



## ***Unmatched safety, Reliability, Intelligence, Sustainability and Asset management***

**Most Preferred Solution for Customers from may decades...**

Type Tested TF-TQ™ Low voltage switchboard offers comprehensive solution for power distribution and motor control with higher safety, reliability and user friendliness.

This Offer also brings intelligent solutions and asset monitoring.

With largest installed base reference, this time-tested offer is one stop solution for all electro-intensive LV applications.



TF-TQ is offered in direct supply (OEM) model from our state-of-art LV CoE Coimbatore facility. This ensures total quality control with stage inspection, compliance with TTC and large-scale output with consistency.



	PCC (Type TF)	MCC (Type TQ)
Complying Standard	IEC 61439-2, IEC TR 61641, IEEE344	IEC 61439-2, IEC TR 61641, IEEE344
Rated Service Voltage	380 / 415 / 440 / 480 / 690V	380 / 415 / 440 / 480 / 690V
Rated Frequency	50 / 60Hz	50 / 60Hz
Rating of Horizontal Busbar (TP-E / TPN-E)	Up-to 6300A (Natural Cooling)	Up-to 6300A (Natural Cooling)
Rating of feeder	Up-to 5500A (Natural Cooling)	–
Fault Level	50 / 65 / 80 / 100 kA for 1 Sec	50 / 65 / 80 / 100 kA for 1 Sec
Internal ARC fault Level	Up-to 100kA for 0.5 Sec, Arcing class-C	Up-to 100kA for 0.5 Sec, Arcing class-C
Rated Insulation Voltage	1000V	1000V
Degree of Protection (External) (IEC 60529)	IP42 / IP54	IP42 / IP54
Form of Separation (BS EN 61439-2)	Up-to Form 4, Type -6	Up-to Form 4, Type -6
Layout / Orientation	Single Front	Single / Double Front
Horizontal Busbar Location	Top / Bottom	Top / Bottom
Cable Entry	Front/Rear Entry (Top / Bottom)	Side Entry (Top / Bottom)
Draw-out Module Type		Open Door / Close Door
Intelligent switchboard Communication Protocol	IEC61850, Modbus RTU etc	Modbus RTU, Modbus TCP/IP, Profibus DP, Ethernet-IP etc



### Key Features

- Compact **Single tier or Multitier** construction for ACBs
- Withdrawable (WWW) modules upto 500A rating
- Distinct **5 position** Draw-out (Connected, Test, Isolated, Withdrawn, Maintenance)
- Operator **Force Independent Module Racking Mechanism**
- **Sturdy Telescopic Rail System** to ensure reliable module contact alignment
- All **Silver Plated withdraw-able contacts** ensuring less Wear and Tear
- **Automatic Safety Shutter** for withdrawable modules
- Optional **True Closed-door Operation**
- **Type tested** as per IEC61439 and Internal Arc compliant with 0.5sec duration
- **Interleaved HBB System** (for 2000A & Above) enhancing Energy Efficiency and reducing carbon footprint for your system



## TQ3 CDO+ True Close Door Design



Service/Test  
Position

Isolated  
Position

Withdrawn  
Position

Maintenance  
Position

### Features

- A) SCPD interlocks : Door should not open if SCPD is switched ON
  - Available in Service, Test, Isolated Position
  - Tool Operated Defeat facility is there for skilled operator to open door even when SCPD is ON
  - SCPD gets ON only at prescribed position – Service, Test, Isolate
- B) Door interlocks : Door interlocking with Module position
  - Door shall not open unless module is in isolated position
  - Tool operated defeat facility is there for skilled operator to open the door in service and test condition
- C) Racking Interlocks
  - Racking of module is possible only when SCPD is Switched Off and Door is Closed
  - Racking end stop there to ensure no rack-in rotation after service position & no rack-out rotation after isolated position
- D) Withdrawal Interlocks
  - Module withdrawal from panel possible after removing hardware (tool operated)
- E) Position Indicator
  - S-T-I Position Indication is visible on Door
- F) Locking/LOTO
  - Module Padlocking – to prevent racking operation by Unauthorized Person
  - Padlocking Possible in "Service", "Test" and "Isolated" Position (default 3 locks)

### Other Features

- Degree of Protection : IP54 is maintained in "Service", "Test" and "Isolated" positions
- Internal Arc Complied in "Service", "Test" and "Isolated" Position
- Blanking Plate (Standard Size) required to cover Control Plate Cut-Out opening while module taken out of the panel
- Module Handling
  - Module can be placed on table top / floor flat surface
  - Puller arrangement for higher size module
- Hinged door considered instead of integral fixed door
- Module five position draw-out
- Human Force Independent & guided Racking Mechanism
- All silver plated withdrawable power/ control contacts

Perfect Solution for your Changing Needs

CDO+ features may be retrofitted to existing TQ3 open door modules and achieve enhanced safety



### Condition Monitoring and Asset management

Behind most of the electrical asset failure, rise in temperature is a common phenomenon. For these cases, early detection of abnormal bus bar temperature rises will prevent electrical failures and fire.

In fact, today periodic thermographic surveys of MV and LV connections have become general practice to mitigate the risk of faulty connections. However, these periodic inspections can have following complications / limitations:

- Restricted access to electrical rooms (safety regulations)
- Operator safety (opening a door to check connections)
- Limited accessibility/visibility of contacts (example busbar)
- Human error in collected data
- Historical data availability for further analysis along with other electrical parameters from relay/meter etc.

In order to overcome above mentioned difficulties, **TF-TQ design** offers continually transmitting temperature sensors, environmental sensors at critical connections, & HMI/SCADA to display alarms and indication when absolute temperatures

exceeding a threshold with status indicators.



This can further be used for health prediction of switchboard, thanks to our newly launched cloud based digital platform **"SMARTCOMM-Predict"**.

#### This helps in:

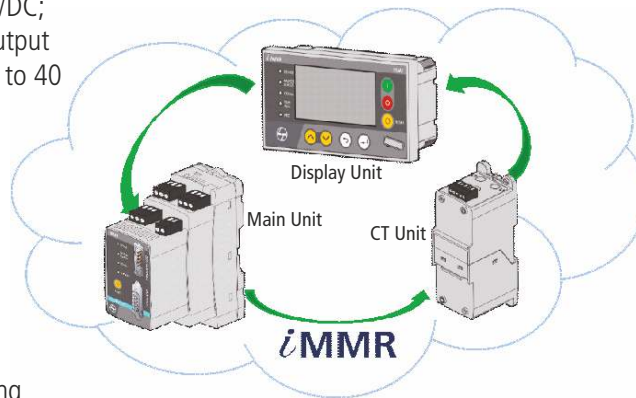
- Avoiding unplanned & costly downtime
- Optimizing maintenance schedule
- Better planning of spare parts
- Taking informed decisions
- Enhancing asset life & Ensuring Sustainability



### Intelligent MCC powered by Intelligent Motor Management Relay

#### Main Unit

- Auxiliary Input: 85-265VAC/DC;
- 4 digital input & 3 Digital output
- Site-selectable trip class – 5 to 40
- One 2 wire RTD/PTC input
- Communication Variant
  - PROFIBUS DP
  - MODBUS RTU
  - MODBUS TCP/IP



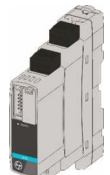
#### Display

- Parametrisation & Monitoring
- Self powered display
- Inbuilt memory module

CT/VT Module		
Module	Current Range	Width
Ct1	0.3 - 3A	45mm
CT1VT	0.3 - 3A	45mm
Ct2	2.5 - 25A	45mm
CT2VT	2.5 - 25A	45mm
Ct3	7 - 70 Amp	70mm
CT3VT	7 - 70 Amp	70mm

#### Expansion Modules

- 4DI+2DO
- 6DI
- 2AI/ 1AO
- EF + 2DI + 1DO



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