



Transformers

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Close the loop

With the manufacture of transformers, Inael Electrical Systems offers a comprehensive medium voltage solution to its clients.

Inael's new transformers comply with the latest Ecodesign directives, seeking maximum efficiency, and therefore, the lowest losses in the line of sustainable development followed for years by the company.

The new line will focus on distribution transformers in both mineral oil and vegetable ester, producing a standard range for the main voltages and powers, both for consumer and generation, and being able to calculate and manufacture more specific transformers based on the client's needs, seeking maximum versatility.



Power from 50 to 3150 kVA.

24 kV series.

Description

The transformers manufactured by Inael have been designed and built to comply with the requirements established in the UNE 21.428, UNE-EN 60076 standards. They comply with the following characteristics:

- Three-phase 50Hz and 60Hz* transformers.
- Indoor or outdoor mounting.
- Immersed in liquid dielectric
- The material used for the windings is Aluminium.
- The colour of the outer layer will be RAL 5008 type 8010-B10G according to the UNE 48103 standard.

Technical data

Serie - 24kV														
Power		50	100	160	250	400	630	800	1000	1250	1600	2000	2500	3150
Secondary tension	V	420V o 800V												
Regulation	%	±2,5 ±5%*												
Connection group		Dyn11*												
Dielectric liquid		Mineral oil*												
No-load losses	W	81	130	189	270	387	540	585	693	855	1080	1305	1575	1980
Pérdidas en carga	W	750	1250	2350	2350	3250	4600	6000	7600	9500	12000	15000		
Short circuit impedance at 75°		4	4	4	4	4	4	6	6	6	6	6	6	6
Acoustic power level	%				42	43	42	36	40	48	50	Under request		
Full Load Performance					98,88	99	99,14	99,14	99,08	99,08	99,10			
Performance at 75% load					99,00	99,18	99,30	99,30	99,00	99,00	99,00			

*Other options upon request

Standard supply

- Voltage regulation and changeover switch (no load)
- Mineral oil, other options on request.
- Lifting eyebolts.
- Porcelain insulators (MT).
- Porcelain secondary bushings (connection blades included).
- Earthing terminals.
- Drain valve.
- Thermometer cover.
- Nameplate.
- Installation and maintenance manual.
- Filling device.
- Moorings for installation.

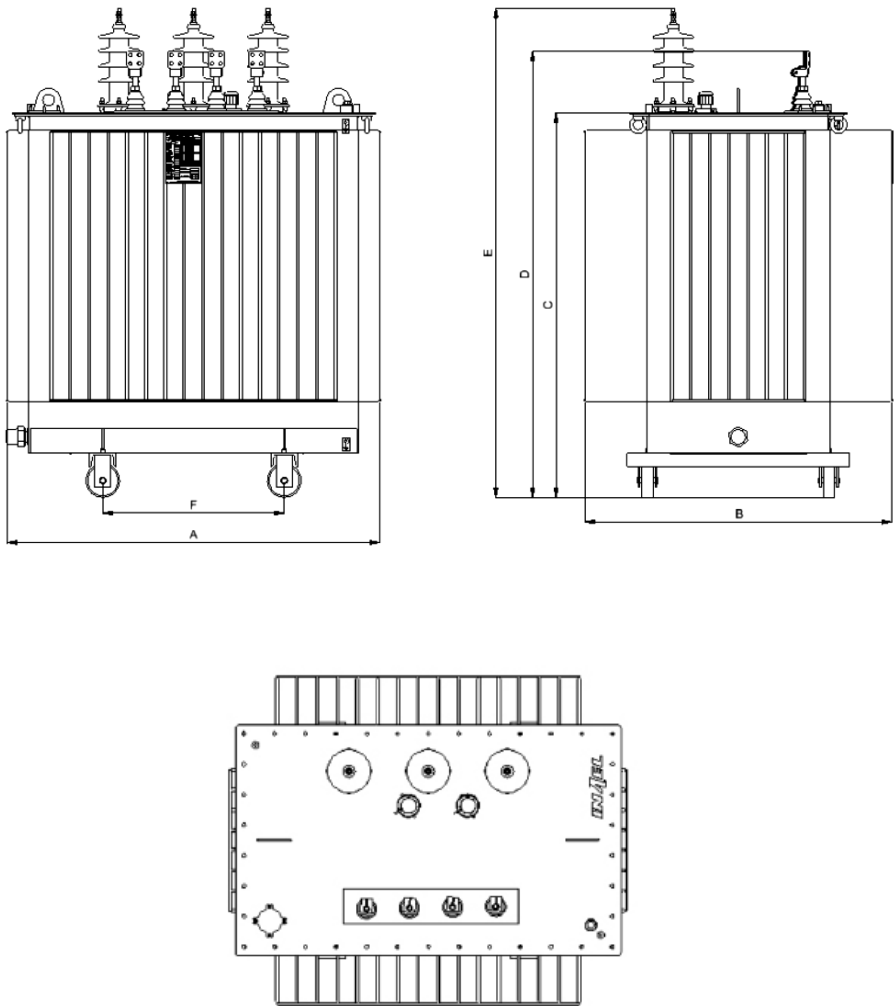
Accesories

- 2-contact thermometer.
- Protection relay.
- Plug-in or screw-in type A, B or C (MV) insulators.
- Other paints and thicknesses on request.
- Outdoor oil collection tank.
- Covering box for scuppers.
- Overpressure valve.

Technical sheet

Below are the dimensions and weights for transformers with double voltage in the primary under 24Kv and powers from 50KVA to 3150KVA.

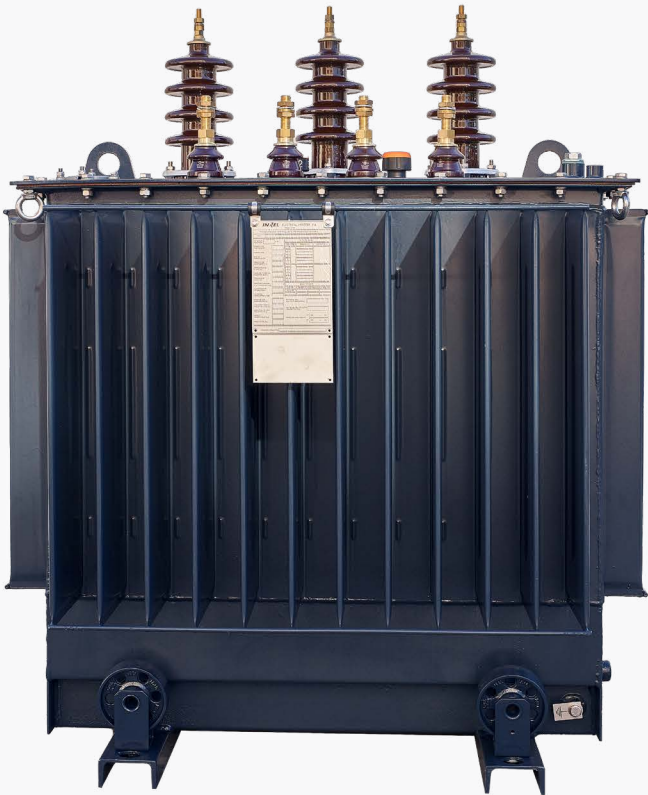
Dimensions



Serie · 24kV								
Power (Kva)	A	B	C	D	E	F	Bushing Metric BT	Bushing intensityBT (A)
50	1100	740	1000	1150	1520	520	M12	250
100	1100	740	1000	1150	1520	520	M12	250
160	1200	830	1000	1150	1570	520	M12	250
250	250	910	1121	1286	1600	670	M20	630
400	1600	1020	1131	1296	1600	670	M20	630
630	1700	1140	1376	1556	1870	670	M30	1250
800	1600	1160	1435	1615	1900	670	M30	1250
1000	1900	1200	1472	1672	1950	670	M42	2000
1250	1900	1200	1472	1672	1950	820	M42	2000
1600	2100	1500	1472	1882	2000	820	M48	3150
2000	*Under request							
2500	*Under request							
3150	*Under request							

Weights		
Power (Kva)	Oil (kg)	Total weight (kg)
50	140	560
100	170	775
160	200	1040
250	365	1500
400	473	2000
630	618	2700
800	813	3560
1000	858	3700
1250	840	3750
1600	1000	4454
2000	*A consultar	
2500	*A consultar	
3000	*A consultar	

*Approximate dimensions and weights. These are subject to change without prior notice due to the continuous improvement in Inael transformers.





From 50 to 3150 kVA. 36KV insulation level.

Description

The transformers manufactured by Inael have been designed and built to comply with the requirements established in the UNE 21.428, UNE-EN 60076 standards. They comply with the following characteristics:

- Three-phase 50Hz and 60Hz* transformers.
- Indoor or outdoor mounting.
- Immersed in liquid dielectric
- The material used for the windings is Aluminium.
- The colour of the outer layer will be RAL 5008 type 8010-B10G according to the UNE 48103 standard.

Technical data

Serie - 36kV														
Power	kVA	50	100	160	250	400	630	800	1000	1250	1600	2000	2500	3150
Secondary tension	V				420V o 800V									
Regulation	%				±2,5 ±5%*									
Connection group					Dyn11*									
Dielectric liquid					Aceite mineral*									
No – load lossses	W	93	150	217	311	445	621	673	797	983	1242	1501	1811	2277
Load Losses	W	825	1375	1925	2585	3575	5060	6600	8360	10450	13200	16500	20350	25300
Short circuit impedance at 75°	%	4,5	4,5	4,5	4,5	4,5	4,5	6	6	6	6	6	6	6
Acoustic power level					42	43	42	36	40	48	50	Under request		
Full Load Performance					99,07	99,19	99,09	99,13	99,11	99,07	99,10			
Performance at 75% load		43	45	48	99,75	99	99,26	99,30	99,28	99,28	99,07			

*Other options upon request

Standar supply

- Voltage regulation and changeover switch (no load).
- Mineral oil, other options on request.
- Lifting eyebolts.
- Lifting eyebolts.
- Porcelain insulators (MT).
- Porcelain secondary bushings (connection blades included).
- Earthing terminals.
- Drain valve.
- Thermometer cover.
- Nameplate.
- Installation and maintenance manual.
- Filling device.
- Moorings for installation.

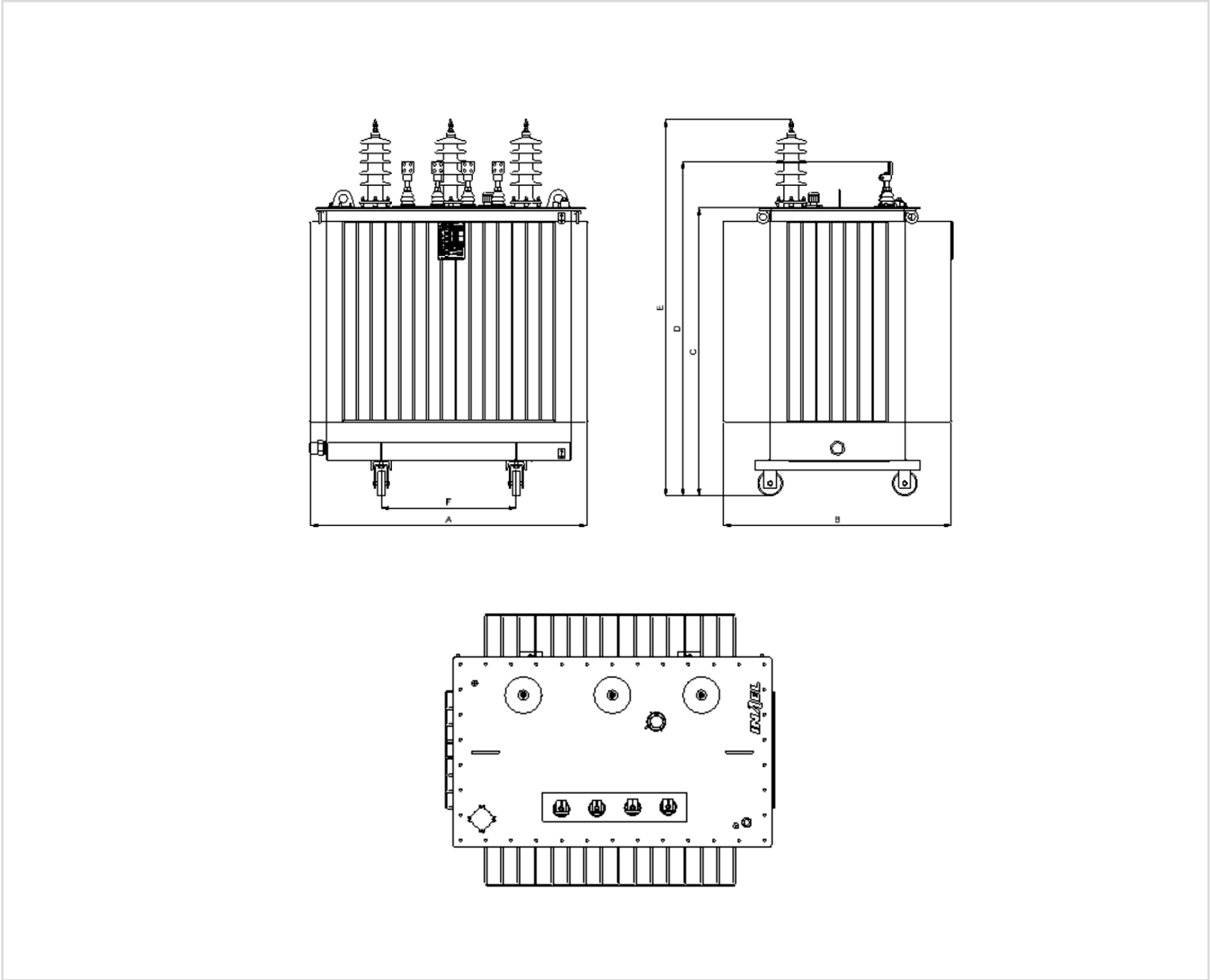
Accesories

- 2-contact thermometer.
- Protection relay.
- Plug-in or screw-in type A, B or C (MV) insulators.
- Other paints and thicknesses on request.
- Outdoor oil collection tank.
- Covering box for scuppers.
- Overpressure valve.

Technical sheet

Below are the dimensions and weights for transformers with primary voltage under 36KV and powers from 50KVA to 3000KVA.

Dimensions



Serie · 24kV								
Power (Kva)	A	B	C	D	E	F	Bushing Metric BT	Bushing intensity BT (A)
50	1100	780	980	1040	1310	520	M12	250
100	1100	780	1010	1130	1400	520	M12	250
160	1300	850	1000	1110	1400	520	M12	250
250	1200	980	1121	1286	1600	670	M20	630
400	1300	1050	1131	1296	1700	670	M20	630
630	1400	1170	1376	1556	1900	670	M30	1250
800	1600	1100	1435	1615	1950	670	M30	1250
1000	1900	1200	1421	1621	2000	670	M42	2000
1250	1900	1300	1472	1672	2000	820	M42	2000
1600	2100	1500	1472	1882	2100	820	M48	3150
2000	*Under request							
2500	*Under request							
3150	*Under request							

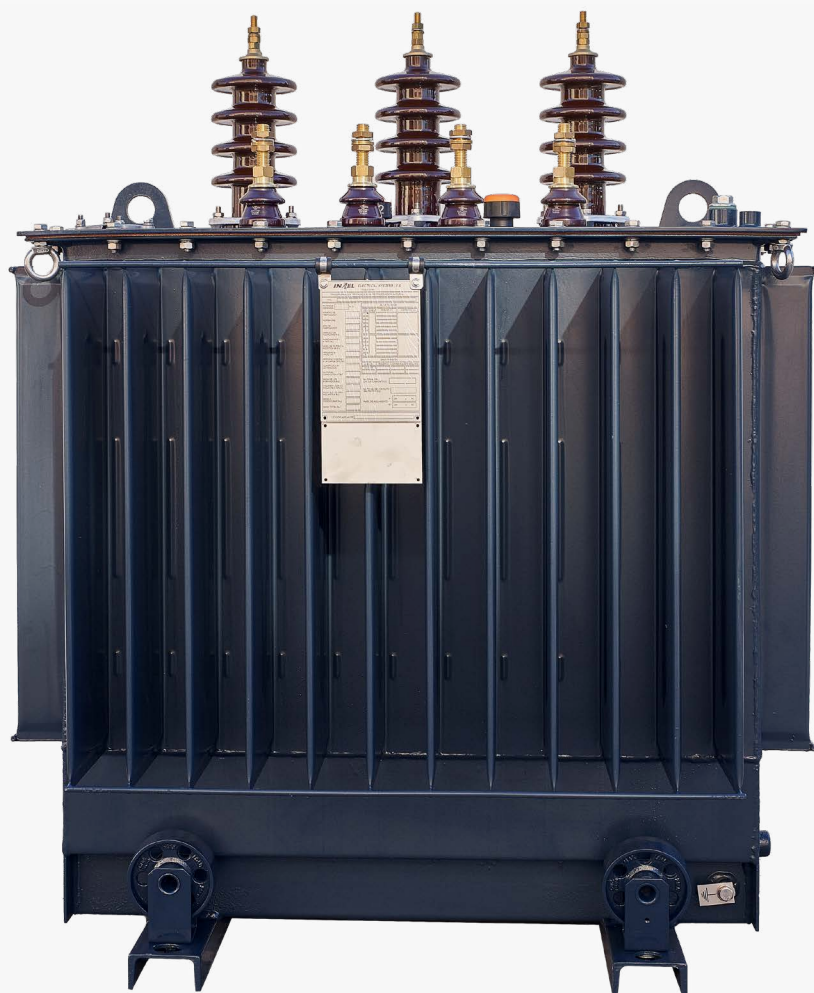
Weights		
Power (Kva)	Oil (kg)	Total Weight(kg)
50	150	565
100	195	815
160	225	1040
250	365	1500
400	470	1870
630	627	2644
800	813	3560
1000	860	3650
1250	880	3680
1600	1000	4454
2000	*Under request	
2500	*Under request	
3000	*Under request	

*Approximate dimensions and weights. These are subject to change without notice due to the continuous improvement of Inael transformers.



GENERAL TERMS AND CONDITIONS OF SALE
ALL PRICES, CODES, AND REFERENCES INDICATED IN THIS PRICE LIST ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE
GENERAL TERMS Any sale made by the Seller shall be expressly subject to the Buyer’s full acceptance of the terms and conditions specified below and the waiver of the Buyer’s general terms of purchase. This acceptance and waiver shall be deemed to have been made with every order placed by the Buyer.
PURPOSE AND SCOPE OF OFFERS The applicable prices are those listed in the Seller’s current price list on the date of the order. Prices and conditions for specific offers shall apply exclusively to the products quoted and shall remain valid for one month unless otherwise stipulated. Acceptance of an offer must be formalized through a purchase order to the Seller. The order shall be considered definitively accepted only after the Seller’s express and unconditional confirmation. Any modifications or variations in scope, deadlines, or other contractual terms proposed by either party must always be communicated in writing and accepted in the same manner.
PAYMENT TERMS Unless special agreements are made, all our sales are insured by an insurance company and must be paid within a maximum period of 60 days from the invoice date, in accordance with the provisions of Law 15/2010 of July 5, amending Law 3/2004 of December 29, which establishes measures to combat late payment in commercial transactions. Under no circumstances shall the maximum deadlines established in this law be exceeded. For orders below €300, payment must be made in advance. In the case of international sales, if payment is made by documentary credit, the Buyer must obtain the Seller’s acceptance of the letter of credit terms and the confirming bank before issuance. Due to the management costs borne by the Seller, a minimum invoice amount of €150 will apply to all sales.
TRANSPORTATION AND INSURANCE For shipments within the Iberian Peninsula, orders exceeding a net value of €2,000 will be shipped freight prepaid. For any other destination, goods will be delivered under EXW Toledo conditions. For prepaid shipments, no transport claims will be accepted after 48 hours from delivery. In cases of urgent shipments requested by the customer, goods will always be shipped freight collect. Goods always travel at the Buyer’s expense and risk, who, in case of damage or delay, must file the relevant claim with the transport companies or agents within 48 hours.
TOOLING AND PACKAGING Tooling manufactured for the production of special products shall be at the customer’s expense and shall be stored at INAEL, used exclusively for the orders for which they were manufactured. Such tooling may only be used for third parties with the express authorization of the customer and will become INAEL’s property five years after its last use. The delivery of tooling must be expressly agreed upon at the time of the order. All materials shipped from INAEL to customers are packaged in standard packaging suitable for road transport. Any specific packaging requested by the Buyer shall be at their expense.
MANUFACTURING In the event of force majeure of any kind, including but not limited to the unavailability of raw materials, manufacturing difficulties, strikes, communication disruptions, or catastrophes, INAEL shall be automatically released from any commitments made, reserving the right to cancel pending manufacturing orders without prior notice.
DELIVERY TIMES Delivery times are approximate unless the Seller expressly agrees to firm delivery deadlines. Delivery times shall commence from the latest of the following dates: - The date of INAEL’s unconditional acceptance of the order. - The date INAEL receives from the customer all the necessary information required to process the order. - The date INAEL receives the advance payment the customer has committed to under the terms of the sales contract. - In the case of payment by Letter of Credit, the date an acceptable documentary credit for INAEL is notified and, if required, confirmed by the same.
If these preconditions are not met within six months of the contract’s existence, the contract shall become null and void, and the Buyer shall waive any claims for damages.
If the Buyer requests a postponement of the delivery date, INAEL may invoice the products when they are made available on the agreed date, without prejudice to charging the Buyer for any incurred storage costs..

GENERAL TERMS AND CONDITIONS OF SALE
OWNERSHIP OF GOODS AND RETENTION OF TITLE INAEL shall retain ownership of the goods until full payment of the invoice sale price has been made, even if a bill of exchange has been issued. The customer is authorized to transform the goods, but this authorization shall automatically cease if the customer fails to strictly comply with the established conditions.
RETURN OF MATERIALS Returns will not be accepted without the express intervention and consent of INAEL, and under no circumstances for special materials. If a return is accepted, all transportation, inspection, repair, or reconditioning costs will be borne exclusively by the sender. No returns of any type of material will be accepted after one year from the delivery date.
TESTING Our products are always tested and verified before being shipped to our customers. If desired, routine tests can be carried out in the presence of customers at our factory, provided that prior notice is given when placing the order to schedule a date. If any other type of testing, third-party inspection, or additional actions are required, they must be quoted and approved by INAEL, with all costs borne by the customer.
WARRANTY We guarantee our manufactured products for one year from the factory dispatch date against any material defects or manufacturing faults. During this period, we commit to repairing or replacing any recognized defective parts at our expense and at our factory within the shortest possible time, without compensation to either party and without accepting liability for any direct or indirect damages that may arise.
To maintain the validity of our warranty, it is essential to follow the instructions in our assembly and maintenance manuals. Any repair or modification of our products without our intervention or consent will result in the immediate termination of the warranty.
Repair, replacement, or substitution of the product or any part thereof during the warranty period shall in no case extend the warranty period of the product.
ENVIRONMENTAL REGULATIONS The holder of the waste is responsible for its collection and disposal or ensuring its proper collection and disposal. For professional electrical and electronic equipment subject to European Directives 2002/96/EC of January 27, 2003, and 2006/66/EC of September 6, 2006, as well as the applicable regulations implementing them, the organizational and financial responsibility for the collection and processing of waste generated by these devices marketed after August 13, 2005, has been transferred to the direct purchaser, who accepts this responsibility. The direct purchaser agrees to assume responsibility for the collection, disposal, processing, and recycling of the waste generated. Failure to comply with these obligations may result in the imposition of criminal penalties by each member state of the European Union. INAEL hereby guarantees that the substances, whether alone or contained in products incorporated into the production process in question, have been used in compliance with applicable registration, authorization, and restriction provisions.
As of January 1, 2024, the tax on equipment containing fluorinated gases, approved by Law 14/2022 of July 8, amending Law 19/2013 of December 9, comes into effect. Specifically, this tax applies to equipment containing SF6 that is delivered and installed in Spain after that date.
In this offer, the tax has been calculated based on the scope and normal installation conditions of the project. If the scope and/or installation conditions change, the tax must be recalculated. This tax is transferable throughout the entire supply chain and is not exempt from VAT.
For equipment intended for export, inquiries can be made with the tax authorities on how to process the refund of the tax amount.
JURISDICTION In the event of disputes, the Judges and Courts of Toledo shall have jurisdiction, to which both parties expressly submit, waiving any other jurisdiction.



Inael Electrical Systems, S.A.
C/ Río Jarama, 7, 45007 Toledo,
Spain

+34 925 233 511
+34 925 231 095
inael@inael.com