



## DRY TYPE TRANSFORMERS



**Rymel's line of dry transformers** offers highly reliable equipment, which are used for the distribution of electrical energy in buildings, shopping centers, hospitals and those places where high fire safety is required and where it is required to minimize environmental impact.

Rymel manufactures dry transformers using materials that withstand high temperatures, fire resistant and self-extinguishing, which makes them very safe equipment that minimizes the risk of fire. This feature allows our transformers to be installed very close to the load, improving system regulation and reducing losses in the low voltage line. On the other hand, since dielectric oil is not used, its installation is facilitated because it does not require the manufacture of a fireproof vault, nor an oil collection well.

Rymel series transformers are manufactured using high quality materials and certified manufacturing processes (ISO 9001, ISO 14001, ISO 45001 and BASC), which in combination with our high technology, allows us to obtain very safe and reliable dry transformers, which they comply with the NTC 3445, NTC 3654, IEC 60076-11 and RETIE standards.

Rymel manufactures three types of dry-type transformers:

- Dry transformers with encapsulated windings class F
- Dry transformers with open windings class H
- Low-Low voltage class H



## TECHNICAL CHARACTERISTICS DRY TYPE EPOXY ENCAPSULATED CLASS F

Rymel brand encapsulated dry transformers are characterized by having their windings encapsulated in dielectric epoxy resin, through a high-tech process in vacuum conditions. Once the resin compound hardens, it obtains great mechanical rigidity, which allows the equipment to withstand great mechanical stress. In addition, the resin compound is self-extinguishing and fire resistant, so there is a minimum risk of fire during the operation of the equipment.

These transformers are designed for a type F thermal class, that is, they can withstand up to 155 °C. In addition, the fact that the internal dielectric materials of the windings are encapsulated and therefore are not in contact with the environment, makes these transformers very durable equipment over time.

These special characteristics make the Rymel line of encapsulated dry transformers highly reliable, safe equipment, with low operating and installation costs, minimum maintenance and minimum environmental impact.



TECHNICAL CHARACTERISTICS	
CAPACITY	Up to 2.500 kVA
TENSION	Up to 36 kV
BIL	Up to 145 kV
OVERVOLTAGE	From 38 kV up to 70 kV
WINDING MATERIAL	Aluminum
COOLING CLASS	AN - AF
FREQUENCY	60 0 50 Hz
TAP CHANGER	± 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 EFFICIENCY	Class A or B; 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 INSTALATION	Indoor.
TYPE OF INSULATION	Epoxy resin encapsulated windings.
ACCESSORIES	<ul style="list-style-type: none"> <li>- Primary and secondary terminals.</li> <li>- Surge arresters.</li> <li>- Temperature controller with three PT100 sensors.</li> <li>- Scroll wheels.</li> <li>- Ground connector.</li> <li>- Lifting device.</li> <li>- Nameplate made of high-strength anodized aluminum.</li> <li>- Tap switch.</li> <li>- Forced ventilation system (optional at the request of the client).</li> </ul>
STANDARD	NTC 3654, NTC3445, IEC 60076, IEEE Std C57.12.01 and RETIE
ADVANTAGES	<ul style="list-style-type: none"> <li>- Fire resistant and self-extinguishing materials</li> <li>- Low noise, low loss magnetic core with dielectric coating</li> <li>- Space optimization</li> <li>- Minimum level of partial discharges</li> </ul>

## DRY TYPE TRANSFORMER WITH OPEN WINDINGS CLASS H

Open dry transformers are characterized by having the high voltage windings exposed and impregnated with a dielectric varnish that protects them from the environment. They are designed for a thermal class H, which means that they can withstand up to 180°C and are manufactured using materials that withstand high temperatures, fire resistant and self-extinguishing, which minimizes the risk of fire during operation.

Rymel brand open dry transformers have a special design that allows them to have sufficient mechanical rigidity to withstand short-circuit stresses, they also have ventilation ducts that allow adequate cooling of the equipment and facilitate its maintenance, through a process of vacuuming or blown with dry air. Rymel's class H line of dry transformers offers very safe equipment, with low installation costs and reduced environmental impact.

## DRY TYPE LOW-LOW VOLTAGE CLASS H

Low-Low dry transformers are used for the transformation of voltages into low voltage levels below 1.2 kV. They are characterized by having their windings insulated using class H dielectric materials, fire resistant and self-extinguishing, which minimizes the risk of fire and also allows the equipment to withstand up to 180 °C.

The Rymel brand Low-Low transformers have a special design that makes the equipment very compact, with optimized dimensions that facilitate its installation indoors, it also has ventilation ducts that allow adequate cooling of the equipment and facilitate its maintenance, through a vacuuming or blowing process with dry air. Rymel's line of Low-Low transformers offers very safe, compact equipment with low installation costs and reduced environmental impact.



TECHNICAL CHARACTERISTICS		
	OPEN WINDINGS CLASS H	LOW-LOW VOLTAGE CLASS H
CAPACITY	Up to 1.500 kVA	Up to 500 kVA
TENSION	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
COOLING CLASS	AN - AF	AN
FREQUENCY	60 0 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	K1, K2, K4, K6, K9, K13, K20 or according to customer requirements.	
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	<ul style="list-style-type: none"> <li>- Primary and secondary terminals.</li> <li>- Surge arresters.</li> <li>- Temperature controller with three PT100 sensors.</li> <li>- Scroll wheels.</li> <li>- Grounded.</li> <li>- Lifting device.</li> <li>- Nameplate made of high-strength anodized aluminum.</li> <li>- Tap changer.</li> <li>- Forced ventilation system (optional at the request of the client).</li> <li>- Cabinet or protection cell type interior or exterior (optional at the request of the client).</li> </ul>	<ul style="list-style-type: none"> <li>- Primary and secondary terminals.</li> <li>- Grounded.</li> <li>- Lifting device.</li> <li>- Nameplate made of high-strength anodized aluminum.</li> <li>- Tap changer.</li> <li>- Indoor type protection cabinet or cell.</li> <li>- External type protection cell (optional at the request of the client).</li> </ul>
STANDARD	NTC 3654, NTC3445, IEC 60076, IEEE Std C57.12.01 and RETIE.	
ADVANTANGES	<ul style="list-style-type: none"> <li>- Fire resistant and self-extinguishing materials.</li> <li>- Low noise, low loss magnetic core with dielectric coating.</li> <li>- Space optimization.</li> </ul>	