LIST OF MATERIALS
Acceptable for Use on Systems of USDA Rural Development Electrification Borrowers

United States Department of Agriculture
Rural Development Utilities Programs
Electric Programs

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<u>DISCLAIMER</u>

Every effort has been made to ensure the accuracy of this document. However, in case of discrepancies, records of Technical Standards Committee "A" are the authoritative source.

PREFACE

This list supersedes all preceding issues including revisions. Revised sheets reflecting changes in the list will be issued quarterly and should be inserted in order to keep your copy up to date.

The items shown in this publication include material and equipment for transmission and distribution facilities. Items not listed include office equipment, tools and work equipment, items of electric general plant and consumer owned wiring facilities. The listings apply only to new items of material and equipment and not to used items.

In addition to items accepted on a general basis, this list also includes items accepted on a conditional basis. As one of the conditions in the acceptance of an item on a conditional basis, contractors are required to obtain the borrower's concurrence prior to its use.

The inclusion of an item in this list does not indicate that item's manufacturer or its principals have not been debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded pursuant to Executive Order 12549, Debarment or Suspension, or any rules or regulations issued thereunder, including 7 CFR Part 3017 ("Debarment Regulations"). Therefore, borrowers must comply with the requirements imposed by the Debarment Regulations before entering into any "covered transaction", as defined by 7 CFR Part 3017, involving any item on this list.

The acceptance of an additional item or the deletion of an existing item is a function of the Technical Standards Committees. Any manufacturer desiring to have a new item placed on the list, or any user believing an existing item should be removed from the list, is invited to submit the matter to the Committees. Any communication calling attention to an error or omission in the list, such as a wrong catalog number, an obsolete item, etc., will be appreciated. All communications should be addressed to Technical Standards Committee "A" (Electric), USDA Rural Development Utilities Programs, Stop 1569, Washington, D. C. 20250-1569.

INDEX - PART I

-A-

Air break switches ..... cg
Anchor rod x
Anchor rod bonding clamps ..... ck
Anchor shackle ..... bo
Anchors ..... z
Angle suspension bracket ..... cr
Angle thimble eye bolt ..... ba
Anodes ..... U si
Arm assemblies, narrow profile ..... eq
Armor grip suspension assembly ..... m
Armor grip suspension assembly with socket eye ..... ei
Armor rods ..... bv
Arms, laminated upswept ..... fq
Arresters, surge ..... ae
Automatic and formed type deadends ..... by
Automatic splices ..... bx

-B-

Ball hook ..... eh
Ball, oval eye ..... fp
Ball, Y-clevis ..... ft
Bolt, angle eye (thimble type) ..... ba
  carriage i
  clevis ..... ef
  double arming ..... n
  double upset ..... q
  oval eye ..... o
  eye double arming ..... dy
  machine c
  shoulder eye ..... o
  single upset ..... bs
  thimble eye, angle ..... ba
  straight eye (thimble eye) ..... ao
Brace, crossarm, steel ..... h
  crossarm, fiber reinforced plastic ..... cu
  crossarm, wood ..... cu
  sidearm diagonal ..... ac
  sidearm vertical ..... bb
  special crossarm ..... em
Bracket, angle suspension ..... cr
    cutout and arrester extension ..... fm
    cutout extension ..... fn
    extension ..... fj
    insulated ..... da
    narrow profile ..... eq
    offset neutral ..... ec
    oil circuit recloser ..... fk
    pole top pin ..... cs
    post insulator ..... eb
    swinging angle ..... fu
    transformer ..... dm
    transformer secondary insulated ..... fo

Capacitor hangers ..... fd
Capacitor oil switch ..... bz
Capacitor, shunt ..... fc
Carriage bolt i
Chain link (end link) ..... br
Clamp, anchor rod bonding ..... ck
deadend l
deadend with socket eye ..... ej
ground rod ..... aj
ground wire ..... dp
guy ..... u
hot line ..... ap
loop deadend ..... bn
suspension ..... m
suspension with socket eye ..... ei
Clevis bolt ..... ef
Clevis type wireholder ..... bt
Clevis, conduit, insulated ..... dr
secondary swinging ..... s
service deadend ..... bh
service swinging ..... as
thimble ci
Clip, ground wire ..... al
guy ..... dz
Combination cutout and arrester ..... ax
Combination power fuse and disconnect switch ..... sl
Compression deadends ..... cp
Compression splices ..... cy
Conductor ..... av
Conduit clevis, insulated ..... dr
Conduit wireholder ..... ds
Connector, grounding, transformer ..... bu
hot line ..... fi
Connectors ..... p
Cross brace assembly vx
Crossarm assemblies and arm spacers ..... gj
Crossarm assembly, "Z" type (wishbone) ..... gz
Crossarm assembly, H frame (small angle - 161 & 230 kV) ..... gw
Crossarm assembly, H frame (tangent - 161 & 230 kV) ..... gy
Crossarm brace, sidearm diagonal ..... ac
Crossarm brace, sidearm vertical ..... bb
Crossarm brace, special ..... em
Crossarm brace, steel ..... h
Crossarm brace, wood ..... cu
Crossarm pin, steel ..... f
Crossarm reinforcing plate ..... eg
Crossarm saddle ..... fg
Crossarms ..... g
Current limiting backup fuses ..... ag
Current transformers ..... sd
Cutout and arrester extension bracket ..... fm
Cutout and arrester, combination ..... ax
Cutout extension bracket ..... fn
Cutouts and fuses ..... af

-D-

Deadend clamp l
Deadend clamp with socket eye ..... ej
Deadend for guy strand ..... u
Deadend for steel strand l
Deadend, automatic & formed type ..... by
compression ..... cp
secondary ..... cq
service ..... dt
Disconnect switch, hook operated ..... sb
Double arming bolt ..... n
Double arming eye bolt ..... dy
Double arming plate ..... ct
Double upset bolt ..... q

-E-

Elliptical eye screw ..... dq
End link (chain link) ..... br
Extension link ..... du
Extension link (fiberglass) ..... eu
Eye bolt, double arming ..... dy
oval ..... o
Eye nut ..... aa
Eye screw, elliptical ..... dq

-F-

Fiber reinforced plastic crossarm braces ..... cu
Fuses and cutouts ..... af
Fuses, current limiting, backup ..... ag
power, substation ..... af

-G-

Gain, pole ..... bi
Grid gain ..... bi
Ground rod clamp ..... aj
Ground rods ..... ai
Ground wire clamp ..... dp
Ground wire clip ..... al
Ground wire staple ..... al
Ground wire support, overhead ..... ed
Ground wire, pole ..... cj
Ground, pole ..... dh
Grounding conductor, substation, coated steel ..... sr
Grounding connector, transformer ..... bu
Guy attachment (Distribution) v
Guy attachment (Transmission) ..... fv
Guy clamp ..... u
Guy clip ..... dz
Guy deadend ..... u
Guy hook ..... bj
Guy marker ..... at
Guy plate ..... bk

Guy strain insulator ..... w
Guy wire ..... y
Guy wire clip ..... dz
Guying plate ..... fv

-H-

H frame crossarm assembly (small angle - 161 & 230 kV) ..... gw
H frame crossarm assembly (tangent - 161 & 230 kV) ..... gy
Hangers, capacitor ..... fd
Hook, ball ..... eh
guy ..... bj
Hook operated disconnect switch ..... sb
Hot line clamp ..... ap
Hot line connector ..... fi

-I-

Insulated bracket ..... da
Insulator and stud, post type ..... ea
Insulator, guy strain ..... w
pin type ..... a
polymer distribution deadend ..... k
spool ..... cm
suspension ..... k

-K-

Keys, pole ..... z

-L-

Laminated upswept arms ..... fq
Lag screw ..... j
Link, chain (end link) ..... br
extension ..... du
extension (fiberglass) ..... eu
Locknuts ..... ek
Loop deadend clamp ..... bn

-M-

Machine bolt c
Marker, guy ..... at
Meter sockets ..... gb
Meters, watthour ..... ga

-N-

Narrow profile brackets and arm assemblies ..... eq
Neutral bracket, offset ..... ec
Numbers, pole and letters ..... az
Nut, eye ..... aa
thimble eye ..... ab

-O-

Offset neutral bracket ..... ec
Oil circuit recloser bracket ..... fk
Oil circuit reclosers ..... be
Oval eye ball ..... fp
Oval eye bolt ..... o
Oval tube splice cx
Overhead ground wire support ..... ed

-P-

Pin type insulator ..... a
Pin, crossarm ..... f
  pole top, steel ..... b
Pipe spacer ..... dl
Plastic wire guard ..... er
Plate, crossarm reinforcing ..... eg
    double arming ..... ct
    guy ..... bk
    pole bearing ..... fs
    pole eye v
Pole bearing plate ..... fs
Pole eye plate v
Pole gain ..... bi
Pole ground ..... dh
Pole ground wire ..... cj
Pole keys ..... z
Pole numbers and letters ..... az
Pole top pin bracket ..... cs
Pole top pin, steel ..... b
Post insulator bracket ..... eb
Post type insulator and stud ..... ea
Power fuses, substation ..... af
Primary metering rack ..... fl

-R-

Rack, primary metering ..... fl
Reclosers, automatic circuit ..... be
Regulator by-pass switch ..... sk
Regulators, voltage ..... sc
Rod, anchor x
Rods, armor ..... bv
    ground ..... ai

-S-

Saddle crossarm ..... fg
Screw, elliptical eye ..... dq
    lag ..... j
Secondary swinging clevis ..... s
Sectional ground rods ..... ai
Sectionalizer ..... el
Service deadend ..... dt
Service deadend clevis ..... bh
Service swinging clevis ..... as

Shackle, anchor ..... bo
Shoulder eye bolt ..... o
Shunt capacitors ..... fc
Sidearm diagonal crossarm brace ..... ac
Sidearm vertical crossarm brace ..... bb
Single upset bolt ..... bs
Sockets, meter ..... gb
Spacer, pipe ..... dl
Special crossarm braces ..... em
Splice cover, plastic ..... es
Splice for steel strand ..... cz
Splice, automatic ..... bx
    compression ..... cy
    formed type ..... ex
    oval tube cx
Spool Insulator ..... cm
Spring washer ..... aw
Staple, ground wire ..... al
Steel strand ..... y
Structure assembly (small angle - 161 & 230 kV) ..... gw
Structure assembly (tangent - 161 & 230 kV) ..... gy
Substation grounding conductor, coated steel ..... sr
Support, overhead ground wire ..... ed
Surge arresters ..... ae
Suspension clamp ..... m
Suspension clamp with socket eye ..... ei
Suspension insulator ..... k
Swinging angle bracket ..... fu
Switch, capacitor oil ..... bz
    combination power fuse and disconnect ..... sl
    hook operated disconnect ..... sb
    pole top air break ..... cg
    recloser, by-pass ..... sj
    regulator by-pass ..... sk

-T-

Thimble clevises ci
Thimble eye bolt, angle ..... ba
Thimble eye bolt, straight ..... ao
Thimble eye nut ..... ab
Tie, insulator, formed type ..... ah
Transformer bracket ..... dm
Transformer grounding connector ..... bu
Transformer secondary bracket, insulated ..... fo
Transformers, current ..... sd
        pole and power ..... an
        voltage ..... se

-V-

Vacuum circuit reclosers ..... be
Voltage regulators ..... sc
Voltage transformers ..... se

-W-

Washer, spring ..... aw
Washers ..... d
Watthour meters ..... ga
Wildlife guards ..... rp
Wire guard, plastic ..... er
Wire, guy ..... y
Wireholder ..... ar
Wireholder, clevis type ..... bt
conduit ..... ds
Wood crossarm brace ..... cu

-Y-

Y-clevis ball ..... ft

-Z-

"Z" type (wishbone) crossarm assembly ..... gz

INDEX - PART II

Underground Distribution Equipment

Anodes ..... U si
Arrester, surge ..... U ae
Boot, insulated ..... U gq
Bracket, combination ..... U hj
    pothead mounting ..... U hd
Cable ..... U hv
Cable accessories ..... U hb
Cable route marker ..... U hx
Cable support ..... U hc
Combination cutout and arrester ..... U ax
Connector block, secondary ..... U gp
    transformer ..... U fz
Connector, secondary tap ..... U fw
Cutout and arrester, combination ..... U ax
Enclosure, equipment ..... U gn
Fault indicator ..... U go
Heat shrink tubing ..... U hr
Jacketed cable restoration kits ..... U hf
Pad, equipment ..... U ja
Pedestal, power ..... U gu
Recloser, pad-mounted ..... U be
Regulator, voltage, pad-mounted ..... U sc
Safety signs ..... U hw
Secondary tap connector ..... U fw
Secondary tap or splice cover ..... U hr
Shield, cable riser ..... U gc
    splice ..... U jb
Splice shield ..... U jb
Splice, secondary ..... U gp
    underground ..... U hy
Stake, power pedestal ..... U gv
Switch, air, group-operated ..... U cg
Switchgear, padmounted ..... U he
Terminations, elbow ..... U hp
    multipoint ..... U hq
    outdoor and indoor ..... U gk
Terminator sealing kit ..... U hf
Transformer connector block ..... U fz
Transformer pad ..... U ja
Transformer, current ..... U sd
Transformers ..... U an
Tubing, heat shrink ..... U hr

a - Insulator, pin type

ANSI Class	55-2	55-3	55-4
Application	5 kV	12.5/7.2 kV and 13.2/7.62 kV systems	12.5/7.2 kV and 13.2/7.62 kV systems (where greater insulation is needed)
Pinhole diameter	1 in.	1 in.	1 in.
ICB	ICB 552	ICB 553	ICB 554
Porcelain Products (Knox) [2]	253	261-S	366-S
Victor Insulators, Inc.	8	5, VI 605R	6, VI 606R

ANSI Class	56-1	56-3	56-4
Application	24.9/14.4 kV distribution lines	33 - 34.5 kV transmission lines	44 - 46 kV transmission lines
Pinhole diameter	1-3/8 in. Metal thimble (unless noted)	1-3/8 in. Metal thimble	1-3/8 in. Metal thimble
ICB	ICB 561	-	-
Porcelain Products (Knox)	-	2045-S	-
Victor Insulators, Inc.	27-R[1], VI 627R	245-R, VI 645R	255-R

[1]Does not have a metal thimble.
[2]ANSI class 55-2, 55-3, and 55-4 pin insulators manufactured at both the Knoxville and Macomb plants are acceptable.

Conditional List
a(1)
July 2009

a - Insulators, pin type (polymer)

Manufacturer	Conditions
Hendrix* HPI-55-3, 12.5/7.2 kV, ANSI Class 55-3 HPI-55-4, 12.5/7.2 kV, ANSI Class 55-4 HPI-25-J-02, 24.9/14.4 kV, ANSI Class 56-1	To obtain experience.

*Does not have metal thimble.

b - Pin, pole top, steel

DISTRIBUTION

	12.5/7.2 or 13.2/7.62 kV	24.9/14.4 kV
Pin length, inches:	20	20
Thread diameter, inches:	1	1-3/8
Hole spacing, inches:	8	8
RUS Specification:	D-3	DT-3
Hubbell (Chance)	2199	2195
Joslyn	J740	J720
Kortick	-	K8086
MacLean (Continental)	U36606F-REA	U36652

Pins listed below have 4-1/2" offset which eliminates the use of Item cs

Hubbell (Chance)	C206-0271
Joslyn	J25179
MacLean (Continental)	U36549

TRANSMISSION

Pin Length, inches:	24
Thread diameter, inches:	1-3/8
Hole spacing, inches:	8
RUS Specification:	DT-3
Hubbell (Chance)	2196
Kortick	K8087
MacLean (Continental)	U36653F

NOTE

1. Flared type pins may be mounted with either side against the pole.

b - Pin, pole-top
(Non-lead threads)

Manufacturer	Conditions
Hubbell Power Systems 2199P (1" threads)	To obtain experience.
Hughes Brothers 2770-A20-100 (1" threads) 2770-A20-130 (1-3/8" threads)	To obtain experience.
Joslyn J740Z (1" threads) J720Z (1-3/8" threads)	To obtain experience.

b - Pin, Fiber-reinforced plastic pole top

Manufacturer	Conditions
Joslyn 7581-624NT (1" threads)* 7581-624XNT (1-3/8" threads)*	To obtain experience.

* Add suffix LT (less tabs) if for steel pole.

c - Bolt, machine

Applicable Specification: ANSI C135.1, "Standards for Galvanized Steel Bolts and Nuts" except that the lengths are in the ranges given below.

Applicable Sizes:

1/2 inch diameter, 6 through 10 inch length
5/8 inch diameter, 6 through 24 inch length
3/4 inch diameter, 6 through 26 inch length
7/8 inch diameter, 6 through 28 inch length

The following manufacturers have shown compliance with the applicable specifications for machine bolts:

Allied Bolt, Inc.
Hughes Brothers
* Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)
* Portland Bolt & Manufacturing Company
The Rockford Bolt & Steel Company
Steel City Bolt & Screw Co., Inc.

*"Static proof" design available.

d - Washers, Flat

Flat Rolled Steel

Size, inches:	2-1/4 x 2-1/4	3 x 3	4 x 4	4 x 4	1-3/8 round	1-3/4 round
Thickness, in.:	3/16	1/4	3/16	1/2	12 gauge	10 gauge
Hole Diam., in.:	13/16	13/16	13/16	13/16	9/16	11/16
Allied Bolt	11550	11551	-	-	104	-
C & C Spacer	4	-	-	-	-	-
FWC	FW1076	-	FW1080	-	FW1086	FW1088
Hubbell (Chance)	6814	6817	6818	6819-1/2	6803	6805
Hughes	SW2-1/4-70-3/16	SW3-70	SW4-70	SW4-70(1/2)	RW1-3/8-50	-
Joslyn	J1076	J1079	J1080	-	J1086	J1088
Kortick	K1553	K1555	K1557	K1559-1/2	K1524	K1525
Line Hardware	SWF-225B	SWF-300B	SWF-400A	-	-	-
MacLean (Continental)	U5485	U5487A	U5488	U5490A	U5478	U5479
Wrought Washer	011206	-	-	-	-	-

Flat Cast

Size, inches:	3 x 3
Thickness, in.:	1/4
Hole Diam., in.:	13/16
Hubbell (Chance) (N)	BB214
Joslyn (Flagg) (N)	P56A

Spurred - 3" Round, 3/16" Thick, 13/16" Hole

MacLean (Continental)	TCSF-30-6

(A) Aluminum Alloy
(M) Malleable Iron
(N) Nodular Iron

d - Washers, Curved

Curved Cast

Size, inches:	2-1/4 x 2-1/4	3 x 3	3 x 4	4 x 4
Thickness, in.:	1/4	5/16	7/16	1/2
Hole Diam., in.:	11/16	11/16	15/16	13/16
Hubbell (Chance) (N)	GCW1A	GCW31	CRW4A	GCW41
Joslyn (Flagg) (M)	P141	P143	P120	P144
Line Hardware (M)	-	CW 33-5	CW 34-7	CW 44-6
MacLean (Bethea)	-	WC-33-5	WC-34-7	WC-44-6
MacLean (Continental)	-	CW-33-5	CW-34-7	CW-44-6
Universal Electric (A)	UW-225	UW-335	UW-347	UW-446

(A) Aluminum Alloy
(M) Malleable Iron
(N) Nodular Iron

Curved Rolled Steel

Sizes, inches:	4 x 4(1)
Thickness, in.:	1/4
Hole Diam., in.:	15/16
Joslyn (Steel)	J6829

(1) To be used only on transmission systems.

f - Pin, crossarm
(With square washer, nut and MF locknut)

DISTRIBUTION

Thread (inches diam.)	1	1-3/8	1	1-3/8
Length above base (in.)	5	7	5	7
Length below base (in.)	5-3/4	7	1-1/2	1-3/4
Shank (inches diam.)	5/8	5/8	5/8	3/4
	Long Shank		Short Shank	
Hubbell (Chance)	881	4717	886	-
Joslyn	J203	J647	J221	J630
Kortick	K7104	K7611	K7122	K7631
MacLean (Continental)	U558	U3137A	U579	U3142

Clamp Type Pin

Thread (inches diam.)	1	1-3/8
Length above base (in.)	5-3/4	7
Hubbell (Chance)	14322	14322-1
Joslyn	J3322	J3324

Washer Plate for Clamp Type Pin

These plates are equipped with lugs to prevent slippage of pin along crossarm. They may be used to replace the bottom plate on pins already installed.

Hubbell (Chance)	450091

f - Pin, crossarm
(With square washer, nut and locknut)

TRANSMISSION

Thread (inches diameter)	1-3/8	1-3/8
Length above base (inches)	10	10
Length below base (inches)	7	1-3/4
Shank (inches diameter)	3/4	3/4

	Long Shank	Short Shank
Hubbell (Chance)	4332	-
Joslyn	J610	J633
Kortick	K7643	K7635
MacLean (Continental)	U3140	U3145

f - Pin, crossarm
(Non-lead threads)
(With square washer, nut and MF locknut)

Manufacturer	Conditions
Hubbell	
881P - 1” thread, 5 3/4” shank	To obtain experience.
886P - 1” thread, 1 1/2” shank	
Hughes Brothers	
2775-A5-3/4, 1" thread, 5-3/4" shank	To obtain experience.
Joslyn	
J203Z, 1" thread, 5-3/4" shank	To obtain experience.
J221Z, 1" thread, 1-1/2" shank	
J647Z, 1-3/8" thread, 7" shank	
J630Z, 1-3/8" thread, 1-3/4" shank	

g - Crossarms, fiberglass

Manufacturer	Description	Conditions
Creative Utility Products		
Braced Application		
CUP08-RUS-LTC-03	8' Type-3 Drill Pattern	To obtain experience.
CUP08-RUS-LTC-04	8' Type-4 Drill Pattern	
CUP10-RUS-LTC-05	10' Type-5 Drill Pattern	
CUP08-RUS-MTC-03	8' Type-3 Drill Pattern	
CUP08-RUS-MTC-04	8' Type-4 Drill Pattern	
CUP10-RUS-MTC-05	10' Type-5 Drill Pattern	
CUP08-RUS-HTC-03	8' Type-3 Drill Pattern	
CUP08-RUS-HTC-04	8' Type-4 Drill Pattern	
CUP10-RUS-HTC-05	10' Type-5 Drill Pattern	
Geotek		
Braced Application		
C22-96-03 (with horizontal bushing at center hole)	8' Type-3 Drill Pattern	To obtain experience.
C22-96-04 (with horizontal bushing at center hole)	8' Type-4 Drill Pattern	
C22-120-05 (with horizontal bushing at center hole)	10' Type-5 Drill Pattern	
T2000-96-03X	8' Type-3 Drill Pattern	
T2000-96-04X	8' Type-4 Drill Pattern	
T2000-120-05X	10' Type-5 Drill Pattern	
T3000-96-03X	8' Type-3 Drill Pattern	
T3000-96-04X	8' Type-4 Drill Pattern	
T3000-120-05X	10' Type-5 Drill Pattern	
(X = color code)		
Braceless (Centermount) Application		
TB22-96-03	8' Type-3 Drill Pattern	To obtain experience.
TB22-96-04	8' Type-4 Drill Pattern	
TB22-120-05	10' Type-5 Drill Pattern	
TB2000-96-03X	8' Type-3 Drill Pattern	
TB2000-96-04X	8' Type-4 Drill Pattern	
TB2000-120-05X	10' Type-5 Drill Pattern	
TB3000-96-03X	8' Type-3 Drill Pattern	
TB3000-96-04X	8' Type-4 Drill Pattern	
TB3000-120-05X	10' Type-5 Drill Pattern	
(X = color code)		

Conditional List
g(1.1)
May 13, 2010

g - Crossarms, fiberglass

Manufacturer	Description	Conditions
MacLean Power Systems		
Braced Application		
PW08REA003	8’ Type-3 Drill Pattern	To obtain Experience
PW08REA004	8’ Type-4 Drill Pattern	
PW08REA005	8’ Type-5 Drill Pattern	
PX08REA003	8’ Type-3 Drill Pattern	To obtain Experience
PX08REA004	8’ Type-4 Drill Pattern	
PX10REA005	10’ Type-5 Drill Pattern	
Braceless (Centermount) Application		
PW08ST003	8’ Type-3 Drill Pattern	To Obtain Experience
PW08ST004	8’ Type-4 Drill Pattern	
PW10ST005	10’ Type-5 Drill Pattern	
PX08ST003	8’ Type-3 Drill Pattern	To obtain Experience
PX08ST004	8’ Type-4 Drill Pattern	
PX10ST005	10’ Type-5 Drill Pattern	
Powertrusion International, Inc.		
Braced Application		
PST08001NR03	8' Type-3 Drill Pattern	To obtain experience.
PST08001NR04	8' Type-4 Drill Pattern	
PST10001NR05	10' Type-5 Drill Pattern	
PHT08001NR03	8' Type-3 Drill Pattern	
PHT08001NR04	8' Type-4 Drill Pattern	
PHT10001NR05	10' Type-5 Drill Pattern	
Braceless (Centermount) Application		
PST08001BR03	8' Type-3 Drill Pattern	To obtain experience.
PST08001BR04	8' Type-4 Drill Pattern	
PST10001BR05	10' Type-5 Drill Pattern	
PHT08001BR03	8' Type-3 Drill Pattern	
PHT08001BR04	8' Type-4 Drill Pattern	
PHT10001BR05	10' Type-5 Drill Pattern	
Shakespeare		
LSC-REA-03-(X)**	8' Type-3 Drill Pattern	To obtain experience.
LSC-REA-04-(X)**	8' Type-4 Drill Pattern	
LSC-REA-05-(X)**	10' Type-5 Drill Pattern	
(**X=2-gray color or 5-dark bronze color)		

Note: Gripping studs or teeth on clamp type crossarm pins (item f) should not be installed against the surface of the fiberglass crossarms.

g - Crossarms, composite

Manufacturer	Description	Conditions
Petroflex North America, Inc.		
Braced Application		
CA-8(X)**	8' Type-4 Drill Pattern	To obtain experience.
(**X=B for black color X=G for grey color)		

h - Brace, crossarm, steel

Wherever item “h” is shown on a construction drawing, use a brace from page cu.

i - Bolt, carriage

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes: 3/8 inch diameter, 3 through 6 inch length
1/2 inch diameter, 3 through 6 inch length

The following manufacturers have shown compliance with the applicable specifications for carriage bolts.

Allied Bolt, Inc.
Hubbell (Chance)
Hughes Brothers
Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)
The Rockford Bolt & Steel Company

j - Screw, lag

Applicable Specifications: ANSI C135.3 "Standard for Zinc Coated Ferrous Lag Screws"

Applicable Sizes:	1/2 inch diameter, 4 inch length
	1/2 inch diameter, 5 inch length
	5/8 inch diameter, 4 inch length
	5/8 inch diameter, 5 inch length

The following manufacturers have shown compliance with the applicable specifications for lag screws:

Hubbell (Chance)
Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)

k - Insulators, suspension

ANSI Class Type	52-9A Clevis	52-1 Clevis	52-4 Clevis	52-3 Ball & Socket
Disc Diameter	4-1/4"	6"	9” or 9-1/2"	9” or 9-1/2"
M & E Rating, lbs.	10,000	10,000	15,000	15,000
Leakage	6-3/4"	7"	11-1/2"	11-1/2"
Flashover, kV: Dry	60	60	80	80
Flashover, kV: Wet	30	30	50	50
NOTES	(3) (4)	(3) (4)	(5)	(2)

Manufacturer	Catalog Number			
ICB	ICB 529-A	ICB 521	-	-
Lapp	-	-	9100	9000
Locke	16044	16583	15S410	15S409
Sediver	CT-4R2-M	-	-	-
Victor Insulators, Inc.	817	804	-	-

ANSI Class Type	52-3 Ball & Socket	52-4 Clevis	52-5 Ball & Socket	52-6 Clevis
Disc Diameter	10"	10"	10"	10"
M & E Rating, lbs.	15,000	15,000	25,000	25,000
Leakage	11-1/2"	11-1/2"	11"	11"
Flashover; kV: Dry	80	80	80	80
Flashover, kV: Wet	50	50	50	50
NOTES	(2)	(1)	(2)	-

Manufacturer	Catalog Number			
GEC Alsthom	-	105452	-	-
Lapp	8200	8100	301425	2300
Locke	-	20S580	-	30S257
Porcelain Prod. (Knox)	81022	81012	-	-
Sediver	-	CT-8R2	-	-

Notes:

(1) Use two for 24.9/14.4 kV deadends.
(2) To be used only on transmission lines.
(3) To be used only on distribution lines.
(4) Use two insulators for 12.5/7.2 kV deadends and three for 24.9/14.4 kV deadends.
(5) Use two insulators for 24.9/14.4 kV deadends.

k - Insulator, suspension

Manufacturer	Conditions
Sediver	
10" suspension insulator	To obtain experience.
N-8R2 (ball & socket, 20,000 lbs.)	
CT-14R2 (clevis, 30,000 lbs.)	
N-14R2 (ball & socket, 30,000 lbs.)	

Conditional List
k(2)
March 25, 2010

k - Insulator, polymer distribution deadend

Manufacturer	Conditions
Advanced Rubber Products*	
ARP-15EACE-I (EPDM – 15 kV)	1. To obtain experience.
ARP-25EACE-I (EPDM – 25 kV)	2. For use as deadends on distribution lines only.
ARP-35EACE-I (EPDM – 35 kV)	3. Not recommended for use in areas subject to contamination.
ARP-15SKCE-S (Silicone – 15 kV)	
ARP-15SKCE-A (Silicone – 15 kV)	
ARP-25SKCE-S (Silicone – 25 kV)	
ARP-35SKCE-S (Silicone – 35 kV)	

* A = Aluminum end-fitting, I = Cast iron end-fitting, S = Steel end-fitting

Dulmison	
H-15 kV-4	Same as above.
H-25 kV-6	
GLP	
DS-15 (15 kV)	
DS-28 (25 kV)	
Hubbell (Ohio Brass)	
"Veri*Lite"	Same as above.
Type PDI-15 (15 kV)	
Type PDI-25 (25 kV)	
Type PDI-35 (35 kV)	
K-Line	
KL-15ASCTM (15 kV line-to-line)	Same as above.
KL-28ASCTM (25 kV line-to-line)	
KL-35SCTM (35 kV line-to-line)	
MacLean (Reliable)	
DS-15G (15 kV)	Same as above.
DS-15M (15 kV) (metal end fittings)	
DS-28G (25 kV)	
DS-28M (25 kV) (metal end fittings)	
DS-35G (35 kV)	
DS-35M (35 kV) (metal end fittings)	
Porcelain Products	
PDEI-15, 15 kV	Same as above.
PDEI-25, 25 kV	

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary. Recommended maximum working load is 5,000 lbs.

k - Insulator, polymer distribution deadend

Manufacturer	Conditions
Pyungil Co. Ltd DN15SD-CT, 15kV DN28SD-CT, 28kV DN35SD-CT, 35kV	1. To obtain experience. 2. For use as deadends on distribution lines only. 3. Not recommended for use in areas subject to contamination.
Salisbury 9501 Series, 15 kV 9502 Series, 25 kV 9501U-SI (silicone - 15 kV) 9502U-SI (silicone - 28 kV) 9503U-SI (silicone - 35 kV) 9502L-EP (EPDM - 28 kV)	Same as above.
Sediver ODI-11-70-15 (15 kV) ODI-15-70-28 (25 kV) ODI-17-70-35 (35 kV)	Same as above.
Victor Insulators, Inc. 8015 (15kV) 8025 (25kV) 8035 (35kV) 8215 (15kV) 8225 (25kV) 8235 (35kV)	Same as above.
Volt Tek 1515-00 (EPDM - 15 kV) 2515-00 (EPDM - 25 kV) 3515-00 (EPDM - 35kV) 1515S-00 (Silicone - 15kV) 2515S-00 (Silicone - 28kV) 3515S-00 (Silicone - 35kV)	Same as above.

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary. Recommended maximum working load is 5000 lbs.

I - Clamp, deadend

DISTRIBUTION

Copper 2 through 6		ACSR (Aluminum Clamps)			
CWC 4A through 8A		4/0 & 3/0	2/0	1/0	2&4
-	Alcoa	302	302	302	302
80500-2000	Hubbell (Anderson)	PG-57N	PG46N	PG-46N	PG-46N
-	C & R	CR-20-90	CR-10-90	CR-10-90	CR-10-90
-	Lapp	306120N	306118N	306118N	306118N
-	MacLean (Bethea)	DA-20N	DA-15-N	DA-15-N	DA-15-N

I - Deadend for steel strand (overhead ground wire)

TRANSMISSION

For high strength, extra high strength steel strand and aluminum clad steel strand

	High Strength Steel		Aluminum-clad steel			Extra High Strength		
Manufacturer	3/8"	7/16"	7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG	5/16"	3/8"	7/16"
Compression Type								
Alcoa	4620.12	4627.14						
Burndy	YTW375E	YTW438E	YTW7M9T	YTW7M8T	YTW7M7T			
Hubbell (Fargo)	861255	861430	861225	861227	861430	861022	861225	861430
Formed Type*								
Helical Line Prod.	HG210-3/8	HG211-7/16	HG523-12.5M	HG525-16M	HG528-20M	HG209-5/16	HG210-3/8	HG211-7/16
Hubbell (Chance)				16M-AWTLG	20M-AWTLG			

* Class B galvanizing. When overhead ground wire has Class C galvanizing, formed deadend should also have Class C galvanizing.

Automatic Type								
Hubbell (Fargo)	GDE-302	GDE-303	GDE-302	GDE-302	GDE-303	GDE-301	GDE-302	GDE-303
MacLean (Reliable)	5202	5203	5202	5202	5203	5201	5202	5203
Clamp Type								
MacLean (Continental)	FQD-55-3LW	FQD-55-3-LW						
Hubbell (Anderson)	SWDE-55N	SWDE-55N						
MacLean (Bethea)	FD-550-N							

Conditional List
l(1)
March 25, 2010

l - Clamp, deadend

DISTRIBUTION

2-Bolt Straight Line, Aluminum Alloy*

Manufacturer	Conditions
Burndy Aluminum alloy deadend Catalog No. CUW26RE-1 (#2-2/0 Str. Aluminum, #4-2/0 ACSR)	1. To obtain experience. 2. Applications limited to replacements under hot line conditions.
C & R Products Catalog No. CRDE-10-180 (#4 - 2/0 ACSR) Catalog No. CRDE-20-180 (3/0 - 4/0 ACSR)	Same as above.
Hubbell (Anderson) Aluminum alloy deadend Catalog No. ADSO-88(#2-1/0 ACSR) Catalog No. ADS-48-N (2/0 ACSR) Catalog No. ADS-60-N (3/0 ACSR)	Same as above.
Hubbell (Chance) Aluminum alloy deadend Catalog No. SDF10A (4 through 4/0 ACSR)	Same as above.
Hubbell (Fargo) Aluminum alloy deadend Catalog No. GD-961A side opening keeper (No. 4 and No. 2 ACSR) Catalog No. GD-972A (2/0, 3/0, 4/0 ACSR)	Same as above.
MacLean (Bethea) Aluminum alloy deadend Catalog No. ASO-684-2 (1/0, 2/0, 3/0 ACSR) Catalog No. ASD-2-N (4-2/0 ACSR) Catalog No. ASD-34-N 3/0, 4/0 ACSR Catalog No. HDSO 57 (with side opening) (4-4/0 ASCR)	Same as above.

*Straight line deadend clamps are applicable for urban construction where tensions are moderate and on lines often worked hot.

I - Clamp, deadend

DISTRIBUTION

(wedge type)

Manufacturer	Conditions
Hubbell (Fargo)	
GDW-2010A (#4 - 2/0 ACSR) Bare Aluminum jaws	To obtain experience.
GDW-2010 (#4 – 2/0 Str Cu) Plated Aluminum jaws for use with copper conductor	
GDW-2040A (#4 – 4/0 ACSR) Bare Aluminum jaws	
GDW-2040 (#4 – 3/0 Str Cu) Plated Aluminum jaws for use with copper conductor	
GDW-556 (266.8 - 477 kcmil ACSR)	

m - Clamp, suspension

2 BOLT - DISTRIBUTION

	Copper & CWC	ACSR with Straight or Formed Armor Rods			
		4	2	1/0 & 2/0	3/0 & 4/0
ABB	6240	6241	6242	6243	6244
Alcoa	-	-	-	-	HSU*
C & R Products	-	-	-	CRSC-1	CRSC-2
Dulmison	-	-	-	-	HSU*
Hubbell (Anderson)	MS-46-N	MS-60-N	MS-70-N	HAS-85-N	HAS-104-N
Hubbell (Chance)	FWG1	FWG2	FWG3	FWG4	-
Lapp	305740N	306027N	306028N	306029N	306030N
MacLean (Bethea)	FS-46-N	GW-1-N	LS-0-N	LS-1-N	LS-2-N
MacLean (Continental)	FSC-46-N	FSC-60-N	SC-70-N	SC-85-N	SC-105-N
Preformed Line Products	-	-	-	-	AGS*

*Accepted for larger sizes.

m - Clamp, Suspension

ANGLE - DISTRIBUTION No. 2 & 4 ACSR Plus Rods		2-BOLT TRANSMISSION For 3/8" Steel Overhead Ground Wire
2300	ABB	6240
	MacLean (Continental)	FSC-46N
AAC-301 & 302	Hubbell (Anderson)	MS-46-N
-	Hubbell (Chance)	FGW1
GD-907A	Hubbell (Fargo)	-
306092	Lapp	305740N
AC-60	Line Hardware	-
RALS-1	MacLean (Bethea)	

m – Clamp, suspension - cushioned

Condition: To obtain experience

ACSR

	kcmil					
	266.8	336.4	477	556.5	795	954
Preformed	CGS-1100	CGS-1102	CGS-1105	CGS-1106	CGS-1110	CGS-1112

m - Clamp, Suspension, high temperature
For use with High Temperature Conductors

Manufacturer	Conditions
Preformed Line Products (PLP) Suspension System To be used with CTC High Temperature Conductors ACCC (Aluminum Conductor Composite Core)	1. To obtain experience. 2. Use high temperature accessories approved by the manufacturer and accepted by RUS

Note: These clamps are acceptable when installed using tools and dies in accordance with the conductor manufacturer's recommendations.

n - Bolt, double arming

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes: 5/8 inch diameter, 12 inch through 24 inch length

3/4 inch diameter, 20 inch through 24 inch length

The following manufacturers have shown compliance with the applicable specifications for double arming bolts:

Allied Bolt, Inc.
Hubbell (Chance)
Hughes Brothers
* Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)
Portland Bolt & Manufacturing Company
Steel City Bolt & Screw Co., Inc.

*"Static proof" designs available.

o - Bolt, eye, oval

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes: 5/8 inch diameter, 6 through 20 inch length

3/4 inch diameter, 8 through 20 inch length

The following manufacturers have shown compliance with the applicable specifications for oval eye bolts:

Allied Bolt, Inc.
Berny's Forging Company
* Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)

*"Static proof" designs available.

Shoulder Eye Bolt
for Transmission Structures

3/4 inch diameter, 8 inch through 20 inch length

	Catalog Number
Joslyn	J9528 to J9540
Kortick	K9558 to K2570

p - Connectors, distribution (Parallel Groove)

Applicable Specification: ANSI C119.4

ACSR to ACSR
To same size or smaller

Bare Conductor

	4/0 - 2/0	1/0	2	4
Alcoa	-	396.6	490.0	490.0
Blackburn	PAE 4141-9	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	KVS28A	UCG25R	UC25R2R	UC25R2R
Connector Mfg.	APC-2/0	APC-2/0	APC-1/0	APC-1/0
Hubbell (Anderson)	LC-53A	LC-51C	LC-51A	LC-51A
Hubbell (Fargo)	GA-9040L	GA-9020L	GA-9002L	GA-9003L
MacLean (Reliable)	APG-3	APG-2	APG-1	APG-1
Penn-Union	PCAA-20BF	PCAA-15BF	PCAA-10BF	PCAA-10BF
Tyco (AMP)	1710521-5	1710521-3	1710521-1	1710521-1

Over Armor Rods

	3/0	2/0	1/0	2	4
Blackburn	-	-	PAA10	PAA10	PAA10
Burndy	-	-	UC32R	UC32R	UC32R
Hubbell (Anderson)	LC-83A	LC-52C	LC-52C	LC-52C	LC-52C
Hubbell (Fargo)	GA-9843	GA-9842	GA-9041L	GA-9020L	GA-9020L
MacLean (Reliable)	-	-	744AL	600AL	600AL
Penn-Union	-	-	ARC-12	ARC-11	ARC-14

p - Connectors, Distribution (Parallel Groove)

Applicable Specification: ANSI C119.4

ACSR to Copper or Copperweld-Copper

ACSR Size (Bare Conductor)

	3/0	2/0	1/0	2	4
Alcoa	197	R193	R193	195	195
Blackburn	PAC7	PAC7	PAC345	2CA	4CA
Hubbell (Anderson)	LC-811A	LC-811A	LC-522A	LC-511A	LC-511
Hubbell (Fargo)	GA-9040L	GA-9040L	GA-9020L	GA-9002L	GA-9003L
MacLean (Reliable)	600ALC	555ALC	438ALC	438ALC	438ALC

ACSR Size (Over Armor Rods)

	3/0	2/0	1/0	2	4
Alcoa	201	R197	R197	R197	199
Blackburn	-	-	PAC7	PAC7	PAC7
Hubbell (Anderson)	LC-833	LC-833	LC-811A	LC-811A	LC-811
Hubbell (Fargo)	GA-9843C	GA-9842C	GA-9040L	GA-9020L	GA-9020L
MacLean (Reliable)	-	-	744ALC	600ALC	600ALC

p - Connector, Distribution

Applicable Specification: ANSI C119.4

Copper Type Conductors
Connections to same size or smaller

Bare Conductor

	Copperweld Copper	2A		4A	6A	8A
	Copper	0x7	2x3		4	6
(s)	Blackburn	1/0H	1H	2H	4H	6H
(s)	Burndy	KS-25	KS-23	KS-23	KS-20	KS-17
(s)	Dossert	DS-10-F	DS-6-F	DS-6-F	DS-3-F	DS-2-F
(s)	Greaves	-	A-8	-	A-5	A-3
(s)	Homac	-	1F	2F	4F	6F
	Hubbell (Anderson)	DG-1/0	DG-1	DG-2	DG-4	DG-6
	Hubbell (Fargo)	GC-5020	GC-5002S	GC-5002	GC-5004	GC-5006
(s)	ILSCO	IK-1/0	IK-2	IK-2	IK-4	IK-6
(s)	Kearney/Cooper Power Systems	118109	118109	118108	118104	118102
(s)	Krueger & Hudepohl	UC58C-EV	-	-	-	-
(s)	Penn-Union	S1/0	S2	S3	S4	S6
	Richards Manufacturing Company, Sales Inc.	VC10	VC10	VC7	VC5	VC3
	Royal Switchgear	1739	1739	-	-	-

Over Armor Rods

	Burndy	KVS-31	KVS-31	KVS-28	KVS-26	KVS-26
	Hubbell (Anderson)	K-5	K-4	K-4	K-2	K-2
	Hubbell (Fargo)	GC-5035	GC-5035	GC-5040	GC-5020S	GC-5020
	ILSCO	IKB-350	IKB-350	IKB-4/0	-	-
(s)	Kearney/Cooper Power Systems	118112	118112	118111	118110	118110
	Penn-Union	VT-4	VT-3	VT-3	VT-2	VT-1

(s)designates split bolt connectors

Long Connectors (Split Bolt)
Copper to Copper

	2	4	6
Blackburn	2H3	4H3	6H3
Burndy	KS-22-3	KS-20-3	KS-17-3
Dossert	DS5-3	DS3-3	DS2-3
Greaves	A-9	A-6	A-4
Homac	-	4F	6F
Hubbell (Anderson)	C-2-L	C-4-L	C-6-L
Kearney/Cooper Power Systems	118107	118105	118103
Penn-Union	SEL-2	SEL-4	SEL-6

p - Connectors, Service (Parallel Groove)

Applicable Specification: ANSI C119.4
Aluminum-to-Aluminum
Solid or Stranded

	No. 2	No. 4
Alcoa	490.0	490.0
Blackburn	PAE 2121-9	PAE 2121-9
Burndy	UC25R2R	UC25R2R
Hubbell (Anderson)	LC-51A	LC-51A
Hubbell (Fargo)	GA-9002L	GA-9002L
MacLean (Reliable)	APG-1	APG-1
Penn-Union	PCAA-10BF	PCAA-10BF

p - Connectors, Service (Parallel Groove)

Applicable Specification: ANSI C119.4
Aluminum-to-Copper
Solid or Stranded

	2 Al to 4 Cu	4 Al to 6 Cu
Blackburn	PAC345	PAC345
Hubbell (Anderson)	LC-511A	LC-511A
Hubbell (Fargo)	GA-9002L	GA-9002L

p - Connectors, Service

Applicable Specification: ANSI C119.4
Copper-to-Copper
Solid or Stranded

Manufacturer	No. 4	No. 6
Blackburn	4N	6N
Burndy	KP4C	KP6C
Dossert	ES-4	ES-6
Hubbell (Anderson)	4E	6ES
Hubbell (Fargo)	GC-5004	GC-5006
Ilsco	SX-4	SX-6
Maclean (Reliable)	BVC-4	BVC-6
Penn-Union	SX-4	SX-6
Richards Manufacturing Company, Sales Inc.	VC5	VC3
Southport	SE-3	SE-2

p - Connectors, Guy Bond (Parallel Groove)

Applicable Specification: ANSI C119.4

ACSR to Guy Strand

	2/0	1/0	2 & 4
Alcoa	396.6	396.6	490.0
Blackburn	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	UC 28R	UCG25R	UCG25R
Dossert	AC103-LW	AC101-LW	AC100-LW
Hubbell (Anderson)	LC-52A-GP	LC-51C-GP	LC-51A-GP
Hubbell (Fargo)	GA-9040L	GA-9040L	GA-9040L
MacLean (Reliable)	744AL	555AL	438AL
Penn-Union	ALC-15	ALC-10	PCA-010

Copper to Guy Strand

AMP	C-LOK Series
Blackburn	K-1
	2HPW (1/4")
	1/0 HPW (3/8")
Burndy	UC8W26L
C & R	CRJC-1
Dossert	UDV 13-1-P
Galvan	K1
Hubbell (Anderson)	LC-511A
Hubbell (Fargo)	GC-8040P
ILSCO	SK-3 (1/4")
	SK-1/0 (3/8")
Joslyn	J8300
Kearney/Cooper Power Systems	9968-1
Krueger & Hudepohl	UC58B-EV
MacLean (Reliable)	438ALC
Penn-Union	JC-1-AC
	(1/4", 3/8" guy strand)
	(1/0 strand copper max.)

p - Connectors, Compression
Applicable Specification: ANSI C119.4

DISTRIBUTION

	Aluminum to aluminum	Aluminum to copper	Copper to copper	Tap Connections (Al to Al,Al to Cu)
Blackburn	Type WR	Type WR	Type CF-1	Type WR
Burndy	"Hycrimp" (Type YH)	"Hycrimp" (Type YH)	“Crimpit" (Type YC-C)	"Cabelok Crimpit" (Type YP-U)
Cembre	-	-	C	-
Homac	H Tap-OB&DB	H Tap-OB&DB	CC	H Tap-OB&DB
Hubbell (Anderson)	AC Series	AC Series	VCUC	VCP
Kearney/Cooper Power Systems	"Squeezeon" (Aluminum)	"Squeezeon" (Aluminum)	"Squeezeon" (Copper)	"Squeezeon" (Aluminum)
Penn-Union	"Press-On" (Aluminum)	"Press-On" (Aluminum)	"Press-On" (Copper)	"Penn-L-Tap"

NOTE: These connectors are acceptable when installed using tools and dies in accordance with the connector manufacturer's recommendations.

p - Connectors, Compression
Applicable Specification: ANSI C119.4

SERVICE

	Aluminum-to-Aluminum Aluminum-to-Copper	Copper-to-Copper
Blackburn	CS, KL ICS-1, IKL (Insulated)	-
Burndy	"Linkits" (Type YSU, YSD) "Insulink"(ES)	“Hysplice" (Types YDS-C, YDS-W)
Homac	"Shure Splicers"	-
Hubbell (Anderson)	VAUS	VHS
Kearney/Cooper Power Systems	"Serv-ens"	-
National Tel. Supply	"Nicopress"	-
Penn-Union	"Penn Sleeves"	-

These connectors are furnished in a variety of sizes to fit all combinations of aluminum and copper service wire.

NOTE: These connectors are acceptable when installed using tools and dies in accordance with the connector manufacturer's recommendations.

p - Connectors, Transmission
Applicable Specification: ANSI C119.4

BOLTED TYPE

ACSR to ACSR
ACSR to Copper

Alcoa	580 Series
Burndy (ACSR to ACSR)	UP-A, UP-R

When ordering these clamps specify size, stranding and material of both conductors.

COMPRESSION TYPE

ACSR to ACSR
Same Size

Conductor Size	Alcoa	Blackburn	Burndy	Hubbell (Anderson)	Kearney/Cooper Power Systems
1/0	5074.438	RCJ10	YCS25R	VPUS	OHR-1/0-61AJ
2/0	5074.484	RCJ20	YCS26R	-	OHR-2/0-61AJ
3/0	5075.547	RCJ30	YCS27R	Order	OHR-3/0-61AJ
4/0	5075.609	RCJ40	YCS28R	by	OHR-4/0-61AJ
266.8 kcmil	5076 Order by	RCJ266M	YCS30R	Conductor	HR-266-267AJ
336.4 kcmil	5076 stranding	RCJ336M	YCS33R	Size	HR-336-267AJ

ACSR to Copper

Alcoa	5070 Series
Burndy	YCR-R-CA
Hubbell (Anderson)	VPUS

(Order by conductor sizes)

NOTE: These connectors are acceptable when installed using tools and dies in accordance with the connector manufacturer's recommendations.

p - Connectors

(wedge type)

Manufacturer	Aluminum-to-aluminum	Aluminum-to-copper	Copper-to-copper	Tap Connections (Al to Al ,Al to Cu)
AMP	AMPACT MINIWEDGE	AMPACT MINIWEDGE	AMPACT C-LOK Series	AMPACT MINIWEDGE
Burndy	WEJTAP	WEJTAP	WEJTAP	WEJTAP
Connector Products, Inc.	Aluminum Tap Connector	Aluminum Tap Connector	-	Aluminum Tap Connector
Homac	Power Tap	Power Tap	-	Power Tap

p - Connectors

Manufacturer	Conditions
<u>Blackburn</u>	
Bolted, insulated IPC 1102 (#2-1/0 run, #2 tap) IPC 4111 (1/0-4/0 run, #2-1/0 tap) IPC 4141 (1/0-4/0 run, 1/0-4/0 tap)	1. For use on 600 volt maximum insulated conductors. 2. To be used only for connecting service drop conductors to service entrance conductors. 3. To obtain experience.
<u>Homac</u>	
*Compression, Insulated "Shure Splicers" Types Q1N and U1N	To obtain experience.
<u>Hubbell (Anderson)</u>	
*Compression al to al al to cu "Versa-Crimp" L tap.	To obtain experience.
Parallel groove, aluminum LC-52C (1/0 - 6/1 ACSR over armor rods) LC-51C (1/0 - 6/1 ACSR)	To obtain experience.
<u>Kupler</u>	
Bolted, insulated 130001 (#2-1/0 run, #2 tap) 130003 (1/0-4/0 run, #2-1/0 tap) 130004 (1/0-4/0 run, 1/0-4/0 tap)	1. For use on 600 volt maximum insulated conductors. 2. To be used only for connecting service drop conductors to service entrance conductors. 3. To obtain experience.
<u>Penn Union</u>	
*Compression, Insulated Type PIK	To obtain experience.
<u>Utilco</u>	
Two bolt style, al to al Type PM	To obtain experience.

*NOTE: These connectors are acceptable when installed with tools and dies in accordance with the connector manufacturer's recommendations.

q - Bolt, double upset

Applicable Specification: "RUS Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches Length, inches	5/8 7	5/8 8	5/8 9	5/8 10
Hubbell (Chance)	-	7826	7828	7830
Joslyn	-	J2394	J2395	J2396
Kortick	K4760	K4761	K4762	K4763
MacLean (Continental)	U31065	U31067	U31069	U31071

s - Clevis, secondary swinging

Applicable Specifications: "RUS Specifications for Secondary Swinging Clevises," D-6

Manufacturer	Clevis only*	Clevis with 1-3/4" groove spool	Clevis with 3" groove spool
Hubbell (Chance)	0352	0352-C909-1032	0352-C909-1034
Joslyn	J0322	-	-
Kortick	K9259	K9109	K9149
MacLean (Continental)	U32043	U36043	U32143

*Catalog Number does not include spool. See page cm for spool type insulators.

u - Deadend for galvanized steel or
aluminum-clad steel guy strand

3-Bolt Guy Clamp

	Light (1/2" bolts)	Heavy (5/8" bolts)*
Almat	-	K162-4
Hubbell (Chance)	6450	6461
Joslyn	J930	J931
Kortick	K4124	K4005
MacLean (Continental)	U5273	U5275

U-Bolt Guy Clamp

	Light (3/8" bolts)	Heavy (1/2" bolts)
Hubbell (Chance)	GCU38C	-
Joslyn (Flagg)	PAX-64C	PAX-67C
MacLean (Continental)	GC-64C	GC-67C

Offset Guy Clamp

	Light (1/2" bolts)	Heavy (5/8" bolts)
Hubbell (Chance)	6409	6410
Joslyn	J926	J927

*For use on transmission.

u - Deadend for galvanized steel guy strand

Strand Size:	1/4"	9/32"	5/16"	3/8"	7/16"
		Automatic			
MacLean (Reliable)					
Bail for thimble eye	5100	5201	5201	5102	5103
Bail for guy insulator	5150	5251	5251	5152	5153
		Formed Type			
Alcoa Conductor Accessories For standard guy*	GYDEGB061	GYDEGB071	GYDEGB079	GYDEGB091	GYDEGB110
Dulmison For standard guy*	SGG-0610	SGG-710	SGG-0790	SGG-0915	SGG-1105
Florida Wire & Cable For standard guy*	FLA 1300	FLA 1400	FLA 1500	FLA 1600	FLA 1700
Helical Line Products For standard guy*	HG-207-1/4"	HG-208-9/32"	HG-209-5/16"	HG-210-3/8"	HG-211-7/16"
Payer Industries For standard guy*	25-GNBS	-	30-GNBS	35-GNBS	38-GNBS
Preformed Line Products					
For standard guy*	GDE-1104	GDE-1105	GDE-1106	GDE-1107	GDE-1108
For wrapped guy	WGL-2100	WGL-2101	WGL-2102	WGL-2103	WGL-2104

*Class B galvanizing. When guy wire has Class C galvanizing, formed deadend should also have Class C galvanizing.

u - Deadend for aluminum clad steel guy strand

Strand Size	3#10 (4M)	7#12 (6M)	7#11 (8M)	7#10 (10M)	7X.110" (11.5M)	7#9 (12.5M)	7X.121" (14M)	7#8 (16M)	7X.148" (20M)
Formed Type Aluminum-Clad Steel Guy Strand									
Alcoa Conductor Accessories For standard guy	GYDEAW055	GYDEAW060	GYDEAW068	GYDEAW077	GYDEAW082	GYDEAW087	GYDEAW090	GYDEAW096	GYDEAW112
Dulmison For standard guy	AWGG 0555	AWGG 0600	AWGG 0685	AWGG 0770	AWGG 0825	AWGG 0870	AWGG 0905	AWGG 0965	AWGG1125
Helical Line Products For standard guy	-	HG517-6M	HG519-8M	HG521-10M	-	HG523-12.5M	HG524-14M	HG525-16M	HG528-20M
Hubbell (Chance) For standard guy	-	6M-AWTLG	8M-AWTLG	10M-AWTLG	-	12.5M-AWTLG	-	-	-
Preformed Line Products For standard guy	AWDE-4108	AWDE-4110	AWDE-4113	AWDE-4116	AWDE-4118	AWDE-4119	AWDE-4120	AWDE-4122	AWDE-4126
For wrapped guy	-	WGL-4110	WGL-4113	WGL-4116	-	WGL-4120	-	-	-
Automatic Aluminum-Clad Steel Guy Strand									
Hubbell (Fargo)	-	GDE-300	GDE-301	GDE-301	-	GDE-302	-	-	-
MacLean (Reliable)	-	5200	5201	5201	-	5202	-	-	-

v - Guy Attachment
for 5/8" bolt

Type:	Formed Strap	Angle Bolt Eye	Guy Hook	Guy Hook*
Maximum Working Load Rating	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Hubbell (Chance)	5004	0100	-	GH5
Joslyn	J25164	J6500	J6555 J6556	-
Joslyn (Flagg)	-	-	-	P151X
Kortick	K4035 K4047	K3140	-	-
Line Hardware	-	-	-	HGA-58C
MacLean (Bethea)	-	-	-	AG-5
MacLean (Continental)	U31030	U5531	GAD	GAD-56-4
Power Play Products	-	-	-	B58GH
Universal Electric	-	-	-	UGA-56C

*This hook may be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.

Pole Eye Plates
(5/8" Bolt)

Type	Pole Eye Plate
Maximum Working Load Rating	37,800 N. (8500 lbs.)
Hubbell (Anderson)	GSP-05
Joslyn (Flagg)	PX88
Line Hardware	PGA-548
MacLean (Bethea)	PE5-6A
MacLean (Continental)	PEP-66-45

Conditional List
v(1)
July 2009

v - Guy attachment

Manufacturer	Conditions
MacLean (Continental)	
Pole Band, UCB-15E	To obtain experience. For distribution lines only and 10,000 lbs maximum loading.
Hubbell (Chance)	
Pole Band, with cone head bolt 6280, and guy clip 456 6276 (for 6" to 10" pole) 6277 (for 8" to 14" pole)	To obtain experience. For distribution lines only and 10,000 lbs maximum loading.
Joslyn	
Pole Band, with cone head bolt J-6281, and guy clip J-6275 J-6280 (for 6" to 10" pole) J-6270 (for 8" to 14" pole)	To obtain experience. For distribution lines only and 10,000 lbs maximum loading.

w – Insulators, guy strain
(Fiber Reinforced Plastic)

Ult. Strength, lbs.	11,000	15,000	21,000
Aluma-Form, Inc.	-	FGS 16 Series	FGS 21 Series
Dulmison	HSI1-1P Series	HSI-2X Series	HSI3-2P Series
EPAC	CC Series	CC Series	CC Series
Hubbell (Chance)	-	GS-16	GS-21
Hughes Brothers	-	692 Series	694 Series
Joslyn (Flagg)	150 Series	150 Series	210 Series
K-Line	-	-	KL Series
MacLean (Continental)	G-11 Series GAC 11 Series (for 5/16" guy strand)	G-15 Series GAC 15 Series (for 3/8" guy strand)	G-21 Series -

x - Rod, anchor

Applicable Specification: ANSI C135.2, "Standards for Galvanized Ferrous Strand Eye Anchor Rods"

Applicable Sizes:

Single guy: 5/8 inch diam. 6, 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

Double guy: 5/8 inch diam. 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

Single Guy: Drive: 5/8 inch diam. 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

Double Guy: Drive: 5/8 inch diam. 7 and 8 feet long
3/4 inch diam. 8, 9 and 10 feet long
1 inch diam. 9 and 10 feet long

The following manufacturers have shown compliance with the applicable specifications. Some manufacturers cannot supply all sizes listed above. Check with manufacturer or distributor for availability.

Dixie
Eritech (Carolina Galvanizing/Knight)
Grip-Tite
Hubbell (Chance)
Joslyn
Kortick
Utilities Service

x - Rod, anchor

Applicable Specification: ANSI C135.2 "Standards for Galvanized Ferrous Strand Eye Anchor Rods" except rods are copper covered. Copper coating thickness is 13 mil minimum at any point and a 15 mil average. All purchases should specify that a factory certification to the thickness of the copper must accompany the shipment of the rods.

Applicable Sizes: Double Guy - 3/4 inch diameter, 8 and 9 feet long.

Manufacturer	Conditions
Joslyn	1. To obtain experience. 2. For transmission purposes only. 3. For use with log anchors or copper covered plate anchors only. 4. To be used with copper coated hardware or bronze hardware underground.

y - Galvanized Steel Strand

Usage: Guy, Distribution or Transmission Line
Overhead Static Wire

ASTM Specification: A 475 - For Guy Strand
A 363 - For Overhead Static Wire

Following grades/diameters of steel wire strands are preferred sizes:

For Guying

Siemens-Martin	High Strength	Extra High Strength Grade	
Distribution Line	Dist. or Trans.	Distribution	Transmission
1/4" dia.	1/4" dia.	1/4" dia.	1/4" dia.
3/8"	9/32"	9/32"	9/32"
7/16"	5/16"	5/16"	5/16"
	3/8"	3/8"	3/8"
	7/16"		7/16"

For Overhead Static Wire (Groundwire)

High Strength	Extra High Strength Grade
3/8" dia.	5/16" dia.
7/16"	3/8"
	7/16"

Alcan Cable
Armco Steel Corporation
Bekaert Steel Wire Corporation
Cal-Wire
Central de Herramientes, S.A. de C.V.
Davis-Walker
Florida Wire and Cable
Indiana Steel and Wire
Mitchell Industries
National Strand Products
Paulsen Wire and Rope Corporation
Seal Wire Company
Southwire

Note: The buyer should specify Class A, B, or C coating per ASTM A363 or A475.

y - Steel Strand

Aluminum-Clad
Specifications: ASTM B415 and B416

<u>For overhead groundwire</u>
(Joint and splice requirements for wire and strand to meet ASTM A363)
AWG Sizes: (a) 7 No. 10, (c) 7 No. 9, (d) 7 No. 8, (e) 7 No. 7 AWG

Intral and Company, Ltd.	(a), (c), (d), (e)
Nehring - Conex	(a), (c), (d), (e)
United States Alumoweld	(a), (c), (d), (e)

<u>For guy strand</u>
(M is rated breaking load in thousand lbs)
M Sizes: 6M (7 No. 12), 8M (7 No. 11), 10M (7 No. 10), 11.5M (7 x .110"), 12.5M (7 No. 9), 14M (7 x .121"), 16M (7 No. 8), 18M (7 x .139"), 20M (7 x .148")

Alumoclad de Mexico, S.A. de C.V.	8M, 10M, 16M
Intral and Company, Ltd.	6M, 8M,10M, 12.5M, 16M, 18M, 20M
Nehring - Conex	8M, 10M, 12.5M, 16M, 18M
United States Alumoweld	6M, 8M, 10M, 12.5M, 14M, 16M, 18M, 20M

y - Aluminum Coated Steel Wire
Applicable Specification ASTM A474

National Strand Products, 3/8"

Distribution Guy Strand Siemens-Martin High Strength Extra High Strength	To obtain experience.
Transmission Guy Strand High Strength Extra High Strength	To obtain experience.
Overhead Static Wire High Strength Extra High Strength	1. To obtain experience. 2. Must meet the joint requirements of ASTM A363.

y - Zinc - 5% Aluminum - Mischmetal alloy (Zn-5Al-MM) - Coated
Steel Wire Strands
Applicable Specification ASTM A855

Bekaert Corporation

Type/Grade:	Nominal diameter (7-wire strand), in.
(HS):	1/4", 5/16", 3/8", & 7/16".
(EHS):	1/4", 5/16", 3/8", & 7/16".

	Conditions
Distribution Guy Strand High Strength (HS) Extra High Strength (EHS)	To obtain experience.
Transmission Guy Strand High Strength (HS) Extra High Strength (EHS)	To obtain experience.
Overhead Static Wire High Strength (HS) Extra High Strength (EHS)	1. To obtain experience. 2. Must meet the joint requirements of ASTM A363.

NOTE: Only available with Class C coating.

Indiana Steel & Wire Co.

Type/Grade:	Nominal diameter (7-wire strand), in.
(S-M):	1/4", 3/8", & 7/16".
(HS):	1/4", 9/32", 5/16", 3/8", & 7/16".
(EHS):	1/4", 9/32", 5/16", 3/8", & 7/16".

	Conditions
Distribution Guy Strand Siemens-Martin (S-M) High Strength (HS) Extra High Strength (EHS)	To obtain experience.
Transmission Guy Strand High Strength (HS) Extra High Strength (EHS)	To obtain experience.
Overhead Static Wire High Strength (HS) Extra High Strength (EHS)	1. To obtain experience. 2. Must meet the joint requirements of ASTM A363.

NOTE: The buyer should specify Class A, B, or C coating.

z - Anchors, Expanding and Plate

DISTRIBUTION

Designated Maximum holding power-lbs.		6,000	8,000	10,000	12,000
Min. Area (sq. in.)		90	100	120	135
Rod Dia. (inches)		5/8	5/8	3/4	3/4
Rod Length (feet)		7	7	8	-
	Type				
Grip-Tite	8 way	A322812G	A322812G	A322812G	A322812G
Hubbell (Chance)	8 way	88135	88135	88135	88135
Joslyn	8 way	-	J8115	J8135	J8135
Line Hardware	8 way	8-100G	8-115G	8-135G	8-135G
MacLean (Continental)	8 way	UC88100-G	UC88115-G	UC88135-G	UC88135-G
	Plate	-	UC617-G	UC622-G	UC822-G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, plate

Applicable Specification: "RUS Specification for Steel Plate Anchors," T-3

TRANSMISSION

Minimum Area 400 sq. in.

	3/4" Galv. Rods
Grip-Tite	XP24 - 3/4 - G
Hubbell (Chance)	X24 - 3/4
Joslyn	J3524 - 3/4
Line Hardware	CP-24G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, Service

Designated Maximum Holding Power in Sand - 2500 lbs.

	Screw	Expanding
Dixie	D-6526	-
Eritech (Carolina Galvanizing)	86346606	-
Grip-Tite	-	322065G
Hubbell (Chance)	6346	6870
Joslyn	J6526W-CA	JO870
Line Hardware	-	8-70G
MacLean (Continental)	UC6346-G	UPL62-2.5-G

z - Anchors, Swamp

DISTRIBUTION

	10" dia.	12" dia.	15" dia.
Dixie	D-6710-S	D-6713-S	D-6715-S
Foresight	-	MR-SR*	-
MacLean (Continental)	UC10150A-G	UC122A-G	UC152A-G

*Drive type anchor. Surface area meets or exceeds that of 12" diameter anchors.

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, Rock

	Expanding Rock Anchors			Rock Guy Bolt
Anchor Size - inches	1-3/4	1-3/4	1-3/4	1-3/4
Rod Length - inches	15	30	53	18
Rod Diameter - inches	3/4	3/4	3/4	1
Almat	K148-15	K148-30	K148-53	-
Hubbell (Chance)	R315	R330	R353	-
Joslyn	J3436	J3437	J3438	-
Kortick	K5503	K5504	K5505	K2377
MacLean (Continental)	UCR315	UCR330	UCR353	U5003

z - Pole keys

Hubbell (Chance)	P-4817
Joslyn	J-4817
MacLean (Continental)	UCP-4817

z - Anchors, Power-installed screw

Manufacturer: Dixie Electrical Manufacturing Company
Multi-Helix Screw Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1 (Soil Class 2)	D-6632 D-6636 D-6637	D-6632 D-6636 D-6637	D-6636 D-6637 D-6638	D-6636 D-6637 D-6638
A2 (Soil Class 3)	D-6632 D-6636 D-6637	D-6632 D-6636 D-6637	D-6636 D-6637 D-6638	D-6637 D-6638 -
B (Soil Classes 4 & 5)	D-6632 D-6636 D-6637	D-6636 D-6637 D-6638	D-6636 D-6637 -	D-6638 - -
C (Soil Classes 6 & 7)	D-6636 D-6637	D-6637 -	D-6638 -	- -

Manufacturer: Hubbell (A. B. Chance Company)
"SS" Multi Helix Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1 (Soil Class 2)	12642-AE 12642-AEJ 12642-EJN	12642-AE 12642-AEJ 12642-EJN	12642-AEJ 12642-EJN 12642-EJNS	12642-AEJ 12642-EJN 12642-ENJNS
A2 (Soil Class 3)	12642-AE 12642-AEJ 12642-EJN	12642-AE 12642-AEJ 12642-EJN	12642-AEJ 12642-EJN 12642-EJNS	12642-EJN 12642-EJNS -
B (Soil Classes 4 & 5)	12642-AE 12642-AEJ 12642-EJN	12642-AEJ 12642-EJN -	12642-AEJ 12642-EJN 12642-EJNS	12642-EJNS - -
C (Soil Classes 6 & 7)	12642-AEJ 12642-EJN	12642-EJN -	12642-EJNS -	- -

NOTES:

1. See RUS Specification T-10 for definitions and explanations.

2. Anchors in the 53,400 N (12,000 lb.) category or above for use on wood poles must be used with hardware commensurate with the working load. Hardware may provide for either single or multiple guy attachments to the anchor.

3. Anchors listed in a specific working load category and/or soil class may generally be used at lower working load categories and/or lower numerical soil classes.

z - Anchors, Power-installed screw

Manufacturer: Joslyn
"PS" Screw Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1 (Soil Class 2)	J23380ACA J23381ACA J23383ACA	J23380ACA J23381ACA J23383ACA	- - -	- - -
A2 (Soil Class 3)	J23380ACA J23381ACA J23383ACA	J23380ACA J23381ACA J23383ACA	J23381ACA J23383ACA J29726ACA	J23383ACA J29726ACA -
B (Soil Classes 4 & 5)	J23380ACA J23381ACA J23383ACA	J23380ACA J23383ACA -	J23381ACA J23383ACA J29726ACA	J29726ACA - -
C (Soil Classes 6 & 7)	J23381ACA J23383ACA	J23383ACA -	J29726ACA -	- -

NOTES:

1. See RUS Specification T-10 for definitions and explanations.

2. Anchors in the 53,400 N (12,000 lb.) category or above for use on wood poles must be used with hardware commensurate with the working load. Hardware may provide for either single or multiple guy attachments to the anchor.

3. Anchors listed in a specific working load category and/or soil class may generally be used at lower working load categories and/or lower numerical soil classes.

z - Anchors

Manufacturer	Conditions
Bathurst Screw anchors, power installed BMS-003 (6,000 lbs.) BMS-003R (5/8” rod) BMS-004 (10,000 lbs.) BMS-004R (3/4” rod)	To obtain experience.
Dixie Screw anchors, power installed D-1162-G (6,000 & 8,000 lb., 5/8" rod) D-1375-G (10,000 & 12,000 lb., 3/4" rod)	To obtain experience.
Foresight MR-1, MR-2, MR-3, MR-4	1. To obtain experience. 2. Each installation must be proof tested. Maximum rating is test value achieved.
Hubbell (Chance) Screw anchors, power installed 024462 (6,000 and 8,000 lb.) 12332P (5/8" rod) 12587 (5/8" thimbleye nut) 024484 (10,000 and 12,000 lb.) 12632P (3/4" rod) 6512 (3/4" thimbleye nut)	To obtain experience.
Joslyn Screw anchors, power- installed J1lB-CA (6,000 & 8,000 lb., 5/8" rod) J13C-CA (10,000 & 12,000 lb., 3/4" rod)	To obtain experience.

NOTES: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

Catalog numbers shown for screw anchors are for anchors with 1-3/8" hubs. Equivalent anchors with 1-1/2" hubs are also acceptable. (A special installing wrench is required.)

aa - Nut, eye
ab - Nut, thimble eye

	aa			ab	
	Oval eye nut 5/8”	Oval eye nut 3/4”	Thimble Eyelet	Thimble eye nut 5/8”	Thimble eye nut 3/4”
Berny's Forging Co.	OE1	-	-	-	-
Dixie	-	-	-	D6510	-
Hubbell (Chance)	6502	-	B14A	6510	-
Hughes	EN60	-	-	-	-
Joslyn	J1092	-	J1126	J6510	-
Kortick	K4212	J1093	K4413	K3111	-
Line Hardware	OEN-58	-	BEL-58	-	-
MacLean (Continental)	EN-5	-	BE-5	TN-5	-

ac - Brace, sidearm diagonal

	1-1/2 inch angle 3/16" x 5'	1-3/4 inch angle 3/16" x 7'
Hubbell (Chance)	-	6984
Joslyn	-	J1525
Kortick	K1951	K1954
MacLean (Continental)	U5210	U5212

ae - Surge (lightning) Arrester, Distribution Class

SiC Type

Manufacturer	Type	Ratings, kV	Housing	Duty
General Electric	Alugard	9, 10, 18	Porcelain	Heavy

MOV Type

Manufacturer	Type	Ratings, kV	Housing	Duty
Cooper Power Systems	AZL VariSTAR	9, 10, 18, 27	Porcelain	Heavy

ae - Surge (Lightning) Arresters, Substation*

SiC Type

Manufacturer	Type	Accepted Ratings - kV	Housing	Manufacturer's Classification
General Electric	Alugard	3, 9, 10, 18	Porcelain	Distribution

MOV Type

Manufacturer	Type	Accepted Ratings - kV	Housing	Manufacturer's Classification
Hubbell Power Systems (Ohio Brass)	DynaVar			
	VLA	3-27	Porcelain	Station
	VL	3-48	Porcelain	Station
	VN	54-312	Porcelain	Station

* For instructions concerning application at substations, refer to RUS Bulletin 1724E-300, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage ratings in accordance with the line voltage and the type of construction (grounded or ungrounded).

ae - Surge (Lightning) Arresters, Distribution Class

CONDITION OF ACCEPTANCE: To Obtain Experience

MOV Type

Manufacturer	Type	Ratings, kV	Housing	Duty
ABB	Polim-D	9,10,18	Polymer	Heavy
Cooper Power Systems	AZS VariSTAR	9,10,18,27	Porcelain	Normal
	UNS Ultra Sil Housed VariSTAR	9,10,18,27	Polymer	Normal
	UHS Ultra Sil Housed VariSTAR	9,10,18,27	Polymer	Heavy
General Electric	Tranquell, 9L23 Series	9,10,18,27	Polymer	Heavy
Hubbell Power Systems (Ohio Brass)	DynaVar PDV-65	9,10,18,27	Polymer	Normal
	PDV-100 Optima	9,10,18,27	Polymer	Heavy
Joslyn	ZNP	9,10,18,27	Polymer	Normal
	ZHP	9,10,18,27	Polymer	Heavy
Raychem Corporation	HDA Series	9,10,18,27	Polymer	Normal
Tyco	DAH	9,10,18,27	Polymer	Heavy

MOV Type (Internally Gapped)

Manufacturer	Type	Ratings, kV	Housing	Duty
Cooper Power Systems	URT Evolution	9,10,18,27	Polymer	Heavy

Conditional List
ae(2)
July 2009

ae - Surge Arrester, Substation*

CONDITION OF ACCEPTANCE: To Obtain Experience

MOV Type

Manufacturer	Type	Accepted Ratings - kV	Housing	Manufacturer's Classification
ABB	XPI-III	9, 10, 18, 27	Polymer	Intermediate
	XPS	9, 10, 18, 27	Polymer	Station
	EXLIM-R	9, 10, 18, 27	Porcelain	Station
	EXLIM-Q	9, 10, 18, 27	Porcelain	Station
Cooper Power Systems	VariStar	3-312	Porcelain	Station
	VariStar AZF	3-120	Porcelain	Intermediate
	VariSTAR US	120-140	Polymer	Station – 5.6 kJ/kV(1)
	VariSTAR UI	3-108	Polymer	Intermediate
	VariSTAR US	3-108	Polymer	Station - 3.4 kJ/kV(1)
	VariSTAR US	3-108	Polymer	Station - 3.4 kJ/kV
	VariSTAR UH	3-108	Polymer	Station - 5.6 kJ/kV
	VariSTAR UH	3-108	Polymer	Station - 5.6 kJ/kV(1)
	VariSTAR UH	120-140	Polymer	Station - 8.9 kJ/kV(1)
	VariSTAR UX	3-108	Polymer	Station - 8.9 kJ/kV(1)
General Electric	Tranquell	2.7-612	Porcelain	Station
	Tranquell	3-120	Porcelain	Intermediate
Hubbell Power Systems (Ohio Brass)	PVI-LP	3-72	Polymer	Intermediate
	PVIA	3-72	Polymer	Intermediate
	DynaVar Type PVI	3-144	Polymer	Intermediate
	DynaVar Type PVN	3-228	Polymer	Station
	DynaVar Type SVN	54-444	Polymer	Station
Joslyn	Type ZS	3-240	Porcelain	Station
	Type ZSH	258-468	Porcelain	Station
	Type ZIP	3-120	Polymer	Intermediate
	Type ZSP	3-144	Polymer	Station
MagneTek	ZSE-E2A	3-39	Porcelain	Station
	ZSE-E3A	45-312	Porcelain	Station
Siemens Power	3EQ1	36-240	Polymer	Station
	3EQ4	96-444	Polymer	Station
	3EP2	12-384	Porcelain	Station
	3EP4	12-150	Porcelain	Station

*For instructions concerning application at substations refer to RUS Bulletin 1724E-300, "Design Guide for Rural Substations." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

(1) Energy ratings based on single impulse ratings

af - Cutouts, Distribution, Open

Manufacturer	Type	Voltage Rating
ABB	ICX	15, 27 kV
	LBU-II	15, 27 kV
Cooper Power Systems	S1	15, 27 kV
	L	15, 27 kV
Hubbell (Chance)	C	15, 27, 35 kV
	C (loadbreak)	15, 27, 35 kV
	C-Polymer	15 kV
	C-Polymer (Loadbreak)	15 kV
Kearney/Cooper Power Systems	HX	15, 27 kV
Power Line Hardware	DHC	15, 27 kV
	SIL (polymer)	15, 27 kV
S & C Electric	XS-Polymer	15, 27 kV
Southern States	Series 66	15, 27 kV
	Series 70	15 kV
United Copper Industries	APD1516100110	15 kV
	APD2712100125	27 kV

NOTE: The buyer should specify the load rating, voltage rating, interrupting rating and required accessories.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

af - Cutout, open-link fuse support

Manufacturer	Mounting	12.5/7.2 kV 50 amp.	24.9/14.4 kV 50 amp.
Cooper Power Systems	Crossarm	FT1A2	FT1A4
	Bushing	FT10A3	-
Kearney/Cooper Power Systems	Crossarm	6484-55	-
	Bushing	6483-59	-

NOTE: The open link fuse supports listed above are fuse supports only and have no inherent interrupting capacity. They should be used with fuse links capable of interrupting at least 1200 amperes and for transformer protection only.

af - Power Fuses, Substation

Manufacturer	Type	Voltage Rating (kV)
Cooper Power Systems	CMU (Boric acid, non refillable)	15-34.5
Eaton (Cutler-Hammer)	RDB (Boric acid, refillable)	15-34.5
	DBA (Boric acid, non-refillable)	46-69
	DBU (Boric acid, non-refillable)	15-34.5
Kearney/Cooper Power Systems	HX	15
	HX	27
S & C Electric*	SMD (Boric Acid)	15-138
Southern States	Series P	15-161

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators 34.5 kV on request.

NOTE: All fuses listed on this page should be furnished with NEMA standard insulators. The buyer should specify the current rating, voltage rating, interrupting rating and required accessories.

af - Cutouts, Distribution, Open
with Linkbreak Attachment

Manufacturer	Type	Voltage Rating	Conditions
Hubbell	C	15, 27 kV	1. To obtain experience. 2. Limited to 100 amp cutouts. 3. To be used only with Hubbell (Chance), Cooper and Kearney fuses. Will not break S&C and some other fuse types.
	C-Polymer	15 kV	1. To obtain experience. 2. Limited to 100 amp cutouts. 3. To be used only with Hubbell (Chance), Cooper and Kearney fuses. Will not break S&C and some other fuse types.

ag - Fuses, Current Limiting, Backup

Manufacturer	Conditions
ABB 15 kV Class Type CLTX, 25K/15T 25 kV Class Type CLTX, 25K/15T	1. To obtain experience. 2. Must be used in series with external expulsion fuse 25K OR 15T or smaller or with CSP transformers 50 kVA or smaller.
Cooper Power Systems 15 kV Class FAH series 25 kV Class FAH series	Same as above.
General Electric 15 kV Class 9F59U Series 25 kV Class 9F59U	Same as above.
High-Tech Fuses 15 kV Class No. HTDE23 (X)025 25 kV Class No. HTDE24 (X)025 35 kV Class No. HTDE25 (X)025	Same as above.
Hubbell (Chance) 15 kV Class Type K-Mate 25 Catalog No. C70L-31KA 25 kV Class Type K-Mate 25 Catalog No. C70L-32KA	Same as above.

ah - Tie, insulator, formed type

Manufacturer	Type
Dulmison	LT "Longspan" top tie (Order for specific conductor size and insulator) ST side tie (Order for specific conductor size and insulator) Type SPL* (Side tie for use on spool insulator with 1-3/4" groove) DBST double side tie (Order for specific conductor size and insulator) DST double support tie (Order for specific conductor size and insulator)
Helical Line Products	HTT Series (Order for specific conductor size and insulator)
Hubbell (Chance)	Super Top-Tie, Type STT for single or double support use, with insulators 2-1/4" through 3-1/2" neck diameter and single support use on spool insulators with 1-3/4" groove diameter (Order for specific conductor size.)
Preformed Line Products	WT "Wraplock" (Order for specific conductor size and insulator) ST "Groove-Formed" side tie (Order for specific conductor size and insulator) Spool Tie for ACSR, Type SPL* (Side tie for use on spool insulator with 1-3/4" groove) DST double support top tie (Order for specific conductor size and insulator) DBST double side tie (Order for specific conductor size and insulator)

*Not for side mounting on pin or post insulators.

ah - Tie, insulator, formed type

Manufacturer	Conditions
Dulmison Type QSPL “Quick Spool” spool tie (Order for specific conductor size)	To obtain experience.
Preformed Line Products EZ-WRAP* spool tie (order for specific conductor size)	To obtain experience.

*Not for side mounting on pin or post insulators.

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Copper-covered steel rods

	5/8"	3/4"
Alumoclad	AL- 588	-
Apache	588R	-
Blackburn	625813MX	-
Boggs	EB-810-13	-
Eritech (Carolina Galvanizing/Knight)	615883	-
Galvan Industries, Inc.	6258G13	7508G13
Harger	588RUS	
Joslyn	J8338-13	-
Korns	KCG588-13	-
Republic Wire	RGC5883	-
South Atlantic, LLC (Southern Grounding)	C58813	C34813
Wilcor	WA588C	-

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Hot Dip Galvanized Steel

Manufacturer	5/8"	3/4"
Blackburn	-	GR7508
Boggs	G588	G348
	PTG588**	PTG348**
Dixie	D8578	D8618
Erico	G588	G348
	G588PT**	G348PT**
Eritech (Carolina Galvanizing/Knight)	815880	813480
	815889**	813489**
Galvan	GR6258F	GR7508
	GR6258FP**	GR7508P**
Grip-Tite	GT588	GT348
Hubbell (Chance)	8578	8618
	C203-0107**	-
	C203-0377*	-
Joslyn	J5328	J5338
Korns	KG58	KG34
Kortick	K4658	K4678
Line Hardware	GR-588G	GR-348G
Lloyd	6258H	7508H
MacLean (Continental)	U5307	U6338
Porcelain Products	7338	7348
South Atlantic, LLC (Southern Grounding)	ZZ588	Z348
Wilcor	WA8580G	WA8340G

Electro-Galvanized Steel

Apache	G588	G348
	G588PT**	G348PT**
Blackburn	GR6258	-
Calpico	G8580	-
LMP	6258E**	7508E**

Stainless Steel

Galvan	S6258	S7508
Harger	588SS3	-
Wilcor	WA 588-S	WA348-S

*Rod furnished with clamp.
**Rod furnished with 4 ft., No. 6 tinned or galvanized copper pigtail.

NOTE: The 2007 National Electrical Safety Code requires that the diameter of galvanized ground rods be not less than 0.625 inch. Some suppliers may still be providing ground rods with smaller diameters.

ai - Rods, ground, sectional

Galvanized steel and copper-covered steel

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods. Rods are copper-covered unless marked galvanized steel.

Sectional Ground Rods

Manufacturer	8' long	10' long	Coupling	Driving studs
Blackburn	6258S13MX	6260S13MX	60C	60DS
			60CNT2*	60DSNT*
Demark	-	-	GRC 58B*	-
Galv. Steel			GRC 58G*	
Eritech				
(Carolina Galv./Knight)	635883	635803	CR-58/CC-58*	DSH 58
Galv. Steel	835880	835800	GC 58	DSH 58
Galv. Steel	833480	833400	-	DSH 34
Galvan	-	-	GRC-625G**	-
	-	-	GRC-34G**	-
Galv. Steel	6258G13S	6260G13S	60-C	60-DS
	-	-	60-TC*	-
Hubbell (Chance)				
Galv. Steel	C203-0052	8512	8611	-
Joslyn	-	-	J9182	J9186
Galv. Steel	-	-	J23282A	-
South Atlantic, LLC				
(Southern Grounding)	CS58813	CS581013	-	-
	CS34813	CS341013	-	-

* Threadless coupling or drive head
** Threadless coupling for galvanized rod

NOTE: The 2007 National Electrical Safety Code requires that the diameter of galvanized ground rods be not less than 0.625 inch. Some suppliers may still be providing ground rods with smaller diameters.

aj - Clamp, Ground Rod

Manufacturer	For 5/8" Copper-Covered Rod	For 3/4" Galv.or Stainless Steel Rod	For 5/8" Galv.or Stainless Steel Rod
AMP	C-LOK Series	81412-1	81412-1
Blackburn	G5	-	-
Boggs	G31	-	-
Burndy	GRC58	-	-
C & R Products	CRGC-58	-	-
Connector Castings	G5	-	-
Dossert	GNL62H	-	-
*Erico (Cadweld)			
1 ground wire	GR1-161G	GR1-181G	GR1-161G
2 ground wires	GT1-161G	GT1-181G	GT1-161G
Erico	EHL58C1T	-	EHL58G1T
	EHL58C1K	-	EHL58G1K
	EHL58C1G	-	EHL58G1G
Eritech (Carolina Galv./Knight)	CP 58	UCSS	-
*FCI Burndy	Type BCR-1	Type BCR-1	Type BCR-1
	BS-2012	BS-2017	BS-2012
Galvan	G5	-	-
	SRC	SRC	SRC
	DGC-5844	-	-
	DGC-5866	-	-
Greaves/Mercury	G-580	-	-
*Harger			
1 ground wire	G11-588	G11-348	G11-588
2 ground wires	G21-588	G21-348	G21-588
Hubbell (Anderson)	GC-5	-	-
Ilsco	GRC-58	-	-
Joslyn	J8392AB	J25985	J25932
Kortick	K4647	-	-
Lew Electric Fittings	GRC-5/8"	-	-
Line Hardware	RC-58CE	-	-
Penn-Union	CEB-2	CEB-3-TN	CEB-2-TN
MacLean (Reliable)	E58	3459	3459
*Thermoweld	Type CR-1	Type CR-1	Type CR-1
	M-2012	M-2017	M-2012
Wilcor	HGR5/8	WAU 5834-B	WAU 5834-B

*Includes disposable molds.

aj - Clamp, ground rod

Manufacturer	Conditions
Burndy YGHP (for 5/8" copper-covered rods)	To obtain experience.
DeMark Copperhead (for 5/8” copper-covered, galvanized, and stainless rods)	To obtain experience.
DMC Power** GC***B***-625 (for 5/8” steel rods) GC***B***-662 (for 5/8” copper clad rods) GC***B***-750 (for 3/4” steel rods)	To obtain experience.
Line Hardware RC-34 (for 5/8" and 3/4") galvanized or stainless steel ground rods	To obtain experience.
Thomas & Betts DGC58-44 (#4 copper ground wire) DGC58-66 (#6 copper ground wire) (for 5/8" copper-covered rods)	To obtain experience.

** These clamps require the use of special swage connection tools for installation. Manufacturer’s recommendations should be followed.

al - Staples, ground wire

Applicable Specification: ANSI C135.14, "Standards for Staples with Rolled or Slash Points"

Length x Spread (inches)	1-1/2 x 1/4	2 x 1/2	1-1/2 x 3/8	3 x 1-1/16
Diameter	9 gauge Galv. Steel	8 gauge Galv. Steel	8 gauge Copper-Coated	1/4 Moulding
Apollo	AP52l-S1672G	AP521-S1570	AP501-S6652	AP500-S6497
Copperweld Bimetallics, LLC	-	CP52	-	-
FWC	FW1672G	FW157	FW6652	FW6497
Hubbell (Chance)	C205-0247	C205-0216	9167	9161
Joslyn	J1672G	J157	J6652	J6497
Kortick	-	-	K247	K236
L & J Industrial Stples	C1525148-G	D2050162-G	C1538162-C	D3090250-C
Larson	-	350453	750233	721312
Lindsey	10248	-	-	10270
Redmore Products	SCSG1525148	SDSG2050162	SCCC1538162	SDSG3090250
MacLean (Continental)	U88	U86	U48	U46

Barbed staples, ground wire

Length x Spread (inches)	1-1/2 x 3/8	2 x 5/8	1-1/2 x 3/8	3 x 1-1/16
Diameter	.131 Galv. Steel	.165 Galv. Steel	.140 Copper-Coated	7/32 Galv. Steel
Apollo	AP520-57488HTG	AP50l-S66525	-	-
Hubbell Power Systems	C205-0460	C205-0463	C205-0464	C205-0462
Joslyn	J7656	J7672	J7682	J7664
Redmore Products	-	TDSG2063187	TCCC1538162	TDSG3090250

Staples, alumoweld

Length x Spread (inches)	2 x 1/2	1-1/2 x 3/8	3 x1-1/16
Diameter	8 gauge	8 gauge	1/4 moulding
Apollo	AP531-S6655AL	AP531-S6652AL	AP530-S7493AL
Redmore Products	-	-	SDAA3090250

Clip, ground wire

Kearney/Cooper Power Systems	12326

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

Applicable Specifications: "RUS Specifications for Rural Distribution Transformers," D-10

Listing is by type rather than by catalog number because of the many possible combinations of voltage, kVA and taps and protective equipment.

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
Power Partners, Inc.			
Conventional, single bushing	S-B3	S-B3	S-B3
Self-protected, single bushing	CSP-B3	CSP-B3	CSP-B3
Conventional, two bushing	S-A	S-A	S-A
Type S-B3 may also be obtained with internal fuse, with internal fuse and double gap, and with lightning arrester and open link cutout (Type PC).			
Arkansas Electric Cooperative			
Conventional, single bushing	ASE	-	-
Central Moloney			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	DVP	DVP	DVP
The single bushing transformer may also be obtained with bushing mounted cutout and lightning arrester, and with internal fuse and double gap.			
Cooper Power Systems[1]			
Conventional, single bushing*	REA-Conv	REA-Conv	REA-Conv
Self-protected, single bushing*	REA-CSP	REA-CSP	REA-CSP
Conventional, two bushing*	REA-Conv	REA-Conv	REA-Conv
Conventional single bushing type may also be purchased with external overload protection and double gap and with bushing mounted cutout and lightning arrester.			

*Cooper Envirotemp FR3 dielectric fluid is available as an option

Note:
1. Available with optional covers insulated for 15 kV dielectric strength at additional cost. (Transformer covers with higher electrical insulation, together with other coordinated electrical insulating protective measures, should help to significantly lessen shock and electrocution hazards to raptors, other birds, and small mammals.)

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
ERMCO[1]			
Conventional, single bushing	CONV	CONV	CONV
Conventional, two bushing	CONV	CONV	CONV
Self-protected, single bushing	CSP	CSP	CSP

The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA).

Dead-front for use in enclosure: Add "R" (Radial) or "LF" (Loop feed) to designation

Howard Industries			
Conventional, single bushing	REC-C	REC-C	REC-C
Conventional, two bushing	Conv-2B	Conv-2B	Conv-2B
Self-protected, single bushing	REC-P	REC-P	REC-P
Kuhlman			
Conventional, single bushing	I	I	I
Conventional, two bushing	B	B	B
Self-protected, single bushing	H	H	H

Type I may also be purchased with internal fuse, with internal fuse and double gap (Type G), and with bushing mounted cutout and lightning arrester (Type J).

Note:
1. Available with optional covers insulated for 15 kV dielectric strength at additional cost. (Transformer covers with higher electrical insulation, together with other coordinated electrical insulating protective measures, should help to significantly lessen shock and electrocution hazards to raptors, other birds, and small mammals.)

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
Magnetic Electric			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	AOD	AOD	AOD
Sesco			
Conventional, single bushing	RU	-	-
Self-protected, single bushing	ESP	-	-
Conventional, two bushing	CONV	-	-
United (Ky. AEC)			
Conventional, single bushing	SC	SC	DSC
Conventional, two bushing	SC	SC	DSC
Self-protected, single bushing	SCP	SCP	DSCP
VanTran			
Conventional, single bushing	CR	-	-
Self-protected, single bushing	CSP-R	-	-
Conventional, two bushing	CD	-	-

Type RU may also be purchased with internal fuse and/or lightning arrester.

SC and DSC may be purchased with external fuse and arrester (SP and DSP)

an - Transformers, Power
Single-Phase, Step-Down for Distribution Substation Use

Manufacturer	Primary Voltage - kV	Nominal OA Capacity (kVA) 167 - 833	1250 - 10,000
ABB	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
Central Moloney	34.4	X	
Cooper Power Systems*	34.4	X	X
	43.8	X	X

* Also available with optional Envirotemp FR3 fluid. Although Envirotemp FR3 fluid is a vegetable oil-based product, end-users are still subject to the federal oil pollution regulations under 40 CFR 112. End-Users should contact their appropriate local, state, or federal regulatory authority regarding the management, spills, and spent Envirotemp FR3 fluid.

Kuhlman	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
Pennsylvania Transformer Technology, Inc.	34.4	X	X
	43.8	X	X
	67.0	X	X
Waukesha Electric Systems	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X

All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and, 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

an - Transformers, Power
Three-Phase, Step-Down for Distribution Substation Use

Manufacturer	Primary Voltage - kV	Nominal OA Capacity 750 to 3750 kVA	Nominal OA Capacity 5 to 30 MVA
ABB	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Types UTS-A, UTT-B and UVW load tap changers.

Cooper Power Systems*	34.4	X	X
	43.8	X	X

* Also available with optional Envirotemp FR3 fluid. Although Envirotemp FR3 fluid is a vegetable oil-based product, end-users are still subject to the federal oil pollution regulations under 40 CFR 112. End-Users should contact their appropriate local, state, or federal regulatory authority regarding the management, spills, and spent Envirotemp FR3 fluid.

Transformers 5 MVA and larger also accepted as load tap changing transformers using Cooper Types 550, 550B and 550C load tap changers.

Kuhlman	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis Types TLS and TLH load tap changers

Manufacturer	Primary Voltage - kV	Nominal OA Capacity 750 to 3750 kVA	Nominal OA Capacity 5 to 30 MVA
Pennsylvania Transformer Technology, Inc.	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Cooper Types 550, 550B and 550C load tap changers.

Waukesha Electric Systems	34.4	X	X
	43.8	X	X
	67.0	X	X
	115	X	X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Type UZE; Reinhausen RMT-1;Reinhausen RMV-2; or Waukesha Electric Systems Type UZD load tap changers.

Notes:
All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and, 15 kV or 25 kV class secondary voltages.
115 kV and 138 kV transformers may have one step reduced BIL.

an - Transformers, Distribution, Pole Type

Manufacturer	Conditions
Power Partners, Inc. 7.2/12.5, 7.62/13.2 14.4/24.9 kV & Dual Voltage	
Single-phase, single bushing, 25 and 50 kVA pole type distribution transformers with amorphous metal cores.	To obtain experience.
Single-phase, single bushing and two-bushing with internal UMX Under-oil Arrester or with internal "Tranquell" Under-oil Arrester.	To obtain experience.
Cooper Power Systems[1] 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage*	
Single-phase, single bushing, self-protected, with Magnex Interrupter	To obtain experience.
Above or Conventional, single or two bushing; Type REA Conv. or Self-protected, single bushing Type REA-CSP with Type AZU, MOV, heavy-duty under-oil arrester.	To obtain experience.

*Cooper Envirotemp FR3 dielectric fluid is available as an option

Ermco[1] 7.2/12.5 and 7.62/13.2 and14.4/24.9 kV	
Single-phase, single bushing with internal Tranquell Under-oil Arrester	To obtain experience.

Note:

1. Available with optional covers insulated for 15 KV dielectric strength at additional cost. (Transformer covers with higher electrical insulation, together with other coordinated electrical insulating protective measures, should help to significantly lessen shock and electrocution hazards to raptors, other birds, and small mammals.)

an - Transformers, Distribution, Pole Type

Manufacturer	Conditions
GE-Prolec 12.47/7.2, 13.2/7.62, & 14.4/24.9 kV; 5 through 50 kVA Single bushing and two bushing Conventional & self-protected and 12.47/7.2 x 24.9/14.4 dual voltage	To obtain experience.
Howard Industries 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage	
Single-phase, single bushing, and two bushing with internal"AZU" or "Tranquell" under-oil arrester	To obtain experience.
Single-phase, single bushing, and two bushing; 5 - 50 kVA; with or without taps, with amorphous metal cores	To obtain experience.
Kuhlman 7.2/12.5 kV and 7.62/13.2 kV Toroform design 10, l5, & 25 kVA	To obtain experience.
NECO 7.2/12.5 kV and 14.4/24.9 kV Single-phase, two bushing, 10-50 kVA, Conventional	To obtain experience.
VanTran 14.4/24.9 kV and Dual Voltage	
Conventional, single bushing Type CR	To obtain experience.
Conventional, two bushing Type CD	To obtain experience.
Self-protected, single bushing Type CSP-R	To obtain experience.

an - Transformers, Distribution, Pole Type
with non-porcelain secondary bushings

Manufacturer	Conditions
Cooper Power Systems Fully or conditionally accepted with Central Moloney polymer secondary bushings	To obtain experience.
ERMCO[1] Fully or conditionally accepted with Central Moloney polymer secondary bushings	To obtain experience.
Howard Industries Fully or conditionally accepted with Central Moloney polymer secondary bushings	To obtain experience.
Kuhlman Fully or conditionally accepted with Central Moloney polymer secondary bushings	To obtain experience.
Magnetic Electric Fully accepted with Central Moloney polymer secondary bushings	To obtain experience.
United (Ky. AEC) Fully accepted with Central Moloney polymer secondary bushings	To obtain experience.

Note:
1. Available with optional covers insulated for 15 KV dielectric strength at additional cost. (Transformer covers with higher electrical insulation, together with other coordinated electrical insulating protective measures, should help to significantly lessen shock and electrocution hazards to raptors, other birds, and small mammals.)

an - Transformers, Power
Single-Phase, Step-Down
for Distribution Substation Use

Conditions for Acceptance: "E" - To obtain experience
"T" - Manufacturer to furnish RUS with satisfactory test results
(Only performance specifications have been submitted)

Manufacturer	Primary Voltage - kV	Nominal OA Capacity (kVA) 167 - 833	Nominal OA Capacity (kVA) 1250 - 10,000
Delta-Star	34.4	E	E
	43.8	E	E
	67.0	E	T
	115	-	T
ESCO	34.4	E	-
Ferranti-Packard	67.0	T	E
Industrias IEM, S.A. de C.V.	67	-	E

All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

Conditional List
an(3)
September 17, 2009

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Conditions for Acceptance: "E" - To obtain experience
"T" - Manufacturer to furnish RUS with satisfactory test results
(Only performance specifications have been submitted)

Manufacturer	Primary Voltage - kV	Nominal OA Capacity 750 to 3750 kVA	Nominal OA Capacity 5 to 30 MVA
Delta Star	34.4	E	E
	43.8	E	E
	67.0	E	E
	115	-	E
	138	-	T

Transformers 5 MVA and larger also accepted as load tap changing transformers using Seimens-Allis Types TLS and TLH-21 load tap changers.

Ferranti-Packard	34.4	E	T
	67.0	T	E
	115	-	E
GE-Prolec	67	-	E
	115	-	E
	138	-	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using Reinhausen type RMV-II, Reinhausen type RMV-A, and ABB type UZE load tap changers.

Howard Industries	115	-	E
	138	-	E
Hyundai Heavy Industries Co., Ltd.	115	-	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB type UZE and Reinhausen type RMV-II load tap changers.

Industrias IEM, S.A. de C.V	115	-	E
MGM	34.4	E	T
	43.8	E	T
	67.0	T	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Types UTS-A and UTT-B load tap changers.

Pauwels Transformers	34.4	-	E
	67.0	-	E
	115	-	E
Uptegraff	34.4	T	E
	43.8	T	E

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Conditions for Acceptance: "E" - To obtain experience
"T" - Manufacturer to furnish RUS with satisfactory test results
(Only performance specifications have been submitted)

Manufacturer	Primary Voltage - kV	Nominal OA Capacity 750 to 3750 kVA	Nominal OA Capacity 5 to 30 MVA
Virginia Transformer	34.4	E	E
	43.8	-	E
	67.0	-	E
	115	-	E
	138	-	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB type UZE and Reinhausen type RMV-2 tap changers

WEG-Voltran	67.0	-	E
	115	-	E
	138	-	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using Reinhausen type RMV-II load tap changers.

Howard Industries	67.0	-	E

All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

an - Transformers, Step Ratio, Single Phase,
Autotransformers or Two-Winding Transformers
for Use in System Voltage Conversion

Condition of Acceptance: To obtain experience

Manufacturer	Designation	Size
Power Partners, Inc.		
2-WND	"Jumbo"	167-500
Central Moloney		
2-WND	AOD	167-500
Cooper Power Systems		
2-WND	"Round-Coil"	167-500
AUTO	MEPS-AUTO	167-1000
Delta Star		
2-WND	LTD	167-500
AUTO	LTD-A	167-1000
General Electric		
2-WND	HS STEP	167-500
AUTO	HS STEP	167-1000
Howard Industries		
2-WND	STEPS	167-500
AUTO	STEP-AUTO	100-1500

NOTE: Two-winding transformers are self-protected under external short circuit in accordance with ANSI C57.12.90A. Auto-transformers will withstand 25 times rated current under external short circuit in accordance with ANSI C57.12.90A.

ao - Bolt, strand eye, straight (thimble eye)

Applicable Specification:	ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."
Applicable Sizes:	5/8 inch, 6 through 12 inch length 3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specification:

Hubbell (Chance)
Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)

ap – Clamp, hot line
Copper and Copperweld-copper Conductor
(Clamps with internal springs and enclosed threads)

Conductor	Conductor Size
Copper:	6 thru 2/0
Copperweld-copper:	8A thru 2A

Manufacturer	
Blackburn	HLC 2108
Connector Products, Inc.	HTC 100
	HTC 100-6
	HTC 200
	HTC 200-4
Electric Motion Company	EM HLC-101
H-J Enterprises	UBBC20-001
Hubbell (Anderson)	BC-2/0
Hubbell (Chance)	S1520CC
Hubbell (Fargo)	GH-100S
	GH-201 (For use with CL Fuse)
Ideal	3532
MacLean (Reliable)	C1520
Penn-Union	HLC-020-LS
Richards Manufacturing, Sales Inc.	BHLC-100

ap - Clamp, hot line
ACSR with armor rods

Clamps listed below have spring action and enclosed thread chambers.

		Conductor Size				
Manufacturer	Tap Conductor	477 & 336.4	4/0 & 3/0	2/0	1/0 & 2	4
Connector Mfg.	Aluminum		HL 4/0	-	-	-
	Copper		-	-	-	-
Connector Products, Inc.	Aluminum	HTC 200 HTC 200-4 HTC 300	HTC 100 HTC 100-6 HTC 200 HTC 200-4	HTC 100 HTC 100-6 HTC 200 HTC 200-4	HTC 100 HTC 100-6	HTC 100 HTC 100-6
	Copper	HTC 200 HTC 200-4 HTC 300	HTC 100 HTC 100-6 HTC 200 HTC 200-4	HTC 100 HTC 100-6 HTC 200 HTC 200-4	HTC 100 HTC 100-6	HTC 100 HTC 100-6
H-J Enterprises	Aluminum		-	UBBC30-001	UBBC30-001	UBBC30-001
	Copper		-	UBBC30-001TP	UBBC30-001TP	UBBC30-001TP
Hubbell (Anderson)	Aluminum		AC-800	AH-4	AH-4	AH-4
	Copper		AC-800-GP	AH-4-GP	AH-4-GP	AH-4-GP
Hubbell (Chance)	Aluminum		S1540-AA	S1540-AA	S1530-AA	S1530-AA
	Copper		S1540-AC	S1540-AC	S1530-AC	S1530-AC
Hubbell (Fargo)	Aluminum		GH-202AL	GH-202AL	GH-101A	GH-101A
	Copper		GH-102AC	GH-102AC	GH-101AC	GH-101AC
MacLean (Reliable)	Aluminum		-	-	C1530A	C1530A
	Copper		-	-	C1530A	C1530A
Penn Union	Aluminum		-	-	HLCA-040	HLCA-040
	Copper		-	-	HLCA-040	HLCA-040
Richards Manufacturing, Sales Inc.	Aluminum				AHLC300-TN	AHLC300-TN
	Copper					
Utilco	Aluminum		-	HLC-397	-	HLC-40
	Copper		-	-	-	-

ar - Wireholder

Applicable Specification: "RUS Specification for Service Wireholders," D-15

	With #22 Wood Screw
Blackburn	SW3
Hubbell (Chance)	3-11-44
Porcelain Products	1986

NOTE: For triplex type service cable see clevis type wireholders on page bt-1.

Conditional List
ar(1)
July 2009

ar - Wireholder
(with #22 wood screw)

Manufacturer	Conditions
Hubbell Power Systems (Chance) C207-0138 (nylon alloy)	To obtain experience.
Joslyn J089Z (nylon alloy)	To obtain experience.

as - Clevis, service swinging

Applicable Specifications: "RUS Specifications for Service Swinging Clevises," D-7

Manufacturer	Clevis Only*	Clevis with Wet Process Spool	Clevis with Dry Process Spool
Hubbell (Chance)	1948C	1948C-C909-1031	1948C-0606
Joslyn	J1614	-	-
Kortick	K9260	K9141	K9142
MacLean (Continental)	U32004	U31003	U31004

*Catalog number does not include spool; for spool insulators see Item cm.

at - Guy Marker, 8 Foot Length

Steel

Manufacturer	Full Round	Half Round
Joslyn	J1618	J1528
Kortick	K3729	-

at - Guy Marker
8 Foot Length
Plastic or Fiberglass

Manufacturer	Catalog Number
Auburn Extrusions	TK-808 (Yellow) (with bolt type clamp)
Custom Plastics	CPI-100XX-PVC Series
Dulmison	HGG-OL8Y-C (Yellow)*
Electrical Materials	70-7 tie G (Gray)* 70-7 tie Y (Yellow)* 70-7 tie O (Orange)* 70-7 tie YORS (Yellow with Orange Stripes)*
Hubbell (Chance)	96-PBG-2 (Gray) 96-PBG-2Y (Yellow) 96-PBG-2ORG (Orange) 96-FRPMR-GRY (Gray)* 96-FRPMR-YEL (Yellow)* 96-FRPMR-ORG (Orange)* 96-FRPMR-GRN (Green)*
Joslyn	J1491Y (Yellow) J1491G (Gray) J5518 (Yellow)*
Mangrum	R-8-Y
Osmose	OZ-25-18R (Yellow)
Preformed Line Products	PG-5508 (Gray)* PG-5518 (Yellow)*
Radar	6032B (Yellow)*
Vaughn	003-7l40 (Gray)* 004-7l40 (Yellow)* 005-7l40 (White)*
Virginia Plastics	TG-137-8G (Gray)* TG-137-8Y (Yellow)* FG-8G (Gray)** FG-8Y (Yellow)**

* For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.
** Available with either 1 or 2 bolt clamps.

at - Guy Marker
(Non-Flame Retardant)
8 Foot Length
Plastic or Fiberglass

Manufacturer	Catalog Number
Custom Plastics	CPI-100XX-PVC Series
Joslyn	J5718 (Yellow)* J1493Y (Yellow)
L. F. Manufacturing	MS-8-Y
Petroflex	P100-SDR17 Series
Preformed Line Products	PG (Poly) Series
R&M Plastics	GGY-TU-8 RMY GG-SM-8*
Radar Engineers	6034 and 6036
Virginia Plastics	TGP-16 PF

*For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

at - Reflective Guy Marker, 8-foot length

Plastic or Fiberglass

Manufacturer	Conditions
*Nordic HG-815 yellow	To obtain experience.

*For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

av – Conductor, ACSR

Applicable Specification: ASTM Specification B 232

Preferred Sizes:

Distribution	Transmission
4 – 6/1	1/0 – 6/1
4 – 7/1	2/0 – 6/1
2 – 6/1	3/0 – 6/1
2 – 7/1	4/0 – 6/1
1/0 – 6/1	266.8 kcmil – 26/7
2/0 – 6/1	336.4 kcmil – 26/7
3/0 – 6/1	477 kcmil – 26/7
4/0 – 6/1	556.5 kcmil – 26/7
266.8 kcmil 18/1	795 kcmil – 26/7
336.4 kcmil 18/1	954 kcmil – 54/7
477 kcmil 18/1	

NOTE: Larger sizes may be used where the engineer's study shows they are required.

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable
Conductores Monterrey S.A. de C.V.
Condumex
General Cable
Kobrex S.A. de C.V.
Marmon Utility LLC (Hendrix/Kerite)
Midal Cables Ltd.
Nehring
Nexans Canada
Nexans Korea
Noranda
Phelps Dodge
Phelps Dodge - Honduras
Prysmian
Southwire
Synergy Cables USA, Ltd.
Taihan Electric Wire

NOTES:

1. Conductors with 18/1 stranding have different sag characteristics than conductors with 6/1 or 26/7 stranding. This difference in sag characteristics must be taken into consideration in the line design.
2. 266.8 kcmil 26/7, 336.4 kcmil 26/7, and 477 kcmil 26/7 may be used for distribution underbuild on transmission lines.

av - Conductor, copper

Applicable Specifications: ASTM Specification B1 for hard-drawn solid
ASTM Specification B8 for hard drawn stranded and soft stranded
ASTM Specification B3 for soft or annealed solid

Preferred Sizes: Hard-drawn solid - 4 and 6
Soft or annealed solid - 4 and 6
Hard-drawn stranded - 2x3, 1/0 x 7, 2/0 x 7
Soft stranded - 4 and 6

The following manufacturers have shown compliance with the applicable specifications:

Alan Wire Company

Conductores Monterrey S.A. de C.V.

Condumex

General Cable

Hickory Wire, Inc.

Nehring

Republic Wire

Rome Cable

Seal Wire Company

Service Wire Company

Southwire

av - Conductor, Copper and Copper-clad steel

Applicable Specification: ASTM Specification B 229

Preferred Sizes

Distribution	Transmission
8A	1/0 F
6A	2/0 F
4A	3/0 F
2A	4/0 F

The following manufacturers have shown compliance with the applicable specification for the sizes indicated:

Copperweld Bimetallics, LLC	(All sizes)
Southwire	(2A and smaller)

av - Conductor, Service
(Single Conductor)

Manufacturer	Aluminum	Copper
Alcan Cable	x	-
Conductores Monterrey	x	-
Condumex	x	x
General Cable	x	x
Nehring	x	-
Nexans Canada	x	-
Prysmian	x	x
Rome Cable	x	x
Southwire	x	x

Applicable Specification: ICEA-NEMA Standard S-66-524

Insulation: Cross-linked thermosetting polyethylene or equal.

Conductor: MHD copper or HD (Aluminum 1350) aluminum (Compact or compressed stranded conductor is acceptable.)

Marking: Manufacturer's name and type of insulation shall be clearly shown in durable markings on the surface of the insulation at intervals no greater than 24 inches.

av - Conductor, Service Cable
(Triplex and Quadruplex)

Manufacturer	Aluminum	Copper
Alcan Cable	x	-
Conductores Monterrey	x	-
Condumex	x	x
General Cable	x	x
Hendrix	x	x
Nehring	x	-
Nexans Canada	x	-
Phelps Dodge	x	x
Phelps Dodge (Honduras)	x	-
Prysmian	x	x
Rome Cable	x	x
Service Wire	-	x
Southwire	x	x

Applicable Specifications: RUS Specification D-2, Specifications for 600 Volt Neutral-Supported Secondary Service Drop Cables.

av - Conductor, Aluminum Alloy

Applicable Specification: ASTM Specification B399

Preferred Sizes:

DISTRIBUTION		TRANSMISSION	
6201	ACSR Equiv.	6201	ACSR Equiv.
48,690 cmil - 7 str.*	4	123,300 cmil - 7 str.**	1/0
77,470 cmil - 7 str.*	2	155,400 cmil - 7 str.**	2/0
123,300 cmil - 7 str.	1/0	195,700 cmil - 7 str.**	3/0
155,400 cmil - 7 str.	2/0	246,900 cmil - 7 str.	4/0
195,700 cmil - 7 str.	3/0	312,800 cmil - 19 str.	266,800 cmil
246,900 cmil - 7 str.	4/0	394,500 cmil - 19 str.	336,400 cmil
		559,500 cmil - 19 str.	477,000 cmil
		652,400 cmil - 19 str.	556,500 cmil
		927,200 cmil - 37 str.	795,000 cmil

*Not recommended for multiphase lines with span lengths exceeding 300 ft.

**Not recommended for suspension type construction.

The following manufacturers have shown compliance with the applicable specifications:

Manufacturer	Type
Alcan	6201
General Cable	6201
Midal Cables Ltd.	6201
Phelps Dodge	6201
Southwire	6201
Conddctores Monterrey	6201

Conditional List
av(1)
September 2, 2010

av - conductor

Manufacturer	Conditions
Alcan Cable Duplex type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
Copperweld Bimetallics, LLC Alumoweld-aluminum 6/1 ACSR/AW, 2, 1/0, 2/0, 4/0 4/3 AWAC, 4, 2, 1/0	1. To obtain experience.
General Cable ACSR/TW, ACSS/TW conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations. 3. Indicate type of steel core wire and class (if applicable) of coating.
Phelps Dodge ACSR/TW, ACSS/TW conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations. 3. Indicate type of steel core wire and class (if applicable) of coating.
Viakon Conductores Monterrey ACSR/AW-TP conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations. 3. Indicate type of steel core wire and class (if applicable) of coating.

av – covered tap wire
(for use as primary jumpers)

Manufacturer	Conditions
Hendrix	
TW#2, TW#4	1. To obtain experience.

av - Conductor, Service
(Single and Multi Conductor)

Manufacturer	Conditions
Southwire SIW (Single input wire) type construction in accordance with ASTM B 901.	1. To obtain experience.

Applicable Specification: ICEA-NEMA Standard S-66-524

Insulation: Cross-linked thermosetting polyethylene or equal.

Conductor: HD (Aluminum 1350) aluminum

Marking: Manufacturer's name and type of insulation shall be clearly shown in durable markings on the surface of the insulation at intervals no greater than 24 inches.

av – Conductor, High Temperature

Preferred Conductor Sizes
(equivalent in diameter to the following ACSR conductors)*

Transmission Lines
336.4 kcmil - 26/7
477 kcmil - 26/7
556.5 kcmil - 26/7
795 kcmil - 26/7
954 kcmil - 54/7
1272 kcmil - 54/19

Manufacturer	Conditions
3M ACCR – Aluminum Conductor Composite Reinforced CTC Cable Corporation ACCC – Aluminum conductor Composite Core General Cable ACSS – Aluminum Conductor Steel Support Viakon ACSS - Aluminum Conductor Steel Support	1. To obtain experience. 2. Conductor handling and installation shall be i accordance with the manufacturer's recommendations. 3. Use high temperature accessories approved by the manufacturer and accepted by RUS. 4. If applicable, indicate type of steel core wire and class of coating.

NOTES:
1. Larger sizes may be used where the engineer's study shows they are required.
2. Conductor diameter should be within 10% of ACSR equivalent diameter size.

Conditional List
av(5)
July 2009

av – Conductor, Twisted Pair (T-2 & VR type)

Preferred Conductor Sizes
(equivalent in diameter to the following ACSR conductors)*

Transmission Lines
336.4 kcmil - 26/7
477 kcmil - 26/7
556.5 kcmil - 26/7
795 kcmil - 26/7
954 kcmil - 54/7
1272 kcmil - 54/19

T-2 type (ACSR-II)

Aluminum Conductor Steel Reinforced- Twisted Pair
ACSR or AAAC (6201)

Manufacturer	Conditions
General Cable Nexans Canada	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations. 3. Use accessories recommended by the manufacturer and accepted by RUS

VR-2 type

Aluminum Conductor Steel Reinforced- Twisted Pair
ACSR or AAAC (6201)
Vibration Damping

Manufacturer	Conditions
Southwire	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations. 3. Use accessories recommended by the manufacturer and accepted by RUS

NOTES:
1. Larger sizes may be used where the engineer's study shows they are required.
2. Conductor diameter should be within 10% of ACSR equivalent diameter size.

aw - Washer, spring

Clip
1/4" x 1-3/4" x 3-1/2"

Manufacturer	Bolt Size 5/8"	3/4"	7/8"
Hubbell (Chance)	3540	3541	-
Joslyn	J3540	J3541	J3542
Kortick	K2909	-	-
Line Hardware	SCW-58	SCW-34	SCW-78

Double Coil Lock

Manufacturer	Bolt Size 5/8"	3/4"	7/8"	1”
Electrical Materials Company	#MW 5/8”	#MW 3/4” #MW3/4EXT	#MW 7/8”	#MW 1”

ax - Cutout and Arrester, Combination

Nominal System Voltage		For 12.5Y/7.2 kV			For 13.2Y/7.6 kV		For 24.9Y/14.4 kV	
Cutout Max. Voltage Rating		7.8 kV		15 kV	15 kV		18 kV	27 kV
Application		1ø Trans.	1ø Sect.	3ø Bank 3ø Sect.	1ø Trans.	3ø Bank 3ø Sect. 1ø Sect.	1ø Trans.	3ø Bank 3ø Sect. 1ø Sect.
Cutout Current Rating		50*	100	100	50*	100	50*	100
Manufacturer	Type Mounting	Catalog Numbers						
ABB	Crossarm		7.8 NCX/9 LVG	15 NCX/10 LVG		15 NCX/10 LVG		24.9 NCX/18 LVG
	Crossarm (L)		7.8 LBU-II/9 LVG	15 LBU-II/10 LVG		15 LBU-II/10 LVG		24.9 LBU-II/18 LVG
Cooper	Crossarm (L)		AFZS510B Series	AFZS510C Series		AFZS510C Series		AFZS518D Series
	Transformer	AFZS110M010			AFZS110M010		AFZS110M018	
	Crossarm		L4A1P1A00-BDOA	L4A1P1A00-BDOA		L4A1P1A00-BDOA		L9CAP1A00-BGOA
Hubbell	Crossarm		C7 Series	C7 Series		C7 Series		C7 Series
	Transformer							
	Crossarm			CP7 Series (Polymer)				
Kearney/Cooper Power Systems	Crossarm			KE3AB110E-110		KE4AB110E-110		KE7BD109E-110
	Transformer	294072			294073		294074	

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

*These cutouts have open links and must not be used where fault currents are high or for sectionalizing.

(L) Indicates loadbreak type is available.

az - Pole Numbers and Letters, Metal

Manufacturer	Catalog No.
Almetek Industries, Inc.	"E-Z Tags" - Order by description
Premax Products	1523
Tech Products	Everlast Tag
Electromark	EMB-1.5 EMB-3.0 HOLD-AL1 HOLD-PL1 PERMAGRAVE SLIDE-INS #ET1041-KY-1S PERMAHOLD-AL1 PERMAHOLD-PL1 SLIDE-1S

ba - Bolt, Angle Eye

Thimble Type

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction"

Applicable Sizes : 5/8 inch, 6 through 12 inch length
3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specifications:

Hubbell (Chance)
Joslyn Mfg. and Supply Company
Kortick Manufacturing Company
MacLean (Continental)

bb - Brace, sidearm vertical

	26" brace 24" bolt-hole spacing	50" brace 24" bolt-hole spacing
Dixie	D6986	D6987
Kortick	K1931	K1932
MacLean (Continental)	U5249	U5250

be - Reclosers, oil and vacuum

Mfr	Phases	Type	Circuit Voltage	Continuous Rating	Int. Rating	Oil/ Vacuum	Hydraulic/ Electronic
Cooper	1	H	12.5/7.2	5-50	1250	O	H
	1	4H	12.5/7.2	5-100	2000	O	H
	1	L	12.5/7.2	25-100	4000	O	H
	3	6H	12.5/7.2	5-100	2000	O	H
	3	W	12.5/7.2	100-560	10,000	O	H
	3	WE	12.5/7.2	560	10,000	O	H
	3	VSA-12	12.5/7.2	100-560	12,000	V	E
	1	E	24.9/14.4	5-100	2500	O	H
		(Type E available with shunt lockout solenoid for three-phase operation)					
	1	4E	24.9/14.4	50-200	4000	O	H
	3	WV	34.5/19.9	560	8000	O	H
	3	WVE	34.5/19.9	560	8000	O	E
Lexington Switch and Controls	1	A Line Model B	12.5/7.2	5-50	1250	O	H
	1	A Line Model D	12.5/7.2	25-100	2000	O	H
	1	A Line Model K	12.5/7.2	25-100	4000	O	H

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Recloser, oil circuit
12.5/7.2 kV

Manufacturer	Conditions
ABB Three phase oil circuit recloser (Shunt trip with static or relay type controls)	
Type ES-400 (15-400 amperes) Type ES-560 (15-560 amperes) Type ESM-560 (100-560 amperes) Type ES-105 (15-560 amperes)	To obtain experience.
Cooper Power Systems Single phase, Type D rated 100 amperes continuous, 10,000 amperes symmetrical	To obtain experience.
Lexington Switch and Controls Three phase oil circuit recloser, 50,100 and 280 ampere frames. A Line, Model 3B (5-50 amperes) Model 3D (5-100 amperes) Model 3K (25-280 amperes)	To obtain experience.

24.9/14.4 kV

Lexington Switch and Controls Oil circuit recloser, Single phase-A Line, Model M rated 100 amperes Three phase-A Line, Model 3M rated 100 amperes	To obtain experience.

34.5/19.9 kV

Cooper Power Systems Single phase, Type DV rated 100-280 amperes continuous, 8,000 amperes symmetrical	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Reclosers, vacuum interrupter

Manufacturer	Conditions
ABB	
Three phase Type ESVA rated 560/800 amps continuous, 12,000 amps symmetrical, maximum voltage 15.5 kV for 12.5/7.2 kV	To obtain experience.
Three phase Type ESMVA rated 560 amps continuous, 16,000 amps symmetrical, maximum voltage 15.5 kV for 12.5/7.2 kV	To obtain experience.
Cooper Power Systems	
Single phase, Type V4H rated 5-100 amperes continuous, 2,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Single phase, Type V4L rated 50-100 amperes continuous, 6,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type V6H rated 5-100 amperes continuous, 2,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Recloser vacuum interrupter

Manufacturer	Conditions
Cooper Power Systems Three phase, Type VW rated 560 amperes continuous, 2,000 amperes symmetical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type VWE rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type VSA-16 rated 560 amperes continuous, 16,000 amperes symmetrical, maximum voltage 15.5 kV for 12.5/7.2 and 13.2/7.62 kV	To obtain experience.
Three phase, Type VWV27 rated 560 amperes continuous 12,000 amperes symmetrical, maximum voltage 27 kV for 24.9/14.4 kV	To obtain experience.
Three phase, Type VWVE27 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 27 kV for 24.9/14.4 kV	To obtain experience.
Three phase, Type VWV38 rated 50-560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for34.5/19.9 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

Conditional List
be(2.2)
July 2009

be - Recloser, vacuum interrupter

Manufacturer	Conditions
Cooper Power Systems Three phase, Type VWVE38 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for 34.5/19.9 kV	To obtain experience.
Three phase, Type VSO-12 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for 34.5/19.9 kV	To obtain experience.
Three phase, Type VSO-16 rated 560 amperes continuous, 12,000 amperes symmetrical, maximum voltage 38 kV for 34.5/19.9 kV	To obtain experience.
Single phase, type VXE electronically controlled, vacuum interrupting, rated 10-200 amps continuous, 8000 amperes symmetrical, maximum voltage of 15.5 kV for 12.5/7.2 kV & 27 kV for 24.9/14.4 kV systems	To obtain experience.
Engineering & Equipment de Mexico Three phase, type, EEVW15, rated 25 to 560 amp continuous, 12000 amp interrupting, maximum voltage 15.5 kV for 12.4/7.2 kV.	To obtain experience.
Hubbell Power Systems Single phase, Type VERSA-TECH electronically controlled, vacuum interrupting, rated 400 amperes continuous, 8,000 amperes symmetrical, maximum voltage of 27 kV for 24.9/14.4 kV systems	To obtain experience.
Joslyn Three phase, Type JVR, SF6 insulation, rated 400 amps continuous, 6,000 amperes symmetrical, maximum voltage 15 kV for 12.5/7.2 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Recloser, vacuum interrupter

Manufacturer	Conditions
Lexington Switch Single phase, type EV627 rated 400 amp continuous, 6000 amp interrupting, maximum voltage 27 kV for 24.9/14.4 kV	To obtain experience.
Single phase, type EV815 rated 400 amp continuous, 8000 amp continuous, maximum voltage 15.5 kV for 12.9/14.4 kV	To obtain experience.
S&C Electric Single phase, TripSaver (cutout mounting), rated 100 amp continuous, 4000 amp interrupting, maximum voltage 15.5 kV for 12.9/14.4 kV and 27 kV for 24.9/14.4 kV	To obtain experience.
Whipp & Bourne Three-phase, Type GVR, SF6 insulation with vacuum interruption, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption for 15.5 kV and 27 kV, 8000 amps RMS symmetrical for 38 kV. 15.5 kV maximum voltage for 12.5/7.2 kV, 27 kV maximum voltage for 24.9/14.4 kV, 38 kV maximum voltage for 34.5/19.9 kV.	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Recloser, SF6 interrupter

Manufacturer	Conditions
Hawker Siddeley Type PMR-3/15 rated at 560 amperes continuous, 12,000 amperes symmetrical maximum, 15.5 kV Type PMR-3/27 rated at 560 amperes continuous, 12,000 amperes symmetrical maximum, 24.9 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

be - Recloser, vacuum interruption with solid dielectric

Manufacturer	Conditions
ABB Single phase, Type OVR electronically controlled, vacuum interruption, solid dielectric, 800 amps maximum continuous, 10000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV.	To obtain experience.
Three phase, Type OVR electronically controlled, vacuum interruption, solid dielectric, 630 amps maximum continuous, 12500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV.	To obtain experience.
Three phase, Type OVR electronically controlled, vacuum interruption, solid dielectric, 800 amps maximum continuous, 16000 amps RMS symmetrical interruption, 38 kV maximum for 34.5/19.9 kV.	
Cooper Power Systems Three phase, Type NOVA electronically controlled, vacuum interruption, solid dielectric, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV.	To obtain experience.
Single Phase, Type NOVA electronically controlled, vacuum interruption, solid dielectric, 400 amps maximum continuous, 8000 amps RMS symmetrical interruption, or 800 amps maximum continuous, 12500 amps RMS symmetrical interruption 15.5 kV maximum for 12.5/7.2 kV, 29.2 kV maximum for 24.9/14.4 kV.	To obtain experience.
Three phase, Type NOVA-TS Triple-Single electronically controlled, vacuum interruption, solid dielectric, 400 amps maximum continuous, 12500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 29.2 kV maximum for 24.9/14.4 kV.	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

Conditional List
be(4.1)
February 25, 2010

be - Recloser, vacuum interruption with solid dielectric

Manufacturer	Conditions
G & W Electric Company Three phase, electronic, VIPER Series, vacuum interruption, solid dielectric, 800 amps maximum continuous, 12,500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14/4 kV.	To obtain experience.
Joslyn Hi-Voltage Three-phase, Type TRIMOD 300 series, vacuum interruption, solid dielectric foam, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV	To obtain experience.
Single-phase, Type TRIMOD 100 series, vacuum interruption, solid dielectric foam, 560 amps maximum continuous, 12500 amps RMS symmetrical interruption, 17.1 kV maximum for 12.5/7.2 kV, 29.3 kV maximum for 24.9/14.4 kV	To obtain experience.
Siemens Three phase, Type SDR Recloser, rated 800A maximum continuous, electronically controlled, vacuum interruption, solid dielectric, 12500 amps RMS symmetrical interruption for 15.5 kV, 16000 amps RMS symmetrical interruption for 27 kV, (15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV)	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

bh - Clevis, Service Deadend

Applicable Specification: "RUS Specification for Service Deadend Clevises," D-8

Manufacturer	Clevis Only*	Clevis with dry process spool	Clevis with wet process spool
Hubbell (Chance)	0341	0341-0606	0341-C909-1931
Joslyn	J0313	-	-
Kortick	K9250	K9100	K9099
MacLean (Continental)	U32136	U31136	U36136

*Catalog number does not include spool; for spool see Page cm.

bi - Gain, Pole

For use with rectangular crossarms

Hubbell (Chance)	4092
Joslyn (Flagg)	PX252
MacLean (Continental)	CAG-44-5

For braceless crossarms (narrow profile construction)

Joslyn (Flagg)	PX182A
MacLean (Bethea)	GCAF-6A
MacLean (Continental)	DEA-65-10A

Transmission

Grid Gains

	Sizes in inches	
	4" x 4"	4" x 9"
Hubbell (Chance)	PG44	PG945
Hughes Brothers	l263	l260
Joslyn (Flagg)	PX122	PX260
MacLean (Bethea)	GSF-44-7	GSFT-95-7
MacLean (Continental)	GGSF-4040-7	GRF-9045-7

bj - Guy Hook

Applicable Specification: Edison Electric Institute Specification TD-11- 1951, "Specifications for Guy Hooks and Guy Strain Plates."

Hubbell (Chance)	6584
Joslyn	J1019
Kortick	K4031
MacLean (Continental)	U5310

bk - Guy Plate

Applicable Specifications:

Strain Type: Edison Electric Institute Specification TD-11 1951, "Specifications for Guy Hooks and Guy Strain Plates."

Lift Type: None

	Strain Type 4" x 8" x 14 gage	Lift Type 2-1/2" x 7" x 1/4", 2 hole
Almat	K45-1	-
Hubbell (Chance)	6575	7898
Joslyn	J1034	-
Kortick	K4015	K3511
Line Hardware	GSP-1	-
MacLean (Continental)	U5351	UC434

bn - clamp, loop deadend

For ACSR

	3/0	2/0	1/0	2	4
ALCOA	-	413	413	412	411
Blackburn	DLC23	DLC2106	DLC2106	DLC2106	DLC2106
Burndy	-	-	UW25R	UW2R	UW2R
C & R	-	-	CRLD-10	CRLD-10	CRLD-10
Hubbell (Anderson)	LC-74B	LC-71B	LC-70B1	LC-70B	LC-70B
Hubbell (Fargo)	GA-145	GA-145	GA-144	GA-144	GA-144
MacLean (Bethea)	ALD-7373-U	ALD-34-U	ALD-1313-U	ALD-1313-U	ALD-1313-U

bo - Shackle, anchor

Distribution

	20,000 lbs. 5/8" Pin
Hubbell (Anderson)	AS-25
Hubbell (Chance)	5801
Joslyn	J2742
Kortick	K4481
Lapp	33852
Lindsey	3260
Line Hardware	AS-1
MacLean (Bethea)	ASH-45
Sur-Loc, Inc.	5500

Transmission

	30,000 lbs. 3/4" bolt	50,000 lbs. 7/8" bolt
Joslyn	BT3023BNK	BT3036BNK
MacLean (Bethea)	ASH-56-BC	ASH-67-BC

br - Chain Link (End Link)

Manufacturer	Catalog Number
Joslyn	BT-3082
Lapp	6415-HT
Lindsey	3403
MacLean (Bethea)	CL-5

bs - Bolt, single upset

Applicable Specifications: "RUS Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches	5/8	5/8	5/8	5/8
Length, inches	7	8	9	10
Hubbell (Chance)	-	7741	7741-1/2	7742
Joslyn	-	J2342-1/2	J2343-1/2	J2344-1/2
Kortick	K4929	K4950	K4930	K4951
MacLean (Continental)	U3105-1/2	U31053	U31053A	U31054

bt - Wireholder, clevis type with No. 24 wood screw

(For use with triplex type service cable, Drawing K10C-A)

Hubbell (Chance)	0192*
Joslyn	J075*

*Catalog number does not include insulator. Use secondary type spool insulator with 1-3/4 inch groove diameter. See page cm-1.

bu - Connector, grounding
for transformer or other equipment

Manufacturer	Copper Alloy [1]	Plated Copper Alloy [2]	Aluminum Alloy [3]
Blackburn	TTC-4	TTC2P	-
Burndy	EQC632C	EQC632C-TN	-
Dossert	TGCL8-50	TGCL8-50-SN	-
Hubbell (Anderson)	GTCL-23A	GTCL-23A-TP	-
Hubbell (Fargo)	GC-207	GC-207P	GA-220
Line Hardware	TGL-110	TGL-110P	-
Maclean (Reliable)	BVC-207	-	-
Penn-Union	GSE-C1	GSE-C1TN	-
Richards Manufacturing, Sales Inc. (Chin Fong Co., Ltd.)	RTG512	-	-
Tanner	-	GET-1-TN	-

1 - For use with copper type ground wire.

2 - For use with both copper and aluminum type ground wire.

3 - For use with aluminum type ground wire.

bv - Rods, armor

(includes standard, double insulator, and tapping rods)

Aluminum or aluminum alloy rods for use on ACSR

Alcoa Conductor Accessories	Formed Type
Dulmison	Formed Type
Florida Wire and Cable	Formed Type
Helical Line Products	Formed Type
Helix Uniformed Ltd.	Formed Type
Preformed Line Products	Formed Type

Copperweld rods for copper or CWC conductor

Dulmison	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Alumoweld rods for aluminum clad steel (Alumoweld) overhead ground wire

Dulmison	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type

bx - Splice, automatic

Copper	Hubbell (Fargo)	MacLean (Reliable)
6	GL-111	61
4	GL-112	41
2 x 3	GL-115	-
1/10 x 7	GL-117	107
2/0 x 7	GL-118	207
3/0 x 7	GL-119	307
4/0 x 7	GL-120	407
CWC		
8A	GL-112	-
6A	GL-113	47
4A	GL-115	27
2A	GL-117	-
ACSR	GL-400A Series*	7650 Series*
Aluminum Alloy (6201 and 5005)	GL-400A Series	AL55 Series

*For use on conductors 4/0 and smaller only.

bx - Splice, automatic

Manufacturer	Conditions
DISTRIBUTION	
Blackburn	
#4, #2 ACSR or 6201 (ACSR equiv.) ATS42 1/0, 2/0 ACSR or 6201 (ACSR equiv.) ATS1020 3/0, 4/0 ACSR or 6201 (ACSR equiv.) ATS3040 266.8, 336.4 kcmil ACSR ATS266336 477 kcmil ACSR ATS397477	1. To obtain experience. 2. For use on distribution systems only.
Connector Products, Inc.	
2 ACSR (S1000) #1 ACSR (S1000) #2 AAC (S1000) 1/0 AAC (S1000) 2/0 AAC (S1000) #2 AAAC (S1000) 1/0 AAAC (S1000)	1. To obtain experience. 2. For use on distribution systems only.
Hubbell (Fargo)	
AWAC 4 - 4/3 GLA-105 AWAC 2 - 4/3 GLA-110 AWAC 1/0 - 4/3 GLA-115	Same as above.
266.8 kcmil ACSR 18/1 GL-410 336.4 kcmil ACSR 18/1 GL-411 477 kcmil ACSR 18/1 GL-413	Same as above.
MacLean (Reliable)	
266.8 kcmil ACSR 18/1 7657 336.4 kcmil ACSR 18/1 7658 477 kcmil ACSR 18/1 7659	Same as above.
DISTRIBUTION AND TRANSMISSION	
Hubbell (Fargo)	
266.8 kcmil ACSR 26/7 336.4 kcmil ACSR 26/7 477 kcmil ACSR 26/7	To obtain experience.

by - Deadend, automatic and formed Type

Conductor Size

Cu	CWC	Hubbell (Fargo)	Maclean (Reliable)
-	4A	GD-515	27-SDS
-	6A	GD-513	47-SDS
-	8A	GD-512	-
2 x 3	-	GD-515	271
4	-	GD-512	41LD
6	-	GD-511	61LD

ACSR

*Blackburn	ATD Series
*Dulmison	AWDG-0805, 0990, and 1135
*Hubbell (Fargo)	GD-400 Series
*MacLean (Reliable)	7650 Series
Preformed	DG Series

*For use on conductors 4/0 and smaller only.

Aluminum Alloy
(6201 and 5005)

Blackburn	ATD Series
Hubbell (Fargo)	GD-A Series
MacLean (Reliable)	AL Series
Preformed	DG Series

by - Deadends, automatic and formed type

FORMED TYPE

Manufacturer	Conditions
Preformed Line Products	
AWAC 4 - 4/3 DG-4560 AWAC 2 - 4/3 DG-4562 AWAC 1/0 - 4/3 DG-4565	To obtain experience.

AUTOMATIC TYPE

Hubbell (Fargo)	
AWAC 4 - 4/3 GDA-235 AWAC 2 - 4/3 GDA-240 AWAC 1/0 - 4/3 GDA-245	To obtain experience.
266.8 kcmil ACSR 18/1 GD-53l5A 336.4 kcmil ACSR 18/1 GD-53l5A 477 kcmil ACSR 18/1 GD-5325A	1. To obtain experience. 2. For use on distribution lines only.
MacLean (Reliable)	
AWAC 4 - 4/3 5201 AWAC 2 - 4/3 5202 AWAC 1/0 - 4/3 5204	To obtain experience.
226.8 kcmil ACSR 18/1 7657 SDS 335.4 kcmil ACSR 18/1 7658 SDS 477 kcmil ACSR 18/1 7659 SDS	1. To obtain experience. 2. For use on distribution lines only.

bz - Switch, oil

12.5/7.2 kV

	Type	Description
ABB	CSL**	Single-phase, manual and remote manual or elec. control, 200 amp. Three-phase, remote manual or elec. control, 200 amp.
Cooper Power Systems	NR*	Single-phase, remote elec. control, 200 amp.
	VR*	Three-phase, remote elec. control, 400 amp.
General Electric	FKC-2	Single and three-phase, manual, 200 amp.
	FKC-2*	Single and three-phase, remote control, 200 amp.
Maysteel Trinetics	CSD-95, CSD-125	Single-phase, manual and remote manual or elec. control, 200 amp. Three-phase, remote manual or elec. control, 200 amp.

*Control equipment should be selected in accordance with the requirements of individual installations.

**This item is also available in a special design for use in areas where corrosion is a serious problem.

bz - Switch, oil

Manufacturer	Conditions
Cooper Power Systems Capacitor oil switch Type TSC, 38 kV max. 100 ampere capacitor switch, 300 ampere load switch	1. To obtain experience.
Oil switch with125 kV BIL accessory Type NR, 15 kV, single- phase, remote electric control, 200 amp. at 75 to 100 percent power factor	1. To obtain experience. 2. For use on single- phase taps of 24.9/14.4 kV multi- grounded wye systems.

bz - Switch, vacuum
(For capacitor switching)

Manufacturer	Conditions
Joslyn Capacitor vacuum switch, VerSaVac, 200 Amp, 95 or 125 kV BIL, single-phase or three-phase for use on 15 kV systems	1. To obtain experience. 2. Single-phase switch rated 125 kV BIL may be used on single- phase taps of 24.9/14.4 kV multi-grounded wye systems. 3. Three-phase switch requires special mounting bracket.
Yaskawa Types LFG-15E-K (15 kV), LFG-25E-K (25 kV), LFG-35E-K (35 kV) 3-phase SF6 capacitor switch, pole mounted type, 200 A (capacitive), 630 A (continuous)	1. To obtain experience.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins. Type	Tilting Ins. kV	Vertical Break Type	Vertical Break kV	Side Break Type	Side Break kV	Center Break Type	Center Break kV	Double Break Type	Double Break kV
ABB	Horizontal			TTR6	345						
	Horizontal			TTR8	15-230						
G & W Electric Co.	Horizontal			MK-40	15-69	PMB-40A	15-69	LPC	69-230		
Hubbell (Chance)	Horizontal			D6(L)	15-34.5						
	Phase over Phase			D6(L)	15-34.5						
	Vertical			D6(L)	15-34.5						
Johnson	Horizontal			VIP	15-230	LS	15-69	M	15-230		
Joslyn (Hi-Voltage)	Horizontal			RF-2(VL)	15-230	RB-1(VL)	15-25				
	Horizontal					RB-1*	15-115				
Kearney/Cooper Power Systems	Horizontal	AR 60-P	15-69								
MEMCO	Horizontal	AgF	15-69	EA	15-345			EE	69-230		
	Horizontal	AgC	15-69			Rl4-C	l5-46				
MORPAC (Morgan)	Horizontal			VBV (VL)	15-230			CBV	15-230		
	Vertical			VBV (VL)	15-230			CBV	15-230		
	Phase over Phase							CBV	15-25		
Royal Switchgear	Horizontal							V	15-230		
	Phase over Phase							V	15-23		

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.
*These switches may be purchased with reduced voltage vacuum interrupters and may be applied for loop sectionalizing duty when peak recovery voltage does not exceed 25 kV

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins. Type	Tilting Ins. kV	Vertical Break Type	Vertical Break kV	Side Break Type	Side Break kV	Center Break Type	Center Break kV	Double Break Type	Double Break kV
S & C***	Horizontal			Alduti(L)	15-34.5	Alduti(L)	15-25			Alduti(L)	34.5-46
	Phase over Phase			Alduti(L)	15-25	Alduti(L)	15-25			Alduti(L)	34.5-46
	Vertical			Alduti(L)*	15-34.5	Alduti(L)	15-25			Alduti(L)*	34.5-46
SEECO	Phase over Phase			GOABS(VL)	15-69						
Siemens-Allis	Horizontal			AVB(VL)**	115-345			CB	115-230		
								CBL-2	115-230		
Southern States	Horizontal			EV	15-230						
				TA(VL)	15-69	SSB-T	15-69	EC	115-230		
Turner	Phase over Phase					(1D, 2D, 3D)(VL)	15-161				
	Horizontal					1D(VL)	15-161				
	Horizontal			TH1(VL)	15-161						
USCO	Horizontal			AVR(VL)**	15-230	ASB	35-138	AGCH **	15-345		
	Horizontal							AGCH-V**	34.5-230		
	Phase over Phase					ASB-II	15-25	GCH	15-23		

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

*These switches, except 34.5 kV Alduti vertical break, are available and accepted with the S & C type SMD substation fuse cutouts listed on page af-3.

** Also available in bronze in some ratings.

***Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three pole, group operated
(Factory Preassembled)
(FOR USE ON STEEL SUBSTATION STRUCTURES)

Manufacturer	Mounting	Vertical Type kV	Side Break Type kV
Hubbell (Chance)	Vertical	-	D7(L) 15-27
	Horizontal	-	D7(L) 15-27
S & C*	Phase-over-Phase	Alduti(L) 34.5(200 kV BIL)	Alduti(L) 34.5(200 kV BIL)
	Vertical	Alduti (L) 34.5(200 kV BIL)	

(L) Means gas or solid material full-load interrupters are accepted and available.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

cg - Switch, air, three-pole, group operated

(not Suitable for Substation Use)

Manufacturer	Acceptable Mounting	Vertical Break Type	Vertical Break kV	Side Break Type	Side Break kV	Center Break Type	Center Break kV
Hubbell (Chance)	Horizontal			D6(L)	15-34.5		
	Phase over Phase			D6(L)	15-34.5		
	Vertical	D7(L)	15-34.5				
Cooper Power Systems (Kearney)	Horizontal			M-FORCE(L)	15-35		
	Phase over Phase			M-FORCE(L)	15-35		
	Vertical			M-FORCE(L)	15-35		
Royal Switchgear	Horizontal					V	15-23
	Phase over Phase					V	15-23

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, three-pole, group-operated
(Factory Preassembled)

Manufacturer	Acceptable Mounting on Structures	Vertical Break Type	Vertical Break kV	Side Break Type	Side Break kV
ABB	Horizontal (A)			SLB-3(L)	15-25
Bridges Electric#	Horizontal (A)			Vector(L)	15-27
	Phase over phase (A)			Vector(L)	15-27
	Vertical (A)			Vector(L)	15-27
#Both operating shaft and hookstick versions of switch accepted.					
Cooper Power Systems (Kearney)	Horizontal (A)			M-FORCE	15-35
	Phase over phase (A)			M-FORCE	15-35
	Vertical (A)			M-FORCE	15-35
Hubbell (Chance)	Horizontal (A)			D7(L)	15-27
	Phase over phase (A)			D7(L)	15-27
	Vertical (A)			D7(L)	15-27
	Horizontal (B)			D7(L)	34.5
	Phase over phase (B)			D7(L)	34.5
	Vertical (B)			D7(L)	34.5
Inertia Engineering	Horizontal (A)			LBS(L)	15-35
	Vertical (A)			LBS(L)	15-35
	Phase over phase (A)			LBS(L)	15-35
S&C*	Horizontal (A)			Alduti(L)	15-25
				Alduti(L)	34.5
				(200 kV BIL)	
	Phase over phase (A)			Alduti(L)	25
				Alduti(L)	34.5
				(200 kV BIL)	
	Vertical (A)			Alduti(L)	15-25
				Alduti(L)	34.5
				(200 kV BIL)	
	Phase over phase (B)	Alduti(L)	34.5	Alduti(L)	34.5
	Vertical (B)	Alduti(L)	34.5		

(L) Means gas or solid material full-load interrupters are accepted and available.
(A) Not suitable for substation use.
(B) For station and transmission use only. The steel crossarm base must be grounded with an adequate grounding connector. 200 kV BIL only.

NOTE: Switches with factory-assembled crossarm type bases for distribution lines must have non-conducting crossarm type bases, non-conducting braces, and insulated interphase and control rods, except as otherwise noted.

* Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

cg - Switch, air, three-pole, group operated

Manufacturer	Conditions
Cleaveland/Price Type V2-C (15-69 kV) Vertical break, horizontal or vertical mounting Type RL-C (15-69 kV) Single side break, horizontal or vertical mounting	1. To obtain experience. 2. Insulated interphase and control rods required on wood distribution structures.
G & W Electric Company Type MK-40A 15 kV through 345 kV(horizontal upright mounting)	1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 23 kV models used on wood structures. 3. Steel interphase base required when mounted as in RUS Drawing TM-3.
Type LPV, 3-pole 72.5-272 kV, 1200 amp., 1600 amp., 2000 amp., center sidebreak for horizontal mounting.	To obtain experience.
Hubbell (Chance) Type AR Side-break, horizontal phase-over-phase, and vertical mounting, with non-conducting crossarm type base and insulated interphase and control rods, 15, 25 and 34.5 kV(grounded wye)	To obtain experience.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

cg - Switch, air, three-pole, group-operated

Manufacturer	Conditions
PASCOR	
VBP (15 - 230 kV) VBS (69 - 230 kV) Vertical break, vertical or horizontal mounting. Phase-over-Phase mounting(VBS, 69 - 115 kV only)	1. To obtain experience. 2. Insulated interphase and control rods required on wood distribution structures.
SB (15 - 69 kV) Side break, vertical or horizontal mounting.	1. To obtain experience. 2. Insulated interphase and control rods required on wood distribution structures.
CB (15 - 115 kV) Center break, vertical or horizontal mounting.	1. To obtain experience 2. Insulated interphase and control rods required on wood distribution structures.
CBSA (69 - 138 kV) Center Break Vee, vertical, horizontal, or phase-over-phase mounting. (Also accepted as a copper switch at 69 - 115 kV.)	To obtain experience.
S & C*	
Line-rupter with SF_6 interrupter. Horizontal mounted 115-230 kV	To obtain experience.
Omni-Rupter #(L) Side-break, horizontal phase-over-phase, and vertical mounting, with non-conducting crossarm type base and insulated interphase and control rods, 15 kV and 25 kV #Both operating shaft and hookstick versions of switch accepted.	To obtain experience.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

cg - Switch, Air, Three-Pole, Group Operated

Manufacturer	Conditions
<u>SEECO</u>	
GOABS (VL) Vacuum interrupter type 115-169 kV	To obtain experience.
<u>Southern States</u>	
"Pole-Pak" 15-23 kV	To obtain experience.
Type ES; 15, 23 and 34.5 kV (horizontal upright models only)	1. To obtain experience. 2. For 15 kV and 23 kV distribution lines, insulated interphase and control rod spacers required. See RUS Drawings M3-15 and VM3-16. 3. NEMA insulators and steel interphase base required for transmission line structure as in TM-3. 4. Acceptable on steel substations 15 through 34.5 kV with NEMA insulators and uninsulated interphase rods.
Type 57L sidebreak, 115-161 kV,600 and 1200 amp., horizontal upright	To obtain experience.
Type CBL-T, 15-69 kV,1200 amp (center break, horizontal upright mounting)	1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 25 kV models used on wood structures.
<u>Travis Switchgear</u>	
MA-32512, 25 kV, 150 kV BIL, vertical break	1. To obtain experience. 2. Insulated interphase and control rods required when used on wood structures.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

ci - Clevis, thimble

Rated Strength

Manufacturer	20,000 lbs.	40,000 lbs.	50,000 lbs.
Joslyn (Flagg)	PA271	PA272B	-

cj - Pole Ground Wire

Soft annealed iron, BB Grade, class C galvanizing
(For pole protection only)

Manufacturer	Size 1.15 Ohms/1000 ft., max.
Florida Wire and Cable	3-wire, 5/16 inch
Indiana Steel and Wire	3-wire, 5/16 inch
National Strand Products	3-wire, 5/16 inch
Southwire	3-wire, 5/16 inch

Copper, soft annealed solid
ASTM Specification B3

Manufacturer
(See page av-2)

Aluminum (for above ground use only)
Hard-drawn

Manufacturer
(See page av-1)

Aluminum Alloy (for above ground use only)

Manufacturer	Type
Alcan Cable	6201
American Electrical	6201
Southwire	6201

Copper-Clad Steel, Annealed 40 percent Conductivity

Manufacturer	Size
CommScope BiMetals*	No. 6
Copperweld Bimetallics, LLC*	No. 6

* Not for use on distribution when neutral is larger than #1/0 ACSR.

ck - clamp, anchor rod bonding

For Standard and Drive Type Rods

Diam. of Rod	Type of Eye	5/8"	3/4"	1"
C & R Products	Single	CRBC-1	CRBC-1	CRBC-1
	Twin	CRBC-2	CRBC-2	CRBC-2
	Triple	-	CRBC-3	CRBC-3
Hubbell (Chance)	Single	G5060	G5060	G5060
	Twin	G5061	G5061	G5061
	Triple	-	G5063	G5063
Joslyn	Single	3230	3230	3230
	Twin	3231	3231	3231
	Triple	-	3233	3233
Kortick	Single	K3147	K3147	-
	Twin	-	K3148	K3148
	Triple	-	K3149	K3149
Line Hardware	Single	RBC-100	RBC-100	RBC-100
	Twin	RBC-200	RBC-200	RBC-200
	Triple		RBC-300	RBC-300
MacLean (Continental)	Single	UCG5060	UCG5060	-
	Twin	-	UCG5061	UCG5061
	Triple	-	UCG5063	UCG5063

For Power Installed Screw Anchors

C & R Products	Single	CRBC-4	CRBC-5	-
Hubbell (Chance)	Single	G5067	G5068	-
Joslyn	Single	J26714	J26715	-
Line Hardware	Single	RBC-400	RBC-500	-

cm - Insulator, Spool

Type:	Secondary (Wet Process)		Service: Wet Process	Service: Dry Process
Groove Diameter:	1-3/4"	3"	1-3/8"	1-3/8"
ANSI Class	53-2	53-4	53-1	NA
Cooper Power Systems	DE4S3	DE5S3	DE2S2	DE2S1
Hughes	2102	-	-	-
ICB	ICB 532	ICB 534	ICB 531	-
Joslyn	-	J0101A	J150A	J100A
Kortick	K516	K522	K513	K514
MacLean (Continental)	U205	U31221	U208	U207
Porcelain Products (Knox)	5101	5119	5107	5207
Universal	1082	-	-	-
Victor Insulators, Inc.	2012, VI 2612	2026, VI 2626	2011, VI2611	-

cm – Insulators, spool (Polymer)

Manufacturer	Conditions
Hendrix Wire and Cable HPI-53-2 (ANSI Class 53-2)	To obtain experience
Hubbell (Chance) C909-1032P (ANSI Class 53-2)	To obtain experience.

cp - Deadend, Compression Type

ACSR

Conductor Size	Alcoa	Burndy
1/0	Order by	
2/0	Conductor	Type Y-W
3/0	Size and	"
4/0	Stranding	"
		"
266.8 kcmil 18/1		
336.4 kcmil 18/1		
477 kcmil 18/1		
266.8 kcmil 26/7	2-piece	
336.4 kcmil 26/7	alloy	Type Y-W
477 kcmil 26/7	compression	Type YTW
556.5 kcmil 26/7	Type VES or	"
795 kcmil 26/7	HES	"
954 kcmil 54/7	"	"
		"

Conductor Size	Hubbell (Anderson)	Hubbell (Fargo)	Kearney/Cooper Power Systems
1/0	VCD-50R	SEDA-8129	104000
2/0	thru	SEDA-7729	thru
3/0	VCD-61R	SEDA-7829	104000-03
4/0	"	SEDA-7929	"
266.8 kcmil 18/1	VCD-80-R		
336.8 kcmil 18/1	VCD-80-R		
477 kcmil 18/1	VCD-812-R		
266.8 kcmil 26/7	VCD-831-1-RM	Uni-Grip	104000-05
336.4 kcmil 26/7	VCD-831-1-RM	one die	thru
477 kcmil 26/7	VCD-832-2-RM	system	104000-14
556.5 kcmil 26/7	VCD-833-3-RM	Order by	"
795 kcmil 26/7	VCD-835-4RM	conductor size	
954 kcmil 54/7	VCD-835-4RM	and stranding	

NOTE: These compression deadends are acceptable when installed using tools and dies in accordance with the deadend manufacturer's recommendations.

cp - Deadend, Compression Type

ACSR
Adjustable

Hubbell (Fargo)	Order by conductor size and stranding

Aluminum Alloy
(6201 and 5005)

Conductor Size:	4 thru 4/0
Hubbell (Anderson)	Type VCD, Order by conductor size

Copper

Conductor Size:	2 x 3	4	6
National Tel. Supply	71-258/3X	71-204-P	71-162-J

Copperweld-Copper

Conductor Size:	6A	8A
National Tel. Supply	71-6A-P	71-8A-P

NOTE: These deadends are acceptable when installed with tools and dies in accordance with the deadend manufacturer's recommendations.

cp - Deadend, compression type

Manufacturer	Conditions
Burndy	
AWAC 4-4/3 YTW7M10T	To obtain experience.
AWAC 2-4/3 YTW7M9T	
AWAC 1/0-4/3 YTW7M7T	

NOTE: These deadends are acceptable when installed with tools and dies in accordance with the deadend manufacturer's recommendations.

cp –Dead-end, compression

For use with High Temperature Conductors

Manufacturer	Conditions
Alcoa Conductor Accessories Dead-end fitting To be used with 3M High Temperature Conductors ACCR (Aluminum Conductor Composite Reinforced)	1. To obtain experience. 2. Use high temperature accessories approved by the manufacturer and accepted by RUS
Burndy/Hubbell Dead-end Assembly To be used with CTC Cable high Temperature Conductors ACCC (Aluminum conductor Composite Core)	Same as above.
Preformed Line Products (PLP) Thermolign Suspension To be used with 3M High Temperature Conductors ACCR (Aluminum Conductor Composite Reinforced)	Same as above.

NOTE: These compressions are acceptable when installed using tools and dies in accordance with the conductor's manufacturer's recommendations.

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cq - Deadend, Secondary

(For use on secondary deadends only)

Copper
Offset Compression

Conductor Size:	4	6
National Telephone Supply	91-204-P	91-162-J

Copperweld-Copper
Offset Compression

Conductor Size:	6A	8A
National Telephone Supply	91-6A-P	91-8A-P

Copperweld-Copper
Automatic Deadend

Conductor Size:	6A	8A
Hubbell (Fargo)	GD-113	GD-112
MacLean (Reliable)	47FD	-

cr - Bracket, Angle Suspension

Applicable Specifications: "RUS Specification for Angle Suspension Brackets," DT-4

Manufacturer.	Distribution 5/8" Diam	Transmission 3/4" Diam.
Hubbell (Chance)	-	5728
Joslyn	-	J7936
Kortick	K6231	K6230
MacLean (Continental)	U545	U546

cs - Bracket, Pole Top Pin

For Transmission and 24.9/14.4 kV Distribution

Applicable Specifications: "RUS Specifications for Pole Top Brackets for Channel Type Pins," D-14

Hubbell (Chance)	2157
Kortick	K8130
MacLean (Continental)	U36690

ct - Plate, Double Arming

Transmission

Manufacturer	4" x 1/2" x 24"	4" x 1/4" x 17"
Hubbell (Chance)	5844	5819
Joslyn	J1600	-
Kortick	K1454	K1465
Line Hardware	-	DAP-17
MacLean (Continental)	U4117	-

cu – 60 inch Brace, crossarm (underarm)

	Span, inches:	60	60
	Drop, inches:	18	30
Manufacturer .			
Aluma-Form		6018	6030
Barfield Mfg.		BAR-6018	BAR-6030
Brooks		446-60-18	446-60-30
Cox Industries		C-6018	C-6030
Dis-Tran		DT-60R	-
Hatheway Patterson		320-R	325-R
Hughes Brothers		2045-CC	2045-D
Joslyn		J4760R	J4730RW
Pennington		15018	15030
Geotek (PUPI)*		B6018-BM	B6030-BM
Utilities Structures Eng. Inc.		CU-60-18	CU-60-30

*Denotes Fiber Reinforced Plastic, all others are wood

cu – 26 inch Brace, crossarm (side-mounted)

Manufacturer .	Douglas Fir or Southern Yellow Pine	Apitong	Fiber Reinforced Plastic
Aluma-Form2	-	AF626	-
Barfield Mfg.	BAB-626	-	-
Brooks	58128	-	-
Dulmison	-	-	CAB-28
Hatheway Patterson	7026	-	
Hughes Brothers	2023	-	533
Joslyn	J5526	-	
MacLean (Continental)	-	-	CRB-28
Geotek (PUPI)	-	-	B3818-SM

Note: Braces listed above have 26-inch hole spacing. They are to be used in place of the flat steel braces previously listed on page h.

cx - Splice, oval tube

Copper

Conductor Size:	0 x 7	2 x 3	4	6
National Tel. Supply	464	463	459	457

Copperweld-Copper

Conductor Size:	6A	8A
National Tel. Supply	460	459

cy - Splice, Compression

ACSR

Conductor Size	Alcoa	Blackburn	Burndy
4 6/1	2-piece		"Unisplice"
4 7/1	Order	Type RC	(1-piece)
2 6/1	by	1-piece	or Y-S
2 7/1	Conductor	Order	(2-piece)
1/0	Size	by	Order by
2/0	and	Conductor	Conductor
3/0	Stranding	Size	Size and
4/0	"	and	Stranding
		Stranding	
266.8 kcmil 18/1			
336.4 kcmil 18/1			
477 kcmil 18/1			
266.8 kcmil 26/7	2-piece		2-piece
336.4 kcmil 26/7	Compression		Type YTS
477 kcmil 26/7	Alloy Type		"
556.6 kcmil 26/7	CJ		"
795 kcmil 26/7			"
954 kcmil 54/7			"

Conductor Size	Hubbell(Anderson)	Hubbell (Fargo)	Kearney/Cooper Power Systems	
			2 pc	1 pc
	VC-36R			
4 6/1	VC-36R	-	-	OH4-61-71AS
4 7/1	VC-36R	-	-	OH4-61-71AS
2 6/1	VC-36R	-	-	OH2-61-71AS
2 7/1	VC-50R	-	-	OH2-61-71AS
1/0	VC-50R	TJA-8129	OH1/0-61A	OH1/0-61AS
2/0	VC-61R	TJA-7729	OHR2/0-61A	-
3/0	VC-61R	TJA-7829	OHR3/0-61A	-
4/0	-	TJA-7929	HR4/0-61A	-
	VC-80-R			
266.8 kcmil 18/1	VC-80-R	-	-	-
336.4 kcmil 18/1	VC-90-R	-	-	-
477 kcmil 18/1	-	-	-	-
	VC-831-1-RM			
266.8 kcmil 26/7	VC-831-1-RM	Uni-grip	HR-266-267A	-
336.4 kcmil 26/7	VC-832-2-RM	one die	HR336-267A	-
477 kcmil 26/7	VC-833-3-RM	system	HR-477-267A	-
556.5 kcmil 26/7	VC-835-4RM	Order by	HR-556-267A	-
795 kcmil 26.7	VC-835-4RM	conductor size	-	-
954 kcmil 54/7	-	and stranding	-	-

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

cy - Splice, Compression

ACSR

Conductor Size	Nat. Tel. Supply	Homac	ESP
4 6/1	"Nicopress"	"Tension	FTR-4
4 7/1	(1-pc. or 2-pc.)	splicer"	FTR-4
2 6/1	Order by Conduc-	(1-piece or	FTR-2
2 7/1	tor Size and	2-piece	FTR-2.5
1/0	Stranding	Order by	FTR-1/0
2/0	2-pc.	Conductor	FTR-2/0.5
3/0	"	Size and	FTR-3/0
4/0	"	Stranding	FTR-4/0
266.8 kcmil 26/7	"	2-pc.	-
336.4 kcmil 26/7	"	"	-
477 kcmil 26/7	"	"	-
556.5 kcmil 26/7	"	"	-
795 kcmil 26/7	-	-	-
954 kcmil 54/7	-	-	-

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

Splice, Compression

Copper and Copperweld-Copper

Conductor Size	Burndy	Homac	Hubbell (Anderson)	Kearney/Cooper Power Systems	National Tel. Supply
6 cu	YDS6W	J2C3	VCC-28	OH6C	1-162/J
4 cu	YDS4W	L2C5	VCC-28	OH4C	1-204/P
2 x 3 cu	YDS2C-3	S2C7	-	OH2-3CX	1-258/3X
0 x 7 cu	YDS25	U2C9	-	OH1-7C	1-325/7F6
8A CWC	YDS8KT	L2E1	VCC-28	OHR8ACW	1-8A-P
6A CWC	YDS6KT	L2E3	VCC-28	OHR6ACW	1-6A-P
4A CWC	YDS4KT	Q2E5	VCC-37	OHR4ACW	1-4A-X
2A CWC	-	U2E7	VCC-43	-	-

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

cy - Splice, compression
(one-piece)

(For 6201 and 5005 Aluminum Alloy Conductors)

Conductor Size	Burndy	Blackburn	Homac
#4 thru 4/0	"Unisplice"	Type RC	"Tension Splicer"
	Order by Conductor Size and Stranding	Order by Conductor Size and Stranding	Order by Conductor Size and Stranding

Conductor Size	Hubbell (Anderson)	ESP
#4 thru 4/0	Type VC-R	Type FTR
	Order by Conductor Size and Stranding	Order by Conductor Size and Stranding

NOTE: These splices are acceptable when installed with tools and dies in accordance with the splice manufacturer's recommendations.

cy - Splice, compression

1-piece splice for ACSR

Manufacturer	Conditions
*ALCOA "Jiffy Joint"	To obtain experience.

1-piece splice for AWAC

Burndy	
AWAC 4-4/3 YDS7M10T AWAC 2-4/3 YDS7M9T AWAC 1/0-4/3 YDS7M7T	To obtain experience.

*Satisfactory for use with 6201 and 5005 all aluminum alloy conductor through 4/0 and 19 strand conductors of sizes 266.8 kcmil and 477 kcmil.

NOTE: These splices are acceptable when installed using tools and dies in ccordance with the splice manufacturer's recommendations.

Conditional
cy(2)
June 17, 2010

cy -Splice, compression, high temeperature

For use with High Temperature Conductors

Manufacturer	Conditions
Alcoa Conductor Accessories (ACA) Fujikura Limited (AFL) Splice, Compression To be used with 3M High Temperature Conductors ACCR (Aluminum Conductor Composite Reinforced)	1. To obtain experience. 2. Use high temperature accessories approved by the manufacturer and accepted by RUS
Burndy/Hubbell Splice, compression To be used with CTC High Temperature Conductor, ACCC (Aluminum Conductor Composite Core)	Same as above.
Preformed Line Products (PLP) Thermolign Full Tension Splice To be used with 3M High Temperature Conductors ACCR (Aluminum Conductor Composite Reinforced)	Same as above.

NOTE: These splices are acceptable when installed using tools and dies in accordance with the conductor's manufacturer's recommendations.

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cz - Splice for Steel Strand (Overhead Ground Wire)

Compression

Single Sleeve Only

	High Strength Steel		Extra High Strength			Aluminum Clad Steel		
	3/8"	7/16"	5/16"	3/8"	7/16"	7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG
Alcoa				4914.386	4916.453			
Burndy	YTS375E	YTS438E				YDS7M9T	YDS7M8T	YDS7M7T
Hubbell (Fargo)	81l425	8ll630	81l222	81l425	81l630	811425	811427	811630
Kearney	HR-3/8-3-7S							
National.Tel.Supply	5-7/12OG92	5-7/145J22						
Steel and Aluminum Sleeves								
Homac	28414 (Two piece)							
Automatic								
MacLean (Reliable)	5002	5043	5041	5042	5043	5042	5042	5043
Bolted Type								
Electroline	GD-537							
Formed Type								
Helical Line Products	HS-310-3/8"	HS-311-7/16"						
Hubbell (Chance)	10SS 3/8C	16SS 7/16C	6SS 5/16C	10SS 3/8C	16SS 7/16C			

da - Bracket, insulated

	Bracket without Insulator	Bracket with 1-3/4” Spool Insulator	Bracket with 3” Spool Insulator
Hubbell (Chance)	0327	0327-C909-1032	0327-C909-1304
Hughes Brothers	1077LI	1077SI	1077I
Joslyn	J1300	-	-
Kortick	K9278	K9081	K9082

dh - Ground, pole

(For system grounds, see ground rods on page ai)

Manufacturer	Catalog Number
Galvanized Steel Plate With Insulated Copper Lead	
(For connecting to a copper or aluminum ground wire above ground.)	
Line Hardware	PGPS-56CL8
Galvanized Steel Plate with Connector (For connecting to a galvanized iron ground wire)	
Line Hardware	PGPS-56C
Copper Plate	
Blackburn	GP-100
Drabco	D 101
Eritech	EGP-100
Galvan	GP-100
Homac	5575
Joslyn	J9196
Line Hardware	PGPC-56

dl - Pipe Spacer

3/4" diameter x 1-1/2" length

Manufacturer	Catalog Number
Hubbell (Chance)	2237
Joslyn	J2031
MacLean (Continental)	U36695

dm - Bracket, transformer
(For cluster mounting of two or three transformers on pole)

Manufacturer	Transformer Size, kVA	Band Type	Through Bolt Type
Aluma-Form	3-50	6M3-6	3MW-24-M
	75-100	15M3-6	11MW-24
Barfield Manufacturing Co.	3-50	BMAC-366	-
	75-100	BMAC-3156	-
Dixie	3-25	-	DW-50
	37-1/2-50	-	DW-50
	75-100	-	DW-167
Hubbell (Chance)	3-50	C6M3-6	-
	75-100	C15M3-6	-
Hughes	3-25	-	3021
	37-1/2-50	-	3020
	75-100	-	3020 with adapter plates and back plate
Joslyn	3-25	-	J6865
	37-1/2-50	-	J6864
	75-100	-	J6866
Turner	3-25	-	305-25
	37-1/2-50	-	305-100
	75-100	-	305-100
	For mounting of two transformers		
Aluma-Form	3-100	-	DM-4M2
	3-50	-	DM-2M2
Hubbell (Chance)	3-100	-	C212-0001
Hughes	3-50	-	3022
Turner	3-50	-	205-25

dp - Clamp, ground wire

Transmission

For grounding steel towers and substation structures

Bolt Included

(For use with copper ground wires)

Manufacturer	Catalog Number
AMP	81416-3
Penn-Union	GH-30-C-A1
Royal Switchgear	12202-T (Type LCS)
Square D	GC-143A--OZ

For use in: Pole Grounding Assembly TM-9
Capacitor Assemblies M9-11, M9-12 and M9-13

Manufacturer	For 5/8" Bolt	For 3/4" Bolt
Joslyn	J1163	J1164
MacLean (Continental)	SBL-33	-

dp – Clamp, ground wire

Transmission

For grounding steel towers and substation structures

Bolt Included

(For use with copper ground wires)

Manufacturer	Catalog Number	Conditions
DMC Power	GC910B-***T (single hole pad for copper wire)	To obtain experience.

For use in: Pole Grounding Assembly TM-6, TM-7, TG-15, TG-17, TG-25, TG-27, TG-28, TG-29, TG-35
Capacitor Assemblies Y3.1, Y3.2, Y3.3, Y3.4

dq - Eye Screw, Elliptical

For use in deadending triplex type service cable, Drawing K2.3.

Manufacturer	Catalog Number
Joslyn	J8930

dr - Clevis, conduit, insulated

For use in deadending triplex service cable, Drawing K3.2.

Applicable Specifications: "RUS Specifications for Insulated Conduit Clevises and Conduit Wire-holders for Pipe Mast Deadends," D-16

Joslyn	J0311*

*Insulator not included. See page cm for spool insulator.

ds - Wireholder, conduit

For use in deadending open wire services on pipe masts, Drawing K3.1.

Applicable Specifications: "RUS Specifications for Insulated Conduit Clevises and Conduit Wireholders," D-16

Manufacturer	Catalog Number
Hubbell (Chance)	C207-0075

ds - Wireholder, conduit

Manufacturer	Conditions
Joslyn	
J0588Z (nylon alloy)	To obtain experience.

dt - Deadend, service

For deadending triplex type service cable, Drawing K2.2.

Manufacturer	ACSR Size	Catalog Number	
		Wedge Type	Formed Type
Blackburn	4	W62-1	-
Dulmison	4	-	SG0570
	2	-	SG0735
	1/0	-	SG0915
	2/0	-	SG1020
Helical Line Products	4	-	HSG-514
	2	-	HSG-518
	1/0	-	HSG-522
MacLean (Reliable)	4	7195	-
	2	7187	-
	1/0	7287	-
Penn-Union	4	WDC-2S	-
Preformed Line Products	4	-	SG-4502
	2	-	SG-4504
	1/0	-	SG-4506
	2/0	-	SG-4507
	3/0	-	SG-4508
	4/0	-	SG4509

du - Link, Extension

DISTRIBUTION

Manufacturer	Catalog Number
Joslyn (Flagg)	PA319
Hubbell (Chance)	C207-0112
MacLean (Bethea)	LCE-14
MacLean (Continental)	CEL-14

TRANSMISSION
(25,000 lbs. min. strength)

Joslyn	J26082
MacLean (Bethea)	ASM 7209-I-BC

Guy Extension Link
(For "H" Structure)

Manufacturer	One Guy Attachment	Two Guy Attachment
Joslyn	J22421	J26025

NOTE: The distribution extension links may be substituted for anchor shackle (Item bo), eye bolt (Item o) and eye nut (Item aa) for both small and large conductor drawings shown in RUS Form 803 and RUS Bulletin 50-3 at the option of the owner.

Conditional List
du(1)
July 2009

du - Connecting Links for Pole Bands

Conditions - To obtain experience.in conjunction with pole bands [Item fv(1)]

For Use With Medium Duty Pole Bands

Manufacturer	Link to Insulators	Size	Minimum Strength Rating
Hughes Bros.	3176	3/8"x3"x9-1/2"	25,000 lbs.
Joslyn	J26034	3/8"x3"x9-1/2"	25,000 lbs.

	Link to Guy		
Hughes Bros.	3154	3/8"x2"x9-1/2"	36,000 lbs.
Joslyn	J26035	3/8"x3"x9-1/2"	36,000 lbs.

For Use With Heavy Duty Pole bands

Manufacturer	Link to Insulators	Size	Minimum Strength Rating
Hughes Bros.	3157	3/8"x3"x12"	36,000 lbs.
Joslyn	J26035 - 2	3/8"x3"x9-1/2"	36,000 lbs.

	Link to Guy		
Hughes Bros.	3157	3/8"x3"x12"	51,000 lbs.
Joslyn	J26037	1/2"x3"x12"	51,000 lbs.

dy - Bolt, eye, double arming

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes 5/8 inch, 14 through 26 inch length
3/4 inch, 14 through 26 inch length

The following manufacturers have shown compliance with the applicable specifications:

Allied Bolt, Inc.
Hubbell (Chance)
Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)

dz - Clip, Guy Wire

Manufacturer	5/16"	3/8"	7/16"	1/2"
Hubbell (Chance)	6453	6454	6455	6456
MacLean (Continental)	U4953	U4954	U4955	U4956

ea - Insulator and stud, post type, vertical

DISTRIBUTION (RUS Minimum Requirements)

System voltage, kV	12.5/7.2	12.5/7.2	24.9/14.4
Leakage, inches	7-1/2	10	15
Cantilever strength (pounds)	1875	1875	1875
Flashover, dry, kV	65	70	95
Flashover, wet, kV	40	50	65
Lapp			
7" Stud	4415P	4420P	4427P
1-3/4" Stud	4315P	4320P	4327P
Newell Porcelain			
7" Stud	-	43570-7040	47101-7040
1-3/4" Stud	-	43570-7010	47101-7010
Porcelain Products (Knox)			
7" Stud	5115-6510	5120-6510	5127-6510
1-3/4" Stud	5115-6500	5120-6500	5127-6500

DISTRIBUTION or TRANSMISSION

ANSI Class	57-2	57-3	57-4
System voltage, kV	22	34.5	46
ICB			
7" Stud	-	-	-
1-3/4" Stud	ICB 57-2	ICB 57-3	-
Lapp			
7" Stud	9435	9445	9455
1-3/4" Stud	9335	9345	9355
Newell-PSN			
7" Stud	37620-7040	41640-7040	41650-7040
1-3/4" Stud	37620-7010	41640-7010	41650-7010
Porcelain Products (Knox)			
7" Stud	5135-6512	5145-6512	-
1-3/4" Stud	5135-6502	5145-6502	-

ea - Insulators, horizontal post type

Manufacturer	34.5 kV	69 kV	115 kV
Lapp	F-4745	F-4788	F-70147
Locke	-	LS025l3	LS050l3
Newell-PSN	43740-7700	43790-7700 47043-7700	-
Victor Insulators, Inc.	62356	62359	-

ea - Insulator, post type

Manufacturer	Conditions
Victor Insulators, Inc.	
2120 (12.5/7.2 kV)	To obtain experience.
2127 (24.9/14.4 kV)	
62055 (22 kV)	
62056 (34.5 kV)	

ea - Insulator, post type
(Polymer)

Manufacturer	Conditions
Hubbell Power Systems	
Vertical Post Insulators	To obtain experience.
80S0150F09 (15kV, without Stud)	
80S0250F09 (25kV, without Stud)	
80S0280F09 (35kV, without Stud)	
K-Line	
Vertical post insulators	To obtain experience.
KL 15STFL (12.5/7.2 kV, with 7” Stud)	
KL 15STFS (12.5/7.2 kV, with 1-3/4” Stud)	
KL 28STFL (24.9/14.4 kV, with 7” Stud)	
KL 28STFS (24.9/14.4 kV, with 1-3/4 Stud)	
KL 35STFL (ANSI Class 51-3F, with 7” Stud)	
KL 35STFS (ANSI Class 51-3F, with 1-3/4” Stud)	
KL 46STFL (ANSI Class 51-4F, with 7” Stud)	
KL 46STFS (ANSI Class 51-4F, with 1-3/4” Stud)	
Horizontal post insulators	
KL 46SHG (34.5 kV)	

Conditional List
ea(3)
September 2, 2010

ea - Insulators, horizontal post type (polymer for wood and fiberglass transmission poles) (clamp end fittings and curved bases for use for round poles)							
Voltage:	34.5 kV	46 kV	69 kV	115 kV	138 kV	138 kV	
ANSI Class:	51-34	51-35	51-36	250-54	250-60	250-66	
Rated SCL (lbs.):	2400	2400	2400	2650	2300	2000	
Manufacturer							Conditions
Hubbell	80S0460100		80S0690100				To obtain experience.

* Notes :

1. Flat base for use with flat surface poles
2. Universal base for flat as well as curved poles
3. Two hole blade end fitting available.

ea - Insulators, horizontal post type (polymer for steel and concrete transmission poles)				
Voltage:	115 kV	138 kV	138 kV	
ANSI Class:	250-60	250-66	250-75	
Manufacturer				Conditions

eb - Bracket, Pole Top
For Post type Insulators

DISTRIBUTION

Hubbell (Anderson) (14.4 or 7.2 kV)	84324-2000
Hubbell (Chance) (14.4 or 7.2 kV)	1B4
Joslyn (Flagg) (14.4 or 7.2 kV)	P526
Lapp (Line Ware) (14.4 or 7.2 kV)	304043
Line Hardware (l4.4 or 7.2 kV)	PTIB-375A
MacLean (Continental) (14.4 or 7.2 kV)	PTB-55-8
Universal Electric (14.4 or 7.2 kV)	PT-8R

TRANSMISSION

Hubbell (Chance)	1B4
Joslyn (Flagg)	P532
Lapp (Line Ware)	304044
MacLean (Continental)	PTB-66H

ec - Bracket, Offset Neutral

Hubbell (Chance)	C206-0004
Joslyn	J2352

ed - Support, overhead ground wire

Applicable Specifications: "RUS Specifications for Overhead Ground Wire Support Brackets," T-2

Pole top diameter, inches	6-8	8-10	10-12
Hubbell (Chance)	-	5432	5432
Hughes Brothers	-	2859-12	2859-14
Joslyn	-	J6394	J6395
Kortick	K3580	K3581	K3582
MacLean (Continental)	UC1238	UC1239	UC1240

ef - Bolt, clevis

Applicable Specifications: "RUS Specifications for Clevis Bolts," DT-7

	Dia. (Inches)	8”	10”	12”	14”
Hubbell (Chance)	5/8	15808	15810	15812	15814
	3/4	15828	15830	15832	15834
Joslyn	5/8	J7808	J7810	J7812	J7814

eg - Plate, crossarm reinforcing

TRANSMISSION

For 5-5/8" x 7-3/8" crossarm

Manufacturer	Catalog Number
Hubbell (Chance)	4047
Hughes Brothers	1113.88
MacLean (Continental)	U3838
Brooks Manufacturing Co.	REA Type 01 NP REA Type 02 NP REA Type 03 NP REA Type 04 NP REA Type 05 NP REA Type 05M NP REA Type 14 NP REA Type 22 NP

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eh - Hook, ball

Manufacturer	Catalog Number
Joslyn (Flagg)	13400
Hubbell (Anderson)	HB-30
Lapp	7055
Lindsey	3310
Line Hardware	BH-30
MacLean (Bethea)	BH-5

ei - Clamps, suspension with socket eye

ACSR with Straight or Formed Armor Rods

	AWG			kcmil					
	1/0 & 2/0	3/0	4/0	266.8	336.4	477	556.5	795	954
				Iron or Steel Clamps					
Hubbell (Anderson)	MS-82-S	--	MS-104-S	MS-104-S	--	--	--	--	--
Hubbell (Chance)	FGW4S	--	--	--	--	--	--	--	--
Lapp	305743S	--	--	--	--	--	--	--	--
MacLean (Bethea)	FS-83-S	--	--	--	--	--	--	--	--

ACSR with Straight or Formed Armor Rods

	AWG		kcmil					
	1/0 & 2/0	3/0 & 4/0	266.8	336.4	477	556.5	795	954
			Aluminum Alloy Clamp					
C & R	CRSC-1S	CRSC-2S	CRSC-3S	CRSC-3S	--	--	--	--
Dulmison	--	HSU	HSU	HSU	HSU	HSU	HSU	HSU
Hubbell (Anderson)	HAS-85-S	HAS-104-S	HAS-104-S	HAS-118-S	HAS-139-S	HAS-147-S	HAS-182-S	HAS-182-S
Lapp	306029S	306030S	306030S	306031S	306032S	--	--	--
*Preformed	--	AGS	AGS	AGS	AGS	AGS	AGS	AGS
MacLean (Bethea)	LS-1-S	LS-2-S	LS-2-S	LS-3-S	LS-4-S	LS-6-S	LS-7-S	LS-8-S

*Clevis type available.

ei - Clamps, suspension with socket eye - cushioned

Condition: To obtain experience

ACSR with Straight or Formed Armor Rods

	kcmil					
	266.8	336.4	477	556.5	795	954
*Preformed	CGS-1100	CGS-1102	CGS-1105	CGS-1106	CGS-1110	CGS-1112

*Order with socket-eye fitting.

ei - Clamps, suspension with socket eye - cushioned

For use with **High Temperature Conductors**

Manufacturer	Conditions
Preformed Line Products (PLP) Thermolign Suspension To be used with 3M High Temperature Conductors ACCR (Aluminum Conductor Composite Reinforced)	1. To obtain experience. 2. Use high temperature accessories approved by the manufacturer and accepted by RUS

NOTE: These clamps are acceptable when installed using tools and dies in accordance with the conductor's manufacturer's recommendations.

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ej - Clamps, deadend with socket eye

ACSR

	AWG	kcmil					
	2/0 to 4/0	266.8	336.4	477	556.5	795	954
			Iron or Steel Clamps (requires armor tape or liner)				
Hubbell (Anderson)	-	80445-2000	80445-2000	-	-	-	-
			Aluminum Alloy Clamps (do not require armor tape or liner)				
Anderson/Hubbell	SD-57-S	SD-70-S	SD-70-S	SD-86-S	SD-86S	--	--
C & R	CR-10-60S	CR-20-60S	CR-20-60S	--	--	--	--
Lapp	305757S	305758S	305759S	305760S	--	--	--
MacLean (Bethea)	ADE-21-S	ADE-22-S	ADE-23-S	ADE-24-S	ADE-24-S	ADE-2526-S	ADE-2526-S

NOTE: When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

ej - Clamps, dead-end with socket eye

For use with **High Temperature Conductors**

Manufacturer	Conditions
Preformed Line Products (PLP) Thermolign Dead-end To be used with 3M High Temperature Conductors ACCR (Aluminum Conductor Composite Reinforced)	1. To obtain experience. 2. Use high temperature accessories approved by the manufacturer and accepted by RUS
Alcoa Conductor Accessories (ACA) Compression Dead-end To be used with 3M High Temperature Conductors ACCR (Aluminum Conductor Composite Reinforced)	1. To obtain experience. 2. Use high temperature accessories approved by the manufacturer and accepted by RUS

NOTES:

1. When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

2. These clamps are acceptable when installed using tools and dies in accordance with the conductor’s manufacturer's recommendations.

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ek - Locknuts

MF Type

For Bolt Diam., in.:	3/8	1/2	5/8	3/4	7/8
Hubbell (Chance)	3510	3511	3512	3513	3514
Hughes Brothers	MF30	MF50	MF60	MF70	--
Joslyn	J8581	J8582	J8583	J8584	J8584-1/2
Kortick	K1065	K1066	K1067	K1068	--
Line Hardware	SLN38	SLN50	SLN58	SLN34	SLN78
MacLean (Continental)	U4920	U4921	U4922	U4923	U4924

el - Sectionalizer

Manufacturer	Type
Cooper Power Systems	GH (with crossarm mounting bracket KA27G)

el - Sectionalizer

Manufacturer	Conditions
<u>Cooper Power Systems</u>	
Sectionalizer, three-phase Type GN3	To obtain experience.
Sectionalizer with125 kV BIL accessory Type GH, 15 kV, single phase	1. To obtain experience. 2. For use on single-phase taps of 24.9/14.4 kV multi- grounded wye systems.
*Sectionalizer, three-phase Type GN3E14.4 kV, 200 amp max.	To obtain experience.
*Sectionalizer, three-phase Types GV and GVC 14.4 kV, 400 amp. max.	To obtain experience.
*Sectionalizer, three-phase Types GW and GWC 34.5 kV, 400 amp. max.	To obtain experience.
<u>General Electric</u>	
Sectionalizer, single-phase cutout-type - 15 kV and 25 kV Model 9F41F	To obtain experience.
<u>Hubbell (Chance)</u>	
Sectionalizer, single-phase Type CRS single-phase, Cutout type 15 kV, 95 kV BIL 200 amp max. 27 kV, 125 kV BIL 200 amp max. 38 kV, 150 kV BIL 200 amp max.	To obtain experience.
<u>Joslyn</u>	
Sectionalizer, three-phase, 15 kV, 400 and 600 amperes 25 kV, 600 amperes Model VBM with VT or RS control	To obtain experience.

*NOTE: Ratings greater than 100 ampere for 12.5/7.2 kV application and greater than 200 ampere for 24.9/14.4 kV application are acceptable only with ground trip device.

NOTE: Cutout type sectionalizers may also be used with cutout frames listed on pages af-1 and ax-1. Consult manufacturer for application.

em - Brace, crossarm, special
(angle alley arm)

DISTRIBUTION

15" span, 14" drop; 1-1/2" x 3/16"

Kortick	K1978
MacLean (Continental)	U5514

TRANSMISSION

2'-6" span x 1'-8" drop 3'-6" span x 2'-3" drop

	1-3/4" x 3/16"	1-3/4" x 3/16"
Hubbell (Chance)	-	6999
Hughes Brothers	AS-2309-B	AS-2309-A
Kortick	K1975	K1976
MacLean (Continental)	U5509	U5510

eq - Narrow Profile Brackets and Special Arm Assemblies

METAL BRACKETS

Manufacturer	Conditions
Dixie	
Deadend bracket assembly D21142 for 12.5/7.2 kV Deadend bracket assembly D21144 for 24.9/14.4 kV	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected.
Hubbell (Anderson)	
Standoff bracket, COB-E-180-TGL	Same as above.
Hubbell (Chance)	
Single post insulator brackets C206-0209 for 12.5/7.2 kV construction only C206-0010 for 24.9/14.4 kV construction Deadend bracket assembly, C206-0179 Deadend bracket assembly, C206-0211 for 24.9/14.4 kV construction	Same as above.
Joslyn (Flagg)	
Standoff bracket, PA619B	Same as above.
MacLean (Continental)	
Standoff bracket IACB-18-5	Same as above.

Conditional List
eq(1.1)
July 2009

eq - Narrow Profile Brackets and Special Arm Assemblies

METAL BRACKETS

Manufacturer	Conditions
Joslyn Single post insulator brackets 24840.1, for 12.5/7.2 kV construction only 24840.2, for 24.9/14.4 kV construction	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected.
MacLean (Bethea) Single post insulator bracket, HBF-10-9-GC Standoff bracket VIB3-18-GC	Same as above.
Universal Electric Single post insulator bracket, SAB-3-18-GC	Same as above.

eq - Narrow Profile Brackets and Special Arm Assemblies

FIBERGLASS REINFORCED PLASTIC
For 12.5/7.2 kV

Manufacturer	Catalog Number	Conditions
Aluma-Form		
Single Phase	F1CA-MV-x18*	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.
Hubbell (Chance)		
Two-phase pin bracket	2SBM36VV4	Same as above.
Standoff insulator	1SBM13H1	
Deadend arm	DEM36SP	
MacLean (Continental)		
Two-phase pin bracket	G2MDA x 36DV2	Same as above.
Two-phase angle bracket	G2MDA X 36AX1	
Standoff insulator	G1MDA x 12AS1	
Standoff insulator	G1MDA x 18AS1	
Deadend arm	GDAS-36E	
Suspension bracket	G1MDA x 18AE	
MacLean (Joslyn)		
Standoff bracket	G1MDA x 18AT	Same as above.

* x = “A” for angled, 15 degrees or “H” for horizontal

eq - Narrow Profile Brackets and Special Arm Assemblies

FIBERGLASS REINFORCED PLASTIC
For 12.5/7.2 kV

Manufacturer		Conditions
Hughes Brothers		
Two-phase angle bracket	761-36-8	1. To obtain experience.
Two-phase pin bracket	813-36	2. For use only in scenic areas and locations where right-of-way is limited.
Standoff insulator	560-13	
Standoff insulator	560-18	3. Not to be used where conductor galloping may be expected.
Suspension bracket	615-18	
Deadend arm	540-36	4. Not to be used in contaminated atmospheres.
Standoff bracket	892-18	

eq - Narrow Profile Brackets and Special Arm Assemblies

FIBERGLASS REINFORCED PLASTIC
For 24.9/14.4 kV

Manufacturer	Catalog Number	Conditions
Aluma-Form		
Single Phase	F1CA-MV-x18*	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.
Hubbell (Chance)		
Two-phase pin bracket	2SBM44VV4	Same as above.
Standoff insulator	1SBM19V4	
Deadend arm	DEM48SP	
MacLean (Continental)		
Two-phase pin bracket	G2MDA x 44DV3	Same as above.
Two-phase pin bracket	G2HDA x 48DV3	
Standoff insulator	G1MDA x 18DV3	
Standoff insulator	G1MDA x 19DV3	
Standoff insulator	G1MDA x 20DV3	
Standoff bracket	G1MDA x 18AT	
Deadend arm	GDAS-48E	

* x = “A” for angled, 15 degrees or “H” for horizontal

eq - Narrow Profile Brackets and Special Arm Assemblies

FIBERGLASS REINFORCED PLASTIC
For 24.9/14.4 kV

Manufacturer	Conditions
Hughes Brothers Deadend arm, 540-48 Standoff insulator, 880-20 Two-phase pin bracket, 883-48 Standoff insulator, 870-19 Two-phase pin bracket, 862-44 Standoff bracket, 892-18	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.

eq - Narrow Profile Brackets and Special Arm Assemblies

WOOD ARM ASSEMBLIES

Manufacturer	Conditions
Aluma-Form Arm assembly, 12.5/7.2 kV XA-3812 Arm assembly, 24.9/14.4 kV XA-4214	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used as deadend structures.
Hughes Brothers Deadend arm, 2890-J complete with braces and attaching hardware, fittings and bolts	1. To obtain experience. 2. For use only in scenic areas and locations right-of-way is limited. 3. Not to be used where conductor galloping may be expected.

eq - Narrow Profile Brackets and Special Arm Assemblies

COMBINATION INSULATORS AND BRACKETS

Manufacturer	Conditions
Salisbury Horizontal Post 12.5/7.2 kV, 9561 24.9/14.5 kV, 9562	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected. 4. Not to be used in contaminated atmospheres.

er - Wire Guard, Plastic

See Drawing K4.1G

Manufacturer	Type orCatalog Number
Hubbell (Chance)	PFG
Hubbell (Fargo)	GM-936
Preformed Line Products (Tree Guard)	PTG

es - Splice Cover, Plastic

(For use over compression type service connections in place of tape)

Manufacturer	Type
Hubbell (Anderson)	Type SEC
Kearney/Cooper Power Systems	Type 601
Plastic Engineering & Sales Co.	Wire Splice Cover
3M	PST Series 8420
Virginia Plastics	Type VP

Splice Cover and Moisture Seal for Secondary Cable Connections
(See Drawings G312 and UM5)

Manufacturer	Type
AMP	Sealing & Dielectric Compound
Plymouth/Bishop	10 Plyseal
3M	Scotch Brand #2200

Bolted Connector Cover

(For use over bolted type service connections in place of tape)

Manufacturer	Type
Hubbell (Anderson)	PTC
Hubbell (Fargo)	GA-9000 B Series

eu - Extension Link
(Fiberglass)
(Distribution)

Manufacturer	Strength	Catalog Number
Dulmison	11,000 lbs.	HSB-1-12*
	15,000 lbs.	HSB-2X-12
Joslyn (Flagg)	11,000 lbs.	150-12EE
	15,000 lbs.	150-12EE
Hubbell (Anderson)	10,000 lbs.	GSB1-9*
	15,000 lbs.	GSB2-12
	16,000 lbs.	GS16012EE
K-Line	15,000 lbs.	KL Series
MacLean (Continental)	11,000 lbs.	GEE11-12*
	15,000 lbs.	GEE15-12

*For use with 6" suspension insulators.

ex - Splice, formed type

Manufacturer	Conditions
<u>Preformed Line Products</u>	
Splice for ACSR	To obtain experience.
FTS full tension splice	
Splice for AWAC	For repair only.
LS-0185 for 4-4/3	To obtain experience.
LS-0188 for 2-4/3	For repair only where alumoweld strands are not broken.
LS-0191 for 1/0-4/3	

fc - Capacitors, Shunt
12470/7200 Volts

Manufacturer	Size	1 Bushing	2 Bushing	3 Bushing
ABB	100 kvar	A10009	A10010	
	150 kvar	A15009	A15010	
	200 kvar	A20009	A20010	
	300 kvar	A30009	A30010	
	400 kvar	A40009	A40010	
Cooper Power Systems	50 kvar	CEP120B6	CEP120A6	
	100 kvar	CEP131B6	CEP131A6	
	150 kvar	CEP132B6	CEP132A6	
	200 kvar	CEP140B6	CEP140A6	
	300 kvar	CEP160B6	CEP160A6	
	400 kvar	CEP170B6	CEP170A6	
	500 kvar	CEP180B6	CEP180A6	
General Electric Film/Foil Type	25 kvar	52L226RC	52L206RC	
	50 kvar	51L226RC	51L206RC	
	100 kvar	54L226RC	54L206RC	
	150 kvar	54L526RC	54L506RC	
	200 kvar	58L126RC	58L106RC	
	300 kvar	59L226RC	59L206RC	59L611RC

24900/14400 Volts

Manufacturer	Size	1 Bushing	2 Bushing	3 Bushing
ABB	100 kvar	A10031	A10032	
	150 kvar	A15031	A15032	
	200 kvar	A20041	A20042	
	300 kvar	A30031	A30032	
	400 kvar	A40031	A40032	
Cooper Power Systems	50 kvar	CEP123B9		
	100 kvar	CEP130B9		
	150 kvar	CEP139B9		
	200 kvar	CEP143B9		
	300 kvar	CEP163B9		
	400 kvar	CEP173B9		
	500 kvar	CEP183B9		
General Electric Film/Foil Type	50 kvar	51L252RC		
	100 kvar	54L252RC		
	150 kvar	54L552RC		
	200 kvar	58L154RC		
	300 kvar	59L154RC		
	400 kvar	98L154RC		

fd - Hangers, Capacitor

Crossarm Mounting

	1 unit	2 units	3 or 4 units
ABB	85B397G01	791C644G01	791C644G02
Cooper Power Systems	CH1A1	CH2A2	CH4A1
General Electric	39F41G2	39F53	39F80G1

Pole Mounting

	Single Phase	Three Phase	
		In Line	Cluster
ABB	AL30R (3 units) AL60R (6 units)	(1 Ø units) AL30R AL60R AL90R (3 Ø units) AL13W AL23W AL33W AL43W AL53W	 (3 units) (6 units) (9 units) (1 unit) (2 units) (3 units) (4 units) (5 units)
Aluma-Form	CR-3* thru CR-6*	CR-3/4*	3-CR-3/4*
General Electric	39F41G1 (1 unit) 39F83G1 (3 units)	39F86G1	
Hubbell Power Systems Inc.	CCR-1* Thru CCR-6*	CCR-3/4*	CCR-9/12*

* Available with oil switch mounting bracket.

fg - Crossarm Saddle

(3-3/4" x 4" with 1-1/4" x 1/4" flange)

Manufacturer	Catalog Number
Lapp	10369

fi - Connectors, hot line

Over Armor Rods

Manufacturer	Catalog Number or Series (Al to Al)	Catalog Number or Series (Al to Cu)
Blackburn	PGH	-
Hubbell (Anderson)	AC Series	AC-GP-Series
Hubbell (Fargo)	GA-100 Series	GA-100C Series

fj - Bracket, extension

(For use in mounting circuit reclosers or sectionalizers)

See Drawing VM3-10A

	Through Bolt Type	Band Type
Aluma-Form	TBRSM-1, TB2M1-9*	RSM-1
Dixie	D-2359-M	
Joslyn	J2357	

*For mounting double lug reclosers.

fk - Bracket, circuit recloser or sectionalizer

(For cluster mounting of three circuit reclosers on pole)

	Cluster Mount	Rack Mount
Aluma-Form	RSM-3, 6M3-9*	3SPR-66, 3SPR-84
Turner	695-3	

*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Barfield Manufacturing Co.	BAPMM6
Turner	3CT-PT

fm - Extension Bracket for Mounting Apparatus
(Arrester, Cutouts and Potheads for Distribution Pole Mounting)

Manufacturer	Application Voltage	Single Phase	Three Phase
Aluma-Form	12.5/7.2 kV	1HCA-18 Series	R3CA-48
		1HCA-C-18	
	24.9/14.4 kV		R3CSA-48
		WBMA-1	
Barfield Mfg. Co.	12.5/7.2 kV	BAC 1256	-
	24.9/14.4 kV	BAC 1710	-
	12.5/7.2 kV	BACA 126	-
		(double mounting)	
	24.9/14.4 kV	BACA 1710	-
		(double mounting)	
Dixie	12.5/7.2 kV	D-1580	D27211-G
	24.9/14.4 kV	D-1583	-
Hubbell (Anderson)	12.5/7.2 kV	COB-E-120-TGL	-
	24.9/14.4 kV	ACOB-E-180	-
		COB-E-180-TGL	-
Hubbell (Chance)	24.9/14.4 kV	C653-1038	C653-1056
Hughes Brothers	12.5/7.2 kV	892-18	670-40
	24.9/14.4 kV		
Line Hardware	12.5/7.2 kV	CA-12-3GL	-
MacLean (Bethea)	12.5/7.2 kV	VIB3-18-R1-GC-C	-
		VIB3-12F-GC	-
	24.9/14.4 kV	VIB3-18-GC	-
			-
MacLean (Continental)	12.5/7.2 kV	IACB-12-5LGE	G3MA013012DD
	24.9/14.4 kV	IACB-18-5LGE	G3MA014017DD
MacLean (Joslyn)	12.5/7.2 kV	PA613B	-
	24.9/14.4 kV	PA619B	-
Universal Electric	24.9/14.4 kV	SAB-3-18-GC	-

Note: Above brackets are not suitable for supporting or deadending distribution line conductors.
(See items “eq” for narrow profile bracket and special arm assemblies)

fn - Extension Bracket for Mounting Cutouts

Refer to item fm

fo - Bracket, Transformer Secondary, Insulated

Manufacturer Insulator	Bracket Without Insulator	Bracket With 2-1/4" Diameter Spool Insulator	Bracket With 3-1/8" Diameter Spool
Hubbell (Chance)	-	9113S	9114S
Joslyn	-	J6765-A	J6765
MacLean (Continental)	U865	U865/208	U865/205

fp - Oval Eye Ball
(30,000 lbs; to be used with 52-3 and 52-5 insulators)

Manufacturer _____ No. _____

(No accepted items at this time)

fq - Laminated Upswept Arms

Applicable Specification: RUS Specification DT-5B
Applicable Drawing: RUS Drawing TUS-1

Manufacturer	Conditions
Hughes Brothers Types: C-4080A (5-1/8" width) C-4080B (5-1/8" width) C-4113A (3-1/8" width) C-4113B (3-1/8" width)	1. To obtain experience. 2. For use only in scenic and urban areas where right- of-way is limited.

fs - Pole Bearing Plate

Manufacturer	Conditions
Joslyn (Flagg) P325B-122	Same as above.
MacLean (Continental) PB-80-7	Same as above.

ft - Y-Clevis Ball

Manufacturer	Catalog Number
Joslyn	BT 3030

fu - Swinging angle bracket

(TRANSMISSION)

Applicable Specification: T-8

Swinging angle bracket with hardware and fittings

Manufacturer	2' - 0"	3' - 6"	Type #1	Type #2
Brooks	64233A	64233B	X	
Hughes Brothers	2848	2848	X	X

fv - Guying Attachments
Transmission

Pole Eye Plates*

25,000 lbs. @ 90°/36,000 lbs. @ 45°

Manufacturer	Single Eye		Double Eye - 7/8" Bolts
	3/4" Bolts	7/8" Bolts	
Joslyn (Flagg)	PX37D	-	PX42
MacLean (Continental)	EPR-66S-12	-	-

*Capacity of pole eye plate

Conditional List
fv(1)
July 2009

fv - Guy Attachments, Pole Bands Attachments, Pole Bands
With Through Bolts for Transmission Lines

Medium Duty Pole Bands

25,000 lbs @ 90°/36,000 lbs @ 45°*

Manufacturer	Pole Band and Associated Hardware**	Conditions
Hughes Bros.	3108.x-2718.55	To obtain experience.
Joslyn	J25968. x GL	To obtain experience.

Heavy Duty Pole Bands

36,000 lbs. @90° /51,000 lbs. @ 45°*

Manufacturer	Pole Band and Associated Hardware**	Conditions
Hughes Bros.	3107.x-2718.55	To obtain experience.

* For a guy lead greater than 1/1, capacity of pole band should be derated.

** Associated hardware includes through bolt, band connecting bolts, nuts, grounding clip and lag screws (if any). Connecting links (Item du (1)) of the required strength should be ordered separately from the same manufacturer.

ga - Watthour and Watthour-Demand Meters
1ø, 2 and 3 wire or 2/3 wire 120/240 volts

(Classes 100, 200, 10, and 20)

Self-Contained Types

Manufacturer	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
1	2	3	4	5	6
Elster	Bottom Con.	-	-	-	-
	Socket	AB1	-	-	4
General Electric	Bottom Con.	I50A	IM50A	-	4
	Socket	I70S	IM70S	-	4
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MS	BMS-2S	TMS	4
Schlumberger	Bottom Con.	J5SA	J5DSA	-	-
	Socket	J5S*	J5DS	-	4

Transformer Rated Types

Elster	Bottom Con.	-	-	-	-
	Socket	AB1	-	-	5 or 6
General Electric	Bottom Con.	I50A	IM50A	-	5 or 6
	Socket	I70S	IM70S	-	5 or 6
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MS	BMS	TMS	5 or 6
Schlumberger	Bottom Con.	J5SA	J5DSA	-	-
	Socket	J5S	J5DS	-	5 or 6

* Type J4ES for Class 320

ga - Watthour and Watthour-Demand Meters
Polyphase 2 element - 3 wire, 240 volts - Delta and 120/208 Volts Network

(Classes 100, 200, 10, and 20)

Self-Contained Types

Manufacturer 1	Type of Base 2	Watthour Meter Type 3	Mechanical Demand Watthour Type 4	Thermal Demand Watthour Type 5	Number of Terminals 6
Elster	Bottom Con.	-	-	-	-
	Socket	ABS-5	-	-	-
General Electric	Bottom Con.	V62A	VM62A	-	5
	Socket	V62S	VM62S	-	-
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT012S or 13S	BMT-12S or 13S	TMT-12S	5 or 8
Schlumberger	Bottom Con.	SL2A	SL2DA	-	5 or 8
	Socket	SL2S	SL2DS	-	-
		SL12S	SL12DS		

Transformer Rated Types

Elster	Bottom Con.	ABA-2	-	-	-
	Socket	ABS-2	-	-	8
General Electric	Bottom Con.	V63A	VM63A	-	8
	Socket	V63S	VM63S	-	-
Landis & Gyr	Bottom Con.	MT-5A	BMT-5A	TMT-5A	8
	Socket	MT-5S	BMT-5S	TMT-5S	8
Schlumberger	Bottom Con.	SL3A	SL3DA	-	-
	Socket	SL3S	SL4DS	-	8

ga - Watthour and Watthour-Demand Meters
Polyphase 2 element - 4 wire Delta - 120/240 volts

(Classes 100 or 200)

Self-Contained Types

Manufacturer	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
1	2	3	4	5	6
Elster	Bottom Con.	ABA-7	-	-	7 or 8
	Socket	ABS-7	-	-	-
General Electric	Bottom Con.	V66A	VM66A	-	7
	Socket	V66S	VM66S	-	-
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT-15S	BMT-15S	TMT-15S	7
Schlumberger	Bottom Con.	SL6A	SL6DA	-	-
	Socket	SL6S	SL6DS	-	7 or 8

ga - Watthour and Watthour-Demand Meters
Polyphase - 2-1/2 element - 4 wire wye - (120/208) (277/480) volt

(Classes 100, 200, 10, and 20)

Self-Contained Types

Manufacturer 1	Type of Base 2	Watthour Meter Type 3	Mechanical Demand Watthour Type 4	Thermal Demand Watthour Type 5	Number of Terminals 6
Elster	Bottom Con.	ABA-8	-	-	-
	Socket	ABS-8	-	-	-
General Electric	Bottom Con.	V65A	VM65A	-	7
	Socket	V65S	VM65S	-	-
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT-14S	BMT-14S	TMT-14S	7
Schlumberger	Bottom Con.	SL5A	SL5DA	-	-
	Socket	SL5S	SL5DS	-	7 or 8
Transformer Rated Types					
Elster	Bottom Con.	ABA-8	-	-	-
	Socket	ABS-8	-	-	13
General Electric	Bottom Con.	V65A	VM65A	-	7 or 13
	Socket	V65S	VM65S	-	-
Landis & Gyr	Bottom Con.	MT-6A	BMT-6A	TMT-6A	10
	Socket	MT-7S or 6S	BMT-7S or 6S	TMT-7S or 6S	7 or 13
Schlumberger	Bottom Con.	SL5A	SL5DA	-	-
	Socket	SL5S	SL5DS	-	13

ga - Watthour and watthour-Demand Meters

Polyphase - 3 element - 4 wire wye - (120/208) (277/480) volt

(Classes 100, 200, 10, and 20)

Self-Contained Types

Manufacturer 1	Type of Base 2	Watthour Meter Type 3	Mechanical Demand Watthour Type 4	Thermal Demand Watthour Type 5	Number of Terminals 6
Elster	Bottom Con.	ABA-3	-	-	-
	Socket	ABS-3	-	-	7 or 8
General Electric	Bottom Con.	V64A	VM64A	-	-
	Socket	V64S	VM64S	-	7 or 8
Landis & Gyr	Bottom Con.	-	-	-	-
	Socket	MT-16S	BMT-16S	-	7
Sangamo	Bottom Con.	S4A	S4DA	-	-
	Socket	S4S	S4DS	-	7 or 8

Transformer Rated Types

Elster	Bottom Con.	ABA-3	-	-	-
	Socket	ABS-3	-	-	-
General Electric	Bottom Con.	V64A	VM64A	-	-
	Socket	V64S	VM64S	-	13
Landis & Gyr	Bottom Con.	MT-9A	BMT-9A	-	12
	Socket	MT-9S or 10S	BMT-9S or 10S	-	13
Sangamo	Bottom Con.	SL4A	SL4DA	-	-
	Socket	SL4S	SL4DS	-	13

ga - Meters, Min/Max Indicating

Ammeters Indicating

Manufacturer	Type	Description
Biddle	50,000 Series	Thermal, Max Pointer
Demico	AD121R	Digital min/max ampere demand meter
ED Electric	Max-I-Meter(all models)	Thermal Ammeter
Schlumberger	ADS	Thermal Ammeter

Voltmeter, Min/Max

Manufacturer	Type	Description
Bitronics	VMAMC1	Digital Demand min/max voltmeter
Demico	AV121R	Digital min/max voltmeter
Reid and Rochon Associates	LVM-100	Digital Demand min/max voltmeter

ga - Watthour and Watthour-Demand Meters

Manufacturer	Conditions
Landis & Gyr	
Special base, 3 wire, 1 ø watthour meter, Type MS-K, Class 400 watthour and mechanical demand Type BMS-K watthour and thermal demand Type TMS-2K	1. To obtain experience. 2. To be used only where Class 400 meters are permitted by local regulatory bodies.
Socket base, 3 wire, 1 ø watthour meter, Type MS-E, Class 300	1. To obtain experience. 2. To be used only where Class 300 meters are permitted by local regulatory bodies.

Conditional List
ga(2)
February 25, 2010

ga - Watthour and Watthour-Demand Meters
Solid State Registers

Manufacturer	Conditions
Electro Industries/GaugeTech	
NEXUS 1262 Form 9S, Class 20 NEXUS 1272 Form 9S, Class 20	To obtain experience.
Elster	
Solid State Polyphase Watthour meter, Alpha line, A1, A and S type bases (all forms) Class 20 and 200, 120, 240, 277, and 480 V	To obtain experience.
GE	
kV Vector Meter Form 10A, 36A, 45A, 48A, 3S, 9S, 36S, 45S, 56S; Class 20; 120 V to 480V or 57V to 120V Form 13A, 16A; Class 150; 120V to 480 V Form 2S, 12S, 16S; Class 200 or 320; 120V to 480V	To obtain experience.
Sensus	
Socket base, single-phase watthour meters Form 1s, 12s, 2s, Class 200 @ 120, and 240 Volts Form 2s Class 320 @ 240 Volts Form 3s & 4s Class 20 @ 120, and 240 Volts	To obtain experience.
Socket base, poly-phase watthour meters Form 9s Class 20 @ 120-480 Volts Form 16s Class 200 @ 120-480 Volts	To obtain experience.
Itron Inc.	
SENTINEL Forms 9S, 10A, 45A, 45S, 46A, 46S, 48A, 66S Class 20 Form 16A Class 150 Forms 2S, 12S, 16S Classes 200 and 320	To obtain experience.

ga - Watthour and Watthour-Demand Meters
Solid State Registers

Manufacturer	Conditions
<u>Landis+Gyr</u>	
Solid State Watthour Meter Type DDS2, Form 5S, 6S, 8S, 9S, 10S, Class 20.	To obtain experience.
FOCUS Form 1S, Class 100 Form 25S, Class 200 Form 2S, Class 200TA30 and 200TA50 Form 2SE, Class 320TA30 and 320TA50 Form 2K, Class Class 4800/600 Form 3S, 4S, Class 10 and 20	
Altimus Solid State Meter Form 1S, Class 100 Form 25S, Class 200 Form 2S, Class 200TA30 and 200TA50 Form 2SE, Class 320TA30 and 320TA50 Form 2K, Class 480/600 Form 3S, 4S, Class 10 and 20	
S4 Polyphase Solid State Meter Form 5S/45S, 6S/36S, 9S/8S, Class 20 Form 12S, 16S, Class 200	
<u>Power Measurement</u>	
ION 8300 Form 9S, 35S, 36S Class 20	To obtain experience.
ION 8400 Form 9S, 35S, 36S, 39S, 76S Class 20	To obtain experience.
ION 8500 Form 9S, 35S, 36S, 39S, 76S Class 20	To obtain experience.
<u>Schlumberger</u>	
CENTRON Form 2S, Class 200. Solid State or Mechanical Register.	To obtain experience.
FULCRUM SQ400 Form 5A, 6A, 9A, 5S, 6S, 9S, 10S, Class 20	To obtain experience.
FULCRUM SL300 Series Form 5A, 6A, 8A, 9A, 5S, 6S, 8S, 9S, 10S, 12S, 14S, 15S, 16S, Class 20 and 200.	To obtain experience.
QUANTUM Q200 Series Form 5A, 6A, 8A, 9A, 5S, 6S, 8S, 9S, 10S, 26S, Class 20 and 200.	To obtain experience.
QUANTUM Q300 Series Form 6A, 9A, 6S, 9S, 10S, Class 10 and 20.	To obtain experience.
VECTRON SVX Form 5A, 6A, 8A, 10A(9A), 5S, 6S, 9S(8S), 12S, 16S(14S, 15S), 26S, Class 20 and 200.	To obtain experience.

ga - Watthour and Watthour-Demand Meters
Solid State Registers

Manufacturer	Conditions
Transdata, Inc. MARK-V EMS Form 5S, 5A, 6S, 6A, 8S, 8A, 9S, 9A Class20	To obtain experience.

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
ABB	#S		4, 5, 6	100
	STS		5, 6	200/400** 1ø 3w
	STS-2		8	200/400** 3ø 3w
	STS-3		13	200/400** 3ø 4w Y or Delta
	STS-7		8	200/400** 3ø 4w Delta
	STS-8		8 or 13	200/400** 3ø 4w Y
		STA-2		200/400 3ø 3w
		STA-3		200/400 3ø 4W Y or Delta
		STA-7		200/400 3ø 4w Delta
		STA		200/400 1ø 3w
# Anchor	1000 Series (1003-1006)	1000 Series (1003-1006)	4, 5	100
	1100 Series (1100-1109)	1100 Series (1100-1109)	4, 5, 7	150
	1200 Series (1201-1209)	1200 Series (1201-1209)	4, 5	200
		1200/1300 Series (1275-1300)	4, 5, 7	200
	1600 Series (1600-1661)	1600 Series (1600-1661)	4, 5	320
	1500 Series (1500-1526)	1500 Series (1500-1526)	4, 5	100/125 per sta.
	1500 Series (1530-1536)	1500 Series (1530-1536)	4, 5	150 per sta.
	1500 Series (1540-1546)	1500 Series (1540-1546)	4, 5	200 per sta.
	1400 Series (1405-1473)	1400 Series (1405-1473)	4, 5, 6, 7, 8, 13	20/100
Murray	SJ Series* (Single)	RJ Series* (Single)	4, 5, 6	100
	SN Series* (Single)	RN Series* (Single)	4, 5, 6	100
	SS Series* (Single)	RS Series* (Single)	4, 5, 6	200
		RH Series* (Single)	5, 7	200 HD

#Available with UL label
*UL label

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
Durham	R-RS512	RS502#	4 or 5	150
	R-RS502	RS512#		
		H-4300 Series#	4, 5, 7	320
		H-5300 Series#		
		H-7300 Series#		
	RS101-RS111#	RS101-RS111#	4 or 5	100
	2R1121-6R1131#	2R1121-6R1131#		
	2R1421-6R1431#	2R1421-6R1431#		
	RS202#	RS202#	4 or 5	200
	RS212, RS213#	RS212, RS213#	4 or 5	200
	RS220-RS233#	RS220-RS233#		
	2R2332-6R2392#	2R2332-6R2392#		
Eaton Electrical	R-RS512-CH	RS502-CH #	4 or 5	150
	R-RS502-CH	RS512-CH#		
		H-4300-CH Series#	4, 5, 7	320
		H-5300-CH Series#		
		H-7300-CH Series#		
	RS101-RS111-CH #	RS101-RS111-CH #	4 or 5	100
	2R1121-6R1131-CH#	2R1121-6R1131-CH #		
	2R1421-6R1431-CH #	2R1421-6R1431-CH #		
	RS202-CH #	RS202-CH #	4 or 5	200
	RS212-CH, RS213-CH #	RS212-CH, RS213-CH #	4 or 5	200
	RS220-RS233-CH #	RS220-RS233-CH #		
	2R2332-6R2392-CH #	2R2332- 6R2392-CH #		
Dyna-Tech	Overhead			
	1100-C - 1107-C	1000-C - 1007-C	4 & 5	100
	1300-C - 1307-C	1200-C - 1207-C	4 & 5	100
	2100-CH-2107-CH	2000-CH-2007-CH	4 & 5	200
	2300-CH-2307-CH	2200-CH-2207-CH	4 & 5	200
	Underground			
		2590-CHU-2597-CHU	4 & 5	200
		2790-CHU-2797-CHU	4 & 5	200
		2090-CHU-2097-CHU	4 & 5	200
		2290-CHU-2297-CHU	4 & 5	200
General Switch	42100 Series*		4, 5, 6	100

*UL Label
#Available with UL label

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
Landis & Gyr	Overhead			
	AS Series	AS Series	4, 5, 6	100-200
		A2 thru A6	4, 5	100-200
		Series (Multiple Mounting)		
		CQ#	4, 5, 7	200
		HQ#	4, 5, 7	200 HD
		HQ-T	6, 7, 8, 13	20
	Underground			
		RSU#	4, 5, 6	200
		CQ-U#	4, 5, 7	200
		HQ-U#	4, 5, 7	200
Milbank	Overhead			
		S7462, 3,4,5,6		
		U7362*, 3,4,5,6	4 or 5	100
	S7486 Series	R7486 Series*	4 or 5	100
	S7262 Series	U7262 Series*	4 or 5	150
	S7021 Series	U7021 Series*	4 or 5	200
	S9550 Series	U9550 Series*	4 or 5	200 (HD)
	S9700 Series	U9700 Series*	7	200 (HD)
	Underground			
	S8086-XL	U8086-XL*	4 or 5	100
	S8084-XL	U8084-XL*	4 or 5	150
	S7040-XL	U7040-XL*	4 or 5	200
	S9551-XL	U9551-XL*	4 or 5	200 (HD)
	S9701-XL	U9701-XL*	7	200 (HD)

Available with UL label
*UL label

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating Amps.
Superior	Overhead			
		501	4, 5	100
	314*	414*	4, 5	150
	314*	414*	4, 5	200
		452 Series	4, 5	150 per sta.
	382 Series	482 Series*	4, 5	200 per sta.
		492 Series	7	200 3ø 4w Y or Delta per sta.
		RLK Series*	5, 7	200 3ø 4W Y or Delta 600 V
	Underground			
Superior	314*	414*	4, 5	100
		414*	4, 5	150
		414	7	200 3ø 4w Y or Delta
		"RLPK" Series	5, 7	200 3ø 4w Y or Delta 600 V
		BRL 1915	4, 5	150 per sta.

#Available with UL label
* UL label
** Transformer rating in first figure; maximum loading shown by second figure

gb - Meter sockets

Manufacturer	Conditions
<u>Durham</u>	
M-400 ampere 4 or 5 jaws for use with Class 10 meters	To obtain experience.
<u>Landis & Gyr</u>	
Meter mounting device 400 ampere, Type K-4# for use with Type MS-K, 1 ø Duncan meters	1. To obtain experience. 2. To be used only where Class 400 meters are permitted by local regulatory bodies.
Socket type HQ-4S 4 jaws rated for Class 300 service	1. To obtain experience. 2. To be used only where Class 300 meters are permitted by regulatory bodies.
<u>Milbank</u>	
Type S1079-F, 4 jaws rated for Class 320 service	To obtain experience.

#Available with UL label.

gj - Crossarm Assemblies and Arm Spacers

Distribution

Wood crossarm assembly complete with braces and attaching hardware, fittings and bolts

Crossarm Assembly

Manufacturer	Crossarm Size	Catalog No.
Brooks	3-1/2” x 4-1/2” x 8'-0"	3103-A8
	3-3/4” x 5-3/4” x 8'-0"	3103-C8
	3-3/4” x 7-3/4” x 8'-0"	3203-A8
	3-3/4” x 7-3/4” x 10'-0"	3203-A10
Hughes Brothers	3-1/2” x 4-1/2” x 8'-0"	2890A
	3-3/4” x 5-3/4” x 8'-0"	2890B
	3-3/4” x 7-3/4” x 8'-0"	2892-A
	3-3/4” x 7-3/4” x 10'-0"	2892-B
Pennington	3-1/2” x 4-1/2” x 8'-0"	C500B
	3-3/4” x 5-3/4” x 8'-0"	C500F
	3-3/4” x 7-3/4” x 8'-0"	C500M

Twin Arm Spacer*

To be used with standard hardware, 3-5/8" x 4-5/8" x 8’-0” crossarm, and 28" wood braces

Line Hardware CAS-455

*Restricted to applications where the conductor's maximum design tension is less than 1250 lbs. and to conductor sizes 1/0 ACSR and below.

gj - Crossarm Assemblies

Braceless, wood

Manufacturer	Dimensions	Conditions
Aluma-Form		
HD-DEA-86-EB-REA	4-1/4” x 5-1/2” x 8’-0”	To obtain experience.
HD-2-DEA-86-EB-REA	5-3/8” x 5-1/2” x 8’-0”	
HD-DEA-108-EB-REA	4-1/4” x 5-1/2” x 10’-0”	
HD-2-DEA-108-EB-REA	5-3/8” x 5-1/2” x 10’-0”	
Hughes Brothers		
3377-A7.5	3-1/2” x 7-1/2” x 8’-0”	To obtain experience.
3377-A8.5	3-1/2” x 8-1/2” x 8’-0”	
3377-A9.5	3-1/2” x 9-1/2” x 8’-0”	

Braceless, fiberglass

Creative Utility Products		
CUP08RUS-SDE-0/2-A/S-S/D-3	4” x 6” x 8’-0”	To obtain experience
CUP10RUS-SDE-0/2-A/S-S/D-3	4” x 6” x 10’-0”	
Geotek (PUPI)		
DA2000-96	3-5/8” x 4-5/8” x 8’-0”	To obtain experience.
DA2000-120	3-5/8” x 4-5/8” x 10’-0”	
DA2500-96	3-5/8” x 4-5/8” x 8’-0”	
DA2500-120	3-5/8” x 4-5/8” x 10’-0”	
DA3000-96	3-5/8” x 4-5/8” x 8’-0”	
DA3000-120	3-5/8” x 4-5/8” x 10’-0	
DA4000-96	4” x 6” x 8’-0”	
DA4000-120	4” x 6” x 10’-0”	
MacLean Power Systems		
PZ08LD	4” x 6” x 8’ – 0”	To obtain experience.
PZ10LD	4” x 6” x 10’ – 0”	
PY08SD	4” x 6” x 8’ – 0”	
PY10SD	4” x 6” x 10’ – 0”	
PW08LD	3-5/8” x 4-5/8” x 8’ – 0”	
PW10LD	3-5/8” x 4-5/8” x 10’ – 0”	
Powertrusion		
PSD082A1FRUS	4” x 6” x 8’-0”	To obtain experience.
PSD102A1FRUS	4” x 6” x 10’-0”	
PHD082A1FRUS	4” x 6” x 8’-0”	
PHD102A1FRUS	4” x 6” x 10’-0”	
Shakespeare		
IDB096N1224(X)RUS**	3-1/2” x 4-1/2” x 8’-0”	To obtain experience.
XDB096N1224(X)RUS**	4” x 6” x 8’-0”	
HDB096N1224(X)RUS**	4” x 6” x 10’-0”	
IDB120N1224(X)RUS**	4” x 7-1/2” x 8’-0”	
XDB120N1224(X)RUS**	4” x 7-1/2” x 10’-0”	
(**X=2-Gray Color 5-Dark Bronze Color)		

gw - Crossarm Assembly for H-Frame Construction

Applicable Specification: RUS Specification T-7, Revision dated November 1962
Applicable Drawing: TH-11B Series (161 kV maximum)
No braces (TH-11B)
Two vee braces on outside (TH-11BVO)
Two vee braces on inside (TH-11BVI)
Four vee braces (TH-11BV4)

3-5/8" x 9-3/8" x 33' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

	TH-11B	TH-11BVO	TH-11BVI	TH-11BV4
	Items	Items	Items	Items
(Assemblies)	gw	gw and vo	gw and vi	gw and vv
Brooks (1, 2)	6411	6411-1	6411-2	6411-3
Hughes Brothers (1, 2)	C3316-B	C3316-B	C3316-B	C3316-B
Pennington (1, 2)	CCC11B72	CCC11B72-VO	CCC11B72-VI	CCC11B72-V4

1 - Fixed spacer fitting sizes as required
2 - Adjustable spacers are available

gw - Crossarm Assembly for H-Frame construction
(Double Arm) 230 kV (Small Angle)

Applicable Specification: RUS Specification T-8, Drawing: TH-231B

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 9-3/8"

Manufacturer	Catalog Number
Brooks (1, 2)	64231
Hughes Brothers (1, 2)	C-3338-B
Pennington (1, 2)	CCC231B82

Crossarm 5-1/8" x 7-1/2"

Brooks (1, 2)	64231L
Hughes Brothers (1, 2)	C-3338-BL
Pennington (1, 2)	CCC231BT

1 - Fixed spacer fitting sizes as required.
2 - Adjustable spacers are available.

gy - Crossarm Assembly for H-Frame Construction
(Double Arm)

Applicable Specification: RUS Specification T-7, Revision dated November 29, 1962

Applicable Drawing: TH-10 Series
No braces (TH-10)
Two vee braces on outside (TH-10VO)
Two vee braces on inside (TH-10VI)
Four vee braces (TH-10V4)

3-5/8" x 9-3/8" x 32' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

	TH-10	TH-10VO	TH-10VI	TH-10V4
	Items	Items	Items	Items
(Assemblies)	gy	gy and vo	gy and vi	gy and vv
Brooks (1, 2)	6410	6410-1	6410-2	6410-3
Hughes Brothers (1, 2)	C-3316-A	C3316-A	C-3316-A	C-3316-A
Pennington (1, 2)	CCC1071	CCC1071-VO	CCC1071-VI	CCC1071-V4
Niedermeyer-Martin (1)	N-6710	N-6711	N-6712	N-6713

1 - Fixed spacer fitting sizes as required

2 - Adjustable spacers are available

gy - Crossarm Assembly for H-Frame Construction (Double Arm) 230 kV (Tangent)

Applicable Specification: RUS Specification T-8

Applicable Drawing: TH-230

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 9-3/8"

Manufacturer	Catalog No.
Brooks (1, 2)	64230
Hughes Brothers (1, 2)	C-3338-A
Pennington (1, 2)	CCC23081
Niedermeyer-Martin (1)	N-6720

Crossarm 5-1/8" x 7-1/2"

Brooks (1, 2)	64230L
Hughes Brothers (1, 2)	C-3338-AL
Pennington (1, 2)	CCC230T

1 - Fixed spacer fitting sizes as required.

2 - Adjustable spacers are available.

gz - Crossarm Assembly for Wishbone Construction "Z" Type (Single Arm)

Applicable Specification: RUS Specification T-5

Applicable Drawings: RUS Drawing TSZ-1

3-5/8' x 5-5/8" wood crossarm assembly complete with brace and attaching hardware, fittings, and bolts

The following manufacturers have shown compliance with the applicable specifications for this assembly:

Manufacturer	Catalog Nos. or Drawing Nos.
Brooks	64Z1
Hughes Brothers	C-3162-A and C-3162.10

gz - Crossarm Assembly for Wishbone Construction, "Z" Type (Double Arm)

Applicable Specification: RUS Specification T-5

Applicable Drawings: RUS Drawings TSZ-2

3-5/8" x 5-5/8" wood crossarm assembly complete with brace and attaching hardware, fittings and bolts

The following manufacturers have shown compliance with the applicable specifications for this assembly:

Manufacturer	Catalog Nos. or Drawing Nos.
Brooks (2)	64Z2
Hughes Brothers	C-3162-B and C-3162.10

(2) Adjustable spacers are available.

Conditional List
rp(1)
July 2009

rp - Wildlife Guards

Bushings and Live Parts Covers

Manufacturer	Conditions
Chris Kaye (Critter Guard)	
201 - "L" Bracket	To obtain experience.
202 – Roller	
203 - Wheel	
Hendrix Wire & Cable	
BG-9 Bushing Cover	To obtain experience.
Hendrix (Eco Electrical Systems, Inc.)	
EICG-1 Insulator/Conductor Cover	
EICG-1-WLPT Insulator/Conductor Cover	To obtain experience.
EICG-1-20 Insulator/Conductor Cover	
EICG-1-32 Insulator/Conductor Cover	
Kaddas Enterprises Inc.	
KE1045A* Birdguard	To obtain experience.
KE1066* Arrester cap	
KE1077* Bushing cover	
KE1053* Arrester cap	
KE1064* Bushing cover	
KE 1049* Birdguard	
Tripp (Eco Electrical Systems, Inc.)	
ECC-1 Cutout Cover	
ECC-2-27-150BIL-S&C-Version 10 Cutout Cover	To obtain experience.
ECC-3-27-150BIL-S&C-Version 9 Cutout Cover	
ECC-4-27-125BIL-S&C-Kearney HX Cutout Cover	
ECC-5-ABB-LBU Cutout Cover	
Universal Thermography, Inc.	
TGB-50007 Bushing Cover	To obtain experience.
TGB-65010 Bushing Cover	
TGB-82512 Bushing Cover	
W. H. Salisbury & Co.	
21116 Bushing Cover	To obtain experience.
21317 Tri-Port Bushing Cover	
BC512 Cone Bushing Cover	
38-2SC Stinger Cover 3/8” IDx2’	
38-12SC Stinger Cover 3/8” IDx12’	
38-18SC Stinger Cover 3/8” IDx18’	
38-50SC Stinger Cover 3/8” IDx50’	
38-100SC Stinger Cover 3/8” IDx100’	
58-12SC Stinger Cover 5/8” IDx12’	
58-50SC Stinger Cover 5/8” IDx50’	
58-100SC Stinger Cover 5/8” IDx100’	
34-12SC Stinger Cover 3/4” IDx12’	
34-25SC Stinger Cover 3/4” IDx25’	

NOTE: The material composition of these items does not contain a flame-retardant unless specified by the manufacturer.

*Specified by manufacturer as being flame-retardant

Conditional List
rp(1.1)
March 25, 2010

rp - Wildlife Guards
Bushings and Live Parts Covers

Manufacturer	Conditions
Tyco Electronics	
BCAC Bushing Connection Animal Covers	To obtain experience.
BCIC Bus Connection Insulating Covers	
BISG Bus Insulator Squirrel Guard	
MVLC Medium Voltage Line Cover (5-25kV)	

NOTE: The material composition of these items does not contain a flame-retardant unless specified by the manufacturer.

Anti-Perch Devices

Manufacturer	Conditions
Hendrix Wire & Cable Catalog No. HPP-24	To obtain experience

NOTE: The material composition of these items does not contain a flame-retardant unless specified by the manufacturer.

sb - Switch, disconnect (single-pole, hook operated station class)

NEMA standard switches for station or line structure use where single-pole switching is permissible

Manufacturer	Type	Voltage Ratings	System Voltages Line to Line
ABB	HPL	15 thru 69 kV	12.5 thru 69 kV
Bridges	EH	15 thru 69 kV	12.5 thru 69 kV
	EHL(L)	15 thru 34.5 kV	12.5 thru 34.5 kV
Cleaveland/Price	LCO-C	15 thru 69 kV	12.5 thru 69 kV
Cooper Power Systems	D2(PL)	15 and 23 kV	12.5 thru 24.9 kV
G & W Electric	B-2M	15 thru 69 kV	12.5 thru 69 kV
	EV(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
Hubbell (Chance)	M3(PL)	15 thru 27 kV	12.5 thru 24.9 kV
Johnson	HPT	15 thru 69 kV	12.5 thru 69 kV
Joslyn (Hi-Voltage)	HU	15 thru 34.5 kV	12.5 thru 34.5 kV
	HI	15 thru 34.5 kV	12.5 thru 34.5 kV
Kearney/Cooper Power Systems	M-72(PL)	15 thru 69 kV	12.5 thru 69 kV
	H-72	15 thru 34.5 kV	12.5 thru 34.5 kV
MEMCO	STV	15 thru 69 kV	12.5 thru 69 kV
	STU	15 thru 69 kV	12.5 thru 69 kV
Morgan	DHS(PL)	15 thru 69 kV	12.5 thru 69 kV
Royal	BT	15 thru 69 kV	12.5 thru 69 kV
Switchgear	BLT(PL)	15 and 23 kV	12.5 thru 24.9 kV
S & C*	LBD(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
	Alduti (L)	15 and 25 kV	12.5 thru 24.9 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available for voltages 34.5 kV and below. Consult switch manufacturer concerning loop switching applications at higher voltages.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line
structure use where single-pole switching is permissible

Manufacturer	Type	Voltage Ratings	System Voltages Line-to-Line
Seeco	BT	34.5 thru 69 kV	34.5 thru 69 kV
Siemens-Allis	HA	15 thru 69 kV	12.5 thru 69 kV
	HS(PL)	15 and 25 kV	12.5 thru 24.9 kV
Southern States	PBO	15 thru 69 kV	12.5 thru 69 kV
	*PBN	15 thru 23 kV	12.5, 13.2, 24.9 kV
USCO	HH(PL)	15 thru 69 kV	12.5 thru 69 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

* With steel base only.

(PL) Means hooks for portable load interrupters are available for voltages 34.5 kV and below. Consult switch manufacturer concerning loop switching applications at higher voltages.

sb - Switch, disconnect (single-pole, hook operated distribution class)*

For distribution line use where power class insulation is not required and single-phase switching is permissible.

(Not suitable for substation use)

Manufacturer	Type	Voltage Rating	System Voltage Line-to-Line
Cooper Power Systems	D2(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
G & W Electric Company	EV(PL)	15 kV	12.5 kV
Hubbell (Chance)	M3(PL)	15 and 27 kV	12.5 thru 24.9 kV
Kearney/Cooper Power Systems	D-73(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Morgan	DHS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Royal Switchgear	BLT-F(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
S & C**	LBD(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Siemens-Allis	HD(PL)	15 and 25 kV	12.5 thru 24.9 kV

NOTE: Switches on this page must be furnished with four bolts for double crossarm mounting.

(L) Means solid material load interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

(LV) Means vacuum interrupters are available and accepted.

*Steel bases only.

**Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sb - Switch, hookstick
(line tension switches)

for use on 12.5/7.2 kV systems only

Manufacturer	Conditions
AMP AMPACT	To obtain experience.
Bridges 127	To obtain experience.
Hubbell (Chance) ALTD06200R	To obtain experience.
Royal Switchgear IL6B-H (available with silicone polymer insulators as catalog number IL6NP)	To obtain experience.

NOTE: All switches listed on this page have hooks for portable load interrupters.

sc - Regulators, Voltage
12.5/7.2 kV
13.2/7.62 kV

Applicable Specification: "RUS Specification for Substation Regulators," S-2

Type	Size	Description
	ABB	
UTS, UTT	167-1000 kVA	(S) Three phase step type
	Cooper Power Systems	
VR-32	19.1 - 833 kVA	(SL)Single phase - step type
AB	50 amp.	(L) Single-phase - step type (Auto-Booster)
	General Electric	
VR-1	38.1 - 509 kVA	(SL) Single-phase - step type
MLT	500 - 1000 kVA	(S) Three-phase - step type
VML-32	500 - 833 kVA	(S) Single-phase - Vacuum step type
VMLT-32	1200 - 2800 kVA	(S) Three-phase - vacuum step type
	Siemens-Allis	
JFR	38.1 - 667 kVA	(SL) Single-phase - step type

(L) Indicates line use
(S) Indicates substation use

sc - Regulators, Voltage
24.9/14.4 kV

Type	Size	Description
	Cooper Power Systems	
VR-32	72 - 833 kVA	(SL) Single phase - step type
AB.	50 amp	(L) Single phase - step type (Auto-Booster)
	General Electric	
VR-1	72 - 576 kVA	(SL) Single phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 4666 kVA	(S) Three phase - vacuum step type
	Siemens-Allis	
JFR	72 - 833	(SL) Single phase - step type

(L) Indicates line use
(S) Indicates substation use

sc - Regulators, Voltage

Manufacturer	Conditions
General Electric	
Three-phase, step-type substation regulator Type TMLT-32 (13.2/7.62 kV)	To obtain experience.
Howard Industries, Inc.	
Single-phase, 32 step, line/substation, 50, 75, 100, 150, 219, 328, 438, 546, and 656 ampere, 7.62 kV, Type SVR-1	To obtain experience.
Single-phase, 32 step, line/substation, 50, 100, 150, 200, 231, 300, 400, 463, and 578 ampere, 14.4 kV, Type SVR-1	
Siemens-Allis	
Three-phase, step-type substation regulator Type SFR (13.2/7.62 kV)	To obtain experience.

sd - Current Transformers
Outdoor Type

Manufacturer	.6 kV	15 kV	25 kV	34.5 kV	69 kV
ABB	CSF/CMS	KOR-11	ICT-150	ICT-200	ICT-350
	CMF	KON-11	KOR-l5	KOR-20	-
	CLC/CLE	KOT-11	KOT-l5	-	-
Andover	DCBW	-	-	-	-
	DCCW	-	-	-	-
	DCAB	-	-	-	-
G.E.C. Durham Industries (Astra)	AA&TA	-	-	-	-
	AB	-	-	-	-
	AD&AC	-	-	-	-
Electromagnetic Industries (Square D)		CO3-110	CO3-150	CO3-200	lK-350
General Electric	JCR-0	JKW-5	JKW-6	JKW-7	JKW-350
	JCW-0	JCK-5	JKW-150	JKW-200	KG-350
	JAK-0	-	KG-150	KG-200	
	JAD-0	-	-	-	-
Kuhlman Electric		BB-15-971	BB-25-973	BB-34-975	COF-350
		BB-15-972	BB-25-974	BB-34-976	-
Schlumberger	R6S	-	-	-	-
	R6SA	-	-	-	-
	R6M	-	-	-	-
	R6L	-	-	-	-

NOTE: The transformer types listed above are accepted in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

sd - Current Transformers
Outdoor Types

Manufacturer	Conditions
<u>Electromagnetic Ind. (Square D)</u> Type UMCT, 0.6 kV Type UCT, 0.6 kV Type IK 4-350-69, 69 kV (cycloaliphatic resin bushings)	To obtain experience.
<u>Ritz Instrument Transformers, Inc.</u> GIFU 15-01; 0.3 B0.1-1.8, 15kV GIFU 15-01; 0.3 B0.1-0.5, 15kV GIFU 25-01; 0.3 B0.1-0.9, 25kV GIFU 25-01; 0.3 B0.1-2.0, 25kV GIFS 36-55; 0.3 B0.1-0.9, 34.5kV GIF 36-69; 0.3 B0.1-2.0, 34.5kV GIF 72.5-68; 0.3 B0.1-2.0, 69 kV	To obtain experience.

se - Voltage Transformers

Outdoor Types

Manufacturer	.6 kV	15 kV	25 kV	34.5 kV	69 kV
ABB	PPM	VOG-ll	LPT-l50	LPT-200	LPT-350
	-	VOY-ll	VOG-l5	VOG-20	-
	-	VOZ-ll	VOZ-l5	VOZ-20	-
Andover	DVE-6	-	-	-	-
	DVF-6	-	-	-	-
Electromagnetic Industries (Square D)		PO5-110	PO5-150	PO5-200	U3-350-69
General Electric	JVA-0	JVW-5	JVW-6	JVW-7	ET-350
	JVP-0	JVW-110	-	-	JVT-350
	-	-	JVT-150	JVT-200	-
Kuhlman Electric	-	PTT-110-977	-	-	POF-350
Schlumberger	T5R	-	-	-	-
	T6R	-	-	-	-
	T7R	-	-	-	-

NOTE: The transformer types listed above are acceptable in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

se - Voltage Transformers

Outdoor Types

Manufacturer	Conditions
G.E.C. Durham Industries (Astra)	
Type DB, 0.6 kV	To obtain experience.
Type DA, 0.6 kV	
Type DF, 0.6 kV	
Electromagnetic Industries (Square D)	
Type U-450, 0.6 kV	To obtain experience.
Type U-4-350-69, 69 kV (cycloaliphatic resin bushings)	
Ritz Instrument Transformers, Inc.	
VZF 15-20; 2 Bushing 0.3WXYZ, 15 kV	To obtain experience.
VZF 15-10; 2 Bushing 0.3WXY, 15 kV	
VEF 15-10; 1 Bushing 0.3WXY, 15 kV	
VEF 15-20; 1 Bushing 0.3WXYZ, 15 kV	
VZF 25-10; 2 Bushing 0.3WXYZ, 25 kV	
VEF 25-10; 1 Bushing 0.3WXYZ, 25 kV	
VZF 36-10; 2 Bushing 0.3WXY, 34.5 kV	
VEF 36-10; 1 Bushing 0.3WXY, 34.5 kV	
VEF 72-03; 1 Bushing 0.3WXYZ, 69 kV	

sj - Switches, oil circuit recloser by-pass

Manufacturer	15 kV For use on12.5/7.2 kV_systems	27 kV For use on 24.9/14.4 kV systems	27 kV* For use on 34.5/19.9 kV systems	Current Rating Amperes
Cooper Power Systems	FW77D7	FW77D9	FW77D9	600
Hubbell (Chance)	M3-R	M3-R	M3-R	600
Kearney/Cooper Power Systems	D73RB	D73RB		600

*Not For Use In Substations

sk - Switch, regulator by-pass - disconnect
For outdoor use

Manufacturer	15 kV for use on 12.5/7.2 kV Systems	27 kV for use on 24.9/14.4 kV Systems	Current Rating Amperes
Hubbell Power Systems, Inc.	BPR	BPR	600
Kearney/Cooper Power Systems	HB-65	HB-65	600
S & C Electric*	XL	XL	600
Siemens-Allis	HR	HR	600
Southern States	BR	BR	400,600

NOTE: All switches should be furnished with NEMA standard insulators and with 110 kV BIL rating (15 kV systems) or 150 BIL ratings (25 kV systems) for station use.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sk - Switch, regulator by-pass - disconnect
For outdoor use

Manufacturer	Conditions
Cooper Power Systems Type B, 15 kV, 400 amperes, 110 kV BIL for station use, 95 kV BIL for line use.	To obtain experience.

NOTE: All switches should be furnished with NEMA standard insulators and with 110 kV BIL rating for station use.

sl - Switch, Combination Power Fuse and Disconnect

(Used with an additional disconnect switch to by-pass oil circuit reclosers at substations)

Manufacturer	15 kV for use on 12.5/7.2 kV systems	27 kV for use on 24.9/14.4 kV systems
Joslyn (Hi-Voltage)	RFH	-
Kearney/Cooper Power Systems	MHX	MHX
S & C Electric*	SMD/LBD XS/LBD	SMD/LBD -
Southern States	SF	-

NOTE: All switches and cutouts should be furnished with NEMA standard insulators.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sr - Steel Conductor for Substation Grounding, Copper-Clad or Galvanized

(See av-2 for copper grounding conductor)

Manufacturer	Conditions
CommScope BiMetals 40% conductivity copper-clad steel (dead soft annealed) in sizes: 1/2" (7 No. 6 AWG) 9/16" (7 No. 5 AWG) 5/8" (7 No. 4 AWG) 13/16" (19 No. 6 AWG) 7/8" (19 No. 5 AWG)	1. To obtain experience. 2. When used in soil with resistivity of 25 ohm-meters (2500 ohms per centimeter cube) or less cathodic protection must be incorporated into the grounding design.
Copperweld Steel 40% conductivity DSA Copperweld Strand in sizes: 1/2" (7 No. 6 AWG) 9/16" (7 No. 5 AWG) 5/8" (7 No. 4 AWG) 13/16" (19 No. 6 AWG) 7/8" (19 No. 5 AWG)	1. To obtain experience. 2. When used in soil with resistivity of 25 ohm-meters (2500 ohms per centimeter cube) or less cathodic protection must be incorporated into the grounding design.
Indiana Steel & Wire Steel Strand, BB Grade, Class C galvanized 5/8" (19 wire) 1/2" (7 wire) 9/16" (7 wire) 7/16" (7 wire)	1. To obtain experience. 2. When used in soil with resistivity of 25 ohm-meters (2500 ohms per centimeter cube) or less cathodic protection must be incorporated into the grounding design.

vx - Cross Brace assembly, 3-3/8" x 5-3/8"
with hardware and fittings (Dwg. TM-110, RUS Specification T-7)

Manufacturer	Catalog No.
Brooks	
Item 1-vx	6685-1
Item 2-vx	6685-2
Hughes Brothers	
Item 1-vx	1042-1
Item 2-vx	1042-2
Niedermeyer-Martin	
Item 1-vx	N-6714-1
Item 2-vx	N-6714-2
Pennington	
Item 1-vx	CCC-67-1
Item 2-vx	CCC-67-2

Cross Brace assembly, 3-5/8" x 7-1/2" Min.
with hardware and fittings (Dwg. TM-110, RUS Specification T-8)

Manufacturer	Catalog No.
Brooks	6695
Hughes Brothers	2061A
Niedermeyer-Martin	N6721
Pennington	CCC69

PART II

Underground Distribution Equipment

U ae - Surge Arresters, Distribution for Underground System Pole Risers (Lightning Arresters)

SiC Type

Manufacturer	Type	Accepted Ratings - kV	Duty	Manufacturer's Classification	Housing
ABB	GLV	9, 10	Normal	Distribution	
	LVBB	18	Normal	Distribution	
General Electric	Alugard	9, 10, 18	Heavy	Distribution	

NOTE: The arresters listed on this page may be used singly or in parallel, but must be applied in accordance with paragraph VI.A., in RUS Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Conditional List
U ae(1)
September 17, 2009

U ae - Arresters, Surge

(Shielded for Underground System Pad-Mounted Equipment)

CONDITION OF ACCEPTANCE: To Obtain Experience

ELBOW ARRESTERS

Manufacturer	Type	Ratings, kV	Type	Interface
Cooper Power Systems	M.O.V.E.	9/10	MOV	15 kV
	M.O.V.E.	18	MOV	25 kV
	VariGAP	9/10	(1)	15 kV
	VariGAP	18	(1)	25 kV
	Posi-Break M.O.V.E.	3-21	MOV	25 kV
	VariGAP Posi-Break M.O.V.E.	9-15	MOV	25 kV
Elastimold ESNA	167 ESA-10	10	MOV	15 kV
	273 ESA-18	18	MOV	25 kV
Hubbell	PDE	9,10	MOV	15kV
	PDE	18	MOV	25kV
Joslyn	ZE	10	MOV	15 kV
		18	MOV	25 kV

PARKING STAND ARRESTERS

Manufacturer	Type	Ratings, kV	Type	Interface
Cooper Power Systems	MOV PSA	9/10	MOV	15 kV
	MOV PSA	18	MOV	25 kV
	MOV VariGAP PSA	9/10	(1)	15 kV
	MOV VariGAP PSA	18	(1)	25 kV
Elastimold ESNA	167 PSA-10	10	MOV	15 kV
	273 PSA-18	18	MOV	25 kV

BUSHING ARRESTERS

Manufacturer	Type	Ratings, kV	Type	Interface
Elastimold ESNA	167 BSA-10	10	MOV	15 kV
	273 BSA-18	18	MOV	25 kV

(1) MOV Type (Internally Gapped)

U ae - Arresters, Surge
(For Underground System Pole Risers)

CONDITION OF ACCEPTANCE: To Obtain Experience

MOV Type

Manufacturer	Type	Accepted Ratings - kV	Duty	Manufacturer' Classification	Housing
ABB	HMX	9,10,18	Heavy		
	RMX	9,10,18		Intermediate *	
	XPR	9,10,18,27	Heavy	Distribution	Polymer
Cooper	CPS AZR VariSTAR	9,10,18,27	Heavy	Distribution	Porcelain
	URS UltraSIL VariSTAR	9,10,18,27	Heavy	Distribution	Polymer
General Electric	Tranquell ** U.D. II	9,10,18,27	Normal	Distribution	Porcelain
	Tranquell	9,10,18,27	Normal	Intermediate	Porcelain
Hubbell (Ohio Brass)	DynaVar-PVR	9,10,18,27	Heavy	Riser Pole	Polymer
Joslyn	ZRP	9,10,18,27	Heavy	Distribution	Polymer

*Has intermediate class arrester characteristics but does not have intermediate class venting capability.
**A non fragmenting U.D. II Arrester is available for 9 & 10 kV designs at higher cost when specified.

U ae - Arresters, Surge
(For Underground System Pole Risers)

CONDITION OF ACCEPTANCE: To Obtain Experience

MOV Type (Internally Gapped)

Manufacturer	Type	Accepted Ratings - kV	Duty	Manufacturer's Classification	Housing
Cooper Power Systems	URT Evolution	9,10,18,27	Heavy	Distribution	Polymer

U an - Transformers, Distribution
Pad-Mounted, Dead-Front

(For underground application)

Manufacturer	Single-Phase 5 - 167 kVA	Three-Phase 30 - 2500 kVA
ABB	"Mini-Pak U-5"	Type MTR (75-1500 kVA) "Plazapad-U5" (2000-2500 kVA)
Central Moloney	"REA-LP"	-
Cooper Power Systems*	"REA Shrubline"	"REA Terra-Tran"
*Cooper Envirotemp FR3 dielectric fluid is available as an option		
ERMCO	"Low-Profile"	-
General Electric	-	"Compad IV - REA"
H. K. Porter (Delta-Star)	"Low Profile U 5-R"	"Porter U5-R3"
Howard	"Hi Pad REA"	"Hi Pad 3 REA"
Kuhlman	"Lo-Pak ELR"	"K-PAK-3 REA"
Pauwels Tranformers	"Turf-Hugger-R"	"Turf-Hugger-R"
United (KAEC)	"Pad-Mount" 15-100 kVA (1) "Pad-Mount" 25 & 50 kVA (2)	-
VanTran	"Mini-Pad U5" (1)	"VanTran III-U5"

NOTES

All acceptances are based on RUS Specification U-5, "Specifications for Pad-Mounted Transformers (Single and Three Phase)."

All single-phase and three-phase transformers above accepted for the following voltages (kV) unless otherwise noted: 12.47/7.2; 13.2/7.6; 24.9/14.4; and 24.9/14.4 x 12.47/7.2 dual voltage

(1) Accepted for 12.47/7.2 kV and 13.2/ 7.62 kV only.

(2) Accepted for 24.9/14.4 kV only.

The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

Not all kVA sizes in above kVA ranges are available from all listed manufacturers.

Some of the above single-phase and three-phase transformers are available with internal under oil surge arresters. The availability and type of arresters vary with each manufacturer. The following types of under-oil arresters are acceptable: "UMX", "Tranquell" and "AZU."

U an - Transformers, Distribution
Pad-Mounted, Dead-Front

(For unit residential underground application)
(Single-phase, 7.2 kV and 7.6 kV)

Manufacturer	5 - 25 kVA Only
ABB	"Micro-Pak U-5"
Central Moloney	"REA-Mini-LP"
Cooper Power Systems*	"Ranch Runner"
*Cooper Envirotemp FR3 dielectric fluid is available as an option	
ERMCO	"REA-MicroTrim"
Howard	"Spacesaver Pad"

NOTES

All acceptances are based on RUS Specification U-5, “Specifications for Pad-Mounted Transformers (Single and Three Phase).”

The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U an - Transformers, Distribution
Pad-Mounted, Dead-Front

(For underground application)

Conditions for Acceptance: To Obtain Experience

Manufacturer	Type
ABB	"Mini-Pak U-5" - Single-phase with composite fiberglass enclosure "Mini Three Phase" (MTP) 30 - 225 kVA
Cam Tran	"Cam Tran" - Three-phase, 12.47/7.2 and 13.2/7.6 kV; 30-2500 kVA
Carte	Three-phase, 24.9/14.4 kV, 30 - 2,500 kVA
Cooper Power Systems*	Single-phase, self-protected with "Magnex" interrupter Single-phase, self-protected with "AZU" MOV heavy-duty, under-oil arrester *Cooper Envirotemp FR3 dielectric fluid is available as an option
ERMCO	"E-PAD" Three-phase, 12.47/7.2 kV; 30-2,500 kVA "E-PAD" Three-phase, 24.9/14.4 kV; 30-2,500 kVA
General Electric	"Compad -IV-REA" - Three-phase, 75-750 kVA All above with amorphous metal cores
GE-Prolec	Mini Padmount, Single-phase, 10-167 kVA Three-phase, 12.47/7.2 kV, 45-2,500 kVA Three-phase, 24.9/14.4 kV, 45-2,500 kVA
Square D	Class 7230 REA - Three-phase, 75-2500 kVA 12.47/7.2 kV and 13.2/7.62 kV
Van Tran	"Mini-Pad U5" - 5-167 kVA, 24.9/14.4 kV

NOTES

All acceptances are based on RUS Specification U-5, "Specifications for Pad-Mounted Transformers (Single and Three Phase)."

All single-phase and three-phase transformers above conditionally accepted for the following voltages (kV) unless otherwise noted: 12.47/7.2; 13.2/7.6; 24.9/14.4; and 24.9/14.4 x 12.47/7.2 dual voltage

The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

Not all kVA sizes are available from all listed manufacturers.

U ax - Cutout and Arrester, Combination for Underground System Pole Risers

Nominal System Voltage	For 12.5/7.2 kV		For 13.2/7.6 kV	For 24.9/14.4 kV
Cutout Maximum Voltage Rating	7.8 kV	15 kV	15 kV	27 kV
Application	1ø Risers	3ø Risers	1ø and 3ø Risers	1ø and 3ø Risers
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps
Manufacturer	Catalog Numbers			
ABB	7.8LBU-II/10 LV	15LBU-II/10 LV	15LBU-II/10 LV	24.9LBU-II/18 LV
Cooper	AFS300B Series	AFS300C Series	AFS300C Series	AFS300D Series
General Electric	9F80	9F80	9F80	9F80
Hubbell (Chance)	C7 Series	C7 Series	C7 Series	C7 Series
Southern States	CA Series	CA Series	CA Series	CA Series

NOTE: The units listed on this page may be used with single arresters or arresters in parallel, but must be applied in accordance with paragraph VI.A. in RUS Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

U ax - Cutout and Arrester

Combination for Underground System Pole Risers

Metal Oxide Type Arresters

Nominal System Voltage	For 12.5Y/7.2 kV		For 13.2Y/7.6 kV	For 24.9Y/14.4 kV	Conditions
Cutout Maximum Voltage Rating	7.8 kV	15 kV	15 kV	27 kV	
Application	1ø Risers	3ø Risers	1ø and 3ø Risers	1ø and 3ø Risers	
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps	
Manufacturer	Catalog Numbers				
Cooper Power Systems	L4A1P1A00-ECOA(9kV)	L9C1P1A00-ECOA(9kV)	L9C1P1A00-ECOA(9kV)	L9D1P1A00-EGOA	To obtain experience
	L4A1P1A00-EDOA(10kV)	L9C1P1A00-EDOA(10kV)	L9C1P1A00-EDOA(10kV)	-	To obtain experience.

Note 1: Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with RUS Bulletin 61-3, "Underground Rural Distribution."

Note 2: Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

U be - Reclosers, pad-mounted

Manufacturer	Conditions
Cooper Power Systems Single phase, vacuum interrupter, Type PV4H Maximum voltage 14.4 kV for 12.5 and 13.2/7.62 kV	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

U be - Reclosers, vacuum interruption with solid dielectric

Manufacturer	Conditions
G & W Electric Company Three phase, electronic, VIPER Series, vacuum interruption, solid dielectric, 800 amps maximum continuous, 12,500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14/4 kV.	To obtain experience.

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

U cg - Switch, air, three-pole, group-operated for pole-mounted cable risers (Factory Preassembled)

Manufacturer	Mounting	Vertical Break Type kV	Side Break Type kV
ABB	Vertical	LB3-VR(L)15	-
Hubbell (Chance)	Vertical	-	D7(L)15-27
	Horizontal	-	D7(L)15-27
Kearney/Cooper Power Systems	Horizontal	SB_R(L)15-35	-
S & C*	Vertical	-	Alduti(L)15-25
	Horizontal	-	Alduti(L)15-25

(L) Means gas or solid material full-load interrupters are accepted and available.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods.

U cg - Switch, Air, Three-Pole, Group Operated

Manufacturer	Conditions
Hubbell (Chance) Type AR side-break, horizontal and vertical mounting, with non-conducting crossarm type base and insulated interphase and control rods, 15, 25 , and 34.5 kV (grounded wye)	To obtain experience.
S & C* Omni-Rupter (L), side break horizontal and vertical mounting with non-conducting crossarm type base and insulated interphase and control rods, 15 kV and 25 kV	To obtain experience.

(L) Means full-load interrupter accepted and available.

*Available with porcelain insulators. Available with Cypoxy insulators through 34.5 kV on request.

U fw - Secondary Tap Connector

Manufacturer	Type or Catalog No.
Tyco (Raychem)	Compression Connectors CRSM-CT-34/10-150 CRSM-CT-53/13-200 CRSM-CT-84/20-250 Standard Split Bolt CRSM-CT-53/13-200

U fz - Transformer Connector Block, Insulated

Multiple Cable Connectors

Watertight - For use in all locations

Manufacturer	Connection Type	Catalog Number
Blackburn	Lug	SCU, with lugs and sleeves
Burndy	Lug	Stud Mole with sealing sleeve
Utilco	Set Screw	PTF-SS, Watertight insulated transformer connector block

Non-Watertight - For use in above grade locations only

Alcoa	Lug	Interchange 1 ABBD Series (Disconnectable) Use with A9 insulating boots
Alcon	Set Screw	VBTT Series with double sealing sleeve
Blackburn	Set Screw	TSB-J58C (Permanent)
	Set Screw	TSB-D58C (Disconnectable)
Burndy	Set Screw	K-D Series (Disconnectable) K-DF Series (Permanent)
Carr Industries, Inc.	Set Screw	UB Series
Connector Mfg. Co.	Set Screw	Uni-Joint Bar Connectors, (Series RLS, NSM-C, NDS-C, NSC, ZS-C, ZSU-C, RLUS) (Permanent)
	Set Screw	Uni-Joint Bar Connectors, (Series RLSS, NSSM-C, NSSC, ZQC, ZQU-C, RLUSS) (Disconnectable)
ESP	Lug	Types SUR and RDSR(Removable) (With Types LA and AL-lugs and Sleeve kits)
	Set Screw	Type UPSO-I (Permanent) Type UPM-I (Disconnectable)
Homac	Lug	DF Series
	Lug	FTU 125 Series(Disconnectable) with flood seal sleeve kit
	Set Screw	ABD, ABK, ABS, ABW, CLRTR, CSW, CSS, LRT, RAU, EZC, Z series; ZBK with SB covers; ZVW with boot
Hubbell (Fargo)	Bolted	GUC Series
	Set Screw	GUS-460S Series
MacLean (Reliable)	Set Screw	15912-REA (Disconnectable)
Penn Union	Lug	Type DBAT (Permanent)
	Lug	Type DBAT-LH (Disconnectable) Use with Series DBTB, DBTBF and DBTH lug and Sleeves kits
Polaris	Set Screw	PLTZ-CC, PSMTLCC, IPCSMTL
Preformed	Set Screw	SC-C series (Permanent)
	Set Screw	CSC-Q-C Series, SC-Q-C series (Disconnectable)
Utilco	Set Screw	PTF-IN (Permanent)
	Set Screw	PTF-CJNU, PSS Series (Disconnectable)
Vector Connectors Corp.	Set Screw	TQL Series (Disconnectable) (with insulating boot)

Note: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U gc - Shield, cable riser

Manufacturer	Dia. (Inches)	Length (Feet)
	Galvanized Steel	
Almat Metal Limited	2 1/4	8
Electrical Materials	2 - 3 - 4 - 5*	5*
Hubbell (Chance)	2 - 3 - 31/2	5 - 9
Joslyn	2 - 3 - 31/2*	5 - 8*
Midland-Ross (Kindorf Snapduct)	2 1/2 - 3 1/2 - 5 (14 ga. galv. steel)	2 1/2 - 5 - 10
	Plastic and Fiberglass	
Applied Extrusion Technologies (plastic) (Power Mold, I, II, III)	2 - 3 - 4 - 5 - 6*	5 - 8 - 10*
Carlon	2 - 3 - 4 - 5 - 6*	l0*
Custom Plastics	2 - 3 - 4 - 5*	5 - 10*
Electrical Materials (plastic)	1 - 2 - 3 - 4 - 5- 6*	5 - 8 - 10*
Joslyn (plastic)	2*	10*
Nordic (fiberglass)	2 - 3 - 5*	5 - 10*

(Order by size and length)

*All sizes available with back plate.

	Full Round**	
Smith Fiberglass Products (standard wall)	2 - 3 - 4 - 5	30

**Full round riser shield is to be mounted directly to the surface of the pole with no standoffs.

U gk - Terminations, Indoor

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog No.
PREMOLDED	
Cooper Power Systems	Fasterm Stress Cone (15 & 25 kV)
Elastimold (ESNA)	Style 35-MSC (15, 25 & 35 kV)
Hubbell (Chardon)	Termi-Matic, Type A or G (15, 25 & 35 kV)
HEAT SHRINK	
DSG-Canusa	CT Series (15kV, 25kV, 35kV)
G&W	ESTS15_PLA (15 kV) ESTS25_PLA (25 kV)
Hellermann	MVTS15_PLA (15 kV) MVTS25_PLA (25 kV)
Tyco (Raychem)	HVT (15, 25 & 35 kV)
COLD SHRINK	
3M	QT III Series (15 kV) Quick Term II Series (25 & 35 kV)
Joslyn	JIPT Series (15, 25 kV) JPT Series (25 kV)
Tyco (Raychem)	TFT Series (15, 25, 35 kV)
INSULATED WRAP	
Plymouth/Bishop	Stress-Wrap (15, 25 & 35 kV)

U gk - Terminations, outdoor
(with mounting hardware)*

(When ordering, specify conductor size, type, whether copper or aluminum, insulation diameter, and type of mounting desired)

Manufacturer	Catalog Number
POLYMER	
PREMOLDED	
Cooper Power Systems	Fasterm Series (15 & 25 kV)
Elastimold (ESNA)	Style 16-THG (15 and 25 kV) (for bare concentric neutral cable) Style 35-MT (35 kV) (for bare concentric neutral cable) Style PCT-1 (15 kV) (for jacketed cable) Style PCT-2 (25 kV) (for jacketed cable)
Hubbell (Chardon)	Termi-Matic, Type G (15, 25 and 35 kV)
HEAT SHRINK	
DSG-Canusa	CT Series (15kV, 25kV, 35kV)
G&W	ESTS15_PLO (15 kV) ESTS25_PLO (25 kV)
Hellermann	MVTS15_PLO (15 kV) MVTS25_PLO (25 kV)
Plymouth/Bishop	SWO Kit (15, 25 and 35 kV)
Tyco (Raychem)	HVT (15, 25 and 35 kV)
COLD SHRINK	
Joslyn	JPT Series (15, 25, 35 kV)
Tyco (Raychem)	TFT Series (15, 25, 35 kV)
3M	QT III Series (15, 25, & 35 kV)
PORCELAIN	
G & W	"Eliminator" 15 kV, E 25 kV, E 35 kV, E
Joslyn	"Easy-On II" (15, 25 and 35 kV)

*Mounting Hardware is used to attach termination to mounting bracket (U hd or U hj).
NOTE: Some of the above terminators may require ordering the mounting hardware separately.

U gn - Enclosures, equipment

Applicable Specifications: "RUS Specifications for Equipment Enclosures," U-4

Manufacturer	Catalog No.
Durham	AT-42 Series (dead-front) AT-54 Series (dead-front)
Elliott	EPM-PTS (dead-front)
Hoffman Enclosures, Inc.	UJ Series
Malton Electric	ME Series (dead-front) MEV Series (dead-front)
Maysteel	EL100 (dead-front)
Nordic	ND-28 and ND-33

NOTE:

1. The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U gn - Enclosures, Equipment

Sectionalizing Enclosures

Manufacturer	Catalog No.
Brooks Utility Products Group	Single Phase 750-7437-001, 750-7437-002, 750-7437-003, 750-7437-004 Three Phase 750-7438-001, 750-7438-002, 750-7438-003, 750-7438-004, 750-7438-005, 750-7438-006, 750-7438-007
Cooper Power Systems	SecTER Series I and II (Single-Phase and Three-Phase)
Durham	AM Series
Highline Products	FSC-29 Single Phase FSC-32 Single Phase FSC-33 Single Phase FSC-55 Three Phase FSC-62 Three Phase FSC-65 Three Phase FSC-69 Three Phase FSC-71 Three Phase FSC-79 Three Phase FSC-85 Three Phase
Maysteel	CW200 Series CW300 Series
Nordic	ND-Series
Power Design Inc.	Type CJP series, single-phase and three-phase, 15 and 25 kV
Rough Rider Industries	Series RUF93
Shallbetter	SPMS Series (dead-front)

NOTE:

1. The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U go - Fault Indicator
(For Construction Unit UM 6-4)

Manufacturer	Type
Cooper Power Systems	S.T.A.R. CR, DR, ER, MR, TPR
Edison Control Corporation	Series EC100 (single phase) Series EC300 (three phase) (Available with mounting kit KT5002)
E. O. Schweitzer	AutoRANGER AR-OH
Fisher Pierce	Series 1514 (current reset, single-phase Series 1515 (current reset, three-phase) Series 1541 (time reset, single-phase Series 1543 (time reset, three-phase Series 1547 (adaptive trip)
Horstmann GmbH	FCI-LT Series Time Reset 29-3014 (.85 to 1.57 inch) 29-3015 (1.57 to 2.37 inch) Current Reset 29-3114 (.85 to 1.57 inch) 29-3115 (1.57 to 2.37 inch)

Note: Fault indicators that require the drilling or cutting to the enclosure for mounting are not acceptable.

U gp - Connector Blocks and Splices, Secondary

Watertight - For Use In All Locations

Manufacturer	Connection Type	Catalog Number
Alcon	Set Screw	VPB Series
Blackburn	Lug	Series UP (with lugs and sleeves)
	Set Screw	Series USB (1000 amp bus with sleeves)
Burndy	Lug	URD Mole
Connector Mfg. Co.	Compression	Utilug Sure Seal Splice Kits, Series SSK, SSKL
	Set Screw	Uni-Joint Sure Seal Series SSBC
	Set Screw	Secondary Connector ULS2-350
ESP	Lug	Type UC (8 AWG - 500 kcmil) (with LA lug and sleeve)
	Set Screw	Type UPP
Homac	Connector Blocks:	
	Lug	FS-95 Series with flood seal sleeve kit (8AWG - 350 kcmil)
	Lug	FS-125 Series with flood seal sleeve kit (350 - 500 kcmil)
	Set Screw	SHC Series
	Set Screw	RAB Series
	Splices:	
	Compression	RRK Series (#2AWG - 350 kcmil)
	Set Screw	UH11L
	Set Screw	USK Series
	Set Screw	MTB Series
Hubbell (Fargo)	Set Screw	GU-600 Series
Kearney/Cooper Power Systems	Compression	HCR
	Compression	HAR
MacLean (Reliable)	Set Screw	15903-15908, 15910 with sleeve kit (4 AWG - 350 kcmil) 15911 with sleeve kit (500 - 750 kcmil)
Penn Union	Lug	DBA Series with DBTB, DBTBF and DBTH Series lug and sleeve kits
Preformed	Set Screw	HT Kit Series
Raychem	Set Screw	GILS-4/0
Utilco	Set Screw	Safety Sub Splice - USPA-350SS
	Set Screw	Safety Sub Tap Connector - PED-350SS

U gp - Secondary Connector Blocks and Splices, Insulated

Non-Watertight - For Use In Above-Grade Pedestals Only

Manufacturer	Connection Type	Catalog Number
Blackburn	Set Screw	Type PSB-C
Connector Mfg. Co.	Set Screw	Uni-Joint Series NCA
ESP	Set Screw	UPC Series
Homac	Set Screw Set Screw	CLR-350 Series PVAB Series
Hubbell (Fargo)	Set Screw	GUS-460 Series
Polaris	Set Screw	IPLC
Ilsco (Utilco)	Set Screw	PED-350CP Series PED-500CP Series
Vector Connectors Corp.	Set Screw	PC Series

U gq - Boot or sleeve, insulated*

Manufacturer	Catalog Number
Blackburn	MPC9 MPC15
Electrical Materials	100-B (For pad-mounted transformer spade terminals)

*Use restricted to 120/208 volt 500 kVA transformers and larger not equipped with threaded studs.

U gu - Pedestal, Power
(Above-Grade)
Refer to Construction Drawing UK5

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Inside Dimensions Inches	Height Inches	Catalog No.
API	6X6	32	API 6X6
	9X10	25-1/2	API 9 X 10
	10X11	34	API 10 X 11
	10X11	12-1/4	API 10 X FM
	10X11	72	API 10X11XL
	10X14	22-1/2	API 10 X 14
	10X14	26-1/2	API 10 X 14 WB
	16X28	38	API 16X28
	13 Dia.	25	API 176
Coil Sales			
(Charles Industries)	8.25 Dia	31-1/2	CPLP-8
	8.25 Dia	31-1/2	CPLP-8I(Integral Stake)
	10.75 Dia	31-1/2	CPLP-10
	10.75 Dia	31-1/2	CPLP-10I(Integral Stake)
Electrimold	14.5 x 19.5	31.5	EFSO-111630
Highline Products	14 X 9	31	FSP140931AA
	15.5 X 15.5	30	FSP151530AA
	15.5 X 15.5	36	FSP151536AA
	14 X 9	36	FSP140936AA
	9 X 9	31	FSP090931AA
MacLean (Reliable)	8 x 8	38	UP 8HLP
	8 x 8	46	UP 8HP
	10-1/2 x 10-1/2	26	UP 10HLP
	16-1/2 x 10-1/2	36	UP 1016HLP
	10-1/2 x 10-1/2	42	UP 10HP
Nordic	8 x 8	44	PR-50, PR-55
	9 x 14	30	PR-149 (stake)
			PR-150 (stakeless)
	9 x 14	30	PRMC 150 (low profile)
	9 x 14	24	PRMC-160
	9 x 14	30	PRMC-170 (high profile)
	9 x 14	36	PRMC-190
	9 X 13	30	PSP-91330
	10 X 15	38	PSPF-101538
	15 X 15	30	PSP-151530
	21 X 21	15	PHH-212115
	16 X 19	12	PHH-161912

U gu - Pedestal, Power
(Above-Grade)
Refer to Construction Drawing UK5

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Inside Dimensions Inches	Height Inches	Catalog No.
PenCell Plastics, Inc.	10-1/2 X13-1/2	24-1/2	AG-14 (low profile)
	10-1/2 X13-1/2	30-1/2	AG-14 (high profile)
	11X14	37	AG-15
	13X17.5	30.5	AG-18
	10-3/4X14-1/4	34	AG-20
	7-1/2 round	38	AG-8820-EWB
	17 x 30	34	AG-1730-EWB
Shallbetter	7.5 x 10.25	39	SUTP Series
Utility Fiberglass	27 x 16	40	PPFP-2700
Vertex	8 x 14	30	SP 814

*Furnished with stake.
**Pole mounted

U gu - Power Pedestal
(Below-Grade)
Refer to Drawing UK6

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Catalog No.
Armorcast	Polymer concrete frame and cover with fiberglass reinforced polyester skirting 6001 Series. P600XXXXA Rotocast Series, molded polyethylene with penta-head bolt
Associated Plastics	Molded polyethylene with galvanized steel or plastic cover Catalog Nos. 1730-1, 3; 1324-1, 3
Blackburn	Molded polyethylene with galvanized steel cover and ground lug. Catalog No. SDR-2PG
Burndy	Molded polyethylene with galvanized steel cover. Catalog No. URD20G23
Carson	Molded polyethylene with plastic cover Catalog No. 1324-12B and 1730-12B H910, HLW1212, H1118, H1324, H1730, H1730, H2436, H3048, HH3060
CDR Systems (Homac)	Fiber reinforced polymer concrete - PA Series with penta-head bolts
Christy Concrete	Polyester reinforced plastic - Series FL8TRCBOX, FL9TRCBOX, FL30TRCBOX, FL36TRCBOX, SYN1118TBOX, SYN1212TBOX, SYN1324TBOX, SYN1730TBOX, SYN2436TBOX, SYN3048TBOX, and SYN3660TBOX
Dexol	HDPE, DX-101, DX-102 ABS, DX-101HD, DX-102HD
Electrimold	Polymer concrete ring and cover with fiberglass reinforced skirting ECAB series. Boxes EPBTH,EPBA series
Highline Products	FHH Series, Fiberglass CHA Series, Fiberglass polymer concrete hybrid

U gu - Power Pedestal
(Below-Grade)
Refer to Drawings UK6

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Catalog No.
Hubbell (Fargo)	HDPE, B-100R Series ABS, B-200R Series HL51
Malton	Fiberglass secondary pedestal FSP31139, FSP301515
PenCell	PE Series-High Density Polythylene (HDPE) base;lid available in HDPE, fiberglass, aluminum, or stainless steel; PEM Series with modular construction, DT Series – heavy duty HDPE for vehicular traffic
Quazite	Power Pedestal – PV, Boxes - PX/PE Series, PR/LR Series, PC, PG, LG Series
Synertech Moulded Products	S1212, S1118, S1324, S1730, S2436, S3048 and S3660
Thermodynamics	PP91, PP92, PP94, PP96, PP97, PP98, PP03, PPV91, TEVC132415ASY, TEVC121612ASY, and TEVC122016ASY series

U gv - Stake, Power Pedestal
Refer to Construction Drawing UK5

Manufacturer	Length Inches	Catalog No. For Power Pedestal Only	Catalog No. For Joint Pedestal
Hubbell (Fargo)	42-60-72-78	UP-530S Series	UP-530J Series
MacLean (Reliable)	72-78-84	DM Series	DM Series

U hb - Cable Accessories

(When ordering specify conductor size, type whether copper or aluminum and insulation diameter)

(Items on this page are rated for operation on three-phase systems and may be used on single-phase systems.)

200 Ampere Continuous Current Rating

Manufacturer	Catalog No.
Cooper Power Systems	15 kV, used with loadbreak connectors LPC 215 protective cap LBI215 bushing well insert 2637869C01M rotatable two-way bushing well insert 2604231B01 bushing well plug 25 kV, used with loadbreak connectors LPC 225 protective cap LB1225 bushing well insert LB1225L (long) bushing well insert 2637881C01M rotatable two-way bushing well insert 2604231B01 bushing well plug 35 kV, used with loadbreak connectors 2637592B03M protective cap
Hubbell (Chardon)	15 kV, used with loadbreak connectors Switch module 9U02AAB001 Basic connector module 9U05 Series Insulating cap 9U01AEW400 Feed-through insert 9U04AEB001 25 kV, used with loadbreak connectors Switch module 9U02BAB001 Insulating cap 9U01BEW500 Feed-through insert 9U04BEB001

U hb - Cable Accessories

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

(Items on this page are rated for operation on three-phase systems and may be used on single-phase systems.)

200 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Elastimold (ESNA)	15 kV, used with loadbreak connectors Style 1601-CL cable lead Style 1602A3R feed thru insert Style 1601-A3R bushing plug Style 160-DR insulating cap 25 kV, used with loadbreak connectors Style 2701-A2 bushing plug Style 270-DR deadend receptacle 35 kV, used with loadbreak connectors Style 3701A-3 bushing plug* Style 370DR(G) insulating cap

U hb - Cable Accessories

(When ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

600 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Hubbell(Chardon)	15 kV Deadbreak termination connectors 9U60AAL (with test point) 9U60ABL (without test point) 25 kV Deadbreak termination connectors 9U60BAL (with test point) 9U60BBL (without test point)
Cooper Power Systems	15 kV Deadbreak termination connectors Bol-T System T-OP II System Push-OP System DBA615 Bushing Adapter 25 kV Deadbreak termination connectors Bol-T System T-OP II System Push-OP System DBA625 Bushing Adapter 35 kV Deadbreak termination connectors Bol-T System T-OP II System Push-OP System Optional 200 A. loadbreak tap No. 2637449C
Elastimold (ESNA)	15 kV, used with non-loadbreak connectors 600, 650 Series 25 kV, used with non-loadbreak connectors K600, K650 Series 35 kV, used with non-loadbreak connectors 750LR Series
Richards	15 kV, used with non-loadbreak connectors P615HH 25 kV, used with non-loadbreak connectors P625HH
3M	15 kV, Deadbreak termination connectors 5815 Series Modular Splicing System

U hb - Cable Accessories

(When ordering specify insulation diameter)

Concentric Neutral Clamps (Bonding)

Manufacturer	Conditions
Harco URD cable clamp	1. To obtain experience. 2. Only for bonding of anodes or other metals to the neutrals of existing cable installations. 3. Not to be used to connect neutral to grounding electrodes.

U hc - Cable Supports
15 and 25 kV

Manufacturer	Catalog Number	Grip Dia. Range (inches)
Aluma-Form	CS-800 Series	0.75 to 2.0
Economy Cable Grip	SPJ087-U	0.87 to 1.00
	SPJ100-U	1.00 to 1.12
	SPJ113-U	1.12 to 1.25
	SPC125-S-U	1.25 to 1.50
Hubbell (Fargo)	GJ-854	0.718 to 0.919
	GJ-855	0.920 to 1.12
	GJ-856	1.12 to 1.50
Kellums	022-16-011	0.81 to 0.94
	022-16-012	0.87 to 1.00
	022-16-013	0.94 to 1.06
	022-16-014	1.00 to 1.18
	022-16-015	1.06 to 1.25
	022-01-018	1.25 to 1.50
Lewis	A-U-SW-18	0.75 to 1.25
	U-1.12	1.12 to 1.62
Slater	FCSD 14	0.82 to 0.95
	FCSD 15	0.88 to 1.00
	FCSD 16	0.95 to 1.06
	FCSD 17	1.01 to 1.19
	FCSD 18	1.07 to 1.26
	FC125-U	1.25 to 1.50
Woodhead	35032 (SC075-U)	0.75 to 0.99
	35033 (SC100-U	1.00 to 1.24
	35034 (SC125-U)	1.25 to 1.49

U hd - Brackets, pothead mounting, and Brackets, combination pothead and arrester mounting

Manufacturer	Single Phase	Three Phase
Aluma-Form	TB-EMB-1-2PA	TB-EMB-1-6PA

U he – Padmounted Switchgear

12.5/7.2 kV

Manufacturer	Catalog Number
ABB	UTE, PAD-PAK pad-mounted switching device, single and three-phase, 300 amp
Durham	AFSP Series, single-and three phase
Electrical Equipment	FTDF-P Series, single and three-phase one and two fused taps, pad-mounted
Elliott	Type EPMR, single and three-phase, pad-mounted
Malton	*ME Fused Series, single and three-phase pad mounted
Shallbetter	SPMD Series, single and three-phase, pad-mounted SPMC Series, 200 ampere single-pole switching

*Furnished with current limiting fuses.

NOTES:
1. Enclosures on this page must comply with the dead-front requirements of RUS Spec. U-4.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

3. Single-pole switching of three-phase underground circuits may cause ferroresonance.

U he – Padmounted Switchgear

24.9/14.4 kV

Manufacturer	Catalog Number
ABB	UTE, PAD-PAK pad-mounted switching device, single and three-phase, 200 amp
Durham	AFSP Series, single-and three phase
Elliott	Type EPMR, single- and three-phase, pad-mounted
Malton	ME Fused Series, single and three phase, pad- mounted
Shallbetter	SPMD Series, single and three-phase, pad-mounted

NOTES:
1. Enclosures on this page must comply with the dead-front requirements of RUS Specification U-4.

2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

3. Single-pole switching of three-phase underground circuits may cause ferroresonance.

U he – Padmounted Switchgear

(200 and 600 amp)

Manufacturer	Catalog Number
Cooper Power Systems	Type VFI*, single-phase and three phase, padmounted fault interrupters, 15-35 kV Type R-VAC*, three-phase vacuum switchgear, 15-25 kV
*Cooper Envirotemp FR3 dielectric fluid is available as an option	
Elliott	Type EPMR, Single and three-phase, pad-mounted, 25 kV
ERMCO	Type FusePad, single-phase, 200 amp, 15 kV Type ECO-Pad, three-phase, 200 and 600 amp, 15-35 kV
Federal Pacific	Type PSI-PSI/II Series, 15 kV, 25 kV, 600 amp., three-phase switching, and 200 amp., single-phase switching. (When ordering, add suffix B-4) Type PSE Series, 15 kV, 25 kV, 600 amp switch, 200 amp fuse
G & W	Type PVI series, single-phase and three-phase, 200 amp and 600 amp, 15 kV and 25 kV
Hubbell (Chance)	Type LVS (pad-mounted) single-phase and three-phase, vacuum switching equipment, fused or unfused, 200 or 600 amp, 15-25 kV Type AIS padmounted, air insulated switchgear, fused or unfused, 200 or 600 amp, 15 kV or 25 kV

Notes:

1. Enclosures on this page must comply with the deadfront requirements of RUS Spec. U-4.
2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.
3. Single-pole switching of three-phase underground circuits may cause ferroresonance.

U he – Padmounted Switchgear

(200 and 600 amp)

Manufacturer	Catalog Number
Kearney/Cooper Power Systems	Series VP - submersible, single-phase and three-phase, vacuum switching, 200 or 600 amp, 15 and 25 kV, with or without VACOP remote operator
Malton	MES 100 Series, pad-mounted single phase and three phase switching
Scott Engineering	Type SPM-REA, 15 kV, 25 kV, 600 amp., three-phase switching, and 200 amp., single-phase switching
S & C	Mark III, Model PMH (with option G-7), 15-25 kV, 600 amp., three-phase switching and 200 amp., single-pole switching Model PME-15-25 kV, Fully enclosed live parts at all times, three-phase switching and 200 amp single pole switching
Trayer	800 Series, pad mounted three-phase vacuum switching equipment, 200 and 600 amp, 15-25 kV with or without fusing 501 submersible vacuum fuse 15-25 kV enclosure, deadfront 200 or 600 amp., 15-25 kV Type SSA (submersible, fused and unfused) 200 and 600 amp., 15-25 kV

Notes:

1. Enclosures on this page must comply with the deadfront requirements of RUS Spec. U-4.

2. The enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

3. Single-pole switching of three-phase underground circuits may cause ferroresonance.

U hf - Jacketed Cable Restoration Kits
(For resealing concentric neutral wires after installation of splices in jacketed underground cable)

(When ordering, specify diameter of cable over jacket)

Manufacturer	Conditions
Elastimold PCS-1 Power Cable Seal	To obtain experience.
Homac CNC Series Concentric Neutral Cover	To obtain experience.
Joslyn Shrinklite JRS Series	To obtain experience
Raychem WCSM (Tubing Type) MWTM (Tubing Type) CRSM (Wraparound Type)	To obtain experience.
3M HSJ Series (Heat Shrink) SJ Series (Cold Shrink)	To obtain experience.

Conditional List
U hf(2)
July 2009

U hf - Terminator Sealing Kits
(For resealing concentric neutral wires after installation of elbows or outdoor terminations on jacketed underground cable.)

(When ordering, specify diameter of cable over jacket.)

Manufacturer	Conditions
Cooper Power Systems	
JS200 Elastic Seal	To obtain experience.
Elastimold	
200 ECS Elbow Cable Shield, Cold Shrink	To obtain experience.
Homac	
CNC Series Concentric Neutral Cover	To obtain experience.
Raychem	
ESA, Heat Shrink	To obtain experience.
3M	
8450 Series, Cold Shrink	To obtain experience.

U hf - Jacketed Cable Grounding Kits
(For connecting a grounding lead wire to the concentric neutral wires and resealing the jacket)

(When ordering, specify diameter of cable over jacket)

Manufacturer	Conditions
CANUSA-EMI Model CFGK-REA Cable Grounding Kit	To obtain experience.
Raychem Model JGK Cable Grounding Kit	To obtain experience.
3M Model 2252 Cable Grounding Kit	To obtain experience.

U hj - Bracket, combination arrester, cutout and pothead mounting

Applicable Drawing: UA1, UA2, UA3

Manufacturer	Single Phase	Three-Phase
Aluma-Form	1HCA-18-1PB Series	-

U hp - Terminations, Elbow
(rated for switching on three-phase systems)

(When ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Cooper Power Systems	15 kV, Loadbreak SBT IV LE215T Series with test point LE215 Series without test point LEJ215T Series with integrated jacket seal; with test point LEJ215 Series with integrated jacket seal; without test point 25 kV, Loadbreak SBT LE225T Series with test point LE225 Series without test point LEJ225T Series with integrated jacket seal; with test point LEJ225 Series with integrated jacket seal; without test point
Thomas & Betts (Elastimold)	15 kV loadbreak Style 165LR Series, without voltage test point Style 166LR Series, with voltage test point Style 165LRJS Series, without voltage test point, with integral jacket seal Style 166LRJS Series, with voltage test point, with integral jacket seal 25 kV loadbreak Style 275LR Series, without voltage test point Style 276LR Series, with voltage test point Style 275LRJS Series, without voltage test point, with integral jacket seal Style 276LRJS Series, with voltage test point, with integral jacket seal 35 kV loadbreak Style 375LR Series, without voltage test point Style 376LR Series, with voltage test point
Hubbell (Chardon)	15 kV, Loadbreak 9U01A--6--Series 25 kV, Loadbreak 9U01B--5--Series
Richards Manufacturing Co.	15 kV, Loadbreak Style 21LBN Series, without voltage test point Style 21LBT Series, with voltage test point

U hq - Terminations, Multipoint

(Items on this page are rated for operation on three-phase systems and may be used on single-phase systems)

Manufacturer	Catalog Number
Cooper Power Systems	15 kV 2-way, 3-way,& 4-way bushings Series 2637172B with mounting bracket Series 2637164C without mounting bracket 25 kV 2-way, 3-way,& 4-way bushings Series 2637160B with mounting bracket Series 2637166C without mounting bracket
Elastimold (ESNA)	15 kV 2-way bushing, 163J2 3-way bushing, 163J3 4-way bushing, 163J4 25 kV 2-way bushing, 271J2 3-way bushing, 271J3 4-way bushing, 271J4 35 kV 2-way bushing, 373J2 3-way bushing, 373J3 4-way bushing, 373J4
Hubbell (Chardon)	15 kV 2-way bushing 9U07A--2-0 3-way bushing 9U07A--3-0 4-way bushing 9U07A--4-0 25 kV 2-way bushing 9U07B--2-0 3-way bushing 9U07B--3-0 4-way bushing 9U07B--4-0

U hq - Terminations, Feed-Through and Parking Bushings

Manufacturer	Catalog Number
Cooper Power Systems	15 kV Grounded Standoff Bushing, GSB215 Horizontal Portable Feed-through, LPF215H Vertical Portable Feed-through, LPF215V Universal Portable Feed-through, LPF215U 25 kV Grounded Standoff Bushing, GSB225 Horizontal Portable Feed-through, LPF225H Vertical Portable Feed-through, LPF225V Universal Portable Feed-through, LPF225U
Elastimold (ESNA)	35 kV Feed-thru, 373FT Parking Bushing, 371SOP
Hubbell (Chardon)	15 kV Feed-through, 9U07AKF200 Insulated Parking Bushing, 9U07ACF100 Grounded Parking Bushing, 9U07AAF100 25 kV Feed-through, 9U07BCF200 Insulated Parking Bushing, 9U07BCF100 Grounded Parking Bushing, 9U07BAF100

U hq - Terminations, Multipoint

600 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Cooper Power Systems	15 kV and 25 kV 2-way, 3-way, and 4-way bushings Series DJ625A_ (with mounting bracket) Series DJ625A_B_ (without mounting bracket) 35 kV 2-way, 3-way, and 4-way bushings Series 2637195C (with mounting bracket) Series 2637184C (without mounting bracket)
Elastimold (ESNA)	15 kV 2-way bushing, 650J2 or 675J2 3-way bushing, 650J3 or 675J3 4-way bushing, 650J4 or 675J4 25 kV 2-way bushing, K650J2 or K675J2 3-way bushing, K650J3 or K675J3 4-way bushing, K650J4 or K675J4

U hr - Secondary tap or splice cover, submersible

Manufacturer	Type or Catalog No.
Blackburn	Type WDBS (#2 through #4/0), Type DBS (250 kcmil through 1000 kcmil)
Connector Mfg. Co.	Utilug Sure Seal
Elastimold (ESNA)	Style 86
ESP	TSC Series
Homac	FSS Series
Joslyn	Shrinktite JCLS Series
Kearney/Cooper Power Systems	Aqua-Seal Kit
Preformed	HT Series
Plymouth/Bishop	Splice-Wrap
Raychem	Rayvolve RVS Series
3M	PST Series 8420

Heat Shrink Tubing (with sealant throughout)

Manufacturer	Type or Catalog No.
AMP	Black heat-shrink tubing
CANUSA-EMI	CFW
ESP	HSH
Panduit	Heat shrink insulating cover and tubing
Raychem	WCSM cable sleeves
Sigmaform Corporation	Sigmaform heat-shrinkable products
3M	ITCSN tubular cable sleeve

U hv - Cable, Underground
15 kV and 25 kV Cable

Applicable Specification:	RUS Specification U-1
Conductor (15 kV):	Copper or Aluminum - #2 AWG through 1000 kcmil
Conductor (25 kV):	Copper or Aluminum - #1 AWG through 1000 kcmil
Insulation:	Crosslinked Polyethylene (XLP)
	(a) indicates Union Carbide 4201 XLP
	(b) indicates BP 521 XLP
	Tree-retardant Crosslinked Polyethylene (XLP-TR)
	(1) indicates Union Carbide 4202 XLP-TR
	(2) indicates BP H119Y XLP-TR
	(3) indicates BP H118Y XLP-TR
	(4) indicates LG XL8080 TR
	Ethylene Propylene Rubber (EPR)
Neutral:	Copper Concentric Neutral
Jacket:	High Molecular Weight Polyethylene

Manufacturer	Insulation(s)	Flat Strap Neutral Available
Conductores Monterrey, S.A. de C.V.	XLP (a), XLP-TR (1), EPR	No
Condumex	XLP (a), XLP-TR (1), EPR	No
General Cable	XLP (a,b), XLP-TR (1,3), EPR	Yes
Gaon Cable Co., Ltd.	EPR, XLP-TR (4)	No
Marmon Utility LLC (Hendrix)	XLP (a), XLP-TR (1, 2, 3), EPR	No
Marmon Utility LLC (Kerite)	EPR	Yes
Nexans Canada	XLP (a), XLP-TR (1), EPR	No
Nexans Italia	EPR	No
Okonite	XLP (a), XLP-TR (1), EPR	Yes
Phelps Dodge	XLP (a,b), XLP-TR (1,3), EPR	Yes
Prysmian	XLP (a), XLP-TR (1), EPR	Yes
Rome	XLP (a), XLP-TR (1), EPR	Yes
Southwire	XLP (a), XLP-TR (1), EPR	No
Synergy Cables	XLP-TR (1), EPR	No

U hv - Cable, Underground

600 Volt Cable

Applicable Specification: RUS Specification U-2
Conductor: Copper, #4 AWG and larger; Aluminum, #2 AWG and larger
Insulation: Cross-Linked polyethylene (XLPE)

Manufacturer	Type Conductor
Alcan	Aluminum
Conductorres Monterrey, S.A. de C.V.	Copper or Aluminum
Condumex	Copper or Aluminum
Essex	Copper
General Cable	Copper or Aluminum
Nexans Canada	Aluminum
Okonite	Copper or Aluminum
Phelps Dodge	Copper or Aluminum
Prysmian	Copper or Aluminum
Rome Cable	Copper or Aluminum
Service Wire Company	Copper
Southwire	Copper or Aluminum

NOTE: The manufacturers shown above have indicated that their 600 volt cable is suitable for use on 480 volt corner grounded delta circuits.

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground

600 Volt Multi-Conductor Cable

Applicable Specification: RUS Specification U-2
Conductor: Copper, #4 AWG and larger; Aluminum, #2 AWG and larger

Insulation: Cross-Linked polyethylene (XLPE)
Cable Configuration: 3 Insulated Conductors Triplexed

Manufacturer	Type Conductor
Alcan	Aluminum
Conductores Monterrey, S.A. de C.V.	Copper or Aluminum
Condumex	Copper or Aluminum
General Cable	Copper or Aluminum
Nexans Canada	Aluminum
Okonite	Copper or Aluminum
Phelps Dodge	Copper or Aluminum
Prysmian	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground
15 kV and 25 kV Cable

(Alternative Insulation Compound)

Applicable Specification:	RUS Specification U-1
Conductor (15 kV):	Copper or Aluminum - #2 AWG through 1000 kcmil
Conductor (25 kV):	Copper or Aluminum - #1 AWG through 1000 kcmil
Insulation:	Tree-retardant Crosslinked Polyethylene (XLP-TR) (I) indicates Pirelli IE.7100 XLP-TR (II) indicates AT Plastic PowerGuard 320TR (III) indicates Union Carbide HFDB-4202 (IV) indicates Nova Borealis LE 4212 (V) indicates Dow HFDB 8202
Neutral:	Copper Concentric Neutral
Jacket:	High Molecular Weight Polyethylene
Conditions:	To obtain experience

Manufacturer	Insulation(s)	Flat Strap Neutral Available
General Cable	XLP-TR (II, III, IV, V)	Yes
Marmon Utility LLC (Hendrix)	XLP-TR (III, IV)	No
Nexans Canada	XLP-TR (II, III, IV)	No
Phelps Dodge	XLP-TR (II, III, IV, V)	Yes
Prysmian	XLP-TR (I, IV)	Yes
Southwire	XLP-TR (III, IV)	No

U hv - Cable, Underground

600 Volt Cable

(Alternative Cable Constructions)

Applicable Specification: RUS Specification U-2 (except as indicated below)

NOTE: Manufacturers listed below are conditionally accepted for alternatives A, B, C, D and/or E for the products listed on pages U hv-2 and U hv-3.

Alternative A: 8000 series aluminum alloy in accordance with ASTM B800 or B801.

Alternative B: Stranding in accordance with ASTM B786 for aluminum 1350 conductors or ASTM B787 for copper conductors.

Alternative C: Abuse resistant (ruggedized) (single or two layer) insulation in accordance with ICEA S-81-570.

Alternative D: Self-healing

Alternative E: Stranding in accordance with ASTM B 901 for Compressed Round Stranded Aluminum Conductors Using Single Input Wire Construction

Condition: To obtain experience.

Manufacturer	Alternative
Alcan	(A) (C) (E)
Conductores Monterrey, S.A. de C.V.	(C)
General Cable	(A) (C)
Phelps Dodge	(A) (C)
Prysmian	(A) (C) (D)
Nexans	(C)
Southwire	(A) (B) (C) (D) (E)

U hw - Safety signs

Applicable Specifications: RUS Drawings ANSI Z535

Manufacturer	Size (inches)	Danger Sign Catalog No.	Warning Sign Catalog No.	Caution Sign Catalog No.
Almetek	7 x 10	Trident D-100-0710	Trident W-100-0710	
	10 x 14	Trident D-100-1014	Trident W-100-1014	
	14 x 20	Trident D-100-1420	Trident W-100-1420	
Brady*	7 x 10	46133		46043
	10 x 14	46131		46041
Eastern Metal*	7 x 10	REA 12-1-710		REA 12-2-710
	10 x 14	REA 12-1-1014		REA 12-2 1014
	14 x 20	REA 12-1-1420		REA 12-2-1420
	20 x 28	REA 12-1-2028		REA 12-2-2028
Electromark*	7 x 10	REA-1-7x10-SV		REA-2-7x10-SV
	7 x 10	REA-1-7x10-AC		REA-2-7x10-AC
	10 x 14	REA-1-10x14-SV		REA-2-10x14-SV
	10 x 14	REA-1-10x14-AC		REA-2-10x14-AC
	14 x 20	REA-1-14x20-SV		REA-2-14x20-SV
	14 x 20	REA-1-14x20-AC		REA-2-14x20-AC
	20 x 28	REA-1-20x28-SV		REA-2-20x28-SV
	20 x 28	REA-1-20x28-AC		REA-2-20x28-AC
Lem	7 x 10	LSS-1400		LSS-1500
	10 x 14	LSS-1401		LSS-1501
	14 x 20	LSS-1402		LSS-1502
Lyle*	7 x 10	UM12-1-710		UM12-2-710
	10 x 14	UM12-1-1014		UM12-2-1014
	14 x 20	UM12-1-1420		UM12-2-1420
	20 x 28	UM12-1-2028		UM12-2-2028
May Advertising	7 x 10	MY710C		MY710B
	10 x 14	MY1014C		MY1014B
	14 x 20	MY1420C		MY1420B
	20 x 28	MY2028C		MY2028B
For pressure sensitive decal add "D" prefix				
Truck Sign Service*	7 x 10	TSD-710		TSC-710
	10 x 14	TSD-1014		TSC-1014
	14 x 20	TSD-1420		TSC-1420
	20 x 28	TSD-2028		TSC-2028

*Reflective signs also available.

The signs listed on this page are to be secured to equipment and transformer enclosures by means of an adhesive or by welding. Screws and rivets are not to be used.

U hx - Cable Route Marker

Manufacturer	Catalog Number
Surface Mounted	
Hubbell (Chance)	C554-0001
Above Grade	
Carsonite	REA-100
Electromark	REA-3-4x7-SV REA-3-4x7-AC REA-3-5x12-SV REA-3-5x12-AC
Flexstake	603, 604, 605, 606
Greenline	FLU-78 (Decal on one side) DSU-78 (Decal on both sides)
Hubbell (Chance)	C554-0183
J Miller Industries	JMI-375
Lyle	UM12-712
May Advertising (For pressure sensitive decal add "D" prefix to catalog number.)	MY45A, MY712A
Quantum	QM-375
Truck Sign Service	BCW-712
W. H. Brady	BL1 (Decal on one side) BL2 (Decal on both sides)

U hy - Splice, Underground, Permanent

(when ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Cooper Power Systems	15 kV and 25 kV EZ II straright and transition splice #3 throught 4/0 35 kV 2603934B Series straight splice
Elastimold (ESNA)	15 kv Style 1500S, straight splice, through #1/0 Style 25-S, straight splice, 2/0 through 4/0 Style l5PCJ-1, straight splice, through 4/0 Style 25-Y, Y-splice 25 kV Style K-25-S, straight splice Style K-25-Y, Y-splice Style 25PCJ-1, straight splice, through 4/0 35 kV Style M-250-S, straight splice
DSG-Canusa	15 kV CJ 10 Series, heat shrinkable joints 25 kV CJ 10 Series, heat shrinkable joints 35kV CJ 10 Series, heat shrinkable joints
Hubbell (Chardon)	15 kV Straight Splice through #1/0, Model 9U16A-100 "Uni-Matic" Through #2/0, Model 9U06A 25 kV "Uni-Matic" Through #2/0, Model 9U06A
Prysmian	15 kV and 25 kV “Elaspeed” style EPJMe straight splice, #2 through 1000 kcmil
3M	(15, 25, 35 kV) 5400 Series Quick Splice/Quick Splice II/Quick Splice III, 15 kV 5411R cable repair splice 5411R/HSJ-l cable repair splice (for jacketed cable)

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Raychem	15 kV HVS 1510-R__ 200 Amp Splice kit 25 kV For Bare Concentric Neutral Cable: HVS-2510-REAX in-line joint HVS-2510E-R-REAX repair joint For Jacketed Cable: HVS-2510-JCN-REAX in-line joint HVS-2510E-RJ-REAX repair joint 35 kV For Bare Concentric Neutral Cable: HVS-3510E-REAX in-line joint For Jacketed Cable: HVS-3510E-JCN-REAX in-line joint
Sigmaform	15 kV SSK Series (Heat Shrink)
Tyco (Raychem)	15 kV CAS-15WJ-2, cold-applied splice 25 kV For Jacketed Cable: CAS-28WJ-2, cold-applied splice 35 kV For Jacketed Cable: CAS-35M, cold-applied in-line splice

U hy - Splice, Underground, Separable

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
Elastimold (ESNA)	15 kV Style 151-SR, receptacle Style 151-SP, plug Style 150-DP, deadend plug Style 150-DR, deadend receptacle Sty1e l50-T, T-tap 25 kV Style K-151-SR, receptacle Style K-151-SP, plug Style K-150-DR, deadend receptacle Style K-150-T, T-tap

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

600 Ampere Continuous Current Rating

Manufacturer	Catalog Number
Cooper Power Systems	15 kV 2604904B Series straight splice (MPS-600) 25 kV 2604905B Series straight splice (MPS-600)
Elastimold (ESNA)	15 kV Style 650-S, straight splice Style 15PCJ-2, straight splice, through 1250 kcmil Style 650-Y, Y-Splice 25 kV Style K650-S, straight splice Style K650-Y, Y-splice Style 25 PCJ-2, straight splice, through 1250 kcmil 35 kV Style M650S, straight splice

U ja - Equipment Flat Pad*

Manufacturer	Catalog Number
Armorcast	600 Series, Polymer Concrete P600XXXX Rotocast, LLDPE
Associated Plastics	API 4000 Series RPM
Carolina Dielectrics	Model 0502-1, Fiberglass, Size:40"x44"
CDR Systems (Homac)	PP Series, Fiber reinforced polymer concrete
Diversitech	TP Series - Fiberglass reinforced concrete
Electri-Glass	Fiberglass LP-4145, 41" x 45"
Electrical Materials	Molded HMW Polyethylene Model 64-3BC, 42" x 41" x 4" Model 65-4BC, 52" x46"
Electrimold	EPPT
Highline Products	PBP Series, Polymer concrete hybrid HL-46B, Fiberglass, Size: apprx. 42” X 42”
Formex	Mode1 TP-REA, Molded polyethylene
Heil Rotomold, Inc.	T Series, High density polyethylene
Highline	HL-46B, Fiberglass, Size: approx.42"x42"
Hubbell (Chance)	C107-0162 Fiberglass, Size: 40" x 44"
Major Frame-Crete	ETPP precast, cellular concrete, 42"x42"
Nordic	TP Series, Fiberglass
Parking Bumper Company – a Division of Hog Slat, Inc.	7610, 7612, 7613, 7626PE, 7621
PenCell Plastics	TP-4220, TP-4224, TP-4227
Quality Rubber Company	34242 light-weight concrete
Quazite Corp.	Composolite - PH Series
RMI-D	Dwg. No. 730126-2, Molded polyethylene Size: 42" x 42"
Smith Cattleguard	Easi Set T. Series, Precast Reinforced Concrete
Thermodynamics	Poly-Pad, PR Series, Molded polyethylene YEPR031220, YEPR031226, compression molded polypropylene

*Order by catalog number and size.

U ja - Equipment Box Pad (Sleeve)*

Manufacturer	Catalog Number
Acura Fiberglass Corp.	Model AG 4532
Associated Plastics	Transformer pad and box assembly, API 4242 RPM Pad and 1730 Box Transformer Pads, API 16 and API 45
Blue Grass Vault Company	BG-PV-T, BG-PV-1, BG-PV-2
Concast	Fibercrete modular bases
Custom Composites	R Series Fiberglass
D & L	Fiberglass
Electri-Glass, Inc.	BP-2000
Electrimold	EFBT,EFBS,EFBG Series
Fiberglas Fabricators	Transformer pad and sleeve assembly, FFBP series
Formex	Transformer pad and box assembly - TP-REA Series Pad, 1730-A Series Box
Highline	Box pad HL, FBP, FSG, AND FGS Series
Malton	FGS Series Fiberglass ground sleeves and box pads
Maysteel	CW-GS-P Series
Mor-Tech Fab	Transformer pad ground sleeves
Nordic	GS Series Fiberglass (excluding GS-37-43-15-A) CBP-37-43-15-A
PenCell	Transformer pad and box assembly- TPS-20-PE Pad, PE-20GS Box
ProGlass, Inc.	TX, SR, S, and SG Series (All without optional lids)
Quality Fiberglass	QF Series
Synertech Moulded Products	S1212, S1118, S1324, S1730, S2436, S3048 and S3660
Thermodynamics	Poly Pad - VC series (VCC-P series covers available) Polyethylene

*Order by catalog number and size.

U jb - Splice Shield

Manufacturer	Catalog Number
Kellems	No. 014-03-1429

U sc - Regulators, voltage, pad-mounted for underground distribution

12.5/7.2 kV

Manufacturer	Conditions
Siemens-Allis Single-phase, step-type pad-mounted regulator Type PFR (76.2, 114.3 & 167 kVA)	To obtain experience.

U sd - Current Transformers
600 Volt

Direct Burial Type

Manufacturer	Type or Catalog No.
General Electric	JAL-O

Indoor Type for Pad-Mounted Transformers

Manufacturer	Type or Catalog No.
ABB	CMV
G.E.C. Durham Industries (Astra)	AP
General Electric	JAB-O
Schlumberger	R6P

U si - Anodes, Sacrificial
(Drawing M27)

Zinc Anodes*

	Pre-packaged With Connecting Wire			Bare Continuous Strip (Ribbon)	
	12 lbs.	30 lbs.	60 lbs.	5/8" x 7/8"	1/2" x 9/16"
Cathodic Protection Services	12HII-4A	30HII-4A	60HII-4A		
Federated Metals	S-12 packaged	S-30 packaged	S-60 packaged	Regular Size Type II	Junior size
Harco	AZC12GJ	AZC30GJ	AZC60HJ		
Mesa	S-12 packaged	S-30 packaged	S-60 packaged	Regular Size	Junior size
Stuart	SZ-12	SZ-30	SZ-60		
	-----VIBROX packaged-----				

*When ordering, specify zinc anodes that meet ASTM B418-73 Type II Composition and RUS Specification DT-9, "RUS Specification for Zinc Sacrificial Anodes."

U si - Anodes, Sacrificial
(Drawings UM11-1, UM26, UM27, M2-7, M2-17)

Magnesium Anodes**

	Standard Potential				High Potential			
	17 lbs	20 lbs	32 lbs	50 lbs	17 lbs	20 lbs	32 lbs	48 lbs
Cathodic Protection Services	AMH17A packaged	-	AMH32A packaged	AMH50A packaged	17D3 packaged	20D2 packaged	32D5 packaged	48D5 packaged
Federated Metals	17 packaged	-	32 packaged	50 packaged	-	-	-	-
Global Cathodic Protection	-	-	-	-	17D2	20D2	32D3	48D5
Harco	AMC17J	AMC20J	AMC32J	AMC50J	AMC17G	AMC20G	AMC32G	AMC48G
Kaiser Mag.	17 Vibra Pak	-	32 Vibra Pak	50 Vibra Pak	17 Electromag Vibra Pak	-	32 Electromag Vibra Pak	50 Electromag Vibra Pak
Mesa	17 packaged	-	32 packaged	50 packaged	17D Series	20D2	32D Series	48D5
Stuart	SM-17	-	SM-32	SM-50	SM-17H	-	SM-32H	SM-48H

**When ordering, specify magnesium anodes that meet RUS Specification DT-10, "RUS Specification for Magnesium Sacrificial Anodes."