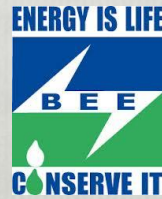


# Know your Star Label & Make a Right Choice



## Session 2

National Retailer Training Programme

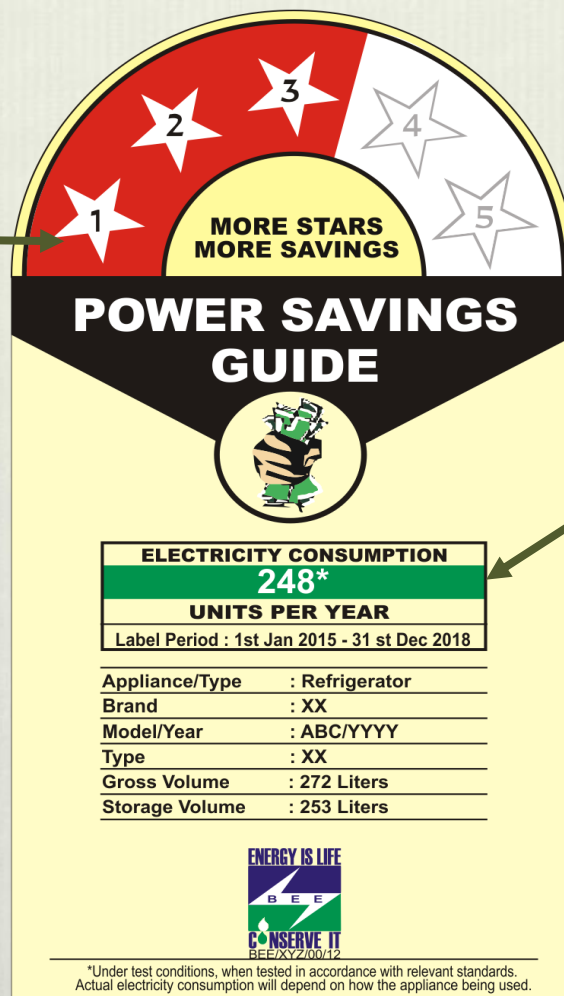
# What Star Label Says?

- ◆ More stars more savings
- ◆ Efficiency parameters
- ◆ Brand & Model details
- ◆ Technical Parameters
- ◆ Applicable dates of standard
- ◆ Manufacturing year

# Star Label Description

More Stars  
More Savings

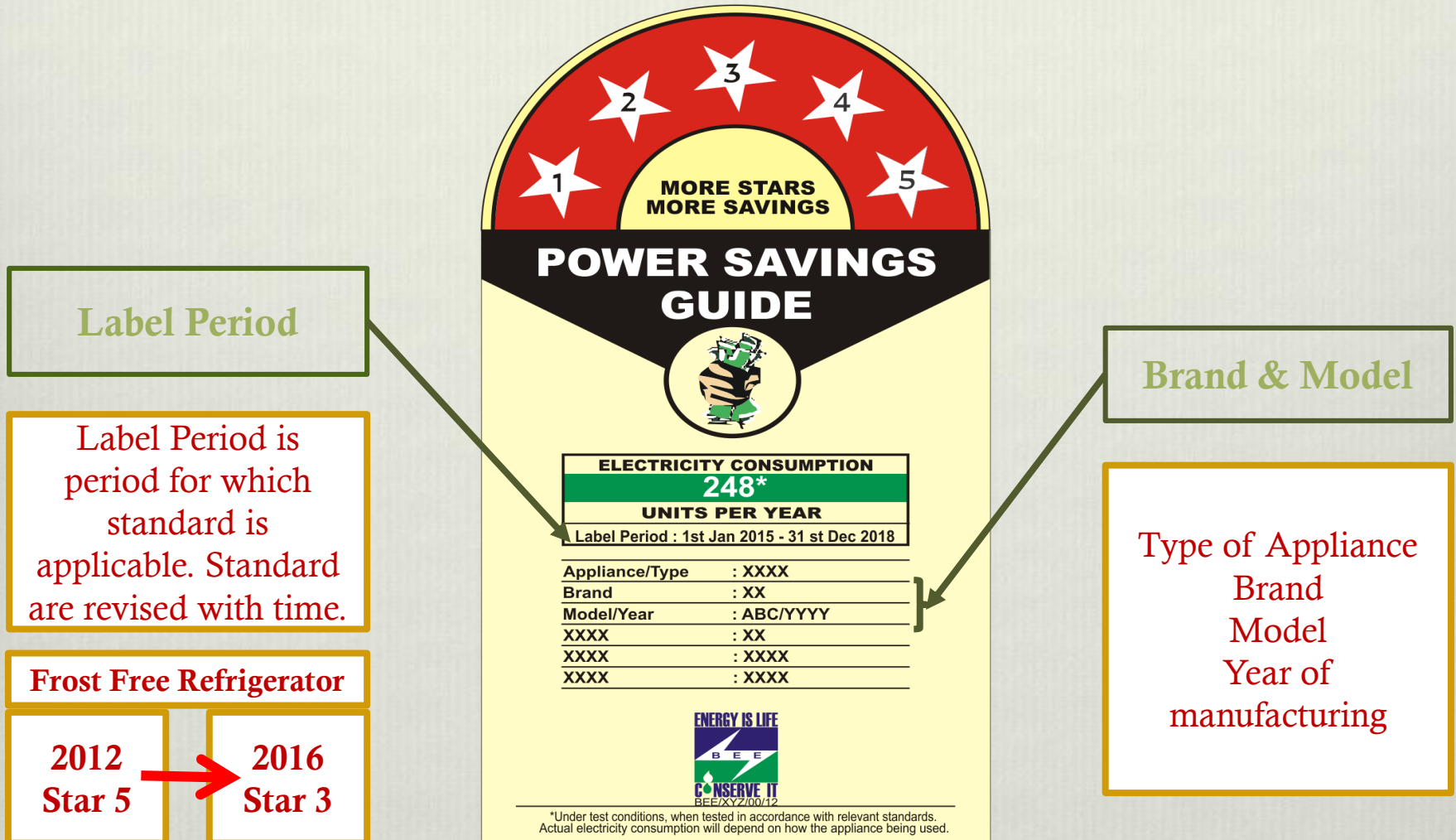
When comparing  
similar sized products  
look for **more stars**  
and save money



Efficiency  
Parameter

Lower Electricity  
Consumption means  
higher savings.  
Sometimes  
efficiency is written  
(eg. AC), where  
higher is better

# Star Label Description





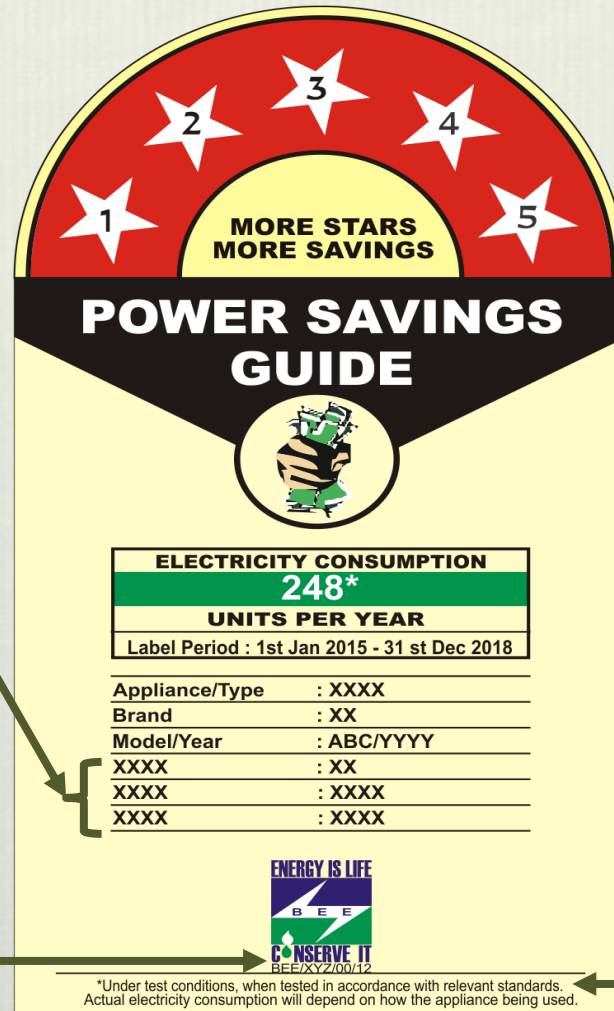
# Star Label Description

- Air Conditioners (All)
- Refrigerators (All)
- Distribution Transformer
- Geysers
- Washing Machine
- Inverter
- LED Lamps
- DG Set

## Technical Details

Technical parameters  
with respect to the  
appliance type

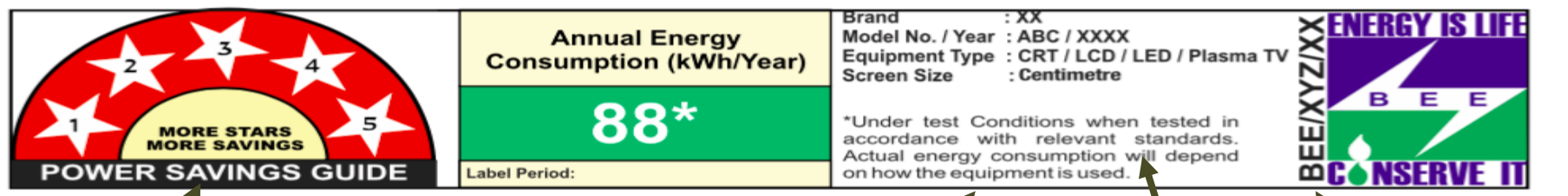
## Unique Code



Applicable standard  
& test conditions for  
the appliance type

## Applicable Conditions

# Other Type of Labels



More Stars  
More Savings

When comparing similar sized products look for **more stars** and **save money**

- TFL

- Colour Television
- LPG Stove

Star rating plan

Applicable standard & test conditions for the appliance type

Applicable Conditions

Unique Code



# Other Type of Labels

- Agriculture Pump (All)
- DG Monoset Pumps

Unique Code

More Stars  
More Savings




When comparing similar sized products look for **more stars** and save money

Technical Details

Technical parameters with respect to the appliance type

Applicable Conditions

Applicable standard & test conditions for the appliance type

		Overall Efficiency of the Pump set* :				IS - 8034	
SUBMERSIBLE PUMPSET				Manufacturers Logo if available			
TYPE	S.NO	Model No/ Year	kW/HP				
Del.SIZE mm	HEAD m	Dis. IPS	CAPACITY RANGE Ips	IPkW			
rpm	OVERALL EFF. %	Operating Head Range m		Min.Sub m:			
V	+6% -15%	Hz	Min.Bore Size mm	No.of Stages	Max Current		
DUTY	S1	CONN	Phase	MONTH	YEAR		
Name of the manufacturer with complete address							
*Under test conditions when tested in accordance with relevant IS No., the actual energy Consumption will depend on how the equipment is being used							

# Other Type of Labels

- Ceiling Fan
- Induction Motors

## Technical Details

Technical parameters  
with respect to the  
appliance type

## Unique Code

## More Stars More Savings

When comparing  
similar sized  
products look for  
**more stars** and  
save money



## Applicable Conditions

Applicable standard  
& test conditions for  
the appliance type



# Other Type of Labels

- Computers/Laptops
- Office Equipment



# How to Check Authenticity

## STEP 1

- Go to BEE official website & Click on Search and Compare

[www.beestarlabel.com](http://www.beestarlabel.com)



## Search & Compare



Frost Free Refrigerator

Schedule 1



TFL

Schedule 2



AC

Schedule 3



Distribution Transformer

Schedule 4

- Click on the equipment of your interest

## STEP 2

## STEP 3

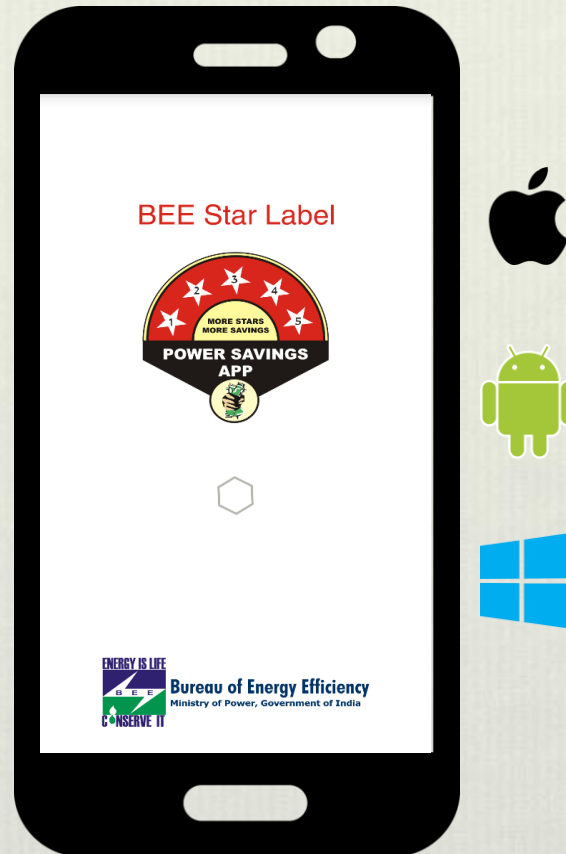
- Check the specification of the equipment

Brand[12]	Model[329]	Gross Volume (litres)	Storage volume (litres)	Electricity Consumption (unit per year)	Star Rating
Select All	Select All	Select All	Select All	Select All	Select All
BOSCH	GN-M702HSH	190	174	184.69	1
ELECTROLUX	GC-B519ESQ	200	189	190	2
GODREJ	GN-M602HLH	231	211	194	3
HAIER	GN-M702HLH	235	214	195	4
HITACHI	GR-M772HLH	240	218	198	5

Please Select the search criteria

# How to Check Authenticity

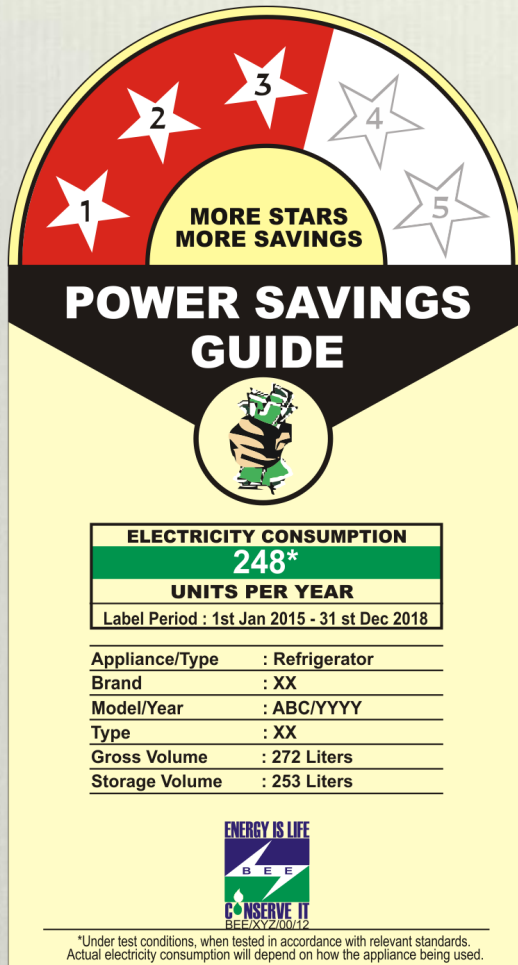
◆ Or Mobile App\*



Search “bee star label”

\*Details in Session 3

# 1. Frost Free Refrigerator



## Mandatory Appliance

**Standard:** IS 15750:2006

Section 14(b): S.O.182 dated 12.01.2009

Section 14 (a): S.O. 183 dated 12.01.2009

Regulation: No.2 /11(5)/03-BEE dated 07.07.2009

**Star Labeling Parameter**  
**Annual Energy Consumption**



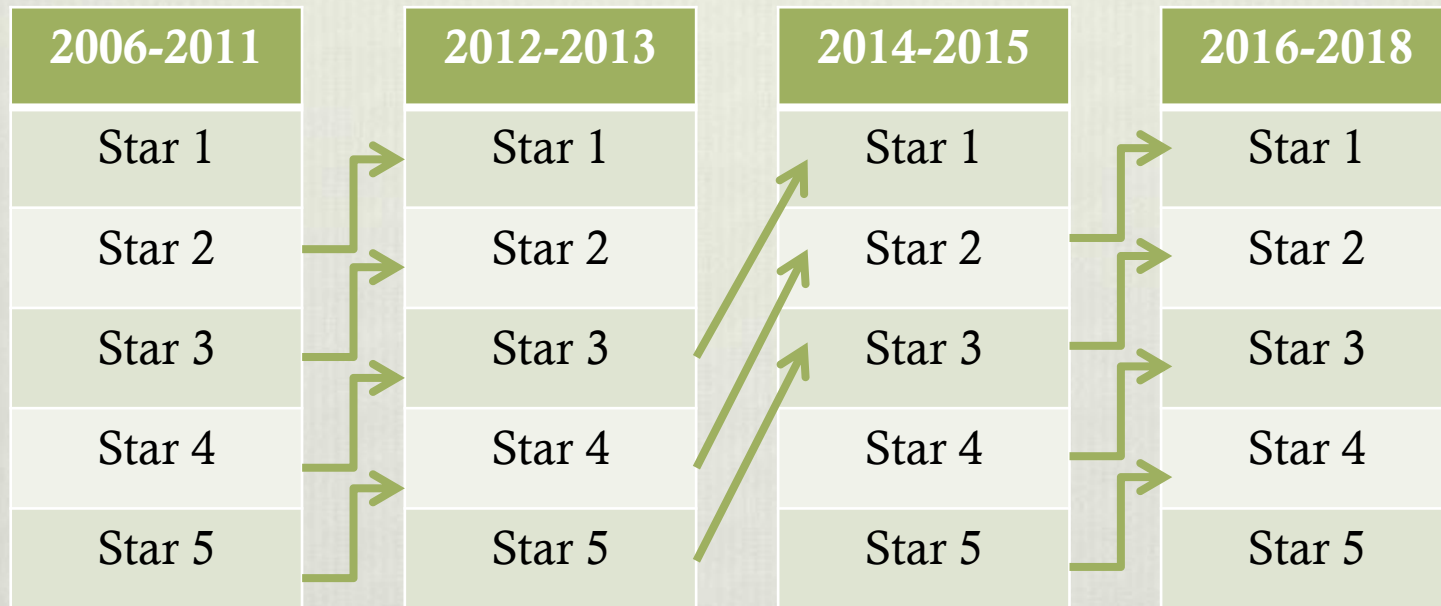
Lower is Better

Bureau of Energy Efficiency



# 1. Frost Free Refrigerator

## Star Label Up-gradation



# 1. Frost Free Refrigerator

Star Rating Band	CEC Criteria
1 Star	$(0.286 \cdot V_{adj\_tot\_nf} + 249) \leq CEC < (0.357 \cdot V_{adj\_tot\_nf} + 311)$
2 Star	$(0.228 \cdot V_{adj\_tot\_nf} + 199) \leq CEC < (0.286 \cdot V_{adj\_tot\_nf} + 249)$
3 Star	$(0.183 \cdot V_{adj\_tot\_nf} + 159) \leq CEC < (0.228 \cdot V_{adj\_tot\_nf} + 199)$
4 Star	$(0.146 \cdot V_{adj\_tot\_nf} + 127) \leq CEC < (0.183 \cdot V_{adj\_tot\_nf} + 159)$
5 Star	$CEC < (0.146 \cdot V_{adj\_tot\_nf} + 127)$

*Total Adjusted Storage Volume for no frost  
 $(V_{adj\_tot\_nf}) = \text{fresh food storage volume} + 1.62 \cdot \text{freezer storage volume}$*

Storage Volume	Star 1 Energy Consumption	Star 5 Energy Consumption	Savings (Rs)
190	379	155	1120
250	400	164	1184
300	418	171	1237
350	436	178	1289
400	454	185	1342
450	472	193	1395

*Assuming Rs 5 per kWh.  
 Refrigerator under standard conditions*

## 2. Direct Cool Refrigerator



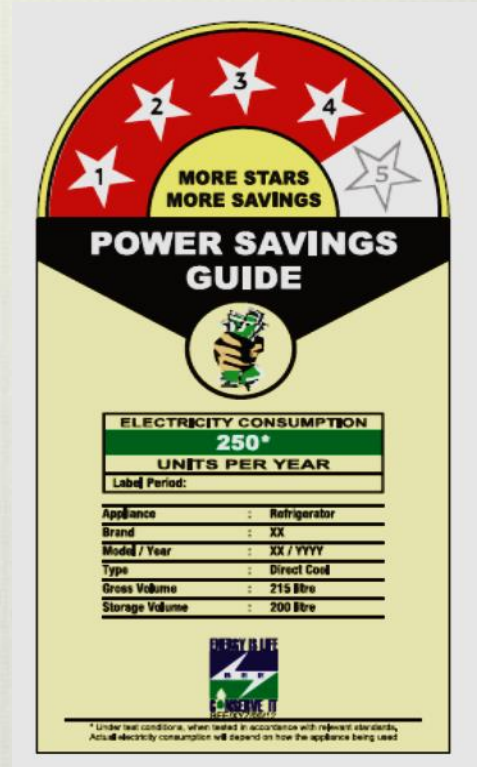
### Mandatory Appliance

**Standard:** IS 1476 (Part 1):2000

Section 14(a): S.O.1899 dated 26.05.2016

Section 14 (b): S.O. 1898 dated 26.05.2016

Regulation:  
BEE/S&L/Ref/70/2016-17 dated 07.07.2009



### Star Labeling Parameter Annual Energy Consumption

Lower is Better

## 2. Direct Cool Refrigerator

### Star Label Up-gradation

2015-2016		2017-2018
Star 1		Star 1
Star 2		Star 2
Star 3		Star 3
Star 4		Star 4
Star 5		Star 5



## 2. Direct Cool Refrigerator

Star Rating Band	Minimum CEC
1 Star	$0.264 * V_{adj\_tot\_dc} + 221 \leq CEC < 0.33 * V_{adj\_tot\_dc} + 277$
2 Star	$0.211 * V_{adj\_tot\_dc} + 177 \leq CEC < 0.264 * V_{adj\_tot\_dc} + 221$
3 Star	$0.169 * V_{adj\_tot\_dc} + 141 \leq CEC < 0.211 * V_{adj\_tot\_dc} + 177$
4 Star	$0.135 * V_{adj\_tot\_dc} + 113 \leq CEC < 0.169 * V_{adj\_tot\_dc} + 141$
5 Star	$CEC < 0.135 * V_{adj\_tot\_dc} + 113$

*Total Adjusted Storage Volume for no frost  
( $V_{adj\_tot\_dc}$ ) = fresh food storage volume + 1.31 \* freezer storage volume*

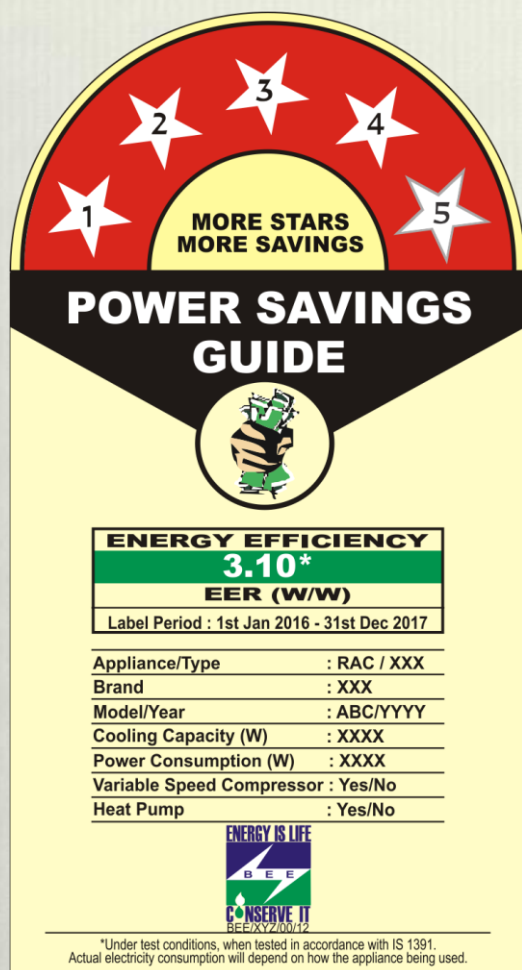
Storage Volume	Star 1 Energy Consumption	Star 5 Energy Consumption	Savings (Rs)
190	339	138	1005
210	346	141	1024
230	352	144	1044
260	362	148	1073
290	372	152	1102
310	379	154	1122

*Assuming Rs 5 per kWh.  
Refrigerator under standard conditions*

# Energy Saving Tips for Refrigerator

- ◆ Allow the hot food to cool first, then put in the fridge.
- ◆ **Do not overfill your refrigerator** : Excessive loading of refrigerator, create trouble in the circulation of cold air inside.
- ◆ **Set the refrigerator temperature as per need** : Refrigerator set to lower than needed will increase your energy consumption by - 20 to 25 %.
- ◆ **Don't open refrigerator door unnecessarily** : Frequently opening of refrigerator door will increase energy consumption by 7%.
- ◆ **Clean it regularly** : By cleaning up the condenser coil, you can reduce energy consumption by approx. 5%.
- ◆ **To get extra saving go for star labelled refrigerator**: Old inefficient refrigerators consumes as much as 40% more energy than a five star rated refrigerator.

# 3. Room Air Conditioner



## Mandatory Appliance

**Standard:** IS 1391:1992

Section 14(b): S.O.180(E)  
dated 12.01.2009

Section 14 (a): S.O. 181 (E)  
dated 12.01.2009

Regulation: No.2 /11(5)/03-  
BEE dated 06.07.2009

**Star Labeling Parameter**  
**Energy Efficiency Ratio**

## Split AC



## Window AC

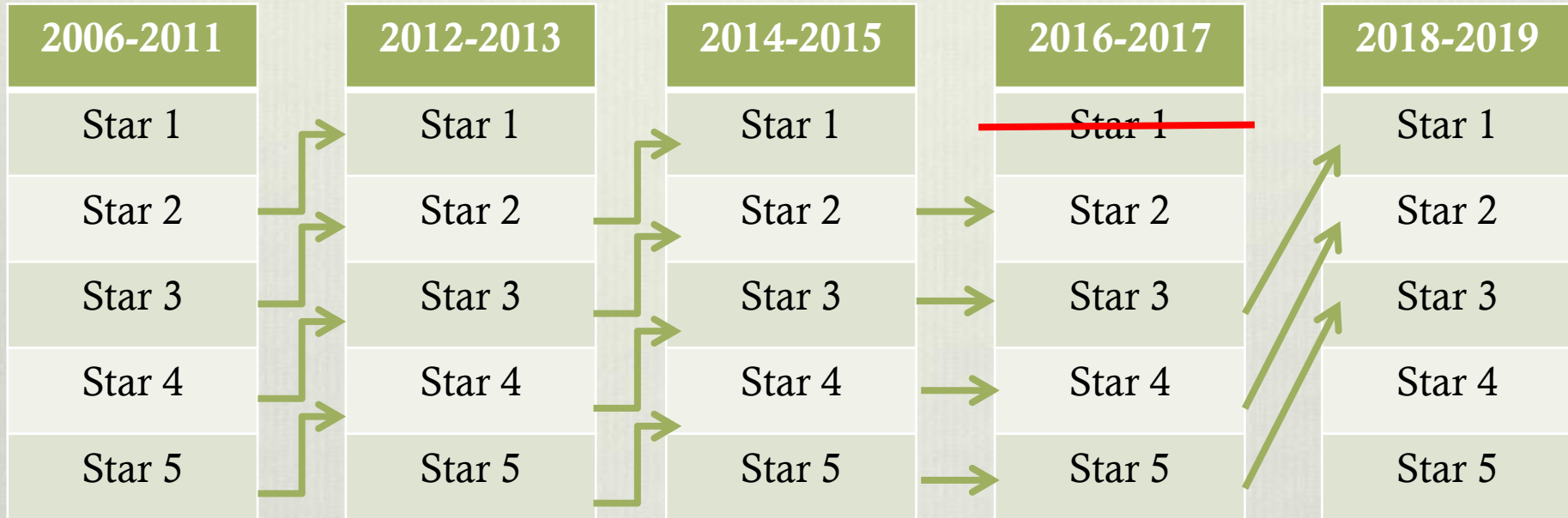


Higher is Better

Bureau of Energy Efficiency

# 3. Room Air Conditioner

## Star Label Up-gradation for Split AC



**2016-17**

Star Level	Min EER	Max EER
Star 1	2.70	2.89
Star 2	2.90	2.99
Star 3	3.10	3.29
Star 4	3.30	3.49
Star 5	3.50	-



# 3. Room Air Conditioner

## Star Label Up-gradation for Window AC

2006-2013		2014-2015		2016-2017
Star 1		Star 1		<del>Star 1</del>
Star 2	→	Star 2	→	Star 2
Star 3	→	Star 3	→	Star 3
Star 4	→	Star 4	→	Star 4
Star 5	→	Star 5	→	Star 5

### 2016-17

Star Level	Min EER	Max EER
Star 1	2.50	2.69
Star 2	2.70	2.89
Star 3	2.90	3.09
Star 4	3.10	3.29
Star 5	3.30	-

# Energy & Cost Saving for 1.5 Ton Split Air Conditioner at Different Star Rating

Star Rating	EER	Cooling Capacity (Watts)	Input Power (Watts)	Units Consumption/ Day	Per Unit Charge (approx.)	Electricity Cost/Month	Cost Saving per year (w.r.t. Base Star)
				kWh	Rs.	Rs.	Rs.
<b>Base Star</b>	2.5	5200	2080	17	4	2040	0
1	2.7	5200	1926	15	4	1800	1200
2	2.9	5200	1793	14	4	1680	1800
3	3.1	5200	1677	13	4	1560	2400
4	3.3	5200	1576	13	4	1560	2400
5	3.5	5200	1486	12	4	1440	3000

Note: Assuming 8 hours operation per day for five months in year

## 4. Cassette Type Air Conditioner

- ◆ Included in the same category in Jan 2016 as of Split Air Conditioners

### Mandatory Appliance

**Standard:** IS 1391:1992

Section 14(b): S.O.180(E)  
dated 12.01.2009

Section 14 (a): S.O.3543(E)  
dated 30.12.2015

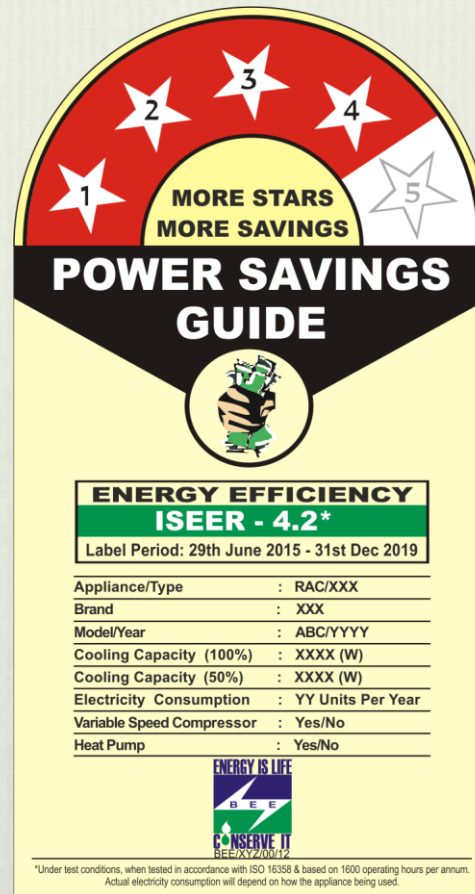
Regulation: No.2 /11(5)/03-  
BEE dated 06.07.2009

**Star Labeling Parameter**  
Energy Efficiency Ratio



# 5. Inverter Type Air Conditioner

Star Level	Min ISEER	Max ISEER
Star 1	3.10	3.29
Star 2	3.30	3.49
Star 3	3.50	3.99
Star 4	4.00	4.49
Star 5	4.50	-



**Voluntary Appliance**

**Standard:** IS 1391:1992  
ISO 16358-1: 2013

**Star Labeling Parameter**  
Indian Seasonal Energy  
Efficiency Ratio (ISEER)



# 5. Inverter Type Air Conditioner

- ◆ How to compare Inverter Split with Normal fixed speed split AC
  - ◆ EER value is equivalent to ISEER
  - ◆ Annual Energy Consumption with ISEER methodology is available on [www.beestarlabel.com/](http://www.beestarlabel.com/)

**Bureau of Energy Efficiency**  
Ministry of Power, Government of India

Search and Compare for Room Air Conditioner

Brand [49]	Type	Model [394]	Energy Efficiency Ratio (EER)(W/W)	Nominal Marketing Capacity (in Ton)	Star Rating
Select All	Select All	Select All	Select All	Select All	Select All
AUX	CASSETTE AIR CONDITI	4501276	2.71	0.7	1
AVI	FLOOR STANDING TOW	WASC18GNBWM	2.72	0.75	2
BLUE STAR	CELLING/FLOOR AIR CC	WASC12GGBWM	2.73	0.8	3
CARRIER	CORNER AIR CONDITIO	WWN18CRA-D	2.74	0.8T	4
CHIGO	SPLIT AIR CONDITIONE	WSM18CRG-C1	2.75	0.9	5
CROMA	WINDOW AIR CONDITIO	WSM12CRG-C1	2.76	1	

SEARCH BACK

You Searched for:

Brand	ALL	Model	ALL
Nominal Marketing Capacity (in Ton)	ALL	Energy Efficiency Ratio (EER)(W/W)	ALL
Type	ALL	Star Rating	5

Export to PDF

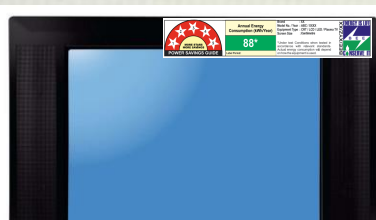
S.No	Brand Name	Type	Model Number	EER(W/W) & Equivalent ISEER	Nom. Marke. Cap. (Ton)	Cooling Capacity (W)	Power Cons. (W)	Seasonal Energy Consumption (CSEC) (KWh)	Valid Till Date	Star Rating
1	WHITE WESTINGHOUSE	Split air conditioner	WASC18GNBWM	3.51	1.5	5270	1501	1161.93	31-12-2017	5
2	WHITE WESTINGHOUSE	Split air conditioner	WASC12GGBWM	3.51	1	3550	1011	782.62	31-12-2017	5

# Energy Saving Tips for AC

- ◆ Set the room temperature between 25°C to 27°C.
- ◆ When a hot day is expected, turn on the air conditioner early rather than wait until the building becomes hot.
- ◆ Adjust air conditioner louvres towards the ceiling (as cool air falls).
- ◆ Have your unit serviced regularly, and keep filters clean.
- ◆ Install your air conditioner on the shady side of the building and make sure the air flow around it isn't obstructed.
- ◆ Always prefer a higher star rated air conditioner than a lower rated one. Although higher rated air conditioners are a bit more costly than lower rated ones, but the energy conservation that they provide will act as a profitable investment in the long run.

# 6. Colour Television

## Mandatory Appliance



**Standard:** IEC 62301, IEC 62087

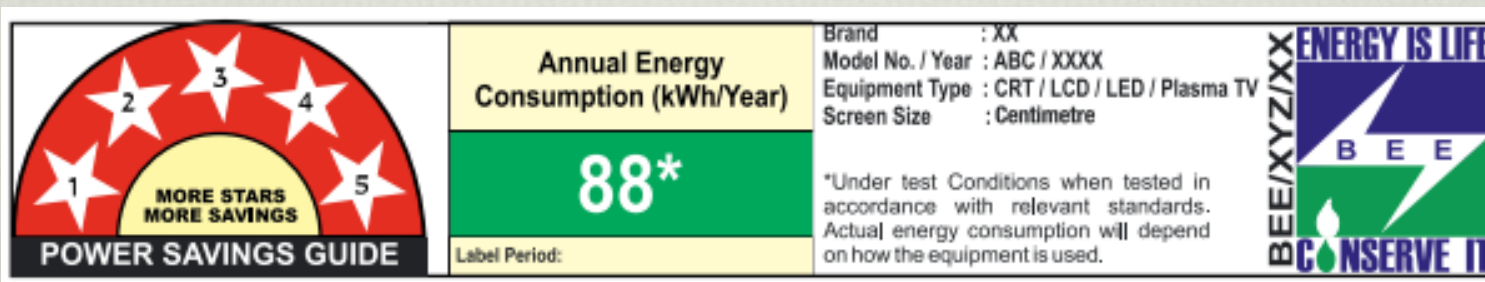
Section 14(a): S.O.1897(E) dated 26.05.2016

Section 14 (b): S.O. 1896(E) dated 26.05.2016

Regulation:  
No.BEE/S&L/CTV/02/2016-17  
dated 26.05.2016

Lower is Better

**Star Labeling Parameter**  
Annual Energy Consumption



# 6. Colour Television

2016-17

A (in square inches)	1 – Star	2 – Star	3 – Star	4 – Star	5 – Star
<b>CRT</b>	$E = (0.578 \times A) + 4.38$	$E = (0.526 \times A) + 4.38$	$E = (0.473 \times A) + 4.38$	$E = (0.421 \times A) + 4.38$	$E = (0.368 \times A) + 4.38$
<b>LCD (with CCFL backlight) / Plasma</b>	$E = (0.386 \times A) + 3.50$	$E = (0.350 \times A) + 3.50$	$E = (0.315 \times A) + 3.50$	$E = (0.280 \times A) + 3.50$	$E = (0.245 \times A) + 3.50$
<b>LCD (with LED backlight)</b>	$E = (0.193 \times A) + 2.63$	$E = (0.175 \times A) + 2.63$	$E = (0.158 \times A) + 2.63$	$E = (0.140 \times A) + 2.63$	$E = (0.123 \times A) + 2.63$

LED  
TV  
2016-17

Screen Size (inches)	Screen Area (sq inches)	Maximum Annual Energy Consumption in kWh/Year				
		1 – Star	2 – Star	3 – Star	4 – Star	5 – Star
		$E = (0.193 \times A) + 2.63$	$E = (0.175 \times A) + 2.63$	$E = (0.158 \times A) + 2.63$	$E = (0.140 \times A) + 2.63$	$E = (0.123 \times A) + 2.63$
20	170.9	36	33	30	27	24
26	288.9	58	53	48	43	38
32	437.6	87	79	72	64	56
37	585.0	115	105	95	85	74
42	753.8	148	135	121	108	95
46	904.2	177	161	145	129	113
50	1068.2	209	190	171	152	134
55	1292.6	252	229	206	184	161

\*Aspect Ratio considered in the example is 16:9



# Energy and Cost Saving of Colour Television

Screen Size (inches)	Base Star AEC (kWh/year)	5 Star AEC (kWh/year)	Energy Saving (kWh/year)	Monetary Saving (Rs./year) @ 5 Rs. per unit (kWh)
37 (LED)	115	74	41	205
37(LCD & Plasma TV)	229	147	82	410
32(CRT)	289	185	104	520

# Energy Saving Tips for TV

- ◆ Replace your CRT & LCD TV with LED TV and save energy:

Screen Size (inches)	CRT TV AEC (1 Star)	LCD TV AEC (1 Star)	LED TV AEC (5 Star)	Saving Against CRT TV	Saving Against LCD TV	Saving Against CRT TV	Saving Against LCD TV
32	289	172	56	233	116	1165	580

- ◆ Turn the TV off from power plug when not in use.
- ◆ Turn the brightness down and use the power saving mode if available.
- ◆ Think about the size of screen – larger screens can consume more electricity than smaller screens.

# 7. Distribution Transformer

## Mandatory Appliance



**Standard:** IS 1180, IS 2026 and IS2500

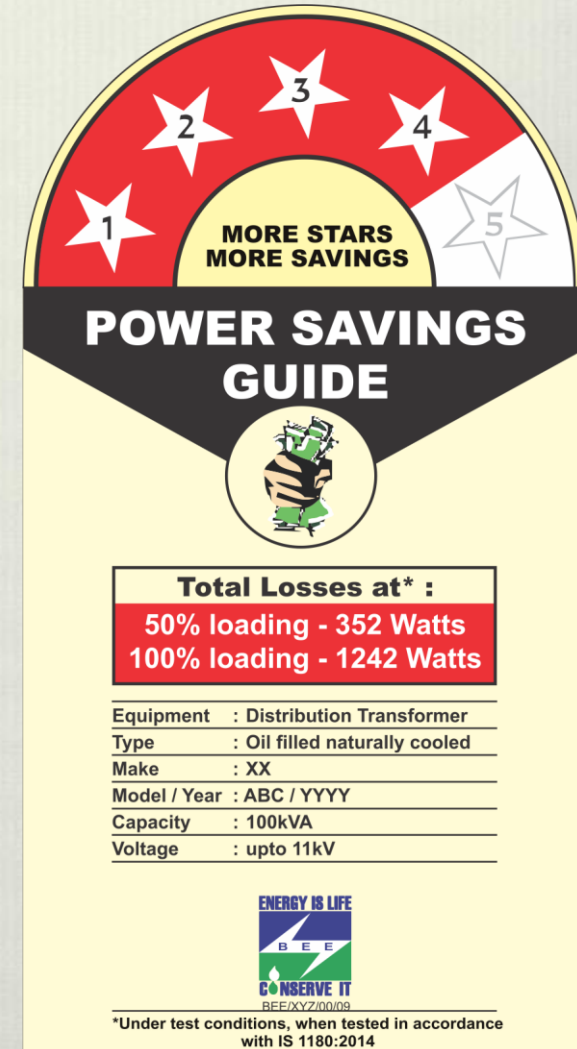
Section 14(a): S.O.4062 (E) dated 16.12.2016

Section 14 (b): S.O. 184(E) dated 12.01.2009

Regulation: No.2 /11(5)/03-BEE dated 05.01.2010

Lesser is Better

**Star Labeling Parameter**  
Load Loss



# 7. Distribution Transformer

Table 1 (Valid up to 30<sup>th</sup> June, 2017)

Rating kVA	1 Star		2 Star		3 Star		4 Star		5 Star	
	Max. losses at 50% (watts)	Max. losses at 100% (watts)	Max. losses at 50% (watts)	Max. losses at 100% (watts)	Max. losses at 50% (watts)	Max. losses at 100% (watts)	Max. losses at 50% (watts)	Max. losses at 100% (watts)	Max. losses at 50% (watts)	Max. losses at 100% (watts)
16	200	555	165	520	150	480	135	440	120	400
25	290	785	235	740	210	695	190	635	175	595
63	490	1415	430	1335	380	1250	340	1140	300	1050
100	700	2020	610	1910	520	1800	475	1650	435	1500
160	1000	2800	880	2550	770	2200	670	1950	570	1700
200	1130	3300	1010	3000	890	2700	780	2300	670	2100



# Energy & Cost Saving for DT

Rating (KVA)	Base Loss at 50%	Loss for 5 Star at 50%	Energy Saving (kWh/year)	Cost Saving (Rs./year) (Rs. 5/unit)
25	290	175	1007	~5000
100	700	435	2321	~11600
200	1130	670	4029	~20150

# Table 2 (Effective from 1<sup>st</sup> July, 2017 onwards) up to 200 kVA rating

## Standard Losses in watts up to 11 KV Class

Rating (kVA)	Star 1		Star 2		Star 3		Star 4		Star 5	
	50 Per cent. Load	100 Per cent. Load	50 Per cent. Load	100 Per cent. Load	50 Per cent. Load	100 Per cent. Load	50 Per cent. Load	100 Per cent. Load	50 Per cent. Load	100 Per cent. Load
16	135	440	120	400	108	364	97	331	87	301
25	190	635	175	595	158	541	142	493	128	448
63	340	1140	300	1050	270	956	243	870	219	791
100	475	1650	435	1500	392	1365	352	1242	317	1130
160	670	1950	570	1700	513	1547	462	1408	416	1281
200	780	2300	670	2100	603	1911	543	1739	488	1582

# Table 3 (Effective from 1<sup>st</sup> July, 2017 onwards) for rating > 200kVA

Standard losses in watts up to 11 KV Class (For ratings above 200 kVA)

Rating (kVA)	Per Cent. Impedance	Star 1		Star 2		Star 3		Star 4		Star 5	
		50 Per Cent. Load	100 Per Cent. Load	50 Per Cent. Load	100 Per Cent. Load	50 Per Cent. Load	100 Per Cent. Load	50 Per Cent. Load	100 Per Cent. Load	50 Per Cent. Load	100 Per Cent. Load
250	4.5	980	2930	920	2700	864	2488	811	2293	761	2113
315	4.5	1025	3100	955	2750	890	2440	829	2164	772	1920
400	4.5	1225	3450	1150	3330	1080	3214	1013	3102	951	2994
500	4.5	1510	4300	1430	4100	1354	3909	1282	3727	1215	3554
630	4.5	1860	5300	1745	4850	1637	4438	1536	4061	1441	3717
1000	5	2790	7700	2620	7000	2460	6364	2310	5785	2170	5259
1250	5	3300	9200	3220	8400	3142	7670	3066	7003	2991	6394
1600	6.25	4200	11800	3970	11300	3753	10821	3547	10363	3353	9924
2000	6.25	5050	15000	4790	14100	4543	13254	4309	12459	4088	11711
2500	6.25	6150	18500	5900	17500	5660	16554	5430	15659	5209	14813";

# 8. Electric Water Heater (Geyser)

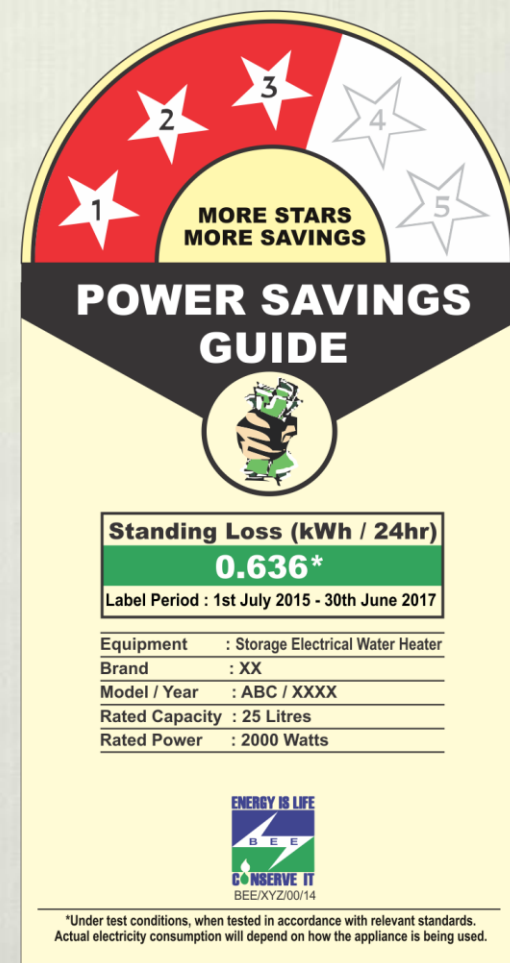
## Mandatory Appliance

**Standard:** IS 2082

Section 14(a): S.O. 2902(E)  
Dated 7.9.2016

Section 14 (b): S.O. 2901(E)  
dated 7.9.2016

Regulation: No.  
BEE/S&L/Water  
heater/3/2015-16



Lesser is Better

**Star Labeling Parameter**  
**Standing Loss**



# 8. Electric Water Heater (Geyser) validity (30<sup>th</sup> June, 2017)

Rated Capacity (Litres)	1 star	2 star	3 star	4 star	5 star
	<b>Standing Losses (kWh/24 hour/45°C)</b>				
6	$\leq 0.469 \ \& \ > 0.426$	$\leq 0.426 \ \& \ > 0.387$	$\leq 0.387 \ \& \ > 0.352$	$\leq 0.352 \ \& \ > 0.320$	$\leq 0.320$
10	$\leq 0.587 \ \& \ > 0.534$	$\leq 0.534 \ \& \ > 0.485$	$\leq 0.485 \ \& \ > 0.441$	$\leq 0.441 \ \& \ > 0.401$	$\leq 0.401$
15	$\leq 0.675 \ \& \ > 0.614$	$\leq 0.614 \ \& \ > 0.558$	$\leq 0.558 \ \& \ > 0.507$	$\leq 0.507 \ \& \ > 0.461$	$\leq 0.461$
25	$\leq 0.823 \ \& \ > 0.748$	$\leq 0.748 \ \& \ > 0.680$	$\leq 0.680 \ \& \ > 0.618$	$\leq 0.618 \ \& \ > 0.562$	$\leq 0.562$
35	$\leq 0.940 \ \& \ > 0.855$	$\leq 0.855 \ \& \ > 0.777$	$\leq 0.777 \ \& \ > 0.706$	$\leq 0.706 \ \& \ > 0.642$	$\leq 0.642$
50	$\leq 1.086 \ \& \ > 0.988$	$\leq 0.988 \ \& \ > 0.898$	$\leq 0.898 \ \& \ > 0.816$	$\leq 0.816 \ \& \ > 0.742$	$\leq 0.742$
70	$\leq 1.233 \ \& \ > 1.121$	$\leq 1.121 \ \& \ > 1.019$	$\leq 1.019 \ \& \ > 0.926$	$\leq 0.926 \ \& \ > 0.842$	$\leq 0.842$
100	$\leq 1.408 \ \& \ > 1.280$	$\leq 1.280 \ \& \ > 1.164$	$\leq 1.164 \ \& \ > 1.058$	$\leq 1.058 \ \& \ > 0.962$	$\leq 0.962$
140	$\leq 1.586 \ \& \ > 1.441$	$\leq 1.441 \ \& \ > 1.310$	$\leq 1.310 \ \& \ > 1.191$	$\leq 1.191 \ \& \ > 1.083$	$\leq 1.083$
200	$\leq 1.761 \ \& \ > 1.601$	$\leq 1.601 \ \& \ > 1.456$	$\leq 1.456 \ \& \ > 1.323$	$\leq 1.323 \ \& \ > 1.203$	$\leq 1.203$

# Energy Saving Calculation

Operation per year = 2.5 hr./day for 100 days

Capacity (KVA)	Base standing losses (kWh/hr)	5 star standing losses (kWh/hr)	Energy Saving (kWh/year)	Cost Saving (Rs. 5 per unit)
25	0.823	0.562	65	325
35	0.940	0.642	75	375
100	1.408	0.962	112	560

# 9. Tubular Fluorescent Light

## Mandatory Appliance



**Standard:** IS 2418:1997

Section 14(a): S.O.179(E)  
dated 16.01.2009

Section 14 (b): S.O. 178(E)  
dated 16.01.2009

Regulation: No.2 /11(5)/03-  
BEE dated 05.01.2010

Higher is Better

**Star Labeling Parameter**  
Lumens per Watt



BEE STAR RATING PLAN					
STAR RATING	*	**	***	****	*****
Lumens per Watt at 0100 hrs of use	<61	>=61 & <67	>=67 & <86	>=86 & <92	>=92
Lumens per Watt at 2000 hrs of use	<52	>=52 & <57	>=57 & <77	>=77 & <83	>=83
Lumens per Watt at 3500 hrs of use	<49	>=49 & <54	>=54 & <73	>=73 & <78	>=78

Under test conditions when  
tested in accordance to IS  
2418. Actual efficiency will  
vary as per site conditions.

# Energy Saving Calculation of TFL

**Example:** Rated Power Consumption= 36 W

5 Star Energy performance = 92 lm/Watt

Light output in terms of Lumens =  $36 \times 92 = 3312$  lm

Base Star Energy Performance = 61 lm/Watt

Base power for the same light output =  $3312/61 = 54$ W

Energy Saving =  $(54-36) \times 1200 / 1000 \sim 22$  kWh/year

Assumption: 1200 hours of operation for full year

Rated Power Consumption (W)	Energy Saved (kWh/year)	Monetary Saving (Rs./year) with 5 rupees per kWh
36	22	110



# 10. LED Lamps

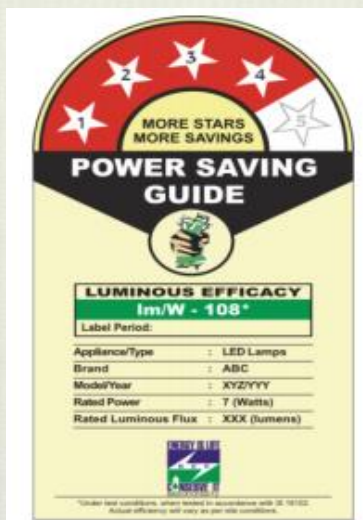


## Voluntary Appliance

Self ballasted non directional general service LED lamps for general lighting services that work on single phase a.c supply up to and including 250 V, 50 Hz

### Standard:

IS 16102:2012- Part 1 &2, IS 16106:2012 & IS 14700 (Part 3/sec2):1999



Star Rating Plan – Voluntary Phase  
(validity up to 31 Dec 2017)

Star Rating	Rated Luminous Efficacy (lm/watt)	Remarks
<del>1 star</del>	<del><math>\geq 68</math> &amp; <math>&lt; 79</math></del>	freezed
2 star	$\geq 79$ & $< 90$	
3 star	$\geq 90$ & $< 105$	
4 star	$\geq 105$ & $< 120$	
5 star	$\geq 120$	

# Energy Saving Calculation of LED

**Example:** Rated Power Consumption = 9 W  
 5 Star Energy performance = 120 lm/Watt  
 Lumen maintenance =  $120 \times 9 = 1080$  lm  
 Base Star Energy Performance = 79 lm/Watt  
 Base power required for the same lumen maintenance =  $1080 / 79 = 14$ W  
 Energy Saving =  $(14 - 9) \times 1200 / 1000 \sim 6$  kWh/year

Capacity (W)	Energy Saving (kWh/year)	Monetary Saving (Rs./year) with 5 rupees per kWh
9	6	30

# Energy Saving Tips for Lighting



- ◆ **Look for lumens, not Watts** - Buy the light bulb that gives off the amount of light you need. Higher lumens mean brighter light.
- ◆ Dirty tube lights and bulbs absorb 50 percent of the light so dust them regularly
- ◆ Use natural lighting during the day.
- ◆ Turn off lights when not in use.

Light output from Incandescent bulb (lm)	Power consumption by Incandescent bulb (W)	Power consumed by CFLs (W) for same light output	Power consumed by LEDs (5 Star) for same light output	Energy Saving against Incandescent bulb (kWh/year)	Energy Saving against CFLs (kWh/year)	Cost Saving compared with Incandescent bulb (Rs./year)(Rs. 5/kWh)	Cost Saving compared with CFLs (Rs./year) (Rs. 5/kWh)
800	60	15	6 -7	~ 64	~ 10	~ 320	~ 50

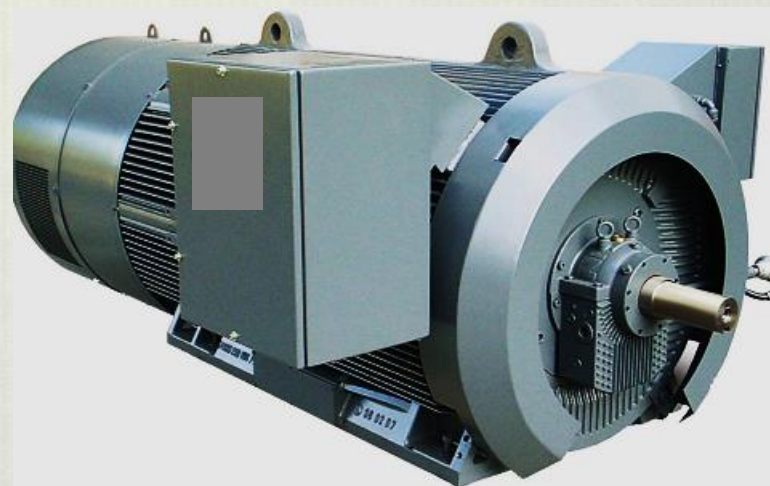
# 11. Induction Motors

**Voluntary Appliance**

**Standard: IS 12615**

	Efficiency(%) : XX%	
	Pole : 3 Phase Induction Motor	
Name of the Manufacturer with complete address		
<small>*Under standard test condition when tested in accordance with relevant IS No., the actual energy Consumption will depend on how the equipment is being used.</small>		

Star Rating	Motor Efficiency Class
1 Star	$\geq \text{IE2} \ \& \ < \text{IE2}(+)$
2 Star	$\geq \text{IE2}(+) \ \& \ < \text{IE3}$
3 Star	$\geq \text{IE3} \ \& \ < \text{IE3}(+)$
4 Star	$\geq \text{IE3}(+) \ \& \ < \text{IE3}(++)$
5 Star	$\geq \text{IE3}(++)$



*IE2 & IE3 values are based on IS 12615:2011*

*IE 2(+) is the intermediate value between IE2 & IE3*




*IE 3(+) is the intermediate value between IE3 & IE3(++)*

*IE 3(++ ) is the value equivalent to IE4 values based on guideline given in IEC 60034-31*

*IE 2 values specified in IS 12615:2011 would be minimum entry level for labelling*



# 12. Agriculture Pump Sets

Overall Efficiency of the Pump set :   

Submersible Pumpset

TYPE  S.NO  Model No/ Year  kW/HP

Del. SIZE mm  HEAD m  Dis. IPS  CAPACITY RANGE lps  IPkW

rpm  OVERALL EFF. %  Operating Head Range m  Min. Sub m:

V  +6% Hz  Min. Bore Size mm  No. of Stages  Max Current

DUTY S1  CONN  Phase  MONTH  YEAR

Name of the manufacturer with complete address

\*Under test conditions when tested in accordance with relevant IS No., the actual energy Consumption will depend on how the equipment is being used

**Voluntary Appliance**

**Standard:**

Openwell: IS 14220  
Mono-set Pump: IS 9079  
Submersible Pump: IS 8034

Star Rating	Performance Factor
1 star	$\geq 1.00$ & $< 1.05$
2 star	$\geq 1.05$ & $< 1.10$
3 star	$\geq 1.10$ & $< 1.15$
4 star	$\geq 1.15$ & $< 1.20$
5 star	$\geq 1.20$



# Energy Saving Calculation for Submersible Pump Set

**Example:** Head = 73 m

Discharge = 6.67 lps, Stage= 7, Rating = 7.5kW

BIS efficiency (i.e 1 star efficiency) = 43.66%

Power consumption (Base) =  $(73 \times 6.67 \times 9.81) / (1000 \times (43.66/100)) = 11 \text{ kW}$

5 Star efficiency =  $1.2 \times 43.66 = 52.39\%$

Power consumed by 5 star energy efficient pump

$= (73 \times 6.67 \times 9.81) / (1000 \times (52.39/100)) = 9 \text{ kW}$

**Energy Saving** =  $(11 - 9) \times 4 \times 200 = 1600 \text{ kWh/year}$

**Cost Saving** (Rs. 5/unit) =  $1600 \times 5 = 8000 \text{ Rs./year}$

Head(meter)	Discharge (lps)	Rating (kW)	Power Consumption for 1 Star (kW)	Power Consumption for 5 Star (kW)	Energy Saving (kWh/year)	Cost Saving (Rs. / Year)
73	6.67	7.5	11	9	1600	8000
122	6.6	13	17.5	14.5	2400	12000
98	3.6	5.6	8.7	7.3	1120	5600

# 14. Ceiling Fans

**Voluntary Appliance**

**Standard: IS 374**



## Star Rating Index Calculation for Ceiling Fans

Star Rating	Service Value for Ceiling Fans
1 star	$\geq 3.2$ to $< 3.4$
2 star	$\geq 3.4$ to $< 3.6$
3 star	$\geq 3.6$ to $< 3.8$
4 star	$\geq 3.8$ to $< 4.0$
5 star	$\geq 4.0$



Model No/Year  
Service Value-3.9\*  
Air Delivery-210 cu m/min  
Size-1200 mm



IS:374



Manufacturer Address and other details if any specified in IS 374

\*Under standard test condition when tested in accordance with IS 374, the actual energy performance will depend on how the equipment is used

# Energy & Cost Saving for Ceiling Fan

**Example:** Air Delivery = 220 cubic meter/minute  
 Service value (Base Star) = 3.2  
 Power consumption (Base Star) =  $220/3.2 = 69W$   
 5 star power consumption =  $220/4 = 55W$   
 Operation: 12 hours a day, for 300 days.  
**Energy Saving** =  $(69-55)*12*300/1000 = 51 \text{ kWh/year}$   
**Cost Saving** (Rs. 5/unit) =  $51*5 = 255$

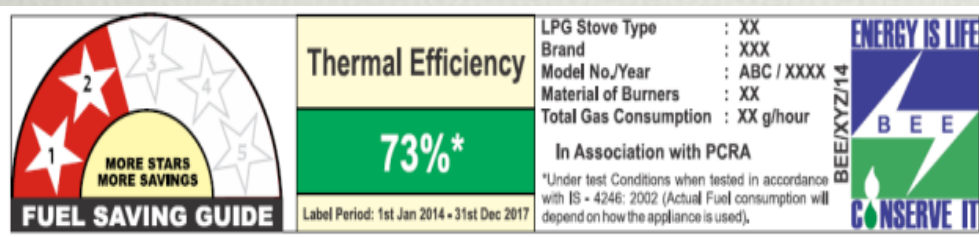
Air Delivery (cmm)	Base Power Consumption (W)	5 Star Power Consumption (W)	Energy Saving (kWh/year)	Cost Saving (Rs./year)
220	69	55	51	255
210	66	53	47	235
228	71	57	51	255



# 14. LPG Stoves

**Voluntary Appliance**

**Standard: IS 4246**



Star Rating	Thermal Efficiency
1 Star	$\geq 68\% \text{ \& } < 72\%$
2 Star	$\geq 72\% \text{ \& } < 75\%$
3 Star	$\geq 75\% \text{ \& } < 78\%$
4 Star	$\geq 78\% \text{ \& } < 81\%$
5 Star	$\geq 81\%$

# 15. Washing Machines

## ◆ Under Abeyance

# 16. Computer (Laptop/Notebook)

**Voluntary Appliance**

**Standard:** ENERGY STAR  
version 6.1



# 17. Ballast (Choke)

**Voluntary Appliance**

**Standard:**

Electromagnetic: IS 1534

Electronic: IS 13021





# 18. Printer/Scanner/MFDs

## Voluntary Appliance

Single Phase Office Equipment namely copiers, printers, fax machines, scanners & multi function devices for office automation

**Standard:**  
Energy Star specification



# 19. Diesel Engine Mono-set Pump

## Voluntary Appliance

Diesel Engine Driven monoset pumps within the range of 2 HP to 10 HP

**Standard:**  
IS 11501:1986



	Specific Fuel Consumption of monoset pump* : g/h/m/l/s			IS - 11501
	Diesel Engine Driven Monoset Pumps for Agricultural Purpose			
		Manufacturers Logo if available		
Pump Type _____	Pump S/N: _____	Model No./Year _____	kW/HP _____	
Suction (size) _____ mm	Delivery (size) _____ mm	Impeller Dia _____ mm		
Full Load Speed _____ rpm	Capacity (Range) _____ (liters/s)			
Duty Point: Head: _____ m	Discharge: _____ l/s			
Fuel Consumption (at Duty Point) _____ cc/hr (at Fuel Density _____ g/cc)				
* Specific Fuel Consumption (SFC) at Duty Point _____ g/h/m/l/s				
Name of the manufacturer with complete address				
Label Period: In Association with PCRA				
*Under test conditions when tested in accordance with relevant IS XXXX the actual energy consumption will depend on how the equipment is being used				

Star Rating	Specific fuel consumption (SFC) in g/h/m/l/s wrt SFC max
1 star	> 0.90 SFCmax to ≤ 1.00 SFCmax
2 star	> 0.80 SFCmax to ≤ 0.90 SFCmax
3 star	> 0.70 SFCmax to ≤ 0.80 SFCmax
4 star	> 0.60 SFCmax to ≤ 0.70 SFCmax
5 star	≤ 0.60 SFCmax

# 20. Solid State Inverter

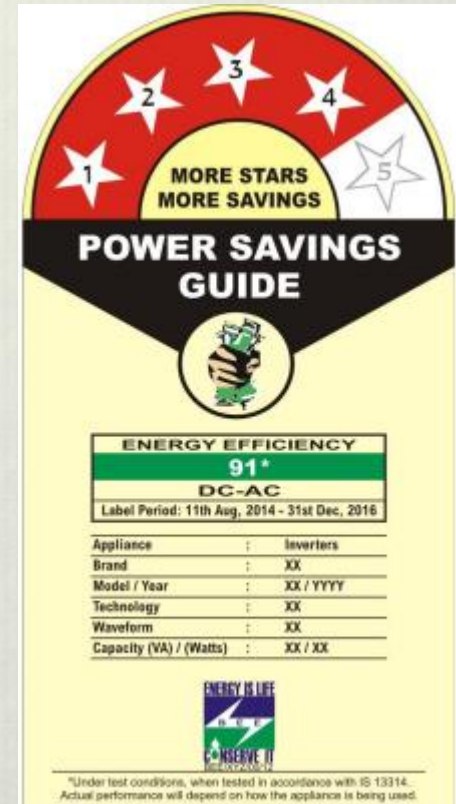
## Voluntary Appliance

Solid State Inverters with output rating between 250 kVA to 2000 kVA run from storage batteries of 12 Volts Direct Current Source

**Standard:**  
IS 13314:1992

Rating Plan for Solid State Inverters run from storage batteries (12 V DC) valid up to 31 Dec 2016

Star Rating	Energy Efficiency (DC to AC)
1 star	83 % up to & including 85%
2 star	Above 85% up to & including 87%
3 star	Above 87% up to & including 89%
4 star	Above 89% up to & including 91%
5 star	Above 91%





# 21. Diesel Generator

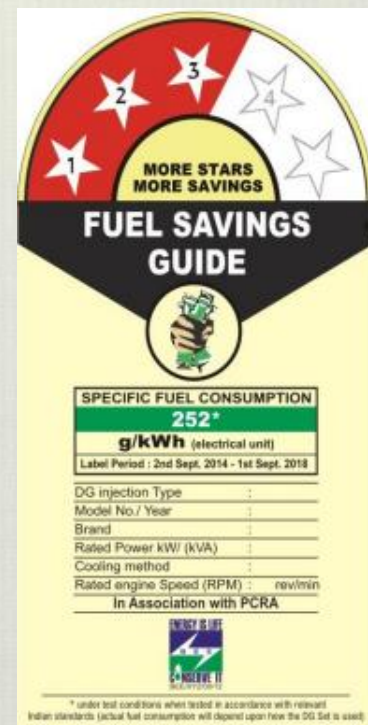
## Voluntary Appliance

Single/ 3 phase DG sets up to 19 kW ratings are covered under the S&L program

### Standard:

IS 10000, IS 10001, IS 13364  
& IS 4889: 1968

Star Level	Specific Fuel Consumption (SFC) in g/kWh
1 star	>302 & ≤ 336
2 star	>272 & ≤ 302
3 star	>245 & ≤ 272
4 star	>220 & ≤ 245
5 star	≤ 220





Thank You for Your Kind Attention