

TECHNICAL SPECIFICATIONS: 20W LED BASED TUBE LIGHT & TUBE LIGHT WITH FITTINGS, 60W LED BASED YARD LIGHTS & 100W LED BASED FLOOD LIGHTS

1.0.0 TECHNICAL AND FUNCTIONAL SPECIFICATIONS

- 1.0.1 To Supply LED light fixtures of 100 & 60 W which are totally enclosed weatherproof fittings with control gear. Also to supply 20 W LED tube lights and tube light with fittings, 18W LED PLL, 8W LED PLS type suitable for illumination of outdoor as well as indoor premises.
- 1.0.2 The 100W yard luminaries shall be installed at BPCL pumping stations street light pole of height 7M to 8M.
- 1.0.3 100W flood lights & 60W yard fittings will be installed on SV Station terrace, normally with height of 4 M-5 M.
- 1.0.4 It should be made out of high quality materials and complying with industrial standard practices to ensure high reliability and long life.
- 1.0.5 The entire fixture shall be capable of withstanding stresses and vibrations likely to be encountered in outdoor conditions by having necessary design/strength and protections inbuilt in its electronics within the specified electrical parameters of the product.

Fixture Parameter	Value
High Efficiency LED manufacturer	CREE/ NICHIA/ OSRAM/ SAMSUNG/ CITIZEN/ PHILIPS/SEOUL
Total Power consumption	8/18/20/100 / 60 W + 10 %
Power Factor	>0.9
Luminous flux efficacy	≥120 Lm/Watt
Usage	Continuous
CRI	≥75
CCT	5000 K-6500 K
THD	≤15%
Efficiency	≥80%
Supply voltage range	120-270V AC
Frequency	47 to 53 Hz
LED Life	>50,000 Burning Hrs
Periodic depreciation	70% Lumen (L70)
View Angle	120 Degree (Min)
Light Colour	Cool white
Driver	Constant current SMPS based LED driver
Operating Temperature	-10 to 50 C
Luminaire Colour/Finish	Silver

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	1

2. ELECTRICAL SPECIFICATIONS

2.1. LED FITTING

- 2.1.1. The LED must be mounted on MCPCB, which should be made up of Metal core (Aluminum metal core) and should have the alumina coating with aerosol spray process of manufacturing to have the better heat conduction or dissipation.
- 2.1.2. All lighting shall maintain CORRELATED COLOUR: 5000K TO 6500K
- 2.1.3. The ballast shall be an integral part of the housing with PF \geq 0.9 and THD \leq 15%.
- 2.1.4. The efficiency of the LED lamps at 85 °C junction temperature shall be more than 85%.
- 2.1.5. Thermal management shall be in such a way that LED soldering point temperature shall not go beyond 75 °C.
- 2.1.6. The output power variation should be less than 10% and the luminaire should perform in the input voltage range of 120-270 V.
- 2.1.7. The LED luminaire shall be free of glare.
- 2.1.8. Electrical connection shall be as per Class I product. Internal Wiring should be High heat/ voltage resistant XLPE/ Silicon insulated tin plated copper wire.
- 2.1.9. The luminaries offered shall conform to Level-1 classification, solidly grounded Class I product for Earthing. The luminaire should have scientific designed Heat Sink to maintain Junction temperature for optimum LED Life.
- 2.1.10. The control gear shall be designed in such a way so that temperature rise of MCPCB shall not be more than 20°C with respect to ambient temperature when measured half inch away from the component.
- 2.1.11. Luminar shall be such that the glare from individual LED is restricted and shall not cause inconvenience.
- 2.1.12. The Diffuser should be used in the luminar to restrict the glare of LEDs. And should have no yellowness during the entire life of the luminaire.

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	2

2.2. LED DRIVER

- 2.2.1. Input voltage Range within 120Vrms to 270Vrms.
- 2.2.2. Operating input voltage 240Vrms.
- 2.2.3. No load power consumption \leq 500mW.
- 2.2.4. Output voltage ripple should be within 3%.
- 2.2.5. Power factor 0.95
- 2.2.6. Full Load Efficiency \geq 90%
- 2.2.7. THD \leq 8 %.
- 2.2.8. Load regulation \pm 5%
- 2.2.9. Maximum Temperature rise \leq 30°C @ 45°C Tamb. with safety margin of 10°C.
- 2.2.10. The driver should comply with CISPR 15 for limits and methods of measurement of Radio Disturbance characteristics.

2.3. ELECTRONIC COMPONENTS

- 2.3.1 IC (Integrated circuit) shall be of industrial grade or above.
- 2.3.2 Metallic film / Paper/Polyester Capacitor shall be rated for a temperature of at least 105°C.
- 2.3.3 The resistors shall be preferably made of metal film of adequate rating. The actual loading versus rating shall be 3.
- 2.3.4 The junction temperature of the Switching devices such as transistors and MOSFETs etc. shall not exceed 125°C (allowing thermal margin of 25 °C).
- 2.3.5 The heat sink compound used should be of silicon with high thermal conductivity with 3W/mk.
- 2.3.6 The heavy components shall be properly fixed. The solder connection shall be with good finish.

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	3

2.3.7 The electronics covered for this equipment shall pass all the tests called for in the specification.

3.0.0 MECHANICAL SPECIFICATIONS

3.0.1 LED luminaries shall be Single piece Die Cast Aluminium alloy Housing.

3.0.2 The housing shall have high conductivity acting as heat sink, with Powder coating with distortion free, clear, Heat Resistant Toughened UV stabilized Glass in the front fixed to the die cast Aluminium frame.

3.0.3 The glass shall be fixed to the housing with high quality long lasting Neoprene Rubber gasket duly impregnated with insecticide and water repellent chemical on the periphery of lamp compartment by means of stainless steel screws to render it dust proof, water proof and vermin proof.

3.0.4 The luminaries shall be having IP-65 Protection for street lights & IP66 for flood lights conforming to **IS: 10322 (part-2) – 1982.**

3.0.5 Especially coated/anodized high quality aluminium reflector to achieve reflectivity of above 95% shall be provided.

3.0.6 The weight of the overall luminaire should be less than 10 KG so that it can be handled / fixed by 1 person.

3.0.7 The luminaries assembly and manufacturing process for the LED source assembly in modules/ arrays shall be designed to assure all internal components are adequately supported to withstand sudden impacts and mechanical shock and vibration from high winds and other sources.

3.0.8 The LED tubelight and tube light with fitting, 18W PLL & 8W PLS shall be provided with drivers such that they are in ready to use condition with normal live and neutral supply (230V AC)

3.0.9 The LED tube light fittings shall be provided with arrangement (pre-fabricated holes in fixture/ mounting arrangement) so that they can be mounted in wall without any hassle.

3.0.9 The fixture shall carry a permanent identification as under:

- Sr.No.
- Name/Year of manufacturing
- Rated wattage (input & output)
- Voltage input
- Batch no. for identification

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	4

4.0.0 INBUILT PROTECTIONS

The Light shall have the following inbuilt protections:

- Over Temperature
- Over Voltage Protection
- Short Circuit. (The output circuit shall have inbuilt short circuit and open circuit protection to the driver unit)
- Transients (Surge Voltage & Current)

5.0.0 CERTIFICATIONS

The equipment offered should also have certifications issued by NABL or NABL approved Lab or Lab approved by DSIR, Ministry of Science & technology, Govt. of India and valid as on the due date of the tender, for critical technical specifications and compliance to standards. The minimum certifications required are:

- Type test certificates
- Acceptance test certificates
- Lumen Depreciation Curve of LEDs used as per L70
- Test report as per LM79 by vendor
- LM 80 report for the LEDs used from manufacturer
- IP-65 /66 certification report as per IS: 10322 (part-2)-1982
- Compliance to the following standards:

- i. EN 60598 (General Requirements & Tests)
- ii. Transient voltages, Voltage dips and fluctuations' shall conform to EN61547 or equivalent.
- iii. EN 61000-3-3 (Flicker)
- iv. EN 55015 (RFI < 30 MHz)

6.0.0 GUARANTEE/WARRANTY

Materials i.e. the full luminary shall be guaranteed against manufacturing defects, materials, workmanship and design for a period of 5 years from the date of receipt of material. Guarantee for replacement of material / accessories should be provided free of charges at our premises. The above guarantee will be without prejudice to the certificate of inspection or material receipt note issued by us in respect of the materials.

The malfunctioning equipment should be replaced within 10 days of reporting by BPCL. RCA (root cause analysis) shall be submitted by the vendor without any charges to assess the performance of the luminary, thereof.

7.0.0 DOCUMENTS TO BE SUBMITTED ALONG WITH BID

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	5

- The bidder shall furnish GA dimensional drawings with all views of Luminary pertaining to the model offered along with the technical bid.
- Type test certificates as mentioned above under Test Certificates
- Technical Catalogue of product
- Operating/fixing manuals / technical leaflets giving all the details of Installation, operation and maintenance.
- Certificates supporting periodic depreciation value.

8.0.0 TESTING

These tests are carried out by an inspecting authority of BPCL at the supplier's premises on sample taken from a lot for the purpose of acceptance of a lot. Acceptance tests shall not be carried out from particular size from the lot on which type tests have already been conducted.

8.0.1 TESTING PLAN

Sl. No.	Description of test	Type Test	Acceptance Test	Routine Test
1	Visual and Dimensional check	Y	Y	Y
2	Checking of documents of purchase of LED	Y	Y	Y
3	Resistance to humidity	Y	-	-
4	Insulation resistance test	Y	Y	Y
5	HV test	Y	Y	Y
6	Over voltage protection	Y	-	-
7	Surge protection	Y	-	-
8	Reverse polarity	Y	Y	Y
9	Temperature rise Test	Y	-	-
10	Ra (Colour Rendering Index) measurement test	Y	-	-
11	Lux measurement	Y	Y	Y
12	Fire retardant Test	Y		
13	Test for IP65 protection	Y	-	-
14	Environmental tests	Y	-	-
15	Reliability Test	Y	-	-
16	Life Test	Y	-	-
17	Endurance Test	Y	-	-
18	EMI/EMC	Y	-	-

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	6

8.0.2 Visual and Dimensional Check:

The unit shall be checked visually for all dimensions as per approved design and drawing. General workmanship should be good; all the components properly secured and sharp edges shall be rounded off. Check the marking and quality of the workmanship visually. Check the rating and make of electronic / electrical items.

8.0.3 Check Document of purchase of LED lamps of approved sources

8.0.4 Insulation resistance test

The insulation resistance of the unit between earth and current carrying parts shorted together shall not be less than 2 M when measured with 500V megger.

8.0.5 HV test

Immediately after insulation resistance test, an AC voltage of 1.72 KV rms (1500 + 2 x rated voltage) of sine wave form of 50 Hz shall be applied for one minute between the live parts and frame. There shall not be any kind of break down, flashover or tripping of supply.

8.0.6 Reverse polarity

The Luminaire shall withstand polarity reversal. It shall be operated with reverse voltage for 5 minutes at maximum value of voltage range. At the end of this period, the supply shall be made correct polarity and Luminaire shall operate in a normal way.

8.0.7 Lux measurement

Lux measurement with the help of Lux meter shall be done at a distance as per relevant standard.

9.0.0 DELIVERY PERIOD

Six week from date of PO.

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	7

ANNEXURE:

PROCUREMENT OF LED LIGHT FITTINGS			
SR.NO	DESCRIPTION	QTY	UNIT
1	Procurement of 60W TERRACE LED lights at Mumbai, MUPL SV01	4.0	NO
2	Procurement of 60W TERRACE LED lights at Manmad, SV 15 TO 20 & JAV	6.0	NO
3	Procurement of 60W TERRACE LED lights at Sanghavi & SV 21	32.0	NO
4	Procurement of 60W TERRACE LED lights at GUJARI & SV 22 TO 25	66.0	NO
5	Procurement of 60W TERRACE LED lights at MANGLIYA & SV 26 TO 32	66.0	NO
6	Procurement of 60W TERRACE LED lights at Uran	13.0	NO
7	Procurement of 60W TERRACE LED lights at Kota, Sherpur to SV 37	5.0	NO
8	Procurement of 60W TERRACE LED lights at Malarna	17.0	NO
9	Procurement of 100W LED Flood lights at SANGHAVI & SV 21	37.0	NO
10	Procurement of 100W LED Flood lights at GUJARI & SV 22 TO 25	42.0	NO
11	Procurement of 100W LED Flood lights at MANGLIYA & SV 29 TO 32	18.0	NO
12	Procurement of 100W LED Flood lights at Malarna 7 SV 38 TO 40	16.0	NO
13	Procurement of 100W LED Flood lights at Bharatpur	12.0	NO
14	Procurement of 100W LED Flood lights at Mathura	4.0	NO

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	8

15	Procurement of 100W LED Flood lights at Piyala & Bijwasan	16.0	NO
16	Procurement of T8 20W LED tube lights at Mumbai & MUPL SV01	102.0	NO
17	Procurement off T8 20W LED tube lights at Uran	147.0	NO
18	Procurement ofT8 20W LED tube lights at Manmad	235.0	NO
19	Procurement ofT8 20W LED tube lights with fitting at Sanghavi	72.0	NO
20	Procurement ofT8 20W LED tube lights with fitting at Gujari	158.0	NO
21	Procurement of T8 20W LED tube lights with fittings at Mangliya	154.0	NO
22	Procurement of T8 20W LED tube lights at Kota	286.0	NO
23	Procurement of T8 20W LED tube lights at Malarna	86.0	NO
24	Procurement of T8 20W LED tube lights at Bharatpur	116.0	NO
25	Procurement of T8 20W LED tube lights at Mathura	180.0	NO
26	Procurement of T8 20W LED tube lights at Piyala & Bijwasan	308.0	NO
27	Procurement of T8 20W LED tube lights at Bijwasan	140.0	NO
28	Procurement of T8 20W LED tube lights at Bina	315.0	NO
29	Procurement of T8 20W LED tube light with fitting at Mumbai & MUPL SV01	15.0	NO
30	Procurement off T8 20W LED tube light with fitting at Uran	22.0	NO
31	Procurement ofT8 20W LED tube light with fitting at Manmad	35.0	NO
32	Procurement ofT8 20W LED tube light with fitting at Sanghavi	11.0	NO
33	Procurement ofT8 20W LED tube light with fitting at Gujari	24.0	NO
34	Procurement of T8 20W LED tube light with fitting at Kota	25.0	NO

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	9

35	Procurement of T8 20W LED tube light with fitting at Mangliya	38.0	NO
36	Procurement of T8 20W LED tube light with fitting at Kota	43.0	NO
37	Procurement of T8 20W LED tube light with fitting at Malarna	13.0	NO
38	Procurement of T8 20W LED tube light with fitting at Bharatpur	17.0	NO
39	Procurement of T8 20W LED tube light with fitting at Mathura	27.0	NO
40	Procurement of T8 20W LED tube light with fitting at Piyala & Bijwasan	67.0	NO
41	Procurement of T8 20W LED tube light with fitting at Bina	47.0	NO
42	Procurement of T5 20W LED tube lights at Mumbai & MUPL SV01	130.0	NO
43	Procurement of T5 20W LED tube lights at Washala	399.0	NO
44	Procurement of T5 20W LED tube lights at Manmad	248.0	NO
45	Procurement of T5 20W LED tube lights at Sanghavi	105.0	NO
46	Procurement of T5 20W LED tube lights at Gujari	110.0	NO
47	Procurement of T5 20W LED tube lights at Mangliya	100.0	NO
48	Procurement of T5 20W LED tube lights at Kota	149.0	NO
49	Procurement of T5 20W LED tube lights at Malarna	146.0	NO
50	Procurement of T5 20W LED tube lights at Bharatpur	50.0	NO
51	Procurement of T5 20W LED tube lights at Mathura	180.0	NO
52	Procurement of T5 20W LED tube lights at Piyala & Bijwasan	448.0	NO
53	Procurement of T5 20W LED tube lights at Bina	90.0	NO
54	Procurement of T5 20W LED tube light with fitting at Mumbai & MUPL SV01	20.0	NO

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	10

55	Procurement of T5 20W LED tube light with fitting at Washala	60.0	NO
56	Procurement of T5 20W LED tube light with fitting at Manmad	37.0	NO
57	Procurement of T5 20W LED tube light with fitting at Sanghavi	16.0	NO
58	Procurement of T5 20W LED tube light with fitting at Gujari	17.0	NO
59	Procurement of T5 20W LED tube light with fitting at Mangliya	15.0	NO
60	Procurement of T5 20W LED tube light with fitting at Kota	22.0	NO
61	Procurement of T5 20W LED tube light with fitting at Malarna	22.0	NO
62	Procurement of T5 20W LED tube light with fitting at Bharatpur	8.0	NO
63	Procurement of T5 20W LED tube light with fitting at Mathura	27.0	NO
64	Procurement of T5 20W LED tube light with fitting at Piyala & Bijwasan	67.0	NO
65	Procurement of T5 20W LED tube light with fitting at Bina	14.0	NO
66	Procurement of 18W PLL 4 PIN LED lights at Mumbai	40.0	NO
67	Procurement of 18W PLL 4 PIN LED lights at Malarna	10.0	NO
68	Procurement of 18W PLL 4 PIN LED lights at Bharatpur	132.0	NO
69	Procurement of 18W PLL 4 PIN LED lights at Piyala	6.0	NO
70	Procurement of 8W PLS 2 PIN LED lights at Malarna	28.0	NO
71	Procurement of 8W PLS 2 PIN LED lights at Bharatpur	76.0	NO
72	Procurement of 8W PLS 2 PIN LED lights at Piyala	6.0	NO

BHARAT PETROLEUM CORPORATION LIMITED	LED LIGHTS AT PIPELINE LOCATION	Page No
BPCL PIPELINE	LOCATION:BPCL PIPELINES	11