

TYPE - TESTED Low Voltage Switchboard



MTLV 400 Series



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Standard Design

Application

The switchboard is designed to handle any switching, protection, isolating, distribution and control functions. It is used in all cases where emphasis is placed on a high degree of availability in operation and extra protection of personnel and plant.

Standard and Regulations

IEC 60 439-1 : 1999

BS EN 60439

TIS 1436-2540

Distinctive Features

- Uniform busbar arrangement in top part of cubicle or rear side of cubicle
- Strict separation of switchboard cable termination and busbar compartments
- Interpanel busbar barriers as standard feature
- High graded steel enclosure
- Switchboard compartment up to 25 modules (Draw-out type)
- Modular design of subsections
- Generously dimensioned cable termination compartment
- Single-fronted or double-front Arrangement as per request
- Free-standing or against-a-wall installation

Standard Structure

Frame	: Made from folded Alu-zinc 2.3mm.thk. or folded paint Electro-galvanized steel sheet painted
Covers	: Made from Folded Electro-galvanized steel sheet 2.0mm.thk. with Painted.
Partition	: Made from Alu-zinc steel sheet
Gland plate	: Removable type made from Alu-zinc steel sheet 2.3mm.thk.
Painted surface	: Epoxy-polyester powder painted for indoor application. Polyester powder painted for outdoor application.
Standard shade	: White-grey RAL 7032 & RAL 7035
Special shade	: Green RAL 6011, Blue RAL 5010 or as per request

Conductors

Copper bus bar	: Bare rating according to DIN 43671
Bus bare support	: Fibre-glass reinforce type reinforced fiber-glass polyester
Power cable	: Fine stranded cable 600/1000V 105° C or 450/750V 70° C
Control cable	: Fine stranded cable 600/1000V 105° C or 450/750V 70° C

Power Distribution Board (PDB)



Application

The Power Distribution Board is designed for power distribution system of all industrial sectors and utility.

Standard and Regulations

The switchboard is modular technology designed according to IEC 60439-1 and TIS 1436-2540 standard

Designed feature

Construction Designed	: Modular technology designed, Single front or Back to back installation : Provided with removable gland plate for cable entry from top or bottom : Cable connection from front side or back side
Main bus bar	: Located on top of panel (Form 3 & Form 4) or Located at the back (Form 2)
Rating of bus bar	: 3 and 4 poles bus bar system, rated current up to 7500A
Insulation materials	: By using 1KV heat shrinkable sleeve (Optional)
Bus bar surface	: Bare rating is standard, tin plated or silver plated is as requested
Maximum size of ACB	: Up to 6300A
Degree of protection	: Up to IP54 for indoor application & up to IP55 for outdoor application (With double front door and canopy)
ACB arrangement	: One ACB per cubicle for ACB size 3200A to 6300A : Two ACBs per cubicle for ACB size 630A to 2500A : Three ACBs per cubicle for ACB size 630A to 1600A
Form of internal separation	: Form 1 to Form 4



Withdrawable Switchboard

MTLV400 Series offer safety and user friendly for operators. The withdrawable units is easy for handling and operation. Design with following features.

- Fully withdrawable module
- Many sizes withdrawable module
 - 1/4M3 & 1/4M4 for KS Module, designed for feeder up to 11KW.
 - 2M, 3M, 4M, 5M, 6M, 7M, 8M for M module, designed for feeder up to 160KW or 400A



Standard designed

- Modular technology designed, single front or back to back installation
- Main Bus bar located on top of panel
- Vertical bus located in bus trunk
- 3 and 4 poles bus bar system and the rating of main bus bar up to 7500A
- Door opening angle up to 180°
- Standard designed with cable chamber beside or without cable chamber (Cable connection at the rear side)
- All equipment will be assembly inside the withdrawable unit only
- Provided with safety shutter
- Provided with door interlocking, it cannot be opened whenever the main switch in "ON" position. However, the interlocking could be defeated by special tool in order to open the door to check operating condition of equipment inside or make thermo-scanning during operation.
- Position indicators of withdrawable units are clearly indicated
- Module can be removable only in case the main switch in "OFF" position
- Compact designed but convenience to service and maintenance
- Provided with heavy duty power plug (Up to 400A for M module and 35A for KS module) & control plug.



Fixed Compartment for M-Module

- Vertical bus bar in the metal trunk with partition and automatic shutter, blanking-off shutters.
- Male power plug & Female control plug will be fixed inside the compartment



Fixed Compartment for KS-Module

- Vertical bus bar in the metal trunk at the back side
- Female power plug & Female control plug will be fixed inside the compartment

Cable chamber for M-Module

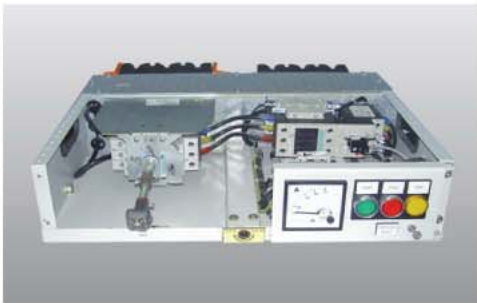
- Control terminals for external control cable connection
- Power cable is designed to connect directly to the bus terminal of fixed outgoing plug in the compartment. The power terminals in the cable chamber can be provided as option.
- Clearly identification tag for all terminals



Cable chamber for KS-Module

- Control terminals for external control cable connection
- Power terminals for external cable connection
- Clearly identification tag for all terminals





M-type Widthdrawable module

- Designed for starter feeder up to 160KW
- Designed for supply feeder up to 400A
- Designed for system voltage up to 690V 50/60Hz
- Compatible with Moulded case circuit breakers, Switches or Fuse switch disconnectors
- Maximum 10 modules (2M) per cubicle

Construction

- 400A Heavy duty incoming plug with lifting guide
- 400A Heavy duty outgoing plug
- 24 pins 16A Control plug and can be increase up to 64 pins 10A
- Ball bearing on the widthdrawable truck for easy and smooth during inserting the truck.
- Heavy duty driving shaft at bottom of the truck with clearly driving indication
- Position indicators
- Swingable Instrument plate for fixing all control devices such as Pilot lamps, Control switches, Meters, etc..
- Main switches or circuit breakers will be provided with extended rotary handle as standard. Door will be interlocked and could not be opened whenever the main switches is in "ON" position, however the interlocked can be defeated by special tool in order to open the door for checking the working condition or thermo-scanning.
- Optional with external over-load resetting without opening the front door



KS-type Widthdrawable Module

- Designed for starter feeder up to 11KW
- Designed for supply feeder up to 32A
- Designed for system voltage up to 690V 50/60Hz
- Compatible with Moulded case circuit breakers or Isolator switches with fuse back-up
- Maximum 20 modules (1/4M4) per cubicle or 24 modules (1/4M3) per cubicle.
- Easy to operate, just only insert the module by hand without using any tool.



Construction

- 35A Heavy duty male plug
- 35A Heavy duty female plug
- 24 pins 16A Control plug
- Guiding pin
- Test switch for using in testing mode whenever the main switch is in "OFF" position.
- Main switches or Circuit breakers will be provided with rotary handle as standard. Door will be interlocked and could not be opened whenever the main switches is in "ON" position
- Provide with external over-load to reset the over-load relay without opening the front door (Optional)



Compartmentalized designed suitable for fixed or plug-in switchboard up to the highest form of internal separation up to form 4 type 7 according to BS EN 60439 . The construction designed will be

- Increase safety during operation
- Compatible with Plug-in circuit breakers, Circuit breakers, Switch or Fuse switch disconnectors
- Cable entry from top or bottom
- Cable termination from rear side only
- Fully internal separation for individual feeders
- Provided with door interlocking

Internal construction

- Main bus bar located on top with metal separation
- Vertical bus bar at the back and located in bus-trunk
- Cable entry can be from top or bottom. Removable gland plate will be provided either top or bottom as per designed cable entry
- Provided with cable ladder on both side
- Provided with cable box to shroud the cable termination
- Provided with cable gland at cable box (Only for form 4 type 7)
- Degree of protection up to IP54 for indoor application
- IP54 or IP55 for outdoor application, designed with double front door and canopy.



LV SWITCHBOARD-MTLV400 Series TECHNICAL DATA

TECHNICAL DESCRIPTION	TESTED SWITCHGEAR AND CONTROLGEAR TYPE ASSEMBLY	STANDARDS / SPECIFICATION IEC 60439-1 (1999), DIN EN 60439-1 (VDE 0660 PART 500)
CREEPAGE DISTANCES AND CLEARANCE	RATED IMPULSE WITHSTAND VOLTAGE (U_{imp})	8 KV
	OVERVOLTAGE CATEGORY	III
	POLLUTION DEGREE	3
RATED INSULATION VOLTAGE (U_i)		1000 V
RATED OPERATION VOLTAGE (U_e)		UP TO 690 V
RATED CURRENTS (I_e) BUS BAR SYSTEM (3 PHASE 4 WIRES)	MAIN HORIZONTAL BUS BARS	RATED CURRENT 7400A RATED PAK WITHSTAND CURRENT (I_{pk}) 176 KA RATED SHORT-TIME WITHSTAND CURRENT (I_{cw}) 80 KA, 1s
	VERTICAL BUS BARS FOR DISTRIBUTION FEEDERS (FIXED MOUNTED DESIGNED)	RATED CURRENT 1650A RATED PAK WITHSTAND CURRENT (I_{pk}) 176 KA RATED SHORT-TIME WITHSTAND CURRENT (I_{cw}) 80 KA, 1s
	VERTICAL BUS BARS FOR WITHDRAWABLE UNIT DESIGNED	RATED CURRENT 900A RATED PAK WITHSTAND CURRENT (I_{pk}) 163 KA RATED SHORT-TIME WITHSTAND CURRENT (I_{cw}) 65 KA, 1s RATED SHORT-TIME WITHSTAND CURRENT (I_{cw}) 50 KA, 3s
RATED POWER FREQUENCY WITHSTAND VOLTAGE	MAIN CIRCUIT / MAIN BUS BAR	2500 V _{ms}
	AUXILIARY CIRCUIT / CONTROL CIRCUIT	1500 V _{ms}
SWITCHGEAR RATED CURRENTS		MAIN CIRCUIT BREAKERS 5000 A OUTGOING CIRCUIT BREAKERS UP TO 5000 A
INTERNAL SEPARATION SURFACE TREATMENT	FORM 1 UP TO FORM 4 TYPE 7 FRAME STRUCTURES	ACC. TO IEC 60439-1, SECTION 7.7 ALU-ZINC STEEL / E.G. STEEL WITH POWDER COATED
	SIDE / REAR / TOP COVERS FRONT DOORS	E.G. STEEL WITH POWDER COATED E.G. STEEL WITH POWDER COATED
DEGREE OF PROTECTION	ACC. TO IEC 60529,	IP 30 UP TO IP 54
STANDARD DIMENSIONS	DIN 40050/1980 HEIGHT	2200, 2600 MM. (WITH 2-LAYERS BUS BAR SYSTEM)
	WIDTH	400, 500, 600, 700, 800, 900, 1000, 1200 MM.
	DEPTH	600, 800, 1000, 1200, 1400 MM.

