



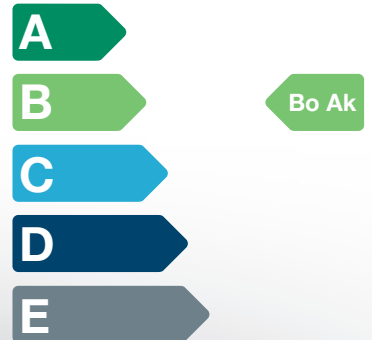
**OIL-FILLED**

from 100 to 2500 kVA with  
insulation cl. < 24 kV  
Losses Bo - Ak according to

**GENERAL INFORMATION**

At present, the improvement of the energy efficiency cannot be considered a slogan anymore, but a need of our time. Bo-Ak series high efficiency transformers are created for this purpose guaranteeing:

- savings in operating costs of the plant, due to low values of losses.
- consumption reduction of energy resources.
- reduction of CO<sub>2</sub> emissions



**ANNUAL SAVINGS (MAXIMUM) COMPARED TO TRANSFORMERS WITH NORMAL LOSSES**

RATED POWER kVA	50	100	160	250	400	630	800	1000	1250	1600	2000	2500
LOW CONSUMPTION MWh	7,2	12,4	18,7	26,2	37,1	51,4	56,9	62,7	66,1	84,5	109,5	124,8
LOW EMISSIONS CO <sub>2</sub> (TON)	5,4	9,3	14,1	19,6	27,9	38,6	42,7	47,0	49,6	63,4	82,1	93,6
ENERGY SAVINGS TOE*	1,4	2,3	3,5	4,9	6,9	9,6	10,6	11,7	12,4	15,8	20,5	23,3

\* TON OF OIL EQUIVALENT

**PARTICULARITIES OF AN OIL-FILLED TRANSFORMER**

The extreme flexibility of the heat reducing waves present on the transformer tank, allows to compensate the volume increases of the insulating fluid related to its operating temperature.

The leak-proofness of the transformer tank prevents the absorption of humidity, making it "Maintenance free".

Reference Norms :

- CEI EN 60067-1 to 10
- CEI EN 50464-1

The phases of design and building, in addition to their compliance with IEC EN norms, take into account the following rules:

- ISO 9001 : 2008 regarding the quality standards and procedures.
- ISO 14001 : 2004 regarding the environmental issues.

We, as a manufacturer, guarantee the use of PCB free insulating fluids. The magnetic core is built of grain-oriented electrical steel sheets and they use the step lap technique for their cut and assembly to reduce the abnormal overheating risks and to decrease the noise.

The coils are designed and built so that the transformer may operate on full-load conditions in strict compliance with A thermal class.

Note: on request, we may provide transformers with the same electrical features but with a conservator.

**DESCRIPTION**

The oil-filled distribution transformers have the following features

- Cooling ONAN.
- They may be installed either inside or outside.
- Anti-corrosion surface treatment.
- Suitable for heavy working conditions.
- Tested according to IEC 60296 standards.



**PROVIDED STANDARD ACCESSORIES**

- Bushings for MV and LV connections.
- Primary voltage regulator with 5 positions installed on the tank.
- Rating plate.
- Lifting lugs.
- 2 Earthing points.
- 4 Bi-directional flat rollers.
- Filling valve.
- Drain valve according to IEC EN 50216-4.

**FROM 100 TO 2500 KVA WITH  
INSULATION CL. 24 KV  
LOSSES B<sub>0</sub> - A<sub>k</sub> ACCORDING TO  
IEC EN 504641**

**Green  
efficiency**

**OIL-FILLED**

<b>RATED POWER kVA</b>		<b>50</b>	<b>100</b>	<b>160</b>	<b>250</b>	<b>400</b>	<b>630</b>	<b>800</b>	<b>1000</b>	<b>1250</b>	<b>1600</b>	<b>2000</b>	<b>2500</b>
NO-LOAD LOSSES	W	110	180	260	360	520	680	800	940	1.150	1.450	1.800	2.150
LOAD LOSSES AT 75 °C	W	750	1.250	1.700	2.350	3.250	4.800	6.000	7.600	9.500	12.000	15.000	18.500
NO-LOAD CURRENT I <sub>0</sub>	%	1	0,9	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,4	0,4	0,4
SHORT CIRCUIT VOLTAGE V <sub>cc</sub>	%	4	4	4	4	4	6	6	6	6	6	6	6
INPUT CURRENT I <sub>E/IN</sub>		11,6	10,6	10,10	9,2	9,4	9	8,4	8,4	8,8	8	7,6	7,5

**OUTPUT AT 75°C**

COSφ 1 100% LOAD	%	98,31	98,59	98,79	98,93	99,07	99,14	99,16	99,16	99,16	99,17	99,17	99,18
COSφ 1 75% LOAD	%	98,60	98,84	99,00	99,11	99,22	99,29	99,31	99,31	99,31	99,32	99,32	99,33
COSφ 0,9 100% LOAD	%	98,12	99,44	98,66	98,81	98,96	99,04	99,06	99,06	99,06	99,07	99,07	99,09
COSφ 0,9 75% LOAD	%	98,45	98,71	98,89	99,01	99,14	99,21	99,23	99,23	99,23	99,25	99,25	99,26

**VOLTAGE DROP AT 75° C**

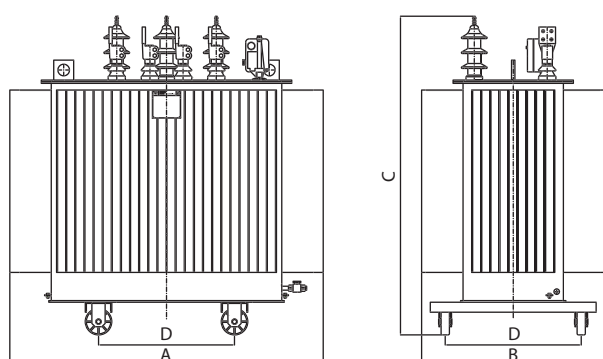
COSφ 1 100% LOAD	%	1,57	1,32	1,14	1,02	0,89	0,94	0,93	0,93	0,93	0,93	0,93	0,92
COSφ 0,9 100% LOAD	%	3,00	2,82	2,68	2,59	2,49	3,41	3,4	3,4	3,4	3,4	3,4	3,39

**NOISE**

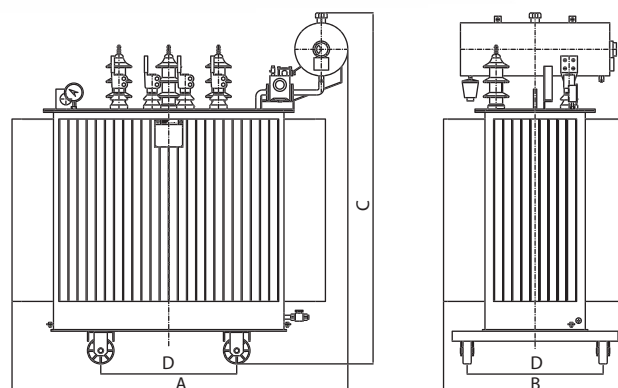
SOUND POWER LEVEL (L <sub>wa</sub> )	dB(A)	42	44	47	50	53	55	56	58	59	61	63	66
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**SIZES AND WEIGHTS (APPROXIMATE)**

**Hermetically Sealed Transformer**



**Transformer with conservator**



**HERMETICALLY SEALED TRANSFORMER**

		<b>50</b>	<b>100</b>	<b>160</b>	<b>250</b>	<b>400</b>	<b>630</b>	<b>800</b>	<b>1000</b>	<b>1250</b>	<b>1600</b>	<b>2000</b>	<b>2500</b>
LENGTH (A)	mm	950	1.000	1.050	1.150	1.250	1.600	1.750	1.750	1.850	1.900	2.200	2.250
DEPTH (B)	mm	530	600	600	600	600	900	1.000	1.000	1.100	1.100	1.200	1.300
HEIGHT (C)	mm	1.250	1.425	1.425	1.425	1.425	1.500	1.500	1.600	1.600	1.700	2.050	2.250
WHEEL INTERAXIS (D)	mm	400	520	520	520	670	670	820	820	820	820	1.000	1.000
WHEEL DIAMETER	mm	150	150	150	150	150	150	150	150	150	150	150	150
OIL WEIGHT	kg	110	170	210	260	330	510	600	670	670	810	1.050	1.200
TOTAL WEIGHT	kg	570	800	1.025	1.300	1.625	2.300	3.000	3.150	3.250	4.150	5.200	5.850

**TRANSFORMER WITH CONSERVATOR**

		<b>50</b>	<b>100</b>	<b>160</b>	<b>250</b>	<b>400</b>	<b>630</b>	<b>800</b>	<b>1000</b>	<b>1250</b>	<b>1600</b>	<b>2000</b>	<b>2500</b>
LENGTH (A)	mm	950	1.000	1.050	1.150	1.250	1.600	1.750	1.750	1.850	1.900	2.200	2.250
DEPTH (B)	mm	530	600	600	600	600	900	1.000	1.000	1.100	1.100	1.200	1.300
HEIGHT (C)	mm	1.350	1.525	1.505	1.545	1.525	1.600	1.720	1.920	1.800	1.900	2.250	2.400
WHEEL INTERAXIS (D)	mm	400	520	520	520	670	670	820	820	820	820	1.000	1.000
WHEEL DIAMETER	mm	150	150	150	150	150	150	150	150	150	150	150	150
OIL WEIGHT	kg	110	175	215	270	340	525	625	700	700	840	1.090	1.250
TOTAL WEIGHT	kg	575	810	1.040	1.320	1.645	2.320	3.020	3.175	3.275	4.180	5.250	5.900