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GENERAL CATALOGUE v.4



Presentation



TORYTRANS S.L. is a Spanish company specialized in design and manufacture of single and three phase transformers, autotransformers, reactors, sinusoidal filters, harmonic filters, voltage stabilizers, etc...

Torytrans S.L. was founded in 1989 as a manufacturer of small transformers. From the beginning it has carried out a policy based on customer satisfaction offering the best service with the highest quality and warranty of our products, being one of the first companies in the electrical industry certified according to the standard UNE EN **ISO 9001** from 1999.

Torytrans has always been aware of the respect and environment care. This fact has always been present in Torytrans policy and our management system which is certified according to the standard UNE EN **ISO 14001**.

At this moment Torytrans has more than 7500 m2 of modern production facilities and a complete laboratory for testing our products, becoming a leading manufacturer in Europe with a reference brand. Currently we are present in more than 50 countries at the world with an own Export department.

We are characterized by providing customized products and solutions with the highest level of quality, featuring technical and human resources that allow us to have great flexibility and ability to design and manufacture, thus being able to offer really short delivery deadlines, that would completely satisfy our customers.

As an added value we offer our services: needs analysis, proposals and improvements, simulations, 3D design, measurements, etc. Not supply only a product, but a solution to your particular needs, we also have at your disposal a team of professionals to provide the support and a complete assistance, satisfying the most demanding requirements and standards.









INDEX

| | Page |
|-----------------------------|------|
| Presentation | 1 |
| Production | 4 |
| R & D | 5 |
| Sectors | 6 |
| Commercial Network & Export | 7 |
| Customized Products | 8 |
| UL | 9 |

| | TRANSFORMERS | |
|----------------|---|-------|
| Series TC | Single phase compact control transformers IP-20 | 10-11 |
| Series CSE | Single phase control transformers IP-20 | 12-13 |
| Series CSS | Single phase control transformers IP-00 | 14-15 |
| Series CN | Single phase isolation transformers | 16-17 |
| Series CUP | Single phase ultra-isolation transformers IP-20 | 18-19 |
| Series TCL | Single phase swimming-pool LED transformers IP-20 | 20-21 |
| Series CPE | Single phase swimming-pool transformers IP-20 | 22-23 |
| Series EPC | Single phase swimming-pool transformers IP-65 | 24-25 |
| Series TOR | Toroidal transformers | 26-27 |
| Series CM-CTM | Transformers for medical rooms UNE EN 61558-2-15:2012 | 28-29 |
| Series MT-MI | Measurement transformers | 30-31 |
| Series CNE-TTE | Isolation transformers encapsulated in resin | 32-33 |
| Series TD-TT | Three phase isolating transformers | 34-37 |
| Series REDLOSS | Low-losses isolation transformers | 38-39 |
| Series TTFK | Three phase isolating transformers "Factor K" harmonics | 40-41 |
| Series TAC | Harmonic filtering compensator transformers | 42-43 |
| Series TAM | Multi-pulse harmonic filtering compensator transformers | 44-45 |
| Series TTM | Three phase to single phase transformers | 46-47 |
| Series TMT | Single phase to three phase transformers | 48-49 |
| Series RDC | Rectifier AC / DC for voltage and current control | 50-51 |

AUTOTRANSFORMERS

| Series AME | Single phase reversible autotransformers | 52-53 |
|----------------|---|-------|
| Series ATS-ATC | Three phase reversible autotransformers | 54-57 |
| Series ATN | Three phase autotransformer Neutral generator | 58-59 |

| | REACTORS | <u> </u> |
|------------|--|----------|
| Series IRT | Three phase filtering reactors for capacitor banks | 60-61 |
| Series ILT | Three phase input line reactors for VFD | 62-63 |
| Series IMT | Three phase output line reactors for VFD | 64-65 |
| Series REN | Reactors for Renewable Energy: Wind & Photovoltaic | 66-67 |

| | FILTERS | | لىلىل |
|-------------|-----------------------------------|----------|-------|
| Series LC | Sinusoidal output filters for VFD | IP-00 | 68-69 |
| Series LCB | Sinusoidal output filters for VFD | IP-23 | 70-71 |
| Series SPF | Passive harmonic filters for VFD | IP-20 | 72-73 |
| Series SPFS | Passive harmonic filters for VFD | IP-00 | 74-75 |
| Series LCR | Line Filters for Regenerative VFD | IP-00 | 76-77 |
| Series SHPF | Shunt hybrid harmonic power filte | rs IP-20 | 78-79 |

| VOLTAGE REGULATORS | | | | | |
|--------------------|---|-------|--|--|--|
| Series SN-ST | Automatic voltage stabilizers | 80-83 | | | |
| Series REDCON | Energy consumption reducer for lighting systems | 84-85 | | | |

| | ACCESORIES | | | | |
|------------------------|---|-------|--|--|--|
| Series XTC | Protective steel enclosures: cabinets IP-23 | 86-87 | | | |
| Rating selection guide | | | | | |
| Sales terms - Legend | | | | | |
| Notes | | 90 | | | |



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Production



R & D



Our R & D department is composed of highly skilled engineers who currently applying the last processes and new technologies such as electromagnetic computer simulation using finite element or 3D modeling.

These softwares make easier to analyze and optimize designs, giving to designers faster results for complex designs that help to reduce material costs, the need of physical prototypes and develop innovating products to provide solutions to the new demands of the market.



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Power & Energy

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Electromagnetic simulation by finite elements::

The competitive demands of the market is imposing increasingly using of electromagnetic simulation packages based on finite elements. Thanks to the results obtained we could retouch dimensional aspects, materials, parts or technical specifications that allow to adapt the product to the customer needs.

3D modeling and mechanical design:

It is an essential tool for the engineers at TORYTRANS. In the last years we have moved to computer design and the digitalization of drawings and component parts of our products. The final result is a highly accurate model with a minimum error margin.

Simulations and electrical designs:

It allows us to know in detail the operation and structure of the final equipment. Is also possible to estimate important parameters such as performance, waveforms, voltage variations, quality of the network, warm-ups, etc.., And get result charts, flow charts and other statistics for study.







Sectors

Main sectors we focus on are: Renewable Energy, Lighting, Industry, Medicine, Motors and Drives, Computers, Railway, Elevation and Quality and Energy Efficiency.

Torytrans offers catalog and customized solutions for each customer needs or application, providing the required optimum product, by analyzing customer or installation requirements or needs, from the specification guidelines and initial design to the final approval tests and / or validation, to ensure compliance with all requirements and regulations.









Commercial Network

Torytrans has a commercial team that ensures fast and personalized response at all times for any query, with the best technical support so that we can always offer the best product according to customer needs.

Our head office and factory are located in Almagro (Ciudad Real), and our nationally representatives are:



Export

Our entrepreneurial spirit and our internationalization strategy have achieved that today Torytrans is present in over 50 countries. Among them may be mentioned some like:

- Germany
- Saudi Arabia
- Belgium
- Bolivia
- Brasil
- Bulgaria
- Chile
- Denmark
- Egypt
- Estonia

- Finland
- FranceNetherlands
- England
- Italv
- Jordan
- Kuwait
- Uruguay
- Libya
- Lithuania

- Mauritania
- Norway
- Portugal
- Russia
- Czech Rep.
- Sweden
- Switzerland
- Taiwan
- Tunisia
- Venezuela

Torytrans provides an international presence, with our engineering, production, sales and distribution, based on a long reach and guaranteed logistics that allows us to support all international customers. Our products leave our factory and are transported to the location of each client with careful packaging and full traceability to the final destination. Finally we contact with customers to verify the reception.

Contact with our Export department:

export@torytrans.com



Customized Products

Most of the production of Torytrans is based on-demand solutions and adjusted to our customers requirements. Our experience allows us to provide special products and we could develop or improve on request the design of transformers, inductors, filters, voltage stabilizers, toroidals, autotransformers, etc..

Our Technical Department, in close cooperation with the customer, studies each particular project, providing an immediately support and a customized attention to achieve:

- Special ratings: power, voltages, currents, insulation class...
- Customized dimensions, sizes and weights.
- Mounting, special brackets, wheels, mechanical supports ...
- Connection types: Terminal blocks, strips, bus bars, screws...
- Components: rectifiers, varistors, thyristors, relays, capacitors...
- Thermal protections: thermal sensors, fuses, circuit breakers, MCB ...
- Forced ventilation: cooling fans, extractors, turbines ...
- Protection degree: IP-00, IP-20, IP-23, IP-54...
- Finishing and coating: varnished, paintings, encapsulated ...
- Vector groups: delta, star, zig-zag...
- Manufacturing under customer samples or drawings.

Contact with us to study and analyze your requirements and application needs.











In US and Canada all electrical control systems must have the required official authorization. Compliance with national safety standards is evidenced by a symbol approval of a testing laboratory qualified and officially recognized.

The test laboratory most recognized is UL (Underwriters Laboratories). It is a globally recognized brand that ensures the reliability of the products, its design and manufacture, validating computers by demanding laboratory tests in addition to regular inspections of the manufacturing process control and traceability of all components.

Torytrans has implemented the UL certification to expand its market to the US and Canada. We guarantee high quality products with carefully selected materials and suppliers recognized by UL.

It covers the specific manufacturing **reactors and transformers Torytrans Series U**-Insulation System UL-CSA adopted:

- E466028 (OBJY2/8)
- E354573 (XORU2/8)

Design according to standards UL 5085-1 y UL 5085-2:

- Single phase transformers 25 VA ÷ 100 kVA
- Three phase transformers 100 VA ÷ 3000 kVA
- Single phase reactors 25 var ÷ 100 kvar
- Three phase reactors 100 var ÷ 3000 kvar



UL recognized brand: transformers or reactors with this mark are generally components of a product or equipment that later will be tested as a whole to obtain the UL listing mark.



Single phase compact control transformers



• Single phase control transformer with separated windings by galvanic isolation between primary and secondary.

- Compact and modular design, therefore reduced dimensions than a conventional one, providing a space-saving installation into electrical cabinets mounting.
- DIN Rail mounting or screw fixing.

• Overtemperature and overload protection via bimetal thermal resetting relay.

• Power "ON" indicated by LED.

• Enclosure is a self-extinguishable V-0 technical polyamide; free of halogens and phosphorus.

• Its safe cover protects users from the risk of electrical shocks and connections contact are not accessible by the user.

• Connections by screws with self-lifting supporting washers.

• Output voltage selection by supplied voltage links.

Technical characteristics

| Power rating | 25, 40, 63 and 100 VA | | | | | | |
|---------------------|--|--|--|--|--|--|--|
| Input voltage | 230 - 400 V | | | | | | |
| Output voltage | 12 - 24 V 115 - 230 V | | | | | | |
| Frequency | 50/60 Hz | | | | | | |
| Ambient temperature | 40 °C | | | | | | |
| Insulation class | B (130 °C) | | | | | | |
| Protection degree | IP-20 | | | | | | |
| Safety class | Class II | | | | | | |
| Test voltage | 4 kV | | | | | | |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-2 | | | | | | |

IEC/UNE-EN 61558-2-2 IEC/UNE-EN 61558-2-4 IEC/UNE-EN 61558-2-6



Electrical diagram







It is recommended a protec

• For general applications, select output power rating according to the load and power factor:

$VA = W / Cos \phi$

• To be used as control transformer for relays, contactors, timers, electro-valves, etc:

1º Sum all maintenance powers of elements.

2º Multiply value by 4. Nominal power rating **VA** is obtained.

Check that instantaneous power of the selected transformer (see table below) is higher than the simultaneous powers of the control elements.

It is recommended a protection against short circuits via fuse, installed in series at the primary circuit.

SERIES

Following we indicate the recommended fuses to put at the primary side of the transformer according to the input voltage and rating.

| Rating | Input voltage | | | | | | |
|--------|---------------|---------|--|--|--|--|--|
| VA | 230V | 400V | | | | | |
| 25 | T 125mA | T 80mA | | | | | |
| 40 | T 200mA | T 125mA | | | | | |
| 63 | T 315mA | T 200mA | | | | | |
| 100 | T 500mA | T 315mA | | | | | |

Inrush current of a transformer can reach about 20-30 times I nominal during 5-10 ms. For this reason, fuses selected must be slowblow or time-delay types.

| Rating VA | | Reference | | | Dimensions mm | | | | | |
|--------------|---------|-----------------|-------------------|----|-------------------------|-----|----|-----|---|-----|
| Nominal | (Inst.) | Sec. 12-24 V | Sec. 115-230 V | А | В | С | D | Е | Ø | kg |
| 25 | (45) | TC025-1 | TC025-3 | 54 | 112 | 112 | 37 | 100 | 6 | 0,6 |
| 40 | (70) | TC040-1 | TC040-3 | 54 | 112 | 112 | 37 | 100 | 6 | 0,8 |
| 63 | (100) | TC063-1 | TC063-3 | 54 | 112 | 112 | 37 | 100 | 6 | 1,0 |
| 100 | (150) | TC100-1 | TC100-3 | 54 | 112 | 112 | 37 | 100 | 6 | 1,5 |



* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.

Output Series Connection. Higher value: 24 V or 230 V accord. to model



Output Parallel Connection. Lower value: 12 V or 115 V accord. to model





Single phase control transformers IP-20



• Single phase control, safety and isolation transformer intended for control, switching and signaling elements supply, in electrical cabinets at machines and processes.

• Separated windings by galvanic isolation between primary and secondary. Wounds totally protected against mechanical chocks and adverse environments.

• DIN Rail mounting (for ratings up to 100 VA) and screw fixing (for all ratings).

• Advanced testing technologies have been adopted in order to satisfy the most exigent demands in terms of reliability and efficiency.

• Up to 1600 VA, enclosure is a self- V-0 technical polyamide; halogens and phosphorus free. From 2000 VA, cast resin encapsulated transformers.

• Its safe cover protects users from the risk of electrical shocks and connections contact are not accessible by the user.

• Up to 630 VA, magnetic core covered of an elastomeric with rubber neoprene that protects against external agents, at the same time as it provides a comfortable and safe manipulation of the transformer. From 1000 VA, epoxy varnish painted core.

• Connections by screws with self-lifting supporting washers.

• Transparent protective cover for the terminals that avoids the risk of accident by direct contact.

Technical characteristics

| Power rating | 25 ÷ 5000 VA | | | | | | |
|--|--|--|--|--|--|--|--|
| Input voltage | 230 - 400 V | | | | | | |
| Output voltage | 12 - 24 V 24 - 48 V 115 - 230 V | | | | | | |
| Frequency | 50/60 Hz | | | | | | |
| Ambient temperature | 40 °C | | | | | | |
| Insulation class | F (155 °C) | | | | | | |
| Protection degree | IP-20 | | | | | | |
| Safety class Ratings 25 - 630 VA | Class II | | | | | | |
| Safety class Ratings 1000 - 5000 VA | Class I | | | | | | |
| Test voltage | 4 kV | | | | | | |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-2 IEC/UNE-EN 61558-2-4 IEC/UNE-EN 61558-2-6 | | | | | | |
| | A CE | | | | | | |

Electrical diagram





SERIES CSE

• For general applications, select output rating according to the load and power factor:

$VA = W / Cos \phi$

• To be used as control transformer for relays, contactors, timers, electro-valves, etc:

1º Sum all maintenance powers of elements.

2º Multiply value by 4. Nominal power rating **VA** is obtained.

Check that instantaneous power of the selected transformer (see table below) is higher than the simultaneous powers of the control elements.

It is recommended a protection against short circuits via fuse, installed in series at the primary circuit.

Inrush current of a transformer can reach about 20-30 times I nominal during 5-10 ms. For this reason, fuses selected must be slow-blow or time-delay types.

It is recommended a fuse at the secondary side of the transformer according to the load to protect it against overload. Its size must be next lower than I nominal of the transformer label.

| Power Rating VA | | Reference | | | | Dimensions mm | | | | | | Tuno | Primary T, a | Primary Protection T, aM, D | |
|--------------------|---------|-----------------|-----------------|-------------------|-----|-------------------------|-----|-----|-----|--------|------|------|-----------------|--------------------------------|--|
| Nominal | (Inst.) | Sec. 12-24 V | Sec. 24-48 V | Sec. 115-230 V | А | В | С | D | Е | Ø | kg | туре | 230V | 400V | |
| 25 | (65) | CSE0025-1 | CSE0025-2 | CSE0025-3 | 82 | 90 | 92 | 58 | 79 | 5,5x12 | 1,0 | Ι | 125mA | 80 mA | |
| 40 | (80) | CSE0040-1 | CSE0040-2 | CSE0040-3 | 82 | 90 | 92 | 58 | 79 | 5,5x12 | 1,3 | Ι | 200mA | 125mA | |
| 63 | (135) | CSE0063-1 | CSE0063-2 | CSE0063-3 | 82 | 90 | 96 | 58 | 79 | 5,5x12 | 1,4 | Ι | 315mA | 200mA | |
| 100 | (210) | CSE0100-1 | CSE0100-2 | CSE0100-3 | 82 | 90 | 106 | 58 | 79 | 5,5x12 | 1,6 | Ι | 500mA | 315mA | |
| 160 | (370) | CSE0160-1 | CSE0160-2 | CSE0160-3 | 94 | 106 | 117 | 58 | 90 | 7x14 | 2,5 | II | 800mA | 500mA | |
| 200 | (460) | CSE0200-1 | CSE0200-2 | CSE0200-3 | 105 | 115 | 116 | 70 | 99 | 7x14 | 2,9 | II | 1A | 600mA | |
| 250 | (650) | CSE0250-1 | CSE0250-2 | CSE0250-3 | 105 | 115 | 127 | 70 | 99 | 7x14 | 3,6 | II | 1,25A | 800mA | |
| 315 | (875) | CSE0315-1 | CSE0315-2 | CSE0315-3 | 115 | 123 | 134 | 80 | 108 | 7x14 | 4,5 | II | 1,6A | 1A | |
| 400 | (1250) | CSE0400-1 | CSE0400-2 | CSE0400-3 | 115 | 123 | 148 | 80 | 108 | 7x14 | 5,5 | II | 2A | 1,25A | |
| 500 | (1400) | CSE0500-1 | CSE0500-2 | CSE0500-3 | 135 | 145 | 148 | 101 | 130 | 7X15 | 6,5 | II | 2,5A | 1,6A | |
| 630 | (1800) | CSE0630-1 | CSE0630-2 | CSE0630-3 | 135 | 145 | 170 | 101 | 130 | 7X15 | 8,4 | II | 3,15A | 2A | |
| 1000 | (3200) | CSE1000-1 | CSE1000-2 | CSE1000-3 | 155 | 158 | 190 | 124 | 143 | 7X15 | 12,7 | III | 5A | 3,15A | |
| 1600 | (5350) | | CSE1600-2 | CSE1600-3 | 155 | 158 | 228 | 124 | 143 | 7X15 | 17,8 | III | 8A | 5A | |
| 2000 | (5600) | | CSE2000-2 | CSE2000-3 | 192 | 212 | 210 | 165 | 195 | 7X16 | 24,6 | IV | 10A | 6,3A | |
| 2500 | (7800) | | CSE2500-2 | CSE2500-3 | 192 | 212 | 210 | 165 | 195 | 7X16 | 26,2 | IV | 12A | 8A | |
| 3150 | (10100) | | | CSE3150-3 | 192 | 212 | 250 | 165 | 195 | 7X16 | 42 | IV | 15A | 8A | |
| 4000 | (12500) | | | CSE4000-3 | 240 | 255 | 235 | 205 | 235 | 9X18 | 53 | IV | 20A | 12A | |
| 5000 | (15000) | | | CSE5000-3 | 240 | 255 | 255 | 205 | 235 | 9x18 | 59 | IV | 25A | 15A | |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.





Type IV



Single phase control transformers

IP-00



• Single phase control transformer with separated windings by galvanic isolation between primary and secondary.

• Screw fixing (for all ratings).

• Economic design intended for installation in control circuits such as switches, interlocking, signaling systems...

• Reduced size and weight for easy installation in switchgear cabinets or control panels.

• Open mounting IP-00 with a completely vacuum varnishing for a robust finish that protects it from moisture, dust and corrosion. It also prevents any vibration and noises.

• Connection protected by connection terminals from direct contact.

• For higher protection it is recommended to install fuses (not included) that could be added on request.

• Wide range of primary and secondary voltages (multi-taps) available according to installation requirements.

Technical characteristics

| Power rating | 25 ÷ 5000 VA |
|---------------------|--|
| Input voltage | ≤ 750 V |
| Output voltage | ≤ 750 V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Insulation class | F (155 °C) |
| Protection degree | IP-00 |
| Safety class | Class I |
| Test voltage | 4 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-2 IEC/UNE-EN 61558-2-4 IEC/UNE-EN 61558-2-6 |



Electrical diagram





• For general applications, select output rating according to the load and power factor:

$VA = W / Cos \phi$

• To be used as control transformer for relays, contactors, timers, electro-valves, etc:

1º Sum all maintenance powers of elements.

2º Multiply value by 4.Nominal power rating VA is obtained.

Verify that instantaneous power of the selected transformer (see table below) is higher than the simultaneous powers of the control elements.

It is recommended a protection against short circuits via fuse, installed in series at the primary circuit.

SERIES CSS

Inrush current of a transformer can reach about 20-30 times I nominal during 5-10 ms. For this reason, fuses selected must be slow-blow or time-delay types.

It is recommended a fuse at the secondary side of the transformer according to the load to protect it against overload. Its size must be next lower than I nominal of the transformer label.

| Power Rating VA | | Reference | Dimensions mm | | | | | | Weight | Type | Primary Protection T , aM , D | | |
|--------------------|---------|-----------|-------------------------|-----|-----|-----|-----|-------|--------|--------|----------------------------------|-------|--|
| Nominal | (Inst.) | | А | В | С | D | Е | Ø | кg | , is - | 230V | 400V | |
| 25 | (65) | CSSx0025 | 75 | 58 | 75 | 44 | 62 | 4x10 | 0,7 | Ι | 125mA | 80 mA | |
| 40 | (80) | CSSx0040 | 75 | 58 | 75 | 44 | 62 | 4x10 | 1 | Ι | 200mA | 125mA | |
| 63 | (135) | CSSx0063 | 75 | 58 | 75 | 44 | 62 | 4x10 | 1,1 | Ι | 315mA | 200mA | |
| 100 | (210) | CSSx0100 | 75 | 72 | 75 | 59 | 62 | 4x10 | 1,6 | Ι | 500mA | 315mA | |
| 160 | (370) | CSSx0160 | 84 | 88 | 82 | 72 | 70 | 5x11 | 2,5 | Ι | 800mA | 500mA | |
| 200 | (460) | CSSx0200 | 96 | 88 | 91 | 70 | 80 | 5x14 | 3 | Ι | 1A | 600mA | |
| 250 | (650) | CSSx0250 | 96 | 98 | 91 | 80 | 80 | 5x16 | 3,6 | Ι | 1,25A | 800mA | |
| 315 | (875) | CSSx0315 | 108 | 105 | 102 | 84 | 90 | 6x16 | 4,5 | Ι | 1,6A | 1A | |
| 400 | (1250) | CSSx0400 | 108 | 122 | 102 | 98 | 90 | 6x16 | 5,4 | II | 2A | 1,25A | |
| 500 | (1400) | CSSx0500 | 126 | 114 | 116 | 88 | 105 | 6X16 | 6,5 | II | 2,5A | 1,6A | |
| 630 | (1800) | CSSx0630 | 126 | 134 | 116 | 108 | 105 | 6X16 | 8 | II | 3,15A | 2A | |
| 1000 | (3200) | CSSx1000 | 150 | 145 | 120 | 116 | 125 | 8X20 | 12 | II | 5A | 3,15A | |
| 1600 | (5350) | CSSx1600 | 150 | 195 | 120 | 166 | 125 | 8X20 | 18 | II | 8A | 5A | |
| 2000 | (5600) | CSSx2000 | 195 | 150 | 175 | 120 | 164 | 10X23 | 21 | II | 10A | 6,3A | |
| 2500 | (7800) | CSSx2500 | 195 | 180 | 175 | 150 | 164 | 10X23 | 30 | II | 12A | 8A | |
| 3150 | (10100) | CSSx3150 | 195 | 200 | 175 | 170 | 164 | 10X23 | 33,5 | II | 15A | 8A | |
| 4000 | (12500) | CSSx4000 | 240 | 218 | 215 | 178 | 200 | 12X28 | 42 | II | 20A | 12A | |
| 5000 | (15000) | CSSx5000 | 240 | 248 | 215 | 208 | 235 | 12x28 | 49 | II | 25A | 15A | |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.



Single phase isolation transformers



• Galvanic isolation between primary and secondary and effective attenuation of electromagnetic disturbances.

• Series CN: open transformer IP-00, vacuum impregnation with dielectric varnish high binding power with special properties that protect windings and magnetic core against dust and humidity.

• Series CNB: in metal enclosure IP-23 protection degree, resin polyester-epoxy powder coated with excellent physical-mechanical and anti-corrosive properties.

• Connection with terminal blocks (rating from 6 to 31 kVA).

 \bullet Connection with flat busbars (rating from 40 to 60 kVA).

• Low losses magnetic cores.

Technical characteristics

| Power rating | 6 ÷ 60 kVA |
|---------------------|---|
| Input voltage | 230 V |
| Output voltage | 230 V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C (Series CN) 30 °C (Series CNB) |
| Insulation class | F (155 °C) |
| Protection degree | IP-00 (Series CN) IP-23 (Series CNB) |
| Safety class | Class I |
| Test voltage | 3 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-4 IEC/UNE-EN 60076-11 |

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Electrical diagram



CE





SERIES CN

• For general use, select the power according to the load and power factor:

• For loads with high inrush current or harmonics, consult "Rating selection guide" at the end of catalogue.

| Rating | Deferrence | | D | imensic | ons m i | m | | Weight |
|-------------|----------------|---------|----------|---------|----------------|-----|----|--------|
| kVA | Reference | Α | B*1 | С | D | E | Ø | kg |
| 6 | CN06 | 240 | 230 | 380 | 205 | 140 | 11 | 40 |
| 8 | CN08 | 280 | 230 | 440 | 225 | 140 | 11 | 50 |
| 10 | CN10 | 320 | 265 | 490 | 265 | 175 | 11 | 78 |
| 12 | CN12 | 320 | 265 | 490 | 265 | 175 | 11 | 81 |
| 16 | CN16 | 320 | 255 | 575 | 265 | 165 | 11 | 91 |
| 20 | CN20 | 320 | 275 | 575 | 265 | 185 | 11 | 105 |
| 25 | CN25 | 420 | 370 | 605 | 300 | 230 | 11 | 126 |
| 31 | CN31 | 420 | 390 | 605 | 300 | 250 | 11 | 149 |
| 40 | CN40 | 420 | 380 | 705 | 300 | 240 | 11 | 173 |
| 50 | CN50 | 420 | 400 | 705 | 300 | 260 | 11 | 201 |
| 60 | CN60 | 420 | 400 | 805 | 300 | 260 | 11 | 252 |
| * Other fea | atures, power, | voltage | e, etc., | on requ | lest | | | |

* Torytrans reserves the right to modify the information in any time and

Series CN IP-00



| Rating | Deference | | Dimensions mm | | | | | | | |
|--------|-----------|-----|----------------------|-----|-----|-----|----|-----|--|--|
| kVA | Reference | А | B*1 | С | D | Е | Ø | kg | | |
| 6 | CNB06 | 475 | 345 | 520 | 320 | 320 | 10 | 53 | | |
| 8 | CNB08 | 545 | 385 | 615 | 350 | 360 | 10 | 66 | | |
| 10 | CNB10 | 615 | 425 | 690 | 400 | 400 | 10 | 98 | | |
| 12 | CNB12 | 615 | 425 | 690 | 400 | 400 | 10 | 101 | | |
| 16 | CNB16 | 615 | 425 | 690 | 400 | 400 | 10 | 111 | | |
| 20 | CNB20 | 615 | 425 | 690 | 400 | 400 | 10 | 125 | | |
| 25 | CNB25 | 775 | 575 | 940 | 400 | 550 | 10 | 161 | | |
| 31 | CNB31 | 775 | 575 | 940 | 400 | 550 | 10 | 184 | | |
| 40 | CNB40 | 775 | 575 | 940 | 400 | 550 | 10 | 208 | | |
| 50 | CNB50 | 775 | 575 | 940 | 400 | 550 | 10 | 236 | | |
| 60 | CNB60 | 775 | 575 | 940 | 400 | 550 | 10 | 287 | | |

Series CNB IP-23

* Other features, power, voltage, etc., on request
 * Torytrans reserves the right to modify the information in any time and

without prior notice.

without prior notice.



EB

Single phase ultra-isolation transformers IP-20



• Single phase transformer with ultra galvanic isolation between primary and secondary winding through one or more electrostatic shields.

• Wounds totally protected against mechanical chocks and adverse environments.

• DIN Rail mounting (for ratings up to 100 VA) and screw fixing (for all ratings).

• Connections by screws with self-lifting supporting washers. Its safe cover protects users from the risk of electrical shocks and connections contact are not accessible by the user.

• High degree of attenuation and filtering of electromagnetic disturbances.

• Elevated harmonic distortion causes electric noises, malfunctioning and failure in electronic and control equipments. CUP series transformer is the most convenient choice to protect them against these undesired disturbances.

- Electromagnetic disturbances can be caused by:
 - Interruptions of inductive loads
 - Deficient or no Earth connection system
 - Atmospheric discharges
 - Operation with significant loads
 - Proximity of electrical motors

Technical characteristics

| Power rating | 200 ÷ 5000 VA |
|---------------------------------------|--|
| Input voltage | 230 V |
| Output voltage | 230 V |
| Frequency | 50/60 Hz |
| Ambient temp. | 40 °C |
| Insulation class | F (155 °C) |
| Protection degree | IP-20 |
| Safety class Ratings 25 ÷ 630 VA | Class II |
| Safety class Ratings 1000 ÷ 5000 V | Class I A |
| Test voltage | 4 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-4 |
| | |



Electrical diagram CU1P - One shield



Electrical diagram CU3P – Three shields





In electricity supply systems, there are three conductors, one supply conductor or active phase, one neutral conductor and one earth conductor. Active phase and neutral conductors provide the electrical power and earth conductor is for safety.

Disturbances or transients in the voltage cause interferences (electrical noises) in the utility. These noises can be:

<u>Common Mode Noise</u>, refers to noise that occur between a active phase or neutral and the ground conductors. Unfortunately, Common Mode Noise does find its way into electrical systems because of noise injection into the neutral or ground conductors from overloaded power circuits, wiring faults and other equipment on the same line. These noises are more dangerous still being much lower magnitude than Normal Mode Noise.

<u>Normal Mode Noise</u>, refers to noise that occur between the hot and neutral conductors. On rare occasions, surge voltages that come from outside of the building enter on the hot conductor and are primarily considered normal mode since the neutral conductor is at ground voltage. An isolation transformer can filter Common Mode Noises due its construction and, the electrostatic shield between primary and secondary filters the Normal Mode high frequency Noises.

If the electrostatic shield is connected to earth, the capacitance between primary and secondary is significantly reduced and the resistance against high frequency noises at the secondary wound is increased.

A series CUP transformer with 1 electrostatic shield provides 60dB attenuation factor; equivalent to a ratio of 1000:1. That means that an input transient energy of 1000V converts it to 1V transient at the output.

A series CUP transformer with 3 electrostatic shields provides 80dB noise attenuation; that means a ratio of 10000:1.

| Rating | Refe | rence | | Dimensions mm | | | | | | Туре |
|--------|----------|-----------|-----|-------------------------|-----|-----|-----|------|------|------|
| VA | 1 Shield | 3 Shields | Α | В | С | D | E | Ø | ку | |
| 200 | CU1P0200 | CU3P0200 | 105 | 115 | 116 | 70 | 99 | 7x14 | 2,9 | Ι |
| 315 | CU1P0315 | CU3P0315 | 115 | 123 | 134 | 80 | 108 | 7x14 | 4,5 | I |
| 500 | CU1P0500 | CU3P0500 | 135 | 145 | 148 | 101 | 130 | 7X15 | 6,5 | Ι |
| 630 | CU1P0630 | CU3P0630 | 135 | 145 | 170 | 101 | 130 | 7X15 | 8,4 | I |
| 1000 | CU1P1000 | CU3P1000 | 150 | 158 | 190 | 124 | 143 | 7X15 | 12,7 | II |
| 1600 | CU1P1600 | CU3P1600 | 155 | 158 | 228 | 124 | 143 | 7X15 | 17,8 | II |
| 2000 | CU1P2000 | CU3P2000 | 192 | 212 | 215 | 165 | 195 | 7X16 | 24,6 | III |
| 2500 | CU1P2500 | CU3P2500 | 192 | 212 | 230 | 165 | 195 | 7X16 | 33 | III |
| 3150 | CU1P3150 | CU3P3150 | 192 | 212 | 250 | 165 | 195 | 7X16 | 42 | III |
| 4000 | CU1P4000 | CU3P4000 | 240 | 255 | 235 | 205 | 235 | 9X18 | 53 | III |
| 5000 | CU1P5000 | CU3P5000 | 240 | 255 | 255 | 205 | 235 | 9x18 | 59 | III |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.









Type III



Single phase swimming-pool LED transformers IP-20



Single phase safety and isolating transformer with galvanic isolation between primary and secondary for swimming pool led lights, garden spotlights, saunas and illuminated fountains.

Ensure the necessary led focus voltage, with margins that ensure the internal operation of all components, preserving the life of the lamp and optimal lighting.

Maximum security against electrical shocks, all live parts are protected and not accessible.

Compact and modular design, therefore reduced dimensions than a conventional one, providing a space-saving installation into electrical cabinets mounting.

DIN Rail mounting or screw fixing.

Enclosure is a V-0 technical polyamide; free of halogens and phosphorus.

Connections by screws with self-lifting supporting washers.

Transparent cover to protect the terminal connections intended to avoid the risk of electrical contact accident.

Technical characteristics

| Power rating | 30 ÷ 120 VA |
|---------------------|--|
| Input voltage | 230 V |
| Output voltage | 12 V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Insulation class | F (155 °C) |
| Protection degree | IP-20 |
| Safety class | Class II |
| Test voltage | 4 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-6 |







Electrical diagram



LED Spotlights Monochrome & Multicolor









Connection diagram: Monochrome LED Light.



Connection diagram: Multicolor LED Light.



Series TCL

| Rating | Rating Deferring LED Spotlight | | otlight | | | Dimens mn | sions n | | | Weight | T |
|--------|--------------------------------|---------------|-----------------|----|-----|--------------|-------------------|-----|-----|--------|------|
| VA | Reference | Max. Power | Power Factor | А | В | С | D | Е | Ø | kġ | туре |
| 30 | TCL30 | 18 W | 0,6 | 54 | 112 | 112 | 37 | 100 | 6 | 0,8 | Ι |
| 50 | TCL50 | 30 W | 0,6 | 54 | 112 | 112 | 37 | 100 | 6 | 1,1 | Ι |
| 75 | TCL75 | 45 W | 0,6 | 82 | 90 | 92 | 58 | 79 | 5,5 | 1,6 | II |
| 120 | TCL120 | 70 W | 0,6 | 82 | 90 | 92 | 58 | 79 | 5,5 | 2,2 | II |

* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.





Single phase swimming-pool transformers **IP-20**



• Single phase safety and isolating transformer with galvanic isolation between primary and secondary for swimming pool, garden spotlights, saunas and illuminated fountains.

- Wounds totally protected against mechanical chocks and adverse environments.
- Maximum security against electrical shocks, all live parts are protected and not accessible.
- There are not hazardous metal parts available in case of fault.
- It provides several taps in the primary winding in order to compensate for the voltage drop in the transformer-spotlight line according to distance.
- Screw fixing and possible horizontal mounting designed for placing in cabinets with reduced height (series CPEH).
- · Connections by screws with self-lifting supporting washers.
- Transparent cover to protect the terminal connections intended to avoid the risk of electrical contact accident.

Technical characteristics

| Power rating | 100, 300 and 600 VA |
|---------------------|---|
| Input voltage | 230 V |
| Output voltage | 12 V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Insulation class | F (155 °C) |
| Protection degree | IP-20 |
| Safety class | Class II |
| Test voltage | 4 kV |
| Standards | IEC/UNE-EN 61558-1 IEC /UNE-EN 61558-2-6 |



Electrical diagram







22

| Selection | table |
|-----------|-------|
|-----------|-------|

| Deteil | Deted | Distance between spotlight and transformer | | | | | | | | | | | |
|--------------|-----------|--|--|-----------------|----------------|---|----------|--|--|--|--|--|--|
| transformer | spotlight | 6 (| 6 mm ² cable section (CPE0100 of 2,5 mm ²) | | | 10 mm ² cable section (CPE0100 of 4 mm ²) | | | | | | | |
| 100 VA | 100 W | | | | | | | | | | | | |
| 300 VA | 300 W | 1 to 6 mts | 6 to 15 mts | 15 to 24 mts | 1 to 10 mts | 10 to 25 | 25 to 40 | | | | | | |
| 600 VA | 2 x 300 W | IIII | into | mo | mo | into | into | | | | | | |
| | | | | | | | | | | | | | |
| Input voltag | ge 230 V | 0 - 3 | 0 - 2 | 0 - 1 | 0 - 3 | 0 - 2 | 0 - 1 | | | | | | |

NOTE: for these figures, CPE600 reference to be connected 2 lines and 1 spotlight of 300W each one.

It is recommended a protection against short circuits via fuse, installed in series at the primary circuit.

Inrush current of a transformer can reach about 20-30 times I nominal during 5-10 ms. For this reason, fuses selected must be slow-blow or time-delay types.

| Follo | owin | ig we | indicate | the re | con | nmer | nded fuses to |
|-------|------|-------|-----------|--------|-----|------|---------------|
| put | at | the | primary | side | of | the | transformer |
| ассо | rdir | ng to | the ratin | g. | | | |

| Power Rating | Fuse 230V |
|-----------------|--------------|
| 100 VA | T 0,63A |
| 300 VA | T 1,6A |
| 600 VA | T 3,15A |

| Series | CPE | Vertical | mounting |
|--------|-----|----------|----------|
| Jenes | | Vertical | mounting |

| Rating | Reference | | Weight | | | | | |
|--------|-----------|-----|--------|-----|----|-----|------|-----|
| VA | | А | В | С | D | E | Ø | Kg |
| 100 | CPE100 | 94 | 106 | 105 | 58 | 90 | 7x14 | 1,9 |
| 300 | CPE300 | 115 | 123 | 137 | 80 | 106 | 7x14 | 4,1 |
| 600 | CPE600 | 135 | 148 | 172 | 91 | 132 | 7x15 | 7,6 |



* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.

| Series CPEH Horizontal mounting | | | | | | | | | |
|---------------------------------|-----------|-----|-----|-------------------|--------------------|-----|------|--------|-----|
| Rating | Reference | | | Dimer m | nsions m | | | Weight | |
| VA | | А | В | С | D | E | Ø | Kg | |
| 100 | CPEH100 | 94 | 116 | 83 | 58 | 100 | 7X14 | 1,9 | |
| 300 | CPEH300 | 115 | 146 | 101 | 80 | 130 | 7x14 | 4,1 | × × |
| 600 | CPEH600 | 135 | 182 | 117 | 91 | 166 | 7x15 | 7,6 | |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.





Single phase swimming pool transformers IP-65



• Single phase safety and isolating transformer with galvanic isolation between primary and secondary for swimming pool, garden spotlights, saunas and illuminated fountains.

• Wounds totally protected against mechanical chocks and adverse environments. Internally encapsulated by resin.

• Automatic protection against overloads and overheat by a built-in self-resetting system that prevents the transformer to reach dangerous temperatures for its normal operation.

- Short-circuit protection by an internal fuse.
- It has several taps in the primary winding in order to compensate for the voltage drop in the transformer-spotlight line according to distance.
- Ground terminal provided. Primary and secondary tap compartments separated and fully enclosed.
- Internal terminal block with cable gland included.

• Enclosure protection by a polycarbonate box IP-65.

Technical characteristics

| Power rating | 100, 300 and 600 VA |
|---------------------|--|
| Input voltage | 230 V |
| Output voltage | 12 – 17 V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Insulation class | F (155 °C) |
| Protection degree | IP-65 |
| Safety class | Class II |
| Test voltage | 4 kV |
| Standard | IEC /UNE-EN 61558-1 IEC /UNE-EN 61558-2-6 |



Electrical diagram





SERIES EPC

Selection table

| Cable | Rated | Transformer EPC100 | | | | | | |
|---------------------|-----------|--|-------------|-------------|-------------|-------------|-------------|--|
| section | spotlight | Distance between spotlight and transformer | | | | | | |
| 2,5 mm ² | 100 W | 1 to 10 m. | 10 to 15 m. | 15 to 20 m. | 20 to 30 m. | 30 to 40 m. | 40 to 50 m. | |
| 4 mm ² | 100 W | 1 to 16 m. | 16 to 25 m. | 25 to 35 m. | 35 to 45 m. | 45 to 60 m. | 60 to 75 m. | |
| | | | | | | | | |
| Input volta | age 230 V | B - 3 | B - 2 | B - 1 | A - 3 | A - 2 | A - 1 | |

| Cable | Rated | Transformer EPC300 | | | | | | |
|---------------------------------------|-----------|--|-------------|-------------|-------------|-------------|-------------|--|
| section | spotlight | Distance between spotlight and transformer | | | | | | |
| 6 mm ² | 300 W | 1 to 10 m. | 10 to 15 m. | 15 to 20 m. | 20 to 25 m. | 25 to 35 m. | 35 to 40 m. | |
| 10 mm ² | 300 W | 1 to 16 m. | 16 to 25 m. | 25 to 35 m. | 35 to 45 m. | 45 to 55 m. | 55 to 65 m. | |
| | | | | | | | | |
| Input voltage 230 V B - 3 B - 2 B - 1 | | | A - 3 | A - 2 | A - 1 | | | |

| Cable | Rated | Transformer EPC600 | | | | | | |
|--------------------|-----------|--|-------------|-------------|-------------|-------------|-------------|--|
| section | spotlight | Distance between spotlight and transformer | | | | | | |
| 6 mm ² | 2x300 W | 1 to 10 m. | 10 to 15 m. | 15 to 20 m. | 20 to 25 m. | 25 to 30 m. | 30 to 35 m. | |
| 10 mm ² | 2x300 W | 1 to 16 m. | 16 to 25 m. | 25 to 30 m. | 30 to 35 m. | 35 to 40 m. | 40 to 45 m. | |
| | | | | | | | | |
| Input volta | age 230 V | B - 3 | B - 2 | B - 1 | A - 3 | A - 2 | A - 1 | |

NOTE: for these figures, EPC600 reference to be connected 2 lines and 1 spotlight of 300W each one.

Following we indicate the recommended fuses to put at the primary side of the transformer according to the rating.

Fuse

230 V T 0,63A

T 1,6A

T 4A

Power

Rating

100 VA 300 VA

600 VA

| Degree of protection again | nst external of | bjects or |
|---|----------------------------|-----------|
| water is indicated by an higher number means more | 'IP' degree nu protection. | imber. A |
| | | |

| IP-6_ | IP5 |
|--------------------------------|------------------------------------|
| | |
| Completely closed enclosure | Water proof hermetically closed |

| Rating | Reference | Diı | Weight | | |
|--------|-----------|-----|--------|-----|------|
| VA | | А | В | С | Kg |
| 100 | EPC100 | 190 | 125 | 95 | 2,9 |
| 300 | EPC300 | 220 | 170 | 120 | 5,5 |
| 600 | EPC600 | 220 | 170 | 120 | 11,0 |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.





А

Toroidal Transformers



• Single phase safety transformer with galvanic isolation between primary and secondary for light and low voltage devices (12 V).

• Optimized design that provides it with electrical and mechanical advantages by comparison with conventional transformers, such as:

- Higher efficiency
- Minimal no-load losses
- Lower magnetic stray field
- · Very low noise field
- Vibrations free
- Lower heat losses
- Reduced dimensions and weight
- Easier mounting
- Flexible design
- Direct output with winding wire.
- On request it could be supplied with potted centre hole or potted in polyamide housings.

Technical characteristics

| Power rating | 50 ÷ 600 VA |
|----------------------------------|--|
| Input voltage | 230 V |
| Output voltage | 12 V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Insulation class | B (130 °C) |
| Protection degree | IP-00 |
| Safety class | Class II |
| Connection type | Connecting leads |
| Accessories | Mounting kit (optional) |
| Test voltage | 4 kV |
| Standards Safety transformers | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-6 |



Electrical diagram





SERIES TOR

Torytrans S.L., as specialized and flexible manufacturer of toroidal transformers, designs and produces custom-made products under the customer's requirements.

Its installations count with its own toroidal magnetic cores production, essential component to assure the most reliable use of the transformer.

Manufactured by high quality grain-oriented electrical steel core (Fe-Si alloy) and processed in updated thermal process. In particular, our toroidal cores are designed with very low losses and optimized working induction.

| Rating VA | Reference | Diameter mm | Height mm | Weight Kg |
|--------------|-----------|-----------------------|---------------------|---------------------|
| 50 | TOR050 | 60 | 42 | 0,6 |
| 100 | TOR100 | 115 | 35 | 1,2 |
| 150 | TOR150 | 115 | 42 | 1,6 |
| 200 | TOR200 | 120 | 44 | 1,8 |
| 250 | TOR250 | 120 | 50 | 2,4 |
| 300 | TOR300 | 130 | 50 | 2,9 |
| 400 | TOR400 | 140 | 51 | 3,6 |
| 500 | TOR500 | 150 | 52 | 4,2 |
| 600 | TOR600 | 166 | 56 | 4,9 |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.

Mounting kit (optional)

| | Reference | Accessories |
|--|-----------|--|
| | TORxxx-1 | 2 Nylon discs (screw included) |
| | TORxxx-2 | 2 isolation washers 2 metal discs (screw included) |

* Other mounting accessories on request

Customized designs (on request)

- Full resin encapsulation
- Potted center hole
- Polyamide plastic housing
- Metal sheet cabinet IP-23
- Connections by terrminal blocks
- Thermal protection and fuses
- Electrostatic shield for earth connection
- Longer length cables and custom colours
- Strip and clamp fast connectors

It is recommended a protection against short circuits via fuse, installed in series at the primary circuit.

Inrush current of a toroidal transformer is higher than a conventional transformer due its air gaps absence in the core.

It is recommended a fuse at the secondary side of the transformer according to the load to protect it against overload. Its type selection must be according to the load and size must be next lower than nominal current of the transformer label.









Isolation transformers for medical rooms IEC/UNE-EN 61558 – 2012



• Single or three phase isolating transformer with galvanic isolation between primary and secondary intended to be installed at medical facilities, according to the new European standard IEC/UNE-EN 61558-2-15 valid from 2012 which cancels and replaces the previous from 2008 and Spanish standard UNE 20615.

• Intended for generate a neutral IT point connection at industries with processes sensitive to interruptions.

• Thermal protection against overload and overtemperature. Low losses magnetic cores.

• Open transformer IP-00, vacuum impregnation with dielectric varnish high binding power with special properties that protect windings and magnetic core from dust and humidity.

• Electrostatic shield between primary and secondary winding connected to PE terminal (individual connector).

Technical characteristics

| Power rating | 1 ÷ 10 kVA |
|---|---|
| Input voltage II Output voltage II | 230 V (Series CM) 230 V (Series CM) |
| Input voltage III Output voltage III | 400 V (Series CTM) 230 V (Series CTM) |
| Frequency | 50/60 Hz |
| Ambient temp. | 40 °C |
| Insulation class | F (155 °C) |
| Protection degree | IP-00 |
| Safety class | Class I |
| Test voltage | 4 kV - 2 kV |
| Inrush current | < 12 I _N |
| No load current | < 3% |
| Leakage current | < 0,5 mA |
| Insulation resistance | 7 ΜΩ |
| Standard New standard of 2012 | IEC/UNE EN 61558-1 IEC/UNE EN 61558-2-15 |



CE

Electrical diagram CM single phase



Electrical diagram CTM three phase - YNyn0





SERIES CM & CTM

Series CM - Single phase

| Rating | Deference | | Dii | | Weight | Tuna | | | |
|--------|-----------|-----|-----|-----|--------|------|----|------|------|
| VA | Reference | А | В | С | D | E | Ø | kg | туре |
| 1000 | CM1000 | 150 | 162 | 185 | 125 | 133 | 8 | 14,1 | Ι |
| 1600 | CM1600 | 180 | 154 | 220 | 150 | 122 | 9 | 18,6 | Ι |
| 2000 | CM2000 | 195 | 188 | 228 | 163 | 154 | 10 | 25,2 | Ι |
| 2500 | CM2500 | 240 | 166 | 270 | 200 | 123 | 12 | 28,4 | Ι |
| 3150 | CM3150 | 240 | 176 | 270 | 200 | 133 | 12 | 32,3 | Ι |
| 4000 | CM4000 | 240 | 136 | 375 | 150 | 110 | 11 | 33,0 | II |
| 5000 | CM5000 | 240 | 156 | 380 | 150 | 131 | 11 | 34,5 | II |
| 6300 | CM6300 | 240 | 176 | 390 | 150 | 151 | 11 | 41,3 | II |
| 8000 | CM8000 | 280 | 176 | 430 | 225 | 149 | 11 | 59,5 | II |
| 10000 | CM10000 | 280 | 216 | 425 | 225 | 189 | 11 | 80,2 | II |

* Also available into IP23 enclosure on request.

* Other features, power, voltage, etc., on request * Torytrans reserves the right to modify the information

in any time and without prior notice.



Type I



Type II

| Rating | Rating | | | Dimensions mm | | | | | | |
|--------|-----------|-----|-----|----------------------|-----|-----|----|----|--|--|
| VA | Reference | Α | В | С | D | E | Ø | kġ | | |
| 1000 | CTM1000 | 240 | 155 | 265 | 200 | 85 | 7 | 11 | | |
| 1600 | CTM1600 | 240 | 165 | 265 | 200 | 95 | 7 | 13 | | |
| 2000 | CTM2000 | 240 | 140 | 280 | 200 | 118 | 7 | 25 | | |
| 2500 | CTM2500 | 300 | 120 | 310 | 200 | 96 | 11 | 27 | | |
| 3150 | CTM3150 | 300 | 140 | 320 | 200 | 115 | 11 | 32 | | |
| 4000 | CTM4000 | 300 | 150 | 320 | 200 | 125 | 11 | 36 | | |
| 5000 | CTM5000 | 300 | 170 | 320 | 200 | 145 | 11 | 45 | | |
| 6300 | CTM6300 | 360 | 135 | 375 | 320 | 110 | 11 | 42 | | |
| 8000 | CTM8000 | 360 | 165 | 380 | 320 | 140 | 11 | 59 | | |
| 10000 | CTM10000 | 360 | 195 | 380 | 320 | 170 | 11 | 72 | | |

Series CTM – Three phase

* Also available into IP23 enclosure on request.

* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.





Measurement transformers

Potential transformer



Technical characteristics

| Power rating | 3 ÷ 150 VA (Class 0,5) 5 ÷ 250 VA (Class 1) |
|------------------------|--|
| Input voltage | max. 690V/ $\sqrt{3}$ |
| Output voltage | $100V/\sqrt{3}$ |
| Accuracy | Class 0,5 Class 1 |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Insulation class | B (130 °C) |
| Protection degree | IP-20 |
| Safety class | Class II |
| Test voltage | 4 kV |
| Continuous overvoltage | +20% |
| Thermal current | $6 \times I_N$ |
| Standard | IEC/UNE-EN 61869-3 |
| | CE |



Current transformer

Technical characteristics

| Power rating | 5 ÷ 10 VA |
|-------------------------|----------------|
| Primary current | 50 ÷ 1000 A |
| Secondary current | 5 A |
| Accuracy | Class 1 |
| Voltage service | 690 V |
| Ambient temperature | 40 °C |
| Insulation class | B (130 °C) |
| Protection degree | IP-20 |
| Safety class | Class II |
| Connection type | Screw |
| Screw fixing | |
| Busbar or cable-through | |
| Standard | IEC/UNE-EN 618 |

369-2

CE





30

SERIES MT & MI

The application of measurement transformers is normally reduction of a higher to a lower voltage or current values that can be measured by protection relays and measurement instruments.

The relation between the primary and secondary is very accurate, independent of primary and load (as long as within the limits of transformer specifications) and 0° shift phase angle. The accuracy class is indicating the maximum error in voltage or current relation, for example class 1 means 1% error.

These transformers provide insulation and separation of circuits and measurement devices from the voltage lines.

To define the transformer power VA, sum all the power consumed by the external loads connected to the transformer and the power consumed by the interconnecting leads. It is recommended to select the closer higher rating because accuracy and safety factor could be changed.

Accuracy:

Class 0,5: Precision and tariff equipments. Class 1: Industrial measurement equipments.

Turns:

The number of turns of the primary cable converts the primary current value proportionally to secondary current (not modify accuracy).

| Rating VA Def | | | | Weight | | | | | |
|------------------|------------|-------|-----|--------|-----|-----|-----|--------|------|
| Class 0,5 | Class 1 | Rel. | А | В | С | D | Е | Ø | kg |
| 3 | 5 | MT003 | 82 | 90 | 96 | 58 | 79 | 5,5x12 | 1,4 |
| 5 | 7,5 | MT005 | 82 | 90 | 106 | 58 | 79 | 5,5x12 | 1,6 |
| 10 | 15 | MT010 | 94 | 106 | 117 | 58 | 90 | 7x14 | 2,5 |
| 15 | 25 | MT015 | 105 | 115 | 116 | 70 | 99 | 7x14 | 2,9 |
| 30 | 50 | MT030 | 115 | 123 | 134 | 80 | 106 | 7x14 | 4,5 |
| 50 | 75 | MT050 | 135 | 148 | 148 | 91 | 132 | 7X15 | 6,5 |
| 100 | 150 | MT100 | 150 | 158 | 190 | 124 | 143 | 7X15 | 12,7 |
| 150 | 250 | MT150 | 150 | 158 | 228 | 124 | 143 | 7X15 | 17,8 |

Series MT Potential Transformers



* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.

| Current Ratio | Power VA | Ref. | Di | mensio mm | Weight ka | Central section | |
|------------------|-------------|----------------------|-----|---------------------|---------------------|-----------------|--------------|
| A | Class 1 | | A | В | C | 5 | mm |
| 50/5 | 5 | MI050 ⁽³⁾ | 75 | 42 | 100 | 0,4 | |
| 100/5 | 5 | MI100 ⁽²⁾ | 75 | 42 | 100 | 0,4 | Ф20 30x10 |
| 150/5 | 5 | MI150 | 75 | 42 | 100 | 0,4 | 00/120 |
| 200/5 | 5 | MI200 | 75 | 42 | 100 | 0,4 | |
| 250/5 | 5 | MI250 | 75 | 42 | 100 | 0,4 | Ф32 40x10 |
| 300/5 | 5 | MI300 | 75 | 42 | 100 | 0,4 | 10/120 |
| 400/5 | 5 | MI400 | 102 | 40 | 128 | 0,6 | |
| 500/5 | 5 | MI500 | 102 | 40 | 128 | 0,6 | |
| 600/5 | 5 | MI600 | 102 | 40 | 128 | 0,6 | Ф46 60x20 |
| 800/5 | 10 | MI800 | 102 | 40 | 128 | 0,6 | |
| 1000/5 | 10 | MI1000 | 102 | 40 | 128 | 0,6 | |

Series MI Current Transformers

(3) Perform 3 turns of the primary cable through the transformer (2) Perform 2 turns of the primary cable through the transformer

* Other central section or current range on request.





Isolation Transformers encapsulated in resin



• Single phase (CNE series) and three phase (TTE series) transformers with galvanic isolation between primary and secondary and excellent attenuation against electrical perturbations.

• Separated windings by galvanic isolation between primary and secondary. Wounds totally protected against mechanical chocks and adverse environments.

• It increases the mechanical resistance against the electrodynamics stresses of the winding extending the working life of the isolations.

• Improves the reliability working on vibratory environments.

• Encapsulated in resin of high robustness and high thermal power dissipation. Optionally you can be done self-extinguishing V0 and fireproof.

• Magnetic core with low losses impregnated with epoxy antioxidant varnish.

• Transparent protective cover for the terminals that avoids the risk of accidents by electrical contact.

Technical characteristics

| Power rating | 5 ÷ 50 kVA | | | | | |
|---------------------------------|---|--|--|--|--|--|
| Input voltage Output voltage | 230 V (Series CNE) 230 V | | | | | |
| Input voltage Output voltage | 3 x 400 (Series TTE) 3 x 400 V + N | | | | | |
| Frequency | 50/60 Hz | | | | | |
| Ambient temperature | 40 °C | | | | | |
| Cooling | Natural | | | | | |
| Insulation class | F (155 °C) | | | | | |
| Protection degree | IP-20 | | | | | |
| Safety class | Class I | | | | | |
| Test voltage | 3 kV | | | | | |
| Accessories (not included) | Lifting eyebolts Wheels Cabinet IP-23 | | | | | |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 | | | | | |



Electrical diagram series CNE single phase



Electrical diagram series TTE three phase - Yyn0







SERIES CNE Y TTE

Series CNE - Single phase

| Rating | Deference | | D | weight | Turne | | | | |
|--------|-----------|-----|-----|--------|-------|-----|----|-----|------|
| kVA | Reference | А | В | С | D | Е | Ø | kg | туре |
| 5 | CNE005 | 240 | 255 | 255 | 205 | 235 | 9 | 59 | Ι |
| 6,3 | CNE006 | 300 | 285 | 210 | 250 | 235 | 9 | 62 | II |
| 8 | CNE008 | 350 | 310 | 270 | 295 | 262 | 12 | 70 | II |
| 10 | CNE010 | 350 | 310 | 280 | 295 | 262 | 12 | 70 | II |
| 12 | CNE012 | 320 | 265 | 490 | 265 | 175 | 11 | 98 | III |
| 16 | CNE016 | 320 | 255 | 575 | 265 | 165 | 11 | 115 | III |
| 20 | CNE020 | 320 | 275 | 575 | 265 | 185 | 11 | 128 | III |
| 25 | CNE025 | 420 | 370 | 605 | 300 | 230 | 11 | 150 | III |
| 31,5 | CNE031 | 420 | 390 | 605 | 300 | 250 | 11 | 172 | III |
| 40 | CNE040 | 420 | 380 | 705 | 300 | 240 | 11 | 195 | III |
| 50 | CNE050 | 420 | 400 | 705 | 300 | 260 | 11 | 230 | III |



Series TTE - Three phase

| Rating kVA | Reference | Dimensions mm | | | | | | weight | Type |
|----------------------|-----------|----------------------|-----|-----|-----|-----|----|--------|------|
| | | А | В | С | D | Е | Ø | kg | Type |
| 5 | TTE005 | 300 | 200 | 320 | 200 | 120 | 11 | 65 | Ι |
| 6,3 | TTE006 | 300 | 220 | 320 | 200 | 140 | 11 | 76 | Ι |
| 8 | TTE008 | 360 | 205 | 375 | 320 | 125 | 11 | 82 | Ι |
| 10 | TTE010 | 360 | 225 | 380 | 320 | 145 | 11 | 95 | Ι |
| 12 | TTE012 | 420 | 230 | 430 | 350 | 140 | 11 | 115 | Ι |
| 16 | TTE016 | 420 | 250 | 435 | 350 | 160 | 11 | 125 | II |
| 20 | TTE020 | 480 | 240 | 490 | 400 | 155 | 11 | 147 | II |
| 25 | TTE025 | 480 | 260 | 490 | 400 | 175 | 11 | 170 | II |
| 31,5 | TTE031 | 655 | 325 | 595 | 400 | 220 | 13 | 220 | II |
| 40 | TTE040 | 655 | 345 | 595 | 400 | 240 | 13 | 265 | II |
| 50 | TTE050 | 655 | 375 | 595 | 400 | 270 | 13 | 305 | II |





Three phase isolating transformers





Three phase isolating transformer with galvanic isolation between primary and secondary.

For general use as isolating transformer and isolation of circuits, eliminating the risk of electrical shock in case of unipolar human contact. For voltage adaptation use in three phase systems, the maximum unbalanced single phase loads between phases should not exceed 25%.

Vacuum impregnation with dielectric varnish high binding power with special properties that protect windings and magnetic core from dust and humidity.

Connection with terminal blocks (rating from 3 to 40 kVA).

Connection with screws for flat terminals (rating from 50 to 125 kVA).

Connection with flat busbars (rating from 160 to 1000 kVA).

Technical Characteristics

| Power rating | 1 ÷ 1000 kVA | | | | | |
|-------------------|---|--|--|--|--|--|
| Input voltage | 400 V | | | | | |
| Output voltage | 230 V (Series TDS) 400 V (Series TTS) | | | | | |
| Vector group | Yyn0 | | | | | |
| Frequency | 50/60 Hz | | | | | |
| Ambient temp | 40 °C | | | | | |
| Insulation class | F (155 ºC) up to TTS0125 | | | | | |
| | H (180 ºC) from TTS0160 | | | | | |
| Protection degree | IP-00 | | | | | |
| Safety class | Class I | | | | | |
| Test voltage | 3 kV | | | | | |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 | | | | | |





Electrical diagram




SERIES TDS Y TTS

• For general use, select the power according to the load and power factor:

$kVA = kW / Cos \phi$ $kVA = \sqrt{3} \times V \times I / 1000$

• For loads with high inrush current or harmonics, consult "Rating selection guide" at the end of catalogue.

| Rating | Refe | rence | | D | imensic | ns m | m | | Weight | Turne |
|--------|----------|----------|-----|-----|---------|------|-----|----|--------|-------|
| VA | 400/230V | 400/400V | Α | B*1 | С | D | E | Ø | kg | туре |
| 1 | TDS001 | TTS001 | 240 | 165 | 260 | 200 | 95 | 7 | 13 | Ι |
| 2 | TDS002 | TTS002 | 240 | 190 | 265 | 200 | 120 | 7 | 20 | Ι |
| 3 | TDS003 | TTS003 | 300 | 180 | 310 | 200 | 100 | 11 | 25 | Ι |
| 4 | TDS004 | TTS004 | 300 | 190 | 320 | 200 | 110 | 11 | 29 | Ι |
| 5 | TDS005 | TTS005 | 300 | 200 | 320 | 200 | 120 | 11 | 34 | Ι |
| 6 | TDS006 | TTS006 | 300 | 220 | 320 | 200 | 140 | 11 | 42 | Ι |
| 8 | TDS008 | TTS008 | 360 | 205 | 375 | 320 | 125 | 11 | 49 | Ι |
| 10 | TDS010 | TTS010 | 360 | 225 | 380 | 320 | 145 | 11 | 60 | Ι |
| 12 | TDS012 | TTS012 | 420 | 230 | 430 | 350 | 140 | 11 | 76 | Ι |
| 16 | TDS016 | TTS016 | 420 | 250 | 435 | 350 | 160 | 11 | 90 | Ι |
| 20 | TDS020 | TTS020 | 480 | 240 | 490 | 400 | 155 | 11 | 107 | Ι |
| 25 | TDS025 | TTS025 | 480 | 260 | 490 | 400 | 175 | 11 | 128 | Ι |
| 31 | TDS031 | TTS031 | 655 | 325 | 595 | 400 | 220 | 13 | 178 | II |
| 40 | TDS040 | TTS040 | 655 | 345 | 595 | 400 | 240 | 13 | 213 | II |
| 50 | TDS050 | TTS050 | 655 | 375 | 595 | 400 | 270 | 13 | 262 | II |
| 63 | TDS063 | TTS063 | 655 | 325 | 795 | 400 | 220 | 13 | 246 | II |
| 80 | TDS080 | TTS080 | 655 | 355 | 795 | 400 | 250 | 13 | 311 | II |
| 100 | TDS100 | TTS100 | 660 | 310 | 875 | 480 | 265 | 13 | 400 | III |
| 125 | TDS125 | TTS125 | 660 | 380 | 875 | 480 | 335 | 13 | 568 | III |
| 160 | TDS160 | TTS160 | 720 | 390 | 940 | 480 | 340 | 13 | 667 | III |
| 200 | TDS200 | TTS200 | 720 | 420 | 940 | 480 | 370 | 13 | 764 | III |
| 250 | TDS250 | TTS250 | 780 | 450 | 1035 | 660 | 395 | 16 | 923 | III |
| 315 | TDS315 | TTS315 | 840 | 575 | 1000 | 660 | 420 | 16 | 1142 | IV |
| 400 | TDS400 | TTS400 | 840 | 615 | 1000 | 660 | 460 | 16 | 1307 | IV |
| 500 | TDS500 | TTS500 | 900 | 605 | 1100 | 660 | 465 | 16 | 1494 | IV |
| 630 | TDS630 | TTS630 | 900 | 650 | 1110 | 660 | 505 | 16 | 1705 | IV |
| 800 | TDS800 | TTS800 | 960 | 690 | 1170 | 660 | 550 | 16 | 2106 | IV |
| 1000 | TDS1000 | TTS1000 | 960 | 760 | 1170 | 660 | 610 | 16 | 2454 | IV |



Type I

* Other features, power, voltage, etc., on request
 * Torytrans reserves the right to modify the information in any time and without prior notice.





Type II

Type III

Type IV



Three phase isolating transformers



Three phase isolating transformer with galvanic isolation between primary and secondary.

For general use as isolating transformer and isolation of circuits, eliminating the risk of electrical shock in case of unipolar human contact. Intended for voltage adaptation in three phase systems and single phase loads with a maximum unbalance of 25% between phases.

Mounting into metal enclosure, protection degree of IP23, coated with a resin polyesterepoxy powder with excellent physicalmechanical and anti-corrosive properties.

Connection with terminal blocks (rating from 3 to 40 kVA).

Connection with screws for flat terminals (rating from 50 to 125 kVA).

Connection with flat busbars (rating from 160 to 1000 kVA).

Technical Characteristics

| Power rating | 1 ÷ 1000 kVA | | | |
|-------------------|--|--|--|--|
| Input voltage | 3 x 400 V | | | |
| Output voltage | 3 x 230 V (Series TDC) 3 x 400 V (Series TTC) | | | |
| Vector group | Yyn0 | | | |
| Frequency | 50/60 Hz | | | |
| Ambient temp | 30 °C | | | |
| Insulation class | F (155 °C) up to TTC0125 | | | |
| | H (180 ºC) from TTC0160 | | | |
| Protection degree | IP-23 | | | |
| Safety class | Class I | | | |
| Test voltage | 3 kV | | | |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 | | | |



CE

Electrical diagram



v4.0 04/15



36

SERIES TDC Y TTC

• For general use, select the power according to the load and power factor:

$kVA = kW / \cos \varphi$ $kVA = \sqrt{3} \times V \times I / 1000$

• For loads with high inrush current or harmonics, consult "Rating selection guide" at the end of catalogue.

| Rating | Refei | rence | | Dimensions mm | | | | | Weight | Tune |
|--------|----------|----------|------|----------------------|------|-----|-----|----|--------|------|
| kVA | 400/230V | 400/400V | Α | В | С | D | E | Ø | kg | туре |
| 1 | TDC001 | TTC001 | 300 | 185 | 305 | 265 | 165 | 7 | 18 | Ι |
| 2 | TDC002 | TTC002 | 300 | 185 | 305 | 265 | 165 | 7 | 25 | Ι |
| 3 | TDC003 | TTC003 | 370 | 225 | 375 | 325 | 205 | 7 | 33 | Ι |
| 4 | TDC004 | TTC004 | 370 | 225 | 375 | 325 | 205 | 7 | 37 | Ι |
| 5 | TDC005 | TTC005 | 370 | 225 | 375 | 325 | 205 | 7 | 42 | Ι |
| 6 | TDC006 | TTC006 | 370 | 225 | 375 | 325 | 205 | 7 | 50 | I |
| 8 | TDC008 | TTC008 | 475 | 345 | 520 | 320 | 320 | 10 | 62 | II |
| 10 | TDC010 | TTC010 | 475 | 345 | 520 | 320 | 320 | 10 | 73 | II |
| 12 | TDC012 | TTC012 | 545 | 385 | 615 | 350 | 360 | 10 | 92 | II |
| 16 | TDC016 | TTC016 | 545 | 385 | 615 | 350 | 360 | 10 | 106 | II |
| 20 | TDC020 | TTC020 | 615 | 425 | 690 | 400 | 400 | 10 | 127 | II |
| 25 | TDC025 | TTC025 | 615 | 425 | 690 | 400 | 400 | 10 | 148 | II |
| 31 | TDC031 | TTC031 | 775 | 575 | 940 | 400 | 550 | 10 | 213 | II |
| 40 | TDC040 | TTC040 | 775 | 575 | 940 | 400 | 550 | 10 | 248 | II |
| 50 | TDC050 | TTC050 | 775 | 575 | 940 | 400 | 550 | 10 | 297 | II |
| 63 | TDC063 | TTC063 | 775 | 575 | 940 | 400 | 550 | 10 | 281 | II |
| 80 | TDC080 | TTC080 | 775 | 575 | 940 | 400 | 550 | 10 | 346 | II |
| 100 | TDC100 | TTC100 | 930 | 710 | 1275 | 480 | 670 | 16 | 468 | III |
| 125 | TDC125 | TTC125 | 930 | 710 | 1275 | 480 | 670 | 16 | 636 | III |
| 160 | TDC160 | TTC160 | 930 | 710 | 1275 | 480 | 670 | 16 | 735 | III |
| 200 | TDC200 | TTC200 | 930 | 710 | 1275 | 480 | 670 | 16 | 832 | III |
| 250 | TDC250 | TTC250 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1041 | III |
| 315 | TDC315 | TTC315 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1260 | III |
| 400 | TDC400 | TTC400 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1425 | III |
| 500 | TDC500 | TTC500 | 1210 | 1070 | 1650 | 660 | 840 | 16 | 1645 | III |
| 630 | TDC630 | TTC630 | 1210 | 1070 | 1650 | 660 | 840 | 16 | 1856 | III |
| 800 | TDC800 | TTC800 | 1210 | 1070 | 1650 | 660 | 840 | 16 | 2257 | III |
| 1000 | TDC1000 | TTC1000 | 1210 | 1070 | 1650 | 660 | 840 | 16 | 2605 | III |



* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.







Low-losses isolation transformers



• Galvanic isolation transformers with reduced losses and high efficiency.

• Series REDLOSS is the most economic solution in the long term and helps to save electrical energy in a significant way.

• Higher electrical efficiency means heat losses reduction and therefore, increases reliability and service life of the transformer.

• REDLOSS transformer operating service resulting in much lower losses than a conventional transformer.

• The high-performance efficiency implies an important reduction of exploitation costs and quick payback of the difference price.

• Suitable for renewable energy facilities in compliance with electric supply company requirements.

• In metal enclosure IP23 protection degree, resin polyester-epoxy powder coated with excellent physical-mechanical and anti-corrosive properties.

Technical characteristics

| Power rating | | 1 ÷ 100 kVA | | | | |
|-------------------|-----------|--|--|--|--|--|
| Input voltage | II III | 230 V (Series RLM) 3 x 400 V (Series RLT) | | | | |
| Output voltage | II III | 230 V (Series RLM) 3 x 400 V (Series RLT) | | | | |
| Frequency | | 50/60 Hz | | | | |
| Ambient temp. | | 30 °C | | | | |
| Insulation class | | F (155 °C) | | | | |
| Protection degree | <u>!</u> | IP-23 | | | | |
| Safety class | | Class I | | | | |
| Test voltage | | 3 kV | | | | |
| Standard | | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 | | | | |



Electrical diagram RLM single phase



Electrical diagram RLT three phase





SERIES **REDLOSS**

Example of energy saving between REDLOSS and standard three phase transformer, over 8760 working hours per year and full load.

| Rating kVA | Standard transformer Losses W | REDLOSS transformer Losses W | Losses (difference) W | Energy saving/year kWh | Yearly savings (0,12 €/kWh) |
|----------------------|--|---|------------------------------------|-------------------------------------|--|
| 10 | 460 | 309 | 151 | 1.323 | 159€ |
| 50 | 1.546 | 916 | 630 | 5.519 | 662 € |
| 100 | 2.354 | 1.522 | 832 | 7.288 | 875 € |



Efficiency

- Environmental protection
- Service life

REDUCES:

- Losses
- Energy consumption
- Heating
- For general use, select the power according to the load and power factor:

$kVA = kW / Cos \phi$ Series RLM: kVA = V x I / 1000 Series RLT: kVA = $\sqrt{3}$ x V x I / 1000

Series RLM Single phase

| Rating | Deference | Effic | Dimensions mm | | | | | | Dimensions mm Weigh | | | Weight | Tur |
|--------|-----------|--------|----------------------|-----|-----|-----|-----|----|----------------------------|------|--|--------|-----|
| kVA | Reference | EIIIC. | А | В | С | D | E | Ø | kg | туре | | | |
| 1 | RLM01 | 95% | 300 | 185 | 305 | 265 | 165 | 7 | 15,2 | Ι | | | |
| 2 | RLM02 | 95,5% | 370 | 225 | 375 | 325 | 205 | 7 | 21,9 | I | | | |
| 3 | RLM03 | 96% | 370 | 225 | 375 | 325 | 205 | 7 | 30,6 | Ι | | | |
| 4 | RLM04 | 96,5% | 370 | 225 | 375 | 325 | 205 | 7 | 37,3 | Ι | | | |
| 5 | RLM05 | 97% | 475 | 345 | 520 | 320 | 320 | 10 | 46 | II | | | |
| 6 | RLM06 | 97,3% | 475 | 345 | 520 | 320 | 320 | 10 | 54,6 | II | | | |
| 8 | RLM08 | 97,6% | 545 | 385 | 615 | 350 | 360 | 10 | 68 | II | | | |
| 10 | RLM10 | 97,8% | 545 | 385 | 615 | 350 | 360 | 10 | 81,3 | II | | | |



Series RLT Three phase

| Rating | Deference | Effic | Dimensions mm | | | | | | Weight | Tung |
|--------|-----------|--------|----------------------|-----|------|-----|-----|----|--------|------|
| kVA | Reference | LIIIC. | А | В | С | D | Е | Ø | kg | Type |
| 10 | RLT010 | 97% | 475 | 345 | 520 | 320 | 320 | 10 | 82 | II |
| 15 | RLT015 | 97,3% | 545 | 385 | 615 | 350 | 360 | 10 | 122 | II |
| 20 | RLT020 | 97,6% | 615 | 425 | 690 | 400 | 400 | 10 | 148 | II |
| 25 | RLT025 | 97,9% | 615 | 425 | 690 | 400 | 400 | 10 | 174 | II |
| 30 | RLT030 | 98% | 615 | 425 | 690 | 400 | 400 | 10 | 210 | II |
| 40 | RLT040 | 98,1% | 775 | 575 | 940 | 400 | 550 | 10 | 239 | II |
| 50 | RLT050 | 98,2% | 775 | 575 | 940 | 400 | 550 | 10 | 288 | II |
| 63 | RLT063 | 98,3% | 775 | 575 | 940 | 400 | 550 | 10 | 338 | II |
| 80 | RLT080 | 98,4% | 775 | 575 | 940 | 400 | 550 | 10 | 395 | II |
| 100 | RLT100 | 98,5% | 930 | 710 | 1275 | 480 | 670 | 16 | 487 | III |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.

* Also available on IP-00 (open construction without cabinet) on request.

EB

Three phase isolating transformers Factor "K" intended for installations with harmonics



Three phase transformer with galvanic isolation between primary and secondary, includes an electrostatic shield for installations with a high level of harmonic distortion.

Transformers factor "k" of Torytrans provide an special design features that protect the transformer from current harmonics that cause losses and overheating at the windings of transformers.

The "K" factor is a constant that indicates the capacity of the transformer to supply non-linear loads (e.g. induction furnaces, variable speed motors, rectifiers, data centers ...) and support harmonic currents without exceeding their operating temperature (do not filter harmonics).

Construction into enclosure, protection degree of IP-23, metal cabinet with epoxy powder coating polyester resin with excellent mechanical and physical properties corrosion.

Technical Characteristics

| Power rating | 10 ÷ 500 kVA |
|-------------------------------------|---|
| Input voltage | 3 x 400 V |
| Output voltage | 3 x 400 V + N |
| Electrostatic shield betw | veen windings |
| Frequency | 50/60 Hz |
| Factor K harmonics overload | k = 13 k = 20 |
| Harmonic distortion max. admissible | THD-I ≈ 50% (k=13) THD-I ≈ 80% (k=20) |
| Neutral overload max. admissible | 2 x I.nom |
| Ambient temp | 30 °C |
| Insulation class | F (155 ºC) Up to 100 kVA |
| | H (180 ºC) From 125 kVA |
| Protection degree | IP-23 |
| Safety class | Class I |
| Voltage test | 3 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 |
| | CE |





• Select the K factor depending on the application and harmonics in the network:

| Factor | Applications |
|--------|---|
| K =13 | Telecommunications equipments Lighting with electronic ballast Air conditioning A / C Inverter UPS Welding equipments |
| K = 20 | Data Centers Variable Frequency drives (VFD) Induction furnaces Machine tools |

Series TTFK

| Rating | Rating | | | Dimensions mm | | | | | | |
|---------------|---------------|-----------|------|----------------------|------|-----|-----|----|------|------|
| kVA K = 13 | kVA K = 20 | Reference | А | В | С | D | Е | Ø | kg | Туре |
| 10 | 8 | TTFK010 | 545 | 385 | 615 | 350 | 360 | 10 | 87 | II |
| 12 | 10 | TTFK012 | 545 | 385 | 615 | 350 | 360 | 10 | 100 | II |
| 16 | 12 | TTFK016 | 615 | 425 | 690 | 400 | 400 | 10 | 120 | II |
| 20 | 16 | TTFK020 | 615 | 425 | 690 | 400 | 400 | 10 | 140 | II |
| 25 | 20 | TTFK025 | 775 | 575 | 940 | 400 | 550 | 10 | 202 | II |
| 31 | 25 | TTFK031 | 775 | 575 | 940 | 400 | 550 | 10 | 235 | II |
| 40 | 31 | TTFK040 | 775 | 575 | 940 | 400 | 550 | 10 | 282 | II |
| 50 | 40 | TTFK050 | 775 | 575 | 940 | 400 | 550 | 10 | 267 | II |
| 63 | 50 | TTFK063 | 775 | 575 | 940 | 400 | 550 | 10 | 329 | II |
| 80 | 63 | TTFK080 | 930 | 710 | 1275 | 480 | 670 | 16 | 445 | III |
| 100 | 80 | TTFK100 | 930 | 710 | 1275 | 480 | 670 | 16 | 605 | III |
| 125 | 100 | TTFK125 | 930 | 710 | 1275 | 480 | 670 | 16 | 735 | III |
| 160 | 125 | TTFK160 | 930 | 710 | 1275 | 480 | 670 | 16 | 698 | III |
| 200 | 160 | TTFK200 | 1070 | 880 | 1460 | 660 | 840 | 16 | 990 | III |
| 250 | 200 | TTFK250 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1200 | III |
| 315 | 250 | TTFK315 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1355 | III |
| 400 | 315 | TTFK400 | 1210 | 1070 | 1650 | 660 | 840 | 16 | 1564 | III |
| 500 | 400 | TTFK500 | 1210 | 1070 | 1650 | 660 | 840 | 16 | 1763 | III |

* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.



Type II

RYTRANS S.L.

Harmonic filtering compensator transformers IP-23



• Electromagnetic filters for the elimination of harmonics based on the cancellation and compensation of magnetic fluxes. Three phase isolating transformers with electrostatic shield between primary and secondary and galvanic isolation of the load.

• Improves energy efficiency, power factor and current and voltage distortion.

• Reduces phase currents, neutral current and neutral-earth voltage.

• **TAC3** compensator is especially designed to cancel homopolar current harmonics (3°-9°-15°) generated by computers, fluorescents and discharge lamps, power supplies, motor starters and other types of single phase non-linear loads. Indicated for data centers, bank offices, telecommunication buildings, etc.

• **TAC5** compensator provides two outputs (12 pulses), each supplying 50% of the load. It is especially designed to cancel current harmonics (5^o-7^o-17^o) generated by frequency converters, variable speed drives for motors, UPS systems, rectifiers, soft-starters and other types of non-linear loads. Indicated for large HVAC installations, three phase coupled power converters and simultaneously working.

• Installed into metal enclosure IP-23 protection degree, resin polyester-epoxy powder coated with excellent physical-mechanical and anti-corrosive properties.

Technical characteristics

| Power rating | 5 ÷ 200 kVA |
|---------------------------------|---|
| Input voltage | 3 x 400 V |
| Output voltage | 3 x 400 V + N |
| Frequency | 50/60 Hz |
| Harmonics overload factor | K ≥ 20 |
| Crest factor of current wave | 4,5 |
| Ambient temp. | 30 °C |
| Insulation class | F (155 ºC) Up to 100 kVA |
| | H (180 °C) From 125 kVA |
| Protection degree | IP-23 |
| Safety class | Class I |
| Test voltage | 3 kV |
| Standard # | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 |
| Å | \boldsymbol{c} |

• Select model TAC3 or TAC5 according to harmonic type present in the network:

| | | TAC3 | TAC5 |
|-------------|---------------------------|-----------|-----------|
| Curre at | nt harmonics : network | 30-90-150 | 50-70-170 |
| | Neutral current | ≈ 90 % | - |
| % | Phase current | ≈ 25 % | ≈ 40% |
| Filtering | THD I | ≈ 50% | ≈ 80% |
| | THD V | ≈ 50% | ≈ 80% |

v4.1 03/16



42

SERIES TAC



Series TAC3 – TAC5

50%

| Rating | Refe | rence | | Di | mensior | nensions mm | | | | Turna |
|--------|---------|---------|------|-----|---------|--------------------|-----|----|-----|-------|
| kVA | TAC3 | TAC5 | Α | В | С | D | E | Ø | kg | туре |
| 5 | TAC3005 | TAC5005 | 475 | 345 | 520 | 320 | 320 | 10 | 55 | II |
| 10 | TAC3010 | TAC5010 | 545 | 385 | 615 | 350 | 360 | 10 | 95 | II |
| 15 | TAC3015 | TAC5015 | 615 | 425 | 690 | 400 | 400 | 10 | 125 | II |
| 20 | TAC3020 | TAC5020 | 615 | 425 | 690 | 400 | 400 | 10 | 150 | II |
| 25 | TAC3025 | TAC5025 | 615 | 425 | 690 | 400 | 400 | 10 | 178 | II |
| 30 | TAC3030 | TAC5030 | 775 | 575 | 940 | 400 | 550 | 10 | 212 | III |
| 40 | TAC3040 | TAC5040 | 775 | 575 | 940 | 400 | 550 | 10 | 254 | III |
| 50 | TAC3050 | TAC5050 | 775 | 575 | 940 | 400 | 550 | 10 | 295 | III |
| 60 | TAC3060 | TAC5060 | 775 | 575 | 940 | 400 | 550 | 10 | 320 | III |
| 80 | TAC3080 | TAC5080 | 775 | 575 | 940 | 400 | 550 | 10 | 390 | III |
| 100 | TAC3100 | TAC5100 | 930 | 710 | 1275 | 480 | 670 | 16 | 495 | III |
| 125 | TAC3125 | TAC5125 | 930 | 710 | 1275 | 480 | 670 | 16 | 600 | III |
| 160 | TAC3160 | TAC5160 | 1070 | 880 | 1460 | 660 | 840 | 16 | 780 | III |
| 200 | TAC3200 | TAC5200 | 1070 | 880 | 1460 | 660 | 840 | 16 | 900 | III |

* Other features, power, voltage, IP00, etc., on request
 * Torytrans reserves the right to modify the information in any time and without prior notice.





Multi-pulse harmonic filtering compensator transformers



Multi-pulse harmonic filtering compensator transformer designed for power converters such as frequency converters with high motor rating at medium voltage from 3,3 kV to 6,6 kV.

The multi-pulse transformer of 18 - 24 - 36 pulses cancels current harmonics, generated by the converter with multilevel technology, providing a low value of current harmonic distortion THD-I <5% and a power factor PF \approx 0.99 without external filters, complying with the strictest standards.

As a result the electric distribution grid and the transformer do not require declassification avoiding unwanted resonances and reducing electrical losses by increasing the efficiency of the installation.

With the advanced design and manufacturing TORYTRANS technology in dry type medium voltage transformers it is provided partial discharge isolation levels lower than 10 pC, according to the standard, that ensure reliability and service life of the transformer for periods greater than 20 years.

Most common applications are for startup and speed variation of high power motors for pumping and Water purification, Mining, Power Generation, Petroleum and Gas Plants, Metallurgy and Paper sectors.

Technical characteristics

| Power rating | 200 ÷ 4000 kVA |
|---------------------------------|---|
| PRIMARY voltage | 3,3 - 4,16 - 6,6 kV |
| SECONDARY votage | 18 pulses – 650 V 24 pulses – 615 V 36 pulses – 650 V |
| THIRD voltage | 400 V |
| Regulation taps | ± 5% at primary |
| Frequency | 50/60 Hz |
| Harmonics overload Factor | K ≥ 20 |
| Crest factor of current wave | 4,5 |
| Ambient temp. | 50 °C |
| Altitude | 1000 m |
| Insulation class | H (180 °C) |
| Protection degree | IP-00 |
| Safety class. | Class I |
| Cooling | AF ≥ 3 m/s |
| Test voltage | 20 kV at 50 Hz 1 min |
| Lightning impulse | 60 kV 1,2/50 µs |
| Partial discharges | < 10 pC |
| Temperature sensor | PT100 |
| Standard | IEC/UNE-EN 60076-1 IEC/UNE-EN 60076-11 IEC/UNE-EN 60146-1-3 IEC/UNE-EN 61378-1 |

v4.0 04/15



44

SERIES TAM



* Other features, power, voltage, etc., on request* Torytrans reserves the right to modify the information

 Torytrans reserves the right to modify the informatio in any time and without prior notice.



Three phase to single phase transformers



• Three phase to single phase isolation transformer to convert three phase power to single phase. It allows to supply single phase equipments (230 V) in three phase installations without neutral (3 x 400 V).

• Minimizes the unbalance in electrical three phase power supply caused by high-power single phase loads.

• Series TTMS: open transformer IP-00, vacuum impregnation with dielectric varnish high binding power with special properties that protect windings and magnetic core from dust and humidity.

• Series TTMC: in metal enclosure IP-23 protection degree, resin polyester-epoxy powder coated with excellent physical-mechanical and anti-corrosive properties.

 \bullet Connection with terminal blocks (rating from 1 to 30 kVA).

• Connection with screws for flat terminals (rating from 40 to 100 kVA).

Technical characteristics

| Power rating | 1 ÷ 100 kVA |
|-------------------|--|
| Input voltage | 3 x 400 V (Three phase) |
| Output voltage | 230 V (Single phase) |
| Vector group | V - Λ inverted |
| Frequency | 50/60 Hz |
| Ambient temp. | 40 °C (Series TTMS) 30 °C (Series TTMC) |
| Insulation class | F (155 °C) |
| Protection degree | IP-00 (Series TTMS) IP-23 (Series TTMC) |
| Safety class | Class I |
| Test voltage | 4 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 |



CE

Electrical diagram



v4.0 04/15



• For general use, select the power according to the load and power factor:

 $kVA = kW / Cos \phi$ $kVA = V \times I / 1000$

• For loads with high inrush current or harmonics, consult "Rating selection guide" at the end of catalogue.

| 00110 | | | | | | | | |
|--------|-----------|-----|-----|--------|--------------|-----|----|--------|
| Rating | Deference | | Di | mensio | ns mn | า | | Weight |
| kVA | Reference | Α | В | С | D | E | Ø | kg |
| 1 | TTMS001 | 240 | 140 | 270 | 200 | 118 | 7 | 20 |
| 2 | TTMS002 | 300 | 130 | 325 | 200 | 105 | 7 | 27 |
| 3 | TTMS003 | 300 | 170 | 325 | 200 | 145 | 7 | 42 |
| 4 | TTMS004 | 360 | 155 | 380 | 320 | 130 | 11 | 49 |
| 5 | TTMS005 | 360 | 165 | 380 | 320 | 140 | 11 | 56 |
| 6 | TTMS006 | 360 | 185 | 380 | 320 | 160 | 11 | 68 |
| 8 | TTMS008 | 420 | 195 | 435 | 350 | 170 | 11 | 90 |
| 10 | TTMS010 | 420 | 215 | 435 | 350 | 190 | 11 | 107 |
| 12 | TTMS012 | 480 | 190 | 500 | 400 | 165 | 11 | 113 |
| 16 | TTMS016 | 480 | 240 | 500 | 400 | 215 | 11 | 160 |
| 20 | TTMS020 | 655 | 260 | 595 | 400 | 195 | 13 | 198 |
| 5 | TTMS025 | 655 | 270 | 595 | 400 | 205 | 13 | 222 |
| 31 | TTMS031 | 655 | 290 | 595 | 400 | 225 | 13 | 256 |
| 40 | TTMS040 | 655 | 320 | 795 | 400 | 255 | 13 | 309 |
| 50 | TTMS050 | 655 | 280 | 795 | 400 | 215 | 13 | 340 |
| 63 | TTMS063 | 655 | 320 | 795 | 400 | 255 | 13 | 418 |
| 80 | TTMS080 | 660 | 350 | 860 | 480 | 275 | 13 | 540 |
| 100 | TTMS100 | 720 | 350 | 875 | 480 | 270 | 13 | 610 |





Series TTMC IP-23

| Rating | D (| | Di | mensio | ns mn | ı | | Weight | - |
|--------|-----------|-----|-----|--------|--------------|-----|----|--------|----------|
| kVA | Reference | А | В | С | D | Е | Ø | kg | Туре |
| 1 | TTMC001 | 300 | 185 | 305 | 265 | 165 | 7 | 25 | Ι |
| 2 | TTMC002 | 370 | 225 | 375 | 325 | 205 | 7 | 33 | Ι |
| 3 | TTMC003 | 370 | 225 | 375 | 325 | 205 | 7 | 50 | Ι |
| 4 | TTMC004 | 475 | 345 | 520 | 320 | 320 | 10 | 62 | II |
| 5 | TTMC005 | 475 | 345 | 520 | 320 | 320 | 10 | 70 | II |
| 6 | TTMC006 | 475 | 345 | 520 | 320 | 320 | 10 | 82 | II |
| 8 | TTMC008 | 545 | 385 | 615 | 350 | 360 | 10 | 106 | II |
| 10 | TTMC010 | 545 | 385 | 615 | 350 | 360 | 10 | 125 | II |
| 12 | TTMC012 | 615 | 425 | 690 | 400 | 400 | 10 | 135 | II |
| 16 | TTMC016 | 775 | 575 | 940 | 400 | 550 | 10 | 195 | II |
| 20 | TTMC020 | 775 | 575 | 940 | 400 | 550 | 10 | 255 | II |
| 25 | TTMC025 | 775 | 575 | 940 | 400 | 550 | 10 | 280 | II |
| 31 | TTMC031 | 775 | 575 | 940 | 400 | 550 | 10 | 315 | II |
| 40 | TTMC040 | 775 | 575 | 940 | 400 | 550 | 10 | 368 | II |
| 50 | TTMC050 | 775 | 575 | 940 | 400 | 550 | 10 | 340 | II |
| 63 | TTMC063 | 775 | 575 | 940 | 400 | 550 | 10 | 400 | II |
| 80 | TTMC080 | 930 | 710 | 1275 | 480 | 670 | 16 | 625 | III |
| 100 | TTMC100 | 930 | 710 | 1275 | 480 | 670 | 16 | 695 | III |



* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.

Single phase to three phase transformers

IP-23



 \bullet Single phase to three phase transformer intended to convert single phase voltage 230 V to three phase 400 V.

• For general use with three phase low power machine-tools (saws, sanders, planers, shears, pressure washers, polishers, pumps, etc).

• In general, TMT transformer is an useful solution for small industries such as wood and metal carpentries, building construction, cleaning services, etc.

• TMT transformer solves the inconvenient where three phase facility does not exist.

- Compact design and light weight converts itself in another working tool.
- Series TMTA includes a galvanic isolation transformer that attenuates and filters possible electrical disturbances on the supply.

Technical characteristics

| Motor rating | 1 CV (0,75 kW) 2 CV (1,5 kW) 3 CV (2,2 kW) |
|---------------------|---|
| Input voltage | 230 V (Single phase) |
| Output voltage | 3 x 400 V (Three phase) |
| Output current | 2 ÷ 6,5 A |
| Frequency | 50/60 Hz |
| Ambient temperature | 30 °C |
| Protection degree | IP-23 |
| Cooling | Natural / Forzada |
| Input connection | Schuko socket II Male (F, N, T) |
| Output connection | Cetac plug III Female (U, V, W, N, T) |
| Input protection | Magnetothermic switch |
| Light status | Green (ON) |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-20 IEC/UNE-EN 61439-1 |
| | |





Series TMT – Single to Three phase transformer with three output phases.



| Motor | rating | Nominal | Deference | | | Dimensio | ns mm | | | Weight |
|-------|--------|---------|-----------|-----|-----|----------|--------------|-----|---|--------|
| kW | CV | | Reference | А | В | С | D | E | Ø | kg |
| 0,75 | 1 | 1500 | TMT15 | 450 | 260 | 490 | 320 | 220 | 9 | 30 |
| 1,5 | 2 | 3000 | TMT30 | 520 | 300 | 585 | 350 | 235 | 9 | 42 |
| 2,2 | 3 | 4500 | TMT45 | 520 | 300 | 585 | 350 | 235 | 9 | 48 |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.

Series TMTA – Single to Three phase transformer with three phases + N output neutral Isolating transformer incorporated



| Motor | rating | Nominal | Deference | | | Dimensio | ns mm | | | Weight |
|-------|--------|---------|-----------|-----|-----|----------|--------------|-----|----|--------|
| kW | CV | | Reference | А | В | С | D | E | Ø | kg |
| 0,75 | 1 | 1500 | TMTA15 | 520 | 300 | 585 | 350 | 235 | 9 | 60 |
| 1,5 | 2 | 3000 | TMTA30 | 590 | 375 | 665 | 400 | 345 | 13 | 75 |
| 2,2 | 3 | 4500 | TMTA45 | 590 | 375 | 665 | 400 | 345 | 13 | 90 |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.





Rectifier AC / DC for voltage and current control



Controlled rectifier for voltage and current designed to be used as a power source in electrochemical processes for surface treatment, chrome, galvanic baths, electrolysis and water purification processes by electrocoagulation.

Fast response and high stability against load variations.

It allows constant control of the output voltage (voltage source mode) or constant control of the output current (current source mode).

Control board to trigger the thyristors (SCR) with adjustable input for 0-10 Volt, 4-20 mA, all / nothing.

General magnetothermic cutting load switch incorporated. Thermal protection against overload.

The galvanic isolation transformer provides a high degree of system reliability against electromagnetic disturbances and avoid the risk of accidental electrocution by direct contact.

Technical characteristics

| Output voltage | 0 ÷ 50 Vdc |
|---------------------|---|
| Output current | 100 ÷ 5000 Adc |
| Input voltage | 3 x 400V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Protection degree | IP-23 |
| Cooling | Air Forced |
| Connection | Busbars |
| Rectifier | Diode bridge B6U |
| Regulation | Thyristors W3C |
| Galvanic insulation | 6-pulse Transformer |
| Control | SCR firing board |
| Standard | IEC/UNE-EN 61439-1 IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 |
| | |

Electrical diagram



CE





SERIES **RDC**



The power of the equipment is selected according to the voltage and current required by the electrochemical process ** Optional: automatic polarity reversal. Other ratings and voltages on request.*



Control cabinet



Single phase reversible autotransformers



 $\bullet\,$ Single phase reversible Autotransformer for adjustment of the voltage 400 V / 230 V, with no requirement for electrical isolation.

• DIN Rail mounting (for ratings up to 200 VA) and screw fixing (for all ratings).

• Advanced testing technologies have been adopted in order to satisfy the most exigent demands in terms of reliability and efficiency.

• Enclosure is a V-0 technical polyamide; halogens and phosphorus free.

• Its safe cover protects users from the risk of electrical shocks and connections contact are not accessible by the user.

• Protection IP-20 against dust, humidity and corrosion. Simple and easy mounting in cabinets, switchboards, panels or installation directly on engine/equipment.

• Epoxy varnish painted core.

• Connections by screws with self-lifting supporting washers.

• Transparent cover to protect the terminal connections intended to avoid the risk of electrical contact accident.

Technical characteristics

| Power rating | 100 VA ÷ 10 kVA |
|---------------------|--------------------|
| Input voltage | 400 V |
| Output voltage | 230 V |
| Frequency | 50/60 Hz |
| Ambient temperature | 40 °C |
| Insulation class | F (155 °C) |
| Protection degree | IP-20 |
| Safety class: | Class I |
| Test voltage: | 3 kV |
| Standard | IEC/UNE-EN 61558-1 |
| | |

IP-20



Electrical diagram





Intended for use as a voltage adapter when an economical solution is required in applications where the galvanic isolation or attenuation of disturbances are not required

For general applications, select output rating according to the load and power factor:

$VA = W / Cos \phi$

Low weight and small size (compared to isolating transformers)

Its main advantage consists in to transform voltage up or down (reversible).

On request we can manufacture autotransformers with other voltages, with taps, with thermal switch, etc.

Series AME

| Rating | Reference | | | Dim | ensio mm | ns | | Weight | Type |
|--------|-----------|-----|-----|-----|--------------------|-----|--------|--------|---|
| VA | | Α | В | С | D | E | Ø | kg | .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| 100 | AME100 | 82 | 90 | 87 | 58 | 79 | 5,5x12 | 1,3 | Ι |
| 200 | AME200 | 82 | 90 | 102 | 58 | 79 | 5,5x12 | 1,6 | Ι |
| 315 | AME315 | 94 | 106 | 107 | 58 | 90 | 7x14 | 2,3 | II |
| 400 | AME400 | 94 | 106 | 107 | 58 | 90 | 7x14 | 2,5 | II |
| 500 | AME500 | 105 | 115 | 111 | 70 | 99 | 7x14 | 3,1 | II |
| 630 | AME630 | 105 | 115 | 116 | 70 | 99 | 7x14 | 3,2 | II |
| 800 | AME800 | 115 | 123 | 127 | 80 | 106 | 7x14 | 3,5 | II |
| 1000 | AME1000 | 115 | 123 | 132 | 80 | 106 | 7x14 | 5,0 | II |
| 2000 | AME2000 | 135 | 148 | 174 | 91 | 132 | 7X15 | 10,1 | II |
| 2500 | AME2500 | 150 | 158 | 196 | 124 | 143 | 7X15 | 13,2 | III |
| 3150 | AME3150 | 150 | 158 | 206 | 124 | 143 | 7X15 | 14,4 | III |
| 4000 | AME4000 | 150 | 158 | 238 | 124 | 143 | 7X15 | 17,7 | III |
| 5000 | AME5000 | 192 | 212 | 215 | 165 | 195 | 7X16 | 24,1 | IV |
| 6300 | AME6300 | 192 | 212 | 215 | 165 | 195 | 7X16 | 27,5 | IV |
| 8000 | AME8000 | 192 | 212 | 230 | 165 | 195 | 7X16 | 30,5 | IV |
| 10000 | AME10000 | 240 | 255 | 235 | 200 | 235 | 9X18 | 43,1 | IV |

* Other features, power, voltage, etc., on request.

* Also available on IP-00 (open construction) on request.

* Torytrans reserves the right to modify the information in any time and without prior notice.













Three phase reversible autotransformers



• Three phase reversible autotransformer.

• Intended for voltage adaptation in three phase systems and single phase loads with a maximum unbalance of 10% between phases.

• Without galvanic isolation between primary and secondary; so they do not avoid earth faults

• Vacuum impregnation with dielectric varnish high binding power with special properties that protect windings and magnetic core from dust and humidity.

 \bullet Connection with terminal blocks (rating from 3 to 40 kVA).

 \bullet Connection with screws for flat terminals (rating from 50 to 125 kVA).

• Connection with flat busbars (rating from 160 to 1000 kVA).

Technical Characteristics

| Power rating | 3 ÷ 1000 kVA |
|-------------------|--|
| Input voltage | 3 x 400 V |
| Output voltage | 3 x 230 V |
| Vector group | YNO |
| Frequency | 50/60 Hz |
| Ambient temp | 40 °C |
| Insulation class | F (155 °C) up to ATS315 |
| | H (180 ºC) from ATS400 |
| Protection degree | IP-00 |
| Safety class | Class I |
| Test voltage | 3 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-13 IEC/UNE-EN 60076-11 |

IP-00



CE

Electrical diagram



v4.0 04/15



• For general use, select the power according to the load and power factor:

$kVA = kW / Cos \phi$ $kVA = \sqrt{3} \times V \times I / 1000$

• For loads with high inrush current or harmonics, consult "Rating selection guide" at the end of catalogue.

| Rating | Deference | | | | Weight | Tune | | | |
|--------|-----------|-----|-----|------|--------|------|----|------|------|
| kVA | Reference | Α | B*1 | С | D | Е | Ø | kg | туре |
| 3 | ATS003 | 240 | 155 | 265 | 200 | 85 | 7 | 11 | Ι |
| 4 | ATS004 | 240 | 165 | 265 | 200 | 95 | 7 | 13 | Ι |
| 6 | ATS006 | 240 | 190 | 270 | 200 | 120 | 7 | 20 | Ι |
| 8 | ATS008 | 300 | 180 | 320 | 200 | 95 | 11 | 24 | Ι |
| 10 | ATS010 | 300 | 190 | 325 | 200 | 105 | 11 | 28 | Ι |
| 12 | ATS012 | 300 | 220 | 325 | 200 | 135 | 11 | 39 | Ι |
| 16 | ATS016 | 360 | 205 | 375 | 320 | 125 | 11 | 46 | Ι |
| 20 | ATS020 | 360 | 225 | 380 | 320 | 145 | 11 | 57 | Ι |
| 25 | ATS025 | 420 | 225 | 435 | 350 | 140 | 11 | 70 | Ι |
| 31 | ATS031 | 420 | 235 | 435 | 350 | 150 | 11 | 79 | Ι |
| 40 | ATS040 | 420 | 255 | 435 | 350 | 170 | 11 | 96 | Ι |
| 50 | ATS050 | 480 | 240 | 500 | 400 | 155 | 11 | 107 | II |
| 63 | ATS063 | 480 | 270 | 500 | 400 | 185 | 11 | 136 | II |
| 80 | ATS080 | 655 | 325 | 595 | 400 | 220 | 13 | 178 | II |
| 100 | ATS100 | 655 | 345 | 595 | 400 | 240 | 13 | 211 | II |
| 125 | ATS125 | 655 | 375 | 595 | 400 | 270 | 13 | 258 | II |
| 160 | ATS160 | 655 | 275 | 810 | 400 | 220 | 13 | 242 | III |
| 200 | ATS200 | 655 | 305 | 810 | 400 | 250 | 13 | 306 | III |
| 250 | ATS250 | 660 | 310 | 875 | 480 | 265 | 13 | 402 | III |
| 315 | ATS315 | 660 | 380 | 905 | 480 | 335 | 13 | 569 | III |
| 400 | ATS400 | 720 | 440 | 875 | 480 | 340 | 13 | 664 | IV |
| 500 | ATS500 | 720 | 470 | 875 | 480 | 370 | 13 | 755 | IV |
| 630 | ATS630 | 780 | 490 | 955 | 660 | 395 | 16 | 931 | IV |
| 800 | ATS800 | 840 | 515 | 1025 | 660 | 420 | 16 | 1126 | IV |
| 1000 | ATS1000 | 840 | 555 | 1035 | 660 | 460 | 16 | 1292 | IV |



* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.





Type III



Type II



Three phase reversible autotransformers



• Three phase reversible autotransformer.

• Intended for voltage adaptation in three phase systems and single phase loads with a maximum unbalance of 10% between phases.

• Without galvanic isolation between primary and secondary; so they do not avoid earth faults.

• Mounting into metal enclosure, protection degree of IP-23, coated with a resin polyesterepoxy powder with excellent physical-mechanical and anti-corrosive properties.

 \bullet Connection with terminal blocks (rating from 3 to 40 kVA).

• Connection with screws for flat terminals (rating from 50 to 125 kVA).

• Connection with flat busbars (rating from 160 to 1000 kVA).

Technical Characteristics

| Power rating | 3 ÷ 1000 kVA |
|-------------------|--|
| Input voltage | 3 x 400 V |
| Output voltage | 3 x 230 V |
| Vector group | YN0 |
| Frequency | 50/60 Hz |
| Ambient temp | 30 °C |
| Insulation class | F (155 °C) up to ATC315 |
| | H (180 °C) from ATC400 |
| Protection degree | IP-23 |
| Safety class | Class I |
| Test voltage | 3 kV |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-13 IEC/UNE-EN 60076-11 |

IP-23



CE

Electrical diagram





• For general use, select the power according to the load and power factor:



• For loads with high inrush current or harmonics, consult "Rating selection guide" at the end of catalogue.

| Rating | Deference | | Weight | Turne | | | | | |
|--------|-----------|------|--------|-------|-----|-----|----|------|------|
| kVA | Reference | Α | В | С | D | E | Ø | kg | туре |
| 3 | ATC003 | 300 | 185 | 305 | 265 | 165 | 7 | 16 | Ι |
| 4 | ATC004 | 300 | 185 | 305 | 265 | 165 | 7 | 18 | Ι |
| 6 | ATC006 | 300 | 185 | 305 | 265 | 165 | 7 | 25 | Ι |
| 8 | ATC008 | 370 | 225 | 375 | 325 | 205 | 7 | 32 | Ι |
| 10 | ATC010 | 370 | 225 | 375 | 325 | 205 | 7 | 36 | Ι |
| 12 | ATC012 | 370 | 225 | 375 | 325 | 205 | 7 | 47 | Ι |
| 16 | ATC016 | 475 | 345 | 520 | 320 | 320 | 10 | 59 | II |
| 20 | ATC020 | 475 | 345 | 520 | 320 | 320 | 10 | 70 | II |
| 25 | ATC025 | 545 | 385 | 615 | 350 | 360 | 10 | 86 | II |
| 31 | ATC031 | 545 | 385 | 615 | 350 | 360 | 10 | 95 | II |
| 40 | ATC040 | 545 | 385 | 615 | 350 | 360 | 10 | 112 | II |
| 50 | ATC050 | 615 | 425 | 690 | 400 | 400 | 10 | 127 | II |
| 63 | ATC063 | 615 | 425 | 690 | 400 | 400 | 10 | 156 | II |
| 80 | ATC080 | 775 | 575 | 940 | 400 | 550 | 10 | 213 | II |
| 100 | ATC100 | 775 | 575 | 940 | 400 | 550 | 10 | 246 | II |
| 125 | ATC125 | 775 | 575 | 940 | 400 | 550 | 10 | 293 | II |
| 160 | ATC160 | 775 | 575 | 940 | 400 | 550 | 10 | 277 | II |
| 200 | ATC200 | 775 | 575 | 940 | 400 | 550 | 10 | 341 | II |
| 250 | ATC250 | 930 | 710 | 1275 | 480 | 670 | 16 | 470 | III |
| 315 | ATC315 | 930 | 710 | 1275 | 480 | 670 | 16 | 637 | III |
| 400 | ATC400 | 930 | 710 | 1275 | 480 | 670 | 16 | 732 | III |
| 500 | ATC500 | 930 | 710 | 1275 | 480 | 670 | 16 | 823 | III |
| 630 | ATC630 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1049 | III |
| 800 | ATC800 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1244 | III |
| 1000 | ATC1000 | 1070 | 880 | 1460 | 660 | 840 | 16 | 1443 | III |



* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.



Three phase Autotransformer Neutral generator



The Torytrans three-phase autotransformers Neutral generators are used to generate an artificial neutral in all those installations that do not have a neutral and need to connect single phase loads between phase-neutral.

The neutral generated for single-phase loads must not exceed a maximum imbalance between phases of 33%.

Series ATNC: in metal enclosure IP-23 protection degree, resin polyester-epoxy powder coated with excellent physical-mechanical and anti-corrosive properties.

Series ATNS: open autotransformer IP-00, vacuum impregnation with dielectric varnish high binding power with special properties that protect windings and magnetic core against dust and humidity.

Connection by screw terminals blocks or flat busbars.

Technical Characteristics

| Power rating | 3 ÷ 100 kVA | | | | | | |
|---------------------|--|--|--|--|--|--|--|
| Input voltage | 3 x 400 V | | | | | | |
| Output voltage | 3 x 400 V + N | | | | | | |
| Connection group | ZNO | | | | | | |
| Frequency | 50/60 Hz | | | | | | |
| Ambient temperature | 40 °C (series ATNS) 30 °C (series ATNC) | | | | | | |
| Insulation class | F (155 °C) | | | | | | |
| Protection degree | IP-00 (series ATNS) IP-23 (series ATNC) | | | | | | |
| Safety class | Class I | | | | | | |
| Voltage test | 3 kV | | | | | | |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 61558-2-13 IEC/UNE-EN 60076-11 | | | | | | |



CE

Electrical diagram









Series ATNS IP-00

| Total | Load | | | | Dimensi | ons mn | 1 | | Waiaht | |
|--------------------------|-------------------------|-----------|-----|-----|---------|---------------|-----|----|--------|------|
| rating III kVA | rating II kVA | Reference | А | В | С | D | E | Ø | kg | Туре |
| 3 | 1 | ATNS003 | 180 | 100 | 190 | 140 | 75 | 7 | 8 | Ι |
| 5 | 1,6 | ATNS005 | 180 | 120 | 190 | 160 | 75 | 7 | 9 | Ι |
| 8 | 2,6 | ATNS008 | 240 | 150 | 265 | 200 | 85 | 7 | 11 | Ι |
| 10 | 3,3 | ATNS010 | 240 | 155 | 265 | 200 | 85 | 7 | 12 | Ι |
| 12 | 4 | ATNS012 | 240 | 165 | 265 | 200 | 95 | 7 | 13 | Ι |
| 16 | 5,3 | ATNS016 | 240 | 190 | 270 | 200 | 120 | 7 | 20 | Ι |
| 20 | 6,6 | ATNS020 | 300 | 180 | 320 | 200 | 95 | 11 | 24 | Ι |
| 25 | 8,3 | ATNS025 | 300 | 190 | 325 | 200 | 105 | 11 | 28 | Ι |
| 31 | 10,3 | ATNS031 | 300 | 190 | 325 | 200 | 105 | 11 | 28 | Ι |
| 40 | 13,3 | ATNS040 | 300 | 220 | 325 | 200 | 135 | 11 | 39 | Ι |
| 50 | 16,6 | ATNS050 | 360 | 205 | 375 | 320 | 125 | 11 | 46 | Ι |
| 63 | 21 | ATNS063 | 360 | 225 | 380 | 320 | 145 | 11 | 57 | Ι |
| 80 | 26,6 | ATNS080 | 420 | 225 | 435 | 350 | 140 | 11 | 70 | Ι |
| 100 | 33,3 | ATNS100 | 420 | 235 | 435 | 350 | 150 | 11 | 79 | Ι |



Series ATNC IP-23

| Total | Load | | | | Dimensi | ons mn | า | | Woight | |
|--------------------------|-------------------------|-----------|-----|-----|---------|---------------|-----|----|--------|------|
| rating III kVA | rating II kVA | Reference | А | В | С | D | E | Ø | kg | Туре |
| 3 | 1 | ATNC003 | 230 | 145 | 245 | 205 | 125 | 7 | 9 | Ι |
| 5 | 1,6 | ATNC005 | 230 | 145 | 245 | 205 | 125 | 7 | 12 | I |
| 8 | 2,6 | ATNC008 | 300 | 185 | 305 | 265 | 165 | 7 | 15 | Ι |
| 10 | 3,3 | ATNC010 | 370 | 225 | 375 | 325 | 205 | 7 | 17 | I |
| 12 | 4 | ATNC012 | 300 | 185 | 305 | 265 | 165 | 7 | 18 | I |
| 16 | 5,3 | ATNC016 | 300 | 185 | 305 | 265 | 165 | 7 | 25 | Ι |
| 20 | 6,6 | ATNC020 | 300 | 185 | 305 | 265 | 165 | 7 | 27 | I |
| 25 | 8,3 | ATNC025 | 370 | 225 | 375 | 325 | 205 | 7 | 32 | Ι |
| 31 | 10,3 | ATNC031 | 370 | 225 | 375 | 325 | 205 | 7 | 36 | Ι |
| 40 | 13,3 | ATNC040 | 370 | 225 | 375 | 325 | 205 | 7 | 47 | I |
| 50 | 16,6 | ATNC050 | 475 | 345 | 520 | 320 | 320 | 10 | 59 | II |
| 63 | 21 | ATNC063 | 475 | 345 | 520 | 320 | 320 | 10 | 70 | II |
| 80 | 26,6 | ATNC080 | 545 | 385 | 615 | 350 | 360 | 10 | 86 | II |
| 100 | 33,3 | ATNC100 | 545 | 575 | 940 | 400 | 550 | 10 | 95 | II |



* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.



Three phase filtering reactors for capacitor banks



• Three phase reactors for harmonic rejection filters and protections of capacitors to compensate the reactive energy in installations with high content of harmonics.

• The rejection filter avoids:

- dangerous destructive resonances that may have destructive results for the capacitor banks, main transformer and main switchboard.

- any amplification of harmonic currents and voltages caused by the resonance between the inductive impedance resulting from the line, power supply transformer and capacitors installed to compensate the power factor.

- an overload of harmonics in the line and the capacitors.

• Overtemperature and overload protection via bimetal thermal resetting relay.

• Vacuum impregnation with epoxy varnish high binding power with special properties that protect windings and magnetic core from dust and humidity.

• Connection with screw terminal blocks (rating up to 20 A).

• Connection with screws for flat terminals (rating from 20 to 60 A).

• Connection with flat busbars (rating over 60 A).

Technical characteristics

| Line voltage | 3 x 400 V |
|---------------------------|---|
| Network overvoltage | 106 % x U1 |
| Harmonic distortion THD U | 3°= 0,5 % 5°= 6 % 7°= 5 % 11°= 3,5 % 13°= 3 % |
| Frequency | 50 Hz |
| Attenuation coefficient | p = 7% |
| Resonance frequency | 189 Hz |
| Capacitor voltage | 3 x 440 V |
| Inductance tolerance: | L ± 3 % |
| Admissible overload | 1,1 I _N |
| Linearity | 1,6 I _N |
| Insulation class | F (155 °C) |
| Ambient temperature | 40 °C |
| Protection degree | IP-00 |
| Cooling | Natural |
| Test voltage | 4 kV |
| Safety class | Class I |
| Protection | Bimetal thermal contact |
| Standard | IEC/UNE-EN 60076-6 |
| \frown | |



SERIES IRT

| Effective rating kVAr | Reference | Capacitor | Current Arms | Inductance mH |
|------------------------------------|-----------|-----------------|-----------------|-------------------------|
| 2,5 | IRT002 | 440V 2,8 kVAr | 4,1 | 15,331 |
| 5 | IRT005 | 440V 5,6 kVAr | 8,2 | 7,665 |
| 6,25 | IRT006 | 440V 7,0 kVAr | 10,2 | 6,132 |
| 10 | IRT010 | 440V 11,3 kVAr | 16,4 | 3,833 |
| 12,5 | IRT012 | 440V 14,1 kVAr | 20,5 | 3,066 |
| 15 | IRT015 | 440V 16,9 kVAr | 24,5 | 2,555 |
| 20 | IRT020 | 440V 22,6 kVAr | 32,7 | 1,916 |
| 25 | IRT025 | 440V 28,1 kVAr | 40,9 | 1,533 |
| 30 | IRT030 | 440V 33,8 kVAr | 49,1 | 1,278 |
| 40 | IRT040 | 440V 45,0 kVAr | 65,4 | 0,958 |
| 50 | IRT050 | 440V 56,3 kVAr | 81,8 | 0,767 |
| 60 | IRT060 | 440V 67,5 kVAr | 98,2 | 0,639 |
| 75 | IRT075 | 440V 84,4 kVAr | 122,7 | 0,511 |
| 100 | IRT100 | 440V 112,5 kVAr | 163,6 | 0,383 |

Selection of the reactor according to each capacitor bank step, rating and voltage capacitor.



| Effective | | | Din | | Weight | - | | | |
|-----------------------|-----------|-----|-----|-----|--------|-----|----|----|------|
| Rating kVAr | Reference | А | В | С | D | Е | Ø | kg | Туре |
| 2,5 | IRT002 | 150 | 90 | 150 | 100 | 62 | 7 | 3 | Ι |
| 5 | IRT005 | 180 | 100 | 190 | 140 | 61 | 7 | 5 | I |
| 6,25 | IRT006 | 180 | 125 | 190 | 140 | 86 | 7 | 8 | Ι |
| 10 | IRT010 | 180 | 145 | 190 | 140 | 106 | 7 | 10 | Ι |
| 12,5 | IRT012 | 240 | 135 | 215 | 200 | 88 | 7 | 10 | II |
| 15 | IRT015 | 240 | 135 | 210 | 200 | 88 | 7 | 11 | II |
| 20 | IRT020 | 240 | 155 | 210 | 200 | 108 | 7 | 16 | II |
| 25 | IRT025 | 240 | 155 | 210 | 200 | 108 | 7 | 16 | II |
| 30 | IRT030 | 265 | 170 | 250 | 200 | 113 | 7 | 22 | II |
| 40 | IRT040 | 265 | 170 | 250 | 200 | 113 | 7 | 23 | II |
| 50 | IRT050 | 265 | 155 | 245 | 200 | 123 | 7 | 26 | III |
| 60 | IRT060 | 300 | 190 | 245 | 200 | 157 | 7 | 38 | III |
| 75 | IRT075 | 300 | 185 | 305 | 200 | 137 | 11 | 43 | III |
| 100 | IRT100 | 300 | 195 | 305 | 200 | 146 | 11 | 47 | III |



Type I

* Other features, power, voltage, etc., on request * Torytrans reserves the right to modify the information in any time and without prior notice.





Three phase input line reactors for VFD



• Three phase line reactors especially designed for power converters such as frequency converters, variable speed drives for DC motors, UPS systems, rectifiers, soft-starters and other types of nonlinear loads.

• It must be installed in the line as closer as possible to the frequency converter's input.

• It reduces current harmonics generated by the loads and the crest factor of the current wave. Attenuates micro cuts in the supply voltage generated by power converters. Reduces energy consumption and improves power factor. Extends the service life of the equipment, avoids breakdowns and improves reliability.

• Vacuum impregnation with epoxy varnish high binding power with special properties that protect windings and magnetic core from dust and humidity.

• Connection with screw terminal blocks (rating up to 20 A). Connection with screws for flat terminals (rating from 20 to 60 A). Connection with flat busbars (rating over 60 A).



Technical characteristics

| Motor rating | 0,75 ÷ 220 kW (1 ÷ 300 CV) | | | | |
|--|--|--|--|--|--|
| Nominal current | 2 ÷ 500 A | | | | |
| Nominal voltage | 380 – 500 V | | | | |
| Inductive impedance | 3,5 % | | | | |
| Frequency | 50/60 Hz | | | | |
| Distortion 75÷100% load Distortion 50÷75% load Distortion < 50% load | ≈ 35% THD-I ≈ 45% THD-I ≈ 60% THD-I | | | | |
| Admissible overload | Permanent 1,07 I_N Transitory 1,5 I_N | | | | |
| Insulation class | F (155 °C) | | | | |
| Ambient temperature | 50 °C @ I _N | | | | |
| Protection degree | IP-00 | | | | |
| Cooling | Natural | | | | |
| Test voltage | 4 kV | | | | |
| Safety class | Class I | | | | |
| Standard | IEC/UNE-EN 60076-6 | | | | |
| | | | | | |









CONVERTER (VFD) MOTOR



Comparative waveform of voltage-current at input of frequency converter



Select reactor according to motor rating

| Mo rat | tor ing | Rated current | Inductance | Reference | Reference Dimensions mm | | | | Weight | Туре | | | |
|-----------|------------|---------------|------------|-----------|--------------------------------|-----|-----|-----|--------|------|------|------------|--|
| kW | CV | Α | mH | | А | В | С | D | Е | Ø | кg | <i>,</i> . | |
| 0,75 | 1 | 2 | 12,812 | ILT002 | 120 | 75 | 122 | 94 | 47 | 6,5 | 1,1 | Ι | |
| 1,5 | 2 | 4 | 6,406 | ILT004 | 120 | 75 | 122 | 94 | 47 | 6,5 | 1,2 | Ι | |
| 2,2 | 3 | 6 | 4,271 | ILT006 | 120 | 84 | 122 | 94 | 57 | 6,5 | 1,7 | Ι | |
| 3 | 4 | 8 | 3,203 | ILT008 | 120 | 84 | 122 | 94 | 57 | 6,5 | 1,8 | Ι | |
| 4 | 5,5 | 10 | 2,562 | ILT010 | 150 | 73 | 149 | 100 | 47 | 7 | 2,3 | Ι | |
| 5,5 | 7,5 | 15 | 1,708 | ILT015 | 150 | 98 | 164 | 100 | 62 | 7 | 3,7 | Ι | |
| 7,5 | 10 | 20 | 1,281 | ILT020 | 150 | 98 | 164 | 100 | 62 | 7 | 3,9 | Ι | |
| 11 | 15 | 25 | 1,025 | ILT025 | 190 | 108 | 205 | 140 | 72 | 7 | 5,4 | II | |
| 15 | 20 | 30 | 0,854 | ILT030 | 190 | 113 | 205 | 140 | 77 | 7 | 6,2 | II | |
| 18,5 | 25 | 40 | 0,641 | ILT040 | 190 | 123 | 205 | 140 | 87 | 7 | 7,6 | II | |
| 22 | 30 | 50 | 0,512 | ILT050 | 240 | 131 | 209 | 200 | 90 | 7 | 9,6 | II | |
| 30 | 40 | 60 | 0,427 | ILT060 | 240 | 131 | 209 | 200 | 90 | 7 | 10,1 | II | |
| 37 | 50 | 80 | 0,320 | ILT080 | 240 | 151 | 209 | 200 | 110 | 7 | 14,7 | II | |
| 45 | 60 | 100 | 0,256 | ILT100 | 240 | 166 | 209 | 200 | 125 | 7 | 18,4 | II | |
| 55 | 75 | 125 | 0,205 | ILT125 | 300 | 163 | 252 | 200 | 100 | 11 | 21,1 | III | |
| 75 | 100 | 150 | 0,171 | ILT150 | 300 | 183 | 252 | 200 | 120 | 11 | 28 | III | |
| 90 | 125 | 200 | 0,128 | ILT200 | 300 | 173 | 302 | 200 | 110 | 11 | 28,8 | III | |
| 110 | 150 | 250 | 0,102 | ILT250 | 300 | 183 | 302 | 200 | 120 | 11 | 34,4 | III | |
| 150 | 200 | 300 | 0,085 | ILT300 | 300 | 193 | 302 | 200 | 130 | 11 | 39,3 | III | |
| 185 | 250 | 400 | 0,064 | ILT400 | 360 | 210 | 363 | 320 | 130 | 11 | 52,4 | III | |
| 220 | 300 | 500 | 0,051 | ILT500 | 360 | 210 | 363 | 320 | 130 | 11 | 55,7 | III | |

* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.



TRANS

Three phase output line reactors for VFD



• Three phase reactors especially designed for the filtering of the power converter output voltages.

• It must be installed between the frequency converter's output and the motor.

• Reduces output ripple current; this reduces the risk of motor heating.

• Attenuates voltage spikes dv/dt at the output of the converter. These spikes cause premature deterioration of the motor isolation.

• Reduces capacitive leakages of significant long cables avoiding the consequent overload of the converter.

• Reduces voltage wave reflection caused by the length of the cable between the converter and the motor. This reflection amplifies the voltages at the motor terminals.

• Extends the service life of the equipment, avoids breakdowns and improves reliability.

• Recommended for cable lengths between the converter and the motor of 25m. For longer distance recommended installing a filter Series LC.

• Vacuum impregnation with epoxy varnish high binding power with special properties that protect windings and magnetic core from dust and humidity.

• Connection with screw terminal blocks (rating up to 20 A). Connection with screws for flat terminals (rating from 20 to 60 A). Connection with flat busbars (rating over 60 A).

Technical characteristics

| Μ | otor rating | | 0,75 ÷ 220 kW (1 ÷ 300 CV) |
|---------|---------------------------------------|-----|--|
| N | ominal current | | 2 ÷ 500 A |
| N | ominal voltage | | 380 - 500 V |
| In | ductive impedance | | 3 % |
| M ot | aximum converters´ utput frequency | | 0 ÷ 70 Hz |
| Μ | ax. commutation fre | q. | up to 10 kHz |
| A | dmissible overload | | Permanent 1,07 I_N Transitory 1,5 I_N |
| In | sulation class | | F (155 °C) |
| Aı | mbient temperature | | 50 °C @ I _N |
| Pr | otection degree | | IP-00 |
| C | ooling | | Natural |
| Τe | est voltage | | 4 kV |
| Sa | afety class | | Class I |
| St | andard | | IEC/UNE-EN 60076-6 |
| | \bigcirc | C | E |
| | VERTER VFD) | IMT | MOTOR |
| | | | |



SERIES IMT

30.00

40.00

Comparative waveform of voltage-current at output of frequency converter:



Select the reactor according to the motor rating

| Motor rating | | Rated current | Inductance | Reference | Dimensions mm | | | | | Weight | Туре | |
|-----------------|-----|------------------|------------|-----------|----------------------|-----|-----|-----|-----|--------|------|-----|
| kW | CV | Α | mH | | Α | В | С | D | E | Ø | kg | 71 |
| 0,75 | 1 | 2 | 10,982 | IMT002 | 120 | 75 | 122 | 94 | 47 | 6,5 | 1,2 | Ι |
| 1,5 | 2 | 4 | 5,491 | IMT004 | 120 | 84 | 122 | 94 | 57 | 6,5 | 1,7 | Ι |
| 2,2 | 3 | 6 | 3,661 | IMT006 | 120 | 84 | 122 | 94 | 57 | 6,5 | 1,8 | Ι |
| 3 | 4 | 8 | 2,745 | IMT008 | 150 | 73 | 149 | 100 | 47 | 7 | 2,3 | Ι |
| 4 | 5,5 | 10 | 2,196 | IMT010 | 150 | 98 | 164 | 100 | 62 | 7 | 3,7 | Ι |
| 5,5 | 7,5 | 15 | 1,464 | IMT015 | 150 | 98 | 164 | 100 | 62 | 7 | 3,9 | Ι |
| 7,5 | 10 | 20 | 1,098 | IMT020 | 190 | 108 | 205 | 140 | 72 | 7 | 5,4 | II |
| 11 | 15 | 25 | 0,879 | IMT025 | 190 | 113 | 205 | 140 | 77 | 7 | 6,2 | II |
| 15 | 20 | 30 | 0,732 | IMT030 | 190 | 123 | 205 | 140 | 87 | 7 | 7,6 | II |
| 18,5 | 25 | 40 | 0,549 | IMT040 | 240 | 131 | 209 | 200 | 90 | 7 | 9,6 | II |
| 22 | 30 | 50 | 0,439 | IMT050 | 240 | 131 | 209 | 200 | 90 | 7 | 10,1 | II |
| 30 | 40 | 60 | 0,366 | IMT060 | 240 | 151 | 209 | 200 | 110 | 7 | 14,7 | II |
| 37 | 50 | 80 | 0,275 | IMT080 | 240 | 166 | 209 | 200 | 125 | 7 | 18,4 | II |
| 45 | 60 | 100 | 0,220 | IMT100 | 300 | 163 | 252 | 200 | 100 | 11 | 21,1 | III |
| 55 | 75 | 125 | 0,176 | IMT125 | 300 | 183 | 252 | 200 | 120 | 11 | 28 | III |
| 75 | 100 | 150 | 0,146 | IMT150 | 300 | 173 | 302 | 200 | 110 | 11 | 28,8 | III |
| 90 | 125 | 200 | 0,110 | IMT200 | 300 | 183 | 302 | 200 | 120 | 11 | 34,4 | III |
| 110 | 150 | 250 | 0,088 | IMT250 | 300 | 193 | 302 | 200 | 130 | 11 | 39,3 | III |
| 150 | 200 | 300 | 0,074 | IMT300 | 360 | 210 | 363 | 320 | 130 | 11 | 52,4 | III |
| 185 | 250 | 400 | 0,055 | IMT400 | 360 | 210 | 363 | 320 | 130 | 11 | 55,7 | III |
| 220 | 300 | 500 | 0,044 | IMT500 | 420 | 280 | 470 | 280 | 165 | 11 | 87,1 | III |

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.



2ANS

Reactors for Wind Converters



Single and three phase inductors specifically designed for wind converters:

- DFM with doubly-fed generator.
- Full Converter for low voltage LV.
- Full Converter for medium voltage MV.

Applications and reactor types:

Reactors dV/dt & LC filter at generator side (1): Protect the generator windings to limit voltage spikes caused by the switching converter. Reduce fault currents in rolling bearings of the turbine extending its useful life.

Reactors for LC & LCL filter at network side (2): Filter voltage harmonics caused by the PWM modulation of the converter, adjusting the output voltage to a sine wave to make the connection to network.

Technical characteristics

| Power generators | 0,65 ÷ 10 MW | | | | | |
|------------------------|-----------------------------------|--|--|--|--|--|
| Nominal voltage LV | 400 ÷ 750 V | | | | | |
| Nominal voltage MV | 3 ÷ 10 kV | | | | | |
| Nominal current (A) | 100 ÷ 4000 Arms | | | | | |
| Nominal inductance (L) | 1 uH ÷ 1000 mH | | | | | |
| Nominal frequency | 1 ÷ 60 Hz | | | | | |
| Switching frequency | 1 ÷ 10 kHz | | | | | |
| Insulation class | H (180 °C) | | | | | |
| Ambient temperature | -25°C ÷ 70°C | | | | | |
| Installation altitude | 0 ÷ 4000 m | | | | | |
| Relative humidity | up to 95% | | | | | |
| Protection degree | IP-00 | | | | | |
| Cooling | Natural / Forced | | | | | |
| Impregnation | VPI & drying oven | | | | | |
| C4M treatment | Anticorrosion and long durability | | | | | |
| Useful life | 30 years | | | | | |

30 years

IEC/UNE-EN 60076-6

File E354573 UL 5085-1 UL 5086-2

File E466028



International standard

UL standard

UL EIS





Reactors for Photovoltaic Inverters





Single and three phase inductors specifically designed for photovoltaic inverters:

- Compact inverters
- Modular inverters
- Inverters with or without galvanic insulation

Applications and reactor types:

DC common mode Reactors at panel side (1): Attenuate the harmonic components of common mode between photovoltaic panels and the inverter input.

Reactors for LCL filter at network side (2): Filter voltage harmonics caused by the PWM modulation of the converter, adjusting the output voltage to a sine wave to make the connection to network.

Technical characteristics

| Power inverters | 10 kW ÷ 2,5 MW |
|------------------------|-----------------------------------|
| Nominal voltage | 230 ÷ 750 V |
| Nominal current (A) | 10 ÷ 4000 Arms |
| Nominal inductance (L) | 1 uH ÷ 1000 mH |
| Nominal frequency | 50/60 Hz |
| Switching frequency | 1 ÷ 10 kHz |
| Insulation class | H (180 °C) |
| Ambient temperature | -25°C ÷ 70°C |
| Installation altitude | 0 ÷ 2000 m |
| Relative humidity | up to 95% |
| Protection degree | IP-00 |
| Cooling | Natural / Forced |
| Impregnation | VPI & drying oven |
| C4M treatment | Anticorrosion and long durability |

30 years

IEC/UNE-EN 60076-6

RANS S.L

File E354573 UL 5085-1 UL 5086-2

UL EIS

Useful life

UL standard

International standard

File E466028





Sinusoidal output filters for VFD



• Three phase sine wave voltage output filters especially designed for frequency converters.

• LC filters of TORYTRANS remove pulses generated by the output voltage of the frequency converters PWM (pulse width modulation) at high frequencies and restore sinusoidal waveform at power converter's output.

 \bullet Avoid the premature motor deterioration caused by high dV / dt, overvoltage and reflection wiring.

• Increase significantly the motor's lifetime, reducing its overheating and eddy current losses.

• Recommended for installations with cables over 50 meters in length between the frequency converter and motor.



NET

YTRANS S.L





CONVERTER

Technical characteristics

| Motor rating | 0,37 ÷ 220 kW (0,5 ÷ 300 CV) |
|----------------------------|---|
| Nominal current | 1 ÷ 500 A |
| Converter output voltage | 380 ÷ 420 V |
| Converter output frequency | 0 ÷ 70 Hz |
| Commutation frequency | 2 ÷ 8 kHz |
| Voltage distortion | ≈ 8% THD-V |
| Insulation class | H (180°C) |
| Admissible overload | Permanent 1,07 I_N Transitory 1,5 I_N |
| Ambient temperature | 50 °C |
| Protection degree | IP-20 (up to LC040) IP-00 (from LC050) |
| Cooling | Natural |
| Standards | IEC /UNE-EN 60076-6 IEC /UNE-EN 61558-2-20 |
| Electrical diagram | CE |
| 10 • | |
| 1V • | |
| 1W • | • • • • 2W |
| PE • = | |
| | |
| LC FILTER | MOTOR |



Output voltage-current comparative waveform of frequency converter

Select filter current according to motor rating

| Motor rating | | Rated current | Deference | Dimensions mm | | | | | Weight | Losses | |
|--------------|-----|---------------|-----------|----------------------|-----|-----|-----|-----|--------|--------|------|
| kW | CV | Α | Reference | Α | В | С | D | E | Ø | kg | W |
| 0,37 | 0,5 | 1 | LC001 | 150 | 120 | 190 | 100 | 46 | 7 | 2,9 | 38 |
| 0,75 | 1 | 2 | LC002 | 150 | 120 | 190 | 100 | 46 | 7 | 3,3 | 48 |
| 1,5 | 2 | 4 | LC004 | 150 | 135 | 190 | 100 | 61 | 7 | 4,2 | 55 |
| 2,2 | 3 | 6 | LC006 | 150 | 135 | 195 | 100 | 61 | 7 | 4,7 | 60 |
| 3 | 4 | 8 | LC008 | 150 | 135 | 195 | 100 | 61 | 7 | 5 | 73 |
| 4 | 5,5 | 10 | LC010 | 180 | 150 | 215 | 140 | 82 | 7 | 8,5 | 85 |
| 5,5 | 7,5 | 15 | LC015 | 180 | 155 | 220 | 140 | 87 | 7 | 9,5 | 105 |
| 7,5 | 10 | 20 | LC020 | 240 | 170 | 285 | 200 | 99 | 7 | 15 | 123 |
| 11 | 15 | 25 | LC025 | 240 | 170 | 285 | 200 | 99 | 7 | 16 | 140 |
| 15 | 20 | 30 | LC030 | 240 | 195 | 285 | 200 | 124 | 7 | 21 | 152 |
| 18,5 | 25 | 40 | LC040 | 240 | 195 | 285 | 200 | 124 | 7 | 22 | 161 |
| 22 | 30 | 50 | LC050 | 300 | 192 | 355 | 200 | 105 | 11 | 29 | 270 |
| 30 | 40 | 60 | LC060 | 300 | 212 | 355 | 200 | 125 | 11 | 36 | 310 |
| 37 | 50 | 80 | LC080 | 300 | 212 | 405 | 200 | 125 | 11 | 43 | 400 |
| 45 | 60 | 100 | LC100 | 300 | 222 | 405 | 200 | 135 | 11 | 45 | 430 |
| 55 | 75 | 125 | LC125 | 300 | 272 | 379 | 200 | 160 | 11 | 68 | 500 |
| 75 | 100 | 150 | LC150 | 300 | 287 | 379 | 200 | 175 | 11 | 77 | 565 |
| 90 | 125 | 200 | LC200 | 360 | 318 | 473 | 240 | 174 | 11 | 90 | 730 |
| 110 | 150 | 250 | LC250 | 420 | 340 | 550 | 280 | 179 | 11 | 120 | 960 |
| 150 | 200 | 300 | LC300 | 420 | 355 | 550 | 280 | 194 | 11 | 135 | 1050 |
| 185 | 250 | 400 | LC400 | 420 | 380 | 550 | 280 | 219 | 11 | 160 | 1220 |
| 220 | 300 | 500 | LC500 | 480 | 370 | 620 | 320 | 208 | 11 | 195 | 1480 |

* Other features, power, voltage, etc., on request

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Sinusoidal output filters for VFD



• Three phase sine wave voltage output filters especially designed for frequency converters.

• LC filters of TORYTRANS remove pulses generated by the output voltage of the frequency converters PWM (pulse width modulation) at high frequencies and restore sinusoidal waveform at power converter's output.

• Avoid the premature motor deterioration caused by high dV / dt, overvoltage and reflection wiring.

• Increase significantly the motor's lifetime, reducing its overheating and eddy current losses.

• Recommended for installations with cables over 50 meters in length between the frequency converter and motor.



NET

YTRANS S.L



CONVERTER

Technical characteristics

| | Motor rating | 0,37 ÷ 220 kW (0,5 ÷ 300 CV) |
|---|--|---|
| | Nominal current | 1 ÷ 500 A |
| | Converter output voltage | 380 ÷ 420 V |
| | Converter output frequency | 0 ÷ 70 Hz |
| | Commutation frequency | 2 ÷ 8 kHz |
| | Voltage distortion | ≈ 8% THD-V |
| | Insulation class | H (180°C) |
| | Admissible overload | Permanent 1,07 I_N Transitory 1,5 I_N |
| | Ambient temperature | 50 °C |
| | Protection degree | IP-23 |
| | Cooling | Natural |
| | Standards | IEC /UNE-EN 60076-6 IEC /UNE-EN 61558-2-20 |
| | Electrical diagram 1U 10 10 10 10 10 10 10 10 10 10 | € 2U 2V 2V 2W 2W |
| • | | MOTOR |

v4.5 12/16
SERIES LCB



Output voltage-current comparative waveform of frequency converter

Select filter current according to motor rating

| Motor rating Rated current | | | Deference | | Di | mensio | ns m r | n | | Weight | Losses | Туре |
|----------------------------|-----|-----|-----------|-----|-----|--------|---------------|-----|----|--------|--------|------|
| kW | CV | A | Reference | Α | В | С | D | E | Ø | kg | W | |
| 0,37 | 0,5 | 1 | LCB001 | 230 | 145 | 245 | 205 | 125 | 7 | 6,9 | 38 | Ι |
| 0,75 | 1 | 2 | LCB002 | 230 | 145 | 245 | 205 | 125 | 7 | 6,3 | 48 | Ι |
| 1,5 | 2 | 4 | LCB004 | 300 | 185 | 305 | 265 | 165 | 7 | 7,2 | 55 | Ι |
| 2,2 | 3 | 6 | LCB006 | 300 | 185 | 305 | 265 | 165 | 7 | 8,7 | 60 | Ι |
| 3 | 4 | 8 | LCB008 | 300 | 185 | 305 | 265 | 165 | 7 | 8 | 73 | Ι |
| 4 | 5,5 | 10 | LCB010 | 300 | 185 | 305 | 265 | 165 | 7 | 16 | 85 | Ι |
| 5,5 | 7,5 | 15 | LCB015 | 300 | 185 | 305 | 265 | 165 | 7 | 17 | 105 | Ι |
| 7,5 | 10 | 20 | LCB020 | 370 | 225 | 375 | 325 | 205 | 7 | 23 | 123 | Ι |
| 11 | 15 | 25 | LCB025 | 370 | 225 | 375 | 325 | 205 | 7 | 24 | 140 | Ι |
| 15 | 20 | 30 | LCB030 | 370 | 225 | 375 | 325 | 205 | 7 | 29 | 152 | Ι |
| 18,5 | 25 | 40 | LCB040 | 370 | 225 | 375 | 325 | 205 | 7 | 30 | 161 | Ι |
| 22 | 30 | 50 | LCB050 | 475 | 345 | 520 | 320 | 320 | 10 | 42 | 270 | II |
| 30 | 40 | 60 | LCB060 | 475 | 345 | 520 | 320 | 320 | 10 | 49 | 310 | II |
| 37 | 50 | 80 | LCB080 | 475 | 345 | 520 | 320 | 320 | 10 | 56 | 400 | II |
| 45 | 60 | 100 | LCB100 | 475 | 345 | 520 | 320 | 320 | 10 | 58 | 430 | II |
| 55 | 75 | 125 | LCB125 | 545 | 385 | 615 | 350 | 360 | 10 | 85 | 500 | II |
| 75 | 100 | 150 | LCB150 | 545 | 385 | 615 | 350 | 360 | 10 | 95 | 565 | II |
| 90 | 125 | 200 | LCB200 | 615 | 425 | 690 | 400 | 400 | 10 | 110 | 730 | II |
| 110 | 150 | 250 | LCB250 | 615 | 425 | 690 | 400 | 400 | 10 | 134 | 960 | II |
| 150 | 200 | 300 | LCB300 | 775 | 575 | 940 | 400 | 550 | 10 | 158 | 1050 | II |
| 185 | 250 | 400 | LCB400 | 775 | 575 | 940 | 400 | 550 | 10 | 185 | 1220 | II |
| 220 | 300 | 500 | LCB500 | 775 | 575 | 940 | 400 | 550 | 10 | 230 | 1480 | II |

* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.







Passive harmonic filters for VFD

IP-20



• Passive harmonic filter especially designed for 6 pulses power converters such as frequency converters, variable speed drives for motors, three phase rectifiers, battery chargers, HVAC systems ...

• SPF filter provides a very good cost-filtering relation and a very effective attenuation of harmonic currents in three phase facilities. Reduces wave form current distortion to the energy network and to the rest of the installation.

• Reduces energy consumption due to higher efficient power energy use, reducing the power energy demand. Improves the reliability and extends the service life of equipments and electrical facilities.

• Additionally it eliminates the notches and transients generated by the power converters avoiding mal-functioning and failure in electronic devices.

• Optionally, a contactor can be incorporated, that according to the converter load level, the reactive part of the filter can be switched off when no-load.



Technical characteristics

| Motor rating | 4 ÷ 220 kW (5,5 ÷ 300 CV) | | | | |
|---|--|--|--|--|--|
| Nominal current | 9 ÷ 408 A | | | | |
| Nominal voltage | 3 x 400 V ± 20 V | | | | |
| Frequency | 50 Hz | | | | |
| Distortion75÷100% loadDistortion50÷75% loadDistortion< 50% load | ≈ 5% THD-I ≈ 6% THD-I ≈ 8% THD-I | | | | |
| Power Factor with full load with load > 40% | ≥ 0,99 ≥ 0,9 | | | | |
| Ambient temperature | 30 °C | | | | |
| Protection degree | IP-20 | | | | |
| Protection | Bimetal thermal contact | | | | |
| Cooling | Natural / Forced | | | | |
| Standard | IEC/UNE-EN 60076-6 IEC/UNE-EN 61000-6 | | | | |
| | | | | | |

CE

* Other ratings and voltages on request.

(VFD)

72

Filtering example for a 75kW motor rating





Minimization in harmonics, SPF also improves the power factor, and helps to reduce energy consumption more than 30% that allows shrinking cables section, protections size, etc, decreasing significantly installation costs.

| Motor | rating | Current | Deference | Dime | ensions | mm | Weight | Losses | Turne |
|-------|--------|---------|-----------|-------|---------|------|--------|--------|-------|
| kW | CV | Α | Reference | A B C | | С | kg | W | туре |
| 4 | 5,5 | 9 | SPF004 | 290 | 250 | 510 | 21,0 | 165 | I |
| 5,5 | 7,5 | 12 | SPF005 | 290 | 250 | 510 | 24,6 | 190 | I |
| 7,5 | 10 | 16 | SPF007 | 290 | 250 | 510 | 27,2 | 225 | Ι |
| 11 | 15 | 23 | SPF011 | 330 | 315 | 610 | 34,3 | 310 | I |
| 15 | 20 | 30 | SPF015 | 330 | 315 | 610 | 40,7 | 350 | Ι |
| 18,5 | 25 | 37 | SPF018 | 330 | 315 | 610 | 50,4 | 405 | I |
| 22 | 30 | 43 | SPF022 | 330 | 315 | 610 | 56,0 | 450 | Ι |
| 30 | 40 | 58 | SPF030 | 410 | 390 | 670 | 66,2 | 565 | I |
| 37 | 50 | 72 | SPF037 | 410 | 390 | 670 | 84,5 | 610 | I |
| 45 | 60 | 86 | SPF045 | 410 | 390 | 670 | 94,4 | 670 | I |
| 55 | 75 | 104 | SPF055 | 410 | 390 | 670 | 105 | 720 | I |
| 75 | 100 | 140 | SPF075 | 490 | 410 | 1275 | 129 | 975 | II |
| 90 | 125 | 168 | SPF090 | 490 | 410 | 1275 | 147 | 1145 | II |
| 110 | 150 | 204 | SPF110 | 570 | 470 | 1520 | 193 | 1345 | II |
| 132 | 180 | 245 | SPF132 | 570 | 470 | 1520 | 222 | 1435 | II |
| 150 | 205 | 278 | SPF150 | 570 | 470 | 1520 | 235 | 1505 | II |
| 160 | 220 | 296 | SPF160 | 570 | 470 | 1520 | 269 | 1610 | II |
| 185 | 270 | 341 | SPF185 | 570 | 470 | 1520 | 298 | 1660 | II |
| 200 | 270 | 369 | SPF200 | 570 | 470 | 1520 | 320 | 1835 | II |
| 220 | 300 | 406 | SPF220 | 570 | 470 | 1520 | 356 | 1835 | II |

Select filter current according to motor rating



 \ast Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.





Passive harmonic filters for power converters IP-00



• Passive harmonic filter especially designed for 6 pulses power converters such as frequency converters, variable speed drives for motors, three phase rectifiers, battery chargers, HVAC systems ...

• SPFS filter provides a very good cost-filtering relation and a very effective attenuation of harmonic currents in three phase facilities. Reduces wave form current distortion to the energy network and to the rest of the installation.

• Reduces energy consumption due to higher efficient power energy use, reducing the power energy demand. Improves the reliability and extends the service life of equipments and electrical facilities.

• Additionally it eliminates the notches and transients generated by the power converters avoiding mal-functioning and failure in electronic devices.

• Optionally, a contactor can be incorporated, that according to the converter load level, the reactive part of the filter can be switched off when no-load.







SPFS FILTER

Technical characteristics

| Motor rating | 4 ÷ 220 kW (5,5 ÷ 300 CV) | | | |
|---|--|--|--|--|
| Nominal current | 9 ÷ 424 A | | | |
| Nominal voltage | 3 x 400 V ±20 V | | | |
| Frequency | 50 Hz | | | |
| Distortion75÷100% loadDistortion50÷75% loadDistortion< 50% load | ≈ 5% THD-I ≈ 6% THD-I ≈ 8% THD-I | | | |
| Power Factor with full load with load > 40% | ≥ 0,99 ≥ 0,9 | | | |
| Ambient temperature | 40 °C | | | |
| Protection degree | IP-00 | | | |
| Protection | Bimetal thermal contact | | | |
| Cooling | Natural | | | |
| Standard | IEC/UNE-EN 60076-6 IEC/UNE-EN 61000-6 | | | |
| | | | | |

CE

* Other ratings and voltages on request.





| Motor rating | | Current | Def | Din | nensions r | nm | Weight | Losses | T |
|--------------|-----|---------|---------|-----|-------------------|------|--------|--------|----------|
| kW | CV | Α | Ref. | А | В | С | kg | w | туре |
| 4 | 5,5 | 9 | SPFS004 | 210 | 205 | 410 | 14 | 165 | Ι |
| 5,5 | 7,5 | 12 | SPFS005 | 210 | 210 | 410 | 16 | 190 | I |
| 7,5 | 10 | 16 | SPFS007 | 210 | 225 | 410 | 20 | 225 | I |
| 11 | 15 | 23 | SPFS011 | 260 | 245 | 510 | 25 | 310 | I |
| 15 | 20 | 30 | SPFS015 | 260 | 250 | 510 | 30 | 350 | I |
| 18,5 | 25 | 37 | SPFS018 | 260 | 265 | 510 | 38 | 405 | I |
| 22 | 30 | 43 | SPFS022 | 260 | 280 | 510 | 46 | 450 | I |
| 30 | 40 | 58 | SPFS030 | 320 | 330 | 570 | 59 | 565 | I |
| 37 | 50 | 72 | SPFS037 | 320 | 335 | 570 | 65 | 610 | I |
| 45 | 60 | 86 | SPFS045 | 320 | 350 | 570 | 78 | 670 | I |
| 55 | 75 | 104 | SPFS055 | 320 | 360 | 570 | 87 | 720 | I |
| 75 | 100 | 140 | SPFS075 | 490 | 370 | 1275 | 108 | 975 | II |
| 90 | 125 | 168 | SPFS090 | 490 | 370 | 1275 | 130 | 1145 | II |
| 110 | 150 | 204 | SPFS110 | 570 | 370 | 1520 | 151 | 1345 | II |
| 132 | 180 | 245 | SPFS132 | 570 | 400 | 1520 | 193 | 1435 | II |
| 150 | 205 | 278 | SPFS150 | 570 | 400 | 1520 | 199 | 1505 | II |
| 160 | 220 | 296 | SPFS160 | 570 | 420 | 1520 | 227 | 1610 | II |
| 185 | 270 | 341 | SPFS185 | 570 | 420 | 1520 | 236 | 1660 | II |
| 200 | 270 | 369 | SPFS200 | 570 | 440 | 1520 | 263 | 1835 | II |
| 220 | 300 | 406 | SPFS220 | 570 | 440 | 1520 | 271 | 1835 | II |

Select current rating of the filter according to the nominal power of the motor:

* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.



Туре І



Type II



Line Filters for Regenerative VFD



Series LCR Torytrans filters are designed to connect between the network and the input frequency inverters (VFD) regenerative in applications where mechanical inertia of the load can be used to regenerate energy and return it to the network at the moment of braking, such as in lift motors (elevators, escalators, forklifts, cranes, etc ...).

Filter the PWM voltage waveform generated by the front inverter of the converter (AFE) adapting to sine wave voltage of the network. They considerably reduce the current ripple and the THD (I) factor of the wave reinjected into the network.

The LCR filters are composed of a line reactor LCR_A connected to the network and the sinusoidal filter LCR_B connected to the input of the regenerative drive VFD.



NET



LCR FILTER

Technical characteristics

| Motor rating | 4 ÷ 30 kW (5,5 ÷ 40 CV) |
|---|---|
| Nominal current Filter | 10 ÷ 75 A |
| Network voltage | 380 ÷ 420 V |
| Network frequency | 50 ÷ 60 Hz |
| Switching frequency | 4 ÷ 8 kHz |
| Admissible overload | 1,1 I _N |
| Ambient temperature | 40 °C |
| Protection degree | IP-00 |
| Cooling | Natural |
| High efficiency | Bobinado en cobre Núcleo de bajas perdidas Condensadores MKP |
| Line Reactor | equipment LCR_A |
| Sinusoidal filter | equipment LCR_B |
| Standard | IEC / UNE-EN 60076-6 IEC / UNE-EN 61558-2-20 IEC / UNE-EN 60831-1 IEC / UNE-EN 60831-2 |
| | CE |
| | a south |
| \leftrightarrow \blacksquare \leftarrow | |

VFD REGENERATIVE

MOTOR





76



Application diagram for the TORYTRANS filter $\ensuremath{\textbf{Series LCR}}$

Select the filter current according to the motor rating.

| Motor rating Current | | Current | Deference | Dimensions mm | | | | | | | Weight | | | | | |
|----------------------|-----|---------|-----------|----------------------|-----|-----|-----|----------|---------|-------|--------|-----|-----|----|-------|----|
| kW | CV | Α | Reference | Equipment | А | В | С | D | E | Ø | kg | | | | | |
| 4 | гг | 10 | | LCR010A | 125 | 80 | 165 | 100 | 60 | 5x8 | 3 | | | | | |
| 4 | 5,5 | 10 | LCRUIU | LCR010B | 190 | 140 | 215 | 170 | 57 | 8x12 | 8 | | | | | |
| | 7 5 | 10 | | LCR018A | 155 | 80 | 200 | 130 | 57 | 8x12 | 5 | | | | | |
| 5,5 | 7,5 | 18 | LCRUIS | LCR018B | 210 | 155 | 245 | 180 | 81 | 8x12 | 13 | | | | | |
| 15 | 20 | 22 | | LCR032A | 190 | 90 | 230 | 170 | 57 | 8x12 | 8 | | | | | |
| 15 | 20 | 52 | 52 | 52 | 52 | 52 | 52 | Z LCRU3Z | LCR032B | 240 | 175 | 285 | 190 | 95 | 12x20 | 20 |
| 22 | 20 | 10 | | LCR048A | 190 | 100 | 230 | 170 | 67 | 8x12 | 10 | | | | | |
| 22 | 50 | 40 | LCKU40 | LCR048B | 240 | 225 | 285 | 190 | 120 | 12x20 | 28 | | | | | |
| 20 | 40 | 75 | | LCR075A | 210 | 120 | 255 | 180 | 81 | 8x12 | 16 | | | | | |
| 30 | 40 | 75 | LCRU75 | LCR075B | 300 | 235 | 325 | 250 | 133 | 12x15 | 45 | | | | | |

 \ast Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.



LCR_A



LCR_B



Shunt hybrid harmonic power filters



• SHPF filter combines harmonic filtering solution and reactive power compensation system in three phase facilities with neutral conductor.

• Gives a strong reduction of the triplen harmonic currents (3°-9°-15°) generated by computers, fluorescents and discharge lamps, power supplies, motor starters and other types of single phase non-linear loads.

• Improves power factor.

• Eliminates the overload in the neutral conductor and the high neutral-earth voltage.

• Features a very significant filtering of the 5°-7° harmonic currents generated by 6 pulses power converters such as frequency converters, variable speed drives for motors, three phase rectifiers, battery chargers, HVAC systems, ...

• Avoids overheating and failures in transformers and cables.

• Avoids tripping of protections without apparent reason.

• Reduces wave form current distortion to the net and to the rest of the installation.

• Reduces energy consumption due the higher efficient power energy use, reducing the power energy demand.

• Improves the reliability and extends the service life of equipments and electrical facilities.

Technical characteristics

| Power rating | 20 ÷ 100 kVA |
|---------------------------|---|
| Rated current | 30 ÷ 150 A |
| Nominal voltage | 3 x 400 V + N |
| Main Frequency | 50 Hz |
| Filtering spectrum | 30-50-70-90- 110-130-150. |
| Final harmonic distortion | ≈ 4% THD-I |
| Power Factor | ≥ 0,99 |
| Display Analyzer | Digital network analyzer and Energy counter. Communication by ethernet / gsm_grps / modbus_profibus / USB / RS-485 / RS- 232 (expansion modules available). Master-Slave configuration, programmable alarms, user password and locks, etc. |
| Ambient temperature | 30 °C |
| Protection degree | IP-20 |
| Cooling | Forced fan cooling |
| Standard | IEC/EN/UNE-EN 60076-6 IEC/EN/UNE-EN 61000-6 IEC/UNE-EN 61439-1 |
| | |

CE



* Other ratings and voltages on request.

- Select according to harmonic current to be filtered (see table below).
- Several filters can be installed in parallel to the load or in cascade distributed at the facility.

• Impedance study is not required; resonance free with other equipments of the facility (transformers, capacitor banks, ...).

| Nominal current | | Maximum harmonic current filtered and reactive power compensation | | | | | | |
|-----------------|-----------|---|---|-------------------------------|--|--|--|--|
| Arms | Reference | Harmonic phase current Arms | Harmonic neutral current Arms | Reactive power kVAr | | | | |
| 30 | SHPF030 | 26 | 30 | 10 | | | | |
| 60 | SHPF060 | 52 | 60 | 20 | | | | |
| 90 | SHPF090 | 78 | 90 | 30 | | | | |
| 120 | SHPF120 | 104 | 120 | 40 | | | | |
| 150 | SHPF150 | 130 | 150 | 50 | | | | |

Automatic harmonic filtering and reactive power compensation by 10kVAr steps.



Single phase automatic voltage Stabilizers



• Single phase automatic voltage stabilizers consist of a buck-boost transformer, in series with variable the line, and motor driven autotransformer with individual phase regulation. • Torytrans voltage stabilizers are intended for operation of electrical and electronic equipment which need a constant value of voltage supply in order to work correctly. Provide a fast speed response time against voltage fluctuations and variation of power consumed by load. In this way, our stabilizers avoid malfunctioning and failures of equipments and installations caused by these voltage fluctuations.

• Output voltage display and switch circuit breaker ON/OFF at the front panel.

• No harmonic distortion and protected against short circuits and overloads.

• Series SNA includes line conditioner transformer with galvanic insulation and electrostatic shield, providing a stable output voltage and attenuation and filtering of electromagnetic disturbances.

• Applications:

- Data centers, processing and computer rooms
- Transmissions, telecommunications and radio
- Hospitals and medical centers, particularly in X-Ray scanning equipments
- Lifts, escalators, offices, hotels and shops
- Motors, industrial machines, lasers and robots
- Railway, Offshore, Wind Farm and Security
- Any electronic or electric equipment sensitive to voltage variations.

Technical characteristics

| Power rating | 1 ÷ 60 kVA |
|---------------------|---|
| Input voltage | 230 V |
| Input margin | ±15% |
| Output voltage | 230 V |
| Output accuracy | ±1% |
| Response time | \approx 10 to 20 V/s |
| Frequency | 50/60 Hz |
| Ambient temperature | 30 °C |
| Protection degree | IP-23 |
| Cooling | Natural |
| Service | Continuous |
| Harmonic distortion | Nil |
| Load-break switch | ON/OFF |
| Efficiency | > 95% |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 IEC/UNE-EN 61439-1 |

CE

OPTIONAL:

- Enclosure for high protection degree (IP54).
- External Bypass switch.
- Additional power meter and monitoring.
- Protection against transitory surges.
- Wall mounting design.

*Customized stabilizer and features on request.





SERIES SN

| Series | SN | | | Sing | le phase | | |
|--------|------|------|----------------------|------|----------|--|--|
| Rating | Dof | Dime | Dimensions mm | | | | |
| kVA | Rel. | А | В | С | kg | | |
| 1 | SN01 | 370 | 225 | 375 | 15 | | |
| 2 | SN02 | 370 | 225 | 375 | 20 | | |
| 3 | SN03 | 450 | 260 | 430 | 25 | | |
| 5 | SN05 | 450 | 260 | 430 | 33 | | |
| 7,5 | SN07 | 450 | 260 | 430 | 38 | | |
| 10 | SN10 | 520 | 300 | 525 | 55 | | |
| 15 | SN15 | 590 | 340 | 600 | 76 | | |
| 20 | SN20 | 590 | 340 | 600 | 80 | | |
| 25 | SN25 | 750 | 440 | 850 | 122 | | |
| 30 | SN30 | 750 | 440 | 850 | 127 | | |
| 40 | SN40 | 750 | 440 | 850 | 148 | | |
| 50 | SN50 | 750 | 440 | 850 | 175 | | |
| 60 | SN60 | 1070 | 880 | 1460 | 212 | | |

| Series SNA Single pha Line condition | | | | | | | |
|---|-------|------|---------|------|--------|--|--|
| Rating | Dof | Dim | ensions | mm | Weight | | |
| kVA | Rel. | Α | В | С | kg | | |
| 1 | SNA01 | 450 | 260 | 430 | 22 | | |
| 2 | SNA02 | 450 | 260 | 430 | 35 | | |
| 3 | SNA03 | 520 | 300 | 525 | 59 | | |
| 5 | SNA05 | 520 | 300 | 525 | 82 | | |
| 7,5 | SNA07 | 590 | 340 | 600 | 92 | | |
| 10 | SNA10 | 750 | 440 | 850 | 130 | | |
| 15 | SNA15 | 930 | 710 | 1275 | 175 | | |
| 20 | SNA20 | 930 | 710 | 1275 | 209 | | |
| 25 | SNA25 | 1070 | 880 | 1460 | 262 | | |
| 30 | SNA30 | 1070 | 880 | 1460 | 302 | | |
| 40 | SNA40 | 1070 | 880 | 1460 | 348 | | |
| 50 | SNA50 | 1070 | 880 | 1460 | 425 | | |
| 60 | SNA60 | 1280 | 1080 | 1520 | 502 | | |



For general use, select power rating ٠ according to the load and power factor:

 $kVA = kW / Cos \phi$



OUTPUT LOAD

* Other features, power, voltage, etc., on request
* Torytrans reserves the right to modify the information in any time and without prior notice.

Three phase automatic voltage Stabilizers



• Three phase automatic voltage stabilizers consist of a buck-boost transformer, in series with the line, and motor driven variable autotransformer with common phase or individual phase regulation.

• Torytrans voltage stabilizers are intended for operation of electrical and electronic equipment which need a constant value of voltage supply in order to work correctly. Provide a fast speed response time against voltage fluctuations and variation of power consumed by load. In this way, our stabilizers avoid malfunctioning and failures of equipments and installations caused by these voltage fluctuations.

• Output voltage display and switch circuit breaker ON/OFF at the front panel.

• No harmonic distortion and protected against short circuits and overloads.

• Series STA and STFA includes line conditioner transformer with galvanic insulation and electrostatic shield, providing a stable output voltage and attenuation and filtering of electromagnetic disturbances.

- Applications:
 - Data centers, processing and computer rooms
 - Transmissions, telecommunications and radio
 - Hospitals and medical centers, particularly in X-Ray scanning equipments
 - Lifts, escalators, offices, hotels and shops
 - Motors, industrial machines, lasers and robots
 - Railway, Offshore, Wind Farm and Security.
 - Any electronic or electric equipment sensitive to voltage variations.

Technical characteristics

| Power rating | 1 ÷ 100 kVA |
|---------------------|---|
| Input voltage | 3 x 400 V + N |
| Input margin | ± 15 % |
| Output voltage | 3 x 400 V + N |
| Output accuracy | ± 1 % |
| Response time | \approx 10 to 20 V/s |
| Frequency | 50/60 Hz |
| Ambient temperature | 30 °C |
| Protection degree | IP-23 |
| Cooling | Natural |
| Service | Continuous |
| Harmonic distortion | Nil |
| Load-break switch | ON/OFF |
| Efficiency | > 95% |
| Standard | IEC/UNE-EN 60076-11 IEC/UNE-EN 61558-1 IEC/UNE-EN 61439-1 |

CE

OPTIONAL:

- Enclosure for high protection degree (IP54).
- External Bypass switch.
- Additional power meter and monitoring.
- Protection against transitory surges.
- Wall mounting design.



*Customized stabilizer and features on request.

SERIES **ST-STF**

| Series S | ST | Three phase - Common control | | | | | |
|----------|------------|------------------------------|----------------------|------|-----|--|--|
| Rating | Rating Ref | | Dimensions mm | | | | |
| kVA | Rei. | Α | В | С | kg | | |
| 1 | ST01 | 370 | 225 | 375 | 16 | | |
| 2 | ST02 | 370 | 225 | 375 | 20 | | |
| 3 | ST03 | 450 | 260 | 430 | 26 | | |
| 5 | ST05 | 450 | 260 | 430 | 30 | | |
| 7,5 | ST07 | 450 | 260 | 430 | 33 | | |
| 10 | ST10 | 450 | 260 | 430 | 36 | | |
| 15 | ST15 | 590 | 340 | 600 | 54 | | |
| 20 | ST20 | 590 | 340 | 600 | 71 | | |
| 30 | ST30 | 750 | 440 | 850 | 114 | | |
| 40 | ST40 | 750 | 440 | 850 | 126 | | |
| 50 | ST50 | 750 | 440 | 850 | 195 | | |
| 60 | ST60 | 750 | 440 | 850 | 165 | | |
| 80 | ST80 | 930 | 710 | 1275 | 190 | | |
| 100 | ST100 | 930 | 710 | 1275 | 205 | | |

| Series 9 | STF | Thr | ee phas | e – Phas | e control |
|----------|--------|----------------------|---------|----------|-----------|
| Rating | Dof | Dimensions mm | | | Weight |
| kVA | Rel. | А | В | С | kg |
| 1 | STF01 | 370 | 225 | 375 | 16 |
| 2 | STF02 | 450 | 260 | 430 | 35 |
| 3 | STF03 | 590 | 340 | 600 | 40 |
| 5 | STF05 | 590 | 340 | 600 | 46 |
| 7,5 | STF07 | 750 | 440 | 850 | 74 |
| 10 | STF10 | 750 | 440 | 850 | 77 |
| 15 | STF15 | 750 | 440 | 850 | 98 |
| 20 | STF20 | 750 | 440 | 850 | 107 |
| 30 | STF30 | 930 | 710 | 1275 | 168 |
| 40 | STF40 | 930 | 710 | 1275 | 225 |
| 50 | STF50 | 1070 | 880 | 1460 | 283 |
| 60 | STF60 | 1070 | 880 | 1460 | 304 |
| 80 | STF80 | 1280 | 1080 | 1520 | 351 |
| 100 | STF100 | 1280 | 1080 | 1520 | 450 |

Series STA

Three phase – Common control

| Rating | Dof | Dime | ensions | mm | Weight | |
|--------|--------|------|---------|------|--------|--|
| kVA | Rel. | А | В | С | kg | |
| 1 | STA01 | 450 | 260 | 430 | 28 | |
| 2 | STA02 | 450 | 260 | 430 | 40 | |
| 3 | STA03 | 450 | 260 | 430 | 52 | |
| 5 | STA05 | 520 | 300 | 525 | 70 | |
| 7,5 | STA07 | 520 | 300 | 525 | 87 | |
| 10 | STA10 | 590 | 340 | 600 | 110 | |
| 15 | STA15 | 750 | 440 | 850 | 163 | |
| 20 | STA20 | 750 | 440 | 850 | 200 | |
| 30 | STA30 | 930 | 710 | 1275 | 284 | |
| 40 | STA40 | 1070 | 880 | 1460 | 343 | |
| 50 | STA50 | 1070 | 880 | 1460 | 429 | |
| 60 | STA60 | 1070 | 880 | 1460 | 440 | |
| 80 | STA80 | 1070 | 880 | 1460 | 517 | |
| 100 | STA100 | 1070 | 880 | 1460 | 585 | |



* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.







Energy consumption reducer for lighting systems



• Consumption reduction up to 40% at any type of lighting system, mainly for discharge sodium vapor lamps or high pressure mercury vapor lamps.

• Absorbs input voltage fluctuations as for example night overvoltages, being an additional energy saving.

• Increases in the useful life and performance of the lamps, reducing maintenance costs.

• Astronomic switch in order to control Power On-Saving-Power OFF of the equipment.

• Robust, high reliability, easy to install and operate.

• Mounting into metal enclosure IP-23 protection degree, resin polyester-epoxy powder coated with excellent physical-mechanical and anti-corrosive properties.

Technical characteristics

| Power rating | 5 ÷ 60 kVA |
|--|---|
| Input voltage II Output voltage III | 230 V (Series RCM) 3 x 400 V + N (Series RCT) |
| Output voltage (phase-neutral) | 184 V (Sodium) 207 V (Mercury) 230 V (ON) |
| Frequency | 50/60 Hz |
| Ambient temperature | 30 °C |
| Protection degree | IP-23 |
| Safety class | Class I |
| Phase protection | Magnetothermic switch |
| Input voltage margin | ± 10% (Saving) |
| LED indicator | Blue (ON) Green (Saving) |
| Digital display | Output voltage |
| Setting | Astronomical clock |
| Standard | IEC/UNE-EN 61558-1 IEC/UNE-EN 60076-11 IEC/UNE-EN 61439-1 |

CE

• For general use, select the power according to the load and power factor:

 $kVA = kW / \cos \varphi$ II series RCM : kVA = V x I / 1000 III series RCT : kVA = $\sqrt{3}$ x V x I / 1000





SERIES REDCON

REDCON are especially designed to reduce the energy consumption at all lighting facilities:

- Roads, motorways, highways
- Public lighting
- Industrial areas
- Shopping centers
- Companies
- Railway, ports, airports, tunnels...

REDCON improves the energy efficiency of the facilities contributing to the sustainability of the environment reducing the CO2 emissions for the reduction in the demand of energy.



Only 60% power energy is required when the equipment is working at reduced voltage.

Example of REDCON equipment, 60 kVA, working on 2500 hours/year at reduced voltage, see table below the energy saving for each lamp type:

| Lamp type | Consumption Without REDCON kW | Consumption With REDCON kW | Consumption reduction kW | Annual reduction kWh | Annual saving (0,12 €/kWh) |
|-----------|---|--|---------------------------------------|--------------------------------|---------------------------------------|
| Sodium | 56 | 33 | 23 (40%) | 57.500 | 6.900 € |
| Mercury | 56 | 40 | 16 (30%) | 40.000 | 4.800 € |

Series RCM Single phase

| Rating | Deference | Dime | Weight | | |
|--------|-----------|------|--------|-----|----|
| kVA | Reference | А | В | С | kg |
| 5 | RCM05 | 435 | 300 | 690 | 26 |
| 10 | RCM10 | 515 | 340 | 830 | 52 |
| 15 | RCM15 | 515 | 340 | 830 | 61 |
| 20 | RCM20 | 515 | 340 | 830 | 65 |

Series RCT Three phase

| Rating | | Dime | Weight | | |
|--------|-----------|------|--------|------|-----|
| kVA | Reference | А | В | С | kg |
| 15 | RCT15 | 435 | 300 | 690 | 50 |
| 30 | RCT30 | 515 | 340 | 830 | 88 |
| 45 | RCT45 | 585 | 380 | 1000 | 121 |
| 60 | RCT60 | 585 | 380 | 1000 | 155 |

According to the lamp type, add at the end of the reference: **-S** for sodium vapor lamps.

-H for high pressure mercury vapor lamps.

* Other lamps type or protection degree IP00 or IP54, on request.

* Other features, power, voltage, etc., on request

* Torytrans reserves the right to modify the information in any time and without prior notice.





Protective steel enclosures: Cabinets IP-23







Technical Characteristics

| Protection degree | IP-23 |
|-------------------|---|
| Colour | RAL7035 RAL5005 (cabinets type I) |
| Mounting Type | Floor |
| Coated | Epoxy resin painted steel |
| Cables | Cable glands / Open bottom |
| Accessories | Handles (cabinets type I) Wheels (cabinets type II) Lifting eyebolts (not |
| ii | ncluded) |

* Optionally available with special paint colour (on request)

Description

Protective metal enclosures with protection degree IP-23 coated with a resin polyester-epoxy powder with excellent physical-mechanical and anti-corrosive properties.

Intended for the installation of transformers, reactors, filters, stabilizers and other customized products.

Floor and vertical mounting. Its structure allows disassembling easily and quickly, and take the outer covers off.

Perforated steel base for the equipment fixing. Fully ventilated by a separated roof and an opened base for an optimum convection providing a good heat dissipation.

Cable glands at the back side for the access and internal connections at cabinets type I and II.

Wheels for handling and displacement of heavy units at cabinets type II. Handles included for cabinets type I.

RAL 7035 colour for all cabinets references. RAL 5005 only for covers of cabinets type I.

All materials according to the RoHS Directive.



SERIES XTC

| Deference | Dimensions mm | | | | | | Weight | Type |
|-----------|----------------------|------|------|-----|------|----|--------|------|
| Reference | Α | В | С | D | E | Ø | kg | Type |
| XTC100E | 230 | 145 | 245 | 205 | 125 | 7 | 3 | Ι |
| XTC101E | 300 | 185 | 305 | 265 | 165 | 7 | 5 | Ι |
| XTC102E | 370 | 225 | 375 | 325 | 205 | 7 | 8 | Ι |
| XTC103E | 475 | 345 | 520 | 320 | 320 | 10 | 13 | II |
| XTC104E | 545 | 385 | 615 | 350 | 360 | 10 | 16 | II |
| XTC105E | 615 | 425 | 690 | 400 | 400 | 10 | 20 | II |
| XTC106E | 775 | 575 | 940 | 400 | 550 | 10 | 35 | II |
| XTC107E | 930 | 710 | 1275 | 480 | 670 | 16 | 68 | III |
| XTC108E | 1070 | 880 | 1460 | 660 | 840 | 16 | 118 | III |
| XTC109E | 1210 | 1070 | 1650 | 660 | 1030 | 16 | 151 | III |



* Other RAL colour or higher protection degree on request. * Torytrans reserves the right to modify the information in

any time and without prior notice



The IP code indicates the protection degree provided by the enclosure against the access to hazardous parts, the penetration of solid foreign objects and liquids into the housing.

| IP-2_ | IP3 |
|--|--------------------------------------|
| 2 | 3 |
| Protection against medium-size foreign | No harmful effect from rain at angle |
| objects. (greater than 12mm) | less than 60 degrees from vertical |



To select transformers and autotransformers with high inrush current loads like motors, cooling devices, ..., etc, magnitude, duration and repeatability of inrush currents must be taken into account.

Furthermore in case of motors powered by variable frequency drivers (VFD) it should be considered the harmonics that cause overheating on transformers or autotransformers.

Select kVA needed according to the load rating: CV or kW (see table below):

| | | TRANSFORMER OR AUTOTRANSFORMER RATING REQUIRED | | | | |
|------|------|--|----------------|------------------|----------------|------------|
| | | 3 to 5 sta | rters/hour | 12 to 15 st | arters/hour | Motor with |
| LO | AD | Air conditioning | Turbines | Air conditioning | Turbines | frequency |
| RAT | ING | Freeze chamber | Belt conveyors | Freeze chamber | Belt conveyors | converter |
| | | Compressors | Pumps | Compressors | Pumps | (VFD) |
| | | Tool-machines | Press machines | Tool-machines | Press machines | |
| CV | KW | kVA | kVA | kVA | kVA | kVA |
| 0,25 | 0,18 | 1 | 1 | 1 | 1 | 1 |
| 0,5 | 0,37 | 1 | 1 | 1 | 2 | 1 |
| 0,75 | 0,55 | 2 | 2 | 2 | 2 | 2 |
| 1 | 0,74 | 2 | 2 | 2 | 3 | 2 |
| 1,5 | 1,10 | 3 | 3 | 3 | 4 | 3 |
| 2 | 1,47 | 3 | 4 | 4 | 5 | 4 |
| 2,5 | 1,84 | 4 | 4 | 4 | 5 | 4 |
| 3 | 2,2 | 4 | 5 | 5 | 6 | 5 |
| 4 | 2,9 | 5 | 6 | 8 | 8 | 8 |
| 5 | 3,7 | 6 | 8 | 8 | 10 | 8 |
| 5,5 | 4,0 | 8 | 8 | 8 | 10 | 8 |
| 7,5 | 5,5 | 10 | 12 | 12 | 16 | 12 |
| 10 | 7,4 | 12 | 16 | 16 | 20 | 16 |
| 15 | 11,0 | 20 | 25 | 25 | 31 | 25 |
| 20 | 14,7 | 25 | 31 | 31 | 40 | 31 |
| 25 | 18,4 | 31 | 40 | 40 | 50 | 40 |
| 30 | 22,1 | 40 | 40 | 40 | 50 | 40 |
| 40 | 29,4 | 50 | 63 | 63 | 80 | 63 |
| 50 | 36,8 | 63 | 80 | 80 | 80 | 80 |
| 60 | 44,2 | 63 | 80 | 80 | 100 | 80 |
| 75 | 55 | 80 | 100 | 100 | 125 | 100 |
| 100 | 74 | 100 | 125 | 125 | 160 | 125 |
| 125 | 92 | 125 | 160 | 160 | 200 | 160 |
| 150 | 110 | 160 | 200 | 200 | 250 | 200 |
| 180 | 132 | 200 | 250 | 250 | 315 | 250 |
| 200 | 147 | 200 | 250 | 250 | 315 | 250 |
| 220 | 162 | 250 | 315 | 315 | 400 | 315 |
| 250 | 184 | 250 | 315 | 315 | 400 | 315 |
| 270 | 199 | 315 | 400 | 400 | 400 | 400 |



Sales terms - Legend

Sales terms

- The **prices** are quoted in EUROS, on "ex works" (EXW Almagro (Ciudad Real) SPAIN INCOTERMS 2010), and do not include freight, assembly, commissioning and other incidental costs (e.g. customs duties), which shall be charged separately.
- The delivery time is to be understood in our premises for completely fulfilled orders, ready for delivery to forwarders. It never includes the time required for the transportation of the goods from our factory to the client warehouse. It doesn't exist any responsibility of Torytrans S.L. for the loss or delay due to the transport or another circumstance.
- The orders for special or custom made products must be covered by a written order and it is not until the time of receiving such formal order that they will be considered as firm.
- All **right**, title and interest in and to all items covered by Buyer's order are reserved to Torytrans, S.L. until the full purchase price for all such times has been paid.
- Returns of material will not be admitted without acceptance in writing by Torytrans S.L. In any case, we will not admit returns in excess 15 days from receipt of goods. In case of return of standard products, due to any cause which is not imputable to Torytrans S.L., then goods will be applied a 25% depreciation on invoice value. In all cases, returns shall be made freight prepaid.
- Torytrans, S.L. warrants all items against defects in material under normal use and service for a period of one (1) year from the date of shipment. This guarantee shall not apply to items or parts thereof that have been (a) subjected to misuse, neglect, accident, damage in transit, abuse or unusual hazard; (b) repaired, altered or modified by anyone other than Torytrans, S.L.; or (c) used in violation of instructions furnished by Torytrans, S.L. It does not cover the two-way carriage of goods. The buyer agrees to waive the right for claiming indemnities of any kind. All requests for return of items must receive the written authorization of Torytrans, S.L.
- Technical and design information in our catalogs can be modified without notice and always have a certain tolerance. The pictures of the products are not contractual, may be modified between publication of the catalog and put into circulation in the market. We also could be required to stop making some references. Therefore, under the circumstances mentioned above, we are not required to provide the removed or the old specifications items.
- The **civil liability** of our products expires one year after delivery date.
- Place of jurisdiction for both parties is Ciudad Real.

| Ð | Isolating Transformer: Galvanic isolation between primary and secondary windings. | | Transformer for medical use: Isolating transformer for hospital applications with reinforced isolation. |
|---|--|---------|--|
| | Safety Transformer: Transformer with reinforced isolation between primary (isolation transformer) and secondary and secondary voltage below 50Vac. Safe in case of bipolar human contact with secondary voltage. | | Safety Class II transformer: Indicates in which way the safety protection is obtained. All external metal parts are not accessible or galvanically isolated from the active parts. Reinforced isolation. Without earth terminal. |
| | Control Transformer: Isolating transformer for control and power circuits. | | Safety Class I Transformer: Indicates in which way the safety protection is obtained. All accessible external metal parts connected to earth. |
| | Autotransformer: Without galvanic isolation between primary and secondary. Input and output share the same winding. | <u></u> | Resetting thermal protection: Overtemperature and overload protection device. Generally, it is a bimetal thermal relay placed inside of the wound. |
| Ð | Reactor: One or more windings with a frequency dependent impedance, working by the principle of self-inductance, whereby a magnetising current produces a magnetic field. | - | Protection fuse non-resetting: Overtemperature and overload protection device. Interrupts excessive current (blows) according to maximum fuse current rating |

Legend



Notes

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