

Custom-Built Modular Solutions

Draw-out & Fixed



Series 2004

Control Flexi Module

Motor Control Centres - MCC 2004
Power Control Centres - PCC 2004

Custom-Built Low & Medium Voltage Switchboards

*UL type tested for
50 kA (RMS), 1 Sec., 109 kA Peak*

Corporate Mission Statement

The Controls & Switchgear Group aims to be the most professional switchgear manufacturer in the business. It will seek to be the benchmark in terms of quality, reliability and speed for others to aspire.

The Controls & Switchgear Group intends to achieve this leadership status by leveraging the winning combination of world-class products, matchless quality of service and total reliability.



Come and join us in our journey of the legend

From the first Control Panel built in our garage factory in 1966 to a position of one of India's largest manufacturers of world-class Switchboards & LV Switchgear Components.

Stretching across ten different manufacturing plants in the heart of industrial belt of the National Capital Region of Delhi and neighboring Noida. Equipped with contemporary production machinery, elaborate tool rooms and the finest of testing equipment, these plants are geared toward mass production.

With a knowledge bank of expertise by the dynamic team of 2,000 technocrats, R&D Professionals, Engineering & Commercial Managers complemented with high quality workmanship by their master craftsmen. The Controls & Switchgear Group is today determined to reach the power zenith and beyond.



R. N. Khanna
Chairman & Managing Director



Ashok Khanna
Managing Director

The Company

The Controls & Switchgear Company Ltd. was founded with a one-point agenda- to bring world class products and services relating to Power Generation, Distribution, Protection, Control and Automation.

Envisioned by the brothers Ravi Khanna & Ashok Khanna to provide new dimensions to corporate excellence, the company today, after three decades of relentless and uncompromising focus on quality, the group has achieved leadership status at a global level, This has attracted international hi-flyers to collaborate with the group in Joint Ventures, Technical tie-ups, Strategic alliances with buy back arrangements.

The Controls & Switchgear Group comprises of 10 units engaged in a programme of continuous improvement of upgradation of quality, consistent growth, productivity and profitability, customer goodwill, employee satisfaction-all superimposed on a corporate canvas committed to the pursuit of excellence quality without full stops.

Liberalisation and globalisation were the driving forces that inspired this paradigm shift of converting challenges into opportunities. Today premium quality designed for customer-care, is our hard-core mantra.



Control Flexi Module



Infrastructure



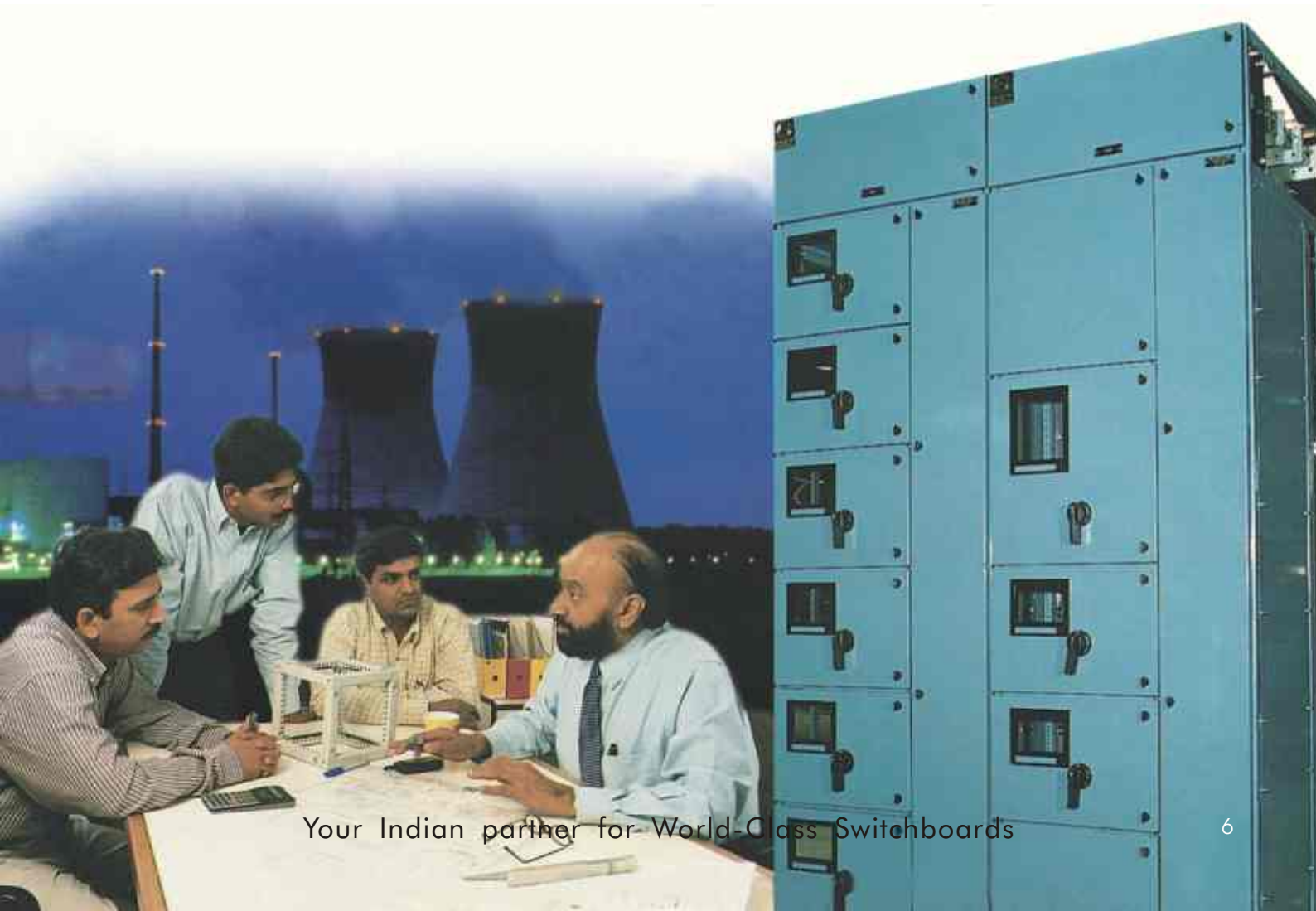
Your Indian partner for World-Class Switchboards

Our products and services do all the talking

MCC-2004 Withdrawable Motor Control Centers are used to control electric motors and other equipments from a central location, or where power is to be distributed, for different equipments, safely and reliably. Withdrawable MCCs are used in Thermal, Hydro, Nuclear and Combined Cycle Power Generating Stations in Paper, Cement, Petrochemical, Steel and Fertilizer plants etc. as also in every other process industry. MCCs-2004 also find their application for special purposes like in ships due to high degree of reliability in operation and due to the extra protection to personnel and plant offered by them.

MCC-2004 is designed to handle any switching, isolating, distribution or control functions and is a result of over 30 years of manufacturing experience. MCC- 2004 is based on the practical experience and investigations made by us on various installations and under every possible site condition. As such, it is ensured that the product of valued customer is matchless in quality and is able to fulfill completely the project requirements.

Series 2004 MCCs are supplied in fully drawout, semi drawout and fixed construction. These MCCs are sheet steel modular construction and each vertical section is segregated into the various sections by making use of metallic barriers.

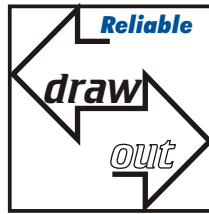


Your Indian partner for World-Class Switchboards

- ◆ Main Busbar/Horizontal busbar chamber at the top of cubical (Busbars at the bottom can also be supplied on request).
- ◆ Vertical busbars/droppers chamber behind the equipment modules.
- ◆ Auxiliary Busbar chamber at the top front side in front of main busbar chamber.
- ◆ Equipment modules or withdrawable Trolleys.
- ◆ Cable alley at the right hand side of each MCC cubicle for termination of power and control cables.

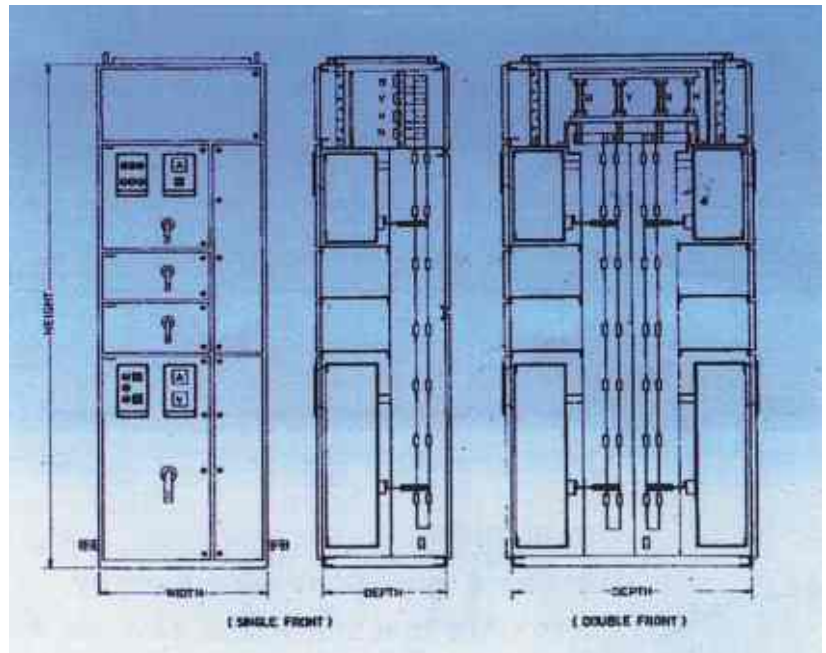
The MCCs are available in SINGLE FRONT and DOUBLE FRONT or BACK to BACK execution to meet any specific requirement.

Therefore, Control Flexi Module gives access to everything, which is required for power distribution boards.



Operational reliability as well as easy servicing are two of the most essential demands of the offshore industry today.

The Control Flexi Module draw-out system meets these demands and has obtained worldwide approvals.



General Overall dimensions of MCC - 2004 in mm

Busbar Ratings	Height SF/DF	Width SF/DF	Depth		Cable Entry
			SF	DF	
1440A	2450	750	500	1000	Bottom
			750	1200	Top
1600A	2450	750	700	1000	Bottom
			750	1200	Top
2250A	2450	750	700	1000	Bottom
			1000	1400	Top
2500A	2450	750	1000	1200	Bottom
			1200	1400	Top
3200A	2450	750	1200	1200	Bottom
			1400	1400	Top



The planning

The whole systems is supported by AUTO CAD. It is quick and easy to design a panel and during the planning stage we can keep modifying the panel according to client's needs.

When the drawing is finished, it serves as professional information for the clients, as well as the technicians on the shop floor.

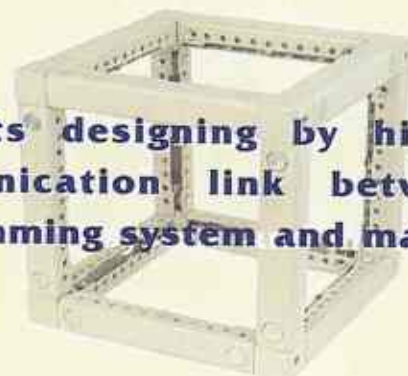
Flexi module CAD system helps to generate instant formation of Bill of material and other related informations.

Depending upon the type of Panel required to be made, a user friendly software has been developed which can easily spell out the type & quantity of each component required for assembling a typical panel or typical set of panels.

The software also generates general arrangement drawing, which indicates clearly the position of fixing holes for mounting components which is a unique feature.



Products designing by high speed communication link between the programming system and machines.



All set to rise

Construction of Control Flexi Module

An extremely versatile modular system where Control Panels, MCC's, PCC's, Control desk, Relay Panel & various other panels can be assembled with ease out of **Ten Main Precision Components Using Standard Hardware.**

The plinth is made out of bolted design permitting ease in entry of the cable from the front. After the entry of the cable the plinth can be bolted again. This feature of removing plinth profile also enables the user to extend the panel on either side or at right angle.

The corner and cross profiles are provided with tapped holes at a pitch of 25 mm which permits the assembly of components to achieves shrouding of all sections in order to make the switchboard corresponding to the requirement of form 2, 3 & 4.

The Complete Alternative through New Thinking

- ◆ Control Flexi Module is competitive alternative to other Switch board systems.
- ◆ The system fully covers all requirements with regard to dependability and personal safety.
- ◆ Future expansion and modifications can be carried out without problems.
- ◆ The flexible system enables an individual freedom to change in any direction.
- ◆ Because everything has been closely considered in details and in design the customer benefits from a cost-effective solution.
- ◆ Control Flexi Module leaves your hands free to choose now and in the future.





Flexi Module Assembly

Reliability

Control Flexi Module Switchboards are built of sturdy, aesthetic and functional from 2 mm Thick epoxy powder coated sheet steel uprights which are linked by cross and vertical members.

This facilitates quick and easy mounting while giving the unit perfect rigidity.

The concept is the result of years of experience in the field of low and medium voltage power distribution assemblies.

Issues related to over heating, ease of assembly as well as the total accessibility of the components and equipments, were taken in to account from the early design stage.

Security

The equipment is fully protected from all sides, thus preventing any contact with live components and ensuring safety and required degree of protection.

To restrict total access and to achieve higher degree of protection separate barriers for achieving complete compartmentalization are provided inside the panels.

Control Flexi Module offers the possibility of internal separations to make the products From 2,3 and 4 as specified in IEC 439-1 /IS:8623 (Part - 1).

Complete range of FLEXI MODULE has been type tested and certified accordingly.

Expendability

The vertical and horizontal modularity of the equipment at a pitch of 25mm allows



an optimal equipment arrangement and maximum flexibility.

The modularity of the equipment, busbars and cable compartments permit the building of any multi cubical type assembly with ease.

Front access to all functions enables the operator to modify, replace or add new components very quickly.

Panels can also be expanded in all 3 dimensions in modules of 200 mm.

The cross members provide excellent support for mounting air circuit breakers and other heavy equipments.

Holes in base frame make lifting safe and easy from bottom. Lifting angles are also provided to lift the flexi module switchboards from the top.

Aesthetics

All our products offer a modern design which matches functionality with colours and shapes.

Ventilation is provided by perforations at adequate places by making best use of corner and cross members.

The combination of our standard shades enables the switchboard to blend harmoniously with any environment.

Bus bar with Flexible Mounting Arrangement

Busbar Supports

Main Busbars and vertical droppers are supported on specially designed SMC/ DMC (Sheet/Dough Moulded Compound) or FRP (Fiberglass Reinforced Polyester) Busbar Supports. The adopted design ensures:

- ◆ High mechanical withstand capabilities.
- ◆ No moisture absorption (Nonhygroscopic).
- ◆ Very high tracking Index.
- ◆ Elevated temperature (upto 120°C), withstand capacity and fire retardant.

Busbars

Aluminium alloy busbars, grade 63401 in 'WP' condition with specific configurations and mounted on specially designed moulded insulating supports. Busbars can be provided with heat shrinkable PVC sleeves, if specified.

Copper busbars can also be provided.

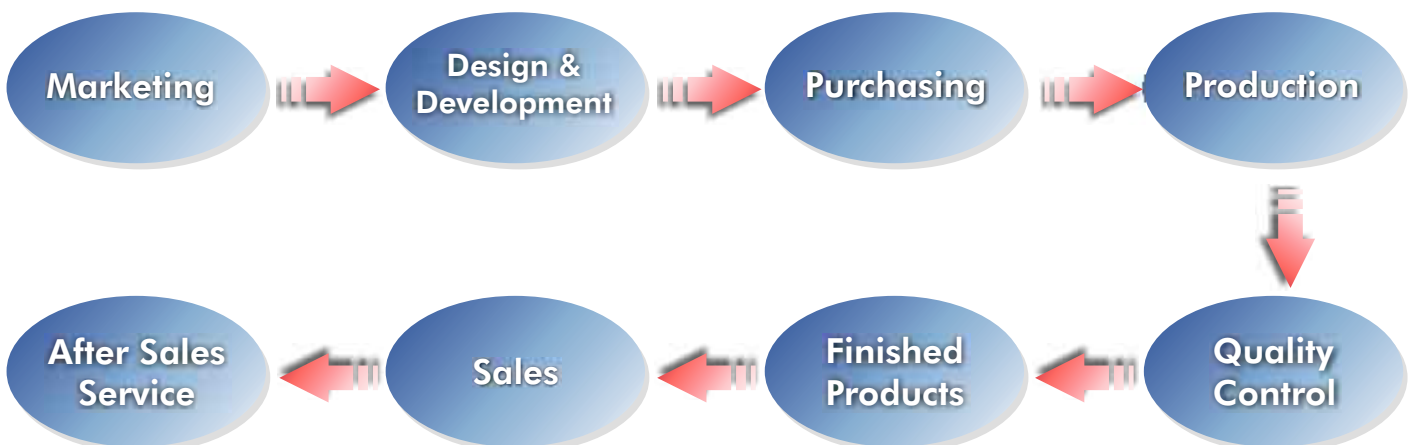


Consistency of Product Quality

Each single step of production process is carried out following well defined procedures.

The quality control system is applied to documentation, equipment, process and production facilities. High tech machine tools form the basis for consistent high quality.

The Group's strength and style of working is maximum standardization from prototypes to series production. Once top quality is achieved then it can consistently reproduce.



World Class Components

Manufactured in house

Self-aligning Power and Control Terminals

The withdrawable chassis is fitted with self-aligning, sliding/ stab in type contacts, both for incoming and outgoing power and control connections. The incoming contacts stab into vertical Busbars mounted at the rear to the chassis. The contact system is designed and type tested for fault currents upto 50KA (RMS). Suitable insulated and shrouded supports are provided, on which these contacts are mounted.

Air circuit Breaker Distribution Panels

CS air circuit breakers floor or pole mounted distribution panels with CS Air Circuit Breakers and metering modules, both for indoor and outdoor applications are also supplied. ACB Panels in Double Tier arrangement are also available complete with interlocks as per customer's specifications.

Motor duty, double break CSSF Switch Fuses

CS-Switch Fuse provides a fused short circuit protection with load break devices on both sides of the fuse. The fuse links are stationary, ensuring a long electrical and mechanical life time for both AC and DC applications. Our Switch Fuse Units and Load Break Switches are manufactured to latest international standards and are exported all over the world.



Service, Test and Isolated Positions

Every drawout module has the following positions

- ◆ Service Power and control terminals engaged. (Door interlock allows door opening only after Switching off).
- ◆ Test Control engaged, Power terminals disconnected. (Easy racking out with a racking handle)
- ◆ Isolated Both power and control terminals disconnected. Mechanical indicator clearly shows the corresponding positions of the module. A spring loaded latching device provided on the module automatically makes sure of all the three positions and avoids accidental withdrawal.

Interchangeability

All identical motor starter and switch fuse feeders are provided with self-aligning power, control terminals and telescopic guide rails to ensure smooth and effort free insertion and withdrawal while ensuring complete interchangeability. Operational reliability as well as easy servicing are two of the most essential demands of the offshore Industry today. The Control Group perils 2001 draw out system meets these demands and has obtained world wide approval.

TC-Contactors and Thermal Overload Relays.

Each Motor Starter Feeder is provided with TC make contactors and overload relay which has built in single phasing preventor. This means, the motor is always protected against single phasing. These Contactors and Overload Relays are manufactured to international standards by our Group company, Telemecanique & Controls (1) Ltd. in joint venture with Telemecanique, France.



SEGC-Microprocessor based Protection Relays

To meet stringent and timely response of protection systems we provide, Microprocessor based Protection Relays including Motor Protection Relays manufactured by our Group Company, AVK SEG Controls (I) Ltd., in joint venture with AVK-SEGC Group of companies, Germany. Microprocessors and highly integrated Microelectronics ensure extreme precision and reliability through self supervision of hardware and software.



CS-Current Transformers

CS-Current Transformers are available in all possible combinations of ratios, burdens, accuracy classes, encapsulations, applications etc. CS-CTs are subjected to plant Quality Assurance Procedures, defined to comply with applicable Standards. CS-CTs have been performing satisfactorily in MCCs and PCCs at important Power stations and other large industrial installations for several years.



Wago-Fit & Forget cage Clamp Terminals

For fixed type multiple connections in non-drawout modules and metering & Protection modules of ACB panels etc. The latest Cage Clamp, Screwless Terminal Blocks are now manufactured in India by our Group Company, Wago & Controls in joint venture with Wago Kataktechnik GmbH of Germany.



Push Buttons and Pilot Lamps

Compact dimensions, 22.5

Simple to fix. Only a screw driver is required.

Unique contact wiping system offers total reliability. Modular construction thus reduces inventory.

A wide variety of actuators, lenses, contact blocks, pilot lamps and accessories offers complete flexibility. IP 65 degree of protection.



The Finished Panel

Doors & covers are fixed with EPDM/ Neuprean Gasket which withstands oil and Chemical resistance.

The doors are hinged for 120° opening for easy access to internal parts.

Each and every component is powder coated/ electroplated to withstand tough climatic conditions.

Flexi Module PCC

PCC-2003 Power Control Centres

PCC -2003 Power Control Centres are used as main Low Tension Switch boards in Power Stations, large industrial plants., process industries and other heavy plants for distribution and control of power. PCC -2003 can be supplied with Air Circuit Breakers, Fuse Switch Units, Isolators etc. With Busbars rated upto 4000A. PCCs with higher ratings can also be supplied for special applications.

PCC - 2003 are engineered to cater to diverse system requirements with highest efficiency thus making them a clear winner over other available traditional designs. The design ensures highest degree of reliability in operation, complete flexibility and proper adoption of project requirements.

The Power Control Centres PCC -2003 are provided with Air Circuit Breakers in drawout or fixed executions.

Other Custom Built Control Relay Panels

Our custom made control & Relay Panels are packaged into modular steel enclosures, designed, manufactured, tested and commissioned. Our inhouse test facilities (which include HV Load Test and Functional Testing capabilities, are unique in the market place. CSC Systems provided.

comprehensive automated power management, control, protection and monitoring solutions for substations automation and generator protection and synchronisation.

Optionally, systems can be so designed to be upgradable, for a SCADC network, this can be done using numerical relays, which allow a minimal initial capital investment while maintaining the ability to upgrade or implement future technological advancements.

The panels designed by CSC combines the hardware and software components required to efficiently integrate various protective relays, metering, control and system monitoring by using a modular approach and common data structure for integration. The Relay Panel system can provided multi-protocol and centralised network management to efficiently communicate between generating plants, substations and operation centres.

CSC application support team are capable of designing of efficient system that provides wide power management & flexible sub-station automation. Not only is the software of automating sub-station fault detection and notification, it is designed to make diagnostic information easily accessible to minimise downtime.

Application software is available to meet the separate requirements of station operators and engineering maintenance staff.

Salient Features of Control Flexi Module Switchboards:

- ◆ Fully compartmentalised construction ensures safety.
- ◆ Modern design which matches functionality with colours and shapes.
- ◆ Drawout Modules are withdrawable with three distinct positions.
- ◆ Drawout units are fully interchangeable.
- ◆ Safety shutter for vertical bus chamber.
- ◆ Main Busbars are easily approachable.
- ◆ Self connecting and disconnecting power & auxiliary contacts.
- ◆ Highly flexible to meet all site requirements.

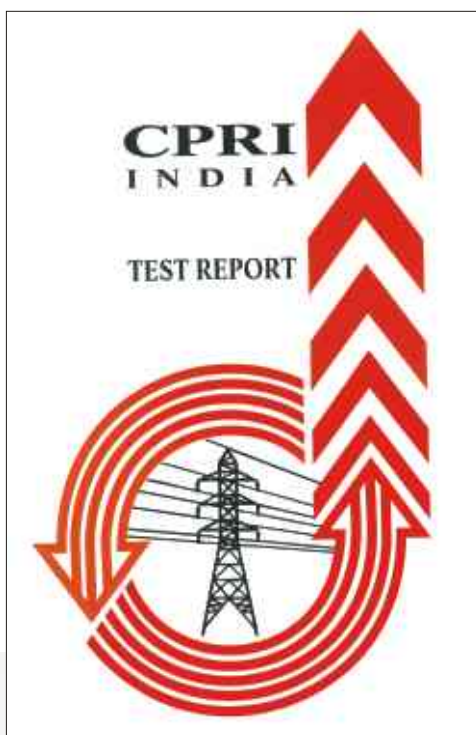


QUALITY POLICY

We are committed to achieve excellence in Design and Manufacture of Electrical Switchboards, distribution & control Upgradation of Products & Quality system as per latest standards; equipments through:

- Prompt redressal of Customer's Concerns;
- Enhancement of employee skills;

by providing adequate resources and reviewing our Quality Management Systems to achieve continual improvements.



The Group at a Glance



Controls & Switchgear
Company Ltd.



RS Components & Controls
(India) Ltd.



Controls & Switchgear
Contactors Ltd.



WAGO®
Wago & Controls
(India) Ltd.



C&S Protection & Control Ltd.



Leroy Somer & Controls
India (P) Ltd.



Controls & Switchgear Gewiss
India (P) Ltd.



Controls & Switchgear Company Ltd.

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