
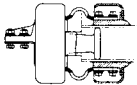

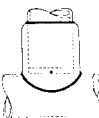

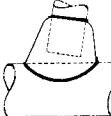
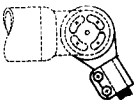
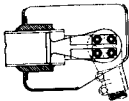
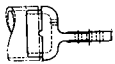
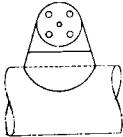






## EHV ALUMINUM CONNECTORS FOR TUBULAR ALUMINUM CONDUCTORS

### PICTORIAL INDEX

	SUBJECT	SECTION 12.5.1.1 PAGE
	WALP — Terminal, Weld-type Clamp	1
	WALP-X — Terminal, Expansion Clamp	1
	WACP — Coupler, Weld-type	2
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	WAVP — Vee Connector, Weld-type	4
	WANTP — Tee Connector, Weld-type	4
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	WACPF — Straight, Tubing to Bolted, Welded	6
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	AM — Corona Shield for Bolted Joints	7
	ABP — Corona Balls	8



# EHV SWITCH TERMINALS—WELD TYPE FOR TUBULAR ALUMINUM CONDUCTOR

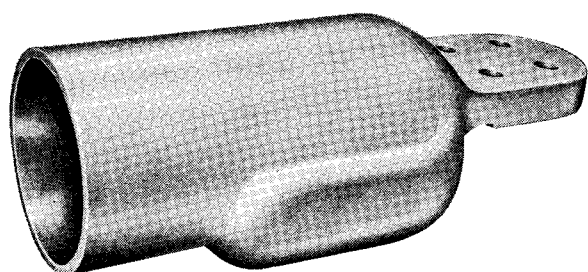


Fig. 1

4840H

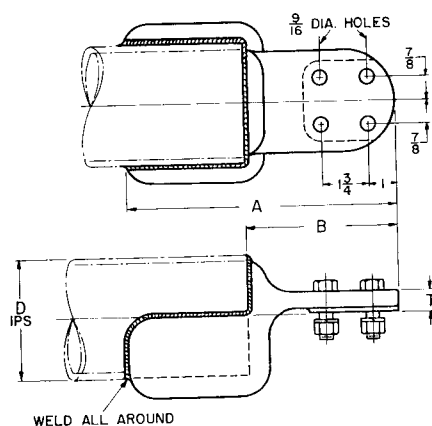


Fig. 2

## WALP-X, 1600 OR 2000 AMP

WALP-X terminals allow total expansion of about 3 inches. Flexes are protected by cast aluminum corona shielding adequate for 550 kV. Stainless-steel bolts, nuts and lockwashers are included.

Order by catalog number and IPS of aluminum tubing, and current rating required.

## CATALOG NUMBERS AND DIMENSIONS

Catalog Number	Dimensions in Inches For Reference Only					
	D IPS	A	B	C	T	X (see note)
WALP-X-HV-288	2½	16½	10½	10	1⅞	18
WALP-X-HV-350	3	16½	10½	10	1⅞	22
WALP-X-HV-400	3½	16½	10½	10	1⅞	25
WALP-X-HV-450	4	16½	10½	10	1⅞	28½
WALP-X-HV-556	5	17½	12	13	1	35
WALP-X-HV-663	6	17½	12	14½	1	41½

X — Approximate total inches of weld.

## WALP

WALP terminals are designed with very heavy sections and generous radii to be corona-free up to 550 kV. Cast from alloy 356-T6 aluminum, they are of the center-formed type, which means the center line of the tubular bus is at the same elevation as the terminal pad. The cradle design supports the aluminum pipe prior to and during the welding operation. Stainless-steel bolts, nuts and lockwashers are included.

Order by catalog number and IPS of aluminum tubing.

## CATALOG NUMBERS AND DIMENSIONS

Catalog Number	Dimensions in Inches for Reference Only				
	D IPS	A	B	T	X (see note)
WALP-HV-288	2½	8½	5⅝	1⅞	14½
WALP-HV-350	3	9⅞	5⅝	1⅞	18
WALP-HV-400	3½	9⅝	5⅝	1⅞	20
WALP-HV-450	4	10⅞	5⅝	1⅞	23
WALP-HV-556	5	11⅞	5⅝	1⅞	28
WALP-HV-663	6	12⅞	5⅝	1⅞	33

X — Approximate total inches of weld.

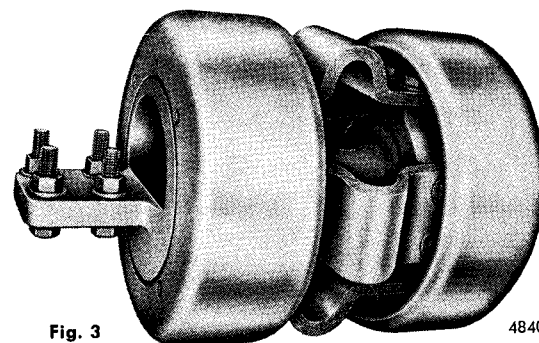


Fig. 3

4840P

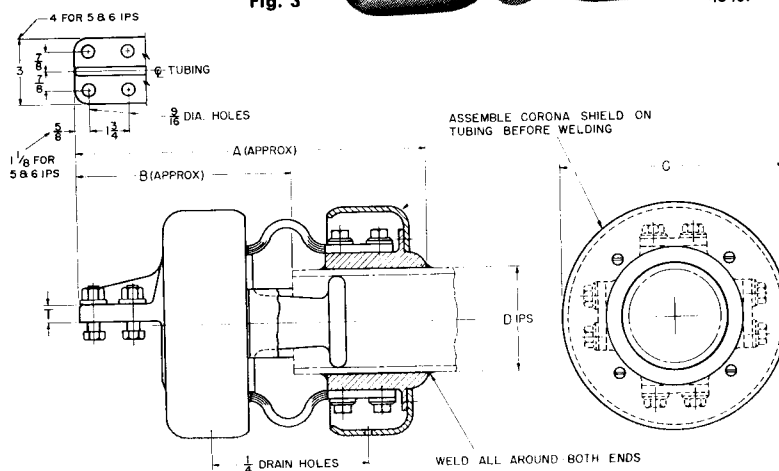


Fig. 4



## EHV CONNECTORS—COUPLERS

### WELD TYPE FOR TUBULAR ALUMINUM CONDUCTOR

#### WACP

WACP straight connectors or couplers are used to facilitate welding together two pieces of aluminum pipe of the same size. The cast aluminum connector maintains a  $\frac{3}{8}$ -inch gap between the two pipe ends, which is filled with weld when welding during installation. The cast connector remains inside the welded joint and helps to strengthen the assembly. Such welded joints should preferably be arranged within (i.e., on the centerline of) bus-support fittings such as those shown on pages 1, 2 and 3 of Section 12.4.1.1. For use with schedule 40 (Standard IPS) aluminum pipe conductors only.

Order by catalog number and pipe size of aluminum tubing.

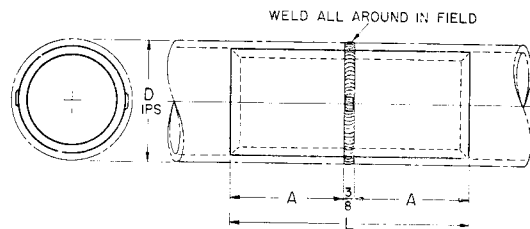


Fig. 5

#### CATALOG NUMBERS AND DIMENSIONS

Catalog Number	Dimensions in Inches For Reference Only			
	D IPS	A	L	X (see note)
WACP-288	2½	3⅝	7	9
WACP-350	3	3⅞	7½	11
WACP-400	3½	3⅞	8	12½
WACP-450	4	4⅝	9	14½
WACP-556	5	4⅞	10	17½
WACP-663	6	5⅞	12	20¾

X — Approximate total inches of weld.



## TEE CONNECTORS

### WELD TYPE FOR TUBULAR ALUMINUM CONDUCTOR

#### WATP 90°

WATP-HV (90°) Tee Connectors are used for sound, easily made, welded Tee joints in aluminum tubular conductors. The heavy alloy 356-T6 aluminum castings have generous radii so as to be corona-free up to 550 kV.

Order by catalog number and specify IPS of tubing.

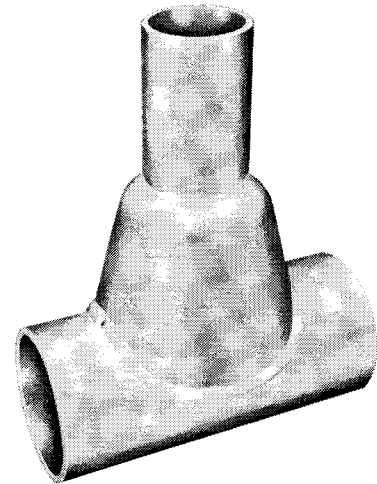


Fig. 1

4840J

#### CATALOG NUMBERS AND DIMENSIONS

Catalog Number	Dimensions in Inches For Reference Only				
	D IPS	DD IPS	A	B	X (see note)
288-WATP-HV-288	2½	2½	5⅞	3	23½
350-WATP-HV-288	3	2½	5½	3	25
350-WATP-HV-350	3	3	6	3½	27
350-WATP-HV-450	3	4	7	4½	30
400-WATP-HV-350	3½	3	6½	3½	29
450-WATP-HV-132	4	1	6	2½	26
450-WATP-HV-288	4	2½	6	3	30
450-WATP-HV-350	4	3	6½	3½	32
450-WATP-HV-450	4	4	7½	4½	35
556-WATP-HV-288	5	2½	6½	3	34
556-WATP-HV-350	5	3	7	3½	36½
556-WATP-HV-450	5	4	8	4½	40
556-WATP-HV-556	5	5	9	5½	43
663-WATP-HV-450	6	4	8½	4½	44
663-WATP-HV-663	6	6	10	6½	50½

X — Approximate total inches of weld.

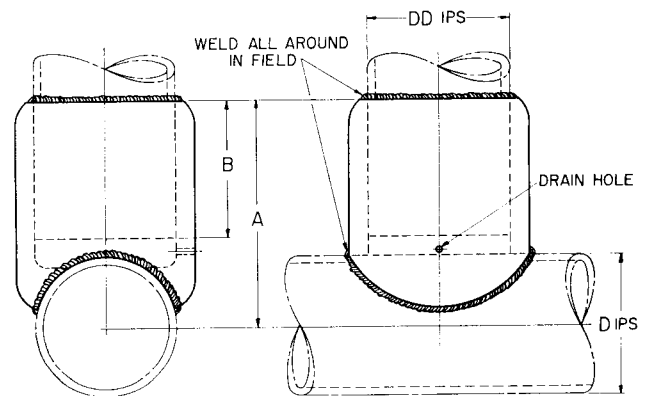


Fig. 2



## VEE AND TEE CONNECTORS WELD TYPE FOR TUBULAR ALUMINUM CONDUCTOR

### WAVP AND WANTP

Vee and Tee connectors as cataloged on this page are used in sets for welded "A-frame" bus assemblies, where in the high-level bus is supported from the low-level bus and runs at right angles to it in a plan view. One WAVP connector is used on the high bus with a pair of WANTP connectors on the lower bus. It is recommended that a bus-support be located at this point, clamping the lower bus midway between the two WANTP connectors and immediately under the WAVP connector on the upper bus. The heavy alloy 356-T6 aluminum castings have generous radii so as to be corona-free up through 550 kV.

Order by catalog number and specify tubing sizes.

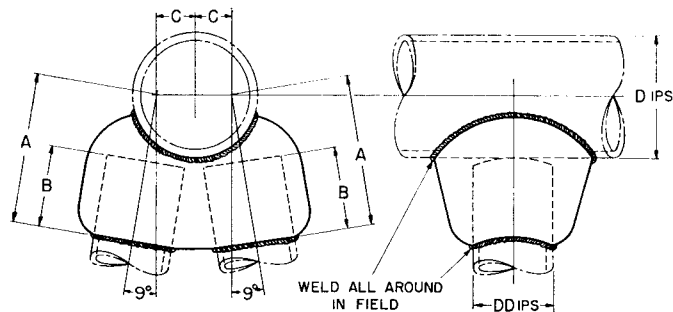


Fig. 3 WAVP

### CATALOG NUMBERS AND DIMENSIONS

FIG. 3 WAVP

Catalog Number	Dimensions in Inches For Reference Only					
	D IPS	DD IPS	A	B	C	X*
450-WAVP-HV-288	4	2½	5½	3	1¾	38
450-WAVP-HV-350	4	3	6½	3½	1¾	42
556-WAVP-HV-288	5	2½	6½	3	1¾	43
556-WAVP-HV-350	5	3	7	3½	1¾	47
663-WAVP-HV-350	6	3	7½	3½	1¾	52
663-WAVP-HV-450	6	4	8½	4½	2½	58

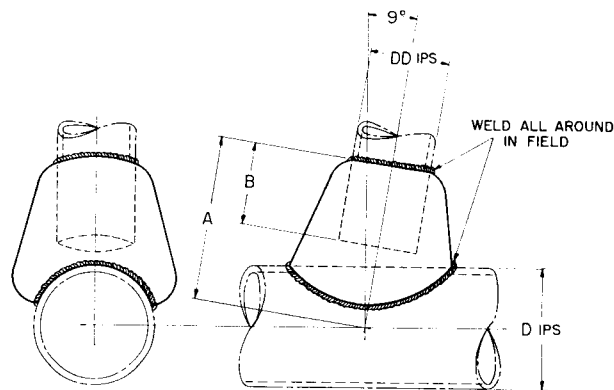


Fig. 4 WANTP

FIG. 4 WANTP

Catalog Number	Dimensions in Inches For Reference Only				
	D IPS	DD IPS	A	B	X*
350-WANTP-HV-350	3	3	6	3½	31
400-WANTP-HV-350	3½	3	6½	3½	31½
450-WANTP-HV-288	4	2½	6	3	30
450-WANTP-HV-350	4	3	6½	3½	32
556-WANTP-HV-288	5	2½	6½	3	34
556-WANTP-HV-350	5	3	7	3½	36½
663-WANTP-HV-350	6	3	7½	3½	40½
663-WANTP-HV-450	6	4	8½	4½	44

\*Approximate total inches of weld.

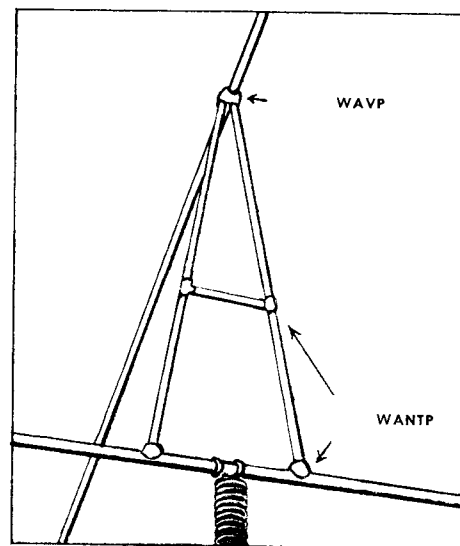


Fig. 5

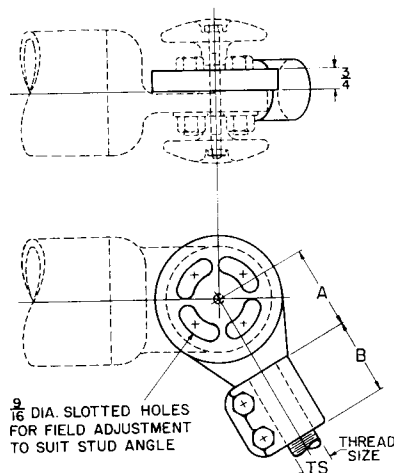
**EHV STUD CONNECTORS****GSF**

This stud connector includes only the tinned bronze casting which clamps onto threaded transformer or circuit breaker studs. FOR A COMPLETE EXPANSION-TYPE CONNECTOR, order from table immediately below, plus type WASP-X for correct pipe size from table under WASP-X. FOR A COMPLETE FIXED STUD CONNECTOR, order from table immediately below, plus type AM corona shield set from page 7, plus type WACPF straight connector from page 6 (Fig. 3), for aluminum tubing, or suitable compression fitting with NEMA standard 1 3/4-inch x 1 3/4-inch drilling for cable. Suitable for any angle.

Order by catalog number and specify stud thread size.

**CATALOG NUMBERS AND DIMENSIONS**

Catalog Number	Threads Per Inch	Dimensions in Inches For Reference Only		
		TS Thread Size	A	B
GSF-10	12	1	3	2 5/8
GSF-11	12	1 1/8	3	2 5/8
GSF-12	12	1 1/4	3	2 5/8
GSF-14	12	1 1/2	3	2 5/8
GSF-16	12	1 3/4	3	3
GSF-20	12	2	3	3
GSF-22	12	2 1/4	3	3

**Fig. 1****WASP-X**

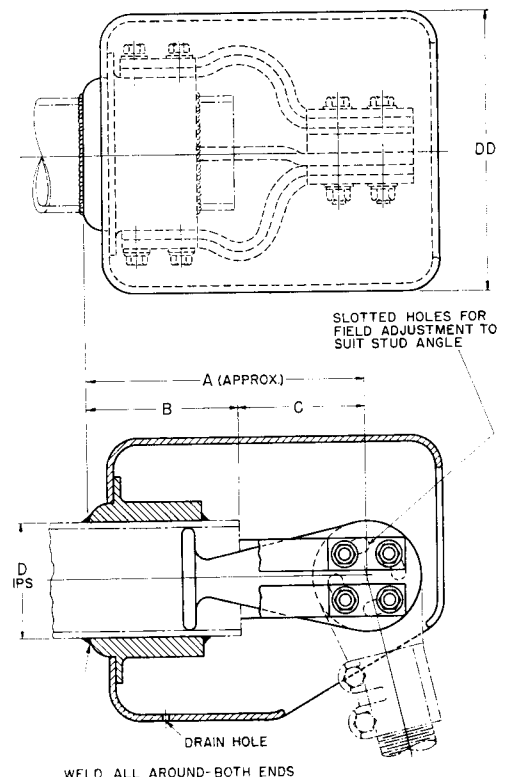
This universal-angle, corona-shielded expansion type stud connector assembly welds to the aluminum tubing and is suitable for voltages up to 550 kV.

Order assembly for proper pipe size from table below, plus GSF stud connector for proper stud size (from GSF).

**CATALOG NUMBERS AND DIMENSIONS**

Catalog Number	Am-peres	Dimensions in Inches For Reference Only					
		D IPS	A	B	C	DD	X (see note)
WASP-X-HV-288-12	1200	2 1/2	11	6	5	11	18
WASP-X-HV-350-12	1200	3	11	6	5	11	22
WASP-X-HV-350-16	1600	3	11	6	5	11	22
WASP-X-HV-450-12	1200	4	11	6	5	11	28 1/2
WASP-X-HV-450-16	1600	4	11	6	5	11	28 1/2
WASP-X-HV-450-20	2000	4	11	6	5	11	28 1/2
WASP-X-HV-556-16	1600	5	11	5 1/2	5 1/2	13	35
WASP-X-HV-556-20	2000	5	11	5 1/2	5 1/2	13	35
WASP-X-HV-663-20	2000	6	11	5 1/2	5 1/2	15	41 1/2
WASP-X-HV-663-25	2500	6	11	5 1/2	5 1/2	15	41 1/2

X — Approximate total inches of weld.

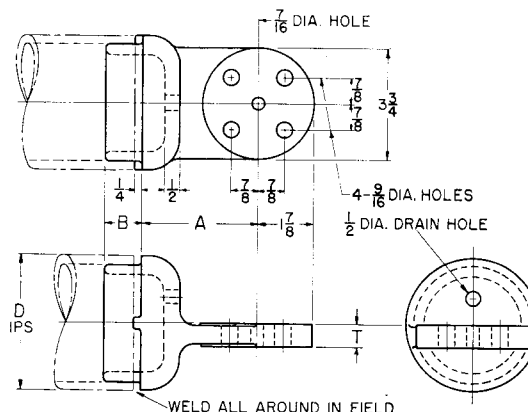
**Fig. 2**

## EHV STRAIGHT AND TEE CONNECTORS REMOVABLE WELD TYPE FOR TUBULAR ALUMINUM CONDUCTORS

## WACPF AND WATPF

The connectors shown on this page weld to standard IPS aluminum tubing and provide removable bolted joints. The connectors may be welded to the tubing on the ground or in the factory, so that only bolted joints need be made after the bus is elevated into position. For higher voltages (up to 550 kV) they are used with the AM corona shields as cataloged on page 7. They are supplied with NEMA standard 1 3/4-inch x 1 3/4-inch drilling and are very universal in their usage in that two WACPF connectors can be used to form a straight, or 90° connection, or reducer coupling. One WACPF and one WATPF can be used for a removable Tee connection, and either can be used with any standard compression connector for copper or aluminum cable. The WACPF can also be used as an inexpensive switch terminal.

Order by catalog number and specify IPS size.

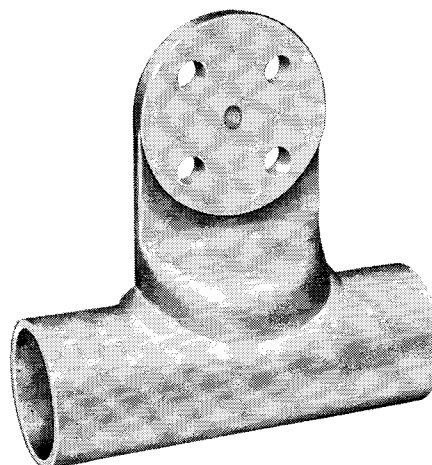


**Fig. 3 WACPF**

## CATALOG NUMBERS AND DIMENSIONS

**Fig. 3 WACPF**

Catalog Number	Dimensions in Inches For Reference Only					
	D IPS	O.D.	A	B	T	X (see note)
WACPF-288	2½	2⅞	3⅞	1	¾	9
WACPF-350	3	3½	3⅞	1	⅝	11
WACPF-400	3½	4	3⅞	1	¾	12½
WACPF-450	4	4½	4⅞	1	¾	14½
WACPF-556	5	5⅞	4¾	2	1	17½
WACPF-663	6	6⅞	4¾	2	1¼	20¾



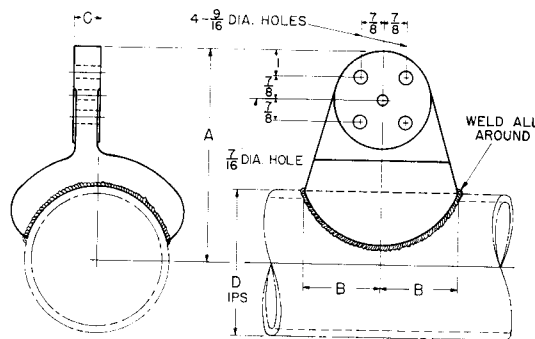
**Fig. 4**

4840K

**Fig. 5 WATPF**

Catalog Number	Dimensions in Inches For Reference Only				
	D IPS	A	B	T	X (see note)
WATPF-288	2½	6¾	1⅞	½	11½
WATPF-350	3	7⅞	2¼	⅝	14
WATPF-400	3½	7⅞	2⅜	¾	16
WATPF-450	4	7⅞	2½	¾	18
WATPF-556	5	8¼	3	1	22
WATPF-663	6	8⅞	3¼	1¼	27

X — Approximate total inches of weld.



**Fig. 5 WATPF**



## CORONA SHIELDS FOR EHV BOLTED JOINTS

### AM

AM corona shields are used for corona protection of bolted joints up to 550 kV. In addition to the cast aluminum corona shields, the catalog numbers shown below also include the  $\frac{3}{8}$ -inch stainless-steel stud and nuts which holds the shields in place, and four sets of  $\frac{1}{2}$ -inch stainless-steel bolts, nuts and lockwashers.

This assembly may be used with any combination of the following connectors:

1. GSF stud connector (page 5)
2. WACPF straight connector for tubing (page 6)
3. WATPF tee connector for tubing (page 6)
4. Any compression-type connector for cable using NEMA standard drilling of four  $\frac{7}{16}$ -inch diameter holes on  $1\frac{3}{4}$ -inch centers. However, the compression connector pad must be drilled with the  $\frac{7}{16}$ -inch diameter central hole and must be so ordered from the connector supplier or from I-T-E (or this hole can be field drilled).

Order by catalog number and specify total thickness of pads to be bolted together.

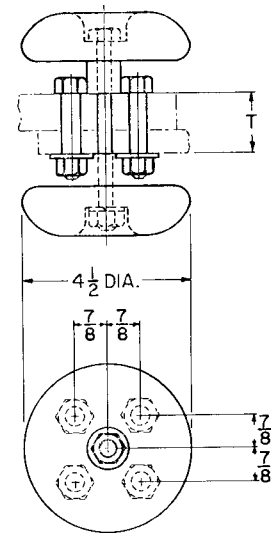


Fig. 1

### CATALOG NUMBERS AND DIMENSIONS

Catalog Number	T Inches
AM-10	1
AM-12	1 $\frac{1}{4}$
AM-14	1 $\frac{1}{2}$
AM-16	1 $\frac{3}{4}$
AM-20	2
AM-22	2 $\frac{1}{4}$
AM-24	2 $\frac{1}{2}$
AM-26	2 $\frac{3}{4}$





## CORONA BALLS FOR TUBULAR ALUMINUM BUS

## ABP

Alloy 356-T6 aluminum ABP corona balls are used for terminations of high voltage tubular aluminum bus, to avoid the corona which would otherwise be present at the sharp edges of the tubing. Corona balls for 345-kV service and below are equipped with a stainless steel set screw to hold them in place. They may also be welded to the bus if desired, although welding is not required. The 500-kV corona balls have no set screw and are welded to the bus in every case.

## CATALOG NUMBERS AND DIMENSIONS

Catalog Number	Dimensions in Inches For Reference Only			Max. Nominal Voltage Kv (1)
	D IPS	R	X (see note)	
ABP-288	2½	2	9	230
ABP-350	3	2⅝	11	230
ABP-400	3½	2⅝	12½	230
ABP-450	4	2⅞	14¼	345
ABP-556	5	3⅞	17½	345
ABP-663	6	4	20¾	345
ABP-451	4	4	14¼	500
ABP-557	5	4½	17½	500
ABP-664	6	5	20¾	500

X — Approximate total inches of weld.

Note (1). Maximum recommended nominal voltage based on acceptable corona and RIV values.

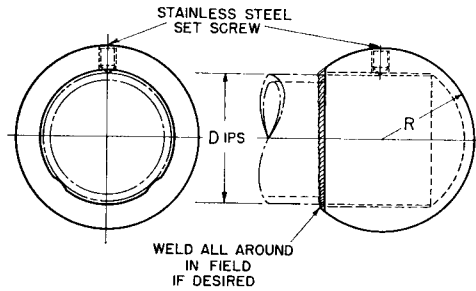


Fig. 2

**EHV ALUMINUM CONNECTORS FOR TUBULAR ALUMINUM CONDUCTORS****LIST PRICES**

Refer to Section 12.5.1.1

**QUANTITY DISCOUNT SCHEDULE**

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

**SWITCH TERMINAL—WELD TYPE WALP**

Page 1

Catalog Number	IPS	List Price
WALP-HV-288	2½	\$12.50
WALP-HV-350	3	14.00
WALP-HV-400	3½	16.50
WALP-HV-450	4	18.00
WALP-HV-556	5	21.50
WALP-HV-663	6	24.00

**SWITCH TERMINAL—EXPANSION TYPE WALP-X**

Page 1

Catalog Number	IPS	List Prices	
		1600 A	2000 A
WALP-X-HV-288	2½	\$215.00	—
WALP-X-HV-350	3	225.00	\$240.00
WALP-X-HV-400	3½	235.00	250.00
WALP-X-HV-450	4	245.00	260.00
WALP-X-HV-556	5	270.00	285.00
WALP-X-HV-663	6	295.00	310.00

**COUPLERS—WELD TYPE WACP**

Page 2

Catalog Number	IPS	List Price
WACP-288	2½	\$11.10
WACP-350	3	12.30
WACP-400	3½	14.10
WACP-450	4	16.00
WACP-556	5	19.70
WACP-663	6	24.00

**TEE CONNECTORS—WELD TYPE WATP 90°**

Page 3

Catalog Number	IPS		List Price
	Run	Tap	
288-WATP-HV-288	2½	2½	\$20.00
350-WATP-HV-288	3	2½	21.50
350-WATP-HV-350	3	3	23.00
350-WATP-HV-450	3	4	26.00
400-WATP-HV-350	3½	3	26.00
450-WATP-HV-132	4	1	21.50
450-WATP-HV-288	4	2½	22.50
450-WATP-HV-350	4	3	24.00
450-WATP-HV-450	4	4	27.00
556-WATP-HV-288	5	2½	26.00
556-WATP-HV-350	5	3	27.00
556-WATP-HV-450	5	4	30.00
556-WATP-HV-556	5	5	33.00
663-WATP-HV-450	6	4	34.50
663-WATP-HV-663	6	6	37.50

**VEE AND TEE CONNECTORS  
WELD TYPES WAVP AND WANTP**

Page 4

Catalog Number	IPS		List Price
	Run	Tap	
450-WAVP-HV-288	4	2½	\$27.50
450-WAVP-HV-350	4	3	32.00
556-WAVP-HV-288	5	2½	30.50
556-WAVP-HV-350	5	3	35.00
663-WAVP-HV-350	6	3	38.00
663-WAVP-HV-450	6	4	41.00
350-WANTP-HV-350	3	3	22.50
400-WANTP-HV-350	3½	3	23.00
450-WANTP-HV-288	4	2½	22.50
450-WANTP-HV-350	4	3	24.00
556-WANTP-HV-288	5	2½	26.00
556-WANTP-HV-350	5	3	27.00
663-WANTP-HV-350	6	3	33.00
663-WANTP-HV-450	6	4	34.50

**EHV ALUMINUM CONNECTORS FOR TUBULAR ALUMINUM CONDUCTORS****LIST PRICES**

Refer to Section 12.5.1.1

**QUANTITY DISCOUNT SCHEDULE**

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

**STUD CONNECTORS—TYPE GSF**

Page 5

Catalog Number	Stud Thread Size	List Price
GSF-10	1	\$43.00
GSF-11	1 1/8	44.00
GSF-12	1 1/4	45.00
GSF-14	1 1/2	46.00
GSF-16	1 3/4	47.00
GSF-20	2	48.00
GSF-22	2 1/4	50.00

**STUD CONNECTORS—EXPANSION TYPE WASP-X**

Page 5

Catalog Number	Amperes	IPS	List Price
WASP-X-HV-288-12	1200	2 1/2	\$200.00
WASP-X-HV-350-12	1200	3	205.00
WASP-X-HV-350-16	1600	3	210.00
WASP-X-HV-450-12	1200	4	215.00
WASP-X-HV-450-16	1600	4	220.00
WASP-X-HV-450-20	2000	4	250.00
WASP-X-HV-556-16	1600	5	245.00
WASP-X-HV-556-20	2000	5	275.00
WASP-X-HV-663-20	2000	6	300.00
WASP-X-HV-663-25	2500	6	350.00

**STRAIGHT AND TEE CONNECTORS  
REMOVABLE WELD TYPES WACPF AND WATPF**

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Catalog Number	IPS	List Price
WACPF-288	2 1/2	\$10.50
WACPF-350	3	12.00
WACPF-400	3 1/2	14.00
WACPF-450	4	16.00
WACPF-556	5	18.00
WACPF-663	6	22.00
WATPF-288	2 1/2	20.00
WATPF-350	3	21.50
WATPF-400	3 1/2	23.00
WATPF-450	4	24.50
WATPF-556	5	26.00
WATPF-663	6	28.00

**CORONA SHIELDS**

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Catalog Number	List Price
AM-10	\$16.00
AM-12	16.00
AM-14	16.00
AM-16	16.00
AM-20	16.00
AM-22	16.00
AM-24	16.00
AM-26	16.00

**CORONA BALLS**

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Catalog Number	IPS	List Price
ABP-288	2 1/2	\$10.00
ABP-350	3	12.00
ABP-400	3 1/2	15.00
ABP-450	4	18.00
ABP-556	5	24.00
ABP-663	6	32.00
ABP-451	4	26.00
ABP-557	5	30.00
ABP-664	6	40.00