Zenith Switchgear 400-800V LV MCC Switchgear

- Fully type test and quality product supplied to Oil & Gas Projects

- MCC equipped with intelligent soft starters and motor protection relays that could interface with RS485 with remote SCADA station.

Preface

The MLS-5.0 LV switchgear is FBA manufactured with standard modules by SGEG, adopting technologies introduced from AEG. It is applicable to AC power systems with a rated frequency of 50 (60)Hz,rated voltage within 660V and rated current within 6300A, and can be used for power distribution,conversion,control and compensation of reactive power.

The basic frame structure of MLS-5.0 is assembled with C section bars, which are made from Al – Zn coated steel plate or cold-rolled steel plate of high quality. Along with some special designed connectors, these C section bars are fastened and connected with each other by self-tapping locking screw or hexagon screw. The standard modular parameter E of these C section bars are 25mm. And cubicles of different shapes can be assembled without special tools.

All components assembled into shells, clapboards and installation plates of the cabinet are manufactured through CNC production line with deposited Al – Zn coated steel plate or cold rolled steel plate of high quality, connecting with each other by self-tapping locking screws or bolts. The highest Ingress protection level of enclosure reaches as high as IP55. Vertical bus systems of the cubicle are separated by insulated multi-functional plates or metal plates. Bus systems, which are made from anaerobic copper of high purity, along with reliable functional units in proper structure and some other accessories, assembles into complete equipments. Dimensions of internal components and compartments are modularized. MLS-5.0 LV switchgear possesses the features of proper structure, advanced technology, excellent protective property, reliable interlocking, comprehensive scheme, and easy combination.

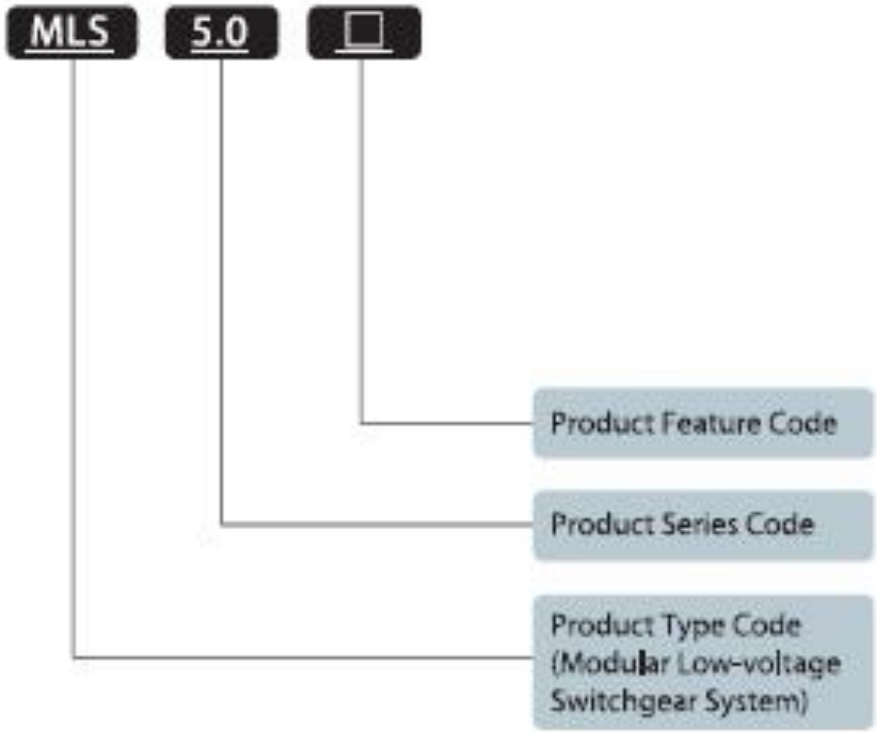
Complying Standards

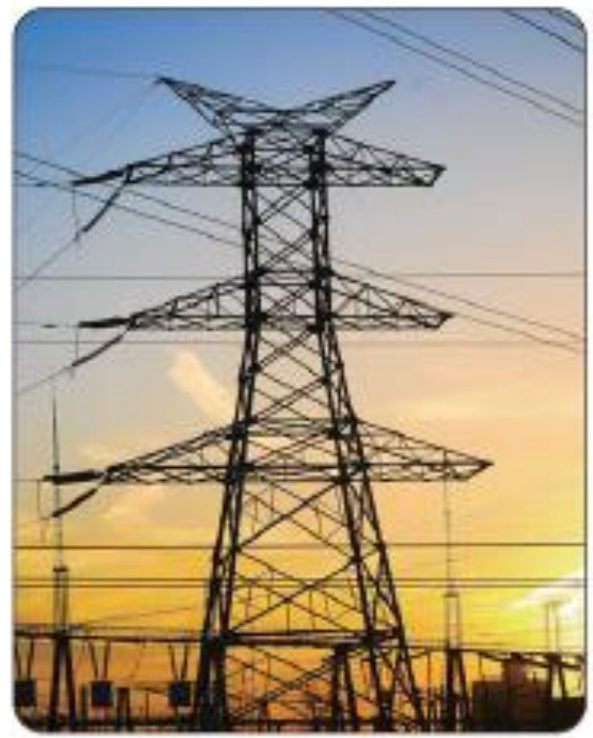
Standards Adopted:

- GB7251.1 Low-voltage switchgear and controlgear assemblies
- JB/T9661 Low-voltage with drawable switchgear assemblies
- IEC 60439-1 Low-voltage switchgear and controlgear assemblies

Besides, ML5-5.0 also complies with the German standard of VDE 0660 Part 5, British standard of BS ENBD439 and the US standard of NEMA.

Legend of Product Type





Product Feature Code: 600 — Outgoing lines goes through the back of the cabinet
1000 — Outgoing lines goes through the right side of the cabinet

Criteria for Application Conditions

- Ambient temperature: Ambient atmospheric temperature should be limited between -5℃ and 40℃, with the average value in 24 hours not higher than 35℃.
- Environmental humidity: Surrounding air should be clear. Relative humidity should not exceed 50% at the highest temperature of 40℃. But this limit could be higher when the temperature is low. E.g. the limit value is 90% when temperature is 20℃. However, there is possibility of condensation because of temperature fluctuation.
- Temperature must be limited between -25℃ to 55℃ during transportation and storage, with the temporary limit (no longer than 24 hours) of 70℃.
- The altitude of installation should not be higher than 2000 meters above sea level.
- Class of pollution: Class 3.
- Negotiations are necessary between manufacturer and user, if there should be any electric elements incompatible with the criteria above.
- Users must initiate a negotiation to manufacturer for solutions, if there should be any inconsistence between the working environment and the above criteria.

Technical Parameters

Description		Unit	Value
Rated working voltage	Main circuits	V	400，660
	Auxiliary circuits		AC220，AC380，DC110，DC220
Rated insulation voltage	Main circuits	V	690，1000
Rated impulse withstand voltage (1.2/50μs)	Incoming terminals and main buses	kV	8
	Circuits and electrical devices		6
Rated working current (IP3X)	Horizontal bus	A	≤6300
	Vertical bus		≤1250 (withdrawable MCC cabinet)，2500 (pluggable MCC cabinet)
Rated short time withstand current	Horizontal bus	kA/1s	50,65,80,100
	Vertical bus		50,65,85,90 (withdrawable MCC cabinet)
Rated peak withstand current	Horizontal bus	kA/0.1s	105，143，176，220
	Vertical bus		105，143，176，198 (withdrawable MCC cabinet)

Structural Features

- The frame structure is assembled with C section bars, which is made from Al—Zn coated steel plate or cold-rolled steel plate of high quality through some special mold. The standard modular parameter E of these C section bars are 25mm and these C section bars assembles into different shapes of cubicles and function units with self-tapping locking screw or hexagon screw.
- Streamlined hinges are adopted and the cubicle doors could open as wide as 180 degree. Besides, a new type of reinforcing bars is also used to enlarge the operating space during maintenance and the improvement the door strength. Operation handles and metering panel are also streamlined, presenting a nice appearance.
- The top of the cubicle are octagonal-shaped structured. Cooling holes distributed on all sides of the cubicle improves the heat dissipation. Since both front and back of function board are able to dissipate heat, flow capacity is raised.
- Front of the cubicle is either single door or double door. As to the double door structure, inner side is for the compartments of functional units and the outer side is explosion-proof door which has both luxury appearance and high ingress protection level.
- Internal spaces are divided into different compartments for horizontal buses, vertical buses, function units and outlet terminals. The compartments are in the form of 3 or 4 and reach the ingress protection level of IP2X. The position of each compartment is demonstrated in figure 1 and figure 2.
- According to the functions of switchgear, the structure of products can be grouped into several types:
  (1) PC cubicle – incoming line, bus-tie and power center (fig.1)
  (2) MCC cubicle — motor control center (fig.2) (3) Reactive power compensation switchgear
- According to the structure of function units, MCC cubicles can be grouped into withdrawable ones and fixed ones.
- Dimensions of cabinets are demonstrated in figure 1, figure 2 and table 1.

General Dimensions

Table. 1.

Height (mm)	Width (mm)	Depth (mm)*	Remarks
2200	300	1000	Busbar connection cubicle
2200	400	1000	PC cubicle
2200	500	1000	
2200	600	1000	PC and reactive power compensation cubicle
2200	800	1000	
2200	1000	1000	
2200	1200	1000	
2200	1000	1000(600)	MCC cubicle (MLS-5.0/1000 with side outlets)
2200	600	1000	MCC cubicle (MLS-5.0/600 with back outlets)

* Note: The depth should be 1200mm when the main busbar is 6300A.

Design features

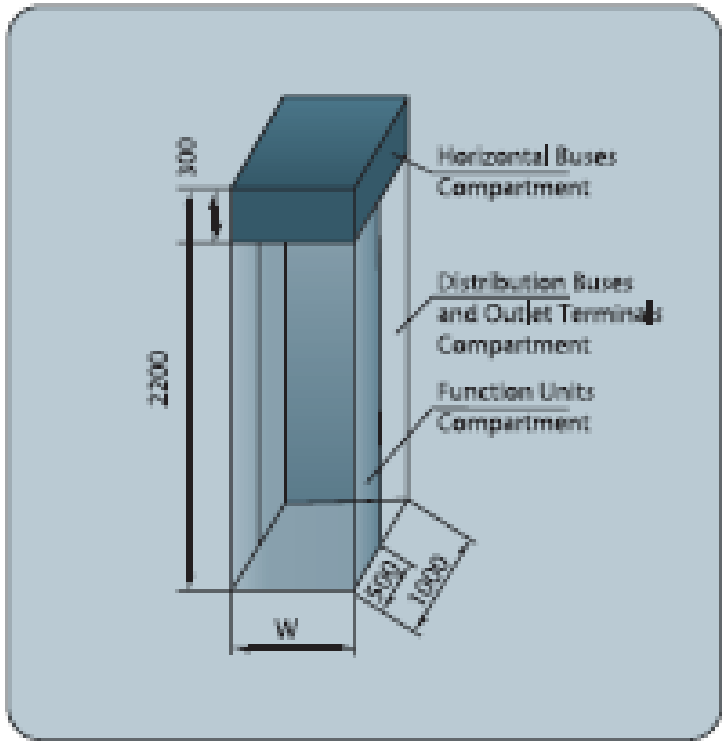


Fig.1. PC Cabinet

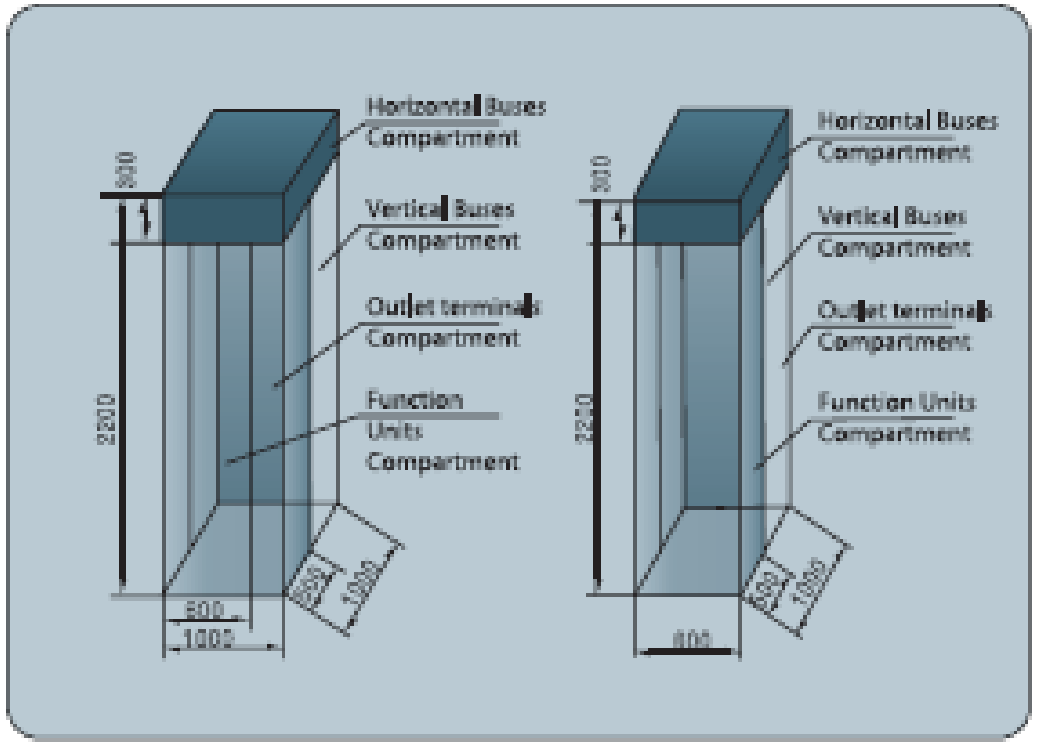


Fig.2. MCC Cabinet

Ingress Protection Level

- Ingress protection level of enclosure: MLS-5.0/600: IP3X(standard type), IP31,IP32,IP4X,IP41.
  MLS-5.0/1000: IP3X(standard type), IP31,IP32,IP4X,IP41,*IP43,*IP52,*IP54.
- If the drawer is at the connection, test, main breaker is in closed or open positions, the ingress protection of enclosure should meet the requirements of product selection.
- Ingress protection of live parts in the insulated compartment should be IPXXB when the drawer is out of the cabinet.

*Note:The necessity of decreasing the capacity should be taken into consideration since the requirement of ingress protection degree is restrict. Besides, the depth of 1000 mm and the structure of double door are required.

Bus System

- Horizontal buses of the MLS–5.0/600, 1000 switchgear are placed on the top of the cabinet (Fig.3.a). Customers are able to install either single or double buses according to requirements. Both of the buses could provide power independently or in the form of parallel connection.
- The grounded protection system made up of independent installed conductor for protection (Line PE) going through the whole array and the naked inductor accessories (main frame). The PE buses should be able to suffer certain short-circuit current.
- Vertical buses of withdrawable MCC cabinet are installed in the insulated functional board, which provides a higher insulation level. Vertical buses of the fixed MCC cabinet are installed in independent compartments, which help avoid the possibility of discharge between different phases of the vertical buses caused by switching arc and improve the protection capability and security rate of the product (Fig.3.b, 3.c).

BUSBAR SYSTEM

a) Horizontal Buses on the Top of the Cabinet

c) Vertical Buses of Fixed MCC Cabinet

b) Vertical Buses of Withdrawable MCC Cabinet

Withdrawable Switchgear and Drawer Units

- Width of the MCC cubicles is either 600 mm (outgoing lines go through the back) and 1000 mm (outgoing lines go through the side). The drawer units are distributed around with the total height of 72E, E = 25mm. The minimal height of each unit is 8E, namely 200mm. There are 18 units installed in each cubicle at most (Fig.4).

- There are following types of drawer units: 8E/2, 8E, 16E, 24E (Fig.5).

Fig.4. Withdrawable Switchgear

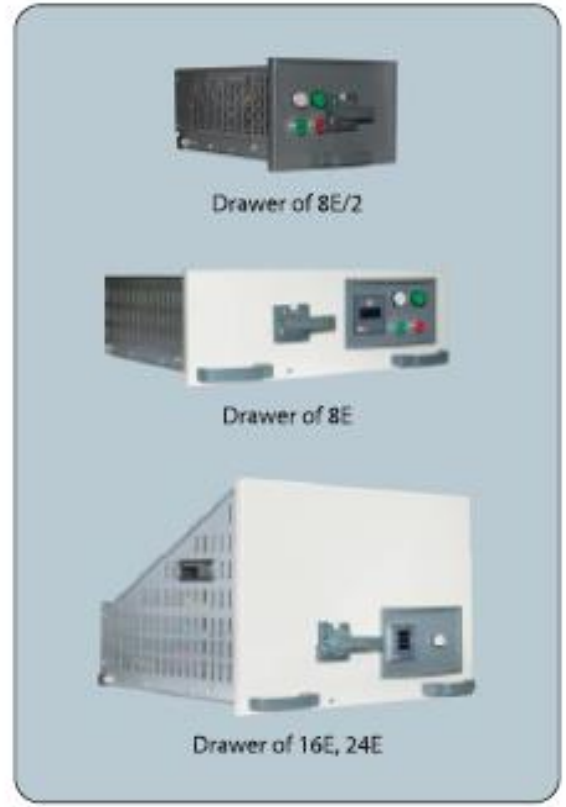


Fig.5. Drawer Units

- The maximum capacity of each drawer unit of MCC cubicle

Size	Maximum Capacity			Effective Installation Space (Height×Width×Depth)
8E/2	100A(3P,4P)	15kW	—	150x230x320mm
8E	225A(3P,4P)	37kW	—	150x505x380mm
16E	400A(3P,4P)	75kW	45kW(Y/△)	350x505x380mm
24E	400A(3P,4P)	160kW	110kW(Y/△)	550x505x380mm

Note:Nonstandard 12E unit can be provided on customer's request. For up to 225A feeder or 55kW, 37kW(Y/△) motor starter.

Operation Handle	Flag	Position	Main Circuit	Control Circuit	Drawer	Descriptions
Operation Handle for Main Switch	I	Close	√	√	Locked	Main switch closed Control circuit put through
	O Test	Open Test	—	√	Locked	Main switch open Control circuit put through
Interlocking device		Connected	√	√	Locked	Main switch open or close Primary plug-ins put through
		Isolated	—	—	Pulled out 30mm and locked	Main switch closed Drawer should not be pulled out Only if the main switch is open, may drawer be pulled out

- Each of the drawer units has 16 secondary insulated outlet terminals in common, and this number can be raised to 32. Two 1.5-2.5 mm^2 multi-wires are connected to each terminal.
- After primary and secondary parts of drawer units are all plugged in, all charged parts are enclosed in fire resistive insulator in case the damages cased by arc and the arc between phases.
- Drawer units are all made from high quality deposited Al – Zn coated steel plate or cold-rolled steel plate, and have excellent mechanical strength and earthling continuity.
- Interlocking: reliable mechanical interlocks are used in each drawer unit in case mis-operation or plugging with load. The closing, opening and testing positions are indicated and controlled by operation handle (Fig.6). Padlocks can be used when the unit is locked to the closing position. Plugging and separating position can be operated by the handle interlocking device of the drawer (Fig.7, Fig.8), and padlocks can be used to any position when fixed.

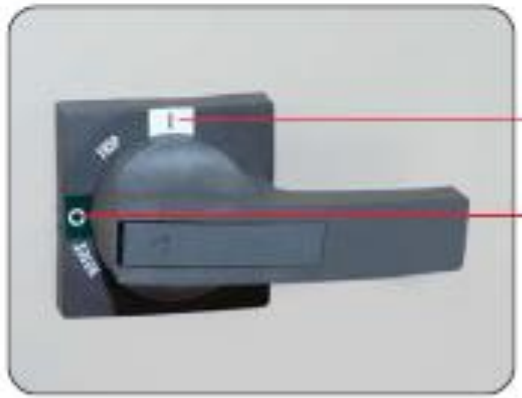


Fig.6. Operation Handle

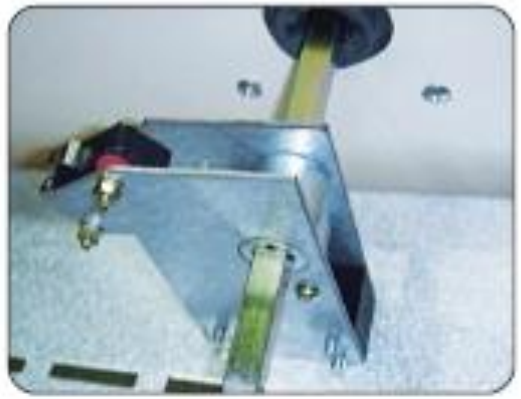


Fig.7. Interlock Mechanism

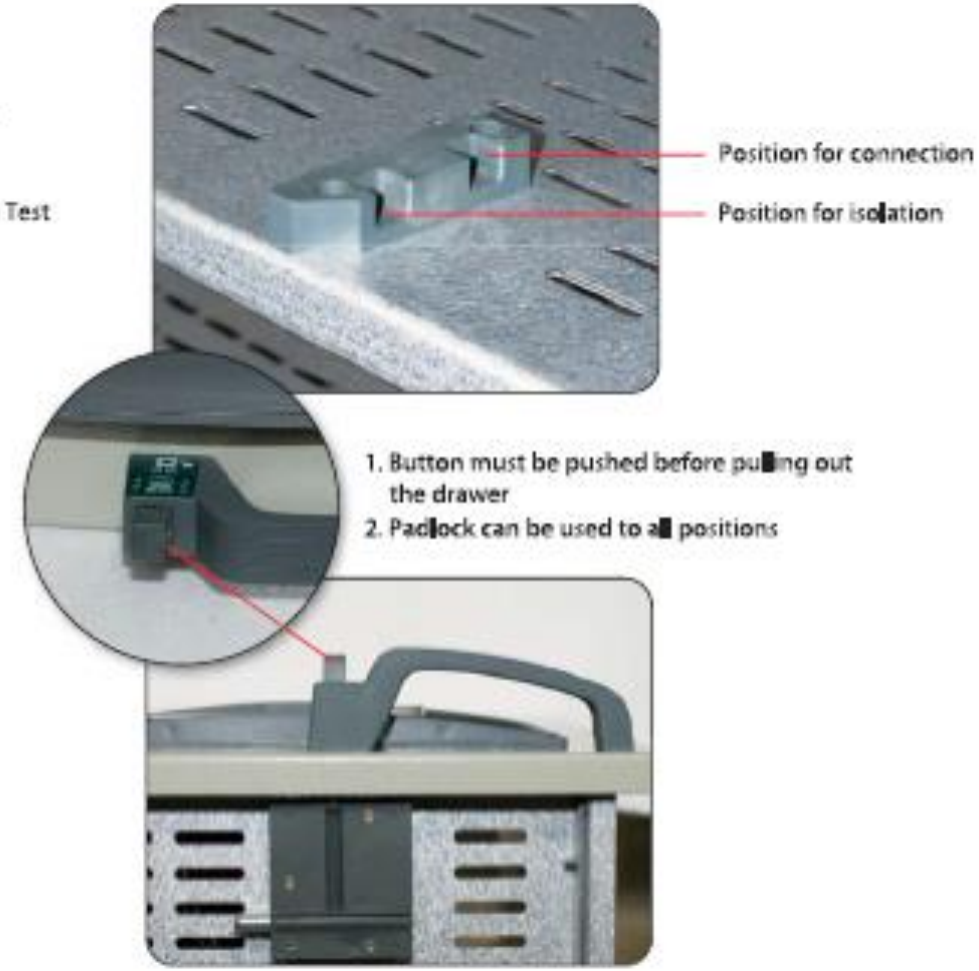


Fig.6. Handle Interlock

Withdrawable Switchgear and Drawer Units

- Width of the fixed unit with plug-in type MCC switchgear is either 600 mm (outlet from the back) or 1000 mm (outlet from the side). The withdrawable function units are distributed around with the total height of 72E, E = 25mm. The minimal height of each unit is 6E, namely 150mm. There are 18 8E/2 function units installed in each cubicle at most (Fig.9).

- The maximum capacity of vertical buses of each fixed switchgear with pluggable components is 2500A (when the switchgear is equipped with MCCBs), with metal plates for separation.

- Pluggable breakers are adopted in the function units. With the feature of pluggable, it is easy to conduct maintenance, repair and substitute.

- There are different types of pluggable function units such as 8E/2, 6E, 8E, 10E, 12E, 16E, 20E, 24E. Switchgear could be assembled by any combination of these breakers according to requirements.

- The maximum capacity of pluggable function units are as follows:
  a)8E/2–100A (3P, 4P Pluggable breaker) b)6E–200A (3P Pluggable breaker)
  c)8E–250A (3P, 4P Pluggable breaker) d)10E-400A (3P, 4P Pluggable breaker)
  e)12E-630A (3P, 4P Pluggable breaker) f)24E-630A (3P, 4P Pluggable breaker)

- Function units, vertical buses and outlet terminals are separated. Outer operation handles are reliably interlocked with doors.

- If pluggable function units are assembled with withdrawable units or ACB breakers, there should be a vacant compartment with height of 8E for bus adaptation.

Fig.9. Pluggable Switchgear

PC Switchgear

- There are six kinds of standardized width of PC cubicles, which are 400mm, 500mm, 600mm, 800mm, 1000mm, 1200mm. Choices can be made according to the capacity of breaker and dimensions, as demonstrated in the primary scheme diagram.

- There must be an additional bus adaptation compartment with width of 300mm for bus coupler switchgear in single line installation.

- 1~3 different types of ACBs can be installed in the cubicle of PC switchgear (Fig.10) which is demonstrated in the primary scheme diagram.

- Generally speaking, it is recommended that PC and withdrawable function units be installed in cubicles of different types to make installation, operation and maintenance more easy. But they are also allowed to be installed in the same cubicle under special circumstances. However, in that case, PC should be placed on the top of the cubicle, while the withdrawable function unit placed at the bottom, with a vacant compartment of 8E for bus adaptation.

Fig. 10. PC Cabinet

Reactive Compensation Switchgear

- Both the compensation scheme of approximate sinusoidal waveform (Primary Scheme NO.81~85) and filter reactor (Primary Scheme No. 86~90) are adopted in the design of automatic reactive power compensation switchgear. Cubicles with the width of 600, 800, 1000 and 1200mm are choices for customers.

- Primary schemes NO. 81~85 are applicable to normal conditions with the harmonic power holds less than 20% of the apparent power, namely Gn/Sn ≤ 20%.

- Primary schemes NO.86~90 are applicable when 20% ≤ Gn/Sn ≤ 60%. Reactors and capacitors are connected in series to realize the function of both reactive power compensation and harmonic absorption. There are two standardized series of compensators, namely the ones with inductive rate $p=X_L/X_C \times 100\%=7\%$ while syntonic frequency $f_R=189Hz$ and the ones with p= 6% while $f_R = 204Hz$, for choice.

- The ones with p= 7% and $f_R = 189Hz$ are able to absorb small amount of the 5th harmonics and separated it from power grid with harmonics.

- The ones with p= 6% and $f_R = 204Hz$ are able to absorb 50% of the 5th harmonics or configured by customer.

Fig. 11.

Placement of Incoming and Outgoing Terminals

- MLS-5.0/600：If there is only one group of horizontal buses (≤4000A), the incoming and outgoing lines are allowed to be placed anywhere within the cubicle dimension (Fig.12). If there are two or more groups of buses or >4000A, the incoming and outgoing line are to placed at the bottom of the cubicle, or on the top of the cubicle with a channel placed at the upper back of cubicle.

- MLS-5.0/1000：If there is only one group of horizontal buses (≤4000A), the incoming and outgoing line are allowed to be placed anywhere within the cubicle dimension (Fig.12). If there are two or more groups of buses or >4000A, the incoming and outgoing line should only be to placed at the bottom of the cubicle.

Incoming and Outgoing Line on the side

Incoming and Outgoing Line at the back

Fig.12. Placement of Incoming and Outgoing Terminals

Installation

- Bottom of the product could be fixed to ground through welding or by 4-M16 screw (Fig.13). The side between cubicles is fastened by 8-M8×20 hexagon socket bolts.

- MLS-5.0/600 should be installed off the wall with a distance larger than 800mm (Fig.13, Fig.14).

- MLS-5.0/600 should be installed against wall. However, a distance larger than 300mm is recommended (Fig.13, Fig.14).

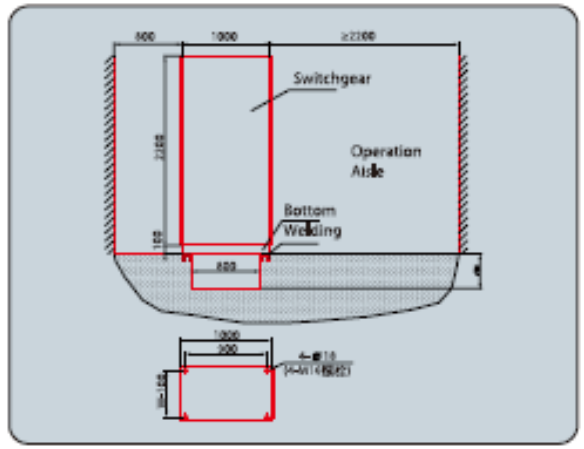


Fig.13. Installation

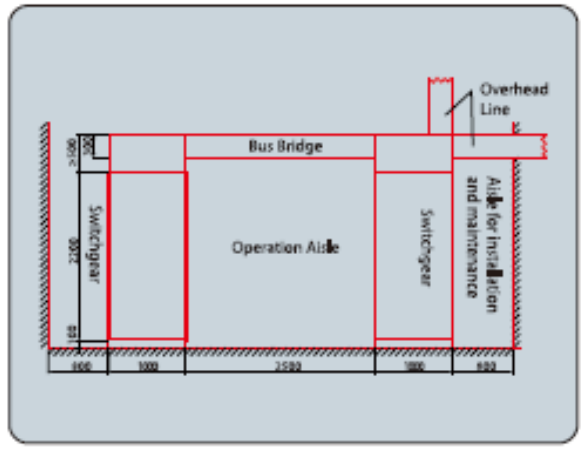


Fig.14. Installation of Overhead Incoming Line and Busduct

Transportation and Storage

Attentions should be paid during transportation and storage of switchgears

- Overturning, upside down placement and fierce vibration are not allowed.
- Products should be prevented from rain in case of damp.
- Electric parts and accessories should not be disassembled.

Order Notes

The following information should be specified by the customer when placing an order:

- Feature code of the products
- Single line diagram of primary scheme
- Secondary schematic diagram
- Detailed specification and amount of electric parts
- Capacity and specification of the main buses
- Placement for incoming line and outgoing line and specification of cables
- Dimensions and layout chart of the switchgears
- Dimension, interface size and capacity of bus bridges (slot)
- If there are harmonic sources in the system (e.g. large rectification equipments), users should take suppression measures or inform the manufacturer when placing orders to handle it through negotiation, in case of damages to power distribution and consumption equipments.

Components-AEG Brand

ME09 Series Air Circuit Breaker(ACB)

- Fixed type or drawer type, 3-pole and 4-pole 1 standard size for all 3dimensions(w-h-d) in full series enables convenience for the standardization of the swithgears
- Rated current:400A~6400A, come with 3 frame sizes
- Breaking capacity:50kA~100kA Icu=Ics=Icw
- Complete choices of trip unit: Mpro-20/30/40
  Mpro-S06/S07/S09/N10/N11
  unique ground-fault protection, thermal memory function, post-acceleration breaking function, remote regulating, remote controlling, remote measuring,remote signaling,etc.

AT10 Series Auto Transfer Switch (ATS)

- Plug-in type terminal of control unit, convenient for installation, operation and maintenance
- Online replaceable control unit
- Reliable manual/auto interlock device, avoid injury in manual operation
- Unique designed driving mechanism with high driving efficiency and low failure rate
- Excitation driving technology achieves high speed of transfer
- Arc chamber of DMC material, enhanced electrical performance, mechanical performance, heat resistance and radiation resistance.

Components-AEG Brand

E90 Series Miniature Circuit Breaker (MCB)

- Miniature circuit breaker, electronic ground-leakage protection circuit breaker meet requirements of various applications including household, commercial building, and industrial engineer
- Rated current up to 63A,breaking capacity up to 10KA, number of poles:1P~4P/1P+N/3P+N
- Highest current limit level (grade 3), reduces the heat at cables and fault points, extends life of the product
- Designed with German advanced technology and the six Sigma philosophy, the least parts used in the industry (only 29 parts)
- Accessories can be installed on both sides, `up to 6 pieces of accessories
- RoHS certified

MM9/MC9 Series Moulded Case Circuit Breaker (MCCB)

- Optional fixed type, plug tupe, drawer type, 3-pole and 4-pole
- Rated current up to 800A
- Rotary contact design, reduces the cycle time of arc extinguish, limit the energy flow, enable highest relibility and selectivity
- Breaking capacity:36kA~150kA:highest breaking capacity, smallest footprint
- Complete choices of trip unit, motor protection, circuit protection, selective protection, cascade protection
- Accessories are compatible in full series; shunt release/under ovltage release/electrical operator are compatible for both AC and DC
- RoHS certified

MC10 Series LV Motor Management Relay

- Complete series with powerful function
- Rated voltage up to 690V
- Analog output(AO) function
- Digital input(DI) / digital output (DO) function
- Large LCD display in Mandarin
- Compact size, easy adopted to all switchgear designs, including drawer type, fixed type,and mixture type
- Separate control module and display module,allows convenient installation and maintenance, provides the most ideal switchgear space

MS10 Series Multifunction Energy Management Meter

- Extra large screen with brighe blue backlight LCD enables a clear display for electric quantity data in multiple lines as well as other graphic and bar displays
- 5 user-friendly functional operation buttons enable communication address, baud rate, parity, PT and CT connection mode,and PT and CT ratio, etc. can be set easily
- Full series, flexible in all applications

Components-AEG Brand

GRT Thermal Relay

- Overload and phase failure protection
- Electronic and thermo-magnetic type
- Manual reset, emergency stop function
- Temperature compensation and action indication
- Continuously adjustable current setting unit
- Plug-in with contactor or installed separately
- Excellent performance and high reliability

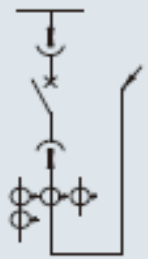
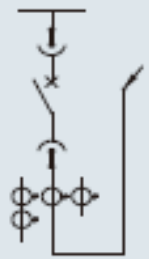
GCM AC Contactor

- Rated current up to 620A, AC-3 category
- Pollution level of 3 degree, category Ⅲ of installation
- Modular and miniaturization type, saving space
- Low noise level and power loss

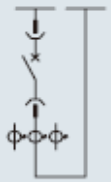
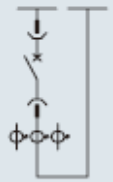
Typical Scheme for Primary Circuit

Note:

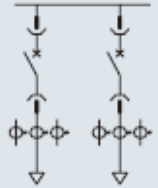
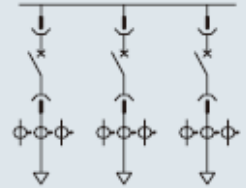
1. In the Width row, the figure above the slash shows the width of MLS-5.0/600 while the figure under the slash shows the width of MLS-5.0/1000
2. Customers are allowed to choose other types of electric equipments according to requirements except for the ones listed in Table.2

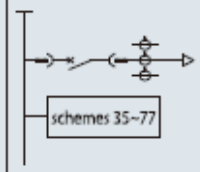
Scheme NO.	01	02	03	04	05	06	07	08
Scheme for Primary Circuit								
Width(mm)	500	600	800	1000	600	800	1000	1200
Height(mm)	72E	72E	72E	72E	72E	72E	72E	72E
Maximum Current (A)	1250A	2500A	3500A	6300A	1600A	2500A	3500A	6300A
Main Equipments (optional)	ME09 800~1250A 8H1-[]	ME09 1600~3200A 8H1-[]	ME09 3200~4000A 8H1-[]	ME09 4000~6300A 8H1-[]	ME09 800~2000A 8H1-[]	ME09 1600~3200A 8H1-[]	ME09 3200~4000A 8H1-[]	ME09 4000~6300A 8H1-[]
Application / Remark	Incoming (outgoing) line on the top (3-pole breaker)				Incoming (outgoing) line on the top (4-pole breaker)			

Scheme NO.	09	10	11	12	13	14	15	16
Scheme for Primary Circuit								
Width(mm)	500	600	800	1000	600	800	1000	1200
Height(mm)	72E	72E	72E	72E	72E	72E	72E	72E
Maximum Current (A)	1250A	2500A	3500A	6300A	1600A	2500A	3500A	6300A
Main Equipments (optional)	ME09 800~1250A BH1-[]	ME09 1600~3200A BH1-[]	ME09 3200~4000A BH1-[]	ME09 4000~6300A BH1-[]	ME09 800~2000A BH1-[]	ME09 1600~3200A BH1-[]	ME09 3200~4000A BH1-[]	ME09 4000~6300A BH1-[]
Application / Remark	Incoming (outgoing) line on the top (3-pole breaker)				Incoming (outgoing) line on the top (4-pole breaker)			

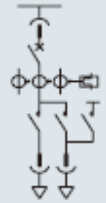
Scheme NO.	17	18	19	20	21	22	23	24
Scheme for Primary Circuit								
Width(mm)	800/500*	900/600*	1100/800*	1300/1000*	900/600*	1100/800*	1300/1000*	1500/1200*
Height(mm)	72E	72E	72E	72E	72E	72E	72E	72E
Maximum Current (A)	1250A	2500A	3500A	6300A	1600A	2500A	3500A	6300A
Main Equipments (optional)	ME09 800~1250A BH1-[]	ME09 1600~3200A BH1-[]	ME09 3200~4000A BH1-[]	ME09 4000~6300A BH1-[]	ME09 800~2000A BH1-[]	ME09 1600~3200A BH1-[]	ME09 3200~4000A BH1-[]	ME09 4000~6300A BH1-[]
Application / Remark	Incoming (outgoing) line on the top (3-pole breaker)				Incoming (outgoing) line on the top (4-pole breaker)			

*Note:The width under the slash should be adopted for the double arrays bus coupler cubicle (face to face). And there must be an additional bus adaptation compartment with width of 300mm for single array bus coupler switchgear.

Scheme NO.	25	26	27	28	29	30	31	32
Scheme for Primary Circuit								
Width(mm)	400/800	500/900	600/1000	800/1000	500/900	600/1000	800/1000	
Height(mm)	2x32E	2x32E	2x32E	2x32E	3x24E	3x24E	3x24E	
Maximum Current (A)	2x630A	2x630A	2x1250A	2x1250A	3x630A	3x1000A	2x1250A	
Main Equipments (optional)	MC639 630A 3P BH1-40[]	MC639 630A 4P BH1-40[]	ME09 400~1600A 3P BH1-60[]	ME09 400~1600A 4P BH1-60[]	MC639 630A 3P,4P BH1-40[]	ME09 400~1250A 3P BH1-60[]	ME09 400~1250A 4P BH1-60[]	
Application / Remark	Feeder (Incoming and outgoing line on the top or at the bottom)				Feeder (Incoming and outgoing cables on the top or at the bottom)			

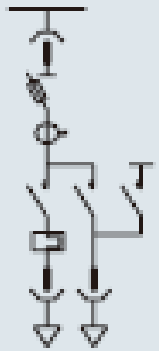
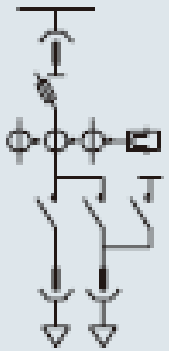
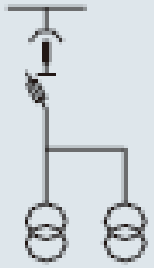
Scheme NO.	33	34	35	36	37	38	39	40
Scheme for Primary Circuit								
Width(mm)	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000
Height(mm)	24E(PC) 40E(MCC)	24E(PC) 40E(MCC)	8E/2	8E	16E	24E	8E/2	8E
Maximum Current (A)	630A(PC)	1250A(PC)	100A	250A	400A	400A	50A	125A
Main Equipments (optional)	MC639 630A 3P,4P BH1-40[]	ME09 400~1600A 3P BH1-60[]	MM169 ≤160A 3P,4P BH1-30[]	MC259 ≤250A 3P,4P BH1-40[]	MC409 ≤400A 3P,4P BH1-60[]	MC409 ≤400A 3P,4P BH1-60[]	OS-63 QSA-63 3P BH1-30[]	OS-160 QSA-125 3P BH1-40[]
Application / Remark	Feeder (Incoming and outgoing line on the top or at the bottom)		Feeder , lighting (3/4-pole breaker)					

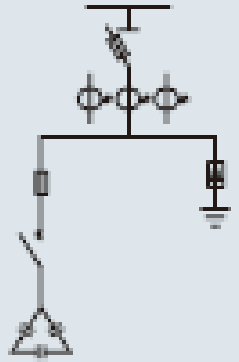
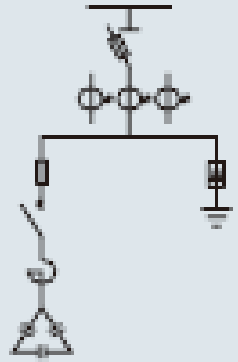
Scheme NO.	41	42	43	44	45	46	47	48
Scheme for Primary Circuit								
Width(mm)	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000
Height(mm)	16E	16E	8E/2	6E	8E	10E	12E	24E
Maximum Current (A)	200A	320A	100A	200A	250A	400A	630A	630A
Main Equipments (optional)	OS-250~400 QSA≤400 3P BH1-40	OS-400 QSA=400 3P BH1-60	MM169 ≤160A 3P,4P Plug-in type BH1-30	MC259 ≤250A 3P Plug-in type BH1-30	MC259 ≤250A 3P,4P Plug-in type BH1-30	MC409 ≤400A 3P,4P Plug-in type BH1-40	MC639 ≤630A 3P,4P Plug-in type BH1-40	MC639 ≤630A 3P,4P Plug-in type BH1-40
Application / Remark	Feeder, lighting (3-pole breaker)		Feeder , lighting/ pluggable unit					

Scheme NO.	57	58	59	60	61	62	63	64
Scheme for Primary Circuit								
Width(mm)	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000
Height(mm)	16E	24E	16E	16E	24E	8E/2	8E	16E
Maximum Current (A)	75	110	45	55	110	15	37	55
Main Equipments (optional)	MC259 GCM(150~250) GRT1[] BH1-40	MC259 GCM(150~309A) GRT1[] BH1-40II	MM169 GCM(65~150A) GRT1[] GRT2[] BH1-40	MM169 GCM(95~185A) GRT1[] BH1-60	MC259 GCM(150~309A) GRT1[] BH1-40	OS63 QSA=63 GCM(9~45A) GRT1[] BH1-30	OS160 QSA=125 GCM(18~95A) GRT1[] GRT2[] BH1-30	OS250 QSA=250 GCM(95~185A) GRT2[] GRT3[] BH1-40
Application / Remark	Motor Control (Reversible)		Motor Control(Y/△)			Motor Control (Irreversible)		

Scheme NO.	49	50	51	52	53	54	55	56
Scheme for Primary Circuit								
Width(mm)	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000
Height(mm)	8E/2	8E	16E	16E	24E	8E/2	8E	16E
Maximum Current (A)	15	37	75	90	160	7.5	30	55
Main Equipments (optional)	MM169 GCM(9~45A) GRT1[] BH1-30	MM169 GCM(18~95A) GRT1[] GRT2[] BH1-30	MC259 GCM(35~185A) GRT2[] GRT3[] GRT4[] BH1-40	MC259 GCM(105~185A) GCM(205~300A) GRT1[] BH1-60	MC 409 GCM(205~300A) GCM(400~550A) GRT1[] BH1-60	MM169 GCM(9~25A) GRT1[] BH1-30	MM169 GCM(40~95A) GRT1[] GRT2[] BH1-30	MM169 GCM(95~185A) GRT2[] GRT3[] BH1-40
Application / Remark	Motor Control (Irreversible)					Motor Control (Reversible)		

Scheme NO.	65	66	67	68	69	70	71	72
Scheme for Primary Circuit								
Width(mm)	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	
Height(mm)	16E	24E	8E/2	8E	16E	16E	24E	
Maximum Current (A)	75	110	7.5	30	55	75	110	
Main Equipments (optional)	OS250 QSA-250 GCM(105~250) GRT1[] BH1-40II	OS400 QSA-400 GCM(150~309A) GRT1[] BH1-40	OS63 QSA-63 GCM(9~25A) GRT1[] BH1-30	OS160 QSA-125 GCM(40~95A) GRT1[] GRT2[] BH1-30	OS250 QSA-250 GCM(95~185A) GRT3[] BH1-40II	OS250 QSA-250 GCM(105~250A) GRT1[] BH1-40II	OS400 QSA-400 GCM(150~309A) GRT1[] BH1-40II	
Application / Remark	Motor Control (Irreversible)		Motor Control (Reversible)					

Scheme NO.	73	74	75	76	77	78	79	80
Scheme for Primary Circuit								
Width(mm)	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000	600/1000
Height(mm)	16E	16E	24E	8E	16E	16E	24E	32E
Maximum Current (A)	45	55	110	100VA	200VA	25VA	25VA	25VA
Main Equipments (optional)	OS160 QSA-160 GCM(65~150A) GRT1[] GRT2[] BH1-40[]	OS250 QSA-250 GCM(95~185A) GRT1[] BH1-40[]	OS400 QSA-400 GCM(150~309A) GRT1[] BH1-40[]	OS63 QSA-63 JDG4-0.5 380/100V	OS63 QSA-63 JDG4-0.5 380/100V	OS63 QSA-63 JDG4-0.5 380/100V	OS63 QSA-63 JDG4-0.5 380/100V	OS63 QSA-63 JDG4-0.5 380/100V
Application / Remark	Motor Control (Y/△)			Power Source		PT		

Scheme NO.	81	82	83	84	85	86	87	88	89	90
Scheme for Primary Circuit										
Width(mm)	600	800	800	1000	1000	600	800	1000	1200	1200
Height(mm)	72E	72E	72E	72E	72E	72E	72E	72E	72E	72E
Maximum Current (A)	16x8=128	16x12=192	30x10=300	16x16=256	30x12=360	30x4=120	30x6=180	30x8=240	30x10=300	50x8=400
Main Equipments (optional)	OS-400 QSA-400 GRT20-63 UA30 B30C BCMJ3-16 CLMD8-15/04 BH1-40||	OS-400 QSA-400 GRT20-63 UA30 B30C BCMJ3-16 CLMD8-15/04 BH1-40■	OESA-630 QSA-630 GRT20-100 UA63 B75C BCMJS-30 CLMD40-30/04 BH1-40■	OESA-630 QSA-630 GRT20-63 UA30 B30C BCMJ3-16 CLMD13-15/04 BH1-40■	OESA-800 QSA-800 GRT20-100 UA63 B75C BCMJS-30 CLMD40-30/04 BH1-40■	OS-400 QSA-400 GRT20-100 UA63 B75C BCMJS-30 CLMD40-30/04 CKSG-[] BH1-40||	OS - 400 QSA-400 GRT20-100 UA63 B75C BCMJS-30 CLMD40-30/04 CKSG-[] BH1-40■	OESA-630 QSA-630 GRT20-100 UA63 B75C BCMJS-30 CLMD40-30/04 CKSG-[] BH1-40■	OESA-630 QSA-630 GRT20-100 UA63 B75C BCMJS-30 CLMD40-30/04 CKSG-[] BH1-40||	QP-1000 NT4-1000 GRT20-160 UA95 BCMJS-50 CLMD53-60/04 CKSG-[] BH1-40■
Application / Remark	Reactive Power Compensation					Reactive Power Compensation and Wave Filtering (p=7%)				

Ordering information required

1. Primary schemes or ZENITH SWITCHGEAR Scheme Number of each switchgear used;
2. Single line system diagram with the specification of VTs, CTs and LA;
3. Specify Basic Impulse Level and Power Frequency Withstand Voltage;
4. Rated voltage, rated current, rated short circuit breaking current;
5. Plan view of substation layout or switchgear layout diagram;
6. Specification of type and size of incoming and outgoing power and control cables;
7. Specification and requirement of control, measurement and protection schemes of each type of switchgear panel;
8. Requirement of interlocks and automatic features if any;
9. Model/part numbers, specification and quantity of key switchgear components.
10. If switchgear is used in special operating environmental condition, please specify clearly;
11. Other special requirements if any.
12. Type of earth system
13. Specify supply voltage of closing/tripping and motor

How to contact us?

ZENITH SWITCHGEAR SDN. BHD.

SALES OFFICE:
UNIT AM13-PJ INDUSTRIAL PARK, JALAN KEMAJUAN,
46200 PETALING JAYA, SELANGOR DARUL EHSAN,
MALAYSIA.

Jimmy Wong, Managing Director, Mobile: +60173460728,
Office/Fax: +60379317072, email: jimwkm@gmail.com,
jimwkm@qq.com

FACTORY ADDRESS:
NO.5, JALAN RAJAWALI 1A, BANDAR PUCHONG, 47100,
SELANGOR, MALAYSIA.