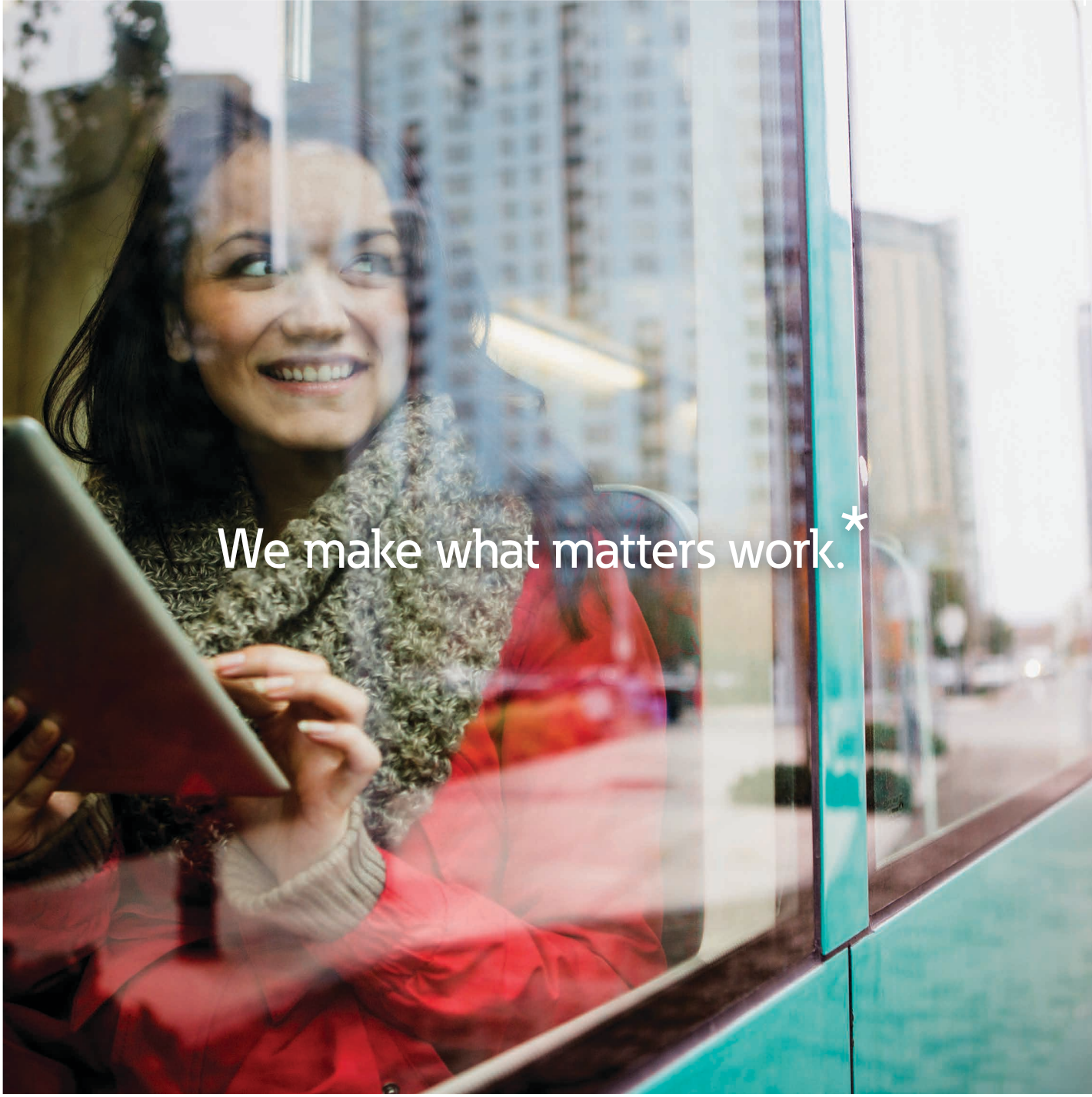
Ulusoy HMH Series Medium Voltage Modular Switchgear

Ulusoy HMH

Air insulated
Expandable

Powering Business Worldwide



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Ulusoy HMH series
Metal enclosed switchgear

Up to 36 kV

Introduction

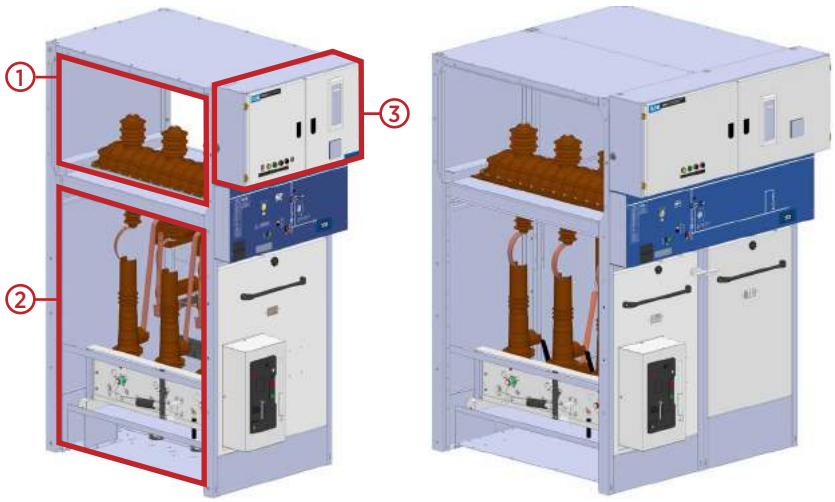
Ulusoy HMH series metal enclosed modular switchgear are medium voltage assemblies for use in secondary distribution systems, compact kiosk-type transformer substations, and industrial facilities. They are designed for indoor use. All functional units can be installed easily side by side.

The switchgear is factory assembled and undergoes all routine type-approval tests. Units can be commissioned quickly and safely.

Enclosures are manufactured using 2 mm hot-dip-galvanized sheets with a thickness of 275 gr/m^2 which exceeds standards and resists deformation even in the most humid environments.

All epoxy resin parts used in the switchgear (capacitive insulators, load break switch housing, etc.) are produced in the epoxy resin facility within the factory. Each component undergoes testing before entering the main assembly line.Switchgear mimic diagrams and electrical protection/control panels are designed on a project basis by project engineers to meet the specific needs of the customer and project.

Various language options are available for Ulusoy HMH series switchgear front panels.



Features of Ulusoy HMH

Value ranges
- Up to 36 kV, 1250 A, 20 kA
- 12 / 24 / 36 kV
- Compliant with IEC standards
- Customized types

Safety
- Equipped with safety locks
- Internal arc classification IAC AFL
- Classified LSC-2A, PI
- Fixed-type circuit breaker

Flexibility
- Wide variety of applications
- 24 kV vacuum circuit breaker and 36 kV SF_6 circuit breaker
- Load break switch (LBS)
- Manual disconnector
- Block voltage transformer, block/ toroidal current transformer
- Wall-mounted or free-standing

Quality
- 100% Eaton quality, factory tested
- Extensive installation network
- Installed in countries worldwide
- Approved for use in special environments including maritime, earthquake and nuclear;type tested in line with IEC standards

Design
- Protection and control
- Earthing switch

The Ulusoy HMH switchgear is divided into three compartments:

1) Busbar compartment: the main busbar is located in this compartment and is where the main busbar connection is made. Busbars can be aluminum or copper. The breaker varies depending on the rated current value.

2) Cable connection and switching compartment: medium voltage cable connections are in this compartment. The earthing switch, breaker, support insulator, capacitive insulator, current transformer, voltage transformer, MV fuse and earthing busbar are also located in this compartment.

3) LV compartment: terminal blocks, LV fuses, thermostat, measuring instruments and protection relays are located in this compartment. When the switchgear (busbars and cables) is energized, operation is possible via the LV panel.

Renewable energy

Public spaces

Airports

Stadiums

Application areas

Ulusoy HMH series metal enclosed switchgear units are specially designed for medium voltage electricity distribution networks.

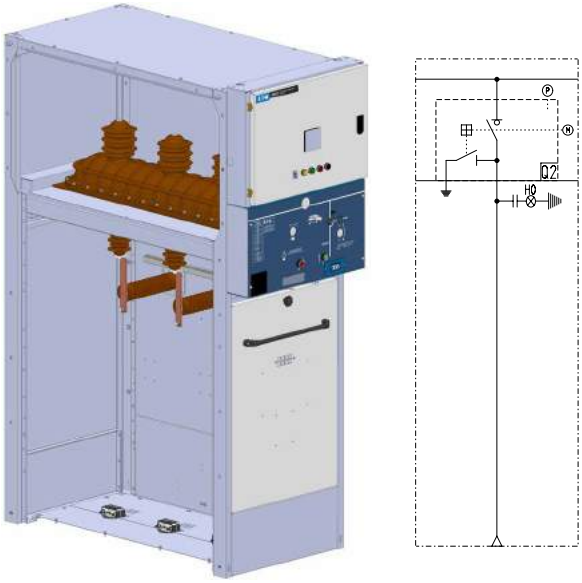
Ease of installation, an expandable design, and a broad range of product types make them the right choice for a variety of industries. Project-specific solutions can be created through flexible design and manufacturing.

They are commonly used in renewable energy facilities such as wind farms, solar power plants, and hydroelectric power plants.

Thanks to their safety features and maintenance-free design, they are also used extensively in electrical distribution systems in highly populated areas such as shopping malls, airports, hospitals, schools, and large residential buildings/complexes.

Ulusoy HMH product types

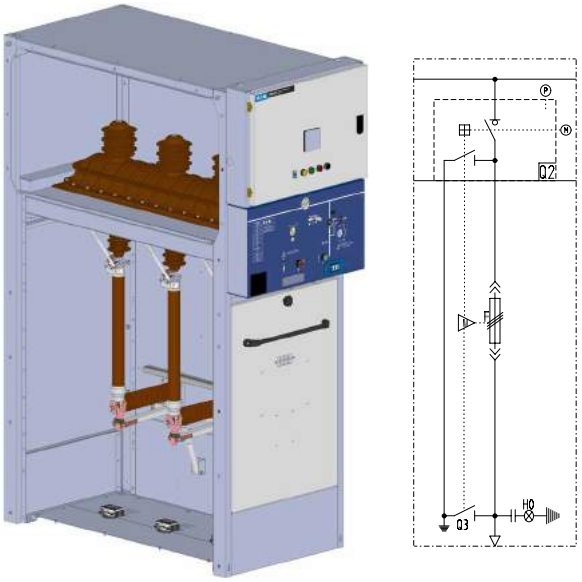
HMH 01: Incoming-outgoing switchgear with load break switch



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
12	500 (375)	960	1800
24	500	960	1800
36	750	1400	2250

Optional equipment: spring-charging motor
fault indicator assembly
surge arrester

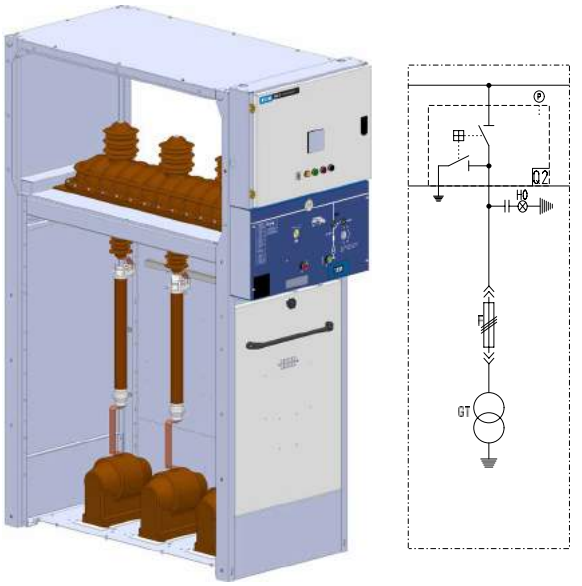
HMH 02: LBS compound with fuse switchgear



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
12	500 (375)	960	1800
24	500	960	1800
36	750	1400	2250

Optional equipment: spring-charging motor

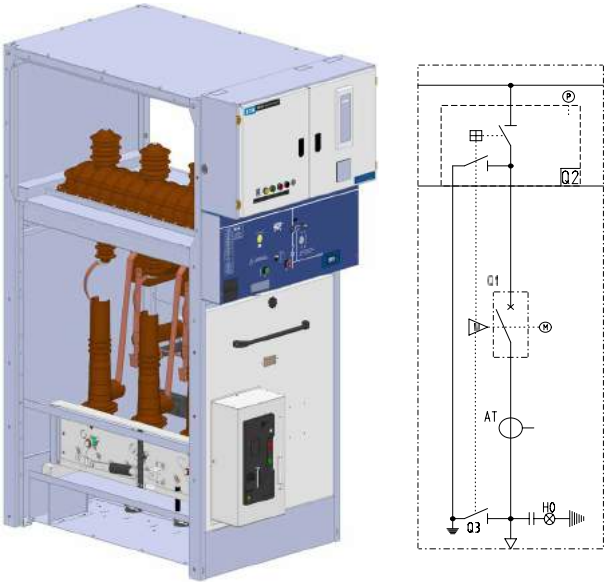
HMH 03: Voltage metering switchgear



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
12	500 (375)	960	1800
24	500	960	1800
36	750	1400	2250

Optional equipment: metering devices

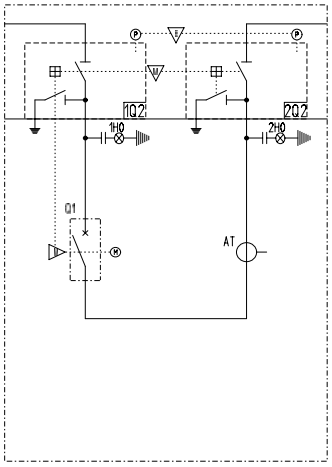
HMH 04: Incoming-outgoing switchgear with disconnector and circuit breaker



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
24	750	960	1800
36	1000	1400	2250

Optional equipment: metering devices

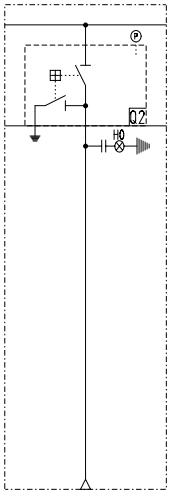
HMH 05: Busbar connection switchgear with disconnector



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
24	1000	960	1800
36	1500	1400	2250

Optional equipment: metering devices

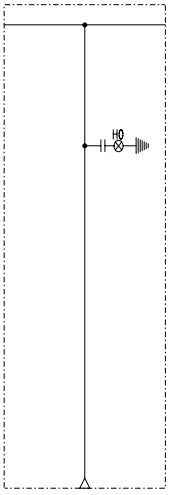
HMH 06: Incoming-outgoing switchgear with disconnector



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
12	500 (375)	960	1800
24	500	960	1800
36	750	1400	2250

Optional equipment: fault indicator assembly
surge arrester

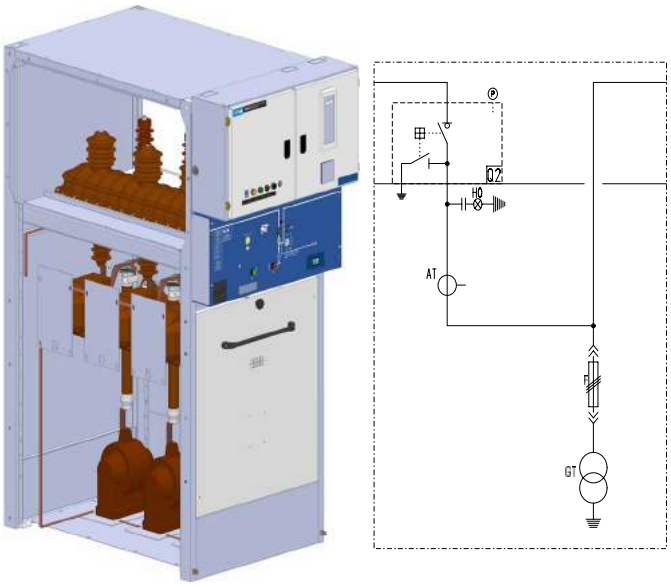
HMH 07: Cable entry connection switchgear



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
12	500 (375)	960	1800
24	500	960	1800
36	750	1400	2250

Optional equipment: earthing switch
surge arrester

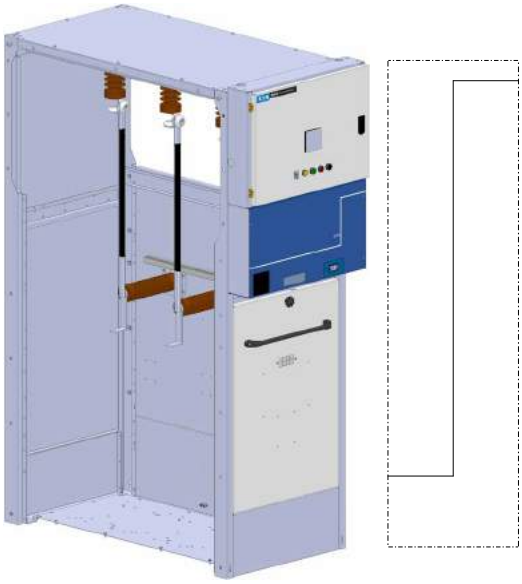
HMH 08: Current and voltage metering switchgear with load break switch



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
24	750	960	1800
36	1000	1400	2250

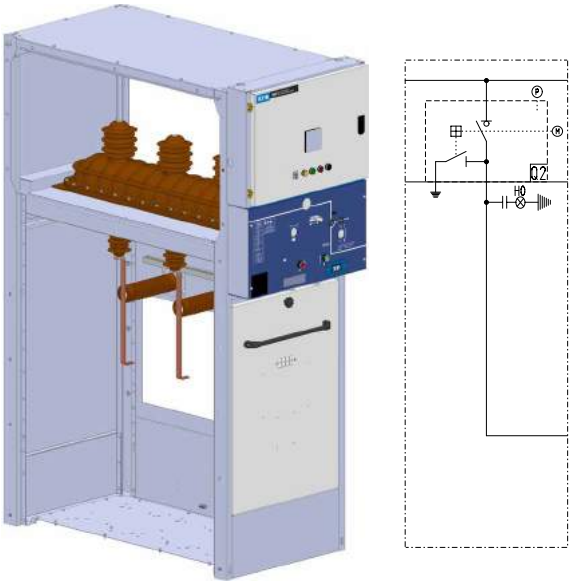
Optional equipment: spring-charging motor
metering devices

HMH 09: Busbar riser switchgear



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
12	500 (375)	960	1800
24	500	960	1800
36	750	1400	2250

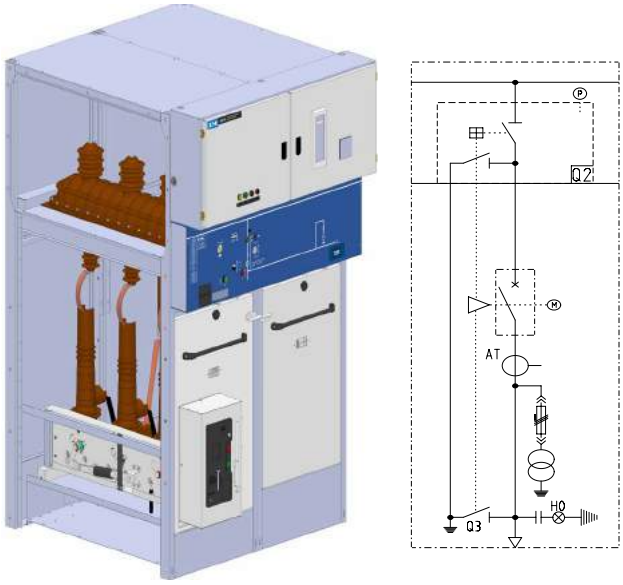
HMH 13: Busbar separator switchgear with load break switch



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
24	500	960	1800
36	750	1400	2250

Optional equipment: metering devices

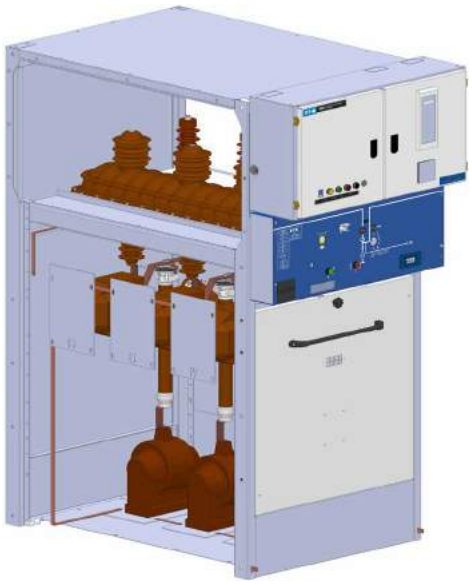
HMH 14: Incoming-outgoing switchgear with circuit breaker / voltage transformer

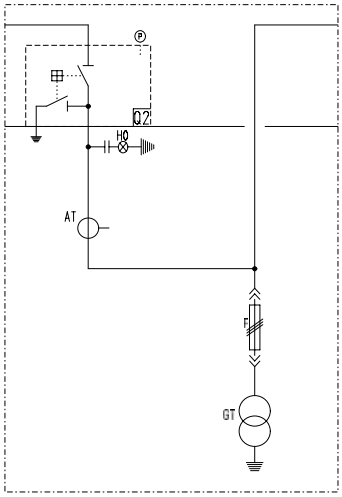


Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
24	1000	960	1800
36	1500	1400	2250

Optional equipment: metering devices

HMH 15: Current and voltage metering switchgear with disconnector

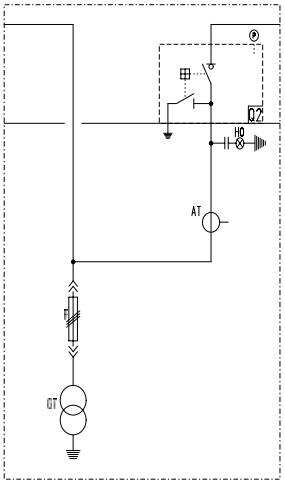




Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
24	750	960	1800
36	1000	1400	2250

Optional equipment: metering devices

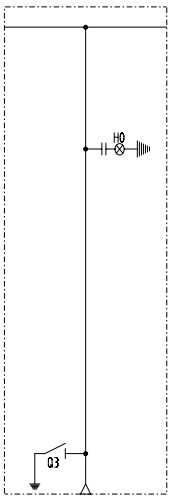
HMH 19: Current and voltage metering switchgear with load break switch



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
24	750	960	1800
36	1000	1400	2250

Optional equipment: spring-charging motor
metering devices

HMH 28: Cable connection switchgear with earthing switch



Rated voltage (kV)	Width (mm)	Depth (mm)	Height (mm)
12	500 (375)	960	1800
24	500	960	1800
36	750	1400	2250

Optional equipment: surge arrester

Technical specifications

Rated voltage	kV	12	24	36
Rated lightning impulse withstand voltage	kV	75	125	170
Rated network frequency withstand voltage (1 min.)	kV	28	50	70
Rated frequency	Hz	50	50	50
Internal arc rating		AFL	AFL	AFL
Loss of service continuity class		LSC2A	LSC2A	LSC2A
Compartment class		PI	PI	PI
Rated short-term withstand current: earthing circuit	kA - 1 sec.	16	16	16
Rated short-term withstand current: main circuit	kA - 1 sec.	16	16	16

Compartment accessibility				
LV breaker compartment		accessible	accessible	accessible
Busbar compartment		inaccessible	inaccessible	inaccessible
Cable compartment		accessible	accessible	accessible
Degree of protection		IP3X	IP3X	IP3X
Installation		indoors	indoors	indoors
Operating temperature	°C	between -5 and +40	between -5 and +40	between -5 and +40

Main busbar system				
Rated current	A	630, 1250	630, 1250	630, 1250
Rated short-term withstand current	kA - 1 sec.	16	16	16
Rated peak withstand current	kA	40	40	40

Circuit breaker				
Rated current	A	630, 1250	630, 1250	630, 1250
Rated short-circuit breaking current	kA	16, 20	16, 20	16, 20
Rated short-circuit closing current	kA/peak	40, 50	40, 50	40, 50
Rated short-circuit withstand current	kA/rms - 1 sec.	16	16	16
Class		E1, M1, C2	E1, M1, C2	E1, M1, C2
Number of short-circuit current breakers		20	20	
Auxiliary voltage	V	AC 220 - DC 24/48/110	AC 220 - DC 24/48/110	AC 220 - DC 24/48/110

Mechanism (breaker)				
Rated process series	A	0 - 300 ms - CO - 3 min. - CO	0 - 300 ms - CO - 3 min. - CO	0 - 300 ms - CO - 3 min. - CO
Class		M1	M1	M1
Number of operations / no load		2,000	2,000	2,000

Primary components

USFB series SF_6 circuit breakers

USFB series circuit breakers are where arc extinguishing takes place. They consist of three independent poles containing fixed and movable contacts that are filled with sulfur hexafluoride in a sealed system that is guaranteed to be impermeable. The breaker mechanism operates by releasing accumulated energy. The mechanism can be operated using a motor or by levers that come with the breakers.

USFB series circuit breakers offer a repeat closing feature and allow various mechanical and electrical interlocks with load break switches or normal disconnectors to be used together.

The USFB series is manufactured in accordance with the IEC 62271-100 standard.

36 kV

RVU series vacuum circuit breakers

RVU series vacuum circuit breakers feature a lateral operating mechanism and are designed for systems with a rated voltage of 12–24 kV. Air insulated switchgears are used for control and protection purposes in settings such as industrial enterprises, mining enterprises, and power generation / distribution facilities.

Evaporation occurs on the surfaces of the vacuum contacts inside the embedded poles due to the heat released during an arc fault. After the arc is extinguished, the metal vapor in the vacuum condenses on the contact surfaces. Contacts have low resistance and a high short-circuit breaking capacity. These features reduce power consumption and temperature increases over long-term operation.

The RVU series is manufactured in accordance with the IEC 62271-100 standard.

12–24 kV

LBSH series load break switches (LBS)

LBSH load break switches are used in the Ulusoy HMH series metal enclosed modular switchgear. The active sections of the LBSH series load break switches are housed inside an epoxy resin body with a sulfur hexafluoride environment enclosed in a sealed pressure system.

Over a 20-year normal service life, the gas does not need refilling and maintenance is not required.

LBSH series load break switches have three poles and two positions. The earthing switch is also in the sulfur hexafluoride environment inside the resin body and closes quickly in the event of a short circuit. This means that arcs created while the switch is closing do not deform the switchgear. This feature on LBSH series load break switches also ensures operator safety.

The mechanical and electrical locking systems between the load break switch and the earthing switch prevent incorrect operation.

The LBSH series is produced in accordance with the IEC 62271-103 (load break switch) and IEC 62271-102 (normal disconnector) standards.

24 kV

36 kV

Current and voltage transformers

The following current and voltage transformer types are used in the Ulusoy HMH series switchgear:

1- Cast resin (support) current transformer

Cast resin current transformers are dry type transformers in which the internal windings and coils are coated with epoxy resin for insulation. These are widely used in switchgear assemblies around the world installed at engineering, construction and energy enterprises where the transformer's primary function is to reduce high currents.

Our cast resin current transformers are manufactured in accordance with the IEC 61869-2 standard.

2- Cast resin voltage transformer

Cast resin voltage transformers are dry type transformers in which the internal windings and coils are coated with epoxy resin for insulation. These are widely used around the world in switchgear assemblies at engineering, construction and energy companies where the transformer's primary function is to reduce high voltages.

Our cast resin voltage transformers are manufactured in accordance with the IEC 61869-3 standard.

3- Toroidal current transformer

Toroidal current transformers are dry type transformers in which the internal windings and coils are coated with epoxy resin for insulation.

Our toroidal current transformers are manufactured in accordance with theIEC 61869-1 and IEC 61869-2 standards.

4- Toroidal Rogowski current sensor

Toroidal Rogowski current sensors are a member of the electrical current transformer family and are produced in accordance with the IEC 60044-8 standard. Rogowski current sensors operate on the basis of electromagnetic field theory. The current-carrying cable passing through the center creates voltage in the sensor's secondary part.

Rogowski current sensors are smaller than current transformers. They also operate at a single standard over a wide range.

Earthing switch

Earthing switches are used to ensure safe closing in the event of a short-circuit in the switchgear. They protect the operator and equipment from possible damage or injury if faults occur.

Our earthing switches are manufactured in accordance with the IEC 62271-102 standard.

Secondary components

Fault notification block with signal indicator

Indicates and directs all potential malfunctions in the protection switchgear in electrical networks. It is a microprocessor-based device.

It provides high levels of convenience in signaling processing *(e.g. Buchholz notification — Buchholz on — Thermometer notification — Thermometer on — Overcurrent notification — Overcurrent on)* for modular switchgear and protection panels.

Fault indicator assembly

This device indicates phase and earth faults. It can be mounted on the control panel or inside the concrete kiosk and is optionally available with the switchgear.

It detects phase and ground faults using the current information received from three current transformers (separate for each phase) connected to underground grid cables. The assembly displays error status information via the indicators on the main unit and the external signal lamp.

Protection relays

A variety of protection and metering and control relays are used in the Ulusoy HMH series switchgear.

Which relay is used depends on the customer's needs and project requirements. Relays are shipped with the desired settings.

Voltage indicator

This device measures the voltage on the main busbar.

Metering devices

Depending on system requirements, these devices measure parameters such as energy, power, current, voltage, harmonic, and power factor. This category includes voltmeters, ampmeters, energy devices, etc.

MV fuses

Used in external and internal switchgears at voltages between 12 kV and 36 kV.

Fuses are filled with quartz sand. When exposed to short-circuit current or overcurrent, the granules extinguish the arc and disperse heat. The fuse also incorporates a mechanical indicator system.

When the melting element melts in the event of overcurrent, the pin moves out to a specified position.

Voltage detection system

The voltage indicator is used together with capacitive voltage insulators.

It shows whether there is energy in the phases. There is a separate indicator for each phase. The plug-in connection design makes installation and wiring easy.

Remote control

The remote control included as standard with the Ulusoy HMH series switchgear enables the switchgear to be controlled from a distance of up to 10 meters.

Standards

The switchgear system and the main equipment included with it comply with the following standards:

CEI EN/IEC standards	Description
IEC 60044-8	Instrument transformers **Part 8:** Electronic current transformers
IEC EN 60529	Degree of protection provided by enclosures (IP code)
IEC 61869-1	Instrument transformers **Part 1:** General requirements
IEC 61869-2	Instrument transformers **Part 2:** Additional requirements for current transformers
IEC 61869-3	Instrument transformers **Part 3:** Additional requirements for inductive voltage transformers
IEC 62271-1	High voltage switchgear and controlgear **Part 1:** Common specifications
IEC 62271-100	High voltage switchgear and controlgear **Part 100:** Alternating current circuit-breakers
IEC 62271-102	High voltage switchgear and controlgear **Part 102:** Alternating current disconnectors and earthing switches
IEC 62271-103	High voltage switchgear and controlgear **Part 103:** Switches and switch-disconnectors for rated voltages above 1 kV up to and including 52 kV
IEC 62271-105	High voltage switchgear and controlgear **Part 105:** Switch-fuse combinations for rated voltages above 1 kV up to and including 52 kV
IEC 62271-200	High voltage switchgear and controlgear **Part 200:** Metal-enclosed factory-built switchgear and controlgear for rated voltages above 1 kV up to and including 52 kV
IEC 62271-202	High voltage switchgear and controlgear **Part 202:** Factory-built high voltage/low voltage substations
IEC 62271-206	High voltage switchgear and controlgear **Part 206:** Voltage presence indicating systems for rated voltages above 1 kV up to and including 52 kV

* The products and systems featured in this catalog are manufactured and sold in accordance with the ISO 9001, ISO 14001 and BS OHSAS 18001 quality management systems.

Notes

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