COMPLETE SYSTEM CAPABILITY

Design, manufacturing & equipment supply
from LV systems upto 230kV

Complete system capability including system design & equipment supply for:

- power & distribution transformers
- HV/MV/LV switchgears
- automation (industrial & buildings)
- industrial control & distribution equipment
- power management with tailor made solutions (energy efficiency & intelligent lighting controls)
- busway systems
- current & potential transformer
- æsthetic lighting products & system design

Adex Factories:

ADEX Transformer Factory

ADEX Switchgear Factory

C O M P A N Y

Adex Corporation Ltd.

Adex originally started its operation in 1982 as a specialist in automation and distribution system for process industries, supporting its customers technically to develop automation systems as well as with automation components and spare parts.

Adex won the heart of its customers in a very short span because of its technical superiority and quality aesthetic look systems/equipment.

To cater demand, Adex expanded its activities as a manufacturer & total package solution provider of electrical distribution and industrial control equipment in the fields of:

- Power Generation
- Power Distribution
- Protection, Automation, Metering & Measurement
- Industrial Controls
- Power Management
- Industrial & Public Lighting System.

Its activities now ranges from 230kV down to the low voltage machine connections with world class manufacturing plants and testing laboratories attached with it.

Adex can offer a complete engineering study for system design, calculations for electrical parameters, diagrams, supply and installation of high and low voltage electrical equipment.

Adex serves and support its customers by giving better and energy efficient solutions to the Utility, Industry, Building and Residential sectors.

The commitment to quality has underpinned the current success of Adex leading to continued growth.

C O M P A N Y

Adex Engineering Ltd.

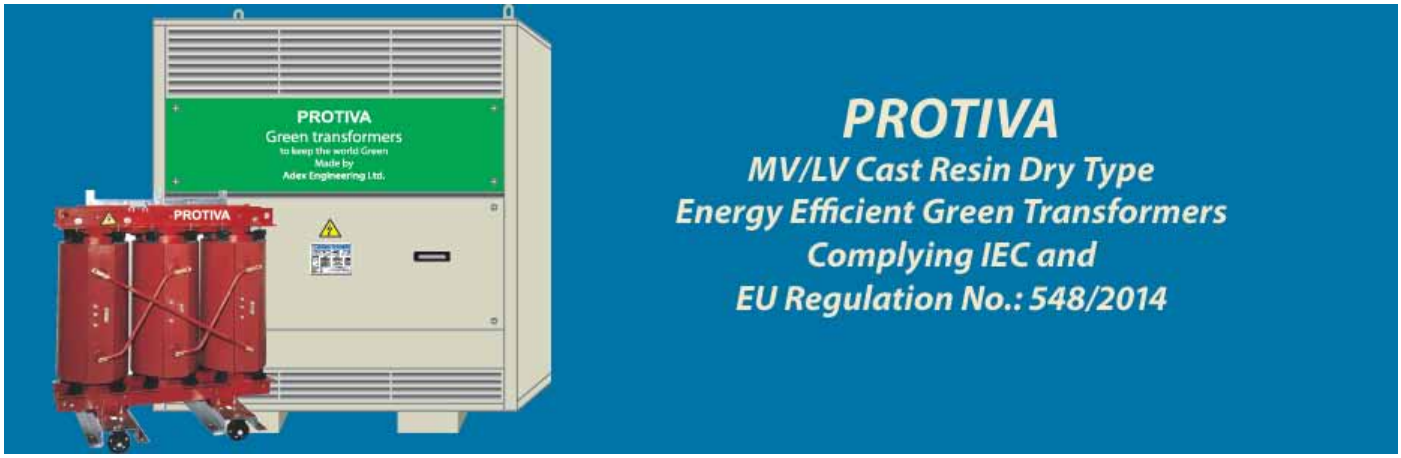
Adex Engineering Ltd. is the manufacturing unit of Adex Group. This manufacturing unit is running independently since 1995 as a transformer and switchgear manufacturer.
In the year 2008, AEL started to manufacture MCB, MCCB, ACB, VCB and magnetic contactors in Bangladesh.

The Manufactured products at AEL factory are:

- Oil cooled power & distribution transformers
- Cast resin insulated dry type transformers
- HV/MV/LV Switchgears
- Distribution Boards
- BTA Busbar trunking system (Power & Lighting)
- NIRAPOD range of circuit breakers:
  - NIRAPOD 5 (Vacuum Circuit Breakers)
  - NIRAPOD 4 (Air Circuit Breakers)
  - NIRAPOD 2 (Moulded Case Circuit Breakers)
  - NIRAPOD 1 (Miniature Circuit Breakers)
- Adecon Contactors
- Adecon Inverters and Starters

All products and electrical systems are designed by our specialised engineers using tailor made engineering software complying IEC 60076, IEC 62271-100, IEC 62271-200, IEC 60947.2, IEC 61439-1, IEC 61439-2 & so on for complete safety of men and machines as well as economical design satisfying the requirement of the installations considering current ratings, short circuit levels, environmental conditions, voltage drops etc.

MV/LV transformers & unit substation



Adex cast resin insulated indoor transformers range from 100kVA to 4MVAfor voltage upto 36kV with no risk of pollution, fire and no dielectric maintenance.

MV Power distribution

With its' integrated intelligence, Adex switchgears & transformers from part of urban and rural electrical distribution systems in: power delivery substations MV/LV including :

- power & distribution transformers
  - oil cooled and
  - cast resin insulated type
- Grid substation and protection, control and monitoring
- Power factor correction & harmonic filtering
- MV distribution and process switchboards
- Power management, monitoring & controls.

Adex is involved at all stages of electrical power distribution, primary and secondary distribution substations, process plant, switchboards and automation systems both as manufacturer & supplier of switchgear equipment and package dealer.

MV/LV prefabricated unit substations are supplied ready for connection to the network and can fit into all type of environment due to the different architectural styles: substations with operator corridor, different roof shapes etc

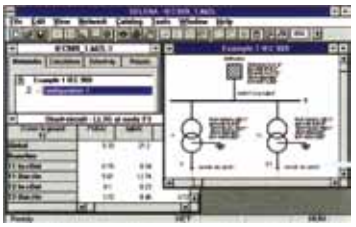
Medium voltage solutions to turn key

From equipment supply ...

- circuit breakers and disconnector switches
- instrument transformers
- power transformers and auxiliaries
- metal clad compartmented MV cubicles
- harmonic compensation and filtering
- multifunction digital protection unit
- VTs, CTs, lightning arrestors
- control and protection board
- monitoring -control of substation.

... to "turnkey"

- engineering design
- layout plans
- civil works guide
- dimensioning and supply of structures
- interconnection diagrams
- list of cables
- earthing grid
- civil works
- installation on site
- site testing and commissioning.



Calculation of high voltage networks on multiple configurations according to IEC 60909 for:

- Automatic single line diagram
- Short circuits
- Cable cross sections
- Protection settings
- Selectivity
- Load flow.

Characteristics
MV equipment

rated voltage (kV)		7.2	12	17.5	24	36	40.5
rated insulation level	(kV r.m.s. 1min)	20	28	38	50	70	85
	(kV impulse 1.2/50μs)	60	75	95	125	170	185
short time withstand current (kA-1s)		50	50	31.5	31.5-40	40	31.5
rated current (A)		630-1250-2500-3150					
short time withstand current (kA-1s)		25-31.5					
rated current (A)		1250-2500					
rated frequency (Hz)		50-60					
HV/MV transformer							
rated power (MVA)		5 to 35					
impedance (%)		7 to 10					

Production Facilities

Technological Development

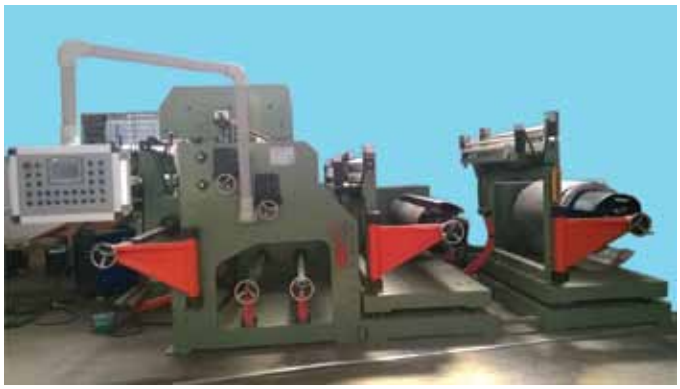
To ensure manufacturing reliability it is important for design and production department to be linked. We facilitate this by our skilled design team and modern digitalized machines for different sections of production. Adex factory is equipped with digital machinery to manufacture quality products. No possibilities of any man made error.

Production Facilities

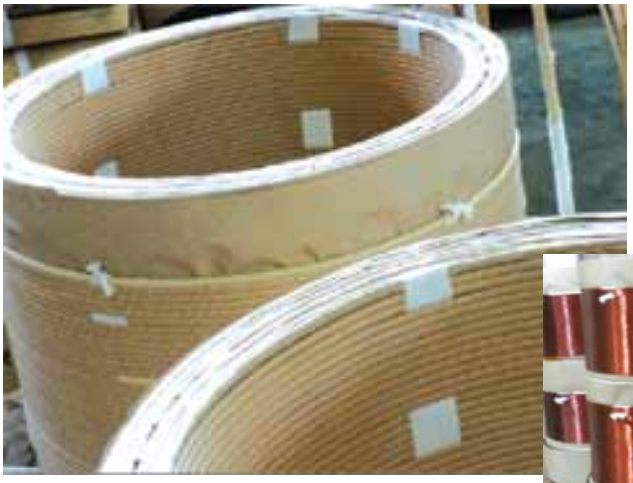
WINDING

Winding is the most important and sensitive part of transformer. Their design and construction decide transformer's parameters demanded by customers.

This section consists series of winding machines for HV,MV and LV coils for all types of conductors,strips and round wires. Digital foil winding machine makes it easy & more accurate winding enabling defect free coils.



Foil winding machine



Low voltage windings are generally layer, helical or disc type. For high voltage windings, flat enamel conductors are used in layer or disc winding technique depending on the voltage and current.

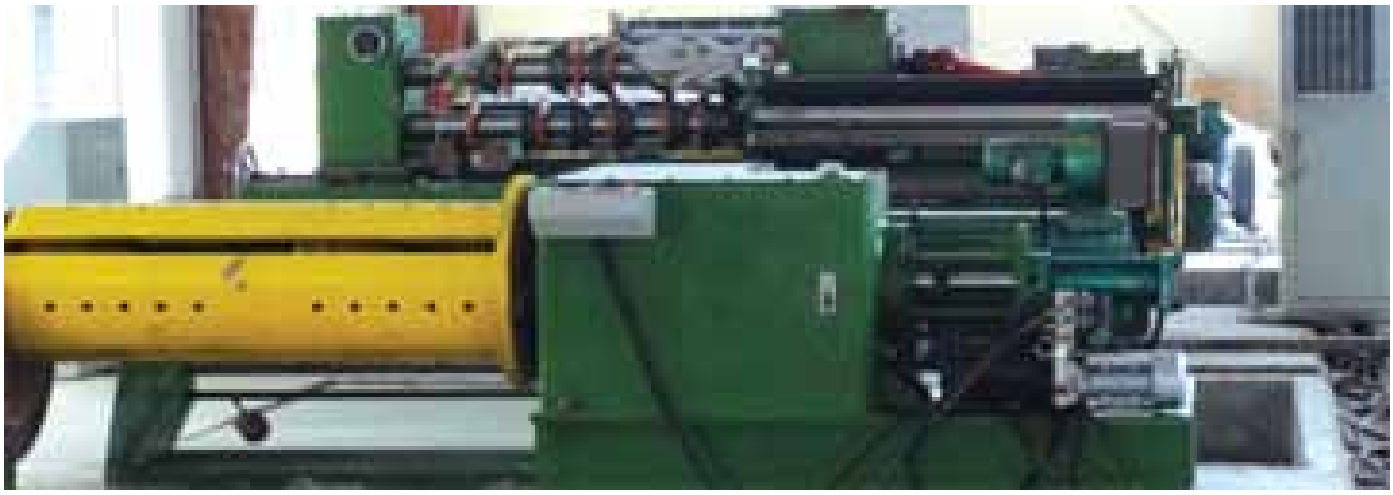
The technologies used are copper or aluminium windings providing transformer its short-circuit strength in accordance with current standards.

DRYING

Before being placed in the tank, the active parts are dried up using vacuum drying oven for removal of moisture and other impurities. It is crucial requirement in transformer ensuring trouble free operation through the life span of the transformer.

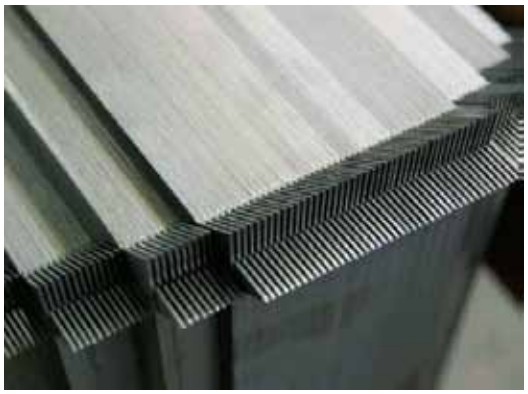
Production Facilities

IRON CORE



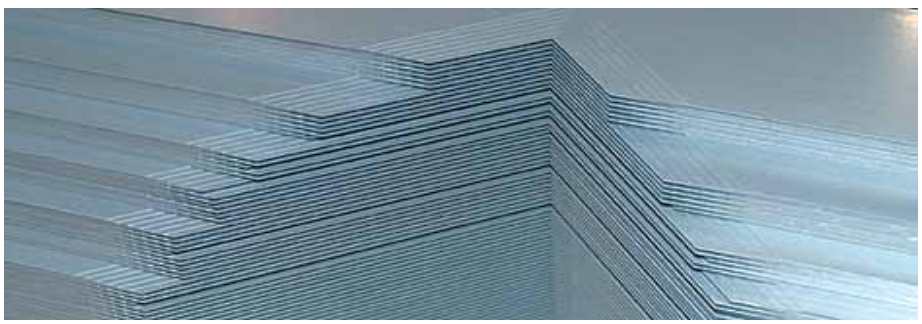
The iron core is made of cold rolled grain oriented, low loss and high magnetic conductive CRGO silicon steel sheet of prime grade only.

The magnetic cores are precisely cut from very wide sheets of electrical steel using a series of slithers and core cutting machines enabling dust free production field for active parts.



Machines are CNC controlled which gives more accuracy and help us obtaining right properties in the material.

Stacking tables for facilitating the standard technique of step lap stacking to reduce core loss and noise level.

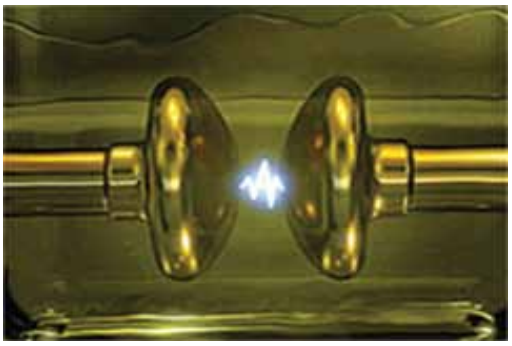


Production Facilities

Testing:

For a quality transformer, Adex has all the world class digital testing facilities including Impulse, power frequency, partial discharge, oil test, load loss/ No-load losses, short circuit tests etc. for greater satisfaction of its customers.

Impulse testing upto 800kV



OIL:

The most commonly used dielectric liquids are of mineral oil type . For purification and filtration, we facilitate oil to be centrifuged by oil centrifuging machine. To control the chemical properties of the insulating material we do testing in our testing laboratory.

R&D:

Adex R&D team consisting of more than 15 engineers & skilled technicians have been working for continuous research & development of its products .

VMC Machine-Making die & molds.

Wire cutter machine

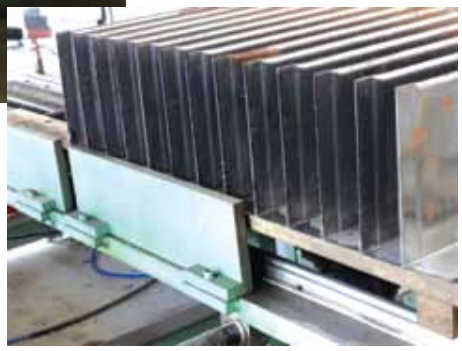
Production Facilities

TANK:

For mechanical production, we have advanced technology facilities like plazma cutting , fin forming machines and etc for making different parts to maintain a high quality. using all digital type machines.

Plasma Cutting machine

Automatic Fins forming & welding machine



MV/LV Switchgears

Bitoron 12

The **Bitoron 12** is a metalclad MV switchgear assemblies designed and made in conformity to new IEC 62271-200 edition 2.0 standards for the safety and protection of life and property as well as easy installation, operation and protecting the environment.

Bitoron 12W switchgear system comprises of modular cubicles with vacuum circuit breakers.

They can be used to build all types of configuration from 3.6 to 12kV 630-2500A,16-25kA. Bitoron-12 meets all the new IEC recommendations.

Bitoron 600

The **Bitoron 600** modular low voltage panel system designed and made in conformity to IEC 61439.1, IEC 61439.2 and is used to compose LV switchboards upto 1000V for all type of applications:

- LV power distribution
- Process control
- Motor control centers and so on

In accordance with IEC 61439.1 & IEC 61439.2 internal partitions between individual compartments can be provided or omitted depending on the type of separations (2a - 2b, 3a - 3b, 4a - 4b)

Bitoron-400

- Compact
- Simple & easy to install
- High breaking capacity
- A modern look, well designed low power distribution board upto 250A designed and made in accordance with IEC 61439.1 & IEC 61439.3

MV/LV Circuit Breaker

NIRAPOD 5 series of **Vacuum circuit breaker** is designed & made in conformity to IEC 60056 standard for system voltages from 3.6kV to 12kV. 630A-2500A, 20kA-25kA-31.5kA
Adex NIRAPOD 5 vacuum circuit breaker is available in two main versions: fixed version & draw-out version to protect & control MV public & industrial distribution network.

NIRAPOD 4 series of **Air circuit breakers** are designed and made incorporating universal control unit NIRAPOD4.02M/H having protection, control & measurement functions. They may be installed in main LV switchboards as incoming units, main and secondary out goings. NIRAPOD 4 ACB offers a complete range with a large selection of performance level:

- ratings from 800 to 6300 A AC,
- breaking capacity from 40 to 150 kA rms;
- operational voltages 690V AC 1000V DC

The circuit breakers is available in two main versions: fixed & draw-out.

NIRAPOD 2 series of **Moulded case circuit breaker** provides the circuit protection & isolation according to IEC 60947.2 using

- thermal magnetic trip units
- electronics / microprocessor based trip units which offers:
  - ▸ Over current protection
  - ▸ Short circuit protection
  - ▸ Isolation to IEC 60947.2

suitable characteristics for:

- distribution circuits
- motor protection
- generator protections

NIRAPOD 1 series **Miniature circuit breaker combines** the following functions :

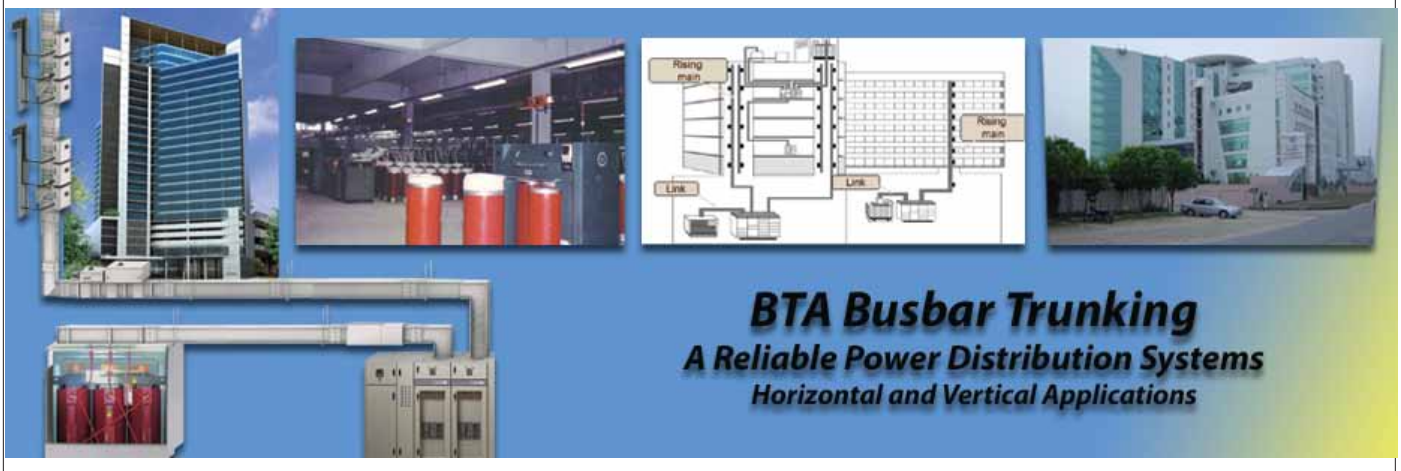
- protection of circuit against short-circuit current.
- protection of circuit against overload current.
- controls.

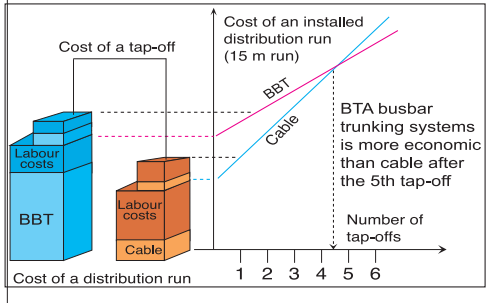
Specially suitable for residential /commercial and industrial installations.

Technical data:

- current rating : 2-63A
- voltage rating : 230/400V~
- breaking capacity : (4-10) kA according to IEC 947-2
- tripping characteristics : B, C & D curve

Power Distribution





Busbar trunking systems

Low voltage power distribution to:

a. industrial machines & lighting

b. commercial & high-rise buildings.

BTA: busbar trunking assemblies

Guarantees a quality distribution system conforming to international standards IEC 61439-6.

When in place shows clearly the distribution circuit diagram and enhances the neatness and aesthetic of a decentralized distribution installation.

Designed in such way as to give the user a maximum of flexibility in use:

Modifications, additions and extensions can be carried out on the installation without disturbing normal activity.

By its simplicity, its rapid assembly and mounting, busbar trunking reduces on site labour charges.

Economical

It is economically profitable by comparison to a cabled installation after the 5th tap-off outlet.

Complete freedom of layout

At the design & installation stages of an electrical distribution system the layouts of the machine and workshop area are seldom finalised.

With tap-off outlets every 0.25 or 0.5 of 1 meter interval, busbar trunking gives the user the total freedom to : carry out tests, install, modify and remove machinery and equipment as required.

Adaptability to environmental conditions

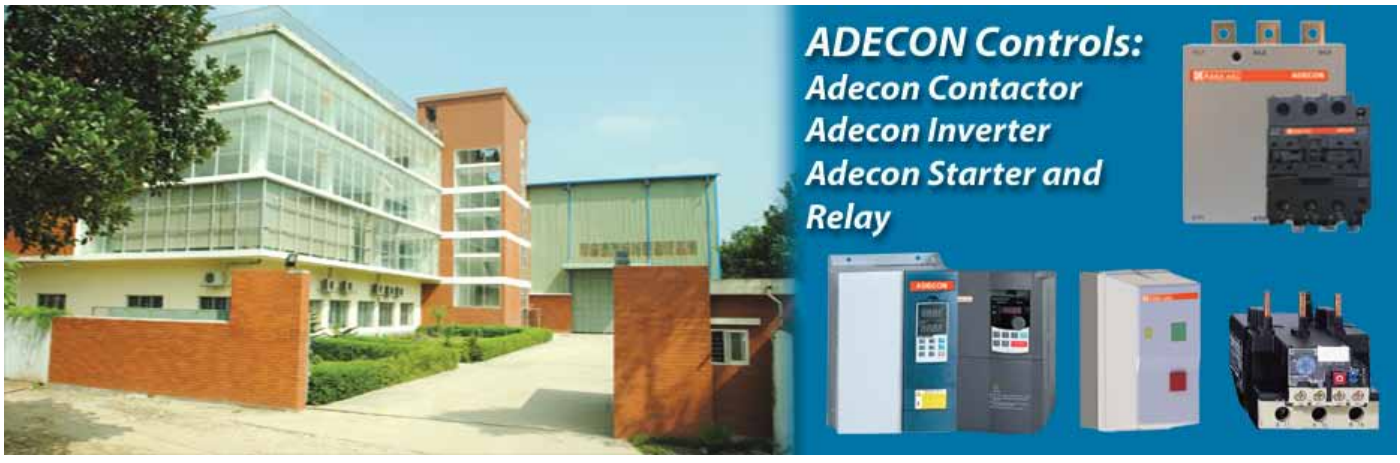
An extensive range of tap-off boxes for automation control & distribution with contactors and circuit breakers can be adapted to difficult environments, dust & damp protection enclosures.

Complete safety

During installation and use, a number of special features have been incorporated into the design of the trunking that eliminate positively any possible errors due to :

- faulty erection (which is impossible)
- unfinished operations
- faulty operations
- easy and rapid jointing of trunking lengths simply by in experts saving costly manpower.
- tap-off outlets protected by automatic shutters a proven safety system for total security.

Industrial controls & reactive power compensations



Reactive power compensation

Cylindrical capacitors are dry capacitors with a tubular casing covering a wide range of powers and voltages both in 50 Hz and 60 Hz.
Its design, manufacturing and testing processes mean that cylindrical capacitors have a high degree of quality and have an extremely long life.

Static regulators (real time)

Regulating reactive energy using a static system is ideal for installations which are sensitive to transients or with very fast reactive power fluctuations (< 0.2 s).

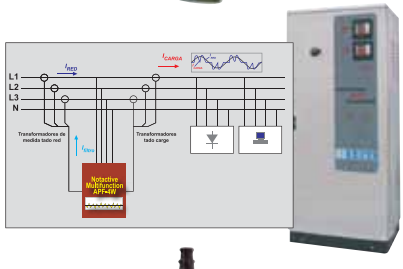
Reactors for filtering

Capacitor banks with rejection filters are designed for systems with a significant harmonic content. They avoid possible resonances with the system and capacitor overload. In order to do this they have a series of reactors and capacitors tuned to a frequency which does not coincide with any harmonic range.

Compensators

A New Concept In Harmonic Filtering

ADEX has a series of electromagnetic filters for the elimination of harmonics named 'Compensators'. These equipments are based on the cancellation and compensation of magnetic fluxes
The main advantage of the Compensator is the absence of electronic components and capacitors. The Compensators are therefore maintenance free, have an extremely long lifetime compared with other types of filters and are compatible with any electrical installation



Industrial Control

A complete range of Industrial control and automation equipment for :

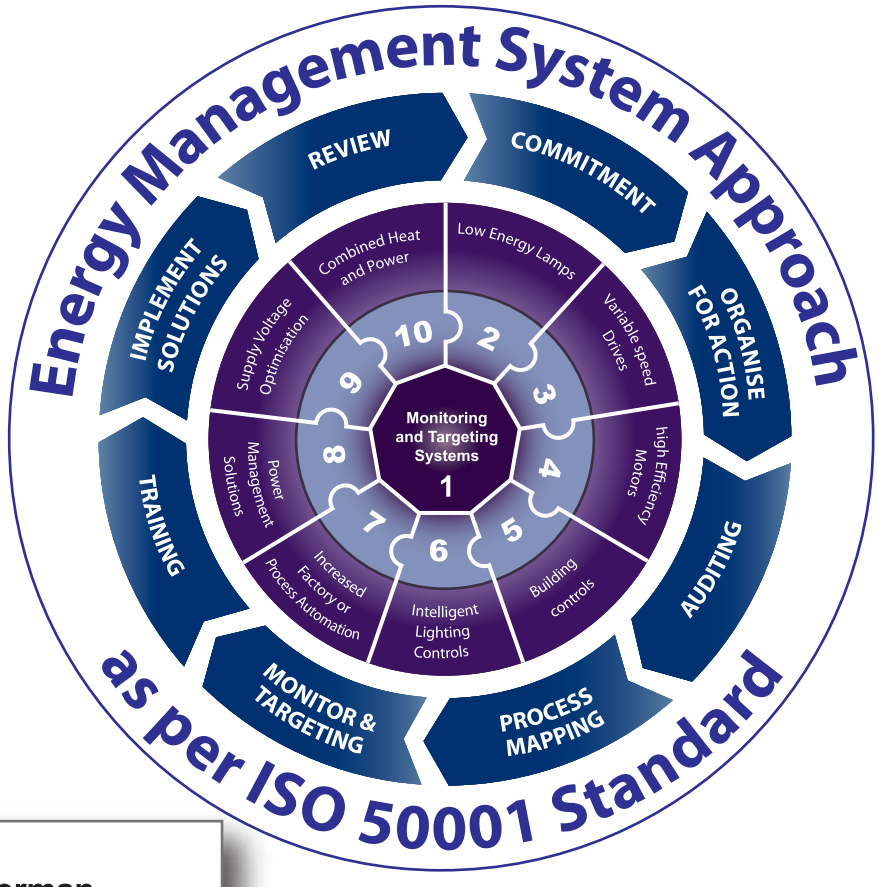
- electromechanical and electronic power switching
- protection and control
- data acquisition
- data processing
- user/machine interfacing
- supervision & controls using PLCs, supervision software and industrial interface terminals
- magnetic contactors
- control & protection relays
- all ranges of motor starters
- soft starter & variable speed drives
- control & signaling devices
- limit switches
- proximity switches
- photo electric detectors.

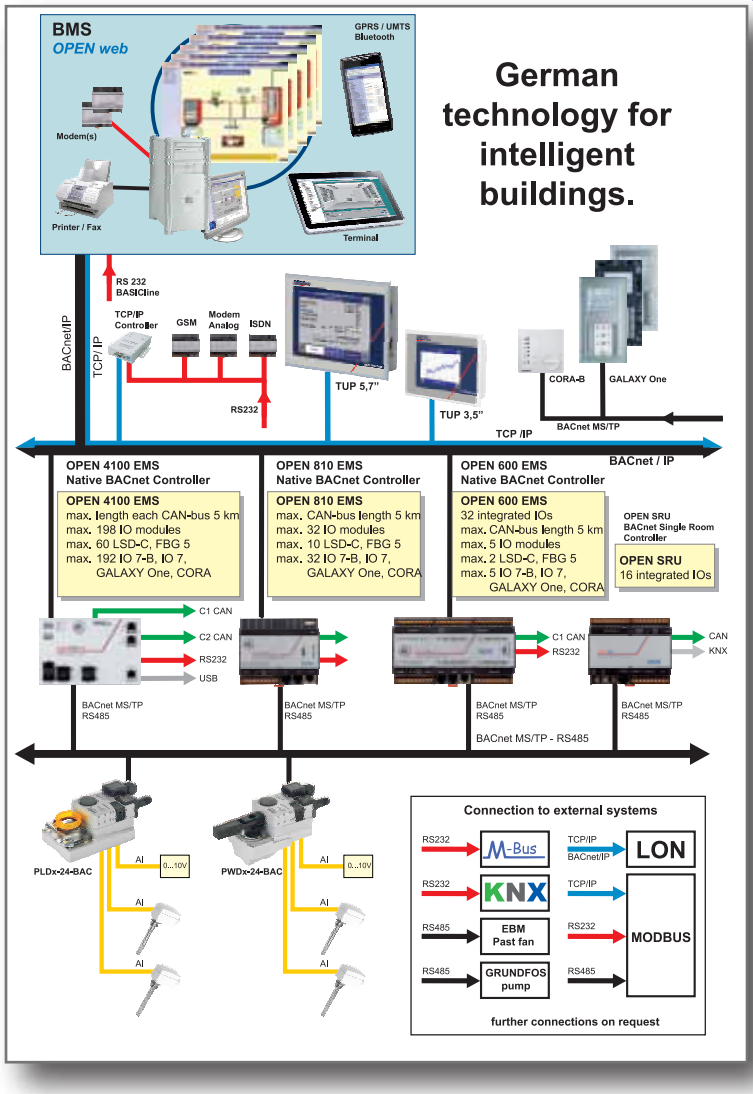
Protection, automation, metering & measurement-PAMM

is responsible for e^3 (electrical energy efficiency)

A complete system solution for Metering & Measurement:-

- The meter can be read remotely & data can be received via a pc or from a central data system.
- Pre-payment solution using a recharging card.
- Readings of different types of consumption at the same time (electricity, water & gas).
- Power control with programmable CUTOFF RELAY & Communications with PLC is possible in Multifunction electronic energy meters.





Complete solution for:-

> HVAC control
> Lighting control
> Parking management
> High level integration (HLI)

Building Management system (BMS) for:-

> Commercial building
> Hotel
> Hospital
> Shopping mall
> Educational institution

Home automation:-

> Anti-theft control
> Automatic gate control
> Access control
> Temperature control
> Lighting control

all are via GSM/GPRS mobile network

Energy efficient lighting design with Intelligent Control

Complete Lighting Solution from Planning to Installation

Services

- **Lighting Design**
  - Interior Lighting
  - Exterior Lighting
  - Emergency Lighting
  - Daylight Studies
  - Digital Renderings
  - Computer Simulation
  - Luminaire
- **Lighting System Design**
  - Daylight System
  - Lighting Control System
  - Emergency Lighting Control System
- **Installation**
- **Programming**
- **Commissioning**

How to Reduce High Energy & Operation Cost ?
Efficient lighting system design is the solution

Lighting consumes 30-40% of total energy in the building

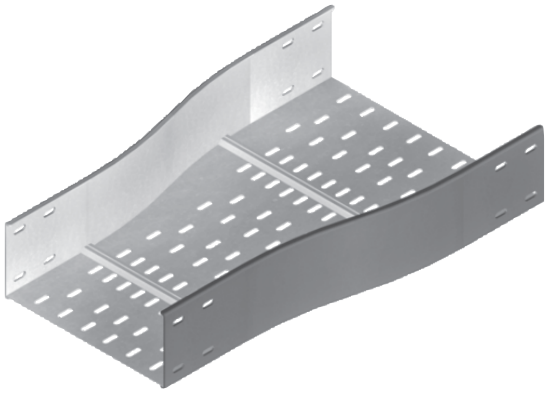
Energy Efficient Lighting for LEED Certification Tubes with 190LM/W - Sensor

Adex Cable Tray

Metallic Adex cable trays are manufactured for the smooth and easy pulling of cable from one point to another to BS EN 61537:2002. We have designed the best cable trays, by taking care of Cable loads and practical site problems. Wherever possible all fitting are made of state of art single piece construction. Slotting Patterns are in such a way that it enables the easy cutting and joining at any point without drilling at site. Design allows greater cable filling capacity and smooth turning at bends.

Product specification
Material and Finish

- Pre-galvanized steel or Zinc plating after steel fabrication (HDGBF) as per BS EN 10142
- Epoxy polyester Powder coating to any RAL colour



Standard sizes available in heavy duty cable tray

Width x Height in mm		
50 x 50	200 x 50	600 x 50
100 x 50	300 x 50	750 x 50
150 x 50	450 x 50	900 x 50

Sizes other than this also available to customer request.

Types available

- Light duty cable tray (P type)
- Medium duty cable tray (M type)
- Heavy duty cable tray (R type)

Length
3 Meter as standard. Other lengths are also available.

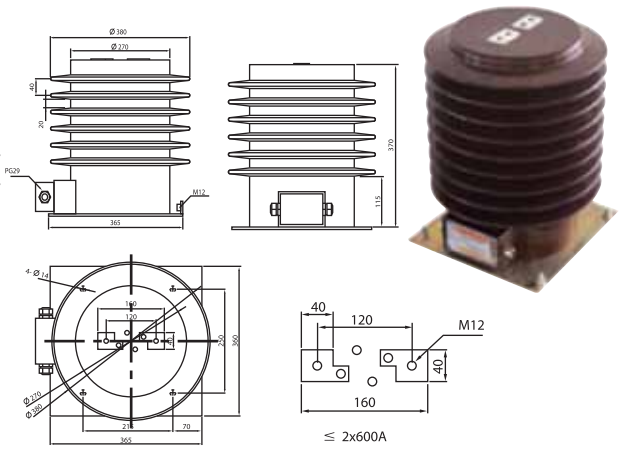
Slotting Pattern
Slots along the length (A) (Standard)

Note: Dimension mentioned through out in the Catalogue is in mm unless otherwise stated.

Outdoor Current Transformer

36kV Single phase epoxy resin type

Epoxy resin casting insulation and fully enclosed support construction, encloses the primary & secondary windings and annular core in the epoxy resin casting body. The product has large periphery insulation creepage distance, withstanding dirtiness and dampness. Be suitable for measuring electric capacity, current and protective relaying in the power system of 36kV (up to 40.5 kV).



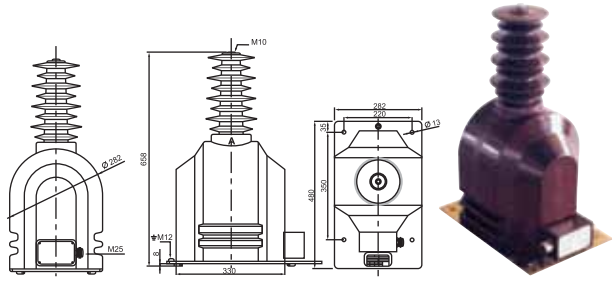
Technical Data:

> Rated insulation level : 36/70/170 kV
> Rated frequency : 50/60Hz
> Installation site : Outdoor
> Technical standard : IEC 60044-2, (IEC 61869-1&3)

36kV Single phase epoxy resin type

Epoxy resin material casting and single pole insulated voltage transformer, is widely used for measuring voltage, electric energy and protective relaying in the electric system with the frequency 50Hz/60Hz and highest voltage for equipment 36 kV (up to ~40.5 kV).

The iron core adopts advanced cold-rolled silicon steel sheet. High voltage outgoing line of primary winding is fetched out from top of the product; outgoing line of secondary winding is fetched out from transverse side of the product.



Technical Data:

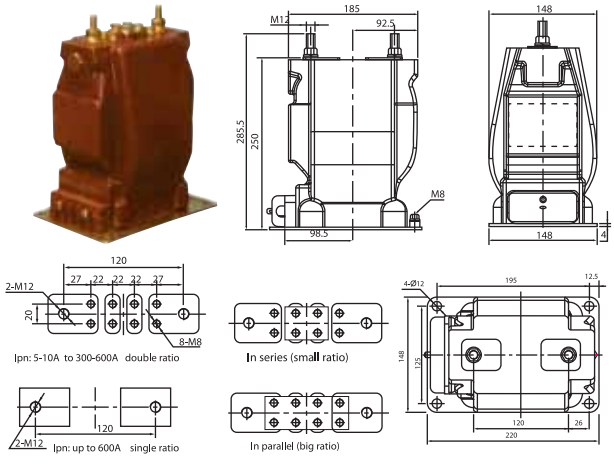
> Installation site : Outdoor
> Rated frequency : 50/60Hz
> Burden power factor : cos ∅ =0.8 (lagging)
> Technical standard : IEC 60044-2, (IEC 61869-1&3)

Indoor Current Transformer

12kV Single phase epoxy resin type

Epoxy resin casting insulation and fully enclosed support construction, encloses primary & secondary windings and annular core in the epoxy resin casting body.

The product has two secondary windings (one measuring winding and one protective winding). It is widely used for measuring current, electric energy and protective relaying in the power system with the rated frequency 50/60Hz and highest voltage for equipment 7.2/12kV.



Technical Data:

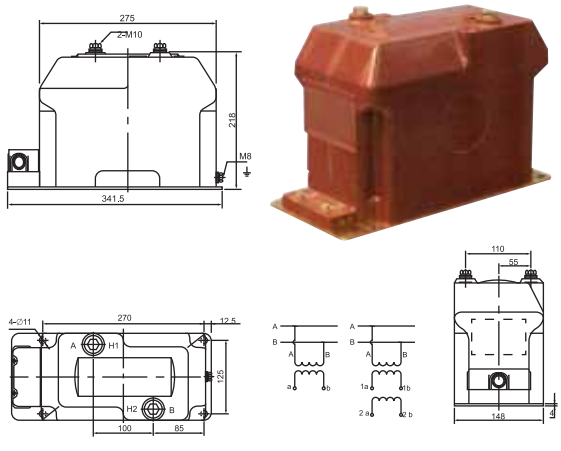
> Rated Installation level : 12/28/75kV
> Rated frequency : 50/60Hz
> Installation site : Indoor
> Technical standard : IEC 60044-1, (IEC 61869-1&2)

Indoor Voltage Transformer

12kV Single phase epoxy resin type

Epoxy resin casting and double pole insulated fully enclosed construction, is used indoor for measuring voltage, electric energy and protective relaying in the electric system with the frequency 50/60Hz and highest voltage for equipment 12kV.

The product has the feature of high reliability, low magnetism of core, large creepage distance of external insulation and maintenance free etc.



Technical Data:

> Installation site : Indoor
> Rated frequency : 50/60Hz
> Load power factor : cos ∅ =0.8 (lagging)
> Technical standard accords with : IEC 60044-2, (IEC 61869-1&3)

Remarks: Upon request we are glad to offer transformers according to other standards or with non-standard technical specifications.

Adecon Contactors

Conforming to IEC 60947-5-1

Model	Maximum rated operational voltage	Maximum rate current for motor control (3 phase 415V, 50/60Hz for AC3 Duty)	3 ~ AC3			Maximum thermal current I_{th} ($\theta \leqslant 40°C$)
			230V HP	46/480V HP	575V HP	
AX3-006	690V	6 A	-	-	-	10 A
AX3-009	690V	9 A	3	5	7.5	25 A
AX3-012	690V	12 A	3	7.5	10	25 A
AX3-018	690V	18 A	5	10	15	32 A
AX3-025	690V	25 A	7.5	15	20	40 A
AX3-032	690V	32 A	10	20	25	50 A
AX3-040	690V	40 A	10	30	30	60 A
AX3-050	690V	50 A	15	40	40	80 A
AX3-065	690V	65 A	20	50	50	80 A
AX3-080	690V	80 A	30	60	60	125 A
AX3-095	690V	95 A	30	60	60	125 A
AD3-115	1000V	115 A	40	75	100	200 A
AD3-150	1000V	150 A	50	100	125	250 A
AD3-185	1000V	185 A	60	125	150	275 A
AD3-225	1000V	225 A	75	150	150	315 A
AD3-265	1000V	265 A	75	150	200	350 A
AD3-330	1000V	330 A	100	200	250	400 A
AD3-400	1000V	400 A	125	250	300	500 A
AD3-500	1000V	500 A	200	400	500	700 A
AD3-630	1000V	630 A	300	600	800	1000 A

Adecon Inverter

Adecon Inverters

Adecon frequency inverter series incorporates high technological software & integrated hardware designed for complex load requirements. With advanced space voltage vector, SPWM control technology achieves high-accuracy closed loop control by high-powered IGBT-DSP chip and built-in current control loop. It can attain high accuracy requirement on output voltage & frequency. Brand-new production craft and optional equipments ensure the high working stability and offer you better motor control solution.

AI - 8000/8100 Series Frequency Inverter 380-500V G4/F3

0.75-7.5kW

AI-8100 G4 General series V/F control (380-500V, 3 phase input & output)

AI No	Model No	Voltage (V)	Power (kW)	Current (A)	Key Model
1	AI-8100A - R75G4	380-500	0.75	2.5	AC6E8100
2	AI-8100A - 1R5G4	380-500	1.5	3.7	AC6E8100
3	AI-8100A - 2R2G4	380-500	2.2	5	AC6E8100
4	AI-8100A - 004G4	380-500	4	8.5	AC6E8100
5	AI-8100A - 5R5G4	380-500	5.5	13	AC6E8100
6	AI-8100A - 7R5G4	380-500	7.5	16	AC6E8100

AI-8100 F3 General series V/F control (380-460V, 3 phase input & output)

AI No	Model No	Voltage (V)	Power (kW)	Current (A)	Key Model
1	AI-8100A - R75F3	380-460	0.75	2.5	AC6E8100
2	AI-8100A - 1R5F3	380-460	1.5	3.7	AC6E8100
3	AI-8100A - 2R2F3	380-460	2.2	5	AC6E8100
4	AI-8100A - 004F3	380-460	4	8.5	AC6E8100
5	AI-8100A - 5R5F3	380-460	5.5	13	AC6E8100
6	AI-8100A - 7R5F3	380-460	7.5	16	AC6E8100

AI-7800 Series Frequency Inverter 380-460V G3

11-630kW

AI-7800 G3 General series V/F control (380-460V, 3 phase input & output)

AI No	Model No	Voltage (V)	Power (kW)	Current (A)	Key Model
1	AI-7800 011G3	380-460	11	25	AC6E7800
2	AI-7800 015G3	380-460	15	32	AC6E7800
3	AI-7800 018G3	380-460	18	38	AC6E7800
4	AI-7800 022G3	380-460	22	45	AC6E7800
5	AI-7800 030G3	380-460	30	60	AC6E7800
6	AI-7800 037G3	380-460	37	75	AC6E7800
7	AI-7800 045G3	380-460	45	90	AC6E7800
8	AI-7800 055G3	380-460	55	110	AC6E7800
9	AI-7800 075G3	380-460	75	150	AC6E7800
10	AI-7800 093G3	380-460	93	170	AC6E7800

Adecon Inverter

AI-9●●● Series Frequency inverter 180-240V (G1) & 380-460V (G3)

0.75-355kW

AI- 9100- G1 General Series Vector Control Inverter (180-240V, single phase input & 3 phase output)

AI	Model No	Voltage (V)	Power (KW)	Current (A)	Key Model
1	AI-9100A - R75G1	180-240	0.75	4	AC6E9100
2	AI-9100A - 1R5G1	180-240	1.5	7	AC6E9100
3	AI-9100A - 2R2G1	180-240	2.2	10	AC6E9100
4	AI-9100A - 004G1	180-240	4	16	AC6E9100

AI- 9000- G3 General Series Vector Control Inverter (380- 460V, three phase input & output) Adecon I- 9100 (0.75kW ~ 7.5kW)

AI	Model No	Voltage (V)	Power (kW)	Current (A)	Key Model
1	AI-9100A - R75G3	380-460	0.75	2.1	AC6E9100
2	AI-9100A - 1R5G3	380-460	1.5	3.8	AC6E9100
3	AI-9100A - 2R2G3	380-460	2.2	5.1	AC6E9100
4	AI-9100A - 004G3	380-460	4	9	AC6E9100
5	AI-9100A - 5R5G3	380-460	5.5	13	AC6E9100
6	AI-9100A - 7R5G3	380-460	7.5	17	AC6E9100

AI- 9200 (11kW ~ 160kW)

7	AI-9200 011G3	380-460	11	25	AC6E9200
8	AI-9200 015G3	380-460	15	32	AC6E9200
9	AI-9200 018G3	380-460	18	37	AC6E9200
10	AI-9200 022G3	380-460	22	45	AC6E9200
11	AI-9200 030G3	380-460	30	60	AC6E9200
12	AI-9200 037G3	380-460	37	75	AC6E9200
13	AI-9200 045G3	380-460	45	90	AC6E9200
14	AI-9200 055G3	380-460	55	110	AC6E9200
15	AI-9200 075G3	380-460	75	150	AC6E9200
16	AI-9200 093G3	380-460	93	176	AC6E9200
17	AI-9200 110G3	380-460	110	210	AC6E9200
18	AI-9200 132G3	380-460	132	253	AC6E9200
19	AI-9200 160G3	380-460	160	304	AC6E9200

AI-9300 (187kW~355kW)

20	AI-9300 187G3	380-460	187	340	AC6E9300
21	AI-9300 200G3	380-460	200	380	AC6E9300
22	AI-9300 220G3	380-460	220	426	AC6E9300
23	AI-9300 250G3	380-460	250	465	AC6E9300
24	AI-9300 280G3	380-460	280	520	AC6E9300
25	AI-9300 315G3	380-460	315	585	AC6E9300
26	AI-9300 355G3	380-460	355	650	AC6E9300

Power Factor Regulators

(Select PF Relay according to applications)

CVM-C10, Power analyzer, panel mounted 96x96
96x96 panel - Power supply 85 ... 265 V_{ac} / 95...300 V_{dc}, and measurement 300 V_{ph-n} / 520 V_{ph-ph}

Type	Code	Current Measuring Channels	Current input	Transistor digital output	Relay digital inputs	Digital (Protocol)	Communication
CVM-C10ITF-485-ICT2	[*] M55911	3	/5 - /1 A	2	2	2	RS-485 (ModBus/ BACnet)

CVM-C5, Power analyzer, panel mounted 96x96
96x96 panel - Power supply 85 ... 265 V_{ac} / 95...300 V_{dc}, measurement 300 V_{ph-n} / 520 V_{ph-ph}

Type	Code	Current Measuring Channels	Current input	Transistor digital output	Digital inputs	Communication
CVM-C5-IC	[*] M55853	3	/5 - /1 A	1	1	-
CVM-C5-ITF-485-I	[*] M55885	3	/5 - /1 A	0	1	RS-485

Power factor regulators (Fast switching)
Computer Smart III-F, special applications for steel mills, welding crane etc., Measurement and protection all in one

Type	Code	Measuring/ Power supply	Nr. Relays	Alarm Relay	Size	Earth leakage $I_{capacitor}$	Communication
Computer SMART 6	[*] R13851	100...520 Vac/ 100...520 Vac	6	Yes	144x144	Yes	Yes
Computer SMART 12	[*] R13862	100...520 Vac/ 100...520 Vac	12	Yes	144x144	Yes	Yes

Computer MAX P&P, Power factor regulators

Type	Code	Power supply	Nr. Relays	Alarm Relay	Size
Computer Max P&P 6	[*] R10871	400 Vac	6	Yes (*)	144x144
Computer Max P&P 12	[*] R10872	400 Vac	12	Yes (*)	144x144
Computer Max P&P 6	[*] R10871002	400 Vac	6	Yes (*)	144x144

FAST reactive energy Regulators, (static capacitor banks)
Computer Smart III-F, Power factor regulators for static capacitor banks, 144x144

Type	Code	Measuring/ Power supply voltage V	No. steps	Alarm relay	Switching unit	Earth leakage, $I_{capacitor}$	Communication
Computer SMART*-F6	[*] R13951	100-520	6	Yes	EMF/ EMB	Yes	Yes
Computer SMART*-F12	[*] R13962	100-520	12	Yes	EMF/ EMB	Yes	Yes

Computer MAX-F P&P, Power factor regulators for static switching, 144x144

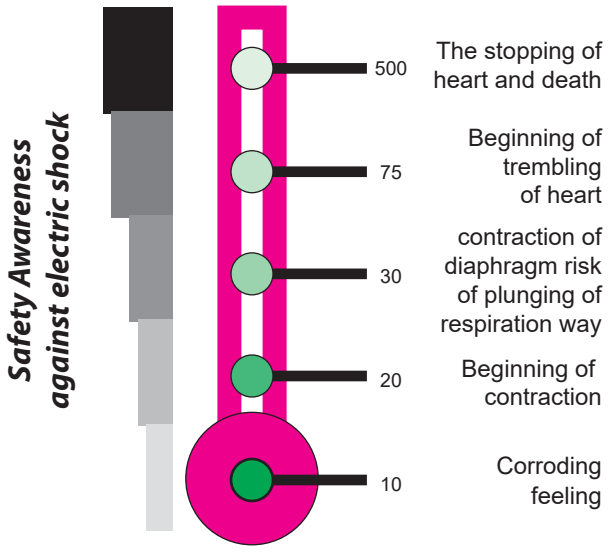
Type	Code	Measuring/ Power supply voltage V	No. steps	Alarm relay	Switching unit	Earth leakage $I_{capacitor}$	Communication
Computer Max 6f	[*] R10851	400	6	-	EMF/ EMB		
Computer Max 12f	[*] R10862	400	12	-	EMF/ EMB		

Guide of selection for harmonic or disturbance filtering equipment

Types of anomalies

Faults	Causes	Solutions	Equipment
After disconnecting the capacitors: ■ Overload in capacitors ■ Problems with electronic controls ■ Transformer vibrations	Resonance in the capacitor bank with the transformer as a result of existing harmonics	Resonance elimination	Detuned filter banks OPTIM FR P&P, OPTIM FRE, FAR Q
Neutral overload in lines for: ■ Lighting ■ Computers	Circulation of third harmonic (homopolar)	Blocking or correcting filter in third harmonic	* TSA, FB3 blocking systems * AFQ active filters
Overheating and overload in: ■ Phase cables ■ Transformers ■ Motors ■ Automatic circuit breakers	Existence of harmonics in different ranges	Harmonic filtering	* LCL, FAR-Q absorption filters * AFQ Active filters
Trips in: ■ Earth leakage circuit ■ Breakers	Existence of high frequency current leakages, caused by EMI filters	Earth leakage protection and filtering	* Reactors LR (1) * Immunized earth leakage relays (2)
Unbalanced lines + Harmonics in neutral	Unequal distribution of single phase loads	Phase balancing and harmonic filtering	Active filter, multifunction

Effect of electric shock on human body depending on level of current.



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