MME-36

MME-24

General:

The MME typed metal-enclosed switchgear and controlgear is reliable and cheap solution for medium voltage applications. It offers;

- Air insulated,
- High level personal safety,
- High level operating reliability,
- Different cubicles types allowing individual configurations and thus high flexibility,
- Modular design allows unlimited installation possibilities,
- LSC 2A-PI (Loss of Service Contiunity),
- Comply with IEC 60271-200,

Structure:

- MME consist of mainly four compartmants. Namely;

  - Main Busbar Compartmanet,
  - Cable Compartment,
  - LV Compartment and Operating Mechanism Compartment.
  - Operating Mechanism Compartment.

- The material of enclosure is 2 mm. galvanized steel sheet. No welding is used during the assembling of the structure.
- The positions of rotary disconnector (contact positions can be checked from the surveillance window.)

Internal Arc Withstand:

MME cubicles has durable design against the thermal and dynamic effects during the internal arc.

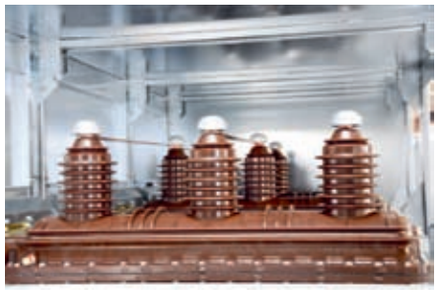
Internal arc class is IAC A (FL) 16 kA-1 s according to IEC 62271-200

Quality Assurance System:

ISO 9001: 2008 certified by independent organisation

Enviromental Management System:

ISO 14001 certified by independent organisation



Main Busbar Compartment;

- Seperated from cable compartment by epoxy housing of disconnector/switch-disconnector.
- Tool based accessible compartment with regard to accessibility.
- Withstand to internal arc.
- Having IP3X protection degree.

Cable Compartment of Cubicle with Circuit Breaker

Cable Compartment:

It is the compartment where the connections between Incoming/outgoing cables and placed at the bottom of the cubicle.

- Procudure based accessible compartment with regard to accessibility.
- Withstand to internal arc.
- Having IP3X protection degree.

According to the functional type of cubicle, it contains;

- MV SF6 insulated or Vacuum circuit breaker,
- MV Measurement Transformers,
- Earthing Switch,
- MV Fuses,

Low Voltage Compartment:

It is placed on the top front of the cubicle. It has IP3X protection degree.

According to the functional type of cubicle, it contains;

- Protection relays,
- LV fuses,
- Measurement devices,
- Auxiliary contacts,
- Electrical terminal arrays,
- AC/DC Supply

Operating Mechanism Compartment:

According to the functional type of cubicle, operating mechanism compartment contains;

- Switch-disconnector mechanism,
- Earthing switch mechanism and/or
- Disconnector mechanism.

The operating mechanism of the circuit breaker is placed on the breaker, separately.

All metal parts of operating mechanism are protected against to corrosions.

Operating mechanism is placed in a metal enclosure having IP 3X protection degree.

The Control and Monitoring Panel has;

- Mimic diagram,
- Open/close knut (latch) for both disconnector and switch disconnector,
- Position indicators,
- "Spring Charged" and "Spring Released" indicators,
- Operating handle slots,
- Voltage Presence Indicator,
- Padlock,
- Operating instructions.

Voltage Indicator: Capacitive Voltage Presence Indicator (VPIS) is provided with as standart equipment.

Voltage Detection System (VPS) is an obtional.

Protection Relay: Provided according to the client requirement.

Remote Monitoring and Command: Various supplementary modules and required equipments for this aim (motor drive unit, (auxiliary switch and contacts, e.g) can be attached later any time.

Operating Mechanism of Switch-Disconnector:

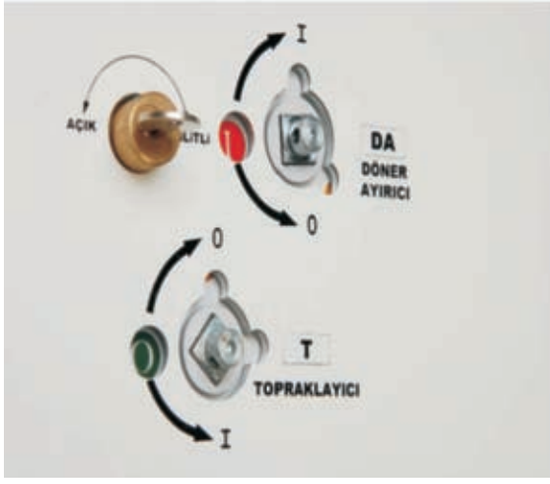
The type of operating mechanism used is energy stored type. Making and closing operations are independent of the operator.

The energy necessary for operations is obtained by the compression of a spring.

Storing energy;

Manually : by an operating handle (standard)

Electrically: by a motor drive unit (optional)



Releasing of energy;

Manually : by the knut (latch) on the mechanism as an standart.

Electrically : by the shunt released, as a standart for fuse-switch combinations, as an optional for switch-disconnectors.

Mechanically : with striker pin for switch-fuse combinations as an standart.

Operating Mechanism of Earthing Switches:(for E2 class)

The type of operating mechanism is quick making type. Making is independent of the operator.

Operating Mechanism of Rotary Disconnector:

The closing and opening operations is dependent of the operator.

Cubicle with circuit breaker

Interlocking :

Interlockings prevents any false operations. The following interlocks comply with IEC recommendation 62271-200.

Cubicle with switch-disconnector and switch-fuse combination:

- The switch-disconnector can only be closed if the earthing switch is OPEN and if the cable compartment door is CLOSED.
- The earthing switch can only be closed if the switch-disconnector is OPEN.
- The cable compartment door can only be opened if the the earthing switch is CLOSED.

and also;

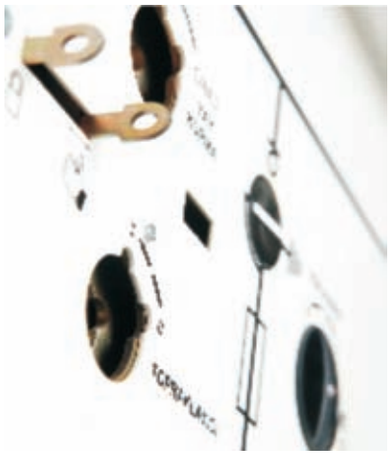
The switch-disconnector can be locked in the open position when the cable compartment door is removed . The earthing switch can then be operated in order to perform outgoing/incoming MV MV cable tests.

Cubicle with circuit breaker:

- The circuit breaker can only be closed if the earthing switch is OPEN and if the cable compartment door is CLOSED.
- The earthing switch can only be closed if the disconnector is OPEN.
- The disconnector can only be opened if the circuit breaker is in open position. The circuit breaker can then be operated with the key being free.

and also;

The disconnector is locked in the open position when the cable compartment door is removed. The earthing switch can then be operated in order to perform outgoing/incoming MV cable tests.



Locking:

MME cubicles can be inoperable by using padlocking. (Switch-disconnectors, earthing switch or disconnector in the OPEN or CLOSED position.)

Switch-Fuse Combinations are used for switching and protection of HV/LV distribution transformers.

- The current limiting fuses with striker pin should be used In case of a fault on any phase, the striker of pin corresponding phase operate the mechanism and all three phases are opened simultaneously.
- The type of striker pin of fuses used within MME should be Medium Type (acc.to (IEC 60282-1).
- The door of the cable compartment having MV fuses can only be opened if the both sides of fuses are earthed. So, replacing of fuses can be taken place safely.

REMARK: It is recommended at 8.103 clause of IEC 62271-105 that all three fuses should be replaced even if only one or two fuse(s) have blow up.

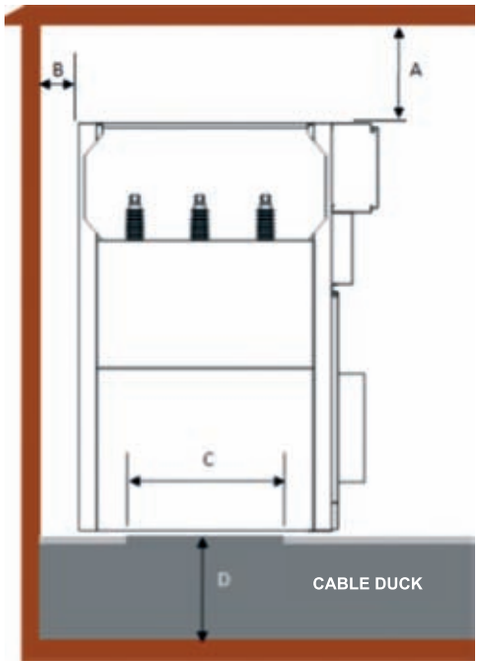
Following table should be used for selection of fuses to be used in MME cubicles according to power of transformers.

HV FUSE SELECTION TABLE									
Rated Voltage (kV)		**36**							
Rated Voltage (kVA)		**160**	**250**	**400**	**630**	**800**	**1000**	**1250**	**1600**
%Uk		4.5	4.5	4.5	4.5	6	6	6	6
İNTERTEKNİK (Tipi: ACT)	In	6.3 A	10 A	16 A	20 A	20 A	25 A	31.5 A	40 A
GÜRAL (Tipi: MGM)	In	4-6 A	10 A	16 A	20-25 A	20 A	25 A	30 A	40 A
EFO	In	-	-	16 A	20 A	20 A	25 A	30 A	40 A
Remark: Ask ELKO about selection of fuses for different power, voltage and % Uk ratings.									

Important !

The fuse link should be placed in a cubicle as shown on the picture above. Otherwise the striker can not trip the mechanism.

The striker side of fuse is marked with an ARROW on the fuse.



MME switchgears should be placed on a cable duck.

The distances to ceiling and back wall is provided below:

A ⩾ 400 mm
B ⩾100 mm

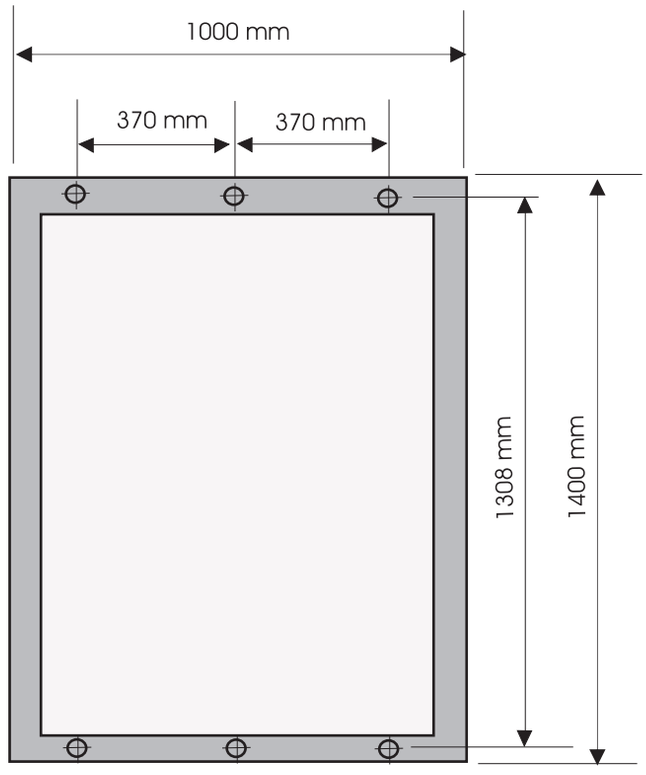
Cable duck dimensions:

Width (C) : 900 mm
Depth (D) : ⩾ 750 mm*

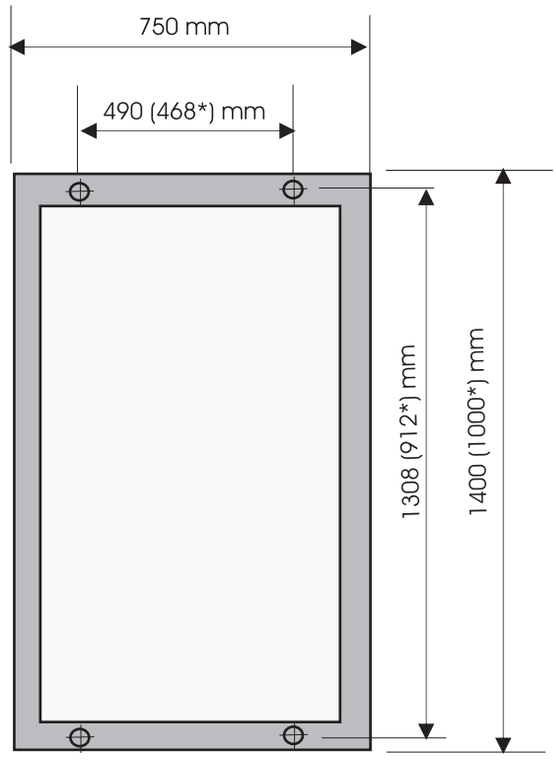
* The dimensions are for 36 kV, XLPE insulation 1x240/25 mm² cable.

Fixing the switchgear to the floor:

The base hole dimensions for MME-36 are below. The switchgear should be fixed to the well-levelled base on the cable duck by using M10X30 steel concrete insert (pin).



For cubicles with 1000 mm width,
(the diameter of holes is 13 mm)



For switchgears with 750 mm width,
(the diameter of holes is 13 mm)
*: for MME-24

Fields of Applications (mainly):

- Secondary Distribution Systems
- MV/LV Distribution Transformer Substations
- Organized Industrial Zones
- Shopping Malls
- Airports, hospitals

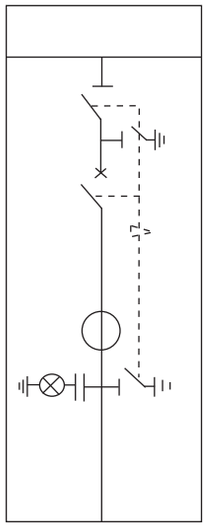
Optional Equipments:

- Motor and Fault Indicator for cubicle with Switch Disconnector.
- Energy meter, Analyzer and Ammeter for cubicle with Circuit Breaker.
- Fault Indicator for cubicle with Disconnector
- Surge arrester for incoming/outgoing cubicles.
- Sf6 gas manometer for Switch-disconnector and disconnector.

Technical Characteristics:

Rated voltage (kV)	12; 17.5; 24	36
Type	MME-24	MME-36
Rated main busbar current (A)	630; 1250	630; 1250
Rated feeder current (A)	630; 1250*	630; 1250*
Rated power frequency withstand voltage (kV-rms)		
▪ To earth and between phases	50	70
▪ Across the isolating distance	60	80
Rated lightning impulse withstand voltage (kV-peak)		
▪ To earth and between phases	125	170
▪ Across the isolating distance	145	195
Rated short-circuit withstand current	▪ 16 kA-1 s ▪ 20 kA-1 s	▪ 16 kA-1 s ▪ 20 kA-1 s ▪ 25 kA-1 s
Rated peak withstand current (kA-peak)	40/50	40/50/62.5
Rated transfer current (A) (For switch- fuse combination)	600	500
Loss of Servise Continuity	LSC 2A-PI	LSC 2A-PI
Internal Arc Withstand	A (FL) 16 kA-1 sec	A (FL) 16 kA-1 sec
Protection Degree	IP 3X	IP 3X
Standards Applied	IEC 62271- 200	IEC 62271- 200
*: Valid for switchgears with circuit breaker		

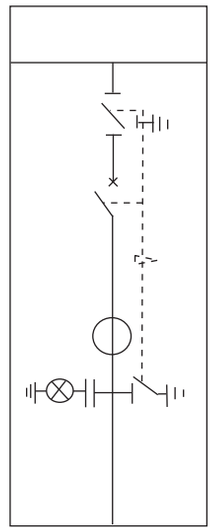
SP (g)
TF(g)



SP(g)	MME-17 MME-24	MME-36
W	750*/850	1000
D	1000	1400
H	1970	2250

Cubicle with Circuit Breaker
(with SF6 Insulated Disconnector)

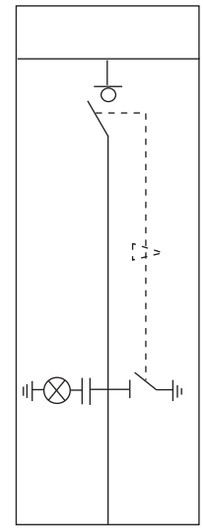
SP (h)
TF(h)



SP(h)	MME-17 MME-24	MME-36
W	750*/850	1000
D	1000	1400
H	1970	2250

Cubicle with Circuit Breaker
(with Air Rotary Disconnector)

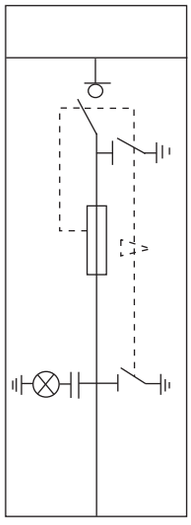
SC (g)



SC(g)	MME-17 MME-24	MME-36
W	450*/550	750
D	1000	1400
H	1970	2250

Cubicle with SF6 Insulated
Switch Disconnector

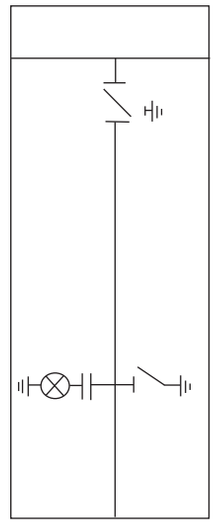
FC-G



FC(g)	MME-17 MME-24	MME-36
W	550	750
D	1000	1400
H	1970	2250

Cubicle with Switch-Fuse Combination
(with SF6 Insulated Switch Disconnector)

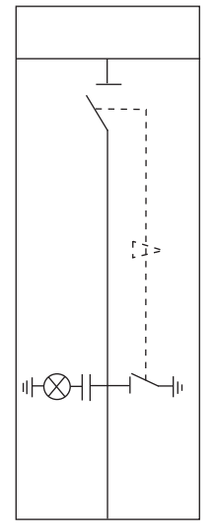
DC (h)



DC(h)	MME-17 MME-24	MME-36
W	750*/850	1000
D	1000	1400
H	1970	2250

Cubicle with Air Rotary Disconnector

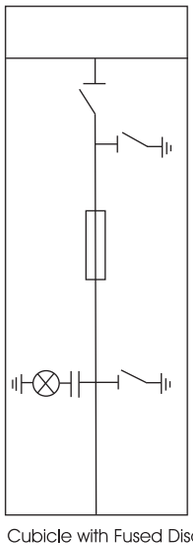
DC (g)



DC(g)	MME-17 MME-24	MME-36
W	450*/550	750
D	1000	1400
H	1970	2250

Cubicle with SF6 Insulated
Disconnector

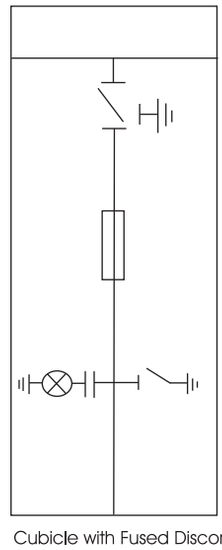
FD (g)



FD(g)	MME-17 MME-24	MME-36
W	550	750
D	1000	1400
H	1970	2250

Cubicle with Fused Disconnector
(SF6 Insulated Disconnector)

FD (h)

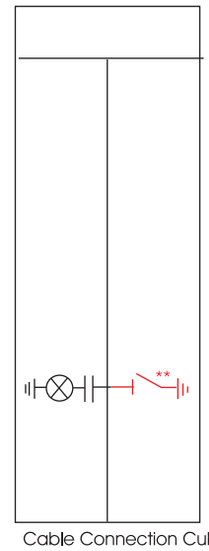


FG(g)	MME-17 MME-24	MME-36
W	750*/850	1000
D	1000	1400
H	1970	2250

Cubicle with Fused Disconnector
(with Air Rotary Disconnector)

* for MME-24

KB



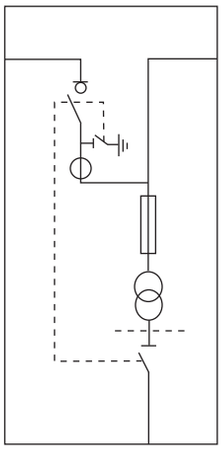
KB	MME-17 MME-24	MME-36
W	450*/550	750
D	1000	1400
H	1970	2250

Cable Connection Cubicle

** upon the request

Ölçüler mm´dir.

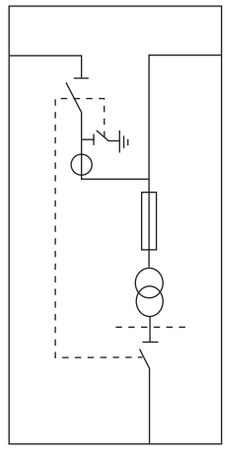
MC (sc)



MC(sc)	MME-17 MME-24	MME-36
W	900*/1000	1000
D	1000	1400
H	1970	2250

Current Voltage Measurement Cubicle
(with Switch Disconnector)

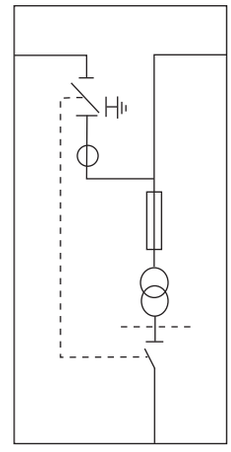
MC (g)



MC(g)	MME-17 MME-24	MME-36
W	900*/1000	1000
D	1000	1400
H	1970	2250

Current Voltage Measurement Cubicle
(with SF6 Insulated Disconnector)

MC (h)

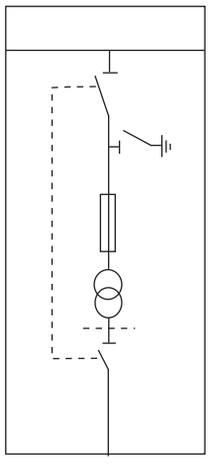


MC(h)	MME-17 MME-24	MME-36
W	900*/1000	1150
D	1000	1400
H	1970	2250

Current Voltage Measurement Cubicle
(with Air Rotary Disconnector)

*If main busbar current is 1250 A

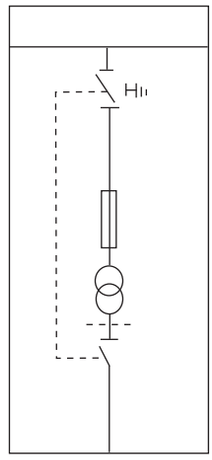
VC (g)
PC(g)



VC(sc)	MME-17 MME-24	MME-36
	450*/550	750
	1000	1400
	1970	2250

Voltage Measurement Cubicle
(with SF6 Insulated Disconnector)

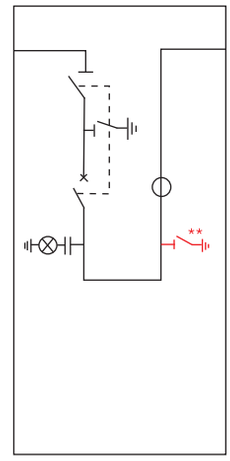
VC (h)
PC(h)



VC(h)	MME-17 MME-24	MME-36
	750*/850	1000
	1000	1400
	1970	2250

Voltage Measurement Cubicle
(with Air Rotary Disconnector)

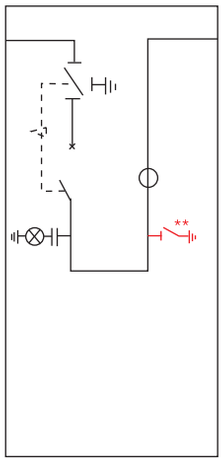
RP (g)



RP(g)	MME-17 MME-24	MME-36
	900*/1000	1000
	1000	1400
	1970	2250

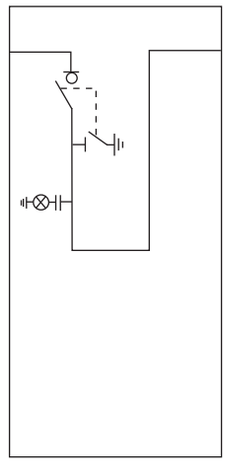
Cubicle Connection Cubicle with Circuit Breaker
(with SF6 Insulated Disconnector)

RP (h)



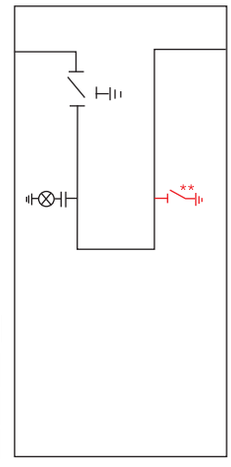
RP(h)	MME-17 MME-24	MME-36
W	900*/1000	1150
D	1000	1400
H	1970	2250

RC (g)



RC(g)	MME-17 MME-24	MME-36
W	900*/1000	1000
D	1000	1400
H	1970	2250

RC (h)

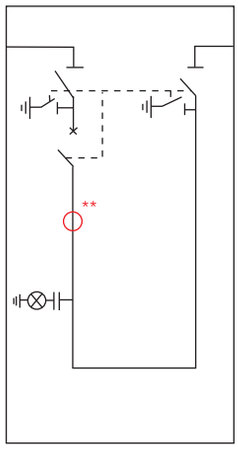


RC(h)	MME-17 MME-24	MME-36
W	900*/1000	1150
D	1000	1400
H	1970	2250

* for MME-24

** upon the request

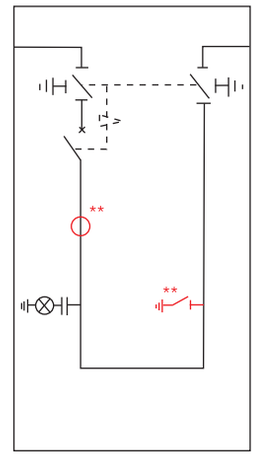
CC (g)



CC(g)	MME-17 / MME-24	MME-36
W	1000*/1200	1750
D	1000	1400
H	1970	2250

Busbar Coupling Cubicle
with SF6 Insulated Disconnector

CC (h)

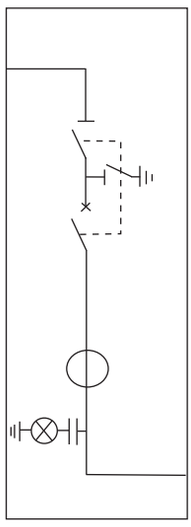


CC(h)	MME-17 / MME-24	MME-36
W	1500*/1700	2000
D	1000	1400
H	1970	2250

Busbar Coupling Cubicle
with Air Rotary Disconnector

* if main busbar current is 1250 A

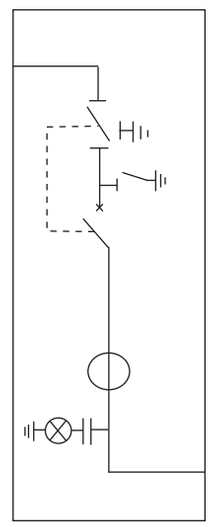
KP (g)



KP(g)	MME-17 / MME-24	MME-36
W	750*/850	1000
D	1000	1400
H	1970	2250

Single isolation Cubicle Lateral Outgoing
(with Circuit Breaker and Sf6 insulated disconnector)

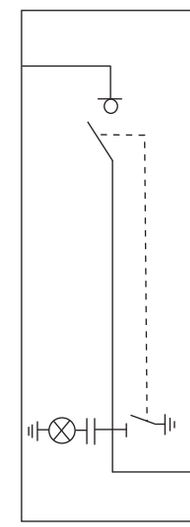
KP (h)



KP(h)	MME-17 / MME-24	MME-36
W	750*/850	1000
D	1000	1400
H	1970	2250

Single isolation Cubicle Lateral Outgoing
(with Circuit Breaker and Air Rotary Disconnector)

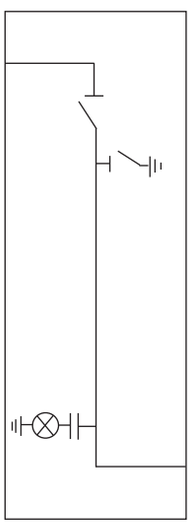
KP (sc)



KP(sc)	MME-17 / MME-24	MME-36
W	450*/550	750
D	1000	1400
H	1970	2250

Single isolation Cubicle Lateral Outgoing
(with Switch Disconnector)

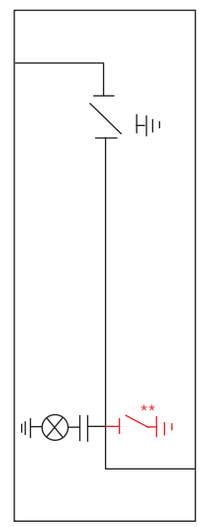
KC (g)



KC(g)	MME-17 / MME-24	MME-36
W	450*/550	750
D	1000	1400
H	1970	2250

Single isolation Cubicle Lateral Outgoing
(with SF6 Disconnector)

KC (h)



KC(h)	MME-17 / MME-24	MME-36
W	750*/850	1000
D	1000	1400
H	1970	2250

Single isolation Cubicle Lateral Outgoing
(with Air Rotary Disconnector)

BS

BS	MME-17 / MME-24	MME-36
W	450*/550	750
D	1000	1400
H	1970	2250

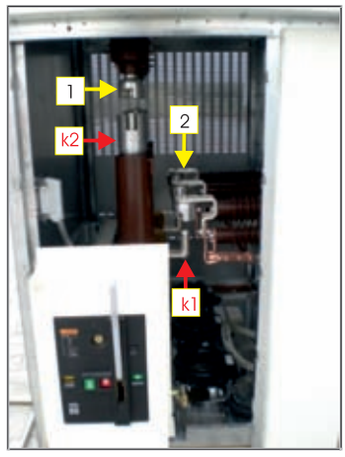
Busbar Rising Cubicle

* for MME-24

** upon the request

Cubicle with withdrawable circuit breaker:

Circuit breaker position: CONNECTED



Circuit breaker position: DISCONNECTED

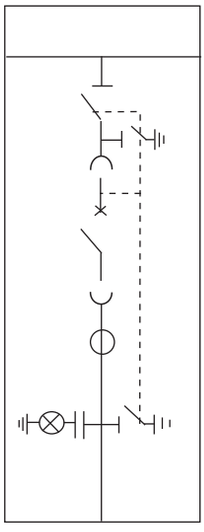
Connection of the Circuit Breakes (CB) to main circuit is **not fixed** connection. It is a kind of «withdrawable» type.

1 Fixed lower terminal of the disconnector with Sf6 gas,

2 Fixed terminal of the incoming/outgoing cable connection,

k1, k2: Moving terminals of the CB.

Connection of the CB to main circuit is obtained by raising the CB with the help of lever. Bolted connection is not required.



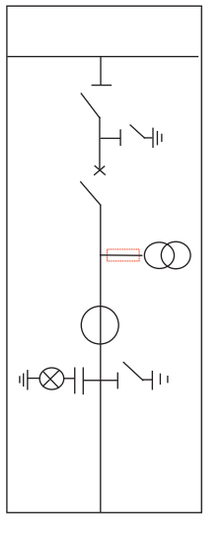
SP (w)

SP(w)	MME-24	MME-36
W	-	1000
D	-	1400
H	-	2250

Technical characteristics:

Rated current: 630/1250 A
Short time withstand current: 25 kA/1s

Cubicle with circuit breaker (current transformer+voltage transformer)



SP (vc)

Dimensions (mm)	
Width	1000*; 1150**; 1400***
Depth	1400
Height	2250

REMARKS

* : if used toroidal type CT and VT without fuse
** : if used support type CT and VT without fuse
*** : if used support type CT and VT with fuse