Let's create together

Product Catalog
Transformers and Metering Solutions

Rymel

Rymel

RELIABLE ENERGY TRANSFORMATION SOLUTIONS

RYMEL Ingeniería Eléctrica S.A.S. is a Colombian company with 48 years of experience in the design and manufacture of electrical equipment for power transformation and energy metering applications.

With a specialized production plant and a team of more than 500 professionals, RYMEL offers a comprehensive product portfolio that includes conventional transformers, CSP units, pad-mounted, dry-type, resin-encapsulated transformers, and CTs and PTs for low and medium voltage. RYMEL also represents Applied Meters, a leading Slovak manufacturer of energy metering solutions, in Colombia.

All products meet strict international standards and are supported by ISO 9001, ISO 14001, ISO 45001, BASC, and UL certifications, ensuring quality, safety, and reliability.

This catalog compiles the technical datasheets of our main products, offering clients a clear and practical tool for informed decision-making.

TABLE OF CONTENTS

Rymel

CONVENTIONAL AND CSP TRANSFORMERS

Conventional and self-protected transformers are essential components in medium-voltage power networks, serving both residential and industrial applications. Installed outdoors on poles or substation floors, they feature specially designed bushings for overhead line connections. Immersed in dielectric oil, these units ensure efficient heat dissipation while providing excellent insulation performance.

Rymel transformers are manufactured with high-quality steel tanks coated with durable paint to ensure long service life, even in outdoor or harsh environments.

With 48 years of industry experience, Rymel offers a complete range of transformers designed with safety as a priority.

Certified manufacturing processes ensure reliability and compliance with ISO and BASC quality standards, delivering solutions built with advanced technology and high-quality materials.

Self-protected transformers provide enhanced reliability and operational safety for electrical networks. They incorporate built-in protective elements, eliminating the need for additional external devices and reducing installation costs. Unlike conventional designs, self-protected units are capable of isolating the transformer from the network in the event of a fault. Protection is provided against overvoltages, overloads, and external short circuits, and a pilot light indicates switching operations or temporary overload conditions.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

FEATURES

TECHNICAL CHARACTERISTICS		
	ONE PHASE	**THREE PHASES**
CAPACITY	From 5 kVA up to 500 kVA	From 15 kVA up to 5000 kVA
PHASES	1	3
VOLTAGE	Single/Dual Votage Up to	
BIL	Up to 250 kV	
WINDING MATERIAL	Aluminum or copper	
COOLING CLASS	ONAN - KNAN	ONAN - KNAN-ONAF - KNAF
FREQUENCY	60 - 50 Hz	
TAP CHANGER	± 2, 2.5% or according to customer requirements.	
TEMPERATURE RAISE	Typically 65/65°C, or according to customer requirements.	
K FACTOR	Up to K20 or according to customer requirements.	
TYPE OF EFFICIENCY	According to DOE 2016	
TYPE OF INSULATION	Mineral or Biodegradable.	
TANK	Cold rolled Steel | Hot rolled steel | stainless steel.	
PAINT SYSTEM	2 layer elctrostatic paint	
GASKET	Nitryl	
ACCESSORIES	High voltage bushings - Low voltage bushings - Pressure relief valve - Oil level: Inside marking or sight glass - Recirculation, drainage and sampling valve - Neutral and tank grounding - Post lifting and fixing device - Nameplate made of high-strength anodized aluminum - Tap changer	
ADDITIONAL ACCESSORIES	-Low- or high-voltage thermomagnetic switch - Internal fuse on the high voltage side. - Fault Indicator Pilot Light. - Operating lever for opening and closing operations. - Surge arresters (optional).	
STANDARD	IEEE C57.12.00, IEEE 57.12.20	

Rymel

PAD MOUNTED TRANSFORMERS

Pad-mounted transformers, are used in underground distribution systems and are commonly applied in residential, commercial, and industrial environments. Rymel transformers are recognized for their high level of safety and reliability, incorporating built-in connection, protection, and switching elements. They are available in both single-phase and three-phase configurations.

For enhanced safety, these transformers feature high-voltage dead-front type terminals and are housed in cabinets with sealed compartments, equipped with doors and locking mechanisms on both the high-voltage and low-voltage sides. Manufactured using high-quality materials and certified production processes, Rymel pad-mounted transformers comply with applicable IEEE and NTC standards.

PROTECTION AND SWITCHING ELEMENTS

- Removable and interchangeable Bay-O-Net type fuses provide protection against extreme overloads and external short circuits in the secondary network.
- Built-in current-limiting fuses protect the primary network from high-current faults within the windings.
- DPS or elbow-type surge arresters safeguard the equipment against network-induced overvoltages.
- A load-break switching device enables safe switching operations under load.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

FEATURES

TECHNICAL CHARACTERISTICS		
	ONE PHASE	**THREE PHASES**
CAPACITY	From 25 kVA up to 500 kVA	From 30 kVA up to 5000 kVA
PHASES	1	3
VOLTAGE	Single-Dual Voltage - Up to 36 kV	
BIL	Up to 200 kV	
WINDING MATERIAL	Aluminum or copper	
COOLING CLASS	ONAN - KNAN	ONAN - KNAN -ONAF - KNAF
FREQUENCY	60 - 50 Hz	
TAP CHANGER	± 2, 2.5% or according to customer requirements.	
TYPE	Radial or Loop Feed	
TEMPERATURE RAISE	Typically 65/65°C, or according to customer requirements.	
K FACTOR	Up to K20 or according to customer requirements.	
TYPE OF EFFICIENCY	According to DOE 2016	
TYPE OF INSULATION	Mineral or Biodegradable	
TANK MATERIAL	Cold rolled Steel | Hot rolled steel | stainless steel.	
PAINT SYSTEM	2 layer elctrostatic paint	
GASKETS	Nitryl	
ACCESSORIES	Dead-Front / Live-Front type high-voltage bushings Low voltage bushings (porcelain, stud) Parking stands Pressure relief valve Pressure relief device Oil level gauge Drain valve with sampling device Ground provision Lifting and fixing devices Nameplate made of high strength anodized aluminum Tap changer High and low voltage cabinets with doors and locks Bay-o-net fuse and oil-immersed current limiting fuse * Additional requested accessories can be integrated into the transformer.	
STANDARD	IEEE C57.12.38, IEEE C57.12.28, IEEE C57.12.29	IEEE C57.12.34, IEEE C57.12.28, IEEE C57.12.29

Rymel

SUBMERSIBLE DISTRIBUTION TRANSFORMERS

Rymel occasionally submerged transformers are designed for underground installations (vaults) exposed to flooding conditions.

These transformers feature tanks manufactured from high-quality stainless steel with an electrostatic paint coating, providing excellent resistance and durability in corrosive environments.

They are equipped with dead-front bushings and specially designed protection and switching elements located on the tank lid, allowing safe operation using a hot stick from the surface, even under flooded conditions.

TECHNICAL CHARACTERISTICS		
PHASE TYPE	**ONE PHASE**	**THREE PHASES**
POWER	From 25 kVA up to 500 kVA	From 30 kVA up to 2500 kVA
PHASES	1	3
VOLTAGE CLASS	Up to 36 kV	
BIL	Up to 150 kV	
WINDING MATERIAL	Aluminum or copper	
COOLING CLASS	ONAN - KNAN	
FREQUENCY	60 / 50 Hz	
TAP CHANGER	± 2, 2.5% or according to customer requirements.	
TYPE	Radial or Loop Feed.	
TEMPERATURE RAISE	55 °C / 55 °C	
TYPE OF EFFICIENCY	Class A, B, C or D; DOE	
TYPE OF INSULATION	Mineral or Biodegradable.	
TANK	Manufactured with cold rolled and hot rolled sheet steel with a designthat allows it to withstand internal pressure and mechanical stress. Or with stainless steel.	
PAINT SYSTEM	Special electrostatic paint of great resistance and durability, especially for outdoors and corrosive environments.	
LID	Lid made of welded or bolted stainless steel, with a design that prevents the accumulation of water on its surface.	
ACCESSORIES	- Dead-front type bushings (weldable well type) - Low-voltage bushings with threaded stud - Support for parking hubs - Low-voltage terminal connectors - Special overpressure valve for submersible equipment - Oil level gauge - Drain valve - Grounding connector - Lifting and fixing devices - Nameplate made of high-strength anodized aluminum - Thermometer - Tap changer - Removable and interchangeable Bay-O-Net type fuses - Built-in current-limiting fuses - DPS or elbow-type surge arresters - Load-break disconnector operable under load	
ELEMENTS OF PROTECTION AND MANEUVER	- Removable and interchangeable Bay-O-Net type fuses, which protect equipment against extreme network failures and overloads. - Built-in limiting fuses that protect the primary network from high current faults in the windings. - DPS or elbow-type overvoltage arresters, which protects the equipment against overvoltages produced in the network. - Disconnector with opening capacity under load, which allows maneuvering operations.	
STANDARD	NTC 4406, IEEE C57.12.24, IEEE C57.12.23, RETIE.	

For more information, please contact a Rymel representative.

rymel@rymel.com.co

Rymel

NETWORK VAULT-TYPE TRANSFORMER

Network-type submersible distribution transformers are primarily used in subway distribution circuits and other underground networks exposed to adverse environmental conditions, including potential flooding. Rymel network-type submersible transformers are designed to comply with NTC 380 and IEEE C57.12.40 standards, ensuring reliable and safe energy distribution even in the most demanding environments.

FEATURES

- Fully submersible transformer design
- Tank manufactured from corrosion -resistant stainless steel
- Dielectric fluid: mineral or biodegradable oil
- Panel-type radiators with robust construction, low maintenance requirements, and minimal risk of leakage
- Cable disconnection chamber
- Network-type primary disconnector
- Dead-front primary terminals

ACCESSORIES

- Off-circuit tap changer
- Lifting devices
- Nameplate
- Grounding connector
- Handhole for inspection and maintenance
- Network-type disconnecting switch
- Oil level indicator, with or without contacts
- Temperature indicator, with or without contacts

For more information, please contact a Rymel representative.

rymel@rymel.com.co

TECHNICAL CHARACTERISTICS				
TYPE		Submersible type Network		
MODEL		TSN-15		
TERMINAL TYPE		Dead front and submersibles		
DIELECTRIC		Mineral or Biodegradable		
SYSTEM		Three Phase		
POWER	kVA	750	500	300
FREQUENCY	Hz	60		
HIGH VOLTAGE				
VOLTAGE CLASS	kV	Up to 36		
RATED VOLTAGE	V	13200		
BIL, WAVE 1.2/50 µs primary	kV	150		
SPANNER MATERIAL		Aluminum or copper		
TAPS		5 positions (+2,-2), 2.5%		
SUPPORTED VOLTAGE (1min)	kV	34		
LOW VOLTAGE				
MAXIMUM VOLTAGE	kV	1.2		
NOMINAL VOLTAGE	V	214		
SPANNER MATERIAL		Aluminum or copper		
SUPPORTED VOLTAGE (1 min)	kV	10		
CONNECTION GROUP		Dyn5		
THERMAL CLASS		Ao		
COOLING		ONAN - KNAN		
INSTALLATION HEIGHT	m	1000		
TEMPERATURE RISE	°C	65		
APPROXIMATE DIMENSIONS				
A. WIDTH	mm	2123		
B. DEPTH	mm	1010		
C.DEPTH	mm	1517		
TOTAL WEIGHT	kg	3861		
MANUFACTURING AND TESTING STANDARD		NTC 380, IEEE C57.12.40		

Rymel

DRY TYPE TRANSFORMERS

Rymel's line of dry transformers is synonymous with confidence and safety in the distribution of electrical energy for buildings, shopping centers, hospitals, and any location that demands high fire safety and low environmental impact. Manufactured with high-temperature, fire-resistant, and self-extinguishing materials, our transformers minimize the risk of fire and allow installations close to the load, improving system regulation and reducing low voltage losses.

With ISO 9001, ISO 14001, ISO 45001, and BASC certifications, and complying with NTC 3445, NTC 3654, IEC 60076-11, and RETIE standards, Rymel dry transformers ensure quality and advanced technology.

We offer three types of dry transformers:

- Dry transformers with encapsulated windings, class FT
- Dry transformers with open windings, class HT
- Dry transformers, Low-Low class H

CAST RESIN DRY-TYPE TRANSFORMER

Rymel's cast resin dry type transformers feature windings that are encapsulated in cycloaliphatic epoxy resin through a high-tech vacuum process. Once the resin hardens, it achieves high mechanical strength, enabling the equipment to withstand significant mechanical stresses.

These transformers, designed to operate at 36 kV with thermal class F, maintain their useful life even at high temperatures up to 155°C. The special characteristics of Rymel's encapsulated dry transformers allow their installation close to the load, improving system regulation and reducing losses in the low voltage line. For this reason, they are widely used in buildings, hospitals, subway tunnels, and other places that require a high level of fire safety.

The encapsulation of the internal dielectric materials of the windings ensures that they are not in contact with the environment, making these transformers extremely durable over time. These qualities, together with their high reliability and safety, translate into low operating and installation costs, minimal maintenance, and minimal environmental impact.

Choose Rymel's line of cast resin dry-type transformers for reliable, safe, and efficient power solutions.

CAST RESIN DRY-TYPE TRANSFORMER TECHNICAL CHARACTERISTICS	
POWER	Up to 2.500 kVA
VOLTAGE CLASS	Up to 36 kV
BIL	Up to 170 kV
OVERVOLTAGE	From 38 kV up to 170 kV
WINDING MATERIAL	Aluminum
COOLING CLASS	AN - AF
FREQUENCY	60 / 50 Hz
TAP CHANGER	5 positions ± 2, 2.5%
TEMPERATURE RAISE	100 °C
THERMAL CLASS	F (155°C)
K FACTOR	K1, K2, K4, K6, K9, K13, K20 or according to customer requirements.
TYPE OF EFICIENCY	Class A, B, C, D
IRONWORK	Manufactured with Cold Rolled and Hot Rolled sheet steel with a design that allows it to withstand internal pressure and mechanical stress, or stainless steel
PAINT SYSTEM	Special electrostatic paint of great resistance and durability, especially for outdoors and corrosive environments.
TYPE OF INSTALLATION	Indoor.
TYPE OF INSULATION	cycloaliphatic epoxy resin encapsulated windings.
ACCESSORIES	- Primary and secondary terminals. - Surge arresters. - Temperature controller with three PT100 sensors. - Transport wheels. - Ground connector. - Lifting device. - Nameplate made of high-strength anodized aluminum. - Tap switch. - Forced ventilation system (optional at the request of the client). - Cabinet or protection cell type interior or exterior (optional at the request of the client).
STANDARD	NTC 3654, NTC3445, IEC 60076, IEEE Std C57.12.01 and RETIE
ADVANTAGES	- Fire resistant and self-extinguishing materials - Low noise, low loss magnetic core with dielectric coating - Space optimization - Minimum level of partial discharges

NOTE: They are offered without cell or enclosure.

DRY TYPE TRANSFORMER WITH OPEN WINDINGS CLASS H

Open dry transformers feature exposed high-voltage windings impregnated with dielectric varnish to protect them from environmental factors. Designed for thermal class H, they can withstand temperatures up to 180°C. These transformers are built with fire-resistant, self-extinguishing materials, minimizing fire risks during operation.

Rymel open dry transformers are specially designed to provide sufficient mechanical rigidity to endure short-circuit stresses. Additionally, they incorporate ventilation ducts for effective cooling and easy maintenance, either by vacuuming or blowing with dry air. Rymel's class H dry transformers offer highly reliable equipment with low installation costs and minimal environmental impact.

DRY TYPE LOW-LOW VOLTAGE CLASS H

Low-Low dry transformers are used for transforming voltages to low levels below 1.2 kV. They feature class H dielectric materials that are fire-resistant and self-extinguishing, withstanding temperatures up to 180°C.

Rymel's Low-Low transformers have a compact design with optimized dimensions for indoor installation. They include ventilation ducts for adequate cooling and easy maintenance through vacuuming or blowing with dry air. These transformers offer safe, compact solutions with low installation costs and reduced environmental impact.

DRY TYPE LOW - LOW VOLTAGE CLASS H

DRY TYPE TRANSFORMER WITH OPEN WINDINGS CLASS H

For more information, please contact a Rymel representative.

rymel@rymel.com.co

TECHNICAL CHARACTERISTICS		
	OPEN WINDINGS CLASS H	**LOW-LOW VOLTAGE CLASS H**
POWER	Up to 1.500 kVA	Up to 500 kVA
VOLTAGE CLASS	Up to 15 kV	Up to 1.1 kV
BIL	Up to 60 kV	-
OVERVOLTAGE	-	Up to 3 kV
WINDING MATERIAL	Aluminum or copper	Aluminum or copper
COOLING CLASS	AN - AF	AN
FREQUENCY	60 / 50 Hz	
TAP CHANGER	± 2, 2.5% or according to customer requirements.	± 2, 2.5%
TEMPERATURE RAISE	125 °C	
THERMAL CLASS	H (180°C)	
K FACTOR	K factor according to customer requeriments.	
TYPE OF EFFICIENCY	Class A, B , C, D; DOE	
IRONWORK	Manufactured with Cold Rolled and Hot Rolled sheet steel with a design that allows it to withstand internal pressure and mechanical stress, or stainless steel.	
PAINT SYSTEM	Special electrostatic paint of great resistance and durability, especially for outdoors and corrosive environments.	
TYPE OF INSTALLATION	Indoor	
TYPE OF INSULATION	Open windings with dielectric varnish coating.	
ACCESSORIES	- Primary and secondary terminals. - Surge arresters. - Temperature controller with three PT100 sensors. - Transport wheels. - Grounded. - Lifting device. - Nameplate made of high-strength anodized aluminum. - Tap changer. - Forced ventilation system (optional at the request of the client). - Cabinet or protection cell type interior or exterior (optional at the request of the client).	- Primary and secondary terminals. - Grounded. - Lifting device. - Nameplate made of high-strength anodized aluminum. - Tap changer. - Indoor type protection cabinet or cell. - External type protection cell (optional at the request of the client).
STANDARD	NTC 3654, NTC3445, IEC 60076, IEEE Std C57.12.01 and RETIE.	
ADVANTAGES	- Fire resistant and self-extinguishing materials. - Low noise, low loss magnetic core with dielectric coating. - Space optimization.	

Rymel

SWITCHGEAR BOXES

The Rymel brand switchgear line offers highly safe, insulated, and oil-cooled equipment for medium-voltage underground systems, excelling in sectionalizing operations under load.

Available in Pedestal and submersible types for single-phase and three-phase circuits, they feature control boxes with inputs, outputs, and multiple derivations.

Equipped with ON/OFF load-break disconnectors for safe switching operations, Rymel brand control boxes have a durable outer surface resistant to aggressive environments. Terminals of the dead front type ensure no exposed energized parts, enhancing reliability and versatility for various medium voltage network applications.

SWITCHGEAR BOX

These types of switchgear are used in underground distribution systems, These types of switchgear are used in underground distribution systems, installed on a base or concrete slab (pedestal) and equipped with built-in control elements. The equipment has dead front type terminals, that is, it does not have exposed energized parts and is located inside a cabinet, with compartments sealed with a safety plate.

SWITCHGEAR SUBMERSIBLE TYPE

This switchgear is designed for underground installations prone to flooding. Its special surface and high IP protection degree enable it to operate underwater and withstand saline and aggressive environments. Terminals and operation mechanisms are conveniently located in the upper part of the tank for easy installation. Maneuvering operations can be performed using a pole from the surface to sidewalk level, even in flooded conditions.

TECHNICAL CHARACTERISTICS		
	SWITCHGEAR BOX	**SWITCHGEAR SUBMERSIBLE**
POWER	200 to 600 A	
WAYS	Up to 6 ways	
PHASES	1 or 3	
VOLTAGE CLASS	Up to 36 kV	
BIL	Up to 200 kV	
WINDING MATERIAL	Copper	
TEMPERATURE RAISE	Typically 65/65 °C, or according to customer requirements.	65 °C
TYPE OF INSULATION	Mineral or Biodegradable.	
TANK	Manufactured with cold rolled and hot rolled sheet steel with a design that allows it to withstand internal pressure and mechanical stress. Or with stainless steel.	
PAINT SYSTEM	Special electrostatic paint of great resistance and durability, especially for outdoors and corrosive environments.	
LID	Lid manufactured from carbon steel or stainless steel, either welded or bolted to the tank, featuring a sloped design that prevents water accumulation on its surface.	Lid made of welded or bolted stainless steel, with a design that prevents the accumulation of water on its surface.
GASKETS	Highly durable and compatible with dielectric oil, to guarantee the life of the equipment.	-
ACCESSORIES	- Dielectric Dead Front Type High Tension Bushings. (Pozuelos and inserts or integral and premolded elbows). - Support for parking hubs. - Oil level gauge. - Recirculation, drainage and sampling valve. - Grounding connector. - Lifting and fixing devices. - Nameplate made of high-strength anodized aluminum. - ON/OFF disconnector of 200 or 600 A with opening capacity under load, which allows maneuvering operations .	
	- Overpressure valve. operable under load. - Cabinets with door and security plate.	- Overpressure valve.
STANDARD	IEEE C37.74-2014, IEEE C37.30.3-2018, IEEE 386-2016, IEC 62271-102, IEC 62271-103.	
TESTS	**STANDARDS**	
VERIFICATION OF DIELECTRIC PROPERTIES (BIL AND POWER FREQUENCY).	NTC 5110:2005 - IEEE C37.71	
VERIFICATION OF TEMPERATURE RISE	IEEE C37.71	
VERIFICATION OF MECHANICAL OPERATION	IEEE C37.71	
LEAKAGE TEST	NTC 3609:2021 - IEEE C37.71	

Rymel

LOW VOLTAGE CURRENT TRANSFORMERS

Rymel designs and manufactures low voltage current transformers (CTs) for measurement and protection applications. These devices reduce primary current levels to standardized secondary values, typically 5 A, allowing safe and accurate monitoring by measuring instruments and protective relays.

Rymel low voltage CTs are characterized by high accuracy, low phase displacement, and reliable performance under normal and overload operating conditions.

Applicable Standards

NTC 5933
NTC 2205
IEC 61869
IEEE C57.13

Routine Tests

- Power-frequency dielectric withstand test on primary terminals
- Power-frequency dielectric withstand test on secondary terminals
- Accuracy verification
- Overvoltage test between windings
- Nameplate and marking verification

Product Scope

Measurement CTs

Designed for connection to measuring instruments. These CTs saturate at moderate overcurrent levels, protecting meters against short-circuit currents.

Protection CTs

Designed to supply protective relays. These CTs maintain accuracy and proportionality under overload conditions, ensuring fast and reliable relay operation.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

TECHNICAL SPECIFICATIONS

LOW VOLTAGE BUSBAR CURRENT TRANSFORMERS

USE: Indoor
MAXIMUM OPERATING VOLTAGE: 0.72 kV
APPLICATION: Measurement or Protection
RATED FREQUENCY: 50 or 60 Hz
INSULATION LEVEL: 3 kV
INSULATION THERMAL CLASS: E

RATIO	ACCURACY CLASS	BURDEN (VA)
50:5	0.5, 0.5S and 1.	2.5
100:5		2.5 and 5
150:5		
200:5	0.2, 0.2S, 0.5, 0.5S,1, 5P,10P.	2.5, 5, 10
300:5		
400:5		
500:5		
600:5		

LOW VOLTAGE SUBMERSIBLE CURRENT TRANSFORMERS

USE: Indoor (submerged)
MAXIMUM OPERATING VOLTAGE: 0.72 kV
APPLICATION: Measurement or Protection
RATED FREQUENCY: 50 or 60 Hz
INSULATION LEVEL: 3 kV

RATIO	ACCURACY CLASS	BURDEN (VA)
From 50:5 up to 4.000:5	0.5,0.5S,1, 5P, 10P	2.5 to 20

FOR MEASUREMENT AND PROTECTION

USE: Indoor or outdoor
MAXIMUM OPERATING VOLTAGE: 0.72 kV
APPLICATION: Measurement or Protection
RATED FREQUENCY: 50 or 60 Hz
INSULATION LEVEL: 3 kV
INSULATION THERMAL CLASS: E

RATIO	ACCURACY CLASS	BURDEN (VA)
From 1500:5 Up to 4000:5	0.5,0.5S,1, 5P, 10P	2.5 to 20

WINDOW-TYPE LOW VOLTAGE CURRENT TRANSFORMERS

USE: Indoor or outdoor
MAXIMUM OPERATING VOLTAGE: 0.72 kV
APPLICATION: Measurement or Protection
RATED FREQUENCY: 50 or 60 Hz
INSULATION LEVEL: 3 kV
INSULATION THERMAL CLASS: E

RATIO	ACCURACY CLASS	BURDEN (VA)	WINDOW DIAMETER (MM)
50:5	0.5, 0.5S and 1.	2.5	32
100:5		2.5 and 5	32
150:5			32
200:5	0.2, 0.2S, 0.5, 0.5S,1, 5P,10P.	2.5, 5, 10	40
300:5			55
400:5			55
500:5			55
600:5			67
800:5			73
1000:5			94
1500:5			94
2000:5			94
2500:5			94
3000:5			94
4000:5			94

* Consult with your trusted advisor if special technical specifications are required.

GENERAL FEATURES:

- Transformer fixing bracket
- Encapsulated nameplate with transparent resin
- Polarity marking on housing
- Designed according to customer-specific requirements

For both indoor and outdoor use, you can select one of the following terminal options:

Terminal block : Suitable for connection with copper or aluminum wires and transparent plastic cover with sealable screw for terminal protection.

Cables: Insulated copper with UV protection type THHN.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

Rymel

INSTRUMENT TRANSFORMERS FOR MEDIUM VOLTAGE

Instrument transformers reduce high voltage and current levels in medium voltage networks to low, non-hazardous, and proportional levels suitable for measuring equipment. Rymel medium voltage instrument transformers are manufactured in accordance with the technical standards NTC 5933, NTC 2205, NTC 2207, IEC 61869, and IEEE C57.13, providing an efficient and safe way to monitor electrical variables in the network.

ACCESSORIES

- Fixing base plate with hardware and ground terminal (all in stainless steel).
- Transparent plastic terminal cover that allows monitoring the status of the connections without having to be removed.
- High and low voltage connections in stainless steel.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

CURRENT TRANSFORMERS FOR INDOOR METERING

TYPE	kV	Interior	
MODEL	-	TCIM	
RESIN	-	Epoxy for interior use	
Ip / Is CURRENT RATIO	A	From 2.5-5/5 to 250-500/5	From 2.5-5/5 to 500/5
MEASUREMENT CLASS	-	0.5S, 0.2S,0.5,0.2	
NOMINAL BURDEN	VA	2.5, 5, 10, 15	
SHORT-TIME THERMAL CURRENT LTH	kA	8kA,16kA,4kV	
NOMINAL DYNAMIC CURRENT	kA	2.5 Ith	
FREQUENCY	Hz	50 - 60	
INSULATION CLASS	-	F	
INSULATION LEVEL	kV	17.5 / 38 / 95	
BIL, WAVE 1.2/50 µS PRIMARY	kV	95	
WINDING MATERIAL	-	Copper	
APPROXIMATE OVERALL DIMENSIONS	-	-	
A. WIDTH	mm	273	
B. LENGTH	mm	304	
C. HEIGHT	mm	283	
TOTAL WEIGHT	Kg	16	
MANUFACTURING AND TESTING STANDARDS	-	IEC61869-2 / NTC5933 / NTC2205	

CURRENT TRANSFORMERS FOR EXTERNAL METERING

TYPE	-	Exterior	
MODEL	-	TCEM	
RESIN	-	Cycloaliphatic epoxy for exterior use	
MAXIMUM INSULATION LEVEL	kV	17.5	
CURRENT RATIO Ip / Is	A	From 2.5-5/5 to 400 - 800/5	From 2.5-5/5 to 800/5
MEASUREMENT CLASS	-	0.5S, 0.2S,0.5,0.2	
NOMINAL BURDEN	VA	2.5, 5, 10, 15	
SHORT-TIME THERMAL CURRENT LTH	kA	8kA, 16kA, 4kV	
RATED DYNAMIC CURRENT	kA	2.5 Ith	
FREQUENCY	Hz	60	
INSULATION CLASS	-	F	
INSULATION LEVEL	kV	17.5 / 38 / 95	
BIL, WAVE 1.2/50 µS PRIMARY	kV	95	
WINDING MATERIAL	-	Copper	
APPROXIMATE DIMENSIONS	-	-	
A. WIDTH	mm	273	
B. LENGTH	mm	304	
C. HEIGHT	mm	283	
TOTAL WEIGHT	Kg	17	
MANUFACTURING AND TESTING STANDARDS	-	IEC61869-2 / NTC5933 / NTC2205	

Stainless steel terminal cover with sealable screws.

INDOOR MEDIUM VOLTAGE POTENTIAL TRANSFORMERS

NUMBER OF POLES	-	2	1
MODEL	-	TPIM2	TPIM1
RESIN	kV	Epoxy for interior use	Epoxy for interior use
MAXIMUM INSULATION LEVEL	kV	17.5	17.5
RATED PRIMARY VOLTAGE	V	From 4.16 to 14.4 kV	From 4.16√3 to 14.4√3kV
RATED SECONDARY VOLTAGE	%	120, 115, 110	120/√3, 115/√3, 110/√3
MEASUREMENT CLASS	VA	0.5, 0.2	0.5, 0.2
RATED BURDEN	-	50, 25, 15, 10, 5, 1	50, 25, 15, 10, 5, 1
VOLTAGE FACTOR	VA	1.2 One continuous	1.2 One continuous1.9 30s
FREQUENCY	Hz	60	60
INSULATION CLASS	-	F	F
INSULATION LEVEL	kV	17.5 / 38 / 95	17.5 / 38 / 95
BIL, WAVE 1.2/50 µS PRIMARY	kV	95	95
WINDING MATERIAL	-	Copper	Copper
APPROXIMATE DIMENSIONS:	-	-	-
A. WIDTH	mm	270	270
B. LENGTH	mm	266	266
C. HEIGHT	mm	246	246
APPROXIMATE TOTAL WEIGHT	Kg	22	22
MANUFACTURING AND TESTING STANDARDS	-	IEC61869-3 / NTC5933 / NTC2207	IEC61869-3 / NTC5933 / NTC2207

Note: It can be manufactured according to IEEE standard upon request.

OUTDOOR MEDIUM VOLTAGE POTENTIAL TRANSFORMERS

NUMBER OF POLES	-	2	1
MODEL	-	TPEM2	TPIM1
RESIN	-	Cycloaliphatic epoxy for exterior use	
MAXIMUM INSULATION LEVEL	kV	17.5	17.5
RATED PRIMARY VOLTAGE	kV	From 4.16 to 14.4 kV	From 4.16√3 to 14.4 √3 kV
RATED SECONDARY VOLTAGE	V	120, 115, 110	120/√3, 115/√3, 110/√3
MEASUREMENT CLASS	%	0.5, 0.2	0.5, 0.2
RATED BURDEN	VA	50, 25, 15, 10, 5, 1	50, 25, 15, 10, 5, 1
VOLTAGE FACTOR	-	1.2 One continuous	1.2 continuous / 1.9 for 30 s
FREQUENCY	Hz	60	60
INSULATION CLASS	-	F	F
INSULATION LEVEL	kV	17.5 / 38 / 95	17.5 / 38 / 95
BIL, WAVE 1.2/50 µS PRIMARY	kV	95	95
WINDING MATERIAL	-	Copper	Copper
APPROXIMATE DIMENSIONS	-	-	-
A. WIDTH	mm	270	270
B. LENGTH	mm	266	266
C. HEIGHT	mm	403	403
TOTAL WEIGHT	Kg	24	23
MANUFACTURING AND TESTING STANDARDS	-	IEC61869-3 / NTC5933 / NTC2207	IEC61869-3 / NTC5933 / NTC2207

For more information, please contact a Rymel representative.

rymel@rymel.com.co

Rymel

36 kV CAST RESIN FEEDER TRANSFORMER FOR RECLOSER APPLICATION (0.5 kVA)

Power transformers, constructed from cycloaliphatic epoxy resin, are designed exclusively to supply auxiliary power for the operation and control of electronic devices such as reclosers.

ADVANTAGES

- Smaller and lighter than conventional designs, these transformers are manufactured using cycloaliphatic epoxy resin, offering high resistance to weathering, corrosion, and environmental exposure.
- They offer easy installation, optimize space, and contribute to a reduced environmental impact.
- Maintenance is minimized.
- Featuring a steel bracket with an integrated pole mount.

INSTALLATION		Outdoor
INSULATING MATERIAL		Cycloaliphatic Epoxy Resin
SYSTEM		Single-phase
POLES OR BUSHING		1-2
MAXIMUM VOLTAGE	kV	36
RATED PRIMARY VOLTAGE	kV	From 7.62 To 13.2
RATED SECONDARY VOLTAGE	V	115-120
THERMAL POWER	kV	0.5 kV
INSULATION CLASS		F (155°C)
INSULATION LEVEL	kV	17.5 / 38 / 95
BIL, WAVE 1.2/50 µS primary	kV	200
FREQUENCY	Hz	50-60
WINDING MATERIAL		Copper
CREEPAGE DISTANCE	mm	585
BUSHING SPACING (F-F)	mm	250
MOUNTING SUPPORT		Including steel bracket for easy installation
MARKINGS		Embossed markings
MANUFACTURING AND TESTING STANDARDS		IEEE Std C57.6-2016

For more information, please contact a Rymel representative

rymel@rymel.com.co

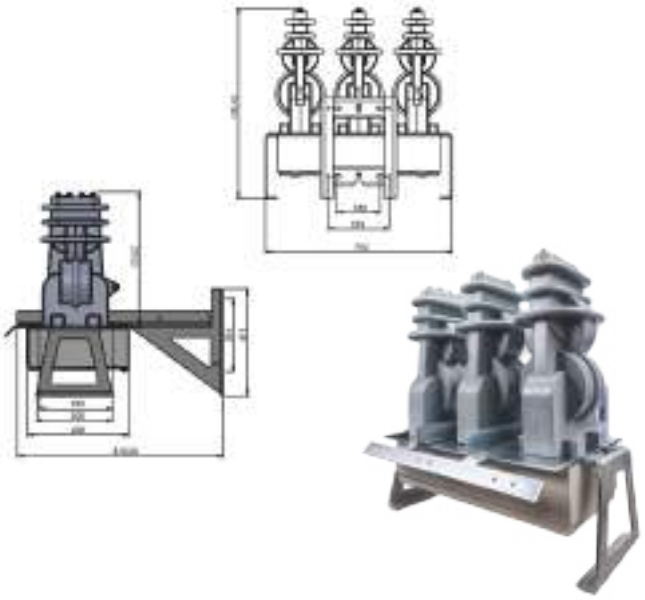
Rymel

17.5 KV MEDIUM VOLTAGE COMBINED TRANSFORMERS

The combined measurement transformers offer a streamlined solution, housing both potential and current transformers within a single element. In a three-phase system, this setup comprises three individual combined transformers and a practical support for installation. Secondary connections are securely housed in a hermetic, hinged compartment integrated into the support structure.

ADVANTAGES

- Reduced installation space requirements due to the compact design.
- High accuracy class, making it suitable for precise measurement locations.
- Resistance to extreme climatic conditions, ensuring reliability in various enviroments.
- Corrosion-resistant fasteners and stainless steel components, enhancing durability.
- Cost savings on structures, connectors, and installation.
- Includes a support system prepared for pole installation, simplifying setup.
- Internal connection between the potential and current transformers, saving time during installation.



For more information, please contact a Rymel representative.

rymel@rymel.com.co

TECHNICAL CHARACTERISTICS

TYPE		Outdoor
MODEL		TCT
CHARACTERISTICS		Terminals or Cable
RESIN		Cycloaliphatic Epoxy
SYSTEM		Three-phase
MAXIMUM INSULATION LEVEL	kV	17.5
OPERATING VOLTAGE	kV	13.2/V3
INSULATION CLASS		F
MAXIMUM VOLTAGE	kV	17.5
BIL, WAVE 1.2/50 µS PRIMARY	kV	95
INSULATION LEVEL	kV	17.5/38/95
FREQUENCY	HZ	60
WINDING MATERIAL		Copper
CREEPAGE DISTANCE		783
POTENTIAL TRANSFORMER CHARACTERISTICS		
RATED PRIMARY VOLTAGE	V	From 7,200/√3 to 14,400/√3 V
RATED SECONDARY VOLTAGE	V	110/V3 - 115/V3 - 120/V3
SECONDARY WINDING RATED		110/V3 - 115/V3 - 120/V3
CLASS	%	0.5-0.2
POWER	VA	25-15-10-5-2.5-1
SECONDARY WINDING POWER SUPPLY	V	120
POWER FACTOR		1.2 One continuous 1.9 30s
CURRENT TRANSFORMER CHARACTERISTICS		
TRANSFORMER RATIO	A	From 2.5/5 A to 500/5 A
PRIMARY CURRENT NOMINAL	A	From 2.5 To 500
RATED SECONDARY CURRENT	A	5
CLASS	%	0.5S-0.2S
THERMAL CURRENT (ITH)	kA	4-8
DYNAMIC CURRENT (ID)	kA	2.5 Ith
APPROXIMATE DIMENSIONS		
A. WIDTH	mm	2782
B. LENGTH	mm	810
C. HEIGHT	mm	798
TOTAL WEIGHT	Kg	150
MANUFACTURING AND TESTING STANDARDS		IEC61869-1-2-3-4

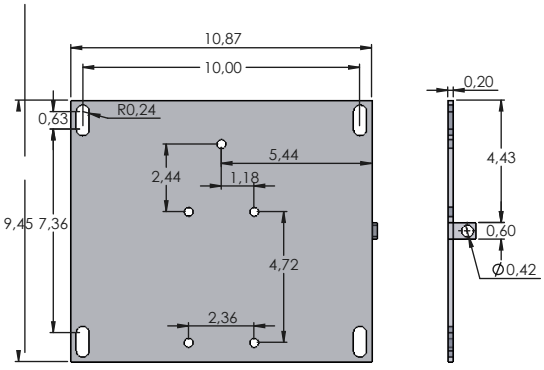
Rymel

15 kV CURRENT TRANSFORMERS

Rymel's current transformers are produced in a voltage range of 0.6 kV to 36 kV. The technical specifications for the 15 kV current transformers are provided in this document. The equipment is produced in compliance with the IEEE C57.13 standard.

Base Plate:

For simple installation, the transformer includes a stainless steel base plate with four openings. A ground connection is welded at a 90° angle to the base plate. The thickness of the foundation plate is 0.2 inches.



Construction:

Instrument transformers produced by Rymel adhere to the most stringent quality standards and comply with IEEE standards. These transformers are produced using cycloaliphatic epoxy resin, which exhibits exceptional resistance to environmental exposure and weathering.

Markings:

- The equipment includes a nameplate made of anodized Aluminum, securely attached to the base plate.
- Both primary and secondary markings are engraved with low-relief using a laser marker.
- Additionally, stickers displaying the connection relations are affixed to the terminal cover of the secondary connection, also located on one side.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

Primary Terminals:

Primary terminals, which have a thickness of 0.25 in, are produced using hot-tinned copper.

Secondary Terminals:

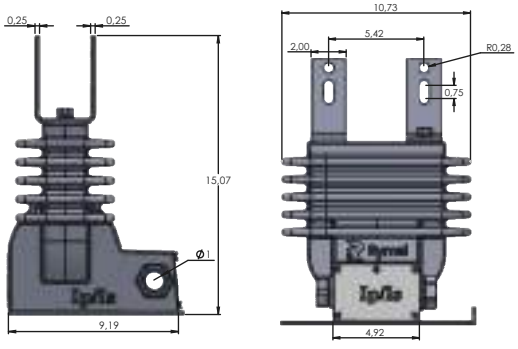
- The secondary terminals are made of stainless steel, 0.25".
- The screws of the secondary terminal block cover are butterfly-type terminals.
- It includes a short-circuit device for the secondary, made of tinned copper, with a thickness of 0.125".
- Designed to short-circuit the equipment between X1 and X2 (when necessary) and also between X2 and Ground.

Installation:

The current transformers are designed for outdoor installation and may be mounted in either vertical or horizontal positions.

Testing:

The equipment is 100% tested in accordance with IEEE C57.13. Standard testing.



Transformation Relations:

CURRENT RATIO (A)	RATING FACTOR [30°C]
2.5/5	3.0
5/5	3.0
10/5	3.0
15/5	3.0
20/5	3.0
25/5	3.0
30/5	3.0
40/5	3.0
50/5	3.0
60/5	3.0
75/5	3.0
100/5	3.0
150/5	3.0
200/5	3.0
300/5	3.0
400/5	3.0
500/5	3.0
600/5	3.0
800/5	1.5
1000/5	1.5

OUTDOOR MEASUREMENT CURRENT TRANSFORMERS		
Type		Outdoor
Model		TCEM
Resin		Cycloaliphatic Epoxy for Outdoor Use
Maximum Insulation Level	kV	15.5
Applied Voltage	kV	34
BIL, Full Wave	kV	110
Creepage Distance	in	27.5"
Weight	Lbs	32
Frequency	Hz	50-60
Insulation Class		F
Winding Material		Copper
Metering Class		0.15, 0.3, 0.6, 1.2
Nominal Burden	VA	B-0.1, B-0.2, B-0.5, B-0.9, B-1.8
Short-time thermal current	kA	2,4,8,16,32
Nominal dynamic current	kA	2.5 Ith

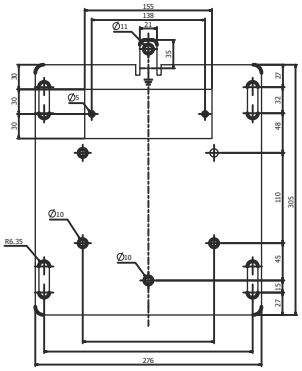
For more information, please contact a Rymel representative.

rymel@rymel.com.co

Rymel

15 kV OUTDOOR MEDIUM-VOLTAGE POTENTIAL TRANSFORMER

Rymel manufactures potential transformers within a voltage range from 15 kV to 36 kV. This document outlines the technical specifications of the 15 kV Potential Transformer series. Our equipment adheres strictly to the IEEE C57.13 standard, ensuring quality and reliability.



Base Plate:

The transformer comes with a stainless steel base plate designed for easy installation, featuring four pre-drilled holes. Additionally, the base plate is equipped with a 90° ground connection, welded securely in place. Its sturdy construction ensures reliability, with a base plate thickness of 0.2 inches.

Construction:

Rymel upholds the highest quality standards and ensures IEEE compliance in the manufacture of instrument transformers.

Our transformers are crafted using cycloaliphatic epoxy resin, renowned for its resilience against weathering and environmental exposure.

Testing:

The equipment is 100% tested in accordance with IEEE C57.13.

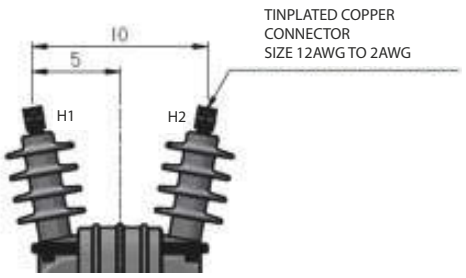
For more information, please contact a Rymel representative.

rymel@rymel.com.co

TYPE		Outdoor
MODEL		TPEM
RESIN		Cycloaliphatic epoxy for exterior use
MAXIMUM INSULATION LEVEL	kV	15.5
APPLIED VOLTAGE	kV	34
MEASUREMENT CLASS		0.3, 0.6, 1.2
NOMINAL BURDEN	VA	W, X
FREQUENCY	Hz	50 - 60
INSULATION CLASS		F
BIL, WAVE	kV	110
CREEPAGE DISTANCE	in	23"
WINDING MATERIAL		Copper
WEIGHT	Lbs	50.7
TRANSFORMER RATIOS	V	7200/120V
		8400/120V
		12000/120V
		14400/120V
		Other combinations

Primary Terminals:

The primary terminals accommodate conductors from 2 AWG to 12 AWG and are easily replaceable for flexibility and convenience.



Secondary Terminals:

The screws of the secondary terminal block cover are of the butterfly type. The secondary terminals are ¼" screws.

Markings:

The equipment comes equipped with an anodized aluminum nameplate affixed to the base plate.

Primary and secondary markings, made with a laser marker, are in low relief for clear identification. Additionally, stickers indicating the connections are provided on the terminal cover of the secondary connection.

Installation:

The transformers are designed for outdoor installation and may be mounted in either vertical or horizontal positions.

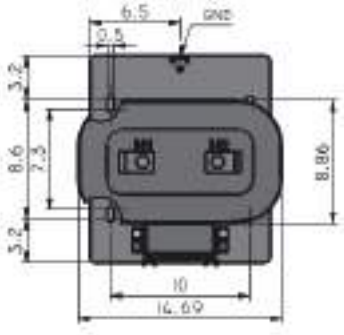
Rymel

36 kV OUTDOOR MEDIUM-VOLTAGE CURRENT TRANSFORMER

Rymel manufactures current transformers within a voltage range spanning from 0.6 kV to 36 kV. This document outlines the technical specifications of the 36 kV current transformer series. All equipment is manufactured in accordance with the IEEE C57.13 standard.

Base Plate:

The transformer is equipped with a stainless steel base plate featuring four holes for convenient installation. Additionally, it incorporates a 90° ground connection that is welded to the plate. The plate itself boasts a thickness of 0.2 inches.



Construction:

Rymel manufactures measuring transformers with the highest quality standards and in compliance with the IEEE regulations. Our transformers are made with cycloaliphatic epoxy resin, which is resistant to weather and environmental exposure.

Markings:

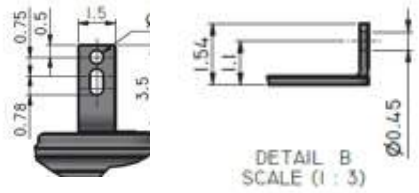
- The transformer comes equipped with an anodized aluminum nameplate securely affixed to the base plate of the equipment.
- Both primary and secondary markings are engraved in low relief using a laser marker.
- Additionally, stickers displaying the markings of the connections are provided on the terminal cover of the secondary connection for ease of identification.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

Primary Terminals:

The primary terminals are crafted from copper and are hot-tinned, boasting a thickness of 0.4 inches.



Secondary Terminals:

The secondary terminal cover screws feature a butterfly-type terminals. Additionally, they incorporate a shorting device made of tinned copper, with a thickness of 0.125 inches. This design is specifically engineered to short-circuit the equipment between X1 and X2 when necessary, as well as between X2 and Ground.

Transformation Relations:

CURRENT RATIO (A)	RATING FACTOR [30°C]
5/5	3.0
10/5	3.0
15/5	3.0
20/5	3.0
25/5	3.0
30/5	3.0
40/5	3.0
50/5	3.0
60/5	3.0
75/5	3.0
100/5	3.0
150/5	3.0
200/5	3.0
300/5	3.0
400/5	2.0
500/5	2.0
600/5	2.0
800/5	1.5

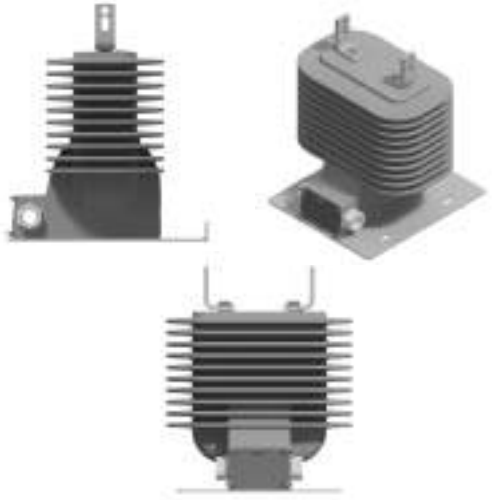
Testing:

The equipments are 100% tested in accordance with the IEEE C57.13 Standard testing.

Installation:

The transformers are meticulously designed for outdoor installation, accommodating both vertical and horizontal orientations with equal efficiency.

TYPE		Outdoor
MODEL		TCEM
RESIN		Cycloaliphatic epoxy for exterior use
MAXIMUM INSULATION LEVEL	kV	36.5
APPLIED VOLTAGE	kV	70
MEASUREMENT CLASS		0.15, 0.3, 0.6, 1.2
NOMINAL BURDEN	VA	B-0.1, B-0.2, B-0.5, B-0.9, B-1.8
SHORT-TIME THERMAL CURRENT Ith	kA	2, 4, 8, 16, 32
NOMINAL DYNAMIC CURRENT	kA	2.5 Ith
FREQUENCY	Hz	50 - 60
INSULATION CLASS		F
BIL, WAVE	kV	200
CREEPAGE DISTANCE	in	44.6"
WINDING MATERIAL		Copper
WEIGHT	Lbs	83.7



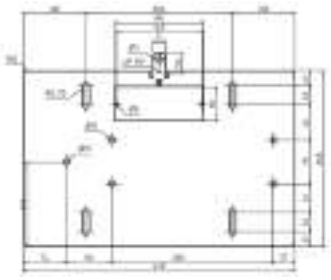
For more information, please contact a Rymel representative.

rymel@rymel.com.co

Rymel

36 kV OUTDOOR MEDIUM-VOLTAGE POTENTIAL TRANSFORMER

Rymel manufactures potential transformers within a voltage range from 15 kV to 36 kV. This document outlines the technical specifications of the 36 kV Potential Transformer series. Our equipment adheres strictly to the IEEE C57.13 standard, ensuring quality and reliability.



Base Plate:

The transformer comes with a stainless steel base plate designed for easy installation, featuring four pre-drilled holes. Additionally, the base plate is equipped with a 90° ground connection, welded securely in place. Its sturdy construction ensures reliability, with a base plate thickness of 0.2 inches.

Construction:

Rymel manufactures measuring transformers with the highest quality standards and in compliance with the IEEE standard. Our transformers are made with cycloaliphatic epoxy resin, which is resistant to weather and environmental exposure.

Testing:

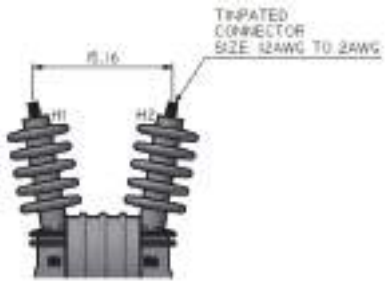
The equipment is 100% tested in accordance with IEEE C57.13.

For more information, please contact a Rymel representative.

rymel@rymel.com.co

Primary Terminals:

The primary terminals accommodate conductors from 2 AWG to 12 AWG and are easily replaceable for flexibility and convenience



Installation:

The transformers are designed for outdoor installation and may be mounted in either vertical or horizontal positions.

Secondary Terminals:

The secondary terminals feature butterfly terminal type screws, each measuring ¼ inch in size.

Markings:

The equipment comes equipped with an anodized aluminum nameplate affixed to the base plate.

Primary and secondary markings, made with a laser marker, are in low relief for clear identification. Additionally, stickers indicating the connections are provided on the terminal cover of the secondary connection.

TYPE		Outdoor
MODEL		TPEM
RESIN		Cycloaliphatic epoxy for exterior use
MAXIMUM INSULATION LEVEL	kV	36.5
APPLIED VOLTAGE	kV	70
MEASUREMENT CLASS		0.3, 0.6, 1.2
NOMINAL BURDEN	VA	W, X, Y
FREQUENCY	Hz	50 - 60
INSULATION CLASS		F
BIL, WAVE	kV	200
CREEPAGE DISTANCE	in	44.6"
WINDING MATERIAL		Copper
WEIGHT	Lbs	172
TRANSFORMER RATIOS	V	34500/115V
		27600/115V
		20125/115V
		Other combinations

Rymel

BESS TRANSFORMERS

SMART, SAFE, AND EFFICIENT SOLUTIONS FOR ENERGY STORAGE

The global energy transition is accelerating the adoption of Battery Energy Storage Systems (BESS). These systems store and release energy exactly when needed—by the market, the grid, or the user helping stabilize power networks, optimize energy costs, and ensure operational continuity.

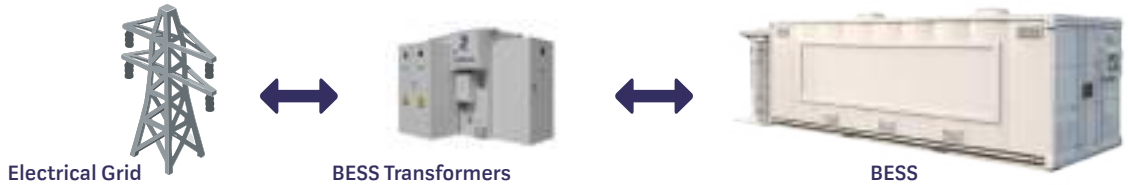
Integrating BESS into electrical grids requires specialized equipment. Rymel has developed transformers specifically designed for BESS applications, engineered to operate under demanding conditions such as bidirectional inverter operation, high harmonic levels, rapid charge/discharge cycles, and dynamic power flows.

Built for Dynamic Operation:

- High harmonic content generated by inverters
- Transient overvoltages
- Stable charge/discharge operation with bidirectional power flow
- Continuous cycling with rapid thermal variations

Advantages of RYMEL Transformers for BESS

- Reinforced thermal design for cyclic operation and extended service life
- Harmonic withstand capability with K-factor rating
- Special insulation system resistant to transients up to 2400 V/µs
- Electrostatic shielding to filter dV/dt gradients and protect windings
- Bidirectional power flow design for both charging and discharging
- High tolerance to cyclic overloads, supported by advanced thermal materials
- Full galvanic shielding to minimize interference propagation
- High efficiency with low losses
- Low audible noise levels
- Fast energy discharge capability, ideal for BESS operation
- Dead-front terminals for enhanced safety
- Four-position switch (ON–OFF–A–B) enabling safe load switching

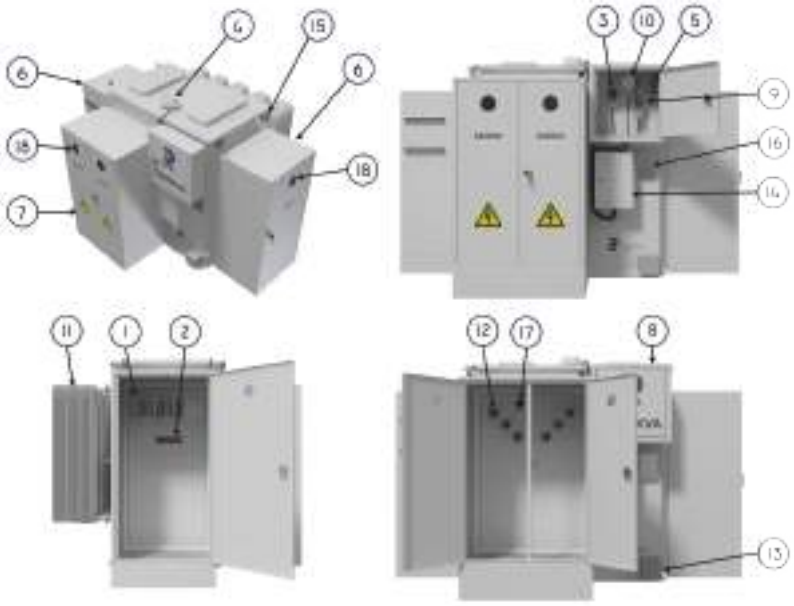


Electrical Grid | BESS Transformers | BESS

For further information, please contact a Rymel representative

rymel@rymel.com.co

BESS TRANSFORMERS



1. Lv bushing
2. Ground provision
3. Oil level
4. Pressure relief device (PRD)
5. Oil filling / drain
6. Lv cabinet
7. Hv cabinet
8. Accesory box
9. Thermometer
10. Pressure gauge
11. Radiator
12. Hv bushing
13. Liquid sampling box device
14. Control box
15. Lifting lug
16. Nameplate
17. Tap changer
18. Ir window

*Additional requested accessories can be integrated into the transformer.

TECHNICAL INFORMATION	
Power Ratings [kVA]:	500 to 5000
System voltage [kV]:	15, 36
Voltage HV [V]	13200 - 34500
Voltage LV [V]:	Up to 800 V
Number of Phases:	3
Operating Frequency Range [Hz]:	50 - 60
Vector Group:	DD, YY, DY
Mounting Type:	Outdoor
Standards:	IEEE
Winding Temperature Rise:	65 °C or 55 °C
BIL [kV]	Up to 200
K Factor	1 to 20
Insulation Class	120
Insulating Fluid	Mineral or Vegetable
Cooling	ONAN KNAN
Tap Changer	5 positions

Special Features:

- Load break switch
- Capability to operate with harmonics
- Electrostatic shield
- Dead-front bushings
- Low-voltage side cabinets for easy connection
- Electrostatic powder coating
- Designed for integration with BESS systems

Rymel

MEDIUM VOLTAGE POWER TRANSFORMERS

MAXIMUM POWER. MAXIMUM PERFORMANCE

Substation-type transformers are designed for industrial and power infrastructure applications that demand high reliability, construction flexibility, and adaptation to project-specific requirements. These units are manufactured with ratings up to 10 MVA and can be configured for both new installations and the modernization or replacement of existing equipment. Their customized designs ensure safe integration with switchgear, control panels, and special substation layouts.

Each transformer is developed through a tailored engineering process, ensuring full compliance with international standards, seamless integration with existing systems, and the option to include special accessories for operation, monitoring, and preventive maintenance.

The transformers can be supplied with natural ester insulation, ideal for applications requiring enhanced fire safety, reduced environmental impact, and extended insulation life, or with conventional mineral oil, suitable for standard applications where special safety or sustainability requirements do not apply.

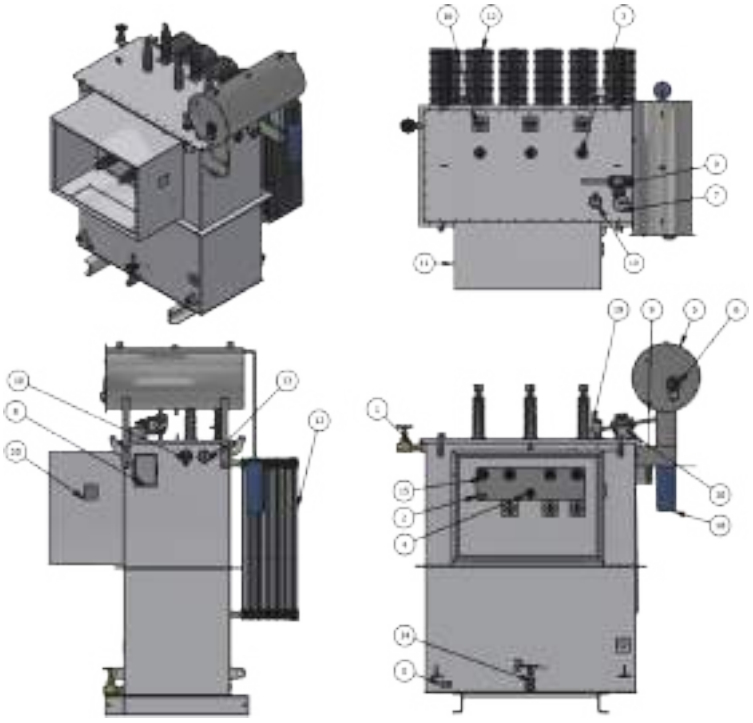
Advantages of RYMEL Power Transformers

- **High operational reliability** for industrial environments and critical infrastructure.
- **Flexible construction design**, adaptable to each project—whether for new installations or replacements.
- **Designed and tested** in accordance with major international standards: IEEE, IEC, DOE, NTC, and RETIE.
- **Fully customizable up to 10 MVA**, configurable in dimensions, connections, and voltages according to project requirements.
- **Bushings mounted** on the top cover or side wall through throat-type openings, adaptable to facilitate interconnection in primary substations.
- **Reinforced tanks** with anti-corrosive coatings for long service life in harsh environments. Available with an expansion tank or air cushion.
- **Guaranteed energy efficiency.**
- **Mechanical flexibility**: core–coil assembly and tank construction adaptable to site dimensional constraints.
- **Optional forced-air cooling system** to increase power rating by +15%, +25%, or +33% above the base kVA.
- **Optional natural ester fluid**, providing increased fire safety, reduced environmental impact, and extended insulation life.

For further information, please contact a Rymel representative

rymel@rymel.com.co

MEDIUM VOLTAGE POWER TRANSFORMERS



1. Oil filling valve
2. Tank Grounding Terminal
3. High-voltage bushings
4. Tap changer
5. Oil conservator
6. Oil level gauge
7. Pressure relief device
8. Control cabinet
9. Buchholz relay with contacts
10. Thermal image window
11. Low-voltage cabinet
12. Radiators
13. Thermometer
14. Oil drain valve
15. Low-voltage bushings
16. High-voltage surge arrester
17. Lifting lugs
18. Silica gel breather
19. Sudden pressure relay
20. Nameplate

TECHNICAL INFORMATION	
Power Ratings [kVA]	Up to 10 MVA
Configuration	Indoor Substation - Outdoor Substation
Maximum Voltage [HV]	Up to 36 kV
Maximum Voltage LV	Up to 15 kV
Connection Group	DD, YY, DY, Three-winding option
Operating Frequency Range [Hz]:	50 - 60
Tap Changer	5 positions
Standard	IEEE, IEC
Temperature Rise	65°C or 55°C
BIL	Up to 200 kV
K-Factor	1 to 20
Cooling	ONAN, ONAF - KNAN, KNAF
Insulation liquid	Mineral or Natural Ester
Thermal Class	120 °C

Special Accessories:

The integration of special accessories with electrical contacts is offered for monitoring, protection, and control, such as:

- Thermometer
- Thermal Image Window
- Buchholz Relay
- Vacuum–Pressure Gauge
- Oil Level Gauge
- Sudden Pressure Relay
- Pressure Relief Device
- Built-in Current Transformers (CTs)
- Bushings Mounted on the Top Cover or Side Wall
- Surge Protection Device (SPD)
- Power Increase with Forced-Air Cooling: +15%, +25%, or +33% above the base kVA rating

Rymel

SUT & PST TRANSFORMERS

In the oil industry, every second of production counts.

Electric Submersible Pumping (ESP) systems have become the most effective solution for extracting large volumes of crude oil from deep wells, maintaining stable performance even under the most demanding conditions. The reliability and efficiency of an ESP system are key factors in sustaining high production levels. These systems, composed of high-power submersible motors controlled by Variable Speed Drives (VSD), allow precise adjustment of frequency and operating speed, optimizing extraction flow and adapting to the specific characteristics of each well.

However, incorporating a VSD alone is not enough for an ESP system to achieve maximum performance. The power supply must be managed by specialized equipment that ensures the proper voltage, frequency stability, and harmonic control.

At this point, two components become essential:

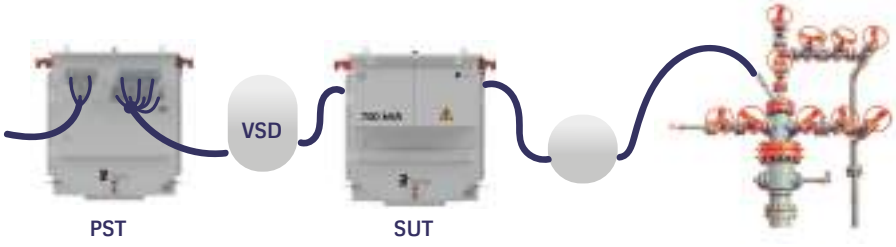
SUT Variable Frequency Transformers (Step-Up Transformer):

- Step-up of VSD output voltage to motor requirements.
- Designed for variable frequency operation.
- Protection against harmonics.
- Filtering of electrical noise.

PST Transformers (Phase Shifting Transformer)

- Minimize harmonic distortion returned by VSDs to the grid.
- Improve power quality and system stability.
- Optimize power factor.
- Increase overall system efficiency.
- Protect associated electrical equipment.

SUT and PST Transformers:
Clean and stable power for enhanced ESP system performance and extended equipment lifespan.



For further information, please contact a Rymel representative

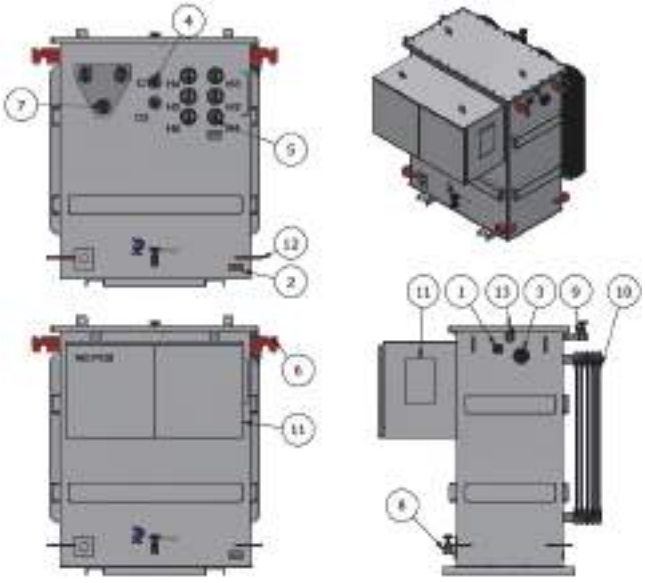
rymel@rymel.com.co

SUT VARIABLE FREQUENCY TRANSFORMERS

For an Electro-Submersible Pumping (ESP) motor to operate with continuous power and reliability, a conventional power supply is not enough. A transformer specifically designed to withstand the extreme conditions of this application is required.

Rymel introduces its SUT (Step-Up Transformer), engineered to:

- Work in perfect harmony with Variable Speed Drives (VSD).
- Step up the VSD output voltage to the optimal levels required by the submersible motor.
- Operate with variable frequency voltages.
- Withstand harmonic distortion without compromising pumping system performance.



1. Oil Level Indicator
2. Tank Grounding Terminal
3. Thermometer
4. *Fine Tap Changer
   *Coarse Tap Changer
5. High Voltage Bushings and Terminals
6. Lifting Device
7. Low Voltage Bushings and Terminals
8. Drain Valve
9. Oil Filling Valve
10. Radiators
11. Cabinet
12. Supports
13. Pressure Relief Valve

SUT VARIABLE FREQUENCY TRANSFORMERS	
Power Ratings [kVA]:	150 to 1250
Series voltage [kV]:	8.7 / 1.2
Voltage HV [V]	1000 - 5000
Voltage LV [V]:	480
Number of Phases:	3
Operating Frequency Range [Hz]:	10 - 90
Vector Group:	Dd0 / Ynd1
Mounting Type:	Outdoor
Standards:	NTC, IEEE
Winding Temperature Rise:	65 C
BIL [kV]	75 / 30
K Factor	1 to 20
Insulation Class	Ao
Insulating Fluid	Mineral Oil or Natural Ester Fluid
Cooling	ONAN KNAN
Tap Changer	25 positions

Note: For voltage ranges different from those listed, please consult the factory.
For higher or lower power ratings, please consult the factory.

Special Features:

- Incorporates 2 Tap Changers for fine and coarse adjustment
- Capability to operate with multiple frequencies
- Includes an electrostatic shield
- Harmonic support capability
- Electrostatic paint coating

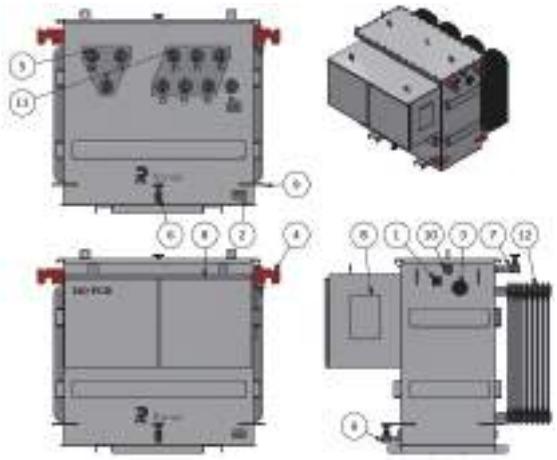
PHASE SHIFTING TRANSFORMERS (PST)

Variable Speed Drives (VSD) provide precise control of electric submersible pumps (ESP). However, by generating harmonics in the electrical network, they can reduce efficiency, cause interference, overheating, and even premature failures in other connected equipment.

To improve system performance and mitigate harmonic distortion in the power grid, Rymel has developed specialized Phase Shifting Transformers (PST). These transformers feed VSDs through multiple three-phase output groups, each phase-shifted with respect to the input voltage, without altering its frequency or magnitude.

By minimizing harmonic distortion returned to the grid, the PST improves power quality, optimizes the power factor, and enhances overall system efficiency, while also protecting associated electrical equipment.

This effect is achieved through specific winding configurations that generate a controlled angular displacement of 30° between two three-phase output groups.



1. Oil Level
2. Tank Ground
3. Thermometer
4. Lifting Device
5. Primary Bushings and Terminals
6. Drain Valve
7. Oil Fill Valve
8. Cabinet
9. Support
10. Pressure Relief Valve
11. Secondary Bushings and Terminals
12. Radiators

PHASE SHIFTING TRANSFORMERS (PST)	
Power Ratings [kVA]:	150 to 1250
Series voltage [kV]:	15 / 1.2
Voltage HV [kV]	13.2, 13.8, 0.48
Voltage LV [V]:	480
No of Input phases:	3
No of Output phases:	6
Pulse number:	6 -12 - 18 - 24
Mounting Type:	Outdoor
Standards:	NTC, IEEE
Winding Temperature Rise:	65 C
BIL [kV]	95 / 30
K Factor	1 to 20
Insulation Class	Ao
Insulating Fluid	Mineral Oil or Natural Ester Fluid
Cooling	ONAN KNAN
Connection group	Dd0yn1 Transformers

Note: For customized power ratings, please contact the factory.

Special Features:

- Includes an electrostatic shield
- Provides two sets of three-phase outputs, phase-shifted by 30°, ideal for 12-pulse VSDs
- Harmonic support capability
- Electrostatic paint coating

COMPARATIVE BENEFITS – SUT AND PST TRANSFORMERS

SUT VARIABLE FREQUENCY TRANSFORMERS

- **Precise Voltage Adjustment**
  Raises and regulates the voltage supplied by the VSD to the optimal level required by the submersible motor, ensuring maximum performance.
- **Variable Frequency Operation**
  Designed to operate seamlessly with the variable-frequency power supplied by VSDs.
- **Harmonic Support**
  Withstands harmonic content without efficiency loss, preventing damage or premature wear.
- **Advanced ESP System Protection**
  Filters electrical noise and voltage spikes, protecting the submersible pump and extending the overall system lifespan.
- **Higher Efficiency and Production**
  Optimizes ESP system performance, maximizing oil and gas extraction.
- **Control and Cost Reduction**
  Enables precise control of pump speed, reducing mechanical wear and energy consumption.
- **High Operational Versatility**
  Equipped with coarse and fine tap changers, allowing adaptation to the specific conditions of each well.

PHASE SHIFTING TRANSFORMERS (PST)

- **Precise Voltage Adaptation**
  Adjusts the voltage to the exact levels required by the VSD, ensuring a stable and efficient power supply.
- **Harmonic Distortion Reduction**
  Decreases harmonics generated by VSDs, preventing interference and overheating in connected equipment.
- **Improved Power Factor**
  Helps optimize the power factor and enhance overall power quality.
- **Comprehensive Harmonic Support**
  Operates without performance loss or reduced lifespan, even under high harmonic conditions.
- **Greater Operational Efficiency**
  A better power factor and lower harmonic content allow the VSD to operate at maximum efficiency, reducing energy losses.
- **Reduced Electromagnetic Interference**
  Minimizes failures in control, instrumentation, and communication systems connected to the same network.
- **Protection for the VSD and ESP System**
  Filters electrical noise and high-frequency voltage spikes, extending the lifespan of the equipment.

Accessories and Design Conditions

- Additional accessories—such as thermometer with contacts, pressure relief valve with contacts, magnetic oil level indicator, winding thermometer, and cooling fans, are quoted upon customer request at an additional cost.
- Equipment design and layout subject to change without notice.

Rymel

TRANSFORMERS FOR DATA CENTERS

MAXIMUM POWER RELIABILITY FOR HIGH-PERFORMANCE COMPUTING INFRASTRUCTURE

The rapid expansion of cloud services, artificial intelligence workloads, and global connectivity has made data centers a cornerstone of modern digital infrastructure. These facilities demand power systems of the highest reliability, capable of ensuring operational continuity, voltage stability, and protection of sensitive electronic loads, even under the most demanding operating conditions.

In this environment, the medium-voltage transformer plays a critical role: it forms the electrical interface between the utility grid and the UPS systems and distribution infrastructure that supply critical loads throughout the facility. Rymel has developed special-purpose transformers for Data Center applications, engineered to meet the demands of high availability, harmonic-rich environments, frequent switching operations, continuous monitoring, and protection of sensitive electronic equipment. Rymel Data Center transformers are conceived to deliver maximum reliability, thermal robustness, and safe performance in both indoor and outdoor installations.

Design & Performance Features:

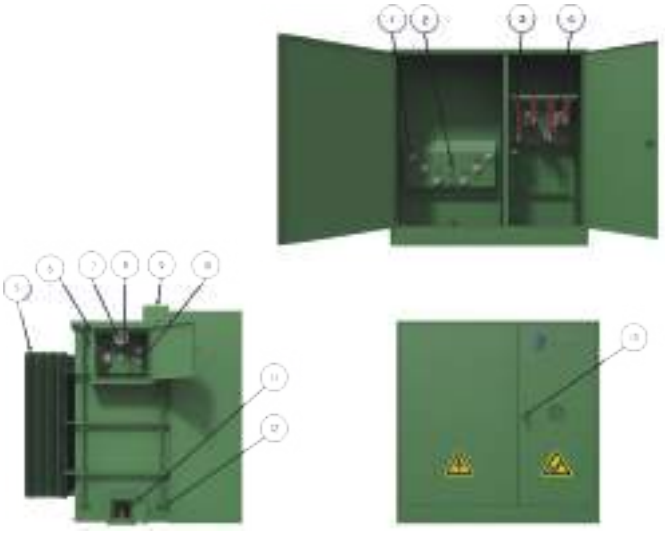
- Designed to supply critical loads with high continuity of service.
- Engineered to withstand non-linear loads and high harmonic content.
- Reinforced thermal sizing for sustained performance under demanding operating conditions.
- Incorporates an electrostatic shield for protection of sensitive electronic equipment.
- Low-voltage winding with reinforced insulation, designed to withstand voltage transients caused by fast switching operations.
- Compatible with frequent switching operations and energization events associated with automatic transfer schemes.
- Protection system with proper coordination, ensuring safe and reliable operation.
- Integration with real-time monitoring and supervisory systems.
- Built for high reliability, operational safety, and extended service life.

For further information, please contact a Rymel representative

rymel@rymel.com.co

Advantages of Data Center Transformers:

- Greater reliability in power supply for critical infrastructure.
- Enhanced protection for sensitive loads such as servers, UPS systems, and electronic equipment.
- Superior performance under demanding operating conditions and harmonic-rich environments.
- Reduced risk of failure due to overheating or dielectric stress.
- Increased safety in outdoor installations.
- Improved operational continuity during source transfer and automatic switchover events.
- Integration capability for permanent condition monitoring of the transformer.
- Higher electrical system availability across the Data Center.
- Adaptability to different project sizes and power distribution architectures.



1. Hv bushing
2. Parking stand
3. Ground provision
4. Lv bushing
5. Radiator
6. Oil level indicator
7. Pressure gauge
8. Load break switch
9. Pressure relief device
10. Thermometer
11. Drain valve with sampler
12. Jack support

*Additional requested accessories can be integrated into the transformer.

TECHNICAL INFORMATION	
Power Ratings [kVA]:	500 to 5000
Series voltage [kV]:	15, 36
Voltage HV [V]	13200 - 34500
Voltage LV [V]:	Up to 440 V
Number of Phases:	3
Operating Frequency Range [Hz]:	60
Vector Group:	DD, YY, DY
Mounting Type:	Outdoor
Standards:	IEEE
Winding Temperature Rise:	65 °C or 55 °C
BIL [kV]	Up to 200
K Factor	1 to 20
Insulation Class	120
Insulating Fluid	Mineral or Vegetable
Cooling	ONAN KNAN
Tap Changer	5 positions

Special Features:

- Load-break switch for on-load operation.
- Designed to operate under harmonic-rich load conditions.
- Electrostatic shield.
- Dead-front bushings.
- Integration with real-time monitoring and supervisory systems.
- Reinforced insulation.
- High-efficiency unit.
- High-voltage and low-voltage compartments.
- Electrostatic powder coating finish.
- Designed to ensure electrical system availability across the Data Center.
- Built for high reliability, operational safety, and extended service life.

Rymel

VAULT-TYPE TRANSFORMER

The Vault-Type Transformer is designed for distribution network applications in vaults, chambers, or underground enclosures where occasional flooding may occur.

It provides a compact, safe, and reliable solution for urban and industrial distribution systems, enabling installation in confined spaces with high service continuity requirements.

This transformer is built to withstand the conditions inherent to underground environments, including exposure to water, humidity, and other harsh factors, while maintaining stable electrical performance and robust mechanical integrity.

ACCESSORIES

- Off-load tap changer
- Pressure relief valve
- Oil level indicator, with or without contacts
- Temperature indicator, with or without contacts
- Lifting devices
- Nameplate
- Grounding connector
- Handhole for inspection and maintenance
- Drain valve with sampling
- Filler cap

TECHNICAL CHARACTERISTICS			
TYPE		Vault Transformer	
TERMINAL TYPE		Dead front	
DIELECTRIC		Mineral or Ester oil	
SYSTEM		Three Phase	
POWER	kVA	300 - 5000 kVA	
FREQUENCY	Hz	60	
CONNECTION GROUP		Dy, Dd, Yy, Yd	
THERMAL CLASS	°C	120	
COOLING		ONAN - KNAN	
INSTALLATION HEIGHT	m	1000	
TEMPERATURE RISE	°C	65	
MANUFACTURING AND TESTING STANDARD		IEEE C57.12.40, IEEE C57.12.24	
		HIGH VOLTAGE	LOW VOLTAGE
MAXIMUM SYSTEM VOLTAGE		Up to 36 kV	1.5 kV
BIL		Up to 200 kV	Up to 30 kV
CONDUCTOR MATERIAL		Aluminum or copper	
TAPS		5 positions (+2,-2), 2.5%	
APPLIED VOLTAGE WITHSTAND, (1 MINUTE)		34 kV	10 kV

Get in touch to discover our solutions.
rymel@rymel.com.co

Autopista Norte Paraje el Noral Copacabana
Antioquia – Colombia
www.rymel.com.co