

व्यापक परिचालन में मसौदे

प्रलेख प्रेषण संज्ञापन

संदर्भ

दिनांक

ईटीडी 16/टी-1 31-07-2018

तकनीकी समिति : ईटीडी 16

प्रेषती :

1. ईटीडी 16 के सभी सदस्य
2. विद्युत तकनीकी विभाग परिषद के सभी सदस्य तथा
3. रूचि रखने वाले अन्य सभी निकाय

महोदय,

कृप्या निम्नलिखित संशोधन मसौदे की एक प्रति संलग्न है :

प्रलेख	शीर्षक
ईटीडी 16 (12138)	आई एस 1180 (भाग 1) : 2014 बाह्य/ आंतरिक -रंग तेल इम्मेर्सेड वितरण ट्रांसफार्मर तक 2 500 kVA , 33 kV - विशिष्टि भाग 1 - मिनरल तेल निमिज्जित (चौथा पुनरीक्षण) की संशोधन संख्या 3 जुलाई 2018

कृप्या इस संशोधन मसौदे का अवलोकन करें और अपनी सम्मतियों यह बताते हुए भेजें कि अंततः यदि ये संशोधन के रूप में प्रकाशित हो जाएँ तो इस पर अमल करने में आपके व्यवसाय अथवा कारोबार में क्या कठिनाइयाँ आ सकती हैं।

सम्मतियाँ यदि कोई हो तो कृप्या अगले पृष्ठ पर दिए पत्र में अधोहस्ताक्षरी को उपरिलिखित पते पर भेज दें।

सम्मतियाँ भेजने की अंतिम तारीख **28/09/2018**

धन्यवाद,

भवदीय,

(राजीव शर्मा)

वैज्ञानिक 'एफ' एवं प्रमुख (विद्युत तकनीकी)

संलग्न : उपरिलिखित

**DRAFT AMENDMENT IN
WIDE CIRCULATION**

DOCUMENT DESPATCH ADVICE

Our Ref

Date

ETD 16/T-1

31/07/ 2018

TECHNICAL COMMITTEE : ETD 16

ADDRESSED TO:

1. All Members of Transformers, Sectional Committee, ETD 16;
2. All Members of Electrotechnical Division Council; and
3. All Interested.

Dear Sir(s),

Please find enclosed copy of the following draft amendment:

Doc No.	Title
ETD 16 (12138)	Draft Amendment No. 3 July 2018 to IS 1180 (Part 1) : 2014 Outdoor/Indoor type oil immersed distribution transformers upto and including 2500 kVA, 33kV - Specification Part 1 Mineral Oil Immersed (Fourth Revision)

Kindly examine the draft amendment and forward your views stating any difficulties which you are likely to experience in your business or profession, if these are finally adopted as **AMENDMENT**.

Comments, if any, may please be made in the format given overleaf and mailed to the undersigned.

Last date for comments: **28/09/2018**

Thanking you,

Yours faithfully

(Rajeev Sharma)
Sc 'F' & Head (Electrotechnical)
Email: eetd@bis.org.in
Encl : See attachment.

DRAFT AMENDMENT NO. 3 JULY 2018
TO
IS 1180 (PART 1) : 2014 OUTDOOR/INDOOR TYPE OIL IMMERSSED DISTRIBUTION
TRANSFORMERS UPTO AND INCLUDING
2 500 kVA, 33kV — SPECIFICATION
(Fourth Revision)

[*Foreword, para 5 (see amendment no. 2)*] — Substitute the following for the existing:

During this revision scope of both standards Part 1 and Part 2 have now been clubbed to make one combined standard for distribution transformer and designated as IS 1180 (Part 1). With the publication of this standard, IS 1180 (Part 2) would be withdrawn. In this revision maximum losses at 50 and 100 percent loading have been incorporated and the scope is extended up to 2 500 kVA. Further, single phase (3.3 to 33 kV) distribution transformers up to 100 kVA rating, have also been included to make it a comprehensive standard on Distribution Transformers.

(*Foreword, para 7*) — Substitute the following for the existing:

In the preparation of this standard, assistance has been derived from REC Specifications on distribution transformers, R-APDRP Technical Specification for such transformers, BEE recommendations for loss levels of 1 star, 2 star, 3 star, 4 star and 5 star rated distribution transformers, Guidelines for Specifications of Energy Efficient Outdoor Type Three Phase and Single Phase Distribution Transformers published by CEA and CBIP Manual on Transformers, Publication 317.

(*Foreword, para 8*) — Substitute the following for the existing:

This standard specifies six energy efficiency levels: level 1, level 2, level 3, level 4, level 5 and level 6. Distribution transformers with Energy efficiency level 2, level 3, level 4, level 5 and level 6 corresponds to 1 star, 2 star, 3 star, 4 star and 5 star labelled transformers respectively, as prescribed by BEE. In due course of time with improvements in technology and materials, higher levels of energy efficient transformers shall be progressively used.

NOTE: Energy Efficiency Level 1 shall be phased out by the date decided by Bureau of Energy Efficiency for orders placed on or before 30th June 2017.

[*Page 1, clause 1 (see also amendment no. 1)*] — Insert following new entry under Note 1:

r) Transformers for Static VAR Compensator

(Page 2, clause 6.8.1) — Insert following Note at the end of this clause:

NOTE — Energy Efficiency Level 1 shall be phased out by the date decided by Bureau of Energy Efficiency for orders placed on or before 30th June 2017.

[Page 3, Table 3 (see also amendment no. 1)] — Substitute the following for the existing table:

Table 3 Maximum Total Losses Upto 11kV Class Transformers
(Clauses 6.8.1.1, 6.8.1.2, 6.8.1.3 and 6.8.2)

Sl No.	Rating (kVA)	Impedance (Percent)	Maximum Total Loss (W)											
			Energy Efficiency Level 1		Energy Efficiency Level 2		Energy Efficiency Level 3		Energy Efficiency Level 4		Energy Efficiency Level 5		Energy Efficiency Level 6	
			50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load
(1)	(2)	(3)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)
i)	6.3	4.0	59	189	53	173	47	158	43	135	41	123	38	113
ii)	10	4.5	94	270	84	240	75	215	68	208	63	191	58	173
iii)	16	4.5	150	480	135	440	120	400	108	364	97	331	87	301
iv)	20	4.5	177	576	159	527	144	487	130	443	117	403	105	366
v)	25	4.5	210	695	190	635	175	595	158	541	142	493	128	448
vi)	40	4.5	277	914	249	834	224	775	202	705	182	642	164	583
vii)	63	4.5	380	1 250	340	1 140	300	1 050	270	956	243	870	219	791
viii)	100	4.5	520	1 800	475	1 650	435	1 500	392	1 365	352	1 242	317	1 130
ix)	160	4.5	770	2 200	670	1 950	570	1 700	513	1 547	462	1 408	416	1 281
x)	200	4.5	890	2 700	780	2 300	670	2 100	603	1 911	543	1 739	488	1 582

(Page 4, clause 7.8.1) — Insert following Note at the end of this clause:

NOTE — Energy Efficiency Level 1 shall be phased out by the date decided by Bureau of Energy Efficiency for orders placed on or before 30th June 2017.

[Page 4, Table 6 (see also amendment no. 1)] — Substitute the following for the existing table:

Table 6 Maximum Total Losses Upto 11kV Class Transformers
(Clause 7.8.1.1)

Sl No.	Rating (kVA)	Impedance (Percent)	Maximum Total Loss (W)											
			Energy Efficiency Level 1		Energy Efficiency Level 2		Energy Efficiency Level 3		Energy Efficiency Level 4		Energy Efficiency Level 5		Energy Efficiency Level 6	
			50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load
(1)	(2)	(3)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)
i)	250	4.50	1 050	3 150	980	2 930	920	2 700	864	2 488	811	2 293	761	2 113
ii)	315	4.50	1 100	3 275	1 025	3 100	955	2 750	890	2 440	829	2 164	772	1 920
iii)	400	4.50	1 300	3 875	1 225	3 450	1 150	3 330	1 080	3 214	1 013	3 102	951	2 994
iv)	500	4.50	1 600	4 750	1 510	4 300	1 430	4 100	1 354	3 909	1 282	3 727	1 215	3 554
v)	630	4.50	2 000	5 855	1 860	5 300	1 745	4 850	1 637	4 438	1 536	4 061	1 441	3 717
vi)	800	5.00	2 459	7 300	2 287	6 403	2 147	5 838	2 015	5 323	1 892	4 853	1 776	4 425
vii)	1 000	5.00	3 000	9 000	2 790	7 700	2 620	7 000	2 460	6 364	2 310	5 785	2 170	5 259
viii)	1 250	5.00	3 600	10 750	3 300	9 200	3 220	8 400	3 142	7 670	3 066	7 003	2 991	6 394
ix)	1 600	6.25	4 500	13 500	4 200	11 800	3 970	11 300	3 753	10 821	3 547	10 363	3 353	9 924
x)	2 000	6.25	5 400	17 000	5 050	15 000	4 790	14 100	4 543	13 254	4 309	12 459	4 088	11 711
xi)	2 500	6.25	6 500	20 000	6 150	18 500	5 900	17 500	5 660	16 554	5 430	15 659	5 209	14 813

...

[Page 5, Table 7 (see also amendment no. 1)] — Substitute the following for the existing table:

Table 7 Standard Ratings
(Clause 8.1)

SI No.	Nominal System Voltage	Standard Ratings (kVA)
(1)	(2)	(3)
i)	Up to and including 11 kV	5, 10, 16, 25, *50, *75 and *100
ii)	Above 11 kV up to and including 22 kV	10, 16, 25, *50, *75 and *100
iii)	Above 22 kV up to and including 33 kV	16, 25, *50, *75 and *100

NOTE — *Ratings are non-preferred.

(Page 5, clause 8.3) — Substitute the following for the existing clause:

‘8.3 Nominal System Voltage

Nominal System Voltage shall be chosen from the following:

- HV — 3.3, 6.6, 11, 22, and 33 kV
- LV — 415 (240 V, 1 Phase)'

[Page 5, clause 8.4 (see amendment no. 1)] — Substitute the following for the existing clause:

‘8.4 Basic Insulation Level (BIL)

Minimum basic insulation level shall be as given in Table 8.

Table 8 Minimum Basic Insulation Level
(Clause 8.4)

SI No.	Nominal System Voltage	Minimum BIL
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	(kV)	(kVp)
(1)	(2)	(3)
i)	3.3	40
ii)	6.6	60
iii)	11	75
iv)	22	125
v)	33	170

NOTE— Insulation coordination of all relevant fittings and accessories corresponding to higher BIL values shall be ensured.

(Page 5, clause 8.5) — Substitute the following for the existing clause:

‘8.5 No-Load Voltage Ratio

The no-load voltage ratios shall be as follows:

- 3 300/√3 / 250 V , 3 300 / 250 V
- 6 600/√3 / 250 V , 6 600 / 250 V
- 11 000/√3 / 250 V , 11 000 / 250 V
- 22 000/√3 / 250 V , 22 000 / 250 V
- 33 000/√3 / 250 V , 33 000 / 250 V

NOTE — Secondary voltage may be selected as 415-240 V, subject to agreement between the user and the supplier

(Page 5, clause 8.8.1) — Insert following Note at the end of this clause:

NOTE — Energy Efficiency Level 1 shall be phased out by the date decided by Bureau of Energy Efficiency for orders placed on or before 30th June 2017.

(Page 5, clause 8.8.1, line 1) — Substitute ‘up to 11 kV’ for ‘11 kV’.

[Page 5, Table 9 (see also amendment no. 1)] — Substitute the following for the existing table:

Table 9 Maximum Total Losses Upto 11kV Class Transformers
(Clauses 8.8.1.1, 8.8.1.2 and 8.8.1.3)

SI No.	Rating (kVA)	Impedance (Percent)	Maximum Total Loss (W)											
			<i>Energy Efficiency Level 1</i>		<i>Energy Efficiency Level 2</i>		<i>Energy Efficiency Level 3</i>		<i>Energy Efficiency Level 4</i>		<i>Energy Efficiency Level 5</i>		<i>Energy Efficiency Level 6</i>	
			50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load	50 % Load	100 % Load
(1)	(2)	(3)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)
i)	5	2.50	40	115	35	95	30	75	27	68	24	62	21	57
ii)	10	4.00	70	190	60	170	55	150	50	135	45	122	40	112
iii)	16	4.00	95	265	82	224	63	190	58	175	54	164	50	145
iv)	25	4.00	125	340	110	300	95	260	88	240	80	225	74	210
v)	50	4.00	230	665	210	590	190	520	177	480	160	451	148	420
vi)	75	4.00	340	995	310	880	285	780	265	720	242	670	223	625
vii)	100	4.00	445	1 250	410	1 140	375	1 030	350	964	320	900	299	842

(Page 6, clause 10.2, para 1, line 1) — Substitute ‘ $3.3/\sqrt{3}$, $6.6/\sqrt{3}$, $11/\sqrt{3}$, $22/\sqrt{3}$ and $33/\sqrt{3}$ ’ for ‘ $11/\sqrt{3}$, $22/\sqrt{3}$ and $33/\sqrt{3}$ ’.

(Page 6, clause 10.2, para 2, line 1) — Substitute ‘3.3, 6.6, 11, 22 and 33’ for ‘11, 22 and 33’.

(Page 8, clause 15.2.1, para 3) — Substitute the following for the existing:

‘For single phase transformers up to 25 kVA, the plain tank shall be capable of withstanding a pressure of 100 kPa and a vacuum of 760 mm of mercury. There should be no deformation of the tank.

For single phase transformers from above 25 kVA to 100 kVA, the plain tank shall be capable of withstanding a pressure of 80 kPa and a vacuum of 250 mm of mercury. Limiting values of deflections are specified in **21.5.3.1**.

NOTE — For single phase transformers up to 100 kVA, the transformer tank shall be of robust construction generally round/ rectangular in shape.

(Page 8, clause 15.2.2, para 1) — Insert the following at the end:

‘For single phase transformers up to 100 kVA, transformer tanks with corrugations shall be designed for a pressure of 15 kPa measured at the top of the tank with no leakage.

NOTE — For single phase transformers up to 100 kVA, the transformer tank shall be of robust construction generally round/ rectangular in shape.

[Page 12, clause 20.1 (r) (see also amendment no. 1)] — Insert the following Note:

NOTE — For cable box/ busduct arrangement, Arcing horns are not required.

[Page 14, clause 21.5.1.1(see also amendment no. 1)] — Insert following as Note 2 and renumber the existing as Note 1:

2 Vacuum is not applicable for corrugations.

[Page 14, clause 21.5.2.1(see also amendment no. 1)] — Insert following as Note 2 and renumber the existing as Note 1:

2 Vacuum is not applicable for corrugations.

(Page 15, clause 21.5.3.1) — Substitute the following for the existing:

21.5.3.1 Pressure test (type test)

For transformers up to 25 kVA

The transformer tank shall be subjected to air pressure of 100 kPa for 30 min (15 kPa for 30 min for corrugated tanks) and a vacuum of 760 mm of mercury for 30 min. There should be no leakage at any point and there is no deformation of tank.

NOTE — Vacuum is not applicable for corrugations.

For transformers above 25 kVA up to and including 100 kVA

The transformer tank shall be subjected to air pressure of 80 kPa for 30 min (15 kPa for 30 min for corrugated tanks) and vacuum of 250 mm of mercury for 30 min. There should be no air leakage at any point. The permanent deflection of flat plates, after pressure/vacuum has been released, shall not exceed the values given below:

<i>Length of Plate</i>	<i>Deflection</i>
Up to 750 mm	5 mm
751 mm to 1 250 mm	6.5 mm
1 251 mm to 1 750 mm	8.0 mm

NOTES

1. Permanent deflection is not applicable for corrugations.
2. Vacuum is not applicable for corrugations.

(Page 15, clause 21.5.3.2) — Substitute the following for the existing:

21.5.3.1 Pressure (routine test)

For transformers up to 25 kVA

The transformer tank shall be tested at a pressure of 35 kPa for 10 min (15 kPa for 10 min for corrugated tanks). There should be no leakage at any point.

For transformers above 25 kVA up to and including 100 kVA

The transformer tank shall be tested at a pressure of 35 kPa for 10 min (15 kPa for 10 min for corrugated tanks). There should be no leakage at any point.

(Page 15, clause 21.5.3.3) — Substitute the following for the existing:

21.5.3.3 Oil leakage test (routine test)

For transformers up to and including 100 kVA

The assembled transformer for with all fittings including bushings in position, shall be tested at a pressure equivalent to twice the normal head measured at the base of the tank for 6 h. There should be no leakage at any point. Tank with corrugations shall be tested for oil leakage test at a

pressure of 15 kPa measured at the top of the tank for 6 h. There should be no leakage at any point.

(Page 15, Annex A) — Substitute 'IS 3024 : 2015' for 'IS 3024 : 2006'.