clamping members. Stainless-steel springs serve to clamp the tubing when the fitting is used as a slide-type support, so that the tube does not vibrate within the fitting and thereby cause radio interference. Castings are alloy 356-T6 aluminum and clamping bolts are aluminum.

When ordering specify:

1. Catalog number.
2. Bus size
3. Whether clamp will be used with tapped cap or pin-type insulator (underhung mounting)

Galvanized-steel mounting bolts are included

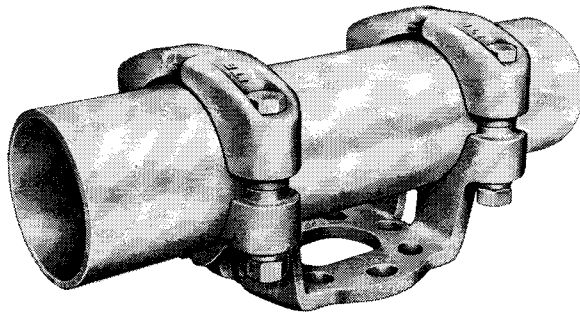


Fig. 1

4840B

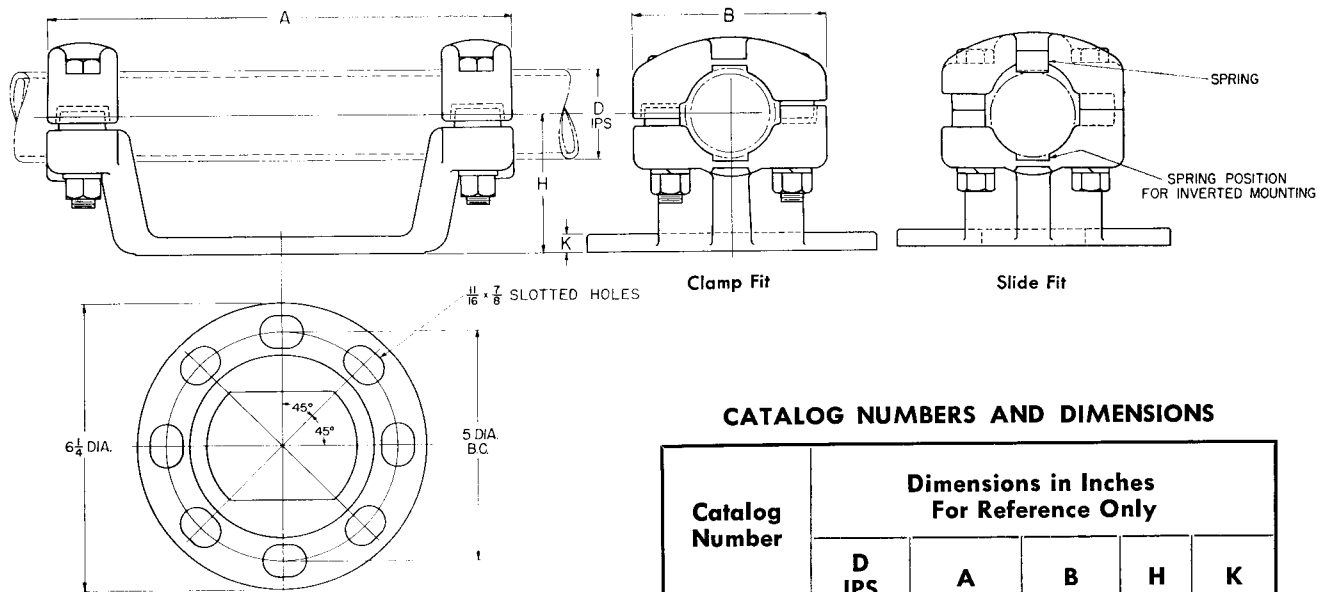


Fig. 2

**CATALOG NUMBERS AND DIMENSIONS**

Catalog Number	Dimensions in Inches For Reference Only				
	D IPS	A	B	H	K
AUP-288	2½	10	5	4	½
AUP-350	3	10¼	6	4	½
AUP-400	3½	10¼	6⅝	4	½
AUP-450	4	10¼	7⅞	4	½



**EHV ALUMINUM BUS-SUPPORT FITTINGS**

**WAUP-DR AND R — WELD TYPE — 5-INCH BOLT CIRCLE**

Recommended for Voltages up to 550 kV

**FOR TUBULAR ALUMINUM CONDUCTOR**

WAUP-DR and R bus-support fittings may be used as either fixed (weld) or slide type. For fixed type, the single or double rings are welded to the aluminum bus at the installation. For slide type, a small braided shunt is welded to the base at the factory and to the bus at the installation. The fitting is alloy 356-T6 aluminum.

When ordering specify:

1. Catalog number (single or double ring)
2. Bus size
3. Whether fixed or slide type
4. Whether clamp will be used with tapped cap or pin-type insulator (underhung mounting)

Galvanized-steel mounting bolts are included

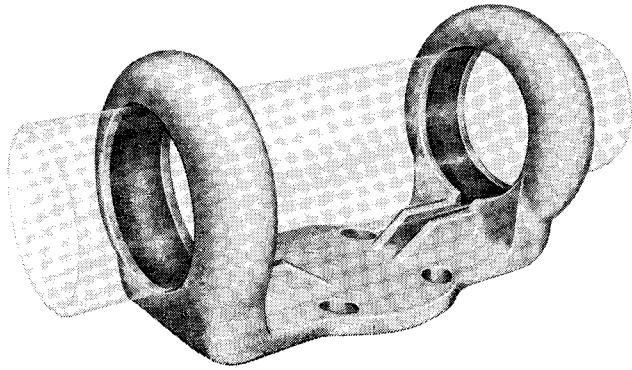


Fig. 3 4840E

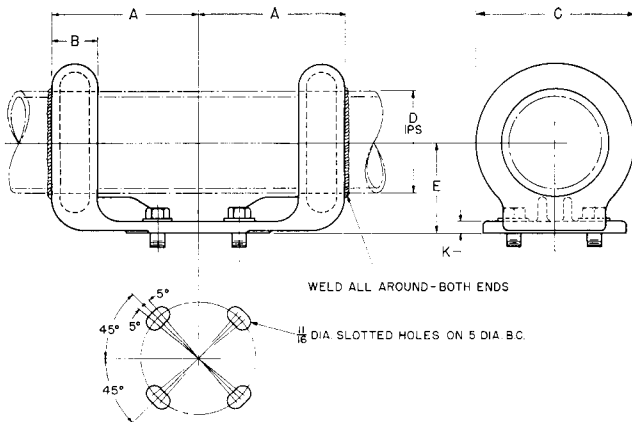


Fig. 4 Double ring, WAUP-DR

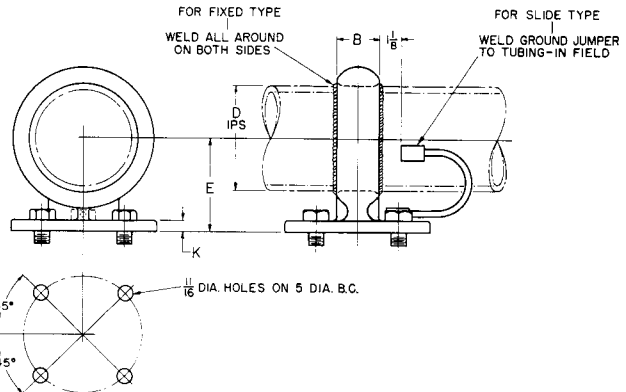


Fig. 5 Single ring, WAUP-R

**CATALOG NUMBERS AND DIMENSIONS**

Catalog Number		Dimensions in Inches For Reference Only						
Single Ring	Double Ring	D IPS	A	B	C	E	K	X (see note)
WAUP-R-HV-288	WAUP-DR-HV-288	2½	6¾	2	4¾	4	½	18
WAUP-R-HV-350	WAUP-DR-HV-350	3	6¾	2	5½	4	½	22
WAUP-R-HV-400	WAUP-DR-HV-400	3½	6¾	2	6¾	4	½	25
WAUP-R-HV-450	WAUP-DR-HV-450	4	6¾	2	6¾	4	½	28½
WAUP-R-HV-556	WAUP-DR-HV-556	5	8	2½	8½	5	5/8	35
WAUP-R-HV-663	WAUP-DR-HV-663	6	8	2½	9½	6	¾	41½

X — Approximate total inches of weld.



**EHV ALUMINUM BUS-SUPPORT FITTINGS**

**WAUP-DH — WELD TYPE — 5-INCH BOLT CIRCLE**

Recommended for Voltages up to 550 kV

**FOR ALUMINUM TUBULAR CONDUCTOR**

WAUP-DH bus-support fittings may be used either fixed (weld) or slide type. For fixed type, the two hooks are welded to the aluminum bus at the installation. For slide type, a small braided shunt is welded to the base at the factory and to the bus on installation. The fitting is alloy 356-T6 aluminum.

This fitting is convenient to use on bent bus sections and in the center of long straight runs. It is not recommended for use as a slide fitting at or near the end of the bus.

When ordering specify:

1. Catalog number.
2. Bus size
3. Whether fixed or slide type
4. Whether clamp will be used with tapped cap or pin-type insulator (underhung mounting)

Galvanized-steel mounting bolts are included

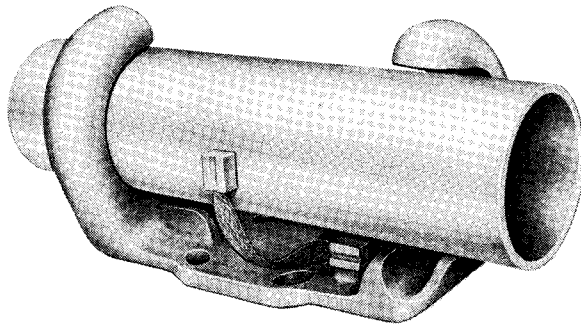


Fig. 1 Slide-type, with ground jumper welded to tubing.

4840G

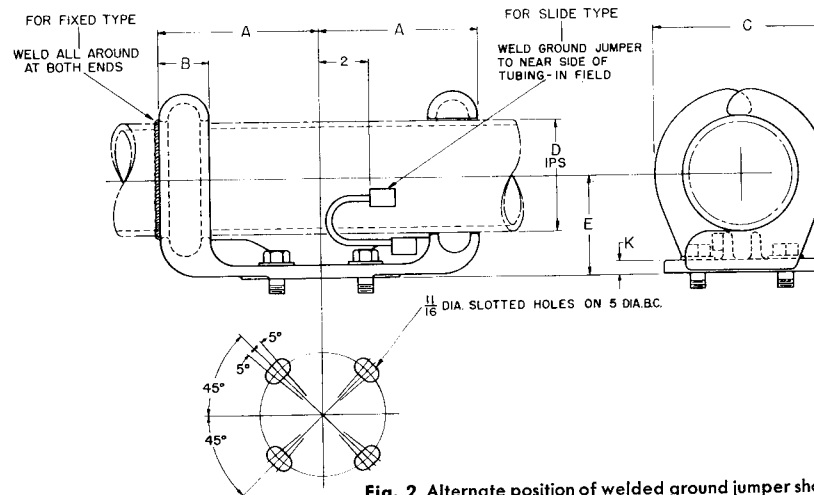


Fig. 2 Alternate position of welded ground jumper shown.

**CATALOG NUMBERS AND DIMENSIONS**

Catalog Number	Dimensions in Inches for Reference Only						
	D IPS	A	B	C	E	K	X (see note)
WAUP-DH-HV-288	2 1/2	6 3/8	2	4 3/4	4	1/2	11
WAUP-DH-HV-350	3	6 3/8	2	5 1/2	4	1/2	13
WAUP-DH-HV-400	3 1/2	6 3/8	2	6 3/8	4	1/2	15
WAUP-DH-HV-450	4	6 3/8	2	6 7/8	4	1/2	17
WAUP-DH-HV-556	5	8	2 1/2	8 1/2	5	5/8	21
WAUP-DH-HV-663	6	8	2 1/2	9 1/2	6	3/4	25

X — Approximate total inches of weld.



### EHV ALUMINUM BUS-SUPPORT FITTINGS

#### WAUP-X EXPANSION TYPE — 5-INCH BOLT CIRCLE

Recommended for Voltages up to 550 kV

#### FOR TUBULAR ALUMINUM CONDUCTOR

WAUP-X expansion coupler bus-supports permit a total movement of about 3 inches in each bus span. Laminated flexes are shielded by cast aluminum corona shields.

When ordering specify:

1. Catalog number.
2. Bus size
3. Whether clamp will be used with tapped cap or pin-type insulator (underhung mounting)

Galvanized-steel mounting bolts are included

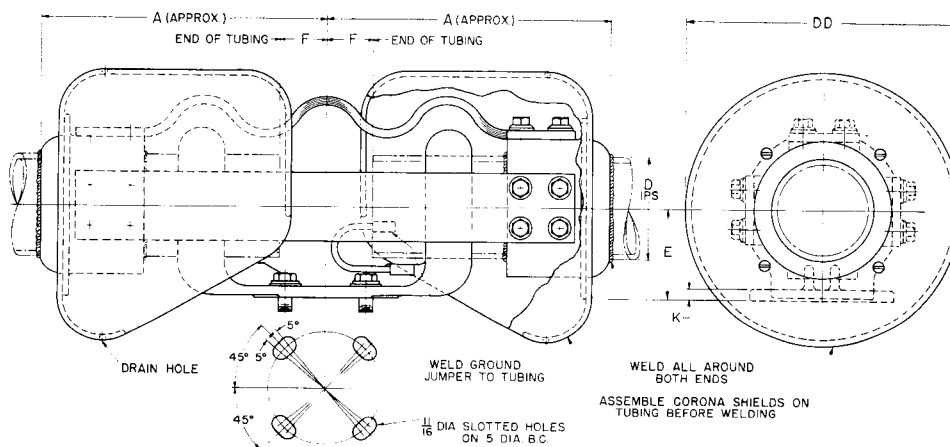


Fig. 3

#### CATALOG NUMBERS AND DIMENSIONS

Catalog Number	Amperes	Dimensions in Inches For Reference Only						
		D IPS	A	DD	E	F	K	X (see note)
WAUP-X-HV-288	1200	2½	12¾	11	4	2	½	36
WAUP-X-HV-350	1600	3	12¾	11	4	2	½	44
WAUP-X-HV-400	2000	3½	12¾	12	4	2	½	50
WAUP-X-HV-450	2500	4	12¾	12	4	2	½	57
WAUP-X-HV-556	3250	5	14½	14	5	2½	⅝	70
WAUP-X-HV-663	3250	6	14½	15	6	2½	¾	83

X — Approximate total inches of weld.



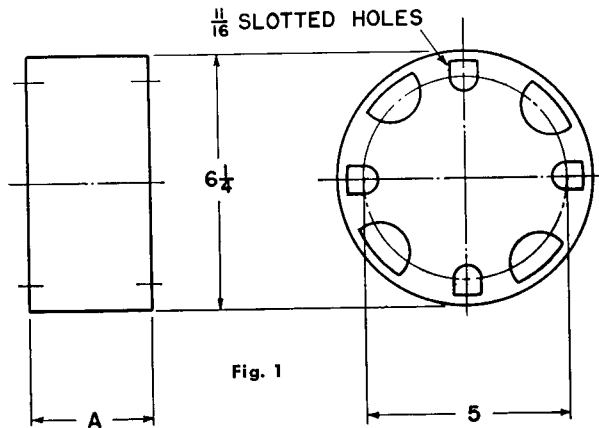
**EHV BUS-SUPPORT HARDWARE**

**SPACERS**

Used on some 5-inch Bolt Circle Switches

Used also with 5-inch bolt circle Bus-Supports.

- (a) To make the clamp line up with a switch terminal.
- (b) To make the insulator stack develop its full electrical characteristics. See Fig. 2.



Height A, (Inches)	Cat. No.
1 1/4	13810
1 1/2	24554
1 3/4	18678
2	24239
2 1/4	18441
2 1/2	31343
2 3/4	18393
3	12712
3 1/4	12714
3 1/2	26454
3 3/4	31344
4	24238
4 1/4	31345
4 1/2	31346
4 3/4	31347
5	31348
5 1/4	31349
5 1/2	31350
5 3/4	31351
6	31352
6 1/4	31353
6 1/2	31354
6 3/4	31355
7	31356
7 1/4	31357
7 1/2	31358

Similar spacers are available for use with 7-inch bolt circle insulators. In ordering, specify height A.

**APPLICATION OF 3 1/2-INCH SPACER**

Catalog No. 26454

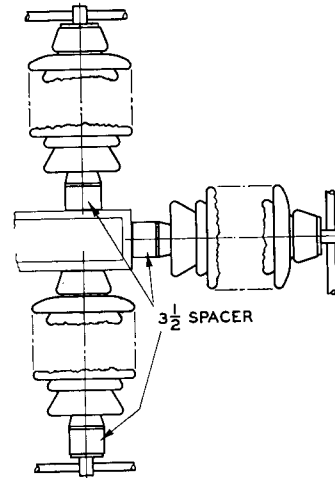


Fig. 2

Recommended use of spacer for stacking cap-and-pin insulator bus-supports when mounted upright, horizontal or inverted.

It is used to increase the height of the support in order to develop full electrical characteristics.

**ADAPTER**

**7-INCH, TO 5-INCH BOLT CIRCLE**

Catalog No. 300-822-001

Alloy 356-T6 Aluminum.

Used for mounting 5-inch bolt circle bus-support fittings on 7-inch bolt circle insulators.

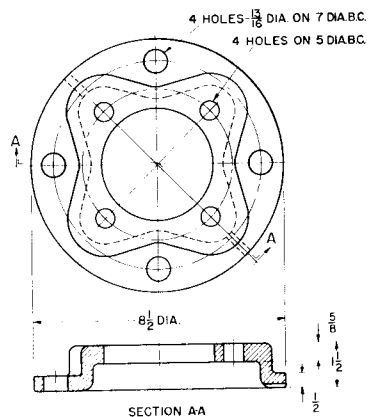


Fig. 3



**EHV INSULATOR BASES**

Used with High Voltage Bus-Supports to correct the variations in heights of insulator stacks, or their angle to the mounting surface

**ADJUSTABLE  
FOR 5-INCH BOLT CIRCLE INSULATORS**

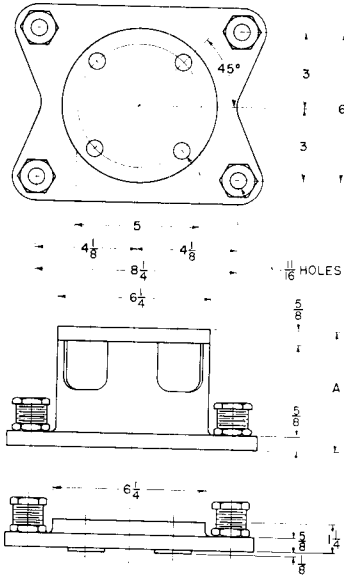


Fig. 4

Height A, Inches	Cat. No.
1 1/2	11578
3 1/2	11581
4	25730
4 1/4	11579
4 1/2	31362
5	11396
5 1/4	31361
5 1/2	31360
6	31359
6 1/2	31363
6 3/4	11580
7	31364
7 1/2	11395

**Detail of Leveling Screw**

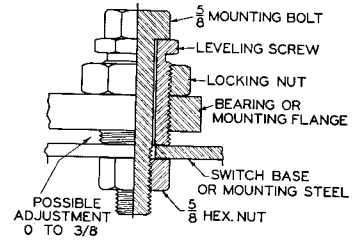


Fig. 5

Also a feature of the mounting flange on a 5-inch bolt circle switch bearing.

**NON-ADJUSTABLE  
FOR 7-INCH BOLT CIRCLE INSULATORS**

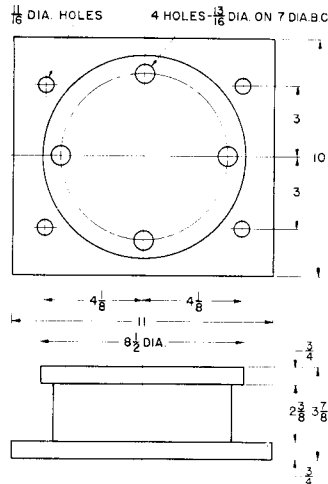


Fig. 6 Catalog Number 307-416-301





**EHV ALUMINUM BUS-SUPPORT FITTINGS FOR ALUMINUM TUBING**

**LIST PRICES**

Refer to Section 12.4.1.1

**QUANTITY DISCOUNT SCHEDULE**

Quantity (All Same Size and Type)	Discount, Per cent	Multiplier
1-3	Plus 10	<b>1.10</b>
4-9	0	<b>1.00</b>
10-19	Less 10	<b>.90</b>
20-99	Less 20	<b>.80</b>
100 and over	Less 30	<b>.70</b>

**BOLTED TYPE AUP**

Page 1

Catalog Number	IPS	List Price
AUP-288	2½	<b>\$21.00</b>
AUP-350	3	<b>24.00</b>
AUP-400	3½	<b>27.00</b>
AUP-450	4	<b>30.00</b>

**SINGLE RING TYPE WAUP-R**

Page 2

Catalog Number	IPS	List Prices	
		Slide (With Shunt)	Weld (Without Shunt)
WAUP-R-HV-288	2½	<b>\$26.00</b>	<b>\$14.00</b>
WAUP-R-HV-350	3	<b>28.00</b>	<b>16.00</b>
WAUP-R-HV-400	3½	<b>30.00</b>	<b>18.00</b>
WAUP-R-HV-450	4	<b>32.00</b>	<b>20.00</b>
WAUP-R-HV-556	5	<b>36.00</b>	<b>24.00</b>
WAUP-R-HV-663	6	<b>40.00</b>	<b>28.00</b>

**DOUBLE RING TYPE WAUP-DR**

Page 2

Catalog Number	IPS	List Prices	
		Slide (With Shunt)	Weld (Without Shunt)
WAUP-DR-HV-288	2½	<b>\$42.00</b>	<b>\$30.00</b>
WAUP-DR-HV-350	3	<b>46.00</b>	<b>34.00</b>
WAUP-DR-HV-400	3½	<b>50.00</b>	<b>38.00</b>
WAUP-DR-HV-450	4	<b>52.00</b>	<b>40.00</b>
WAUP-DR-HV-556	5	<b>56.00</b>	<b>44.00</b>
WAUP-DR-HV-663	6	<b>60.00</b>	<b>48.00</b>

**DOUBLE HOOK TYPE WAUP-DH**

Page 3

Catalog Number	IPS	List Prices	
		Slide (With Shunt)	Weld (Without Shunt)
WAUP-DH-HV-288	2½	<b>\$42.00</b>	<b>\$30.00</b>
WAUP-DH-HV-350	3	<b>46.00</b>	<b>34.00</b>
WAUP-DH-HV-400	3½	<b>50.00</b>	<b>38.00</b>
WAUP-DH-HV-450	4	<b>52.00</b>	<b>40.00</b>
WAUP-DH-HV-556	5	<b>56.00</b>	<b>44.00</b>
WAUP-DH-HV-663	6	<b>60.00</b>	<b>48.00</b>

**EXPANSION TYPE WAUP-X**

Page 4

Catalog Number	IPS	List Price
WAUP-X-HV-288	2½	<b>\$330.00</b>
WAUP-X-HV-350	3	<b>350.00</b>
WAUP-X-HV-400	3½	<b>370.00</b>
WAUP-X-HV-450	4	<b>400.00</b>
WAUP-X-HV-556	5	<b>450.00</b>
WAUP-X-HV-663	6	<b>490.00</b>



**EHV INSULATOR BASES, SPACERS AND ADAPTERS**

**NET PRICES**

Refer to Section 12.4.1.1

**5-INCH BOLT CIRCLE SPACERS**

Page 5

Height A, Inches	Catalog Number	Net Price
1 1/4	13810	\$ 9.50
1 1/2	24554	9.50
1 3/4	18678	9.50
2	24239	9.50
2 1/4	18441	9.50
2 1/2	31343	9.50
2 3/4	18393	9.50
3	12712	9.50
3 1/4	12714	9.50
3 1/2	26454	9.50
3 3/4	31344	9.50
4	24238	9.50
4 1/4	31345	9.50
4 1/2	31346	9.50
4 3/4	31347	9.50
5	31348	9.50
5 1/4	31349	9.50
5 1/2	31350	9.50
5 3/4	31351	9.50
6	31352	9.50
6 1/4	31353	15.00
6 1/2	31354	15.00
6 3/4	31355	15.00
7	31356	15.00
7 1/4	31357	15.00
7 1/2	31358	15.00

**ADJUSTABLE INSULATOR BASES FOR 5-INCH BOLT CIRCLE INSULATORS**

Page 6

Height A, Inches	Catalog Number	Net Price
1 1/2	11578	\$19.00
3 1/2	11581	19.00
4	25730	19.00
4 1/4	11579	19.00
4 1/2	31362	19.00
5	11396	19.00
5 1/4	31361	19.00
5 1/2	31360	19.00
6	31359	19.00
6 1/2	31363	19.00
6 3/4	11580	19.00
7	31364	19.00
7 1/2	11395	19.00

**NON-ADJUSTABLE INSULATOR BASE FOR 7-INCH BOLT CIRCLE INSULATORS**

Page 6

Height, Inches	Catalog Number	Net Price
3 7/8	307-416-301	\$28.00

**ADAPTER—7-TO 5-INCH BOLT CIRCLE**

Page 5

Height, Inches	Catalog Number	Net Price
1 1/2	300-822-001	\$25.00