



# Specpower Engineering

**Distribution Transformer**

**Power Transformer**

**Cast Resin Transformer**

**HT Switchgear**

**LT Switchgear**

**PFI Plant**

**Generator**

**Busbar Trunking System**





## Specpower Brand Transformer

In almost every place where people live and work you will find at least one transformer. Transformers are one of the most important units in every production process. Without them the core activities of nearly every business and factory would come to a standstill with serious financial consequences.

We are well aware of this dependence. This is why we never compromise on the performance, security or reliability of our products nor on design, materials, manufacturing methods, environmental protection or recycling.

Our objective is to support you and to add value to your activities, by offering a comprehensive range of top quality transformers. **We also provide high class service and support.**

With this approach we can tailor the most appropriate technical solution to every problem.

A high quality solution with better service and support, better for the environment and yet with greater availability and a lower total cost of ownership than our competitors.



STANDARDS	IEC 76 ,BS 171 ,ANSI C57 12 ,VDE 0537
FREQUENCY	50 Hz, on request 60 Hz
RATINGS	For ratings higher than 10/14 MVA please consult us.
PRIMARY VOLTAGE	For values above 24 kV and up to 36 kV please consult us. Double high voltages (example 15-20 kV) can be offered.
STANDARD TAPPINGS	$\pm 2.5$ ; $\pm 5$ or $\pm 2 \times 2.5$ ; -7.5 and others on request.
SECONDARY VOLTAGE	400 to 433 V other values may be offered. Double low voltages with 7 LV bushings can be offered with full rating. On both voltages or with reduced rating (75) on lowest voltage.
REMARKS	<ul style="list-style-type: none"><li>- Special designs may be studied on request.</li><li>- We can offer transformers with reduced noise levels and no load losses.</li><li>- If after reading this brochure you have any questions, our engineers will gladly provide you with further information.</li></ul>

## Physical Dimensions of ONAN Transformers

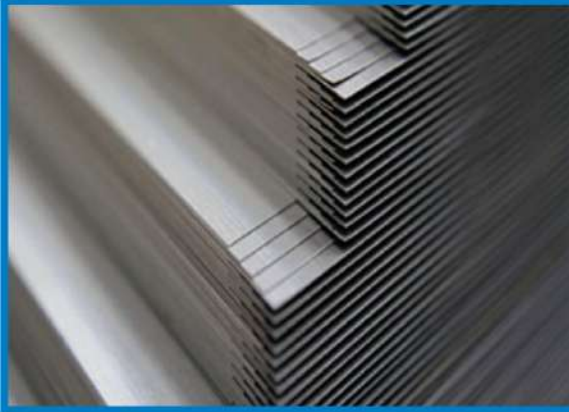
Rating(KVA)	100	150	200	250	315	400	500	630	750	800	1000	1250	1500	2000	3000	5000
Weight(Kg)	600	760	1000	1150	1369	1400	1795	2540	2800	2875	3000	3900	4800	5650	9400	13500
Height(mm)	1350	1450	1600	1550	1600	1600	1650	1750	1990	1990	2050	2150	2250	2500	2650	.....
Width(mm)	900	1050	1000	1000	1230	1230	1530	1630	1600	1650	1850	1950	2050	2200	2450	.....
Length (mm)	1200	1230	1320	1420	1300	1300	1570	1670	1650	1650	1870	1970	2070	2220	2540	.....



Engineering & Innovation

# Specpower Engineering





### Construction of a distribution transformer

The construction of a transformer comprises two active components the ferromagnetic core and the windings within the transformer industry, the core and windings together are normally referred to as the "active part" The passive part of a transformer is the cooling system, in case of liquid-immersed transformers consisting of the tank and the cooling liquid (mineral oil, silicone fluid, synthetic organic ester or natural ester).

### The heart of the matter: the ferromagnetic core

The cut of the core sheets and the material of the ferromagnetic core are optimized according to the desired no-load characteristics and the specified noise level. Extensive rationalization of the shape and the clamping devices enables **Specpower** to produce a core with minimum losses and dimensions. This methodology optimizes the consumption of both materials and energy, bringing benefits to the environment and to both the user and manufacturer.

The core has to be constructed in such a way as to limit the energy losses caused by eddy currents and hysteresis to a minimum. This is achieved by the use of silicon steel, special soft steel with a 3.5% silicon content, which is characterized by low hysteresis losses and high resistivity the reactive power dissipation, can be lowered by limiting flux disturbances and minimizing air gaps in the joints between the core legs and the yokes.

### Material

The core is constructed using thin sheets of cold-rolled grain-oriented magnetic silicon steel. Conventional grain oriented steel (CGO steel) is used for transformers with normal no-load loss characteristics, while transformers with reduced no-load losses are often built using higher-quality HiB steel, usually domain-refined (e.g laser treated) these steel sheets are 0.23 to 0.35mm thick. Extremely low no-load losses can be achieved only by using amorphous metal.

### Winding

Circular type and rectangular type windings are respectively used for relatively large or small type of transformers. Axial and radial ducts of the winding allow the liquid insulation for cooling. It causes uniform heat dissipation due to losses. The round conductor windings consists of individually wound coil sections connected in series to produce phase winding. **Specpower** uses high grade imported copper for LT winding and export quality super enamel gazi wires for HT windings.

### Testing

In the test day, each transformer is subjected to a number of routine measurements and tests.

**Specpower** test laboratory is approved by The Electricity Licensing Board of Energy Ministry and BUET. All test instruments are kept calibrated. Though all tests and checks are done during production process and completed transformer. Following routine tests are conducted also.

- i) Insulation resistance test
- ii) Induced over voltage test
- iii) Separate source voltage withstand test
  - a) HV high voltage test
  - b) LV low voltage test
- iv) Turn ratio test, polarity and phase relationship test
- v) HV and LV resistance test
- vi) No load current and No load loss measurement test
- vii) Load losses test at rated current and frequency
- viii) Percentage impedance
- ix) Core insulation test
- x) Insulating oil test
- xi) Function of tap changer test

### Type test

Type Test (One in each lot)

- i) Temperature rise test
- ii) Over load test
- iii) Noise level test
- iv) Oil leakage test



# Specpower Engineering



## HT SWITCHGEAR

This design ensures ease of operation, low cost maintenance and higher longevity. We are also using very high quality ring main unit (RMU) suitable for highly populated cities for multiple feeders in incoming and outgoing.

HT Panels are equipped with built-in mechanical interlocks for safety and the breaker compartment is so designed, that it ensures the inter changeability with the identical circuit breakers. The cubical design of 12KV, 25KV, and 1250A is also compatible with our SF6 and minimum oil circuit breakers (MOCB). The panels are fully compartmentalized and extensible on both sides, consisting of busbar chamber with adequate air clearances, PT compartment, CT and cable termination compartment, breaker compartment and metering chamber.

### Type of HT Switchgear

#### FIXED TYPE

VCB/LBS/SF6 breaker is suitable for use in cubicle switchgear units. Such breaker is fixed to a switchgear or floor by bolting its base with it. If requested, fixed mounting SF6 Breaker/VCB/LBS's may be provided with wheels which will make its movement easier.

Connections between the breaker and incoming as well as outgoing busbars are made directly and kept fixed.

The terminal arrangement of a fixed mounting breaker is such that connections to various positions are made in the following manner :

- Main connection** - by bolts
- Control connection** - by screws earth
- Connection** - by screws

#### Draw Out Type

VCB/SF6 breaker is mounted on a cradle. The complete unit may be provided with a shutter of front cover. This SF6 Breaker/VCB along with the cradle can be easily installed inside a switchgear compartment without any need of mechanical adjustment.

**The interlock of the draw out mechanism type and its special features are as follows :**

- The circuit breaker cannot be placed in or withdrawn from its cradle when it is in closed position.
- The circuit breaker cannot be operated at the time of inserting in the cradle.

### Testing for HT Switchgear

#### Test before assembly

1. VCB/LBS/SF6/MOCB
2. CT Test
3. PT Test
4. IDMT Relay Test
5. Ammeter Test
6. Voltmeter Test
7. Insulator Test

#### Test after assembly

1. Wiring Test
2. Overall Performance Test
3. Continuity Test
4. Insulation Resistance Test
5. Final Check up
6. Relay Test
7. Contact Resistance Test



### Equipment Used

SL	Equipment	Brand, Model & Country
1.	LBS	F&G /Hausmann, Germany
2.	VCB	ABB, Italy/ Siemens, Germany
3.	CT, PT	Siemens, Germany
4.	IDMT Relay	Omron, Japan/ Mikro, Malaysia
5.	Ammeter, Voltmeter	Rishabh/Risesun, Taiwan



**Specpower Engineering**



## LT SWITCHGEAR

### Main Feature of Our LT Switchgear

#### Construction

- Metal frame : MS Sheet
- Paint : Powder coating at high temperature.
- Busbar : Required rating hard drawn busbar(KA).
- Cable : Eastern NYY Cable, 600/1000 Volts(Black) or equivalent.
- Specification : Plain annealed copper conductor, PVC insulated and PVC Sheathed single cable. Suitable use for indoors, outdoors, underground and water for continuous permissible service voltage of 720/1200V.

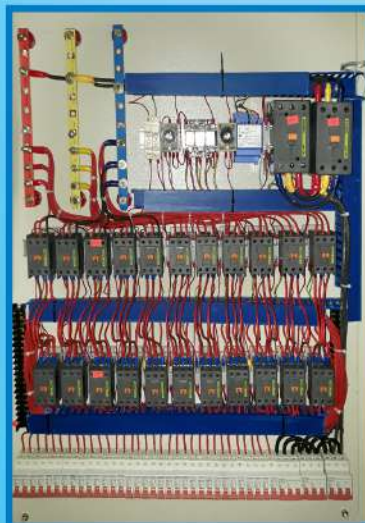
#### Panel Dimension

Dimension	Unit (mm)
Height	2200
Width	1000/900/900/900/900/900=5500
Depth	1000



### Testing for LT Switchgear

Test Before Assembly	Test After Assembly
1. Circuit Breaker/ACB	1. Wiring Test
2. CT Test	2. Performance Test
3. Ammeter Performance	3. Continuity Test
4. Voltmeter Performance	4. Insulation Resistance Test
5. Insulator	5. Final Check Up



**Specpower Engineering**



## POWER FACTOR IMPROVEMENT (PFI) PLANT

### Main Feature of Our Panel

#### Construction

- Metal frame : MS Sheet
- Paint : Powder coating (siemens gray) at high temperature
- Busbar : Required rating hard drawn copper busbar (KA)
- Cable : BRB or Eastern NYY Cable, 600/1000 Volts (Black)
- Specification : Plain annealed copper conductor, PVC Insulated and PVC Sheathed Single cable. Suitable use for indoors, outdoors, underground and water for continuous permissible service voltage of 720/1200V.

### Correction/Improvement Principal

**Specpower** power factor improvement plants are manufactured in modular design and consist of-

- \* relay module
- \* capacitor modules

#### The regulation module consist of -

- \* Solid state reactive power relay with digital indication of power factor
- \* Circuit breaker for control cable protection

#### The capacitor module consist of -

- \* Air break contactors to switch capacitors
- \* Dry power capacitors (insulating gas filled) conforming to IEC 70, IEC 831 (latest specification) EN 60831-1 with
- \* Metalized plastic foil
- \* Low loss (0.2W / KVAR) polypropylene dielectrics that allows self healing
- \* Environment friendly insole device
- \* Harmonic load tolerance
- \* High reliability ting gas filled
- \* Built-in over pressure relief
- \* High overload capacity (15 X rated current)
- \* High capacitance stability
- \* Long life (Approx 100,000 hrs.)
- \* High switching durability
- \* High temperature class
- \* Touch proof terminals

### Why it is essential

Motors, transformers and other inductive loads require reactive power. Transmitting/distributing the reactive power from the power station to the loads is uneconomical. It impose undue burden on generators and transmission/ distribution system, causes additional losses, increases voltage drop and the overall power requirement of the plant.

Economic and technical reasons thus make it expedient to relieve the generators, transmission/distribution system and able of reactive power. The automatically controlled capacitors i.e. **Specpower** power factor improvement (PFI) plant is well suited for this purpose.



# Specpower Engineering

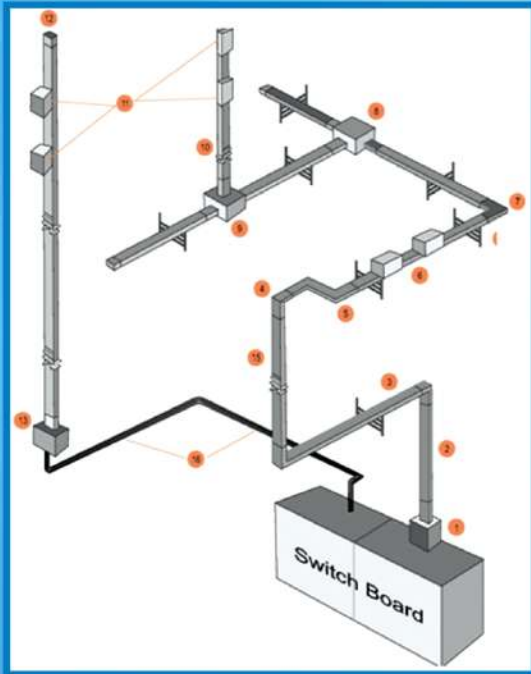


## Busbar Trunking System

Busbar trunking system (BBT) performs the function of transporting current from one point to the other. Traditionally cables were used for this function. BBT goes beyond what cables do. BBT can tap off power to switchgear for further distribution using tap off boxes. In comparison to cables, BBT can thus serve as distribution panels at different stages (at floors of a building). BBT thus continues as a single system to replace cables as well as distribution boards at floor level for building (commercial or industrial).

**Specpower** introduces world-class sandwich Busbar Trunking System (BBT) under the brand LS to its valued Bangladeshi customers. The BBT is totally enclosed, non-ventilated design busbar and is fully insulated using halogen free fire retardant epoxy insulation. LS BBT system offer a superior alternative to cables and other bus trunking options through this compact and scalable range of system thus providing an enhanced solution to power transmission and distribution in buildings as well as industry.

### Typical Busbar Trunking Layout



- 1- Flange End, 2- Vertical Feeder Busbar
- 3- Horizontal Feeder Busbar, 4- Flat-Wise Elbow
- 5- Double Elbow, 6- Horizontal Plug-in Busbar
- 7- Edge-Wise Elbow, 8- T-Section
- 9- Reducer T-Section, 10- Vertical Plug-in Busbar
- 11- Tap-off Unit, 12- End Cover
- 13- End-Feed Cable Box, 14- Horizontal Hanger
- 15- Vertical Spring Support, 16- Cables



### Generator ( 20 KVA-2000 KVA)

**Specpower** is associated with world famous Generator Company Welland Power (UK), Aksa (EU) and FMW/ FUJIAN (China). We always give priority to our valued customer in choosing generator brand.

**Brand : Welland Power (United Kingdom)**

**Engine : Perkins / Cummins**

**Alternator : Mecc Alte / Stamford**

**Brand : Aksa (EU)**

**Engine : Aksa**

**Alternator : Aksa**

**Brand : FMW/FUJIAN (China)**

**Engine : Weifang (Ricardo Series)**

**Alternator : Stamford Type / TFW**



# Specpower Engineering





# Specpower Engineering



Our Channel Partners



**HYUNDAI**  
HEAVY INDUSTRIES CO., LTD.

**SIEMENS**



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