HUBBELL Power Systems



AIS Padmounted Air-Insulated Switchgear

AIS 15kV & 25kV providing combination of Deadfront protection with Air-Insulation benefits



15 & 25kV

Air-insulated Deadfront Padmounted Switchgear

Product Description

The AIS padmounted switchgear is an air-insulated, deadfront switching device used for sectionalizing underground distribution systems. It is available in 15kV and 25kV ratings and in a variety of switch/fuse configurations. There are also extensive options available.

The AIS switchgear is a true deadfront design with a sealed switching compartment, utilizing air as the insulating medium along with a deadfront connector system. This combination minimizes electrical exposure to work crews and the public, reduces outages, reduces maintenance requirements and provides the most cost effective solution for 15kV and 25kV underground system sectionalizing.

Product Function

Air-insulated switchgear are loadbreak switches designed to provide a means for disconnecting, sectionalizing and isolating the electrical distribution system effectively and safely.

| Features | Benefits |
|-------------------------------------|--|
| True air-insulated deadfront design | Minimizes electrical exposure to work crews and the public Reduces maintenance requirements Reduces outages caused by vegetation and/or animal intrusion |
| Louvered Enclosure Design | Prevents unwanted gases and moisture from building up inside the enclosure |
| 11-Gauge mild steel | Superior strength and durability (304-Stainless Steel optional) |
| Large viewing windows | Maximum visibility of 600A switch position and fuse condition |
| Built-in base spacing | Increases door clearance and reduces the need for additional base spacers |
| No center door support | Increases working area in cable compartments |
| Replaceable switch-way bushings | All switch-way bushings (200A or 600A) are easily field replaceable |
| Internal no-drip compound | Prevents moisture condensation from accumulating under the roof |
| Fault indicator window | Viewing window for mounting common fault indicators |

AIS Design Features

Switch Compartment



Fuse Compartment



AIS Design Features in Depth

Structural Stability

The fully welded enclosure is constructed of heavy gauge steel for superior strength and durability. For applications in highly corrosive areas, stainless steel enclosures are available.

Exterior Protection

The surface of each enclosure undergoes a multistage chemical cleaning process. A powder coat finish is then applied for superior corrosion protection, durability and ultraviolet protection. This coating system meets the latest revision of ANSI/IEEE Standard C57.12.28, "Padmounted Equipment Enclosure Integrity."

Padmount Interchangeability

The AIS is designed to be pad interchangeable with competitive designs. Base adapters also are available to make the AIS compatible with pads for some live front gear.

Externally Replaceable Bushings

The 600A bushings on the AIS switch are truly externally replaceable. This feature allows the utility to quickly replace any bushings in the field without disassembling the face-plate. Due to the individualized sub-assembly design, the AIS may be provided with 200A bushing wells in lieu of 600A bushings.

External Side Operator & Removable Lifting Plate

An external operating mechanism is housed on the outside of the center compartment and allows linemen to perform switching functions without opening the cable compartment. Each three-phase gang switch is equipped with its own operator. The external operator can be padlocked in either the open or closed position.

Door Latching System

The low-profile door latch assembly has no protruding handles. The pentahead on the right operates the three-point latch. The pentahead on the left secures the door to the center door jamb. Both pentaheads must be engaged before a padlock can be installed.

Visible Break

Oversized Thermopane windows provide excellent viewing for verification of visible break. The large windows are constructed of heavyduty, mar-proof double pane polycarbonate. They are easily removed in the shop to provide ready access to switch components.

A sturdy operating handle is stored in each operator compartment. The padlocking provisions on the compartment doors accommodate the majority of available padlocks.



Door Latching System



Confirming the visible break through the AIS windows eliminates the need to move the 600A connectors. Sufficient space is provided for feed-through bushings for parking of elbows on parking stands.

Fault Indicator Window & Louvers

The standard fault indicator window allows for visual inspection of the equipment prior to opening up the compartment doors. Also offered as a standard, the louvers feature prevents moisture build up inside the enclosure.

Fusing Flexibility

Fuse versatility was a key design parameter of the AIS in order to utilize existing fuses already approved and in use by the utility and/ or to improve coordination with existing fuse systems. A utility using livefront gear can use the same fuses and end fittings in the AIS. The following 3 fuse options are available.

- S&C SMU-20 power fuse
- S&C SM-4Z power fuse
- Cooper type NX current limiting fuse

Indicator windows are provided for locating blown fuses. Fuse doors are mechanically inter-changeable and require only a simple operation, without de-energizing the 600 amp line side, to change in the field from one type fuse to another.

Models

The Padmounted Air-Insulated Switchgear (AIS) comes in several standard models to meet differing distribution switching requirements. Each model is available in either 15kV or 25kV ratings. All configurations and ratings are factory selected and cannot be field configured. Model configurations are available in combinations of ways (single or three-phase) which may be switched, fused or tapped (solid), with available fusing options.

The AIS is designed with an integrated base spacer for elevated efficiency and accessibility. This enables easy door access in most locations without the need for additional risers. Consult factory representative for details.





Loadbreak elbow must be removed before the mechanical latch can be opened. Parking the elbow insures that the load is safely disconnected. After the elbow has been parked, the interlock bail on the fuse door is released. As fuse door is lowered, a springactivated barrier closes behind it to maintain the deadfront integrity of the switch's tap side. When the fuse door is fully opened, the fuse tray is positioned an ample distance from the cables for easy removal of the fuses.



Fuse door latching provision to change fuses with a grip-all stick as to not cause movement of the fuse door while open.

AIS Ratings | Table 1

| Nominal Voltage | 15kV | 25kV |
|--|---------|---------|
| Maximum Design Voltage | 15.5kV | 29kV |
| BIL | 95kV | 125kV |
| One-Minute Withstand (60Hz) | | |
| Switch and Terminators | 35kV | 60kV |
| Continuous Current Rating | | |
| Switch Side | 600 Amp | 600 Amp |
| Fuse Side (Maximum) | 200 Amp | 200 Amp |
| Load Switching | 600 Amp | 600 Amp |
| Cable Charging Current | 10 Amp | 15 Amp |
| Magnetizing Current | 21 Amp | 21 Amp |
| One-Sec Short-Circuit Withstand Current, RMS (sym) | 18,600A | 18,600A |
| Peak Withstand Current, (Asym) | 41,200A | 41,200A |
| Fault Close, Peak (Asym) | 42,700A | 42,700A |

Ordering Information: 15 and 25 kV AIS Padmounted Sectionalizing Equipment | Table 1-2

| Switch | One-Line | Voltage kV | | Termination & E | Dhasas | | | |
|---------------|--|------------|--------|-----------------|--------|--------|--------|--------|
| Configuration | Diagram | Nom. | BIL | Line 1 | Line 2 | Line 3 | Line 4 | Phases |
| AIS-A | | 15/25 | 95/125 | 200 | 200 | 200 | - | 1 |
| AIS-3 | $\rightarrow \rightarrow $ | 15/25 | 95/125 | 600* | 600* | - | - | 3 |
| AIS-5 | $\succ \checkmark \prec$ | 15/25 | 95/125 | 600* | 200 | - | - | 3 |
| AIS-6 | | 15/25 | 95/125 | 600* | 600* | - | 200 | 3 |
| AIS-9 | | 15/25 | 95/125 | 600* | 600* | 200 | 200 | 3 |
| AIS-10 | | 15/25 | 95/125 | 600* | 600* | 600* | 600* | 3 |
| AIS-11 | | 15/25 | 95/125 | 600* | 600* | 600* | 200 | 3 |
| AIS-12 | | 15/25 | 95/125 | 200 | 600* | 200 | 200 | 3 |
| AIS-13A | | 15/25 | 95/125 | 600* | 600* | 600* | - | 3 |

*200A universal bushing wells can be supplied instead of 600A deadbreak bushings.

AIS Ratings | Table 1-3

| | Height | Width | Depth | | Nominal |
|--------------|--------------|--------------|--------------|--------------|-------------|
| Model No. | | | Base | Overall | |
| | in (cm) | in (cm) | In (cm) | In (cm) | IDS. (KG) |
| AIS-1A/15kV | 45 (114) | 41 (104) | 36-7/8 (94) | 38-1/4 (97) | 475 (215) |
| AIS-1A/25kV | 51-1/2 (131) | 46-1/2 (118) | 49-3/4 (126) | 51-1/8 (130) | 695 (315) |
| AIS-3/15kV | 45 (114) | 41 (104) | 64-1/2 (164) | 67-1/4 (171) | 875 (395) |
| AIS-3/25kV | 46-1/2 (118) | 46-1/2 (118) | 79-1/2 (202) | 82-1/4 (209) | 1275 (580) |
| AIS-5/15kV | 45 (114) | 41 (104) | 64-1/2 (164) | 67-1/4 (171) | 900 (410) |
| AIS-5/25kV | 51-1/2 (131) | 46-1/2 (118) | 79-1/2 (202) | 82-1/4 (209) | 1350 (610) |
| AIS-6/15kV | 45 (114) | 75 (190) | 64-1/2 (164) | 67-1/4 (171) | 1450 (660) |
| AIS-6/25kV | 51-1/2 (131) | 84 (213) | 79-1/2 (202) | 82-1/4 (209) | 1950 (885) |
| AIS-9/15kV | 45 (114) | 75 (190) | 64-1/2 (164) | 67-1/4 (171) | 1500 (680) |
| AIS-9/25kV | 51-1/2 (131) | 84 (213) | 79-1/2 (202) | 82-1/4 (209) | 2000 (910) |
| AIS-10/15kV | 45 (114) | 75 (190) | 70-1/2 (179) | 71-1/4 (186) | 1650 (750) |
| AIS-10/25kV | 46-1/2 (118) | 84 (213) | 86 (220) | 88-3/4 (225) | 2000 (910) |
| AIS-11/15kV | 45 (114) | 75 (190) | 70-1/2 (179) | 71-1/4 (186) | 1650 (750) |
| AIS-11/25kV | 51-1/2 (131) | 84 (213) | 86 (220) | 88-3/4 (225) | 2200 (1000) |
| AIS-12/15kV | 45 (114) | 75 (190) | 64-1/2 (164) | 67-1/4 (171) | 1550 (705) |
| AIS-12/25kV | 51-1/2 (131) | 84 (213) | 79-1/2 (202) | 82-1/4 (209) | 2075 (940) |
| AIS-13A/15kV | 45 (114) | 75 (190) | 70-1/2 (179) | 71-1/4 (186) | 1600 (725) |
| AIS-13A/25kV | 46-1/2 (118) | 84 (213) | 86 (220) | 88-3/4 (225) | 1950 (885) |

Production Testing

After assembly, all switches are tested to ANSI Standards:

1. Voltage Drop Test (IR). Each line direction of the switch configuration is tested. The IR test is a current test where the voltage drop across the area tested is measured to indicate the impedance in the circuit which is tested. This test assures reliable electrical connections.

2. High Potential Testing. Each switch is tested phase-to-phase and phase-to-ground across the insulation system with the switch in the open and closed positions.

AIS Switch Catalog Number System

| Basic Format = | х | х | х | х | х | х | х | х | х | x | х |
|----------------|---|---|---|---|---|---|---|---|---|----|----|
| Position = | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

Example Part Number

0

Α

Part # A090A20C1EIL, shown right below, is for an AIS 9 model which is 15kV unit with provisions for SM-20 fuses, 600A source bushings, removable 600A bushing studs, 6" base pad adapter (Option E), bushing inserts, and Kirk Key interlocks to prevent paralleling source side switches and prevent entry to fuse doors without all feed switches locked open.

9

0

Δ

| | | | Positi | on 8-11 | | | | | | | |
|-----|--------------|---|----------------------------------|---------------------------------|--------------------------|---------------------|--|--|--|--|--|
| | | | Op | tions | | | | | | | |
| | | C1 = Removable stud 600A bushings | | | | | | | | | |
| | | E = 6" base adapter to allow mounting AIS switch on smaller pre-existing pad for live-front switchgear | | | | | | | | | |
| | | | F = Stainless | steel enclosur | re | | | | | | |
| | G = | Kirk Key Inte | rlocks to prever | nt paralleling : | source side switch | ies | | | | | |
| | н | = Kirk Key inte | erlocks to preve feed switche | nt entry to fu s locked oper | se doors without a n. | all | | | | | |
| | | | I = 200A bush | ning well inser | ts | | | | | | |
| | | L = Kirk k | Key Interlocks co | ombining opt | ions G and H | | | | | | |
| - ± | | | Q = 6" k | oase riser | | | | | | | |
| ιτ | | | U = 12" | oase riser | | | | | | | |
| C | | | V = 18" | oase riser | | | | | | | |
| | | | W = 24" | base riser | | | | | | | |
| | | | | | | | | | | | |
| | | | L | | | | | | | | |
| 2 | 0 | 0 | :1 | E | | L | | | | | |
| 6 | 7 | | 8 | 9 | 10 | 11 | | | | | |
| _ | | | | | | | | | | | |
| | | 00 = | No fusing (i.e. A | AIS3,AIS-10, A | IS-13A) | | | | | | |
| | | | | | | | | | | | |
| | | Position 6-7 | | | | | | | | | |
| | F | For 15 kV AIS : | Select the appr | opriate fuse f | rom table below: | | | | | | |
| | Euso | Fuse | Fuse | R | atings | Catalog | | | | | |
| _ | Manufacturer | Mounting (Door) | Mounting (End-Fittings) | Maximum Design kV | Maximum Amperes RMS | Number Additions | | | | | |
| | S&C® | CM 20 | NONE | 17 | 200 | 20 | | | | | |
| | S&C® | SM-20 | SM20 | 17 | 200 | 211 | | | | | |

| Position 1 | | | | | | | | |
|-----------------|----------------------|----------------------|------------------|----------------------------------|-------------------|----------------|-------------|-----------|
| P OSICIOIT I | Position 2-4 | Position 5 | | 00 = | No fusing (i.e. A | AIS3,AIS-10, A | IS-13A) | |
| kV Rating | | | | | | | | |
| A = 15kV | Switch Configuration | Source Connector | | | | | | |
| B = 25kV | 01A = AIS-1A | Provisions | | Positi | ition 6-7 | | | |
| | 030 = AIS-3 | A = 600A deadbreak | Select the appr | propriate fuse from table below: | | | | |
| | 050 = AIS-5 | B = 200A universal | | Fuse | Fuse | Ratings | | Catalog |
| | 060 = AIS-6 | bushing wells | Fuse | Mounting | Mounting | Maximum | Maximum | Number |
| | 090 = AIS-9 | NOTE: All fuse | Manufacturer | (Door) | (End-Fittings) | Design kV | Amperes RMS | Additions |
| | 100 = AIS-10 | connector provisions | S&C [®] | CM 20 | NONE | 17 | 200 | 20 |
| | 110 = AIS-11 | 200A universal | S&C® | SIMI-20 | SM20 | 17 | 200 | 2H |
| | 120 = AIS-12 | bushing wells. 200A | S&C* | CN4 47 | NONE | 17 | 200 | 4Z |
| | 13A = AIS-13A | universal bushing | S&C* | SM-4Z | SM4Z | 17 | 200 | 4H |
| | specified as an opt | | Cooper® | NX (| Code 4 | 8.3 | 1.5-40 | N1 |
| | | <u> </u> | Cooper® | NX | Code 5 | 8.3 | 50-100 | N2 |

Cooper[®]

| Position 6-7 | | | | | | | | | |
|--------------|---|----------------------------|----------------------|------------------------|---------------------|--|--|--|--|
| Fc | For 25 kV AIS : Select the appropriate fuse from table below: | | | | | | | | |
| Fue | _ Fuse Fuse Ratings C | | | | | | | | |
| Manufacturer | Mounting (Door) | Mounting (End-Fittings) | Maximum Design kV | Maximum Amperes RMS | Number Additions | | | | |
| S&C* | CM 20 | NONE | 27 | 200 | 20 | | | | |
| S&C* | SIM-20 | SM20 | 27 | 200 | 2H | | | | |
| S&C* | CM 47 | NONE | 27 | 200 | 4Z | | | | |
| S&C* | SIM-4Z | SM4Z | 27 | 200 | 4H | | | | |
| Cooper® | NX Code 4 | | 15.5 | 1.5-40 | N1 | | | | |
| Cooper® | NX | Code 5 | 15.5 23 | 50-100 6-40 | N2 | | | | |
| Cooper® | NX (| Code 6 | 23 | 6-50 | N3 | | | | |

15.5

NX Code 6

50-100

Ν3

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hpsliterature@hubbell.com

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