



NECESSA TECHNOLOGIES

YOUR ENERGY PARTNER

www.necessatechnologies.com



COMPANY PROFILE

We NECESSA TECHNOLOGIES is leading company involved in design, manufacturing Testing and commissioning of various electrical products technical support/consultancy for electrical installation having latest techniques, well experienced and qualified engineering team with innovative ideas. Our main vision is to provide excellence in comprehensive electrical solution making a single point and troublefree solution for our valued customers. We manufacture our products under the most stringent quality system complying international/national standards. We are specialized in design, engineering, manufacturing and installation of intelligent LV switchgear/MCC's integrated protection and control system distribution boards, PLC automation and AMF/Synchronizing panels, supply and installation of lighting arrester, surge protection device, maintenance free earthing, exothermic welding and complete electrical fittings, cables etc. Due to our continuous efforts for up aradation of auality and workmanship, we assure the

Due to our continuous efforts for up gradation of quality and workmanship, we assure the best quality products, timely delivery and better after sales service.



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QUALITY

Our products are designed in accordance with IEC/IS specifications and as per customer's requirements. We are well equipped with Computer Aided Design & manufacturing facility and information technology systems to undertake custom built jobs. Team of engineers is continuously on inhouse development and upgrading of products to cater to market requirements and to adopt latest technological advancement.

Custom built design/development of diverse range of electrical products is possible by the backing of specialized engineers and draftsmen. Facilitated by in-house test facilities, all new designs as well as modernization are constantly verified and validated to ensure high degree of reliability. Manufacturing operations are controlled and monitored at every stage by trained and skilled workforce.





our SERVICES

* Supply of LT Panels * SITC of 33KV/11KV substation * Commissioning and testing of 33KV/11KV substation * Design, supply, commissioning and testing of C&R panels/ PLC Panels/ Drives Panels/ APFC Panels/ AMF Panels *Bust Ducts *Cable Laying

*Supply and installation of maintenance free earthing (GI electrode/ Copper electrode/copper bonded rod with Earth resistance enhancing compound NABL Lab fested.

*Supply and installation of lightning conductor *Supply and installation of surge protection devices *Supply and installation of exothermic weld powder and moulds *Erection of panels & High mast *Services of motors and generators *Supply of switchgears

*Supply and installation of electrical fittings, cables, etc. *Customised solutions







TEST FACILITIES

- * Primary current injection testing machine
- * Secondary current injection testing machine
- * High voltage testing kit up to 5KV
- * Contact resistance measurement
- * Insulation resistance measurement
- * CT/PT test bench
- * Temperature rise testing facility up to 2000A
- * Relay testing bench
- * Elcometer
- * Earth tester
- * Micro ohm meter
- * Multimeter
- * Digital Vernier andscrew gauge
- * lightning conductor tester
- * cable fault locater
- * earth tester digital







LIGHTING PANEL

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Used for power distribution and control to provide reliable and effective service. These panels are manufactured as per clients specification and requirement which very well meet the industry demand.

The range of lighting panel offers complete solutions for controlling power for lighting loads manually or automatically.



Type tested for Bus Bar Enclosure Material Application

- 1 Material Protection category Incomer Features
 - * CRCA/GP/AL 1.6mm-3mm * powder coating shade RAL 7032/7035, Jay-white
 - * 1P42 to IP55 *10KA for 1 sec
 - * TP upto 250A
 - * MCB/SFU/MCCB
 - push buttons, photocell, timers etc.

 - mode.
 - cabling.
 - Applications
- lighting & metro rail

* CRCA/GA Sheet/Aluminium Sheet

* Industry like power, sheet, Refineries, petro chemical,

Fertilizer oil & gas Plants and commercial buildings.

* Temperature rise

* Degree of protection

* Aluminium or Copper



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Lighting panels are designed as per customer requirement to have complete controlling of power through push buttons, timers and photocell sensors Detachable base plate assembly enables them to be assembled or rectified easily. Termination of outgoing of MCB onto terminal blocks make them ready to install. Compact busbar systems provide the option of increasing the rating, thereby increasing the number of outgoing connections.

* control of power though various arrangements such as

* pad locking arrangement for safety and sealing * Red-Green indicators for on-off indication

* Selector switch availability for selection of controlling

* Detachable gland plates on Top& Bottom for ease of

Finds extensive use on construction site, Industry, residential complex, substation, lighting, power plant





METER PANEL

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An extensive range of low voltage feeder pillars from the transformer to the end distribution, providing solutions from fuse protection to the latest circuit breaker technology. The assemblies are purely custom built to meet customer specific needs. Feeder pillar can be installed outdoors or indoors, in a public or private network to protect and provide bulk distribution of electricity to residential & commercial

complexes.



Din type Feeder Pillar :

This range goes one step further with advanced vertical fuse rail & fuse switch (up to 6300 A) to utilize the blade(Din) type fuse in outgoing feeders. Also available with conventional fuse base type.

Wedge Type Feeder Pillar

Catering to the specific requirements of some regions, which offers a wide range of wedge type feeder pillars with vertical fuse rail (up to 630A) suitable for accommodaing wedge type fuses in outgoing feeders.

Other Ranges

incomer option: SD SDF, MCCB ACB. outgoing option :SDF MCCB, VARIOUS TYPE of cutouts/ such as house service cutouts/ heavy DUTY cutouts.

distribution, data analysis and safety reasons.



Material

Protection category Incomer Outgoing

Features

No. of ways : 4/6

* IP42 to IP 55

- compartment.
- locked position.
- Applications commercial complex shopping mall etc.

- * completely type tested as per IEC 61439-1 at CPRI /ASTA
- * system-415/440 v, 3 phase, 4 wire.
- * highest current rating available : 2400A.
- * increased degree of protection up to IP -55 to provide maximum protection in outdoor installation.
- * short circuit with stand strength up to 46Ka for 1 sec.
- * wide choice of selection of enclosure material as CRCA/GP sheet or aluminium sheet .
- * All live exposed parts screened-greatly reduce the risk of electrical shock during service conditions.
- * Available with wide range of accessories as per customer requirement as MDI, FM, KWH, voltmeters, cable clamps & pad locking etc.
- * Application used by utilities (electricity board) for power distribution in housing, commercial and industrial complex.



Meter panels are used bring all the energy meters at a common point for ease

* CRCA 1.6mm - 2mm Powder coating shade :RAL 7032 /7035 jay - white

* TP/FP MCB from 63A to 125A

* Energy meters with MCB rating from 10A to 40A. /8

* Meter boards consist of a compact busbarsystem

controlled by three phase incomer MCB.

Outgoing connection taken through MCB with

separate energy meter for each connection.

Separate pad locking of each metering

Termination of outgoing connections into terminal strips makes them ready to install.

Acrylic meter windows for data reading in pad

meter panels are used in housing complex,

TRANSFORMERS /

SPECIFICATIONS

3 phase, 50 Hz in voltage of 11 KV and 33 KV. Off circuit tap changer to provide +5% to -5%. Class A insulation Vector group Dyn-11 or as per customer Aluminium / copper wound. Painting as per IS/EC standards HV side : bare busting / cable box LV side cable box / bus duct Standard fittings as per IS 2026 / IEC 76

11KV AND 33 KV VACCUM CIRCUIT BREAKER

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FEATURES

Designed for trouble – free performance for 20-25 years Designed conforming is 2026, BS 171, IEC 76 Low loss designs and limited audible noise Type tested designs to withstands impulses, thermal and dynamic stress Modern manufacturing techniques ensures cost effectiveness and reliability

This specification covers design, manufacturing, testing at manufactures work, supply of 11 KV and 33KV Vacuum Circuit Breakers complete with all accessories require for their satisfactory operation for the subtransmission system. The breakers shall be used for transformer protection for feeder control in the system.



OPTIONAL ACCESSORIES

On-load tap changer (OLTC) PRESSURE relief valve without contact with contact Oil temperature with alarm trip contact Buchholz relay with alarm trip and contact Magnetic oil level gauge with alarm contact Marshalling box to house oil temperature indicator Neutral current transformer

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S.No	Particulars	33KV	11 KV
1	Number of poles	3 nos	3 nos
	Frequency	50 cycles	50 cycles
	Nominal system voltage	33 KV	11KV
	Highest system voltage	36 kv	12 kv
	Interrupting capacity at nominal system voltage	1500 mva	1500 mva
/	Rated continuous current	1250 amp	1250 amp
	Short time current rating for 3 secs	25 KA	25 KA
	Basic insulation level	170 KV	75 KV
	Power frequency with stand voltage for one minute	70 KV	28 KV
	Total break time for any current upto the rated	5 CYCLE	5 CYCLE
	breaking current	(max)	(max)
	Control circuit voltage	30 volt D.C.	30 volt D.C.
	Operation duty for gang operation	0-0.3 SEC -CO -3 Min-co	0-0.3 SEC -CO -3 Min-co
	The VCBs shall be suitable for one reclsing followed		
	by one delayed reclosing and lock out		
	Between phases	430 mm	280 mm
	Between live parts and ground	3700mm	2750 mm
	Creepage distance	900 mm	300mm





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LOW VOLTAGE DISTRIBUTION BOX

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Most of the electrical loads are inductive in nature resulting in lagging power factor. The most practical and economical solution to improve the power factor (PF) is to provide reactive compensation by installing power capacitors of suitable rating at strategic locations. For accomplishing the same low voltage (LV) capacitors are being extensively used both as fixed capacitor banks and in Automatic power factor correction (APFC) panels.

System	415 v ,3 phase ,3 or 4 wire 50 Hz
Degree of protection	415 v ,3 phase ,3 or 4 wire 50 Hz
Switching	Up to IP 55
Cooling	Manual/automatic
PF controller	Natural/ forced
Bus Bar	Up to 20 stages
Enclosure material	Aluminium or copper
Application	CRCA/GP sheet /Aluminium sheet Industrial where power factor improvement & correction required like steel/paper mills garment industries etc.



Single and three phase pole mounted DB fitted with copper / Aluminium busbar for outgoing connections, in conjunction with MCCB as main protection device and installed energy meters for data measurements and analysis.



Material	CRCA shade
Protection category	IP 42 †
Incomer	MCB
Outgoing	Termir
Features	MCB f from a Availe energ arrang Availe direct bushir
Applications	Used in urb energ of pov for po





1.2mm -mm Powder coating RAI 7032/7035, jay-white

to IP 55

from 63A to 20A

nal on busbar

to ensure circuit protection overload and & short circuit. lable with direct/ CT operated gy meters. Pad locking gement to lock /seal DB. ability of models that can be tly mounted on transformers ngs.

for distribution of power an / rural areas installed gy meters to keep a check wer theft and data analysis ower management.





LT ELECTRICAL PANEL

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Electricity is exponentially taking over our life style. its consumption in our life has gone up many folds. Its usage has gone up neck pace in various applications like domestic and industrial. This has forced us to utilize electrical energy In safe and efficient way so that it continues to play a pivotal role in our life. This requires a design / solution which can protect from overload and short circuit in addition to saving energy in every possible way. Timer DB are prefabricated and engineered solution protection to save energy for lighting application.

Features

aesthetically appealing with locking facility.

IP 54 degree of protection

Switch on – off street lights n time scheduling basis by incorporating an analog / digital time switch and contactor.

Rating of contacto depends on the luminaries and wattage of lighting Loads.

Range include from 16A to 110A with analog / digital time switch. Model incorporating energy meter is also available on request.





Switch gears / ACBs confirming to IS 2516 MCCBs confirming to IS 8828-1978 Fuse gears confirming to IS 4064 – 1978 Degree of protection as per IS 2147 - 1962 & as per customer requirement Enclosures fabricated of 16 SWG CRC sheets Powder coated body duty processed in 7 tank cleaning processed in 7 tank cleaning process Indoor and outdoor type panels provided as per customer requirement Provided with reputed makes of switch gears / control gears and other accessories





Power Factor Controller RVC The user-friendly PF controller

Quality capacitors for power factor correction

Applications such as motors, transformers, induction furnaces, welding and lighting installations consume both reactive and active power, resulting in reduced availability and lower quality of power. This translates into lower capacity utilization and eventually additional capital and running costs. ABB with its cutting-edge technologies and extensive experience has developed a wide range of advanced Low Voltage (LV) capacitors, which offer simple and cost effective solution to improve power quality and reduce costs.

Technical data

Range	Cylindrical type - normal duty	Cylindrical type - heavy duty	Box type - normal duty	Box type - heavy duty
Voltage (V)	415/440			
Range (kvar)	1 – 25			
Frequency (Hz)	50			
Connection	3 phase as standard construction			
Discharge resistors	In-built as part of the capacitor			
Execution	Indoor			
Standards	In compliance to IS:13340/41 & IEC 60831-1&2			
Mounting parts	Threaded stud at bottom of can (max. torque = 4Nm for M8 & 10Nm for M12)		Mounting bracket at rear plate	
Earth	Extruded stud		Earth connection on the enclosu	re fixation
Mean life expectancy	100,000 hours (max. 5000 switching per year)	115,000 hours (max. 6000 switching per year)	100,000 hours (max. 5000 switching per year)	125,000 hours (max. 6000 switching per year)

RVC: the user-friendly PF controller





Powerful features

Powerful features

- Common range for all network voltages from 100V to 440V.
 - Measurement and display of key parameters like voltage, current, power factor, THDV and THDI.
 - Fully programmable switching sequence.
 - 1A or 5A current input.
 - Easy commissioning.
 - Complete auto set-up (starting current-C/k, type of switching sequence, phase shift, special connections).
 - Easy to use thanks to a user-friendly interface and ease of access to parameters for manual setting.
 - Highly efficient switching strategy combining integral, direct and circular switching.
 - This allows to :
 - control the cos φ in presence of rapidly varying loads,
 reduce the number of switching,
- avoid unnecessary intermediary switchings,
 - increase the lifetime of the capacitors and contactors.





Indicates a demand for switching on/off a capacitor step

Alarm indication

Inductive/capacitive PF

- Measurement unit
- Programmable parameters :

 • Target Power Factor (cos φ)
- Phase shift (for special connections)
- C/k (starting current)
- · Switching delay times
- Switching sequence

Easy commissioning with automatic recognition of

- Special connections (single-phase, CT leads)
- Number of outputs
- Type of switching sequence
- Suitable for hot environments thanks to max. ambient temperature rating of 60°C.
- Not affected by the harmonics.
- Overvoltage / undervoltage protection and protections against harmonic distortion (THDV).
- Alarm : an alarm contact is opened when any of these conditions are reached:
- the target cos φ is not reached within 6 minutes after all outputs have been switched on,
- the internal temperature of the RVC rises above 85°C,
- overvoltage / undervoltage limits are reached,
- the power supply is out of range,
- the THDV exceeds the limits.

Distribution switchgear **Technical catalogue**





Presentation of the range Characteristics of Gemini switchboards

Gemini is the result of design work conducted by ABB with the direct calaboration of switchboard manufacturers, installers and designers who considered versatility to be the discriminating element when purchasing a switchboard, equally as important as sturdiness and reliability.

Gemini fulfils this requirement by providing a product that can be used for three different purposes: in addition to the basic configuration it also provides the components necessary for equipping it as an automation switchboard or as a distribution and mixed switchboard.

In all applications, compatibility with ABB protection, control and monitoring products means that a real system of integrated and complementary functions can be configured.

Typical examples of some Gemini applications can be seen in installations in industrial production departments and on board machines, in galvanization plants and varnishing cabins, in petrol stations and car-washing plants, boiler-rooms, car parks, shopping malls and in any other environments where distribution and automation demand specific safety requirements and service continuity.

Gemini also has flexible measurements, with six different box sizes and internal space to accommodate from 24 to 216 DIN modules.

To respect safety standards, all the switchboard's components can be fixed to the base plate or to the box frame without having to use any tods; wiring is carded out from the front followed by snapping the base plate or the frame onto the box. The patented frame is fitted with the cable duct incorporated in the uprights. In its design, Gemini repeats the shapes and RAL 7035 grey color of the ArTu switchboards with which it can be configured as a main protection switchboard.



Presentation of the range Introduction

Low voltage power cables, wire and cords (0.6/1kV) are used in most of electrical project like low voltage side of distribution transformer, buildings, low voltage network, control board of motors, control boards in Diesel generators, Telecommunication (DC and AC) power system and etc..

The selection of LV cables, wire and cords for any types of above mentioned projects has to be in proper or an engineering way, otherwise a set of risks will be come up and the cost will be impacted and some time some disaster may be happened.

So, below are two different types of work that LV power cables and

wires are used as an example:

1-Distribution transformer

Regarding the low voltage side of low Voltage Transformer, normally the single

Core cable are used. 2-Wiring of building:

Building, workshop, establishment building Have also needed the engineering plan and Design.







LOW VOLTAGE SWITCH GEAR

like ACB, MCCB, MCB, CONTACTOR, OLR, RELAY CHANGEOVER, ATS, & PANEL EQUIPMENTS



11KV & 33KV RMU (RING MAIN UNIT)



33KV Ring Main Unit RMU Switchgear: Your Primier Supplier

Ring6 33KV SF6 insulated ring main unit (rmu) switchgear is extendible designed for the medium voltage secondary distribution network in 10 different types of configurations suitable for switching system up to 36KV.

One of the main advantages of rmu switchgear is that provides greater security for the users. The switchgear is in the ring network which connected with 2 lines power supply when 1st line power shut down, the 2nd line power is available for supplies.

Ring6 ring main unit can be supplied in 4 ways, 5 ways or 6 ways standard configurations with additional equipment according to customer's specification, all of the rmu combinations was designed according to IEC62271 standard.

Features of 33KV RMU Switchgear

Ring6 33KV ring main unit (rmu) was designed in as compact switchgear with complete sealed tank filling sf6 gas, all of the live components were contained there, the maximum number of modules in one tank is 6 units. This advanced design could ensure the stability of the switchgear and the safety of the operator.

Ring6 rmu switchgear provides two types way to protect the transformer: load switch fuse protector composite apparatus and circuit breaker with relay protection. Load switch fuse protector composite apparatus is used for the transformer with 1600kVA and below.

Circuit breaker with relay protection is used to protect transformers in various capacities. Ring6 can be equipped with integrated remote control and monitoring units according to the requirement of customers.

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Low Voltage Switchgear or LV Switchgear

The incomer feeds incoming electrical power to the incomer bus. The switchgear used in the incomer should have a main switching device. The switchgear devices attached with incomer should be capable of withstanding abnormal current for a short specific duration in order to allow downstream devices to operate. But it should be cable of interrupting maximum value of the fault current generated in the system. It must have an interlocking arrangement with downstream devices. Generally air circuit breakers are preferably used as interrupting device. Low voltage air circuit breaker is preferable for this purpose because of the following features

- Simplicity
- Efficient performance
- High normal current rating up to 600 A
- High fault withstanding capacity up to 63 kA











WIRING ACCESSORIES LIKE

SWITCH SOCKETS, DB's, PHASE SELECTOR DB's. CONDUITS PIPE & FITTINGS.



Converting electricity into mechanical energy is the job of the industrial electric motor. Motors create either a linear or rotary force. While electric motors can be powered by direct current (DC) sources like batteries, they are more often powered by alternating current (AC) sources like generators or the power grid. Here are the main components of industrial electric motors:

INTRODUCTION

Electricity requires an electric path to flow and there are many conducting materials used for this purpose. There are many semi conducting materials which are used to reduce the voltage and also drop the current flow. There are non-conducting materials which are used as insulation during working on live-lines. In this unit we will study how the household or industrial wiring is done and what materials are essential for household or industrial wiring. We will also study the different types of wiring and how they is done.

CAPACITORS & FILTERS

How Filter Capacitors Work

How filter capacitors work is based on the principle of capacitive reactance. Capacitive reactance is how the impedance (or resistance) of a capacitor changes in regard to the frequency of the signal passing through it. Resistors are nonreactive devices. This means that resistors offer the same resistance to a signal, regardless of the signal's frequency. This means, for example, that a signal of 1Hz and a signal of 100KHZ, will pass through a resistor with the same resistance. Frequency isn't a factor. However, a capacitor is not like this. A capacitor is a reactive device. Its resistance, or impedance, will vary according to the frequency of the signal passing through. Capacitors are reactive devices which offer higher resistance to lower frequency signals and, conversely, lower resistance to higher frequency signals, according to the formula $XC=1/2\pi fc$.

Being that a capacitor offers different impedance values to different frequency signals, it can acte



SUBSTATION & LINE CLASS ITEM:

Polymeric Insulators, Hardwares, DO Fuse set, GOS, TPMO, Insulators Stay Set, LA, ACSR Conductors

A substation is a part of an electrical generation, transmission, and distribution system. Substations transform voltage from high to low, or the reverse, or perform any of several other important functions. Between the generating station and consumer, electric power may flow through several substations at different voltage levels. A substation may include transformers to change voltage levels between high transmission voltages and lower distribution voltages, or at the interconnection of two different transmission voltages.







HV cable End Termination kits & \ Straight through.

Terminations to indoor switchgears, electric motors, power transformers, instrument transformers and other electrical MV and HV (MV: Medium Voltage; 1 kV < V < 60 kV. HV: High Voltage: $V \ge 60 \text{ kV}$) equipment issues arising for multiple terminations design, namely for switchgears, and a straight coordination with manufacturer is required.









AMF panel is the short form of auto mains failure panel. Its is also known as automatic transfer switch often as part of comprehensive automatic standby power solution which links ATS UPS and standby generators.

Compact SUBSTATION & Dry Type transformer.

Compact Sub-Station (CSS/PSS) comprises of factory built sheet metal enclosure housing MV Switchgear, Transformer, LT Switchgear, Power Factor Correction System, and other site specific requirement.

Space occupied by CSS will be only approx. 1/4 th of the space required for an open installation. It can be installed in the basement, yard or on the roof top.

Compact Sub- Station answers many important considerations of Architects-Aesthetics (no hanging and sagging wires, otherwise, give a clumsy look), Low Space requirement, safety, Easy and quick installation.



POLES AND HIGH MAST

We provide all type of lighting Mast from 10m to 40m range Street lighting pole from 3m to as per customers requirement. Decorative lighting pole from 3m to as per customers requirement. Camera pole as per customers requirement. Distribution pole as per customers requirement. Smart pole as per customers requirement

Servo Systems & AVR.

How Filter Capacitors Work

Servo motors are a type of electromechanical actuators that do not rotate continuously like DC/AC or stepper motors, rather they used to position and hold some object. They are used where continuous rotation is not required so they are not used to drive wheels (unless a servo is modified). In contrast they are used where something is needed to move to particular position and then stopped and hold there. Most common use is to position the rudder of aircrafts and boats etc. Servos can be used effectively here because the rudder do not need to move full 360 degrees nor they require continuous rotation like a wheel. The servo can be commanded to rotate to a particular angle (say 30) and then hold the rudder there. Servos also employs a feedback mechanism, so it can sense an error in its positioning and correct it. This is called servomechanism. So if the air flow exerts pressure on rudder and deflects it the servo will apply force in opposite direction and try to correct the error. Say if you ask servo to go and lock itself to 30 degrees and then try to rotate it with your hand, the servo will try hard and its best to overcome the force and keep servo locked in its specified angle.



LED AND HPSV LUMINAIES

Street lighting LED Commercial lighting LED Area lighting LED Landscape lighting LED Industrial lighting LED









"Darkness cannot drive out darkness: only light can do that. Hate cannot drive out hate: only love can do that."





Thank you...





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