Lauritz Knudsen
Electrical & Automation

THE NEW-AGE SUSTAINABLE SOLUTION

AIR INSULATED SWITCHGEAR

Compact I Reliable I Safe

ABOUT US

Lauritz Knudsen Electrical & Automation, formerly known as L&T Switchgear, is a leading player in the electrical industry owing to its 70+ years of strong legacy and commitment to the nation's growth. The brand is dedicated to providing a wide range of electrical and automation products and solutions to vital sectors of the economy, including industries, utilities, infrastructure, buildings, and agriculture. Our extensive portfolio includes low-voltage and medium-voltage switchgear, automation solutions, tailored software, and services.

With manufacturing operations in Ahmednagar, Vadodara, and Coimbatore, we adhere to global standards of excellence. Our operations are supported by well-equipped, in-house design and development centers, as well as tooling facilities, ensuring precision in manufacturing.

We proudly operate six Switchgear Training Centers (STCs) across Pune, Lucknow, Coonoor, Vadodara, Delhi, and Kolkata. These centers offer tailor-made classroom courses and lab learning experiences for technicians, customers, engineers, professionals, and students.

With a deep national presence and one of the largest electrical distribution networks, comprising over 1500 partners across the country, we are committed to driving excellence and delivering superior products and solutions that power India's growth journey.

VH - Air Insulated Switchgear

VH-AIS is the result of decades of experience in offering environment-friendly vacuum technology for arc-quenching in highly reliable and safe air insulation, with minimal maintenance, compact space solutions and ease of user management.

VH - AIS comprises metal-clad medium voltage switchgear assemblies from 3.3 to 36kV. We offer the most compact switchgear up to a fault level of 50kA, 3s for 12kV & 31.5kA, 3s for 36kV system.

VH - AIS is well designed to function satisfactorily even in the most adverse environmental conditions, owing to its robust construction and high performance.

Your indoor switching system is absolutely safe and protected with VH - AIS, for wide applications ranging from industries to infrastructure sectors. It adheres to the latest IEC standards.

IEC62271-100
High Voltage Circuit Breakers (1 kV - 52 kV)

IEC62271-200
High Voltage Metal Enclosed Switchgear (1 kV - 52 kV)

IEC62271-102
High Voltage Disconnectors & Earthing Switches

IEC62271-106
High Voltage Contactors (for Controllers & Motor Starters)

Safety

Honored protector

VH - AIS is a robust metal-clad switchgear, divided into four distinct compartments (busbar, circuit breaker, cable and low voltage equipment) segregated by earthed metal panels, to assure your protection against electric shock.

Extreme independence of environment

VH - AIS gives you protection against access to hazardous parts and solid foreign bodies and is designed & engineered to perform satisfactorily in harsh and corrosive environment with dust and pollution.

Touch protective

The earthed metallic, spring operated shutters ensure protection against accidental contact even when the breaker is isolated or withdrawn.

The independent operation and padlocking of the busbar & cable shutters enhances safety during maintenance.

Arc proof - Integral safety

The successful verification of internal arc classification, IAC A (F,L,R), for our switchgear ensures the highest possible degree of protection to operating personnel and switchgear vicinity.

How?

VH-AIS incorporates independent pressure relief flaps for each compartment and completely separated gas duct.

In the unlikely event of an internal arc fault, the gases are expelled at the top of the cubicle, as far from the operator as possible, for improved safety.

Our type-tested VH - AIS also accomplishes the provisions of internal Arc fault withstand stest as per IEC 62271-200 in all aspects.

Criterion	VH-AIS
Correctly secured doors and covers do not open	✓
No enclosure fragmentation during the test period	✓
No holes in accessible sides up to a height of 2m during an arc	✓
Indicators do not ignite due to hot gases caused by the arc	✓
Earth connections remain intact for the safety of operator	✓

A world of Safety interlocks

VH - AIS comprises a set of complete electrical interlocking in grouping with intelligent & strong mechanical interlocks to prevent any accidental erroneous operation, resulting in a safer environment for both plant and personnel.

For maximum safety, all operations are performed from the front with the door closed, with highly reliable fool-proof interlocks:

- For rack-in of VCB or VCU, connection of the LV plug is mandatory.
- VCB or VCU can be racked-in and withdrawn only in OFF condition.
- VCB or VCU can be closed only in Test or Service position.

Earth Switch Interlock

- Earth switch can be closed only when VCB or VCU is in Test position.
- VCB or VCU can be racked in only when Earth switch is in open condition.

Earthing Truck Interlock

- The Bus / Cable circuit can be earthed with the earthing truck only when there is no voltage on Bus / Cable.

Customized Rear Door Interlock

- Rear compartment door opens only when the VCB or VCU is in test position with earth switch closed.

The VH - AIS comes with a host of safety interlocks. Additional interlocking can be engineered to your requirements.

Trusted busbar zone

Generous and optimum clearances for main busbars and connectors warrant unmatched safety for you.

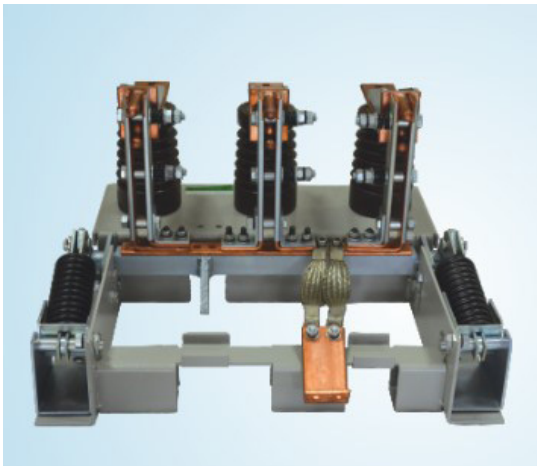
Supports and insulation materials are flame resistant, track resistant and non-hygroscopic exhibiting outstanding electrical properties.

Earthing Switch

Safeguarding of operating personnel is achieved by providing make-proof earthing switch for cable, as well as busbar compartments.

You have an option to select an integral earthing switch or a separate earthing truck.

The switch is tested to make and carry the rated short-circuit current for 3s.



Safety First

Reliability

Unmatched structural integrity

Our cubicles are made of high-grade ‘pickled & oiled’ mild steel sheets, cut and folded on numerically controlled machines, making the enclosure sturdy and reliable.

Surface protector

The 9-tank pre-treatment paint process along with powder coating with robotic paint applicator ensures that your cubicle has a long lasting, high-gloss finish and is optimally protected against corrosion and weathering.

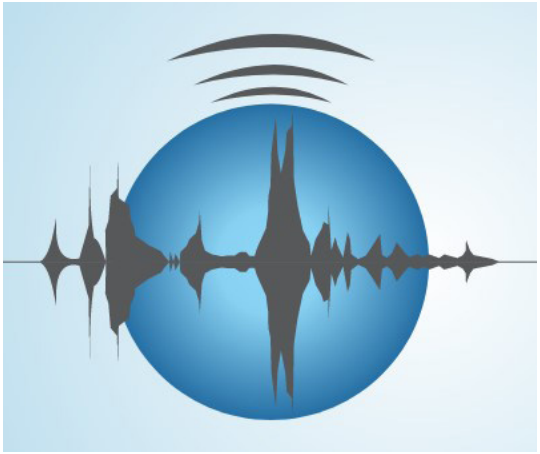
Infinite cycles

Our Vacuum Circuit Breakers require minimal maintenance and have a design life of 20 years or 10,000 mechanical operations.

For motor switching applications, you can rely on our vacuum contactors with a capacity of up to 3 million mechanical operations.

Dynamic driver

Our AIS systems are seismically qualified. They are enhanced for rigidity and tested for stable operation in earthquake prone areas up to Zone V as per latest codes & standards.



A Global validation

VH - AIS is completely type-test-verified at reputed international third-party laboratories to assure you best-in-class products.

CPRI ERDA KRMA CESI ASTA

Factory specialist

The performance of your assemblies is guaranteed by carrying out the following checks as our routine factory test plan:

- Electrical tests
- Visual Checks
- Measurement Checks
- Mechanical tests
- Physical tests

Convenience

Smart addition

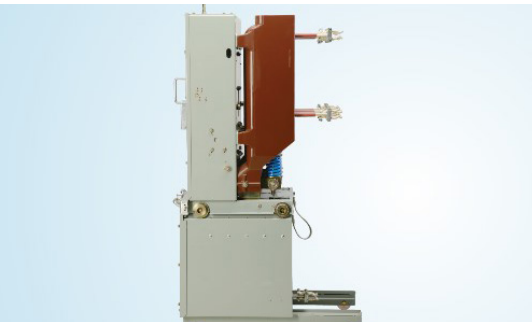
Panel coupling at site is made simple and safe through easily accessible bus bar connections and links.

More space. More capability.

The cable termination height is well above floor level, and generous space is provided for terminating power cables. This ensures a higher bending radius and reduces tension on the terminals.

Stay connected

Our Vacuum Circuit Breakers and Contactor Units are truck-mounted, the movement of which is interlocked with the door to make it very convenient for your operators.



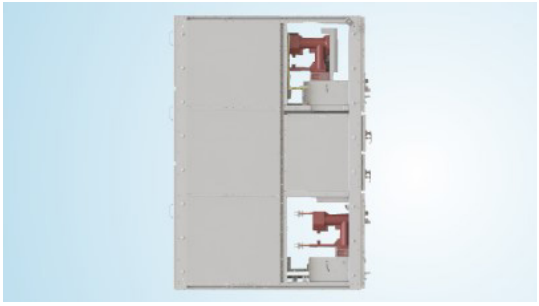
Ergonomic

VH-AIS comes with a single-handle for opening and closing the breaker door, eliminating fasteners. This makes the operation quick and easy.

Minimum Footprint. Optimum Utilisation.

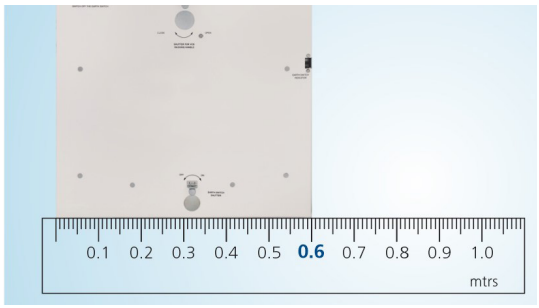
VH - AIS can accommodate 2 VCBs / VCUs in a single vertical section, thereby saving space.

Also, Bus PT and Line PT can be offered in a two-tier arrangement.



Maximize your space

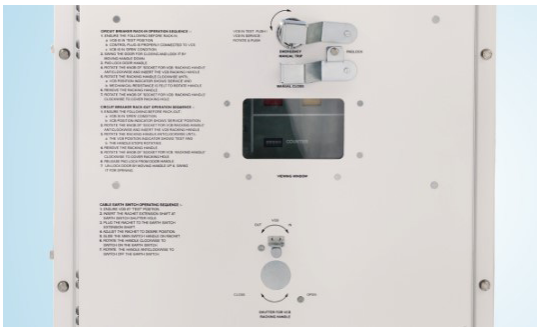
VH - AIS is characterized by a reduced width which offers savings on space and civil costs. Even with panels as slim as 600mm, it offers spacious compartments allowing easy access for installation and maintenance.



Visual appeal

The detailed instructions about operations & interlocks are screen printed on the VCB compartment door for convenience.

Moreover, the front viewing window shows a clear visual display of circuit breaker position, ON/OFF condition, spring charged / discharged and earthing switch status.



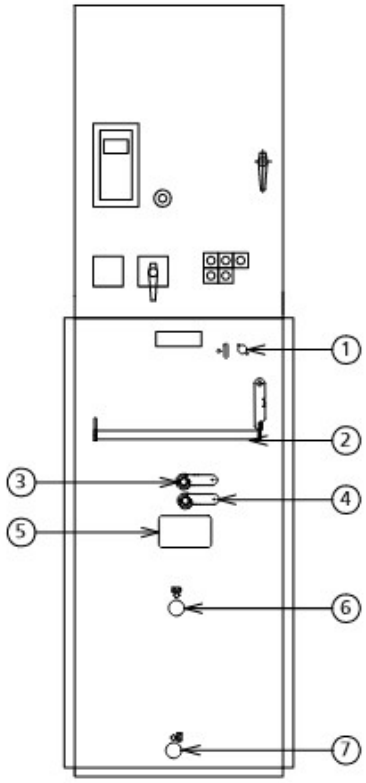
Customize your experience

Round-the-clock project management executives and after-sales teams support your installation, commissioning and maintenance needs.

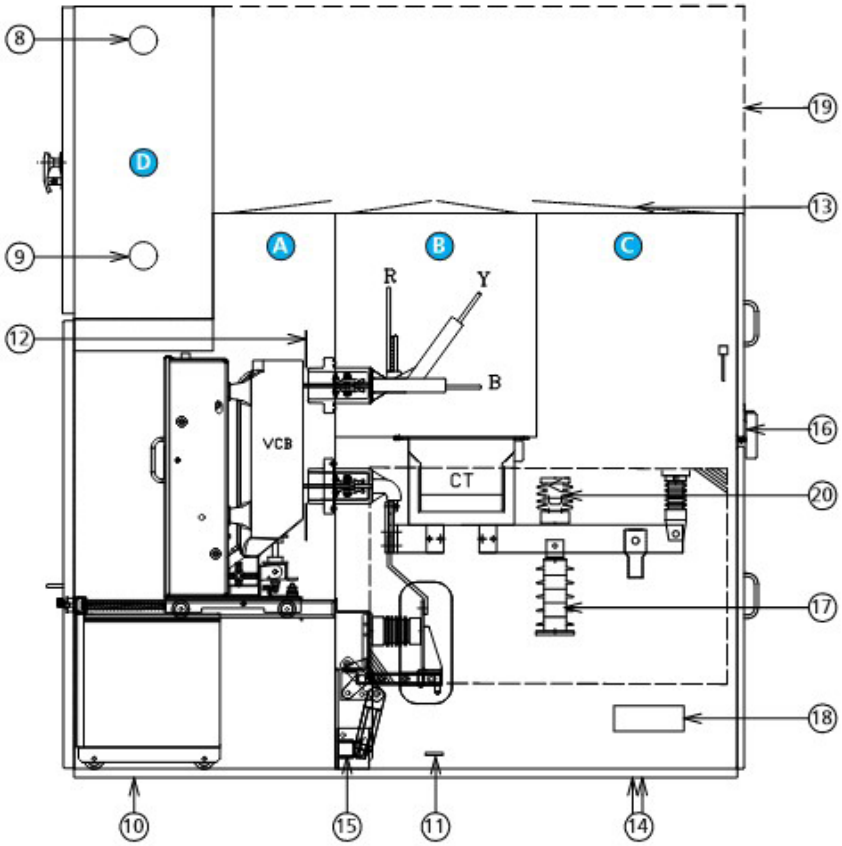
Construction

Typical VH - AIS Arrangement

A - VCB / VCU Compartment
B - Busbar Compartment
C - Cable Compartment
D - Low Voltage Compartment



FRONT VIEW

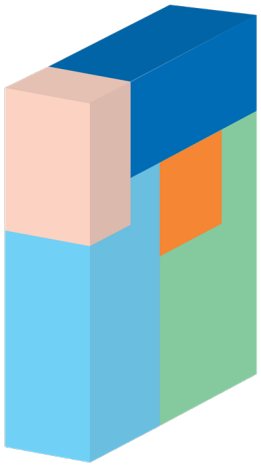


SECTIONAL VIEW

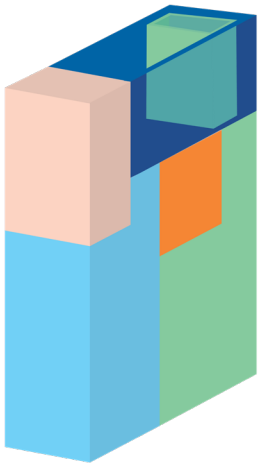
01 - Test / Service position Indicator
02 - VCB door handle & padlocking
03 - Manual trip
04 - Manual close
05 - Viewing window for VCB ON/OFF & Spring charging status indication
06 - VCB Racking slot
07 - Earth switch operating slot
08 - Routing communication wires
09 - Routing Interpanel wires
10 - Control cable entry
11 - Earth bar
12 - VCB safety shutters
13 - Pressure relief flaps
14 - Power cable entry
15 - Earth switch
16 - Rear Door Interlock
17 - Surge Arrester
18 - CBCT
19 - Gas Duct
20 - Voltage Detecting Insulator

Typical configurations

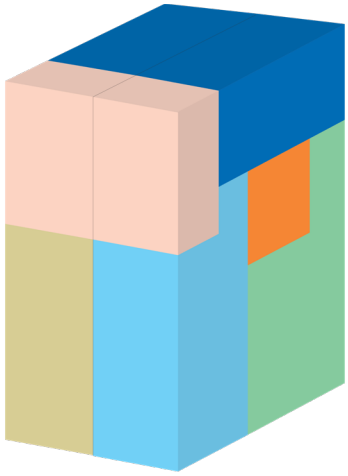
- Busbar
- Gas Duct
- Metering
- Bus PT
- Line PT
- VCB / VCU
- Cable



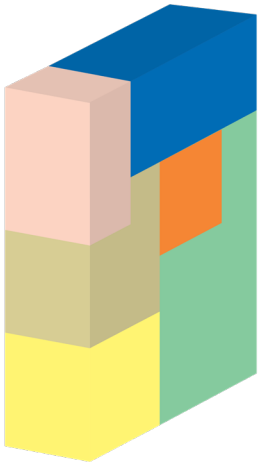
Incomer / outgoing
with bottom cable entry



Incomer / outgoing
with top duct entry

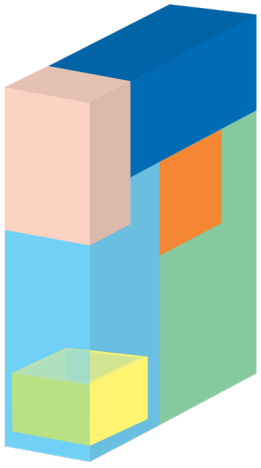


Buscoupler with Bus PT
And Riser Panel



Two tier PT Panel

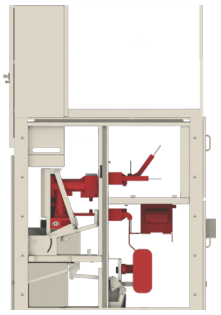
Two tier VCU Panel



Incomer with Line PT

Technical Specifications

7.2 kV AIS with VCU

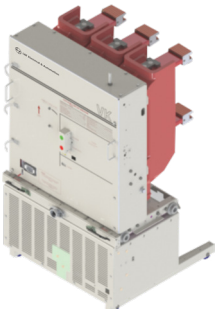


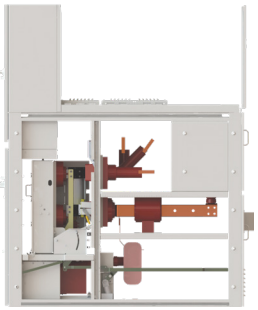
Panel Details	Standards	IEC 62271-200			
	Type Designation	VH1H			
Voltage ratings	Voltage	up to 7.2 kV*			
	Impulse Withstand Voltage	20 kVrms			
	Power Frequency Withstand Voltage	60 kVp			
	Frequency	50 / 60 Hz			
Current ratings	Rated Current	200 - 400 A			
	Short Time Withstand Current	up to 8 kA			
	Short Time Withstand Current (with Fuse)	25 / 40 / 50 kA			
Dimension	Width#	600 mm			
	Depth#	1570 / 1970 mm			
	Height#	2495 mm			
Construction	Partition Class	PM			
	Loss of Service continuity	LSC-2B			
	Degree of protection	IP4X (Higher IP on request)			
	Damage Classification	Type C			
	Internal Arc Classification	A (F, L,R), 40kA, up to 1s			
VCU	IEC Standard	IEC 62271-106			
	VCU Type	Non Latched		Latched	
	Type Designation	VCU7N200	VCU7N400	VCU7L200	VCU7L400
	Opening time	< 35 ms			
	Mechanical Endurance	up to 3 Million		up to 0.3 Million	
	Electrical Endurance	up to 0.3 Million (AC-3)			
	Rated Duties (40% on Load Factor)	Class 300			
	Closing /Tripping Coil	110 / 220 V DC			
	Auxiliary Contacts	3NO+3NC			

2 Tier panel width & depth starts from 800mm & 1970mm respectively

* 12 kV VCU offered on request

12 kV AIS with VCB





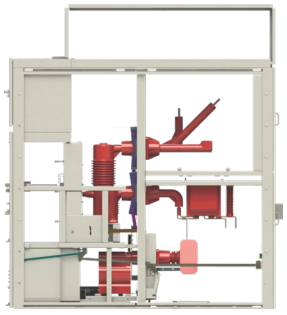
Panel Details	Standards	IEC 62271-200			
	Type Designation	VH1H			
Voltage ratings	Voltage	up to12 kV			
	Power Frequency Withstand Voltage	28 /38* kVrms			
	Impulse Withstand Voltage	75 / 95* kVp			
	Frequency	50 / 60 Hz			
Current ratings	Rated Current	630 / 800 A	1250 A	2000 A	3150 / 4000^ A
	Short Time Withstand Current (3s)	25 / 26.3 kA			
		40 / 50 kA			
	Short Circuit Making current	62.5 / 65.75 kAp			
		100 / 125 kAp			
Dimension	Width#	600 mm		800 mm	1000 mm
	Depth #	1570 / 1970 / 2170 / 2270 mm			
	Height	2495 mm			
Construction	Partition Class	PM			
	Loss of Service continuity	LSC-2B			
	Degree of protection	IP4X (Higher IP on request)			
	Internal Arc Classification	A (F, L,R), up to 40 / 50kA , up to 1s			
VCB	IEC Standard	IEC 62271-100			
	Type Designation	VK series			
	Operating Sequence	O-0.3sec-CO-3min-CO			
	Opening time	< 35 ms			
	Break time	< 3 cycles			
	Mechanical Operations	10,000			
	Closing /Tripping Coil	24 / 48 / 110 / 220 V DC			
	Spring charging motor	24 / 48 / 110 / 220 V DC I 110 / 240 V AC			
	Auxiliary Contacts	6NO+6NC / 12NO+12NC*			

* offered on request

^ with forced ventilation

50kA Panel width & depth starts from 800mm & 1970mm respectively

36 kV AIS with VCB



Panel Details	Standards	IEC 62271-200		
	Type Designation	VH1H		
Voltage ratings	Voltage	36 kV		
	Power Frequency Withstand Voltage	70 kVrms		
	Impulse Withstand Voltage	170 kVp		
	Frequency	50 / 60 Hz		
Current ratings	Rated Current	800 A	1250 A	2000 / 2500* A
	Short Time Withstand Current (3s)	25 / 31.5 kA		
	Short Circuit Making current	63 / 79 kAp		
Dimension	Width	1000 mm		
	Depth**	2650 / 2950 mm		
	Height***	2500 mm		
Construction	Partition Class	PM		
	Loss of Service continuity	LSC-2B		
	Degree of protection	IP4X (Higher IP on request)		
	Internal Arc Classification	A (F, L,R), 31.5kA , 1s		
VCB	IEC Standard	IEC 62271-100		
	Type Designation	VY series		
	Operating Sequence	O-0.3sec-CO-3min-CO		
	Opening time	< 35 ms		
	Break time	< 3 cycles		
	Mechanical Operations	10,000		
	Closing /Tripping Coil	24 / 48 / 110 / 220 V DC		
	Spring charging motor	24 / 48 / 110 / 220 V DC l 110 / 240 V AC		
	Auxiliary Contacts	6NO+6NC		

* Offered on request.

** Depth may vary with cable size & number of Current Transformer.

*** Height is without gas duct and may change (increase/decrease) depending on LV Components / Relays.

The Perfect Match for your VH - AIS

VH - AIS offers the widest range of electrical solutions up to 36kV. Our In-house design and testing facilities enable us to create customized solutions with type tested switchboard combining VCBs and VCUs in perfectly matched configuration as per your requirements. We ensure that you achieve the highest level of cost & design optimisation with our VH - AIS.

Vacuum Circuit Breaker

- VCB Class - E2 | C2 | M2
- Customized 2 trip coils configuration
- Common design & safety interlocks up to 36kV
- Rated current capacity up to 4000A
- Short circuit breaking capacity up to 50kA
- Built - in anti-pumping feature
- User-friendly truck mounted design

Vacuum Contactor Unit

- Fused Short circuit protection up to 50kA
- Available in latched & non latched configurations
- Encapsulated current carrying parts for higher safety
- Truck mounted design similar to VCBs
- Suitable for motor starters with numerous switching operations
- Two VCUs can be accommodated in single panel for optimum space utilisation
- VCU panels can be coupled with VCB panels owing to