

HV/LV distribution transformers

ground mounted, vegetable dielectric immersed
from 50 to 3150 kVA

insulation voltage ≤ 24 kV – IEC 60076-1 standard, UTE losses



standard

These transformers comply with the following standards:

- HD 428.1 S1
- IEC 60076-1 to 10

Products assembled using only both new and warranted PCB-free components.

description

Three-phase distribution transformers, 50Hz, vegetable oil immersed, complying with the following characteristics:

- hermetically sealed with integral filling
- cover bolted on tank
- KNAN type natural cooling
- for indoor or outdoor use (installation to be specified)
- anticorrosion surface treatment : C3(M) class according to ISO 12944-2 standard
- RAL 7033 final colour
- protection index IP00 (without cable box)

dielectric liquid

- «Natural Ester» type
- biodegradable to 99% in 43 days
- non toxic, food grade quality
- easily recyclable and reusable
- enhanced fire behaviour (fire point 360°C)
- improving the insulation paper lifetime
- compatible with all the transformer components

basic fittings

- 1 off-circuit 3 or 5 tapping switch with padlocking located on the cover
- 3 HV fixed plug-in connectors 250 A / 24 kV on the cover
- 4 LV busbars (from 250 kVA only)
- 4 LV porcelain bushings (from 50 to 160 kVA)
- 4 bi-directional flat rollers
- 2 lifting and untanking lugs
- 1 earthing terminal on the cover (pin M12)
- 1 filling plug
- 1 draining device
- 1 aluminium rating plate

options

- protection relay (DMCR ou DGPT2) on filling plug
- free thermowell
- thermal protection devices on thermowell (thermometer with or without contacts, thermostat 1 ou 2 contacts, Pt 100, etc.)
- over pressure device on filling plug
- 3 HV 250 A porcelain bushings
- 4 LV porcelain bushings (from 250 kVA)
- LV air-insulated IP21 or IP54 cables box (possible only with plug-in bushings on HV side)
- locking device (lock not supplied) for plug-in bushings and off-circuit tapping switch
- 3 mobile connectors for HV plug-in bushing 250 A – 24 kV, straight or elbow (cable characteristics should always be specified).



Note : For any further requests (reduced losses, dimensions, or noise level, HV primary rating < 15 kV or > 24 kV, reinforced anticorrosion treatment, etc.), please consult us.

electrical characteristics

rated power (kVA)		50	100	160	250	315*	400	500*	630	800	1000	1250	1600	2000	2500	3150	
rated voltage	primary	15 or 20 kV															
	secondary at no-load	410 V between phases, 237 V phases to neutral															
rated insulation level ⁽¹⁾	primary	17,5 kV for 15 kV 24 kV for 20 kV															
		$\pm 2,5$ % and/or ± 5 %															
HV tapping range (off voltage)		$\pm 2,5$ % and/or ± 5 %															
vector group		Dyn 11															
losses (W)	at no-load	145	210	460	650	800	930	1100	1300	1220	1470	1800	2300	2750	3350	4200	
	on load at 75°C	1350	2150	2350	3250	3900	4600	5500	6500	10700	13000	16000	20000	25500	32000	33000	
rated impedance voltage (%)		4	4	4	4	4	4	4	4	6	6	6	6	6	6	7	
no-load current (%)		2,9	2,5	2,3	2,1	2	1,9	1,9	1,8	2,5	2,4	2,2	2	1,9	1,8	1,8	
switching current	le/ln peak value	14	14	12	12	12	12	12	12	11	10	10	9	9	8	8	
	time constant	0,13	0,15	0,2	0,22	0,24	0,25	0,27	0,3	0,3	0,35	0,35	0,4	0,45	0,5	0,5	
voltage drop at full-load (%)	cos φ = 1	2,74	2,21	1,54	1,37	1,31	1,22	1,17	1,11	1,51	1,47	1,45	1,42	1,45	1,45	1,29	
	cos φ = 0,8	3,93	3,75	3,43	3,33	3,30	3,25	3,22	3,17	4,65	4,63	4,62	4,60	4,61	4,62	5,11	
efficiency (%)	charge 100 %	cos φ = 1	97,09	97,69	98,27	98,46	98,53	98,64	98,70	98,78	98,53	98,57	98,60	98,63	98,61	98,61	98,83
		cos φ = 0,8	96,39	97,13	97,85	98,09	98,17	98,30	98,38	98,48	98,17	98,22	98,25	98,29	98,27	98,26	98,55
	charge 75 %	cos φ = 1	97,64	98,14	98,54	98,70	98,75	98,84	98,89	98,96	98,81	98,84	98,86	98,88	98,87	98,87	99,05
		cos φ = 0,8	97,07	97,69	98,18	98,37	98,44	98,56	98,62	98,71	98,51	98,56	98,58	98,61	98,60	98,60	98,81
noise level dB(A) ⁽²⁾	acoustic power L _{WA}	50	49	62	65	67	68	69	70	67	68	70	71	74	76	76	
	acoustic press L _{PA} at 1 m	42	40	53	56	57	58	59	60	56	57	59	59	61	63	63	

(*) non standard power ratings. Available on request.

(1) reminder of insulation levels:

rated insulation level (kV)	7,2	12	17,5	24
kV RMS, 50 Hz – 1 min	20	28	38	50
kV B.I.L., 1,2/50 μ s	60	75	95	125

(2) measured in compliance with IEC 60076-10 standard

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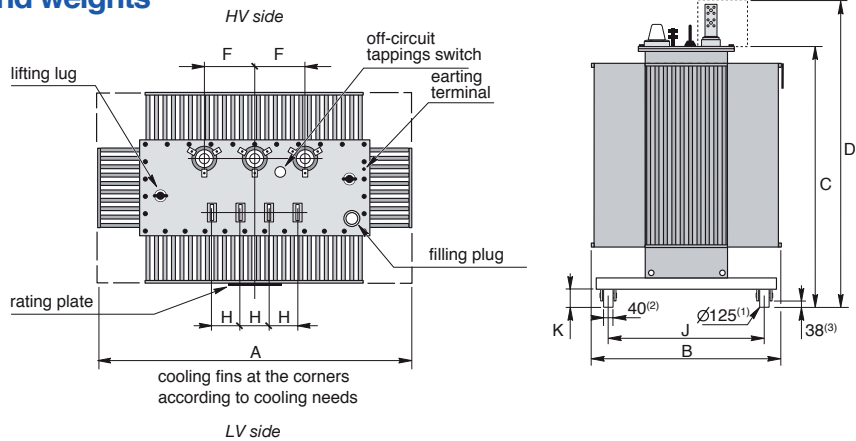
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dimensions and weights



D* : height over LV protection cover ;
assembly with plug-in connectors only

(¹) for 3150, $\varnothing = 200$

(²) for 3150, 80

(³) for 3150, 60

rated power (kVA)	50	100	160	250	315*	400	500	630	800	1000	1250	1600	2000	2500	3150
dimensions (mm)															
A	815	1065	985	1335	1265	1335	1365	1455	1795	1775	1875	1935	2500	2180	2220
B	660	660	785	815	815	825	865	865	1145	1155	1235	1265	1295	1940	2000
C	805	980	995	990	1090	1160	1195	1270	1275	1240	1430	1625	1635	1850	1850
D*	1090	1265	1280	1340	1440	1510	1545	1620	1685	1650	1840	2135	2145	2360	2360
F	265	265	265	265	265	265	265	265	265	265	265	265	265	265	265
H	75	75	150	150	150	150	150	150	150	150	170	170	170	170	170
J	520	520	520	520	670	670	670	670	670	670	820	820	820	820	820
K	105	105	105	105	105	105	105	105	105	85	85	85	85	85	85
weights (kg)															
of the dielectric (vegetable oil)	95	115	190	215	235	290	330	370	480	510	685	945	1060	1615	1690
total (kg)	370	510	755	890	1000	1205	1380	1620	1990	2370	2925	3830	4040	5655	6575

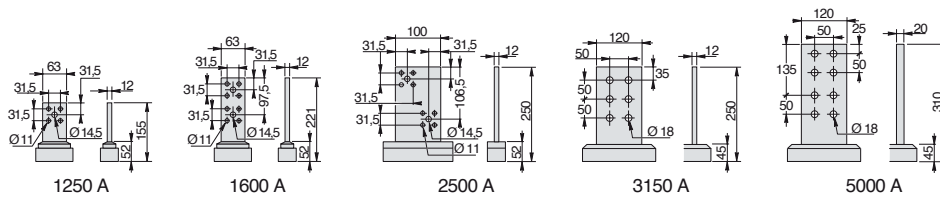
connections

maximum current (A)

LV busbars	—	—	—	1250	1250	1250	1250	1250	1250	1600	2500	2500	3150	5000	5000
LV porcelain bushings	250	250	250	630	630	630	1000	1250	2000	2000	2000	3150	3150	5300	5300

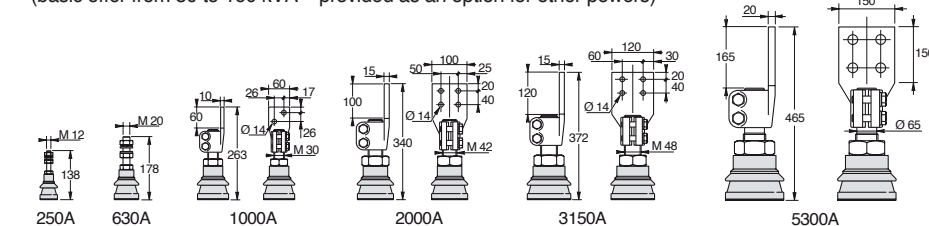
LV connections

busbars - NF EN 50387 standard (basic offer from 250 kVA)



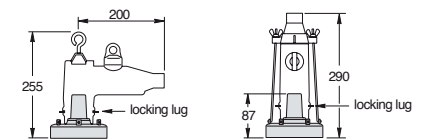
porcelain bushings - NF EN 50386 standard

(basic offer from 50 to 160 kVA – provided as an option for other powers)



HV connections - NF EN 50180 standard

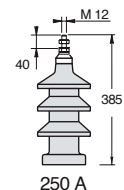
plug-in connectors 250 A / 24 kV (basic offer)



(mobile plug-in connectors provided as an option)

250 A porcelain bushings

(provided as an option)



Casual arrangements such as bars and cable supports, flexible connectors, etc. will be taken by the contractor who will make sure that no mechanical stresses is applied on the transformer connections.

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Postal address:
france transfo
PO box 10140
F-57281 Maizières-les-Metz cedex
France
tel: 33 (0)3 87 70 57 57 / fax: 33 (0)3 87 51 10 16
<http://www.francetransfo.com>

Due to change in standard and materials, the present document will bind us only after confirmation from the technical department