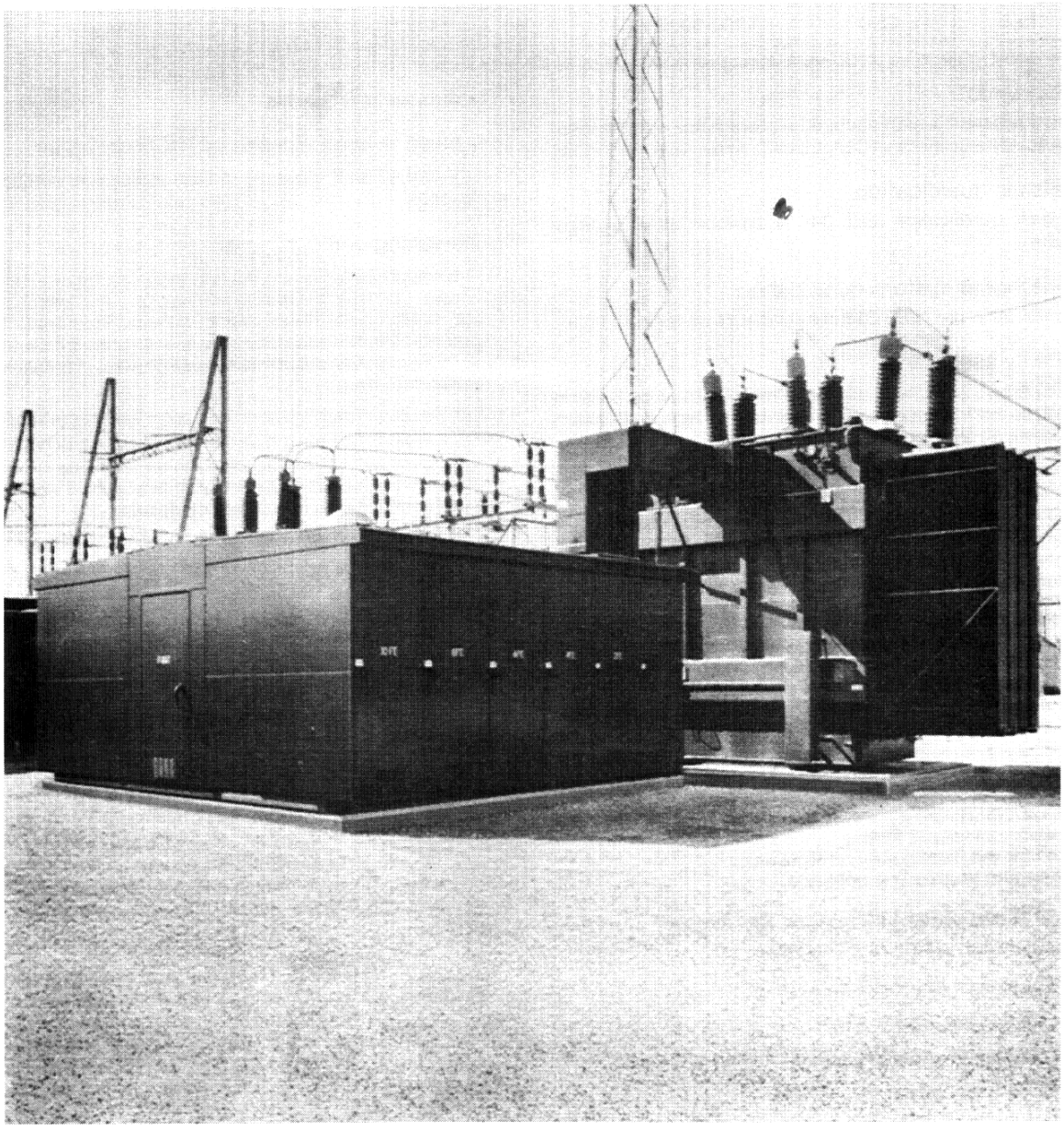
ABB
ASEA BROWN BOVERI

Metal-Clad Switchgear
I-T-E Type HK
4.16 kV 75 thru 350 MVA
7.2 and 13.8 kV 500 thru 1000 MVA
1200 thru 3000 Amperes

Publication No. ABBCAN PD. 10.3.1.0



Introduction

Compact Asea Brown Boveri medium voltage metal-clad draw-out switchgear type HK consists of standard units suitable for use with the complete family of Asea Brown Boveri type HK circuit breakers.
Modern insulating materials with high strength to weight ratios allow for reduction in weight and floor space.

Ratings

Nominal Voltage (kV)	Maximum Rated Voltage (kV)	Rated Continuous Current (A)	Insulation Level		
			BIL (kV)	Dielectric Strength (kV)	Corona Extinction (kV)
2.4	2.6	1200-3000A *	45	15	1.8
4.16	4.76	1200-3000A *	60	19	3.5
7.2	8.25	1200-3000A *	75	26	5.5
13.8	15.0	1200-3000A *	95	36	10.5

*For current ratings above 3000A consult your nearest Asea Brown Boveri sales office. ice

Standards

The equipment is manufactured in accordance with the latest applicable standards of CSA, EEMAC, ANSI NEMA and IEEE.

Seismic qualification

Seismic qualification IEEE 344 is available as an optional adder.

Switchgear system qualification

Qualification per IEEE 323 is available as an optional adder.

Quality assurance

Asea Brown Boveri Canada Inc., Power Distribution Division, realizes the full importance of maintaining high quality standards in all their products.

In order to reach these quality goals, the Power Distribution Division operations are conducted in a manner which complies with the requirements of CSA Standard Z 299.2 – "QUALITY CONTROL PROGRAM REQUIREMENTS". Approval to this standard includes the formal acceptance of the manufacturers Quality Manual and Inspection and Test Plan(s).

In order to be totally effective, the Asea Brown Boveri Quality Control Program is in operation continuously, while the level of monitoring activity may vary depending on specific contractual committments. Asea Brown Boveri has been audited by independent auditors and the Quality Control Program has received their approval to the Z 299.2 level.

Asea Brown Boveri's mandate is to ensure delivery to the customer, the finest quality products that can be manufactured. Asea Brown Boveri's success over the years in meeting this committment speaks for itself. Asea Brown Boveri will continue to provide the finest quality products which will give many years of safe and trouble-free operation.

Asea Brown Boveri Metal-Clad Switchgear designed for safety and reliability.

- Closed-door horizontal drawout
- Safe, positive interlocking
- Coordinated insulation system for each voltage class
- Simplified maintenance
- Most compact Switchgear in many ratings
- All parts easily accessible

Two basic voltage classes of HK Switchgear

4.16 kV and 13.8 kV, available in both indoor and outdoor construction.

Space-saving compactness

Space-saving compactness is the first thing you notice in this Asea Brown Boveri Metal-Clad Switchgear. One standard cubicle size in each class saves space and simplifies layout. It also permits complete allocation of space for future frame additions. You may even substitute some higher-rated breakers in existing cubicles.

Asea Brown Boveri switchgear makes it possible to save space in every installation. Standard frames are designed to house auxiliary equipment – potential transformers – lightning arresters – and bus tie transitions. Information on pages 27 and 31 show preferred location of auxiliary equipment.

You can install this equipment in many locations where other switchgear won't fit.

Features

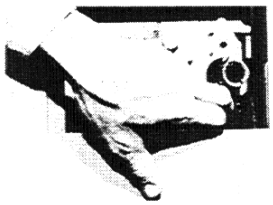
Closed door safety

You never have to open the front door until after the breaker is fully disconnected. For added safety, the breaker cannot be moved unless it has been intentionally tripped and is open.

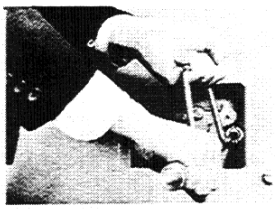
A fully separate test position is automatic in the drawout operation. The movable secondary contacts on the circuit breaker mate with the stationary contacts in the switchgear. Positive stops on the drawout mechanism assure perfect position in the connected, test and disconnected positions. In addition, the closed door disconnect feature of Asea Brown Boveri Switchgear means no cluttered aisles from open doors and no risk of foreign matter getting into the breaker compartment.

Slide back panel

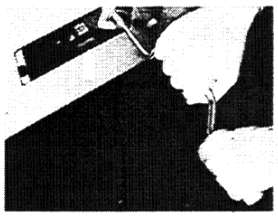
A plainly marked legend on the outside shows the operation of the racking release lever and the racking screw. Regardless of breaker position, these controls are always close to the operating for easy access.



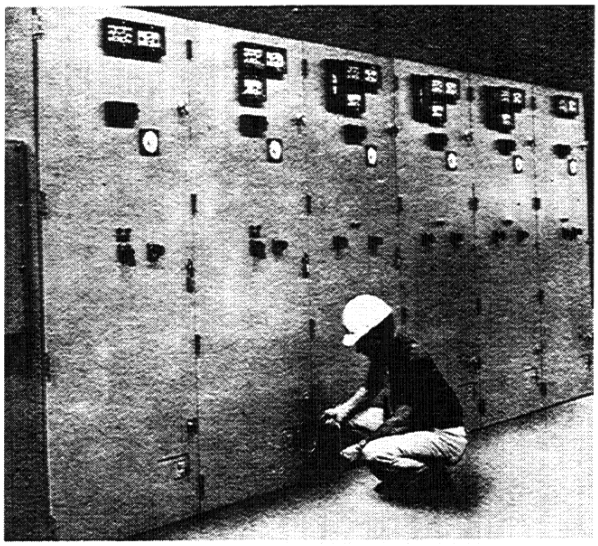
Turn racking release lever.
This unlocks the racking screw so that it is free to turn, but cannot be done unless the breaker is tripped, insuring that breaker position can be changed only when the breaker contacts are open.



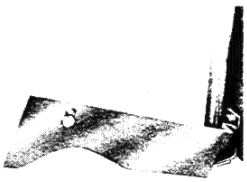
Insert crank and turn.
This easily moves the breaker from connected to disconnected positions. Locking lever provides automatic stop and lock in all positions. Breaker is trip free and cannot be operated at any point between positions.



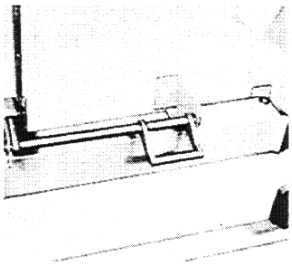
Breaker position indicator.
Operator can tell the position of the breaker immediately from the position indicator without opening door.



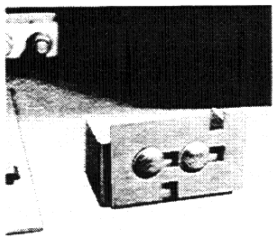
Safety Interlocking



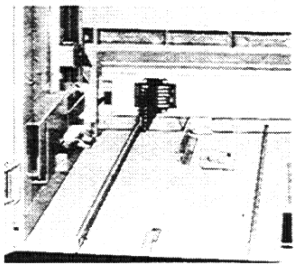
Shutter actuator.
Shutter covering primary leads is forced closed as breaker is removed from the switchgear. Breaker cannot be removed from the cubicle unless shutter is completely closed.



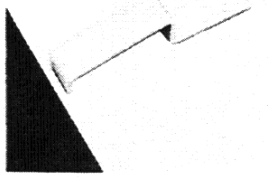
Auxiliary switch actuator.
Operates auxiliary switches in the instrument compartment when the breaker is in the connected position, it can also be arranged for test position operation.



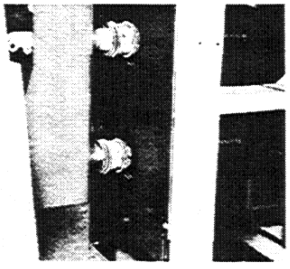
Breaker interference block.
Allows only the correct rating breaker to be inserted into the compartment. It positively prevents inserting an incorrectly rated breaker.



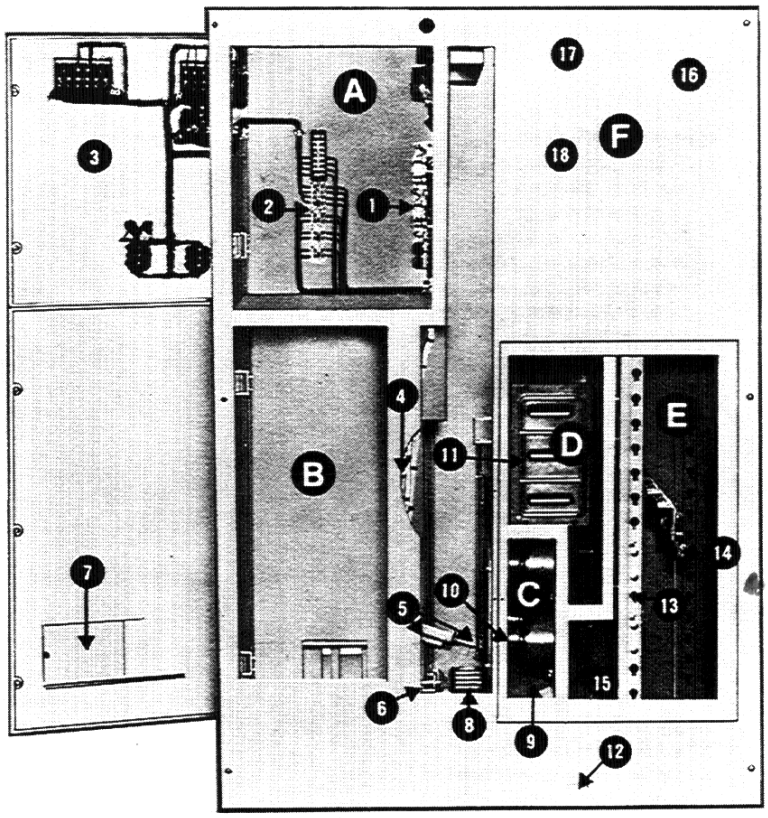
Dual breaker guide rails.
Guarantee positive alignment of the circuit breaker in its compartment, assuring proper mating of all primary, secondary and ground contacts every time.



Automatic spring discharge.
Stored-energy springs automatically discharge either when breaker exits or enters compartment. Breaker is always safe to handle immeditely upon removal.



Primary, secondary and ground contacts.
Contacts on the circuit breaker mate sequentially in a straight line motion with counterparts within the switchgear insuring proper operation at each position.



Side view 5 HK 250 switchgear

Safe Compartmentation – complete accessibility of all components

Each single 5 HK switchgear frame has complete steel side sheets, shown here cut-away to illustrate compartmentation. This unit is divided into six completely segregated areas, with front formed doors with concealed hinges.

A. Instrument Compartment
Isolated from high voltage

1. Ample Auxiliary Switches, Accessible Terminal Blocks, Control Power Cutoff and Control Bus
2. CT Short-Circuiting Blocks
3. Eye-level Instruments, Relays, and Control Switches

B. Circuit Breaker Compartment

4. Cable Trough for customer control cable (bottom entrance)
5. Positive Safety Shutter and Actuator
6. Auxiliary Switch Actuator
7. Sliding Panel for closed-door drawout
8. Secondary Disconnect

C. Current Transformer Compartment

9. Front Removable Toroidal type current transformers
10. Primary Bushings – polyester glass

D. Bus Compartment
Accessible from front and rear

11. Polyester-glass, Bus Supports, Mold-on Bus Insulation, No Compound Bus Joint Covers

E. Cable Compartment

12. Ground Bus
13. Key Slotted Mounting Brackets
14. Cable Lugs (1 per phase standard)
15. Bus-mounted ground fault sensor

F. Auxiliary Device Compartment
Space for:

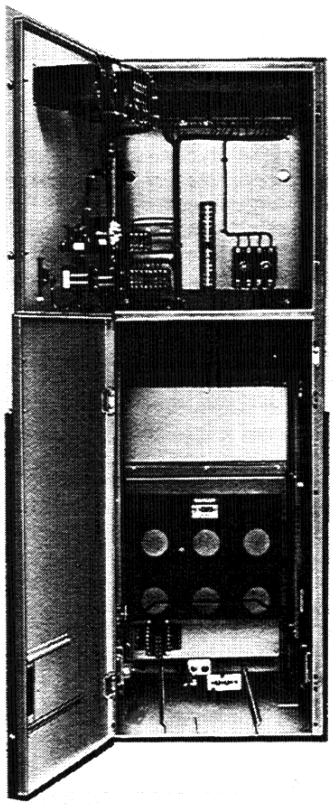
16. Trunnion Type Drawout Potential Transformers
17. Lightning Arresters
18. Bus Transition Space

Design flexibility with separate instrument and breaker compartments

The separate instrument compartment is completely isolated from the high voltage. This "split" door concept allows the operator access to the instrument compartment without being exposed to the primary voltage. A wide variety of instrumentation and protective devices are available in customer-oriented configurations. All secondary wiring including terminal and CT shorting blocks, and other devices are readily accessible from the front. All secondary wiring lugs are of the looped tongue type for greater reliability. They are mounted on removable panels. Here is switchgear with ample room for construction and maintenance personnel.

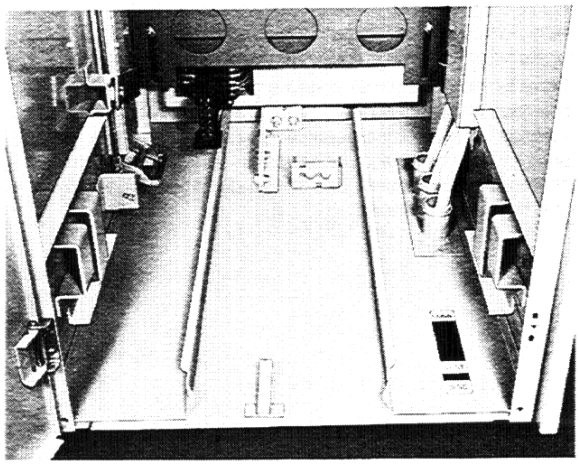
Customer's wire may enter directly from the top or through a covered cable trough from the bottom. Opening in compartment floor is provided for several large conduits. Ample room is available for 24 auxiliary contacts. When a full height instrument panel is required, an 8-inch front extension with a full height front door on each frame in the line-up will be provided.

A safety shutter covers all high-voltage stationary primary disconnects. It is forced downward when the breaker is removed from the switchgear, and covers the primary leads with the breaker in the test or disconnect positions. With the circuit breaker removed you can work in the circuit-breaker enclosure and be perfectly safe from contact with high voltage. On the lower left is the actuator which operates the auxiliary switches mounted in the instrument compartment. It responds to the opening and closing of the circuit breaker contacts when the breaker is in the connected position. An actuator which responds to breaker movement in and out of the switchgear can be furnished on the lower right-hand side of the circuit breaker compartment.



Safe, simple, maintenance-free drawout

No complex drawout mechanism is necessary in the switchgear. Simple stationary racking slots and guide rails are all that is required. An interference key on the floor allows only the correct rating breaker to be inserted. For added safety, HK switchgear is designed so that the breaker closing springs are automatically discharged before the breaker enters or leaves the compartment. Stationary secondary contacts and ground bus at the rear automatically mate with circuit breaker in test and connected position.

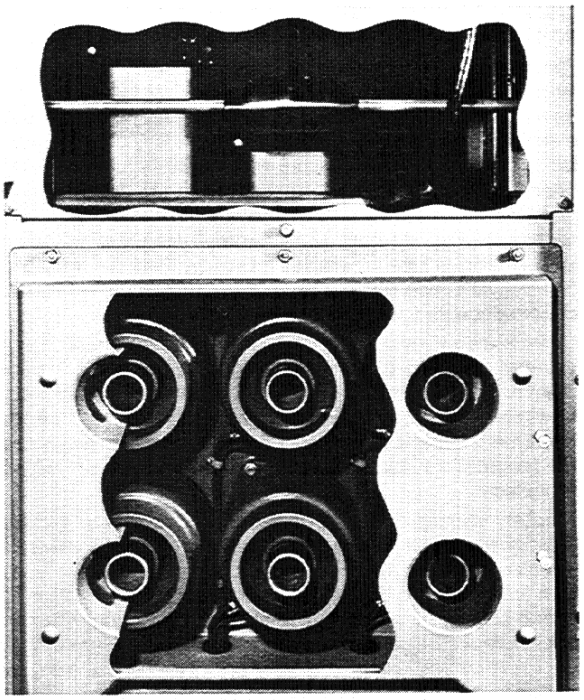


Covenient bus location

This is a feature that makes switchgear installation and maintenance easier than ever. Bus can be reached after de-energization of the circuit from the back through the rear panel or from inside the circuit breaker compartment by simply removing the isolating metal barrier. The bus itself, silver plated for high-conductivity connections, is fully insulated with flame-resistant, track-resistant epoxy resin molded insulation. Vinyl bus joint covers with corona-free high-dielectric characteristics provide sealed joints without need for compound. All problems inherent in the taping of joints have been completely eliminated. Maintenance inspections are fast and simplified.

Front access to current transformers

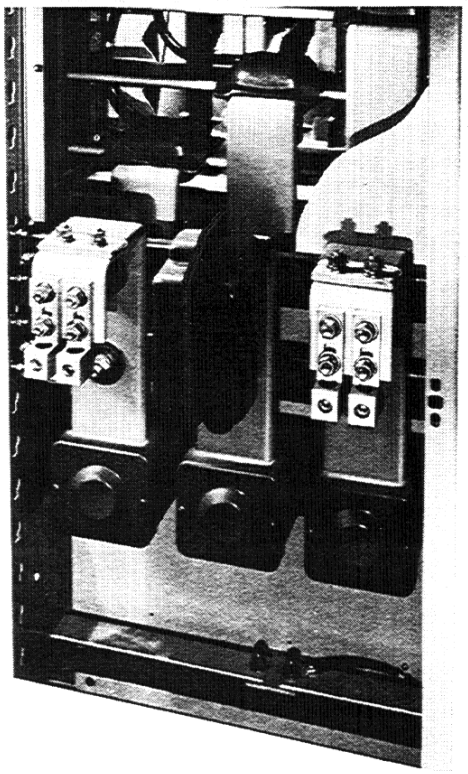
No need to disturb the main bus to change current transformer ratings. Just remove the shutter assembly covering the primary disconnects. The toroidal-type bushing current transformers easily slip over primary studs. Their large cores allow them to be used for some relays and instrument burdens and with substantial short-circuit strength. They are insulated for full-voltage rating of the switchgear. As this cut-away view shows, you can locate them on both load and line sides of the circuit breaker. Thus, in a differential scheme the circuit breaker is included in the protected zone without the necessity for an extra frame, provided the upper current transformers are being utilized in differential protection. The primary lead support is made of a special, flame-retardant, track-resistant polyester-glass molding.



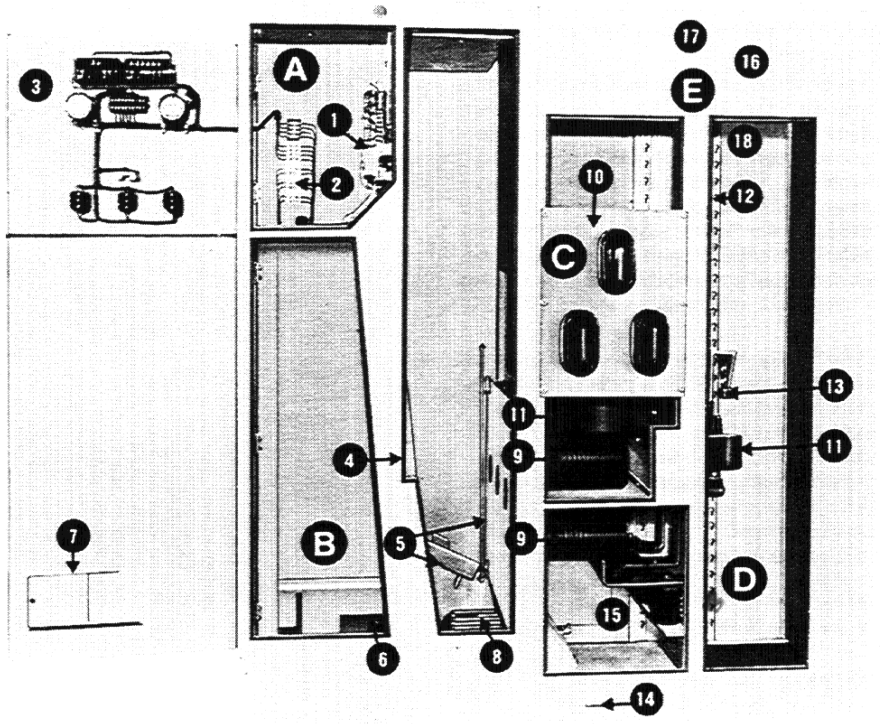
Accessibility for economical installation

No tight space when it comes to cable makeup. Entrance from either top or bottom. Top sheet is easily removed for drilling. Key slots running the full height of the compartment provide a simplified means for mounting cable supports or other equipment. When bottom entrance is used there is room at the top for trunnion type PT's and other auxiliary equipment.

There is ample room for a single pothead in the standard 56 inch depth. When a double pothead is required the rear is extended 8 inches. Main bus compartment cover has been cut away in this view to show location of main bus. Cable lugs and vinyl termination covers (boots) illustrated at right, are available as optional equipment.



7.5 & 15 KV Type 7.5 HK and 15 HK Metal-Clad Switchgear



Side view 15 HK 500 switchgear

Safe compartmentation – complete accessibility

Each single 7.5 and 15 HK switchgear frame has complete steel side sheets, shown here cut-away to illustrate compartmentation. This unit is divided into five completely segregated areas, with front formed doors with concealed hinges.

A. Instrument Compartment
Isolated from high voltage

1. Ample Auxiliary Switches Accessible Terminal Blocks, Control Power Cutoff and Control Bus
2. CT Short Circuiting Blocks
3. Instruments, Relays, and Control Switches

B. Circuit Breaker Compartment

4. Cable Trough for customer control cable (bottom entrance)
5. Positive Safety Shutter and Actuator
6. Auxiliary Switch Actuator
7. Sliding Panel for closed-door drawout
8. Secondary Disconnect

C. Bus Compartment
Accessible from front and rear

9. Porcelain Primary Bushing embedded in flame retardant track-resistant polyester glass
10. Porcelain Bus Supports embedded in polyester-glass
    Molded-on Bus Insulation
    No Compound Bus Joint Covers

D. Cable Compartment

11. Toroidal Type Current Transformers
12. Key Slotted Mounting Brackets
13. Cable Lugs (1 per phase standard)
14. Ground Bus
15. Bus Mounted ground fault sensors

E. Auxiliary Device Compartment
Space for:

16. Trunnion Type Drawout Potential Transformers
17. Lightning Arresters
18. Bus Transition Space

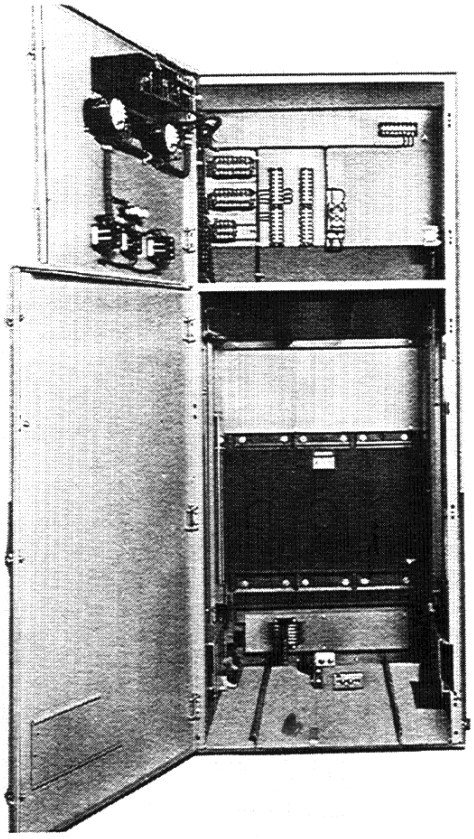
Separate instrument and breaker compartments

The separate instrument compartment is completely isolated from the high voltage. A wide variety of instrumentation and protection devices are available in customer-oriented configurations. All secondary wiring including terminal and CT shorting blocks, and other devices are readily accessible from the front. All secondary wiring lugs are of the looped tongue type for greater reliability. They are mounted on removable panels. Here is switchgear with ample room for construction and maintenance personnel.

Customer's wire may enter directly from the top or through a covered cable trough from the bottom. Opening in compartment floor is provided for several large conduits. Ample room is available for 24 auxiliary contacts on 7.5HK500, 15HK500 and 15HK750 switchgear. 15HK1000 units can accommodate up to 16 auxiliary contacts. When you need a 90-inch instrument panel, Asea Brown Boveri provides an 8-inch front extension with a full height front door on each frame of the line-up. The greatly reduced panel space required by Asea Brown Boveri protective relays will minimize the need for a 90″ instrument panel.

A safety shutter covers all high-voltage primary connections. It is forced downward when the breaker is removed from the switchgear and covers the primary leads with the breaker in the test* or disconnected positions. With the circuit breaker removed, you can work in the circuit-breaker enclosure and be perfectly safe from contact with high voltage. On the lower left is the actuator which operates the auxiliary switches mounted in the instrument compartment. It responds to the opening and closing of the circuit breaker contacts when the breaker is in the connected position. An actuator which responds to breaker movement in and out of the switchgear can be furnished on the lower right hand side of the circuit breaker compartment.

*Disconnected position only, on 1000 MVA switchgear.

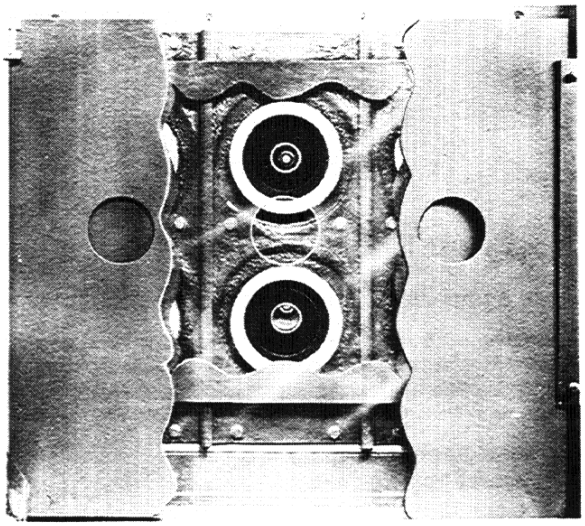


Operator safety – a prime requisite

A safety shutter covers all high-voltage primary connections. (Shown here in plexiglass to illustrate closed position.) It's forced closed when the breaker is removed from the switchboard. Primary lead bushings, behind shutter, are full-rated porcelain embedded in a flame-retardant, track-resistant polyester-glass molding for 7.5 and 15HK switchgear up to 750MVA. Primary disconnect housings for 15HK1000 switchgear are mounted on aluminum.

Bus accessible from front or back

This is a feature that makes switchgear installation and maintenance easier than ever. Bus can be reached after de-energization of the circuit from the back through the rear panel or from inside the circuit breaker compartment by simply removing the isolating metal barrier (removed for photo). The bus itself, silver plated for high-conductivity connections, is fully insulated with flame-retardant, track-resistant epoxy resin molded insulation. Vinyl bus joint covers with corona-free, high-dielectric characteristics provide sealed joints without need for compound.



Safety Shutter

Insulation

Bus supports throughout the entire compartment are porcelain. Main bus supports between frames are porcelain embedded in track resistant polyester-glass.

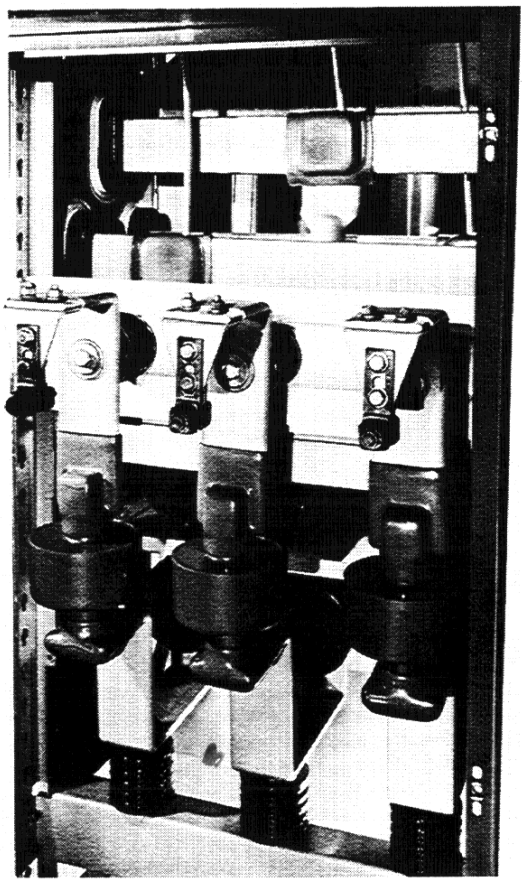
Wherever other bus supports are required, the same high quality porcelain stand-off insulators are used. You can be assured the Asea Brown Boveri will continue to specify the best available insulation material for each voltage class.

Current transformers

Toroidal current transformers can be located on the bus risers on both line and load side of the circuit breaker. Transformers are insulated for full-voltage rating of the switchgear.

Accessibility for economical installation

No tight space when it comes to cable makeup. Entrance from either top or bottom. Top sheet is easily removed for drilling. Key slots running the full height of the compartment provide a simplified means for mounting cable supports or other equipment. There is ample room for single pothead in the standard 81 inch depth. When an optional double pothead is required the rear is extended 8 inches.

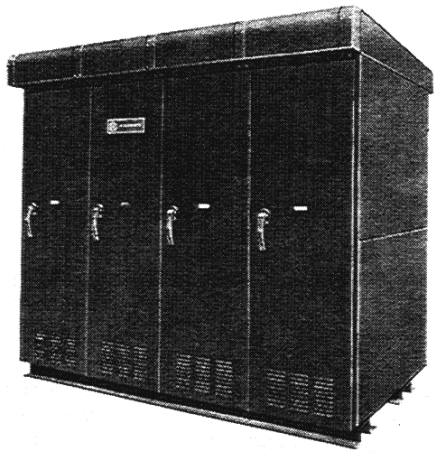


Porcelain bus supports

Outdoor Switchgear 5,7.5 & 15 HK

Only Asea Brown Boveri Switchgear gives you all these advantages in non walk-in and walk-in types

- Doors, side sheets and frames sealed with long-lasting gaskets.
- All parts treated for rust resistance, painted and baked prior to assembly to protect the metal against rust and corrosion, even between overlapping points.
- Bottom of the entire unit undercoated.
- Front and rear doors hinged and louvered. Louvers include a filter.
- Interiors equipped with lights, heaters, and convenience outlets.
- Structures strong enough to be pier mounted.

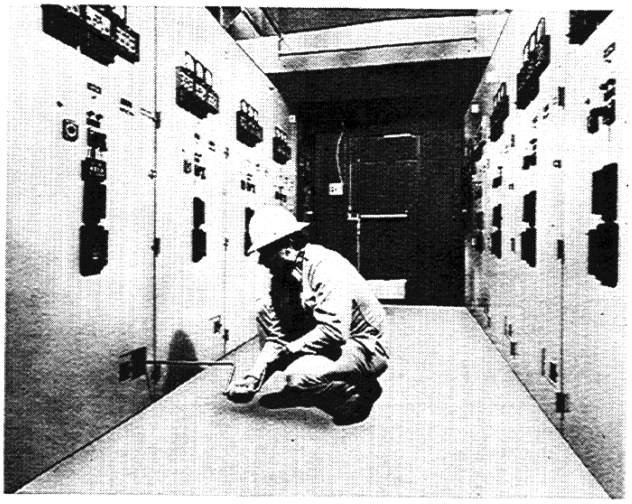


Non walk-in outdoor construction

For the ultimate in space savings, the non walk-in outdoor construction provides the user with maximum control and protection in minimum space. Access to both front and rear of switchgear is provided.

Walk-in outdoor construction

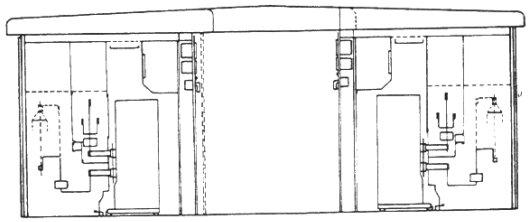
Modern method of enclosure construction to facilitate maintenance of switchgear in any weather. Wide aisle inside for complete circuit breaker withdrawal and space to store an extra breaker. Lights, heat and convenience outlets are provided. Unit is so sturdily built that it may be pier mounted. End doors are provided with panic bar that permits opening even if exterior handle has been padlocked. Hinged rear doors provide easy access to bus and cable compartments. They have provisions for padlocking to prevent unauthorized entrance which is standard for all front and rear doors having access to over 600 volts (both indoor and outdoor switchgear).



Features and Auxiliary equipment 5, 7.5 & 15 HK

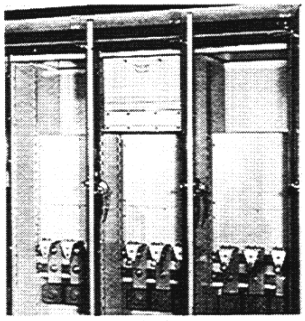
Building block construction

Outdoor construction of the standard Asea Brown Boveri Indoor Switchgear contained within and outdoor enclosure. Non walk-in outdoor enclosure (1) can be modified to single row walk-in (2) by the addition of the walk-in aisle. As load grows you can add switchgear frame to opposite side of aisle to form double row walk-in (3).



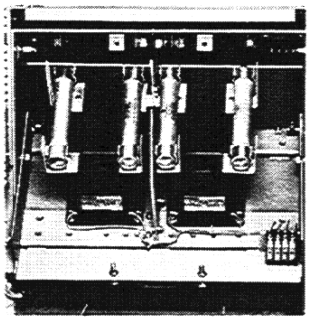
Auxiliary device mounting space

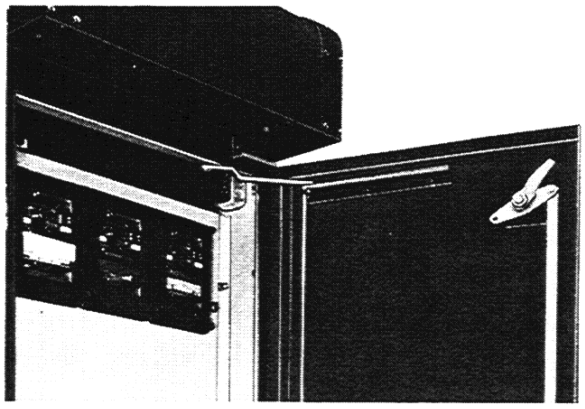
Ample space is available in top rear compartment of circuit breaker unit for mounting potential transformers, lightning arresters and other auxiliary devices. Location charts for auxiliary devices are on pages 29 and 33.



Trunnion-mounted drawout potential transformers

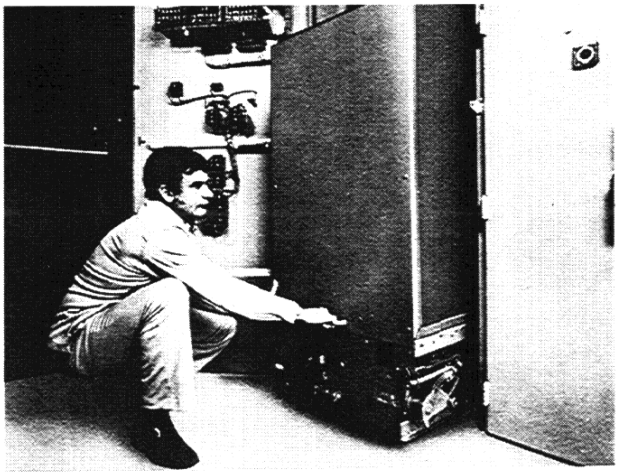
Heavy potential transformers are no longer a problem. Trunnion-type mounting at the center of gravity assures effortless drawout. For operator safety when disconnected, fuses and potential transformers are automatically grounded. A barrier prevents access to the primaries.





Ventilation and weatherproofing

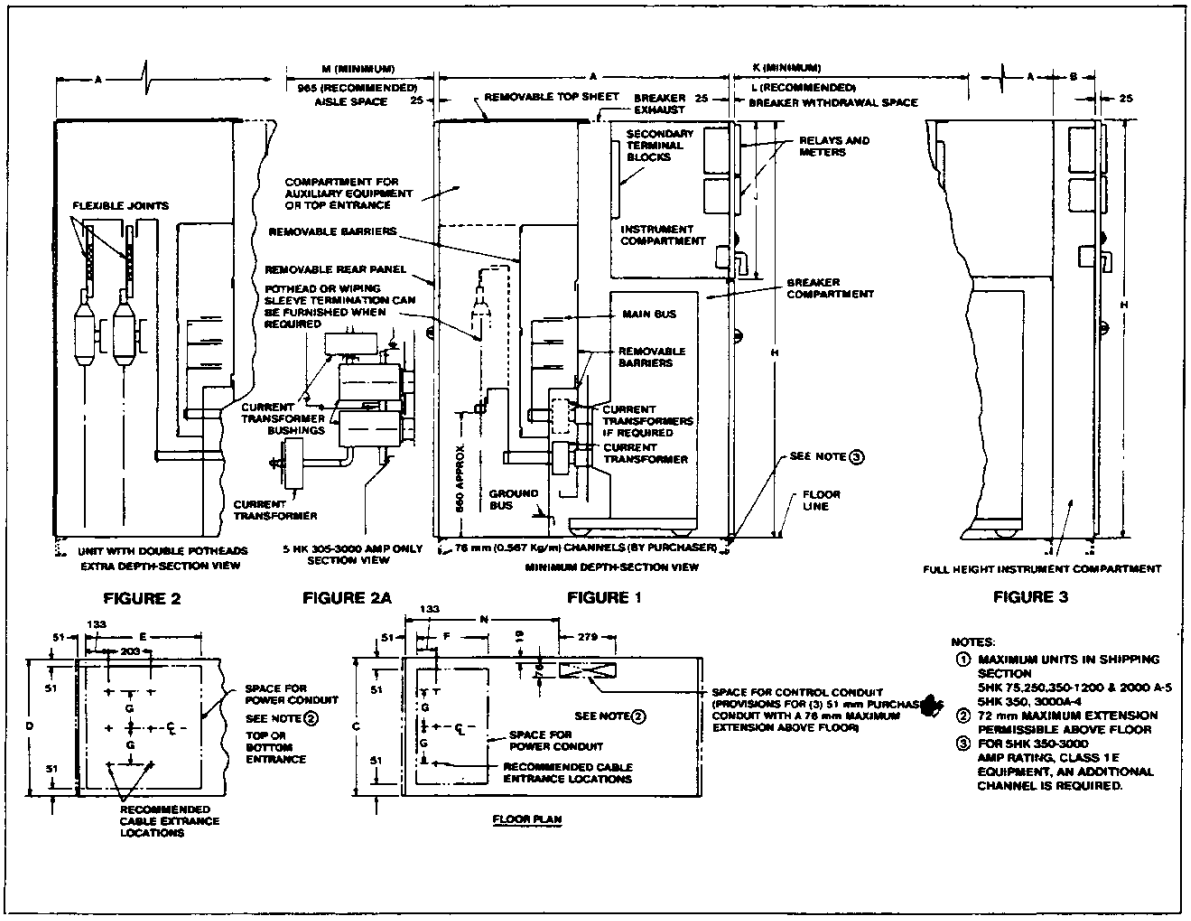
Doors completely weather stripped for complete seal. Latches assure uniform tight fit. Generous filtered ventilation on door and overhead for maximum air circulation. Strip heaters prevent moisture and condensation inside the compartment.



Roll out 15KV circuit breaker

One man can easily move circuit breaker to aisle position for inspection and maintenance.

Dimensions 5 HK Indoor Switchgear



Dimensions

Breaker Type	Indoor Construction	A	B	C	D	E	F	G●	H	J	K	L	M	N
5 HK 75 1200 Amp	Minimum Depth Refer to Figure 1*	1422	—	660	—	—	343	179	2032	762	914	1524	711	737
5 HK 250 1200 Amp / 2000 Amp	Intermediate Depth‡ (Full Height Instrument Compartment) Refer to Figure 3		203							—				—
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear) Refer to Figure 2-3	1626		—	660	546	—	179						940
5 HK 350 1200 Amp / 2000 Amp	Minimum Depth Refer to Figure 1*	1422	—	660	—	—	343	179	2286	762				737
	Intermediate Depth‡ (Full Height Instrument Compartment) Refer to Figure 3		203							—				—
	Extra Depth (Special Application) (Full Height instrument Compartment) (Additional 203 mm in Rear) Refer to Figure 2-3	1626		—	660	546	—	179						
5 HK 350 3000 Amp	Minimum Depth Refer to Figure 2A	1626	—	914	—	—	343	254		711	1321	1676	965	940
	Intermediate Depth (Full Height Instrument Compartment) Refer to Figure 3		203				■							

* Add 102 mm to A when line-up includes minimum depth 5HK350, 3000A unit.
‡ Add 102 mm to B when line-up includes intermediate depth 5HK350, 3000A unit.
● Omit locations at G when cable mounted ground sensors are furnished.
■ Additional space may be required for 5HK350-3000 amp units to meet cable entrance requirements.
Dimensions are in millimetres. They are approximate and should not be used for construction.

Dimensions 5 HK Outdoor Non Walk-in Switchgear

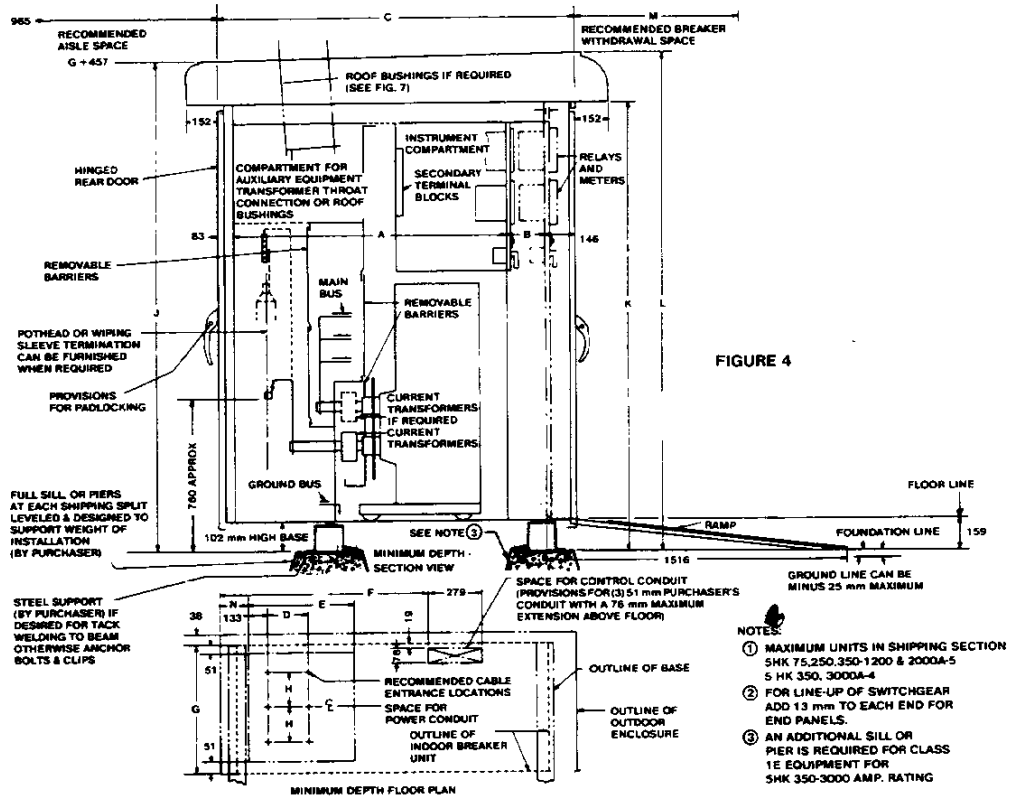


FIGURE 4

Dimensions

Breaker Type	Outdoor Construction	A	B	C	D	E	F	G	H	J	K	L	M	N
5 HK 75 1200 Amp	Minimum Depth*	1422	—	1651	—	343	819	660	179	2497	2292	2585	3048	133
5 HK 250 1200/2000 Amp	Intermediate Depth‡ (Full Height Instrument Compartment)		203	1854										
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)	1626		2057	203	546	1022							
5 HK 350 1200/2000 Amp	Minimum Depth*	1422	—	1651	—	343	819			2751	2546	2839		
	Intermediate Depth‡ (Full Height Instrument Compartment)		203	1854										
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)	1626		2057	203	546	1022							
5 HK 350 3000 Amp	Minimum Depth		—	1854	—	343		914	254				3200	
	Intermediate Depth (Full Height Instrument Compartment)		203	2057										

* Add 203 mm to A and C and 102 mm to F and N when line-up includes minimum depth 5HK350, 3000A unit.
‡ Add 203 mm to A and C and 102 mm to F and N when line-up includes intermediate depth 5HK350, 3000A unit.
Dimensions are in millimetres. They are approximate and should not be used for construction.

Dimensions 5 HK Outdoor Walk-in Switchgear

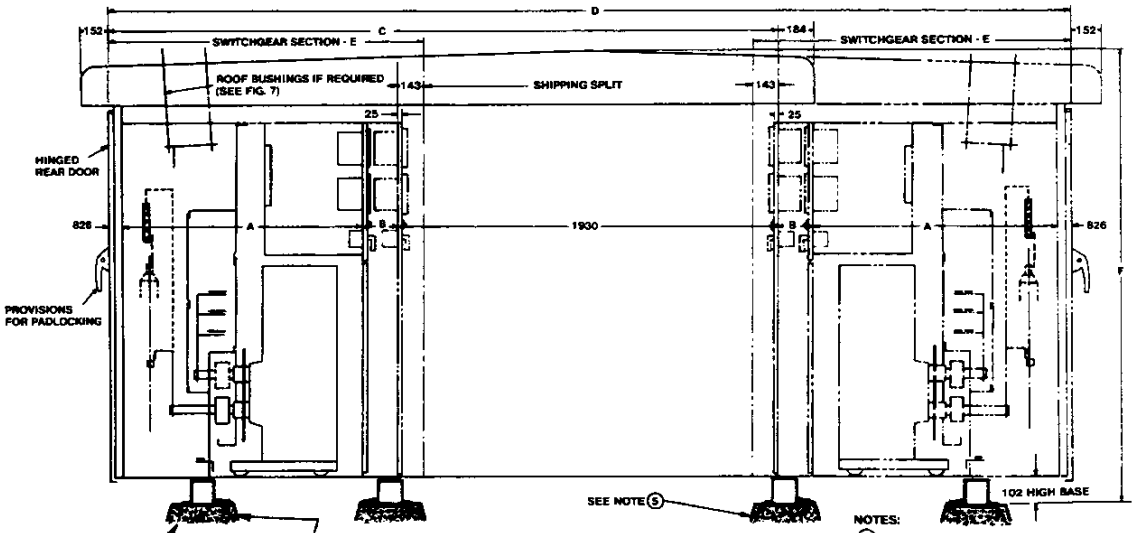


FIGURE 5

Dimensions

Breaker Type	Outdoor Construction	A	B	C	D	E	F
5 HK 75 1200 Amp	Minimum Depth*	1442	—	3435	4940	1648	2610
5 HK 250 {1200 / 2000} Amp	Intermediate Depth‡ (Full Height Instrument Compartment)		203	3639	5347	1851	
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)	1626		3842	5753	2054	
5 HK 350 {1200 / 2000} Amp	Minimum Depth*	1442	—	3435	4940	1648	2851
	Intermediate Depth‡ (Full Height Instrument Compartment)		203	3639	5347	1851	
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)	1626		3842	5753	2054	
5 HK 350 3000 Amp	Minimum Depth		—	3639	5347	1851	
	Intermediate Depth (Full Height Instrument Compartment)		203	3842	5753	2054	

Single Row Walk-in Unit may be converted to Double Row Walk-in by adding additional switchgear section to other side of aisle as shown in phantom.

An additional sill or pier is required for the 5 HK 350 3000 Amp unit when said unit is subject to a seismic experience.

* Add 203 mm to A and C when line-up includes minimum depth 5 HK-350, 3000A, unit.

‡ Add 203 mm to A and C when line-up includes intermediate depth 5 HK-350, 3000A, unit.

Dimensions are in millimetres. They are approximate and should not be used for construction.

Dimensions 5 HK Switchgear

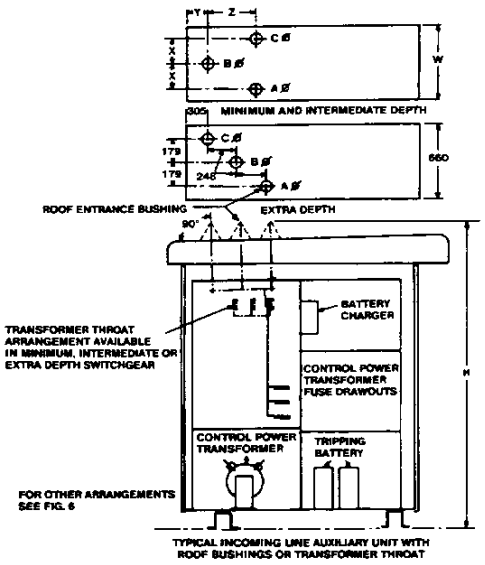
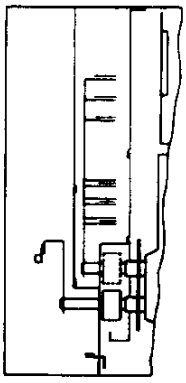
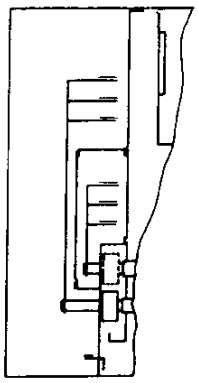


FIGURE 7



BREAKER UNIT ADJACENT TO BUS TIE UNIT BUS TRANSITION (1200 OR 2000 AMP MAIN BUS)

FIGURE 8



BREAKER UNIT BUS TIE (1200 OR 2000 AMP MAIN BUS)

FIGURE 9

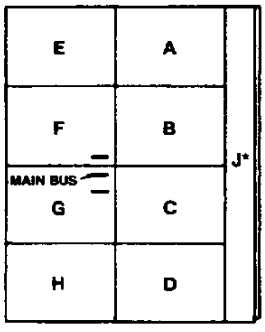
Location chart for 5 HK auxiliary units

Preferred Equipment Locations		
Equipment	Order of Preference	
Incoming Line from Above	E, F, & G (All)	
Incoming Line from Below	F, G, & H (All)	
Relays & Instruments	A-B-C-D-J	
Drawout Fuses & Mech. Interlocked Molded Case Breaker (for Cpt.)	B-E-C	E Not Normally Used for Drawout Units in Walk-in Construction
Control Power Transformer*	C & D (Both) or G & H (Both)	
Battery Charger	C-J	
Control or Tripping Battery (48V)	C & D (Both)	
1, 2 or 3 PT's	B-C-D-E-H	E, F, H & G Not Normally Used for Drawout Units in Walk-in Construction F & G May Be Used if There is No Main Bus
Lightning Arresters	H-E-D	

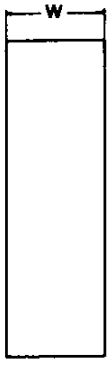
Height & Depth Dimensions of Auxiliary Unit to Match Adjacent Breaker Unit.

*Limited to 25KVA, 1 ϕ max. For larger sizes, refer to nearest Asea Brown Boveri Sales Office. Dimensions are in millimetres. They are approximate and should not be used for construction.

Breaker Type	X	Y	Z	W ACB	W AUX	H
5 HK 75 1200 A	179	279	305	660	660	2819
5 HK 250 1200 A						
5 HK 250 2000 A						2877
5 HK 350 1200 A						3073
5 HK 350 2000 A						3131
5 HK 350 2000 A	254	279	346	914	1016	3073



*FULL HEIGHT INSTRUMENT COMPARTMENT ONLY



BREAKER WITHDRAWAL SIDE

Dimensions 7.5 & 15 HK Outdoor Non Walk-in Switchgear

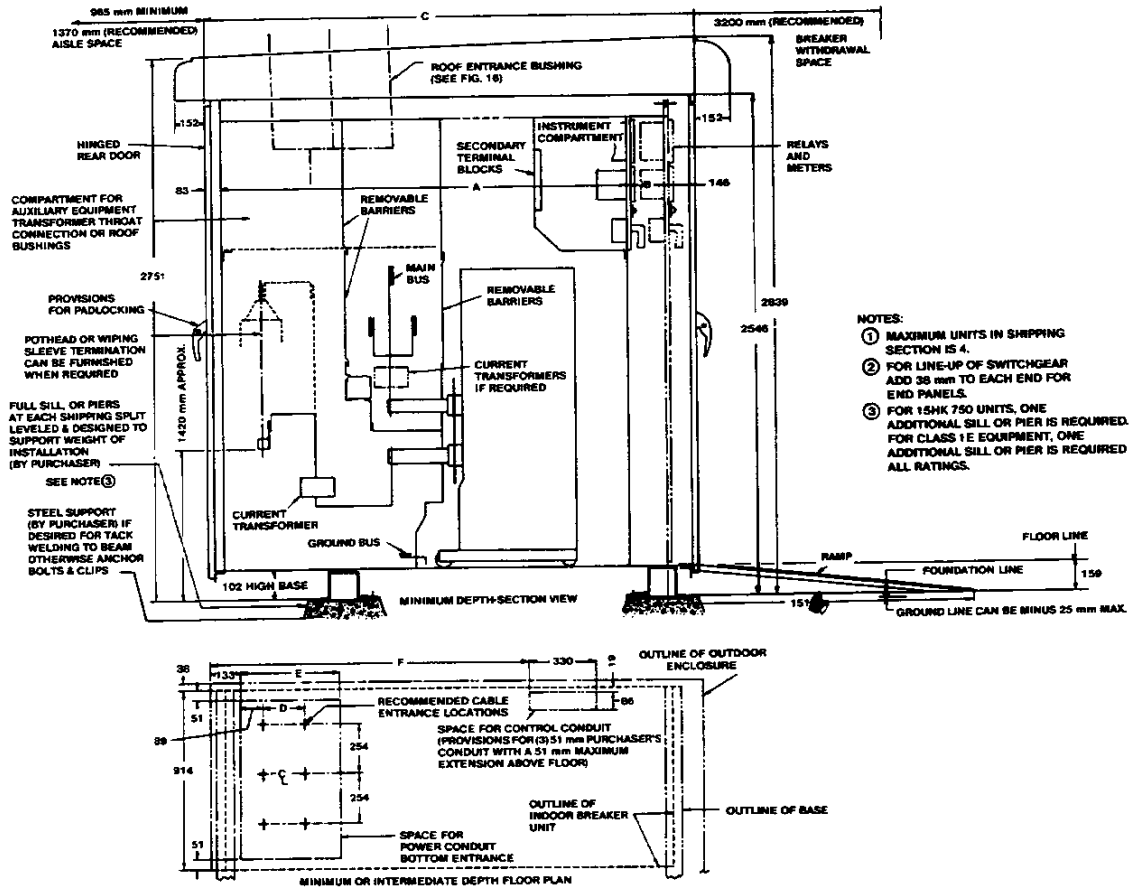


FIGURE 13

Dimensions

Breaker Type	Outdoor Construction	A	B	C	D	E	F
7.5 HK 500 { 1200 Amp / 2000 Amp	Minimum Depth	2057	—	2286	—	266	1402
	Intermediate Depth (Full Height Instrument Compartment)		203	2489			
15 HK 500 { 1200 Amp / 2000 Amp	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)			2692	203	469	1605
15 HK 750 { 1200 Amp / 2000 Amp	Minimum Depth	2261	—	2489	—	266	1402
	Intermediate Depth (Full Height Instrument Compartment)		203	2692			
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)	2464		2895	203	469	1605

Dimensions are in millimetres. They are approximate and should not be used for construction.

Dimensions 7.5 & 15 HK Indoor Switchgear

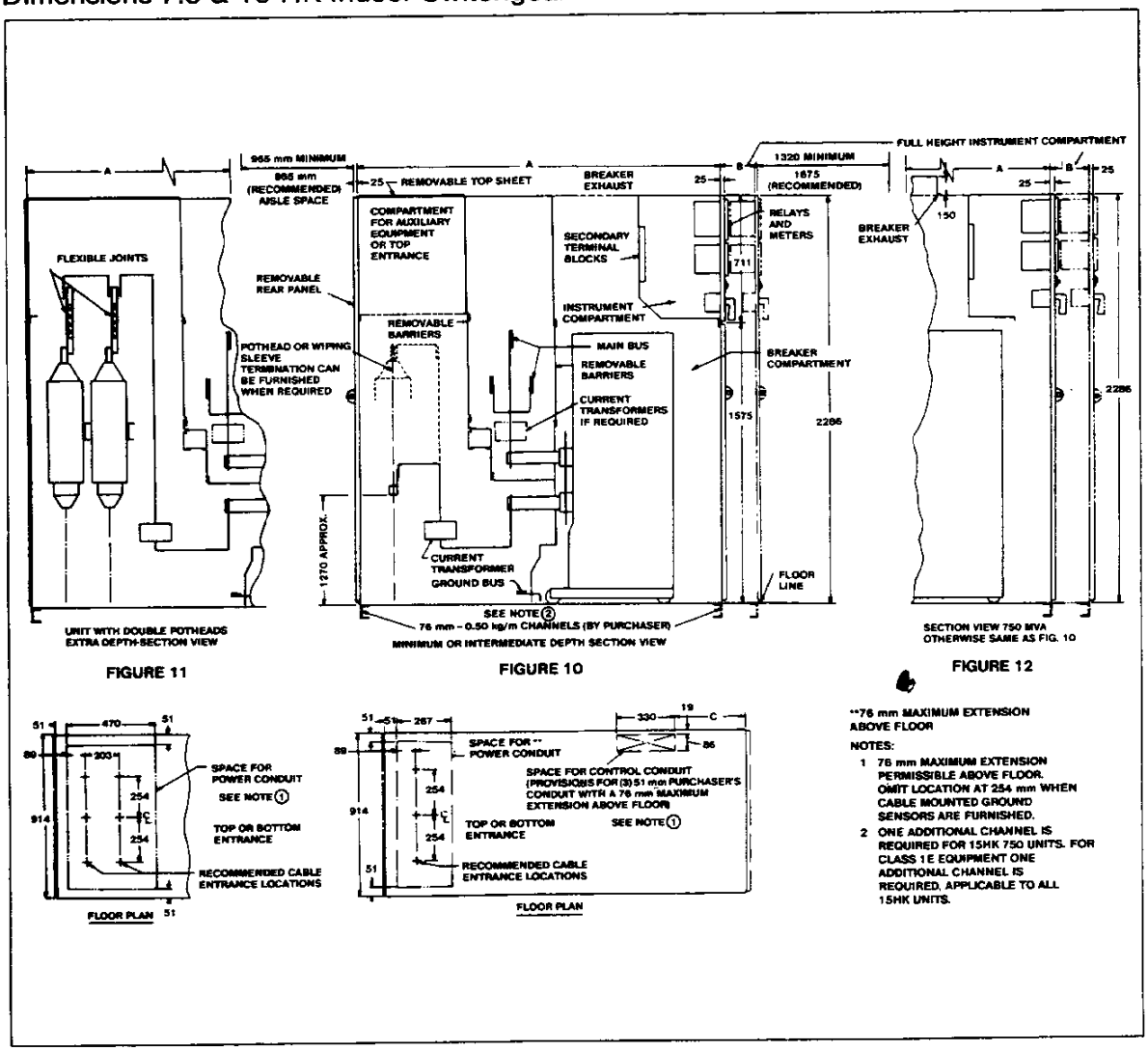


FIGURE 11

FIGURE 10

FIGURE 12

Dimensions

Breaker Type		Indoor Construction	A	B	C
7.5 HK 500	1200 Amp 2000 Amp	Minimum Depth – Refer to Figure 10	2057	—	406
		Intermediate Depth (Full Height Instrument Compartment) Refer to Figure 12		203	
15 HK 500	1200 Amp 2000 Amp	Extra Depth (Full Height Instrument Compartment) (Additional 203 mm in Rear) Refer to Figures 11 & 12			
15 HK 750	1200 Amp 2000 Amp	Minimum Depth – Refer to Figure 10	2261	—	610
		Intermediate Depth (Full Height Instrument Compartment) Refer to Figure 12		203	
		Extra Depth (Full Height Instrument Compartment) (Additional 203 mm in Rear) Refer to Figures 11 & 12	2464		

Dimensions are in millimetres. They are approximate and should not be used for construction.

Dimensions 7.5 & 15 HK Outdoor Non Walk-in Switchgear

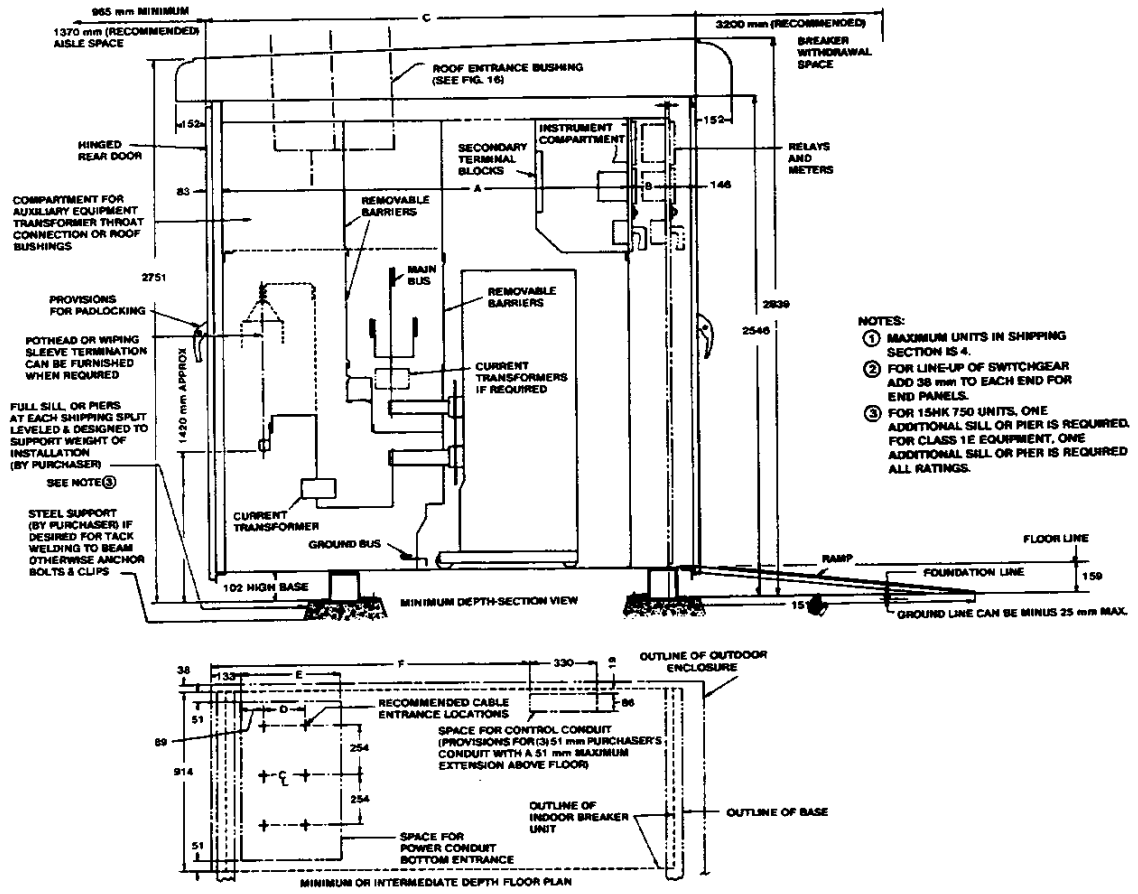


FIGURE 13

Dimensions

Breaker Type	Outdoor Construction	A	B	C	D	E	F
7.5 HK 500 { 1200 Amp / 2000 Amp	Minimum Depth	2057	—	2286	—	266	1402
	Intermediate Depth (Full Height Instrument Compartment)		203	2489			
15 HK 500 { 1200 Amp / 2000 Amp	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)			2692	203	469	1605
15 HK 750 { 1200 Amp / 2000 Amp	Minimum Depth	2261	—	2489	—	266	1402
	Intermediate Depth (Full Height Instrument Compartment)		203	2692			
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)	2464		2895	203	469	1605

Dimensions are in millimetres. They are approximate and should not be used for construction.

Dimensions 7.5 & 15 HK Switchgear

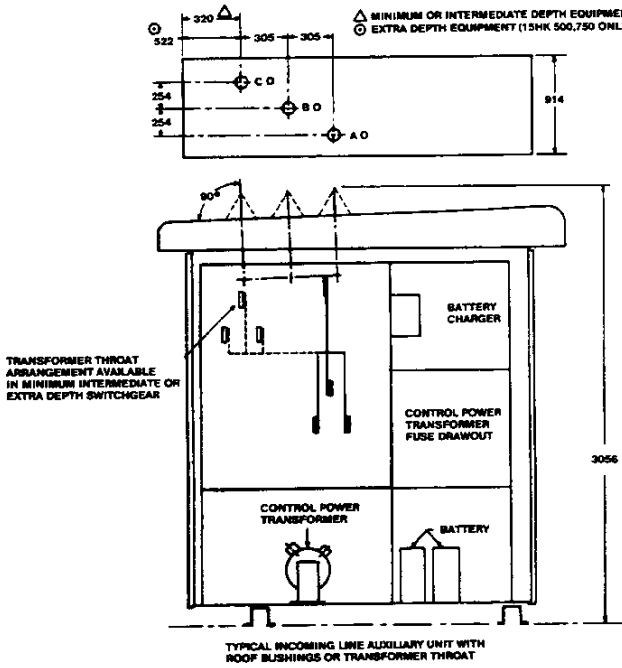


FIGURE 16

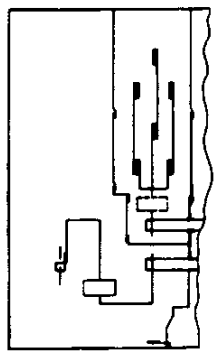


FIGURE 17

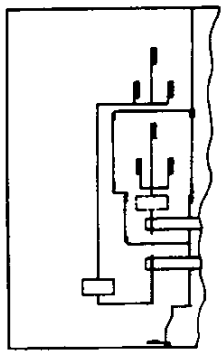


FIGURE 18

Preferred Equipment Locations		
Equipment	Order of Preference	
Incoming Line from Above	D-E & G (All)	
Incoming Line from Below	F-E & G (All)	
Relays & Instruments	A-B-C-H	
Drawout Fuses & Mech. Interlocked Molded Case Breaker (For C.P.T.)	B-F-C	F Not Normally Used for Drawout Units in Walk-in Construction
Control Power Transformers	C-F	
Battery Charger	A-H	
Control or Tripping Battery (48V)	C	
1, 2 or 3 pts.	B-C-F-D	D & F Not Normally Used for Drawout Units in Walk-in Construction
Lightning Arresters	F-D-C	

Overall Dimensions of Auxiliary Unit to Match Adjacent Breaker Unit

* Limited to 25kVA, 1 ϕ max. For larger sizes, refer to nearest Asea Brown Boveri Sales Office.
Dimensions are in millimetres. They are approximate and should not be used for construction.

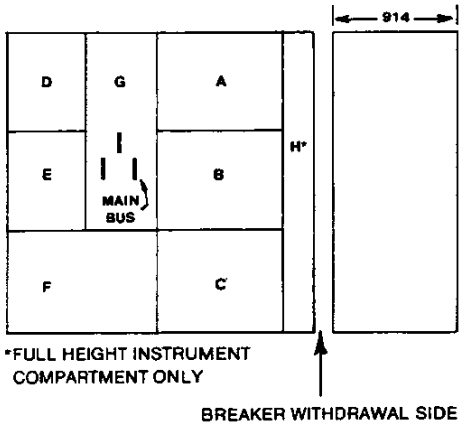
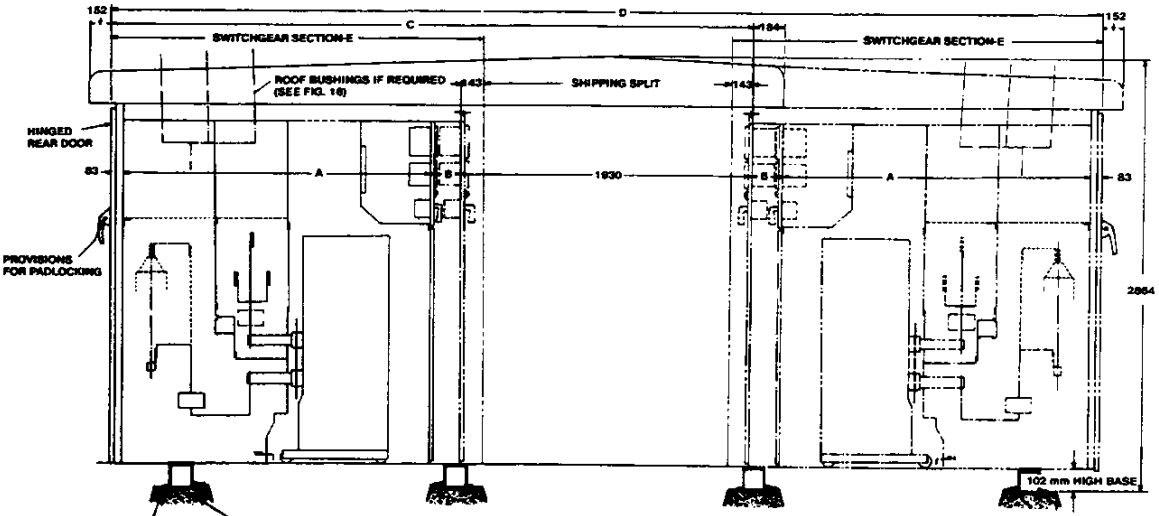


FIGURE 15

Dimensions 7.5 & 15 HK Outdoor Walk-in Switchgear



SINGLE & DOUBLE ROW WALK-IN
FOR POWER AND CONTROL ENTRANCE INFORMATION AND OTHER DESIGN CHARACTERISTICS SEE FIG. 13

FIGURE 14

NOTES:

1. AISLE SPACE AT REAR RECOMMENDED 1370 mm MINIMUM 965 mm
2. MAXIMUM UNITS IN SHIPPING SECTION IS 4.
3. FOR LINE-UP OF SWITCHGEAR, ADD 38 mm TO EACH END FOR END PANELS.
4. FOR 15HK 750 UNITS, ONE ADDITIONAL SILL OR PIER IS REQUIRED. FOR CLASS 1E EQUIPMENT, ONE ADDITIONAL SILL OR PIER IS REQUIRED, ALL RATINGS.

Dimensions

Breaker Type	Outdoor Construction	A	B	C	D	E
7.5 HK 500 {1200 Amp / 2000 Amp	Minimum Depth	2057	—	4070	6210	2283
	Intermediate Depth (Full Instrument Compartment)		203	4274	6618	2486
15 HK 500 {1200 Amp / 2000 Amp	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)			4477	7023	2689
15 HK 750 {1200 Amp / 2000 Amp	Minimum Depth	2261	—	4274	6618	2486
	Intermediate Depth (Full Height Instrument Compartment)		203	4477	7023	2689
	Extra Depth (Special Application) (Full Height Instrument Compartment) (Additional 203 mm in Rear)	2464		4680	7430	2892

Single Row Walk-in Unit may be converted to Double Row Walk-in by adding additional switchgear section to other side of aisle as shown in phantom.

Dimensions are in millimetres. They are approximate and should not be used for construction.

Dimensions 15 HK-1000 Indoor and Outdoor Switchgear

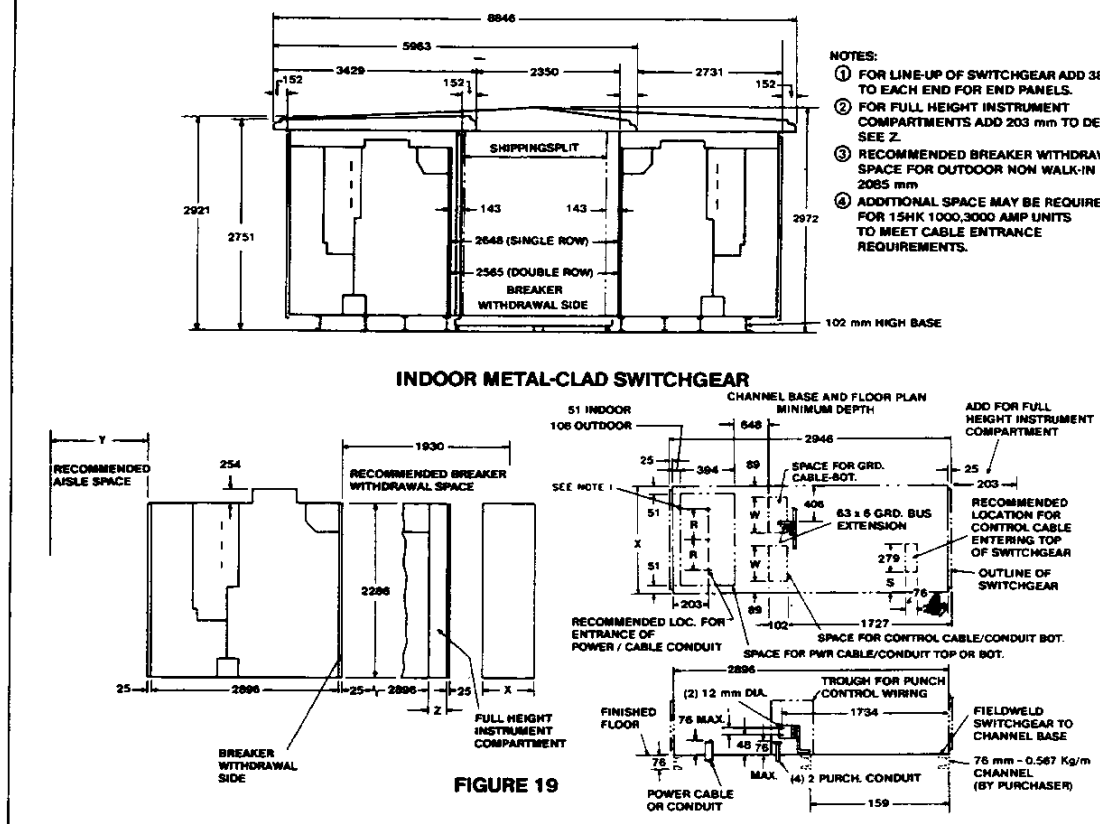


FIGURE 19

Dimensions

Breaker Type	Construction	R▲	S	X	Y	Z	W
15 HK 1000 { 1200 Amp. 2000 Amp.	Minimum Depth	254	152	914	965	—	365
15 HK 1000 – 3000 Amp.		356	229	1168	1219	—	406
15 HK 1000 { 1200 Amp. 2000 Amp.	Intermediate Depth	254	152	914	965	203	356
15 HK 1000 – 3000 Amp.	[Full Height Instrument Compartment]	356	229	1168	1219	203	406

▲ Omit locations at R when cable mounted ground sensors are furnished.
Dimensions are in millimetres. They are approximate and should not be used for construction.

Approximate Weights Table of approximate net weights (kg)

Switchgear assembly – feeder, incoming line or auxiliary unit
(Does not include breaker)

Type of Breaker	Continuous Current Amperes	Indoor			Non Walk-In Outdoor			Single Row Walk-In Outdoor			Double Row Walk-In Outdoor		
		1422 mm	1626 mm	1829 mm	1651 mm	1854 mm	2057 mm	3435 mm	3639 mm	3842 mm	4940 mm	5347 mm	5753 mm
5 HK 75	1200	601	635	669	766	805	843	974	1012	1051	1648	1725	1802
5 HK 250	1200	601	635	669	766	805	843	974	1012	1051	1648	1725	1802
5 HK 250	2000	661	695	729	826	865	904	1035	1073	1111	1769	1846	1923
		Add Per Switchgear for End Panels			267	295	322	757	785	812	1042	1097	1151
5 HK 350	1200	635	673	712	812	855	898	1024	1067	1110	1734	1820	1906
5 HK 350	2000	695	734	772	872	915	958	1084	1128	1171	1854	1941	2027
5 HK 350	3000	—	905	946	—	1131	1178	—	1384	1430	—	2377	2470
		Add Per Switchgear for End Panels			268	295	322	758	785	812	1042	1097	1151
		2057 mm	2261 mm	2464 mm	2286 mm	2489 mm	2692 mm	4070 mm	4274 mm	4477 mm	6210 mm	6618 mm	7023 mm
7.5 HK 500	1200	985	1025	1066	1213	1260	1306	1465	1512	1558	2540	2634	2726
7.5 HK 500	2000	1093	1135	1175	1323	1369	1416	1575	1621	1667	2759	2852	2945
15 HK 500	1200	985	1025	1066	1213	1260	1306	1465	1512	1558	2540	2634	2726
15 HK 500	2000	1093	1135	1175	1323	1369	1416	1575	1621	1667	2759	2852	2945
		Add Per Switchgear for End Panels			352	379	406	867	895	922	1206	1260	1314
		2261 mm	2464 mm	2667 mm	2489 mm	2692 mm	2895 mm	4274 mm	4477 mm	4680 mm	6618 mm	7023 mm	7430 mm
15 HK 750	1200	1025	1066	1107	1260	1306	1353	1512	1558	1604	2634	2726	2819
15 HK 750	2000	1135	1175	1216	1369	1416	1462	1621	1667	1714	2852	2945	3038
		Add Per Switchgear for End Panels			379	406	433	895	922	949	1260	1314	1374
		2896 mm			3124 mm			5748 mm			8750 mm		
15 HK 1000	1200	1202			1565			2245			3810		
15 HK 1000	2000	1315			1678			2359			3924		
15 HK 1000	3000	1497			1950			2676			4627		
		Add Per Switchgear for End Panels			544			1170			1715		

*For circuit breaker weights refer to Publication No. ABBCAN PD10.4.1.0 and Publication No. ABBCAN PD 10.4.2.0.

5 HK – Potential transformer drawout unit with 3 PT's – 98 kg. Deduct 15 kg for each PT not required.
15 HK – Potential transformer drawout unit with 3 PT's – 234 kg. Deduct 39 kg for each PT not required.
5 & 15 KV – Stationary mounted control power transformers to 15 KVA – 138 kg.
5 HK – Drawout fuse unit – 73 kg.
15 HK – Drawout fuse unit – 134 kg.
Switchgear impact loading – switchgear weight.

Floor tolerance

Tolerance on the floor is 1.5 mm side to side and 3 mm front to back per cubicle.

Painting

Asea Brown Boveri standard paint process consists of a three stage wash using a solution of iron phosphate and additional cleaning agents to remove all traces of grease, oil or dirt. A gas fired pre-drying oven is followed by a powder booth where a thermosetting dry powder is electro-statically applied. This coating is cured in a gas fired oven at about 350°F to produce a finished thickeness of 1.5 to 2.0 mills. Standard colour is ASA #61 Grey.

The total system meets CGBS 31-GP-121 and specifications of major Canadian Electrical Utilities.

Accessories

Standard

- Lifting angles
- Electrical diagrams and installation manuals
- Circuit breaker accessories.

Optional

- Base channels
- Ground and test device (with or without making capacity)
- Test jumper for testing the circuit-breaker outside the switchgear
- Test cabinet

Notes