

MAGNETICS

Transformers & Inductors



Power Ratings up to 1000kVA | Customised Magnetics | Complying to International Standards

APPLICATION AREAS...



Renewable and Non-renewable Energy (Wind, Solar & UPS)

- » PFC Chokes
- » Input and Output Filter Chokes
- » Inverter Isolation & Rectifier Input
- » Auxiliary & Integrated Transformers
- » Converter Duty Transformers
- » Air Core Reactors

Traction/Railway

- » Power Supply Auto-Transformers
- » Battery Charging Transformers
- » DC Chokes
- » Hotel Load Converter Chokes

Drives Applications

- » Input / Output / Line Filter Chokes
- » Converter Duty Transformers
- » Low loss Multi Winding Tx & Chokes
- » Phase Shift Transformers

Marine Applications

- » Dry type Transformers and Inductors
- » Water Cooled Transformers and Inductors

Industrial Applications

- » Multi-taping Potential Transformers
- » Power Transformers
- » K rated Transformers
- » Detuned Reactors
- » RL Load Reactors

Machine Tools

- » Isolation Transformers
- » Control Transformers

Special Applications

- » Transformers for Medical applications etc.
- » Intermediate Transformers

SALZER, in Brief

- Established in 1985, headquartered in Coimbatore, South India
- With a wide range of products catering to Industrial, Building and Construction, Energy Management and Automotive Segments
- Five Factories with International affiliations
- Technology Leadership through global alliances and innovations
- International Product Approvals such as CSA, UL, S-mark, CB certification, CE and RoHS- compliance
- India's Leader in Rotary Switches and Wiring Ducts
- Wide distribution network in India and exports to over 50 countries

SALZER Trafomodern - Technical JV

In 2015, Salzer Electronics entered into a Technical Joint Venture with Trafomodern, Austria. The Design and Process Technology is supported by Trafomodern to manufacture energy efficient Transformers, Inductors and Chokes.

Trafomodern - in Brief

- Established in 1945 and located in Hornstein, Austria
- Has achieved market leadership in the course of 70-years
- An ISO 9001, ISO 14001, UL, CSA and ATEX approved company
- Trafomodern, Austria is a market leader for Inductive winding components and are exporting to many countries worldwide

Vision

Our Vision is to be a Global Electrical Solutions Company, most admired for its people, performance and values

Mission

Our Mission is to build on our experience in product excellence and technology / innovation to provide the highest quality and most reliable electrical products and services to our customers

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Engineering

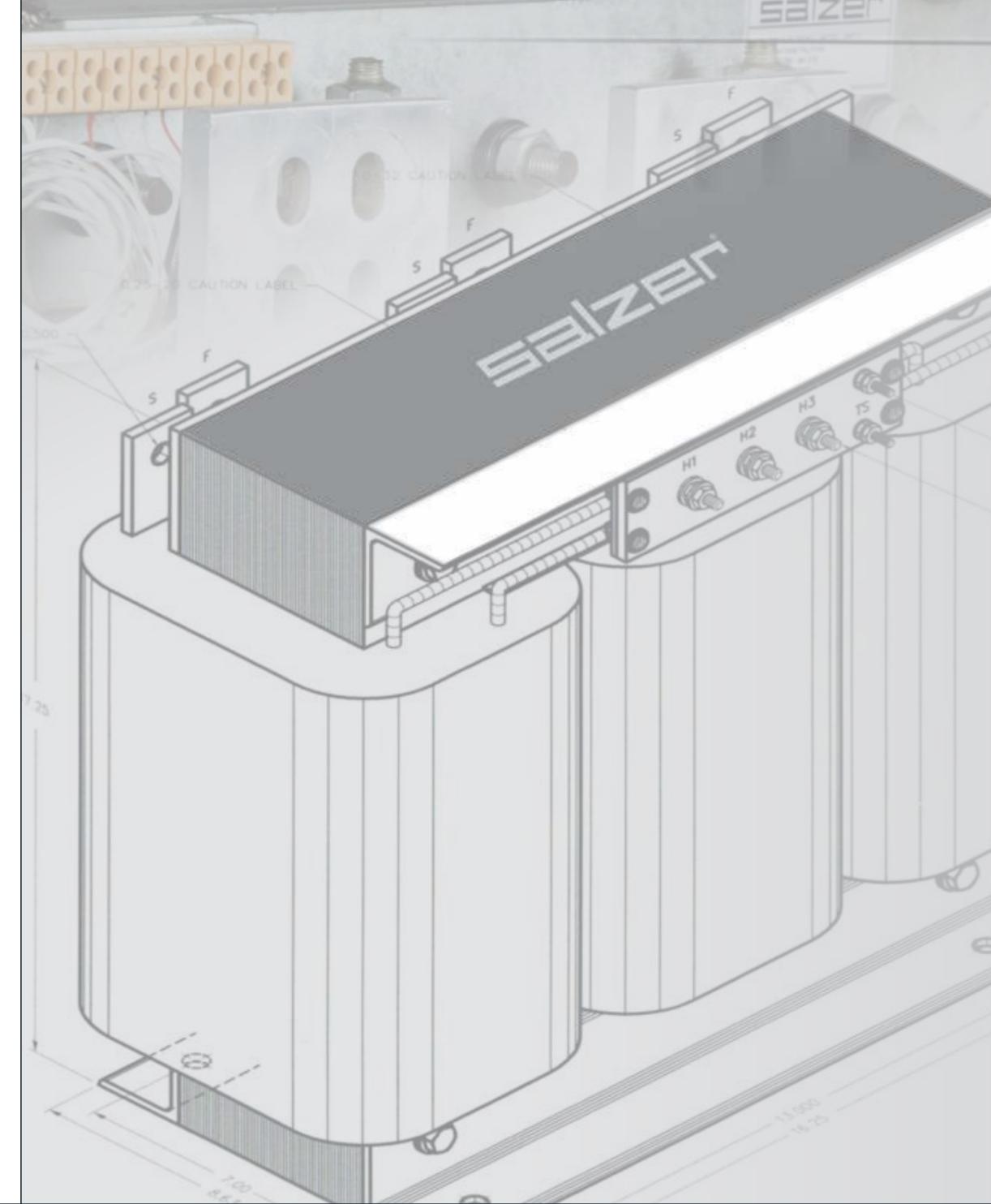
Salzer has design technology capable to develop customised transformer, Inductors and integrated/ assembled magnetics as per the required specification.

Our engineering is strengthened with skills of analysing the important parameters such as Temperature/cooling, Shock and Vibration, Short circuit withstand capability which enables us to offer robust and reliable products.

Our design process is continuously improved with engineering skills and innovative technology by in-house research and development.

We design product in compliance with directives such as IS, IEC, UL, EN, ANSI/CS, RoHS and CE. Our Magnetics are designed to meet High Efficiency, Low Noise, Low Losses, Good dielectric withstand capabilities with proven insulation system up to 220°C.

Salzer Electronics engineering is providing cost effective solution and with value engineering optimising the cost effectiveness.



Magnetic Parts Capabilities

- Transformer (3 Phase and 1 Phase) upto 1000kVA, 690V
- Inductor (3 Phase and 1 Phase) upto 1 MVAR, 2500A-Max Current Rating
- DC Chokes
- Special Products
- OVDT - Open Ventilated Dry type Transformers - 11kV / 433V, Class-F/H-upto 400kVA
- Water cooled Reactors

Product Range by Construction

- 1 Phase and 3 Phase Designs
- 5 Magnetic Limb Designs
- Transformer with Integrated Choke
- Air core Construction Design
- Multiple Tap output Construction
- Parts with Enclosure Design

Product Range by Function - Transformers / Inductors

- | | |
|---|---|
| <ul style="list-style-type: none"> • Step-up and Step-down • Isolation Transformers • Control Transformers • Lighting Transformers • Auto / Multi tapping Transformers • Buck boost Transformers • Power Supplying Units • K-Rated Transformers • Special applications | <ul style="list-style-type: none"> • Input and Output Chokes • Power Factor Correction (PFC) • Boost Choke • Harmonics / Ripple Filtering • DC Chokes • Chokes for Drives application • Balancing Reactor • Power Smoothing Reactor • Detuned Reactor • RL-Load Reactor |
|---|---|



Manufacturing

- ▶▶ Factory infrastructure with dust-free and clean environment
- ▶▶ State of the art winding machines
- ▶▶ Precise Lamination cutting machines
- ▶▶ Customised fixtures to achieve precise calibrated inductance
- ▶▶ Automated Vacuum Pressurised Impregnation plant (VPI)
- ▶▶ SCADA enabled test bench
- ▶▶ Well designed process control system



Quality & Testing

Zero-Defect is our aim. We maintain reliable standards in the quality of our product line. The Magnetics produced in Salzer are tested for various quality parameters. As the Magnetic parts are a critical category the basic validation of design, safety, performance and reliability are tested.

Salzer has full-fledged in-house Automated Testing Laboratory to conduct Routine Test for Transformer and Inductors as per IEC/IS Standards.

The Routine test such as:

- ▶▶ Winding resistance test
- ▶▶ No load loss and current test
- ▶▶ Load Loss test and impedance test
- ▶▶ Turns ratio Test
- ▶▶ Separate source voltage test (Hipot)
- ▶▶ Insulation Resistance (IR) test
- ▶▶ DVDF/IOVT Test
- ▶▶ Inductance test
- ▶▶ Losses test
- ▶▶ Noise level Test
 - Thermal Heat run (Type Test)
 - PD (Type Test)
 - Shock & Vibration (Type Test)
 - Lightning Impulse Test (Type Test)



RENEWABLE ENERGY / WIND & SOLAR

Inductor of single phase and 3 Phase for high frequency filter application. These chokes are designed to specified harmonics to maximize the efficiency by limiting the losses and temperature by using high grade magnetic lamination with low magnetostriction, eddy current, and hysteresis losses and calibrated inductance. Salzer compact design, Insulation class and vacuumed pressurized impregnation makes it maintenance-free for a long service life. The chokes are used in onshore and offshore installations.

In Solar Energy application : 3-phase Sine wave filter inductor used at IGBT output of Inverter and connecting to grid transformer for Current Harmonics Filtering and smoothing application.

Auxiliary isolation transformers for Solar Energy application which is connected to Grid and supplying auxiliary power to Solar Central Inverter accessories like pump, Heat exchanger, cooling fans, cabinet fans, Heaters, SMPS etc. The Grid is connected to output of IGBT bases inverter. Hence transformer will be designed to customised impedance to limit lesser percentage of Voltage THD (Total Harmonic Distortion) at secondary side. Salzer has also Step up Grid transformer with multiple input winding and single output upto 12KV voltage class.

3Phase sine wave filter Inductor



3Phase sine wave filter inductor is used at output of IGBT based inverters (Solar & Wind inverter)

Copper / Aluminium wound
Current: upto 2500A
Inductance: as per customer spec
Insulation Class: upto 220°C

1Phase sine wave filter Inductor



1Phase sine wave filter inductor is used at output of IGBT based inverters (Solar & Wind inverter)

Copper / Aluminium wound
Current: upto 2500A
Inductance: as per customer spec
Insulation Class: upto 220°C

3Phase Water Cooled Inductor



3Phase water cooled inductor is used in Solar panel and Windmills

Copper / Aluminium wound
Current: upto 2500A
Inductance: as per customer spec
Insulation Class: upto 220°C
Water flow: as per customer spec

3Phase Isolation / Auto Transformer



3Phase Isolation / Auto Transformers connected to the grid providing Auxiliary power supply to accessories inverter panel

Copper / Aluminium wound
Rating: upto 100KVA
Insulation Class: upto 220°C

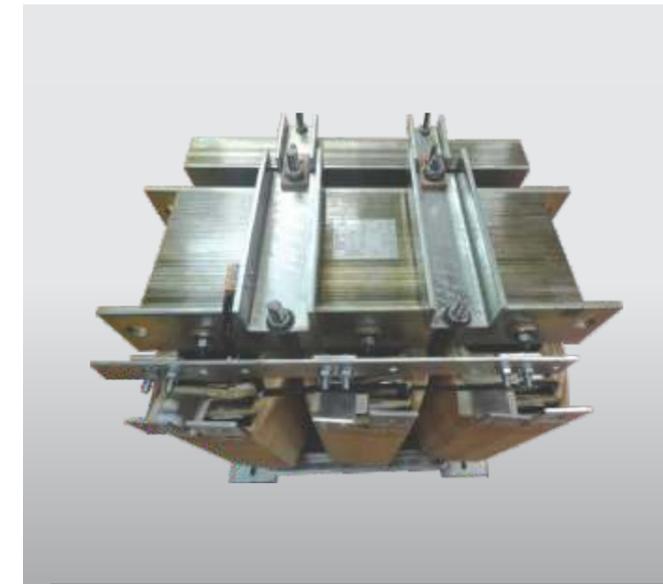
UNINTERRUPTED POWER SUPPLY (UPS)

Salzer provides a complete range of magnetics solutions for UPS applications. PFC Inverter Chokes, Battery Converter Choke, Boost Converter Filter Inductor, Smoothing choke, saturating reactor, Air core inductor, Isolation Transformer, Control Transformer, Matching Transformer, Inverter Isolation, Rectifier Input, Auxiliary, Integrated and auto transformer.

The boost converter filter inductor will be on the input side, which provides a smooth, continuous, input current waveform as opposed to the discontinuous input current of the buck or buck-boost topology. The continuous input current is much easier to filter.

The PFC/INV Chokes designed for switching frequency up to 8kHz with high grade magnetic lamination is economic and more stable inductance with respect to temperature rise. Salzer offers these chokes with powder or ferrite core.

Salzer can provide design and manufacturing solution for UPS Transformer integrated with Ls for compact solution in both core type and shell type. We also manufacture Zig-Zag connected winding transformer, open delta winding, multi-winding transformer for 6 and 12 pulse converter for PWM wave application.



Transformers

- Rectified input Transformer
- Inverter output Transformer / Isolation / Integrated Transformer

Dry type Transformer	
Rating	upto 800KVA
Voltage	upto 750V
Rated frequency	50Hz / 60Hz
Reference standard	EN/IEC 600076 - 11
Number of Phase	1 PH / 3 PH
Cooling	AN/AF
Type	Core / Shell type
Insulation Class	upto 220°C
Vector group	as per customer spec
Magnetizing current	as per customer spec
Impedance	as per customer spec
Losses	as per customer spec
Temperature rise	as per customer spec



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TRACTION / RAILWAY

Salzer produces Auxiliary Transformers, Power Supply Transformers, DC Reactors, Step-up chopper - Inductor, Three phase output choke and Single phase Battery Charger Transformer for the Traction/ Railway Application. The Auxiliary transformers are used for lighting purposes, heating the train wagons or for producing single-phase auxiliary for the safety systems supply or the substation's supply.

Step-up Chopper - Inductor, step-up Chopper in a battery charger, which is used for the adjustment of the output voltage for optimised charging of the traction vehicle battery and supply of the battery load circuits.

3 phase output choke: This Choke is used to filter the current harmonics produced by the PWM of three phase inverter. Range comprises of Battery Charging Converter Transformer, Field Transformer, Power Supply Transformer for Passenger Area, Line Air Choke to DC Link, Boost converter chokes for auxiliary inverters, Power Supply Auto transformer for fan for climate regulating applications. Salzer uses special raw materials for Railway applications for better UL flammability and High Insulation class additional coat varnish etc.

Since Railway application parts are long service magnetics, Salzer takes utmost care while designing: Insulation coordination, Cooling, Environmental conditions (Climate, Pollution / Humidity, Vibration / Mechanical shocks). Validation type tests are conducted on the samples in order to ensure reliability in the long run.

Traction Transformers



Battery & Field Transformer:

Single-phase Transformer with secondary center tapped for rectifier input

Rating: 500 KVA max
Nominal Voltage 750 V max
Operating frequency 600Hz
Insulation temp Req 220°C
Pollution degree: PD4
Standard: EN/IEC 60076,
BS/EN 60310, EN/IEC 60077 -1

DC Reactor



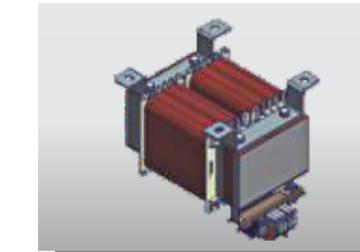
DC Reactor - Filter application for Battery Charging Circuit
Inductance : as per customer spec
Current : 1000Adc max
Nominal Voltage: 3000Vmax
Pollution degree: PD4
Insulation temp Req 220°C
Standard: EN/IEC 60076,
BS/EN 60310, EN/IEC 60077 -1

Power supply transformer



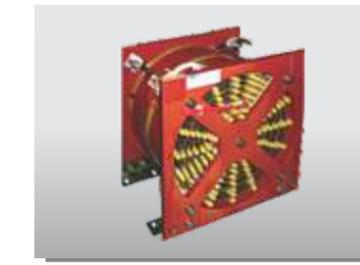
Power supply Transformer for Passenger Area & Mounted Under Floor
Rating : 100 KVA max
Nominal Voltage: 750Vmax
Pollution degree: PD4
Insulation temp Req 220°C
Standard: EN/IEC 60076,
BS/EN 60310, EN/IEC 60077 -1

Power supply transformer



Power supply Transformer Step down / Step up application
Mounted Indoor
Rating : 100 KVA max
Nominal Voltage: 750Vmax
Pollution degree: PD4
Insulation temp Req 220°C
Standard: EN/IEC 60076,
BS/EN 60310, EN/IEC 60077 -1

Air core Inductor



Line Air Choke to DC link
Mounted Under Floor
Voltage: 750VDC
Current: upto 500 Amps
Inductance : As per customer spec
Flammable class UL94/V0
Standard: EN/IEC 60076,
BS/EN 60310, EN/IEC 60077 -1

Boost Converter Chokes



Iron Core Boost Converter Chokes for Auxiliary Inverters
Inductance : as per customer spec
Current : 1000Adc max
Nominal Voltage: 3000Vmax
Pollution degree: PD4
Insulation temp Req 220°C
Standard: EN/IEC 60076,
BS/EN 60310, EN/IEC 60077 -1

Power supply auto transformer



Power supply Transformer for Fan, Climate regulating & Control
Rating : 100 KVA max
Nominal Voltage: 750Vmax
Pollution degree: PD4
Insulation temp Req 220°C
Standard: EN/IEC 60076,
BS/EN 60310, EN/IEC 60077 -1

Marine Products & Applications

Salzer has vast experience in designing and manufacturing magnetics for Marine applications. In Marine application, Salzer offers Transformer and Reactors in VPI version and Water cooled version. Applications include Line reactors and special reactors, Isolation Transformer, Start up Transformers etc.

The key factors for marine magnetic products are low foot print and weight but with highest possible efficiency. Salzer is capable of providing solutions for these applications in both water cooled type and air cooled type meeting those key factors.

Our transformers and inductors for marine applications are made with special insulating materials to ensure longer life in saline atmosphere. In order to ensure product reliability, Salzer can support for environmental type tests including salt mist test, Our Products are meeting EMI and EMC Requirements.

Single or multi secondary windings, thermal protection for the best temperature control are amongst these transformers features. The features are optimised design based on specific harmonic loads, compact dimensions, lightweight materials, designs can be adapted to the dimensional constraints of any installation, specific cooling enclosure, rated power: max 1000 KVA.

Water cooled Transformer



Rating: upto 500kVA
Rated frequency : 50Hz / 60Hz
Nominal Voltage: upto 750V
Cooling: AN, WF
Reference standard : EN / IEC 60076 - 11
Water force : As per customer spec.
Total Losses : As per customer spec.
Magnetizing current: As per customer spec.
Impedance : As per customer spec.
Temperature rise: As per customer spec.
Aluminium or Copper wound
Insulation Class upto 180°C

Water cooled Reactor



Rating: upto 2500A
Rated frequency : 50Hz / 60Hz
Switching Frequency: upto 10KHz
Cooling: AN, WF
Reference standard : EN / IEC 60076 - 6
Water force : As per customer spec.
Total Losses : As per customer spec.
Inductance : As per customer spec.
Temperature rise: As per customer spec.
Aluminium or Copper wound
Insulation Class upto 180°C

Industrial Application

Salzer offers Multi-tapping Potential Transformers, OVDT, Multi winding transformer for converter / furnace application and K-rated transformer for Industrial application up to 12kV class

- ▶▶ Multiple Winding Transformers can also be used to provide either step-up, step-down or a combination of both between the various windings. In fact, a multiple winding transformer can have several secondary windings on the same core with each one providing a different voltage or current level output.
- ▶▶ Multi-coil, or multi-winding transformer will be designed for required vector group as per customer requirement. Also we can design with customized Short-circuit impedance. Multiple winding transformers can be either a single-phase transformer or a three-phase transformer.

The application of a K-rated transformer is used where ever non-linear loads are present. Prime uses would be in factory automation, computer rooms, and office buildings due to high harmonic content in these loads. K-rated transformer isolates or avoiding transferring of harmonics to main power supply in network. Our K-rated transformers designed to dissipate the additional heat generated by harmonics or non linear load.

K-rated transformers are sized appropriately to handle this additional heat and tested according to UL standards. The way a K-rated transformer works is it uses a double sized neutral conductor and either change the geometry of their conductors or use multiple conductors for the coils. Quality transformers are manufactured with high grade silicon steel, copper windings, and extra air ducts.

Harmonics: It is a value used to determine how much harmonic current a transformer can handle without exceeding its maximum temperature rise level.

Detuned Reactors

7%,14%,5.67% Impedance in Copper / Aluminium wound and Air Natural (AN) Cooling

The Detuned Reactors are used in the Circuit to protect the Capacitor. In other words we can say to attain better life of Capacitors. The main application of this Reactors is to filter the Harmonics. Salzer designs have the following advantages - High Quality Raw Materials, Low Noise Level, Smaller in Size and Better total Losses.

Note: The below mentioned ratings are Salzer standard design version. We offer custom designs based on requirements.

Ref. Standard	IEC 60289, IS 5553
Rated Voltage	440 V
Rated Frequency	50Hz
Max. Permissible Operating Voltage	1.05 Un Continuously, 1.1 Un for 8 hours
Max. Permissible Operating current (Linearity)	1.4 In Continously
Duty cycle	1
Class Of Protection	IP 00
Ambient Temperature	50°C
Winding Material	Copper / Aluminium
Class of insulation	Class H
Thermal protection	Thermal switch (NC type, 165°C)
Detuning	5.67% , 7% , 14 %
Harmonics Limit	U3 = 0.5 % Ur (Duty cycle 100%)
	U5 = 6.0 % Ur (Duty cycle 100%)
	U7 = 5.0 % Ur (Duty cycle 100%)
	U11 = 3.5 % Ur (Duty cycle 100%)
	U13 = 3.0 % Ur (Duty cycle 100%)
	U17 = 2.0 % Ur (Duty cycle 100%)
	U19 = 1.5 % Ur (Duty cycle 100%)
Fundamental Current	U23 = 1.5 % Ur (Duty cycle 100%)
	U25 = 1.5 % Ur (Duty cycle 100%)
	I1 = 1.06 Ir



(A) Electrical Data (7% Impedance)

S.No	Salzer Part No. Aluminium Ver.	Salzer Part No. Copper Ver.	KVAR	Un (V)	F1 (Hz)	%p	In or I1[A]	Irms or Ieff [A]	Isat [A]	Isat [A]/I1	Inductance [mH]	*Total Losses	F-Eqt. (Hz)
1	TM32-0002-00	TM32-0030-00	5	440	50	7	6.60	7.40	11.88	1.80	9.280	55	85
2	TM32-0003-00	TM32-0034-00	10	440	50	7	13.10	14.90	23.58	1.80	4.640	75	85
3	TM32-0004-00	TM32-0032-00	12.5	440	50	7	16.40	18.60	29.52	1.80	3.710	90	85
4	TM32-0005-00	TM32-0033-00	15	440	50	7	19.70	22.30	35.46	1.80	3.090	100	85
5	TM32-0006-00	TM32-0034-00	20	440	50	7	26.20	29.80	47.16	1.80	2.320	135	85
6	TM32-0007-00	TM32-0035-00	25	440	50	7	32.80	37.20	59.04	1.80	1.860	160	85
7	TM32-0008-00	TM32-0036-00	50	440	50	7	65.60	74.40	118.08	1.80	0.928	265	85
8	TM32-0009-00	TM32-0037-00	75	440	50	7	98.40	111.60	177.12	1.80	0.619	350	85
9	TM32-0010-00	TM32-0038-00	100	440	50	7	131.20	148.80	236.16	1.80	0.464	400	85

(B) Electrical Data (14% Impedance)

S.No	Salzer Part No. Aluminium Ver.	Salzer Part No. Copper Ver.	KVAR	Un (V)	F1 (Hz)	%p	In or I1[A]	Irms or Ieff [A]	Isat [A]	Isat [A]/I1	Inductance [mH]	*Total Losses	F-Eqt. (Hz)
1	TM32-0012-00	TM32-0039-00	5	440	50	14	6.60	7.00	9.90	1.50	20.060	60	52
2	TM32-0013-00	TM32-0040-00	10	440	50	14	13.10	14.10	19.65	1.50	10.030	95	52
3	TM32-0014-00	TM32-0041-00	12.5	440	50	14	16.40	17.50	24.60	1.50	8.030	100	52
4	TM32-0015-00	TM32-0042-00	15	440	50	14	19.70	22.10	29.55	1.50	6.690	115	52
5	TM32-0016-00	TM32-0043-00	20	440	50	14	26.20	28.00	39.30	1.50	5.020	155	52
6	TM32-0017-00	TM32-0044-00	25	440	50	14	32.80	35.00	49.20	1.50	4.010	190	52
7	TM32-0018-00	TM32-0045-00	50	440	50	14	65.60	70.00	98.40	1.50	2.000	330	52
8	TM32-0019-00	TM32-0046-00	75	440	50	14	98.40	105.10	147.60	1.50	1.340	415	52
9	TM32-0020-00	TM32-0047-00	100	440	50	14	131.20	140.10	196.80	1.50	1.000	450	52

(C) Electrical Data (5.67% Impedance)

S.No	Salzer Part No. Aluminium Ver.	Salzer Part No. Copper Ver.	KVAR	Un (V)	F1 (Hz)	%p	In or I1[A]	Irms or Ieff [A]	Isat [A]	Isat [A]/I1	Inductance [mH]	*Total Losses	F-Eqt. (Hz)
1	TM32-0021-00	TM32-0048-00	5	440	50	5.67	6.6	8.8	15.2	2.3	7.41	60	115
2	TM32-0022-00	TM32-0049-00	10	440	50	5.67	13.1	17.6	30.1	2.3	3.7	95	115
3	TM32-0023-00	TM32-0050-00	12.5	440	50	5.67	16.4	20.9	37.7	2.3	2.96	100	115
4	TM32-0024-00	TM32-0051-00	15	440	50	5.67	19.7	25.1	45.3	2.3	2.47	125	115
5	TM32-0025-00	TM32-0052-00	20	440	50	5.67	26.2	33.5	60.3	2.3	1.85	165	115
6	TM32-0026-00	TM32-0053-00	25	440	50	5.67	32.8	41.8	75.4	2.3	1.48	200	115
7	TM32-0027-00	TM32-0054-00	50	440	50	5.67	65.6	83.63	150.9	2.3	0.741	340	115
8	TM32-0028-00	TM32-0055-00	75	440	50	5.67	98.4	125.4	226.3	2.3	0.494	425	115
9	TM32-0029-00	TM32-0056-00	100	440	50	5.67	131.2	167.3	301.8	2.3	0.37	480	115

*Losses shown are our standard design version. We can design any other lesser losses also based on customer requirement.

Mechanical Dimension Data - Detuned Reactor - 7%,14%,5.67% Imp. Aluminium Wound AN Cooling

(A) Mechanical Data (7% Impedance)

S.No	Salzer Part No.	KVAR	L (mm)	B(mm)	H(mm)	n1 (mm)	n2 (mm)	Slot (mm)	b (mm)	d (mm)	Part Weight (Kg)	Enclosure (Optional)
1	TM32-0002-00	5	225	140	165	203	72	8 X 12	225	94	6	E1
2	TM32-0003-00	10	225	145	170	203	92	8 X 12	225	115	9	E1
3	TM32-0004-00	12.5	225	150	180	203	92	8 X 12	225	115	11	E1
4	TM32-0005-00	15	225	160	180	203	105	8 X 12	225	125	13	E1
5	TM32-0006-00	20	250	150	210	150	110	12 X 20	250	140	16	E2
6	TM32-0007-00	25	270	160	250	150	110	12 X 20	270	140	19	E2
7	TM32-0008-00	50	270	160	310	150	110	12 X 20	270	140	29	E2
8	TM32-0009-00	75	290	210	310	180	145	12 X 20	290	185	38	E3
9	TM32-0010-00	100	360	205	340	180	145	12 X 20	360	185	51	E3

(B) Mechanical Data (14% Impedance)

S.No	Salzer Part No.	KVAR	L (mm)	B(mm)	H(mm)	n1 (mm)	n2 (mm)	Slot (mm)	b (mm)	d (mm)	Part Weight (Kg)	Enclosure (Optional)
1	TM32-0012-00	5	200	140	170	160	90	8 X 12	200	110	8	E1
2	TM32-0013-00	10	225	145	170	180	100	8 X 12	225	120	12	E1
3	TM32-0014-00	12.5	245	150	190	200	105	8 X 12	245	125	16	E1
4	TM32-0015-00	15	290	165	195	230	115	8 X 12	290	145	19	E1
5	TM32-0016-00	20	290	170	215	230	125	12 X 20	290	155	23	E1
6	TM32-0017-00	25	300	175	240	250	130	12 X 20	300	160	28	E2
7	TM32-0018-00	50	310	190	300	250	140	12 X 20	310	170	40	E2
8	TM32-0019-00	75	350	210	320	280	150	12 X 20	350	180	56	E2
9	TM32-0020-00	100	420	230	340	350	185	12 X 20	420	215	80	E4

(B) Mechanical Data (5.67% Impedance)

S.No	Salzer Part No.	KVAR	L (mm)	B(mm)	H(mm)	n1 (mm)	n2 (mm)	Slot (mm)	b (mm)	d (mm)	Part Weight (Kg)	Enclosure (Optional)
1	TM32-0021-00	5	190	130	160	150	80	8 X 12	190	104	8	E1
2	TM32-0022-00	10	200	145	165	150	100	8 X 12	200	124	11	E1
3	TM32-0023-00	12.5	240	145	175	200	95	8 X 12	240	119	15	E1
4	TM32-0024-00	15	240	155	175	200	105	8 X 12	240	129	17	E1
5	TM32-0025-00	20	260	155	200	210	110	12 X 20	260	134	21	E1
6	TM32-0026-00	25	270	165	230	220	125	12 X 20	270	155	24	E1
7	TM32-0027-00	50	270	185	290	220	140	12 X 20	270	170	35	E1
8	TM32-0028-00	75	300	210	310	250	155	12 X 20	300	185	52	E2
9	TM32-0029-00	100	360	230	330	300	175	12 X 20	360	205	70	E3

*Enclosure can be supplied with additional cost.

Mechanical Dimension Data - Detuned Reactor - 7%,14%,5.67% Imp. Copper Wound AN Cooling

(A) Mechanical Data (7% Impedance)

S.No	Salzer Part No.	KVAR	L (mm)	B(mm)	H(mm)	n1 (mm)	n2 (mm)	Slot (mm)	b (mm)	d (mm)	Part Weight (Kg)	Enclosure (Optional)
1	TM32-0030-00	5	215	140	165	203	72	8 X 12	215	94	8	E1
2	TM32-0031-00	10	215	145	170	203	92	8 X 12	215	115	12	E1
3	TM32-0032-00	12.5	215	150	180	203	92	8 X 12	215	115	15	E1
4	TM32-0033-00	15	215	160	180	203	105	8 X 12	215	125	17	E1
5	TM32-0034-00	20	230	150	210	150	110	12 X 20	230	140	21	E1
6	TM32-0035-00	25	250	160	250	150	110	12 X 20	250	140	25	E1
7	TM32-0036-00	50	250	160	310	150	110	12 X 20	250	140	38	E1
8	TM32-0037-00	75	270	210	310	180	145	12 X 20	270	185	50	E1
9	TM32-0038-00	100	340	205	340	180	145	12 X 20	340	185	67	E2

(B) Mechanical Data (14% Impedance)

S.No	Salzer Part No.	KVAR	L (mm)	B(mm)	H(mm)	n1 (mm)	n2 (mm)	Slot (mm)	b (mm)	d (mm)	Part Weight (Kg)	Enclosure (Optional)
1	TM32-0039-00	5	200	140	170	160	90	8 X 12	200	110	11	E1
2	TM32-0040-00	10	225	145	170	180	100	8 X 12	225	120	16	E1
3	TM32-0041-00	12.5	245	150	190	200	105	8 X 12	245	125	21	E1
4	TM32-0042-00	15	290	165	195	230	115	8 X 12	290	145	25	E2
5	TM32-0043-00	20	290	170	215	230	125	12 X 20	290	155	30	E2
6	TM32-0044-00	25	300	175	240	250	130	12 X 20	300	160	37	E2
7	TM32-0045-00	50	310	190	300	250	140	12 X 20	310	170	52	E2
8	TM32-0046-00	75	350	210	320	280	150	12 X 20	350	180	73	E3
9	TM32-0047-00	100	420	230	340	350	185	12 X 20	420	215	104	E4

(B) Mechanical Data (5.67% Impedance)

S.No	Salzer Part No.	KVAR	L (mm)	B(mm)	H(mm)	n1 (mm)	n2 (mm)	Slot (mm)	b (mm)	d (mm)	Part Weight (Kg)	Enclosure (Optional)
1	TM32-0048-00	5	190	130	160	150	80	8 X 12	190	104	10	E1
2	TM32-0049-00	10	200	145	165	150	100	8 X 12	200	124	15	E1
3	TM32-0050-00	12.5	240	145	175	200	95	8 X 12	240	119	20	E1
4	TM32-0051-00	15	240	155	175	200	105	8 X 12	240	129	23	E1
5	TM32-0052-00	20	260	155	200	210	110	12 X 20	260	134	27	E1
6	TM32-0053-00	25	270	165	230	220	125	12 X 20	270	155	32	E1
7	TM32-0054-00	50	270	185	290	220	140	12 X 20	270	170	46	E1
8	TM32-0055-00	75	300	210	310	250	155	12 X 20	300	185	68	E2
9	TM32-0056-00	100	360	230	330	300	175	12 X 20	360	205	91	E3

*Enclosure can be supplied with additional cost.

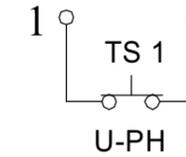
Metal enclosure with Powder Coating and IP 31 with 2 No. SS Gland plate, 2 No.Lifting

Enclosure dimensions are tentative

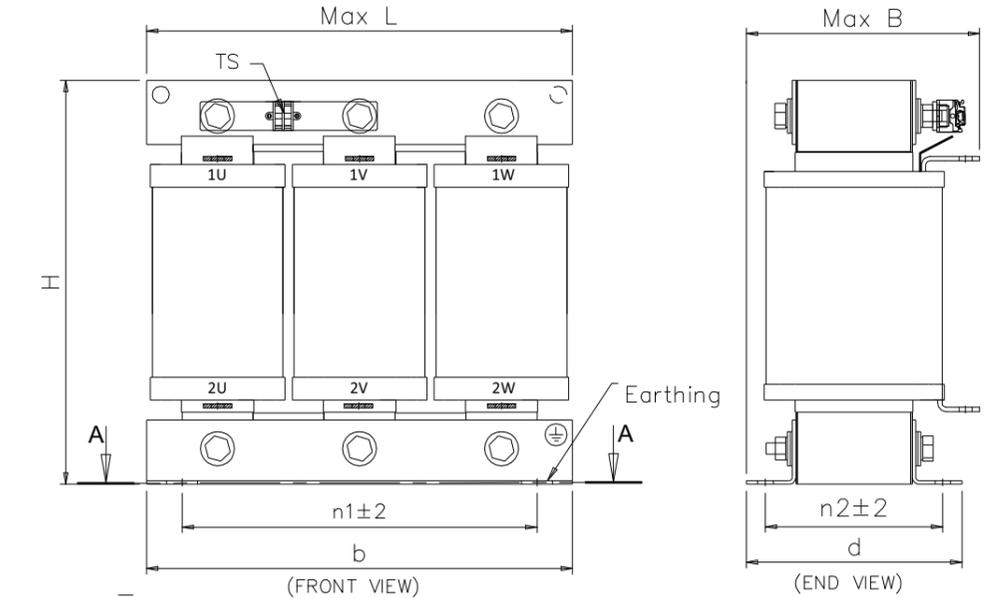
Customised dimensions will be shared during OA

S.No	Enclosure	L1 (mm)	B1 (mm)	H1 (mm)	Wt.(Kg)
1	E1	350	325	435	16
2	E2	400	325	570	19
3	E3	460	375	600	25
4	E4	540	375	600	25

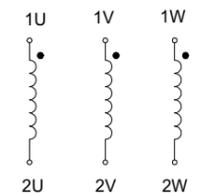
Thermal Switch (TS) for Over temp. Trip



NC type Thermal Switch



SCHEMATIC DIAGRAM:



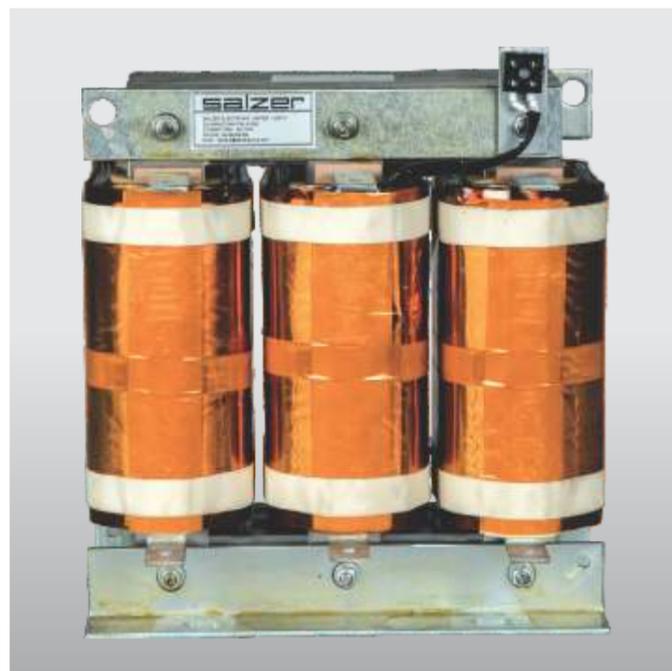
RL LOAD REACTOR / Input and Output Reactor

Aluminium wound and Air Natural (AN) Cooling

The RL Line/Load Reactor helps to keep the equipments healthy. They are robust in filtering application. RL Reactors absorb these line spikes and offer protection to the rectifiers and DC Bus capacitors while minimizing nuisance tripping of the inverter. RL Reactors help to protect motors from the high peak voltages and fast rise times (dV/dt) which can be experienced in IGBT inverter applications, reduce Harmonic Distortion, reduce Motor Temperature and Noise. Salzer designs have the following advantages - Robust in Design, Good Service Factor, High Quality Raw Materials, Low Noise Level, Smaller in Size and Better total Losses.

Note: The below mentioned ratings are Salzer standard design version. We offer custom designs based on requirements.

S.No	PARAMETERS	SPEC
1	Type of Inductor	Dry type, Iron Core, Impregnated with High Bond Strength and Temperature 220°C Varnish
2	Current rating	150% of rating - Up to 750A 125% of rating - Above 750A 200% of rated for 30 minutes 300% of rated for 1 minute
3	Inductance curve	0.95 Ln at 150% rated Current 0.5 Ln at 350% rated Current
4	Tolerance for rated inductance	±5%
5	No. of Phase	3
6	Nominal frequency (Hz)	50/ 60
7	Max. Nominal System Voltage	690V
8	IP Class	00 and 20
9	Insulation class	4 KV
10	Insulation temp. Class	R (220°C)
11	Max. Ambient temp. (° C)	(-30) to 40
12	Winding Temp. rise on ambient (° C).	135
13	Type of cooling	AN
14	Maximum switching frequency	20 KHz
15	Altitude	Up to 2000M
16	dV/dt	Meets NEMA MG-1, part 31
17	Conductor	Aluminium



Electrical and Mechanical Details (Aluminium)

S.N	SALZER REFF.	I (Amps)	Ln (mH)	*Loss (W)	Weight (Kg)	IP 00 - Size (L X B X H mm)	Mounting pitch and Slot details		
							n1	n2	Slot size
1	RL -1500-0025-AL	1500	0.025	1050	175	500 X 370 X 620	430	210	14 X 28
2	RL -1500-0015-AL	1500	0.015	900	125	500 X 320 X 620	430	155	14 X 28
3	RL -1500-0008-AL	1500	0.008	650	80	385 X 340 X 500	300	150	11 X 22
4	RL -1200-0019-AL	1200	0.019	700	110	430 X 330 X 500	360	165	11 X 22
5	RL -1200-0009-AL	1200	0.009	400	70	385 X 280 X 500	300	140	11 X 22
6	RL -1200-0003-AL	1200	0.003	425	50	360 X 240 X 420	300	130	11 X 22
7	RL -1000-0038-AL	1000	0.038	840	105	460 X360 X430	360	205	14 X 28
8	RL -1000-0022-AL	1000	0.022	600	80	430 X300 X430	360	170	11 X 22
9	RL -1000-0011-AL	1000	0.011	450	50	360 X 280 X 370	300	150	11 X 22
10	RL -0750-0048-AL	750	0.048	475	95	440 x 340 x 430	330	220	14 X 28
11	RL -0750-0029-AL	750	0.029	370	68	390 X 300 X 380	330	190	11 X 22
12	RL -0750-0015-AL	750	0.015	270	49	360 X 260 X 370	300	140	11 X 22
13	RL -0500-0085-AL	500	0.085	350	68	430 X325 X 330	330	200	11 X 22
14	RL -0500-0050-AL	500	0.050	260	52	400 X270 X320	330	150	11 X 22
15	RL -0500-0025-AL	500	0.025	200	38	350 X240 X300	300	125	11 X 22

*Losses shown are our standard design version. We can design any other lesser losses also based on customer requirement

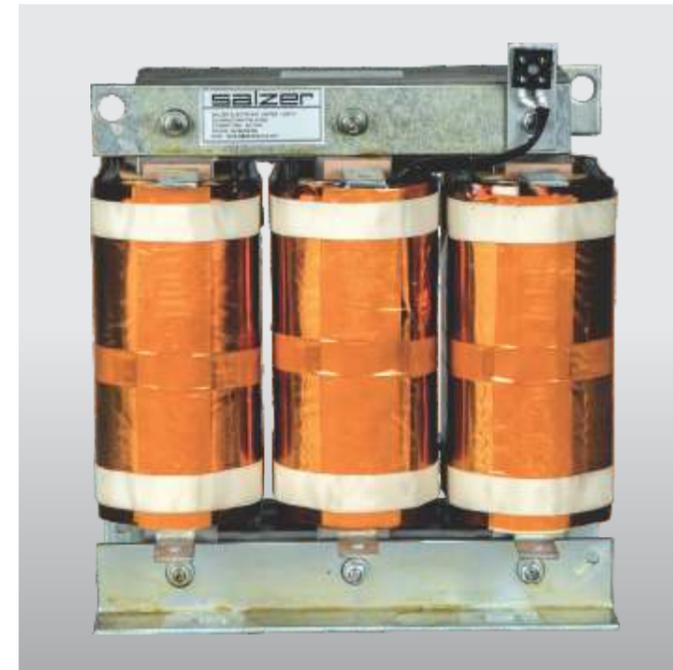
RL LOAD REACTOR / Input and Output Reactor

Copper wound and Air Natural (AN) Cooling

The RL Line/Load Reactor helps to keep the equipments healthy. They are robust in filtering application. RL Reactors absorb these line spikes and offer protection to the rectifiers and DC Bus capacitors while minimizing nuisance tripping of the inverter. RL Reactors help to protect motors from the high peak voltages and fast rise times (dV/dt) which can be experienced in IGBT inverter applications, reduce Harmonic Distortion, reduce Motor Temperature and Noise. Salzer designs have the following advantages - Robust in Design, Good Service Factor, High Quality Raw Materials, Low Noise Level, Smaller in Size and Better total Losses.

Note: The below mentioned ratings are Salzer standard design version. We offer custom designs based on requirements.

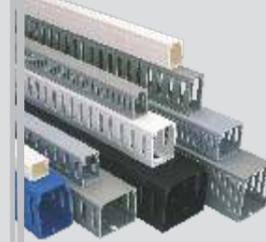
S.No	PARAMETERS	SPEC
1	Type of Inductor	Dry type, Iron Core, Impregnated with High Bond Strength and Temperature 220°C Varnish
2	Current rating	150% of rating - Up to 750A 125% of rating - Above 750A 200% of rated for 30 minutes 300% of rated for 1 minute
3	Inductance curve	0.95 Ln at 150% rated Current 0.5 Ln at 350% rated Current
4	Tolerance for rated inductance	±5%
5	No. of Phase	3
6	Nominal frequency (Hz)	50/ 60
7	Max. Nominal System Voltage	690V
8	IP Class	00 and 20
9	Insulation class	4 KV
10	Insulation temp. Class	R (220°C)
11	Max. Ambient temp. (° C)	(-30) to 40
12	Winding Temp. rise on ambient (° C).	135
13	Type of cooling	AN
14	Maximum switching frequency	20 KHz
15	Altitude	Up to 2000M
16	dV/dt	Meets NEMA MG-1, part 31
17	Conductor	Copper



Electrical and Mechanical Details (Copper)

S.N	SALZER REFF.	I (Amps)	Ln (mH)	*Loss (W)	Weight (Kg)	IP 00 - Size (L X B X H mm)	Mounting pitch and Slot details		
							n1	n2	Slot size
1	SE -1500-0025-C	1500	0.025	1050	190	520 X 400 X 490	450	225	14 X 28
2	SE -1500-0015-C	1500	0.015	900	150	500 X 360 X 490	450	190	14 X 28
3	SE -1500-0008-C	1500	0.008	650	110	360 X 360 X 440	300	190	14 X 28
4	SE -1200-0019-C	1200	0.019	750	110	450 X 360 X 395	390	180	14 X 28
5	SE -1200-0009-C	1200	0.009	450	92	360 X 340 X 395	300	175	14 X 28
6	SE -1200-0003-C	1200	0.003	350	70	350 X 300 X 395	300	130	14 X 28
7	SE -1000-0038-C	1000	0.038	750	130	430 X400 X400	360	220	14 X 28
8	SE -1000-0022-C	1000	0.022	550	110	410 X350 X400	360	185	14 X 28
9	SE -1000-0011-C	1000	0.011	425	65	360 X 300 X 370	300	135	11 X 22
10	SE -0750-0048-C	750	0.048	475	110	380 x 350 x 380	330	200	11 X 22
11	SE -0750-0029-C	750	0.029	350	80	370 X 320 X 295	330	200	11 X 22
12	SE -0750-0015-C	750	0.015	275	55	360 X 270 X 295	300	135	11 X 22
13	SE -0500-0085-C	500	0.085	400	85	365 X335 X 297	300	205	11 X 22
14	SE -0500-0050-C	500	0.050	275	63	350 X290 X295	300	190	11 X 22
15	SE -0500-0025-C	500	0.025	225	53	350 X250 X295	300	160	11 X 22

*Losses shown are our standard design version. We can design any other lesser losses also based on customer requirement



Other products:

- ▶▶ Rotary Switches / Load Break Switches
- ▶▶ Photo Voltaic Isolators
- ▶▶ Cable Ducts & Special Profiles
- ▶▶ Terminal Connectors
- ▶▶ Relays & Contactors
- ▶▶ Motor Protection Circuit Breaker (MPCB)
- ▶▶ Toroidal Transformers & CT's
- ▶▶ Limit & Foot Switches
- ▶▶ MCB's & Distribution Boards
- ▶▶ Automatic Changeover with Current limiter
- ▶▶ Wires & Cables / Wire Harness
- ▶▶ Sensors
- ▶▶ Enameled Wires & Flexible Busbar

■ India's leader in Rotary Switches & Wiring Ducts ■ International product approvals ■ Worldwide market presence ■ Five units with International affiliations

Salzer Electronics Limited

Registered & Corporate Office: Samichettipalayam, Coimbatore - 641 047 India

Salzer Unit II : Chinnamaddampalaym, Coimbatore - 641 019 | Tel: +91 4254 302000 | Fax: +91 4254 272012 | E-mail: salzer2@salzergroup.com