Overhead Switches

Type AR (Automation Ready) Gang Operated Air Break Switches

Catalog 14A July 2023

HUBBELL
Power Systems

Type AR (Automation-Ready) Switch

15kV, 27kV 34.5kV (Grd-Wye) or 38kV 900 Amperes Continuous/Interrupt

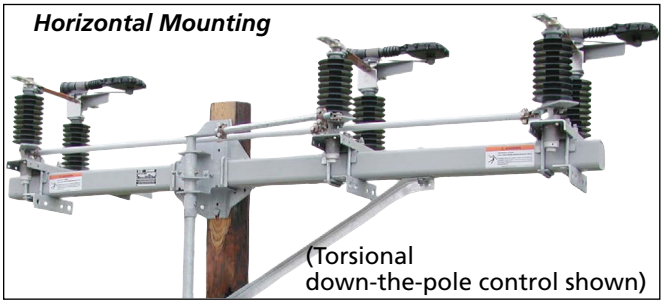
Description

The Hubbell unitized Type AR switch is a distribution-level, loadbreak, gang-operated side-break switch designed to meet not only today's needs but well into utilities' future of distribution automation. Designed for nominal system voltages of 15kV, 27kV 34.5kV (Grd-Wye) or 38kV. The Type AR switch is available with a variety of options, and in ratings for present and planned requirements.

To minimize field installation time, the Type AR switch is pre-assembled, adjusted and mounted on a crossarm. Installation time is even faster for a Type AR switch with the hook stick-operation option.

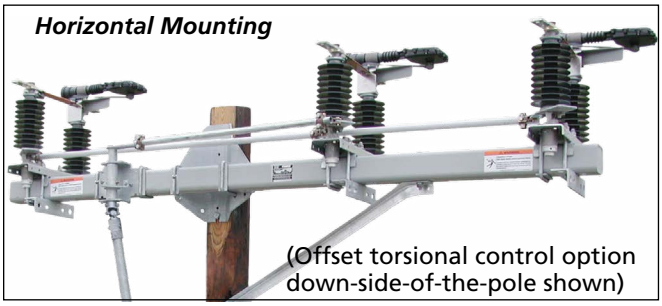
Variations and Configurations

Horizontal Mounting



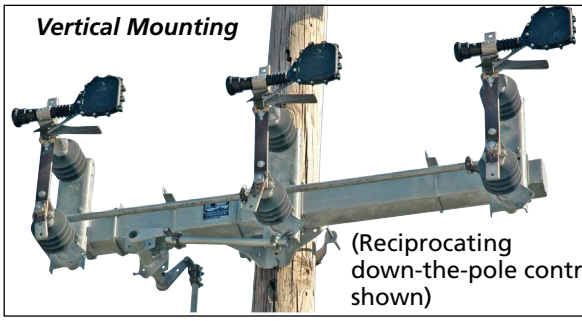
(Torsional down-the-pole control shown)

Horizontal Mounting



(Offset torsional control option down-side-of-the-pole shown)

Vertical Mounting



(Reciprocating down-the-pole control shown)

Type AR Switch Ratings

Nominal Voltage/Lightning Impulse Withstand	15kV, 27kV, 34.5kV (Grd-Wye), 38kV, 200kV BIL
Continuous Current	900 amperes
Interrupting Current	900 amperes
Peak Withstand Current	65,000 amperes peak
Short Time Withstand Current	3 sec.....25,000 amps, sym
Fault Making: 1 time	25,000 amperes, asymmetrical
3 time	20,000 amperes, asymmetrical
Dead-ending:	8,000-lb. working load
Ice Breaking:	$^3/_4$-in. thick, opening and closing

The Type AR switch is available in five basic configurations:

•Horizontal •Vertical •Phase-over-Phase •Delta •Inverted

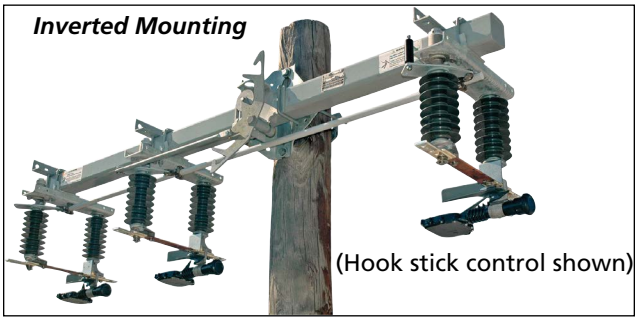
All feature clockwise opening and are operable by torsional or reciprocating controls as well a hookstick operation option (full-length down-the-pole control or crossarm-mounted hook stick-operation control).

1. ***Full-length down-the-pole controls*** consist of Torsional swing-handle operation for Horizontal, Delta and Inverted switches and Reciprocating pump-handle operation for Vertical and Phase-over-Phase switches. (Standard Duty or Heavy Duty conrols are available for Vertical and Phase-over-Phase switches.) Switch open or close positions locking provisions are provided.
2. ***Offset control option for horizontal configuration*** allows the control to be trained down the side of the pole where interference prohibits mounting the control on the front of the pole.
3. ***Crossarm-mounted hook stick-operation controls*** provide pull-to-open / pull-to-close switch with maximum target hook stick accessibility.

Features:

All three phase switches feature a Roller Cam overtoggle mechanism to assure locked closed blades, mechanical advantage for easier open and close operation, and "snap" feedback to the operator.

Inverted Mounting



(Hook stick control shown)

Phase-over-Phase Mounting

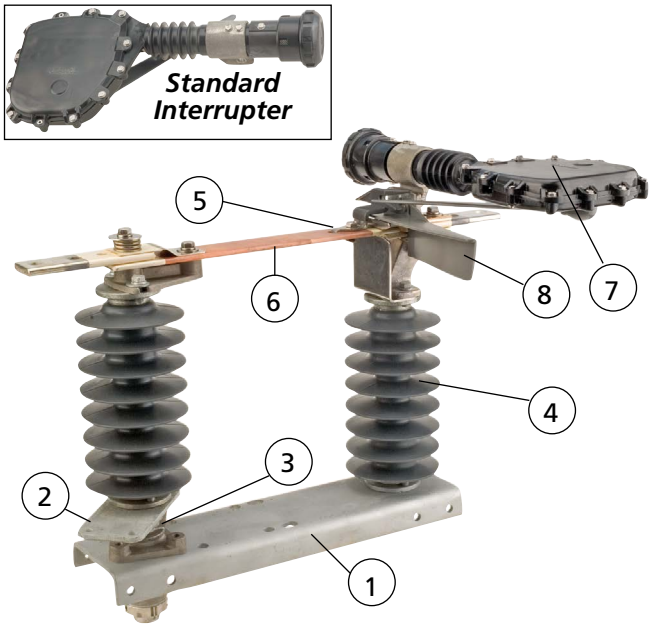
Delta Mounting

Type AR (Automation-Ready) Switch

HUBBELL Power Systems

15kV, 27kV 34.5kV (Grd-Wye) or 38kV 900 Amperes Continuous/Interrupt

Feature —	*Advantage —*
• *Automation-ready design*	• *Compatible with today's D/A environment by adding a motor operator and RTU of your choice, or upgrade in the future*
• *900-amp continuous and interruption current rating*	• *Meets present and future operation requirements*
• *Roller Cam Overtoggle*	• *Mechanical advantage reduces operating torque to the lowest level in the industry to date* • *Overtoggle feature assures blades are closed and gives "snap" feedback to the operator*
• *Hook stick operation*	• *Minimizes installation time, reduces possible vandalism, eliminates control adjustments*
• *Unitized, pre-assembled construction*	• *Minimizes installation time and eliminates control adjustments*
• *Five mounting arrangements*	• *Meets various utility installation requirements*
• *Single Point Lifting Bracket*	• *Provides a single, balanced lifting point to connect strap during switch installation*



Single Phase of Type AR Switch

1. Hot-rolled steel base formed into a channel and gavanized per ASTM A153.
2. Hot-rolled crank lever provides high strength and corrosion resistance. Galvanized per ASTM A153.
3. Delrin® bushing coupled with a cast aluminum rotating shaft eliminates the need for lubrication during the life of the switch.
4. Insulators available in 2.25" bolt circle, porcelain or polymer.
5. High-conductivity copper with phosphorous-bronze back-up springs and copper-tungsten fault-closing tips provide reliable contact areas. Silver-to-silver current-transfer points.
6. Blade formed from hard-drawn, high-conductivity copper for maximum current carrying capability.
7. Interrupter provides current interruption without external arc or flame. High-strength polyurethane material for strength, weatherability and UV resistance. Bolted tongue-in-groove mounting ensures positive alignment.
8. Polycarbonate ice shield helps protect contacts from ice build up.

Available Options

Hook stick Operation The Type AR switch can be operated by a hook stick operation. This option eliminates control pipe sections down the pole and their attendant adjustment during installation and maintenance.

Extra Pipe The extra pipe section includes guide, coupling, and all hardware for attachment.

Extension Links When deadending to the AR switch, extension links must be used to give needed clearance. The end clevis has a slotted hole for inserting the machine bolt without having to remove the extension bar. The extension links supplied are 14 inches long, hot-dip galvanized, and REA accepted. Catalog No. C2070112; six required per switch.

Surge Arrester Brackets Three brackets can be supplied for mounting six surge arresters (utility supplied) for over-voltage protection.

Sensor Brackets Extension Brackets can be supplied, or added to the AR Switch, to allow for the additon of line voltage/current sensors.

Crossarm Braces may be specified as an option.

ESP™ polymer Insulators The distribution insulators, 2.25-inch bolt circle, are available in a U.S.-manufactured ESP polymer design. They are light weight, durable, and they offer long-term performance in every type of environment.

Terminal Connectors Catalog No. ATC1343, fortified cadmium-plated aluminum parallel-groove clamp can be supplied with switches. Six per switch.

Cable Range:
Minimum No. 2 solid copper [0.258 inch (6.55 mm)] to maximum 500 kcmil copper [0.811 inch (20.60 mm)].

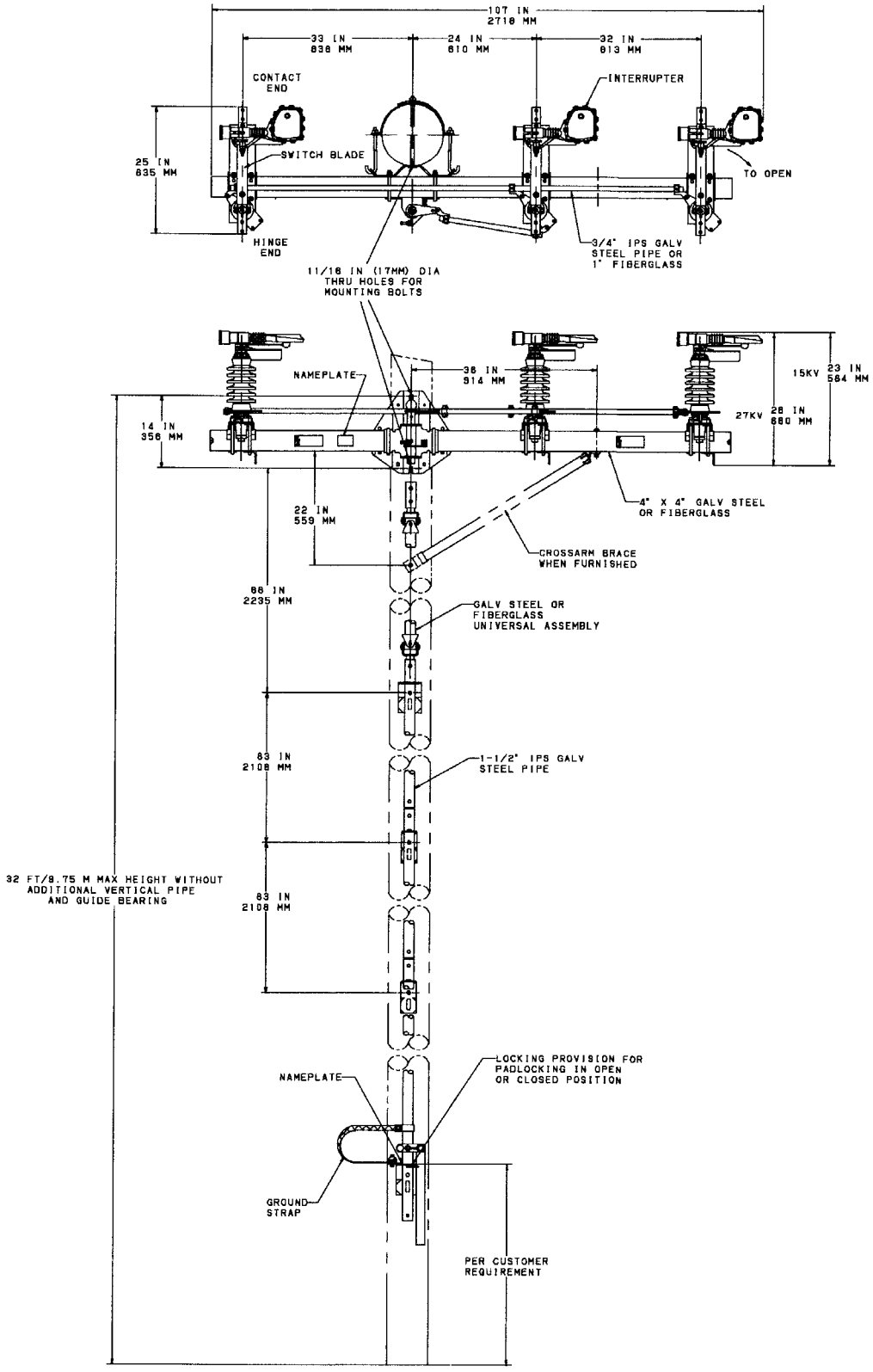
Control Insulator One 150 kV LIW (Lightning Impulse Withstand - BIL) polymer insulator in vertical control pipe.

Captive Hardware Two stainless-steel spline bolts pressed into each terminal pad, nuts and lockwashers included.

Type AR (Automation-Ready) Switch

15kV, 27kV 34.5kV (Grd-Wye) or 38kV 900 Amperes Continuous/Interrupt

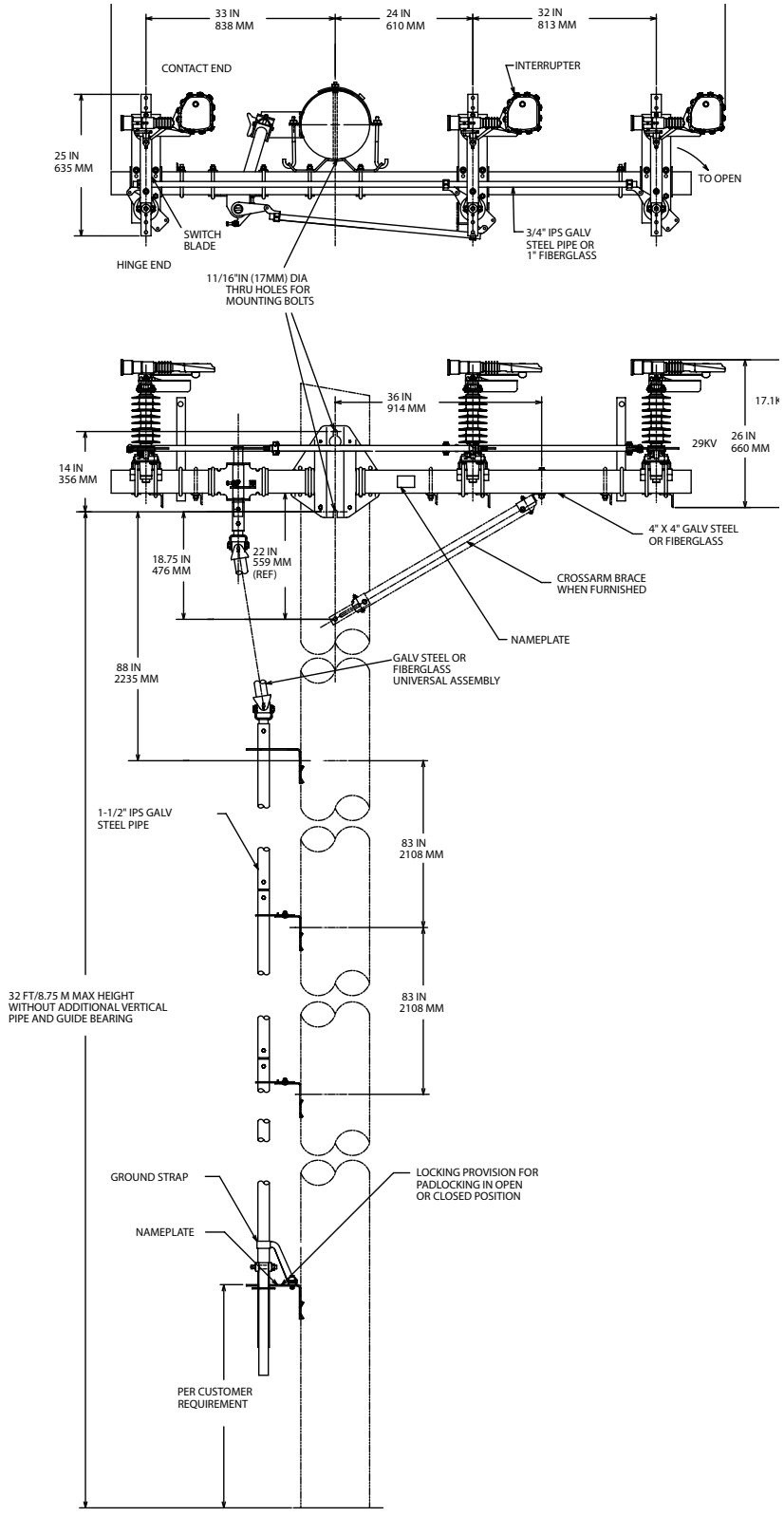
Horizontal Mounting – Down-the-Pole Control



Type AR (Automation-Ready) Switch

15kV, 27kV 34.5kV (Grd-Wye) or 38kV 900 Amperes Continuous/Interrupt

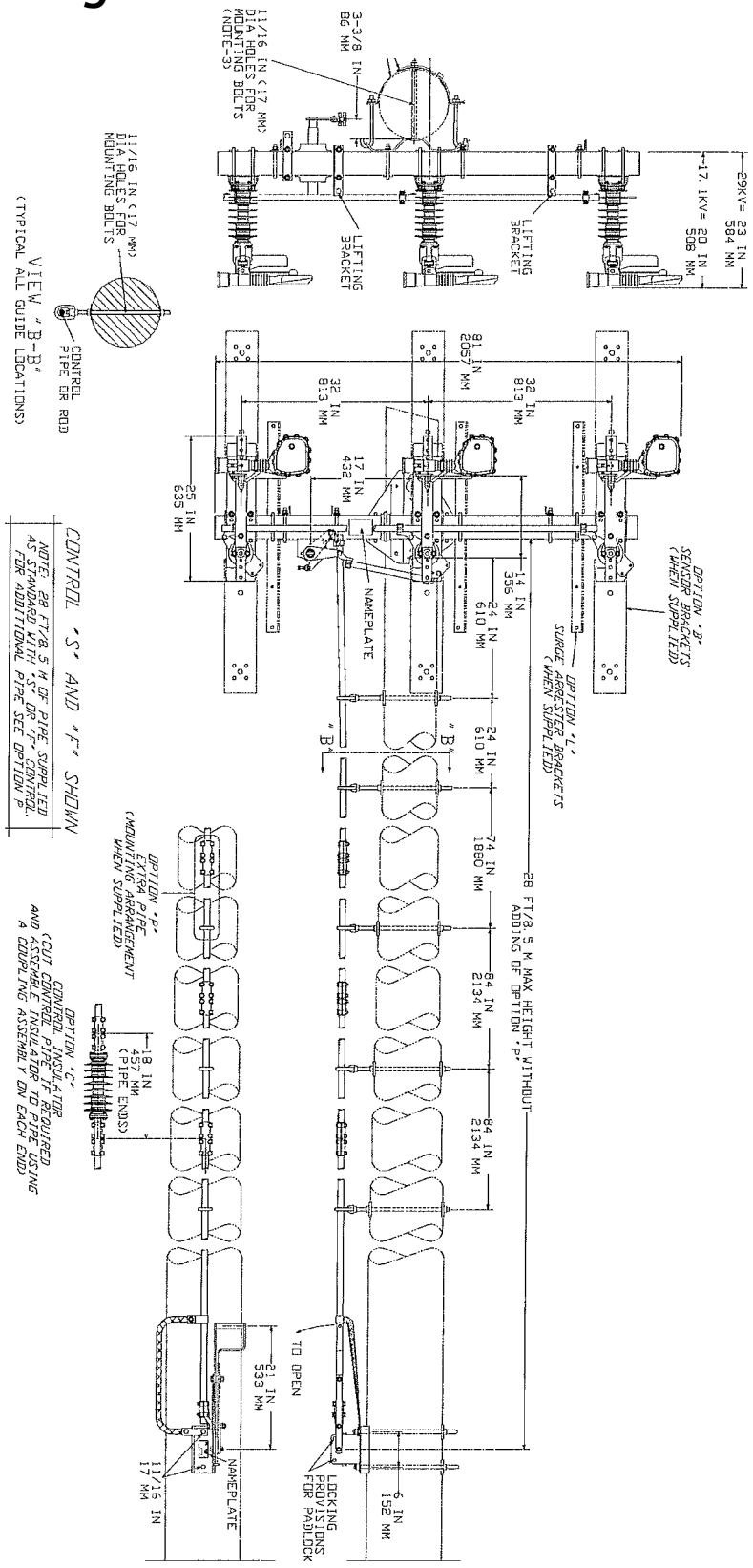
Horizontal Mounting – Offset Side-of-the-Pole Control



Type AR (Automation-Ready) Switch

15kV, 27kV 34.5kV (Grd-Wye) or 38kV 900 Amperes Continuous/Interrupt

Vertical Mounting



Type AR (Automation-Ready) Switch

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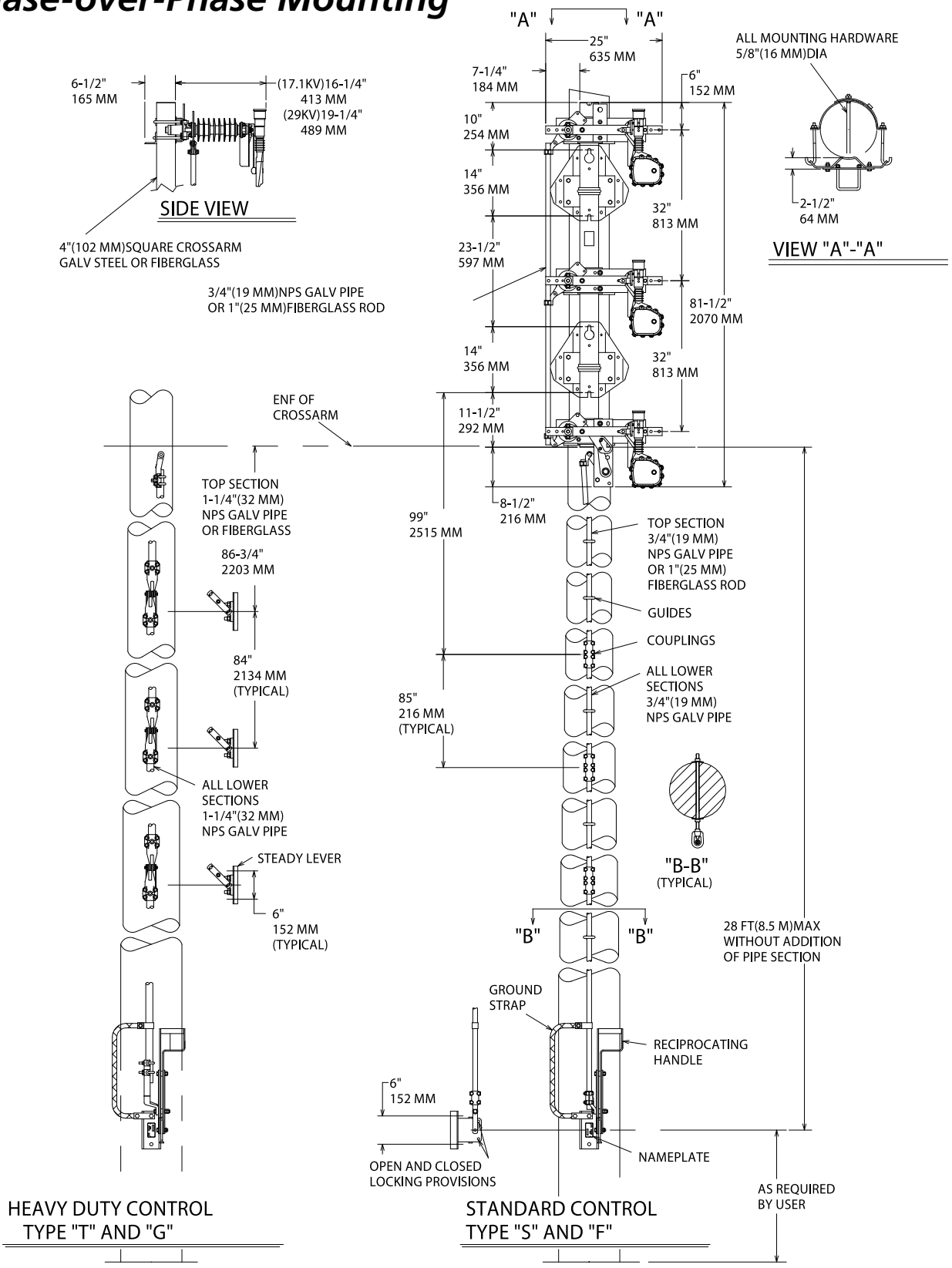
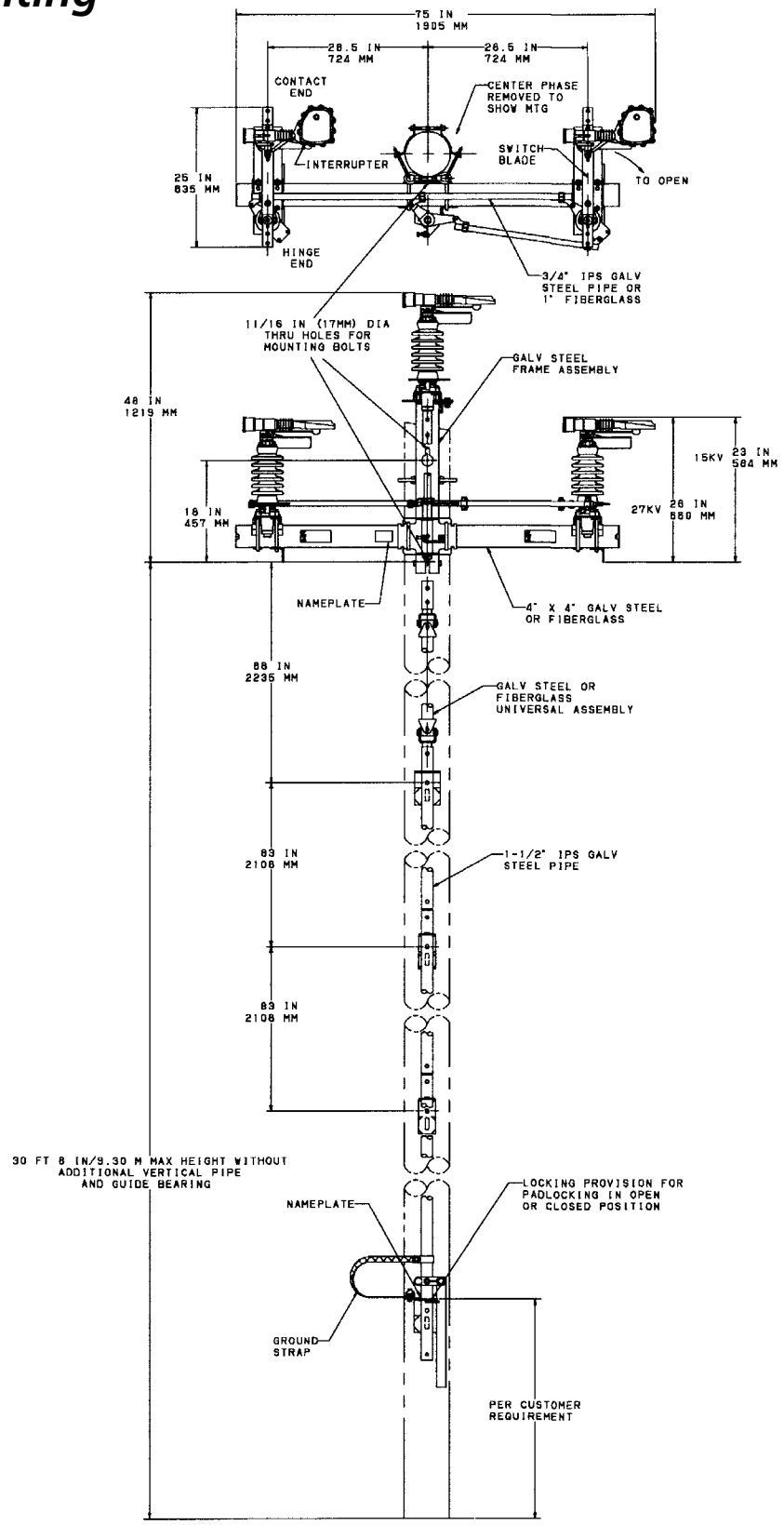
Phase-over-Phase Mounting



Type AR (Automation-Ready) Switch

15kV, 27kV 34.5kV (Grd-Wye) or 38kV 900 Amperes Continuous/Interrupt

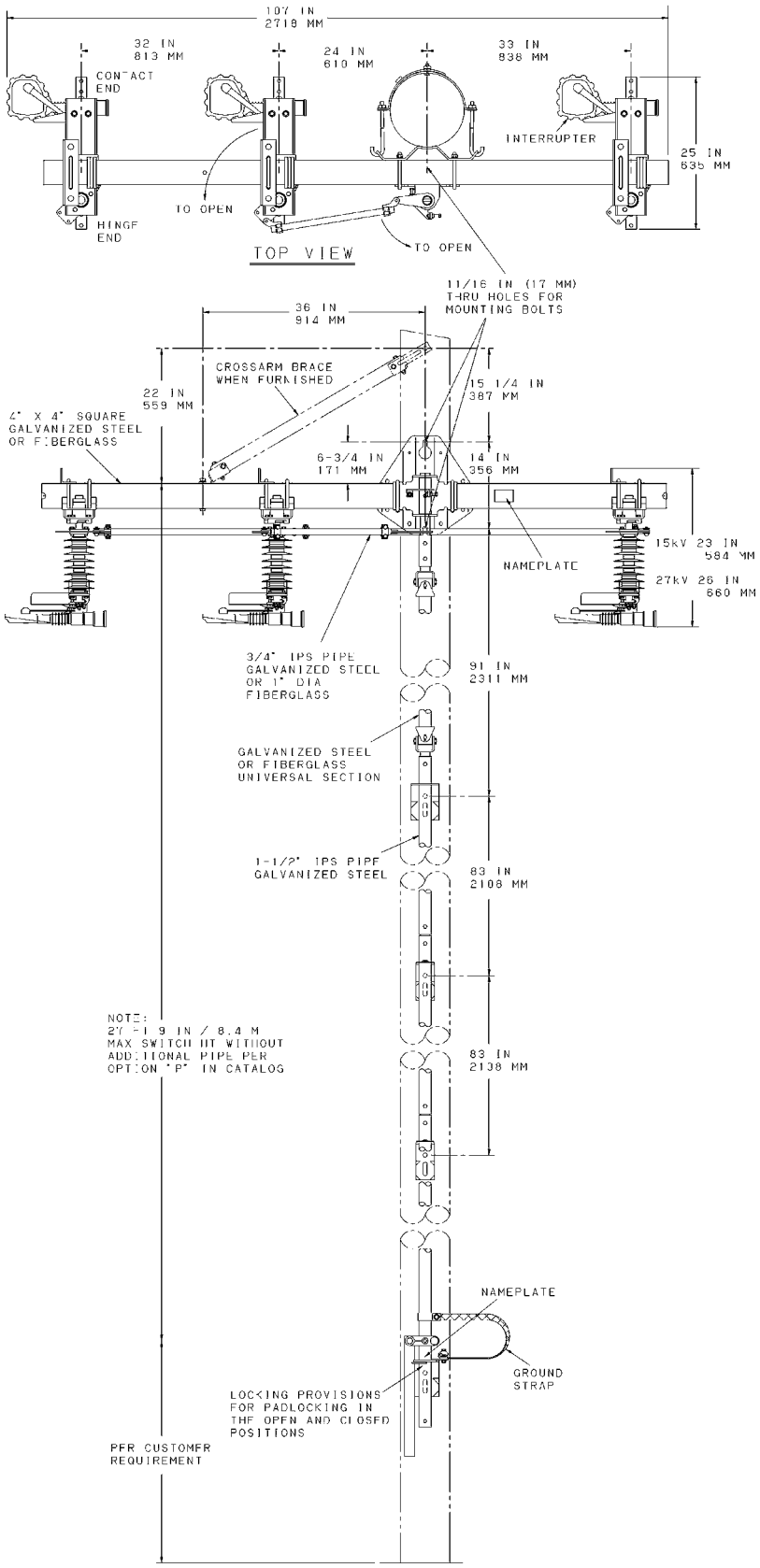
Delta Mounting



Type AR (Automation-Ready) Switch

15kV, 27kV 34.5kV (Grd-Wye) or 38kV 900 Amperes Continuous/Interrupt

Inverted Mounting



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For details on Motor Operated AR Switches, refer to catalog section 14C.

Catalog Numbering System

A R X X X X X X X X X X X X X

Position 1:

1 = ***Standard*** Interrupter

Position 2:

Configuration

1 = ‡Horizontal
2 = Vertical
3 = Ø-over-Ø
4 = Delta
5 = Inverted

Position 3:

Insulation, kV Impulse (maximum system kV)

1 = 110 porcelain (17.1kV)
3 = 110 polymer (17.1kV)
4 = 150 polymer (29kV, No Restrictions)
6 = 150 polymer (34.5kV Grounded-Wye only)
7 = 150 polymer Long Leak 39.6" (34.5 kV, Grounded-Wye only)
8 = 200 polymer (38kV, No Restrictions)

‡To specify Offset Control, add 0116 as a suffix after building a complete Catalog Number for all other features.

Position 4:

Crossarm/Interphase Shaft

S = Steel/Steel
F = Fiberglass/Fiberglass
M = Steel/Fiberglass

Position 5:

Standard Controls — Pipe sizes on drawings, pages 14A-4 thru -8 (All configurations)

S = All Steel Vertical Sections (Includes standard 28' pipe)
F = One Fiberglass Vertical Section
H = Vertical Controls replaced with Hookstick Operating Mechanism

Heavy-Duty Controls — 1¼" IPS (Vertical and Ø-over-Ø only)

T = All Steel Vertical Sections
G = One Fiberglass Vertical Section
A = Torsional - All Steel Sections 1 ¼" Pipe
B = Torsional - All Steel Sections 1 ¼" Pipe except Top Section Fiberglass Tube

Positions 6 through 13:

See Option Tables for each Configuration

Options by Configuration

Horizontal and Inverted Switches

B = Sensor Brackets, Kit – AR11B
* ***C*** = Control Insulator, Kit – AR11C
† ***H*** = Captive Hardware
L = Surge Arrester Brackets Kit – AR11L
* ***P*** = Extra Pipe Option, Kit – AR11P
* ***PP*** = Two Extra Pipes, Kit - AR11P Qty 2
S = Steel Crossarm Brace, only one supplied
† ***T*** = Terminal Connectors (ATC 1343)
W = Wood Crossarm Brace, only one supplied
X = Extension Links

Phase-over-Phase Switch, S & F Controls

B = Sensor Brackets
* ***C*** = Control Insulator
† ***H*** = Captive Hardware
L = Surge Arrester Brackets
* ***P*** = Extra Pipe Option, Kit – AR13P
* ***PP*** = Two Extra Pipes, Kit - AR11P Qty 2
† ***T*** = Terminal Connectors (ATC 1343)
X = Extension Links

Phase-over-Phase Switch, T & G Controls

B = Sensor Brackets
* ***D*** = Control Insulator
† ***H*** = Captive Hardware
L = Surge Arrester Brackets
* ***R*** = Extra Pipe, Kit - AR12R
* ***RR*** = Two Extra Pipes, Kit - AR12R Qty 2
† ***T*** = Terminal Connectors (ATC 1343)
X = Extension Links

* Variation 0116 Option is Switch with Side Controls

Vertical Switch, S & F Controls

B = Sensor Brackets
* ***C*** = Control Insulator
H = Captive Hardware
L = Surge Arrester Brackets
* ***P*** = Extra Pipe Option, Kit – AR12P
* ***PP*** = Two Extra Pipes, Kit - AR11P Qty 2
† ***T*** = Terminal Connectors (ATC 1343)

Vertical Switch, T & G Controls

B = Sensor Brackets
* ***D*** = Control Insulator
H = Captive Hardware
L = Surge Arrester Brackets
* ***R*** = Extra Pipe, Kit – AR12R
* ***RR*** = Two Extra Pipes, Kit - AR12R Qty 2
† ***T*** = Terminal Connectors (ATC 1343)

Delta Switch

B = Sensor Brackets
* ***C*** = Control Insulator
† ***H*** = Captive Hardware
L = Surge Arrester Brackets
* ***P*** = Extra Pipe, Kit – AR11P
* ***PP*** = Two Extra Pipes, Kit - AR11P Qty 2
† ***T*** = Terminal Connectors (ATC 1343)
X = Extension Links

****Options C, P, R, PP and RR do not apply when Hook Stick Operated Control is supplied.***

†***Options H and T, Captive Hardware and Terminal Connectors, cannot be ordered together.***

Replacement Parts

C8180001	***Standard*** Interrupter (all Configurations)
PSE8180136P	Interrupter 38kV Switches
E8181000P	Live Parts (all Ratings & Configurations)

NOTES

HUBBELL®
Power Systems

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1M RGS 3/13

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