



**PHILIPS**

MASTER  
LEDspot LV



## Technical Application Guide

# Philips Master LED MR16

Philips LED Spot MR16 is the latest in Philips' series of low voltage (12VAC) Halogen MR16 replacements. Not only does it employ Philips' patented solution to guarantee the broadest possible compatibility with standard 12V Halogen electronic transformers, it also delivers beam intensity which equivalent to 50W Philips Halogen MR16 lamp.

The form-factor of the Philips LED Spot MR16 guarantees a 100% form-fit on the back-side of the Lamp (exact form-fit with Halogen lamps).



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# Design highlights

- Up to 86% energy saving compared to standard halogen MR16 lamps
- Long lifetime of 40,000 hours (F50, L70)
- Retrofits into a vast majority of GU5.3 based fixtures
- Compatible with a broad selection of transformers
- 24 & 36 degrees beam angle for a clearly defined beam spread
- CCT: 2700K,
- No UV and Cool Beam (no IR), making it suitable for illuminating heat-sensitive objects (food, organic materials, paintings, etc.)
- Environmental friendly (free of mercury and other hazardous materials)
- RoHS compliant



## Application areas

Philips LED MR16 lamp is suitably designed for general lighting applications in the hospitality and retail segment.

Unlike the conventional halogen reflector lamp, Philips LED MR16 lamp has 7/8W power consumption per lamp, so it has a long lifetime of 40,000 hours ensuring minimum maintenance cost in hospitality and retail shop. It is suitable for various applications such as:

- Lobby / Reception areas
- Hotel room / Ball room / Business center
- Corridors / Stairway / Washroom
- Display area / Dress room / Check out

## Application notes

- Operating temperature range is between -20°C and 40°C ambient
- Compatible with broad transformers (refer to the recommended with a broad selection of transformers list), also suitable for 12V DC input
- Suitable for total enclosure fixture application (refer to failure rate curve, make sure Tc is not over max)
- For use in fixtures that can structurally support a lamp weighing 50 grams
- Do not use or install the lamp in wet environment
- Not intended for use with emergency light fixtures or exit lights

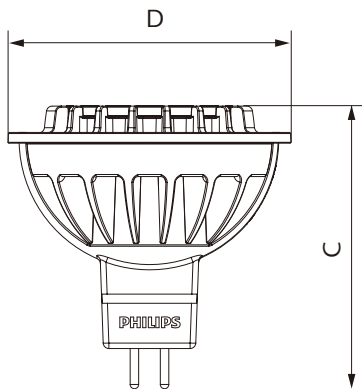
# Product features

## Technical Specifications

| Product type                      | Voltage (VAC) | Lamp Wattage (W) | Replaced Wattage (W) | Base  | Lumen (lm) | Beam Angle (°) | CCT (K) | MBCP (Cd) | Lifetime (Hrs) | CRI | Dimmable |
|-----------------------------------|---------------|------------------|----------------------|-------|------------|----------------|---------|-----------|----------------|-----|----------|
| MASTER LED 7-35W 927 MR16 24D Dim | 12            | 7.0              | 35                   | Gu5.3 | 400        | 24             | 2700    | 2100      | 40,000         | 90  | Yes      |
| MASTER LED 7-35W 927 MR16 36D Dim | 12            | 7.0              | 35                   | Gu5.3 | 400        | 36             | 2700    | 1150      | 40,000         | 90  | Yes      |
| MASTER LED 8-50W 927 MR16 24D Dim | 12            | 8.0              | 50                   | Gu5.3 | 635        | 24             | 2700    | 1150      | 40,000         | 90  | Yes      |
| MASTER LED 8-50W 927 MR16 24D Dim | 12            | 8.0              | 50                   | Gu5.3 | 635        | 36             | 2700    | 1150      | 40,000         | 90  | Yes      |

## Fixture Compatibility

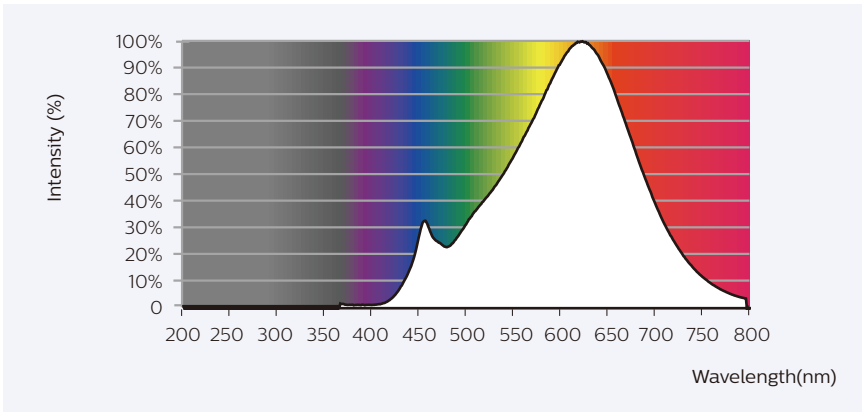
| Type                      | C max. Overall Length (mm) | D max. Diameter (mm) | max. Weight (gram) |
|---------------------------|----------------------------|----------------------|--------------------|
| MASTER LED 7-50W MR16 Dim | 51                         | 51                   | 50                 |
| MASTER LED 7-50W MR16 Dim | 54                         | 51                   | 60                 |



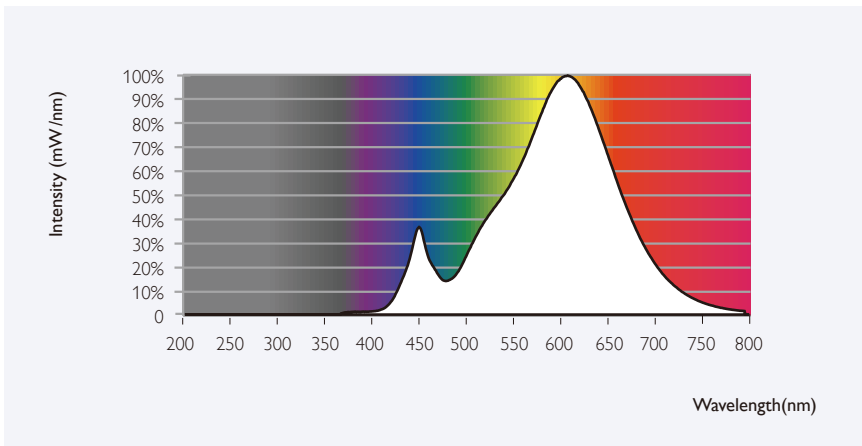
## Spectral Power Distribution

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2700 K



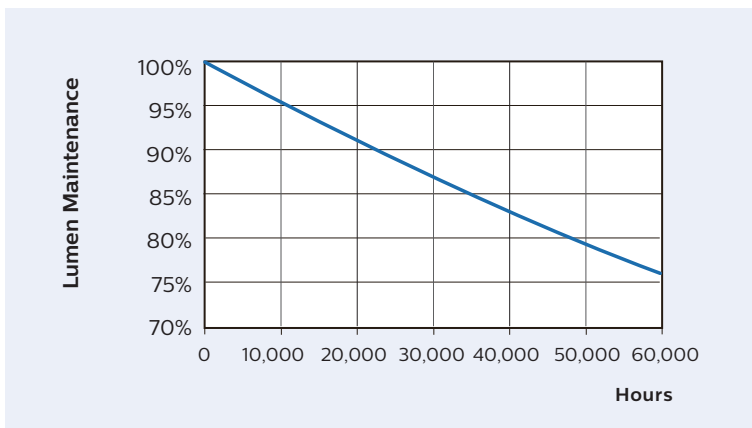
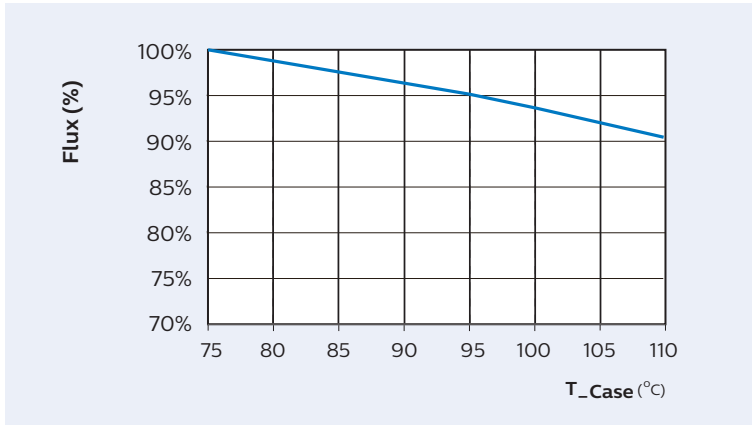
2700 K



## Temperature

Philips LED MR16 is designed for operation in all GU5.3 lighting installations in open and closed fixtures, refer to the failure rate curve, make sure Tc is not over the max temperature.

### LEDspotLV MR16 7/8 W



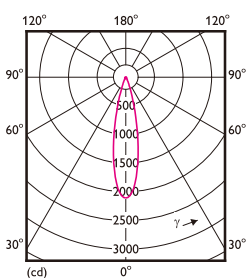
# Photometric Diagrams

MASTER LED 7-35W 927 MR16 24D Dim

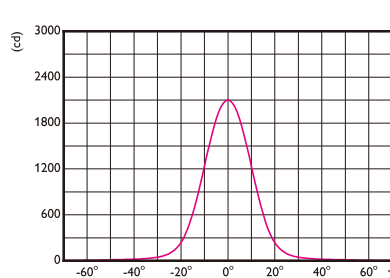
420 lm

|                    |      |                            |                     |
|--------------------|------|----------------------------|---------------------|
| Light output ratio | 1.00 | $I_{max}$                  | 2104 cd             |
| Service upward     | 0.00 | $BS (\frac{1}{2} I_{max})$ | $2 \times 12^\circ$ |
| Service downward   | 1.00 | $VBA (\frac{1}{2} E_0)$    | $2 \times 11^\circ$ |

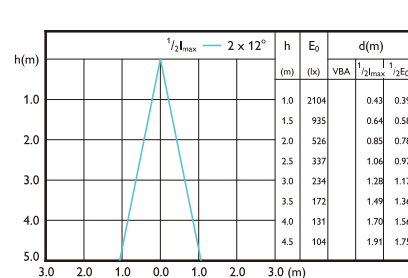
Polar intensity diagram



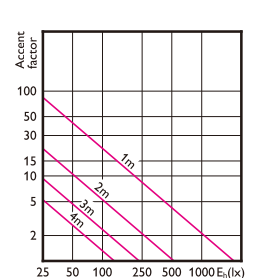
Cartesian intensity diagram



Beam diagram

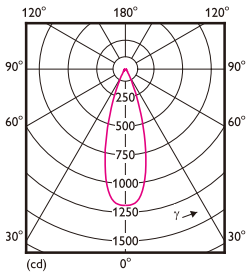


Visual impact diagram

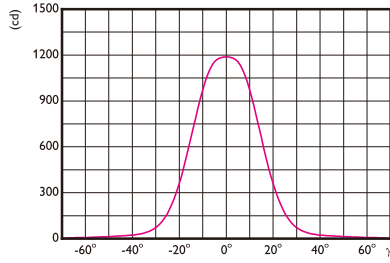


|                    |      |                            |                     |
|--------------------|------|----------------------------|---------------------|
| Light output ratio | 1.00 | $I_{max}$                  | 1188 cd             |
| Service upward     | 0.00 | $BS (\frac{1}{2} I_{max})$ | $2 \times 16^\circ$ |
| Service downward   | 1.00 | $VBA (\frac{1}{2} E_0)$    | $2 \times 15^\circ$ |

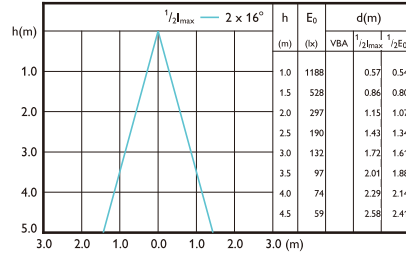
Polar intensity diagram



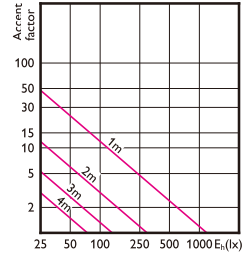
Cartesian intensity diagram



Beam diagram



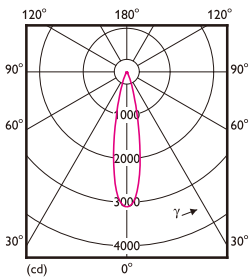
Visual impact diagram



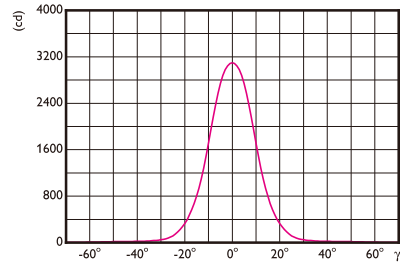
MASTER LED 8-50W+ 827 MR16 24D Dim

|                    |      |                            |                     |
|--------------------|------|----------------------------|---------------------|
| Light output ratio | 1.00 | $I_{max}$                  | 3100 cd             |
| Service upward     | 0.00 | $BS (\frac{1}{2} I_{max})$ | $2 \times 11^\circ$ |
| Service downward   | 1.00 |                            |                     |

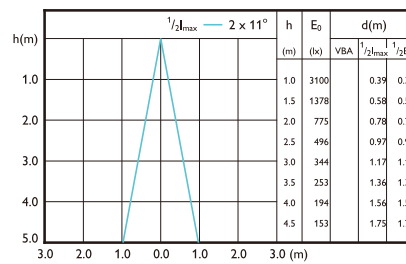
Polar intensity diagram



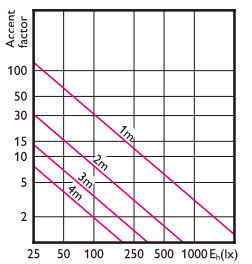
Cartesian intensity diagram



Beam diagram



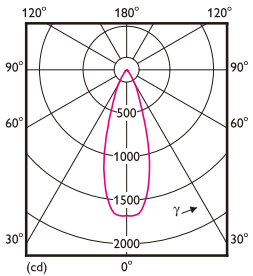
Visual impact diagram



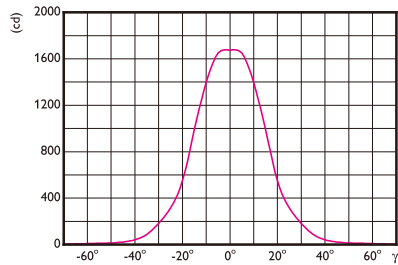
MASTER LED 8-50W 827 MR16 36D Dim

|                    |      |                            |                     |           |         |
|--------------------|------|----------------------------|---------------------|-----------|---------|
| Light output ratio | 1.00 | VBA                        | $2 \times 41^\circ$ | $I_{max}$ | 1650 cd |
| Service upward     | 0.00 | $BS (\frac{1}{2} I_{max})$ | $2 \times 17^\circ$ | K5        |         |
| Service downward   | 1.00 | $VBA (\frac{1}{2} E_0)$    | $2 \times 16^\circ$ |           |         |

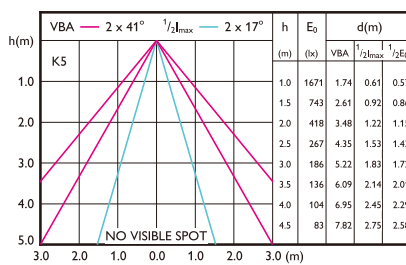
Polar intensity diagram



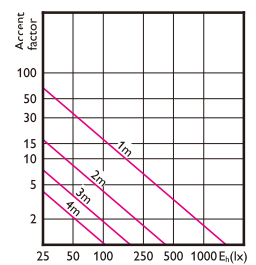
Cartesian intensity diagram



Beam diagram

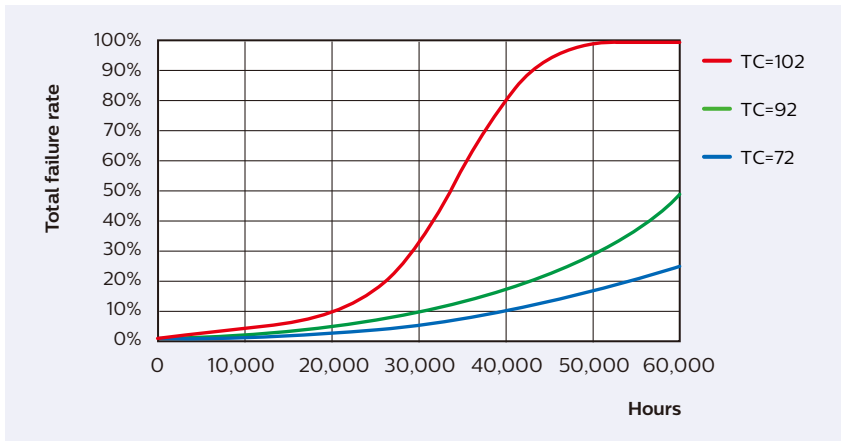


Visual impact diagram



## Lifetime + Sustainability

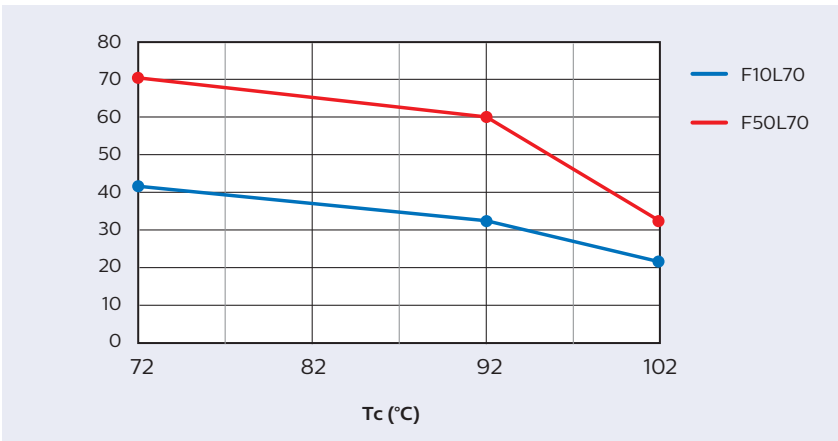
Failure Rate Curve of LED 7W 12V MR16



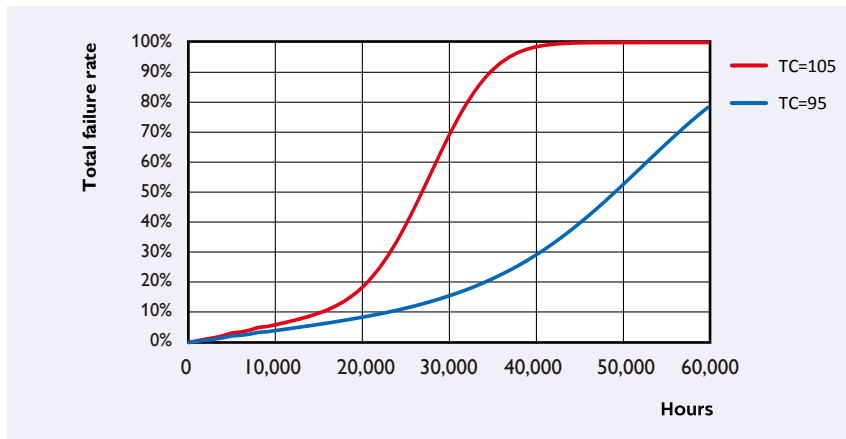
Philips LED MR16 lamp has a lifetime of 40,000 hours, defined as the number of hours when 50% of a large group of identical lamps below 70% of its initial lumens.

Lifetime estimation based on the application environment condition: at room temperature (25°C@ 10mm free air), base down burning position, and at rated voltage.

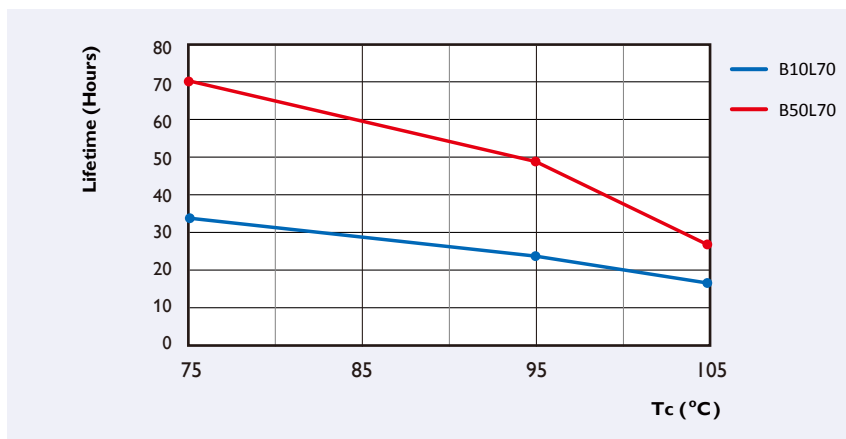
Master LED 7W Lifetime Vs Tc



Failure Rate Curve of LED 8W 12V MR16



Master LED 8W Lifetime Vs Tc



## Installation Guide

Philips LED 7W MR16 lamp has a unique, patented, electronic solution that makes this LED Replacement lamp compatible with the broadest possible range of standard 12VAC Halogen electronic transformers in the global market place except for some IC-base transformers WHEN the whole system is without dimmers. Compatibility with electromagnetic transformers is guaranteed as well. To determine the maximum number of these LED MR16 lamps to be connected to a standard halogen transformer, is by simply dividing 40% of the rated power of the transformer by LED lamp wattage.

Thus, a 60W Halogen transformer will hold Master Premium LED Spot 7W up to  $INT(60 \times 40\%/7) = 3$  lamps.

1. Determine the max. number of lamps can be connected to a ET, 40% power derating of ET should be considered
2. For dimming system, you can install for each dimmer

Example:

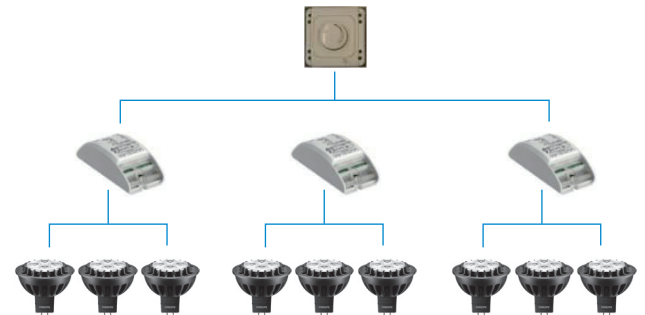
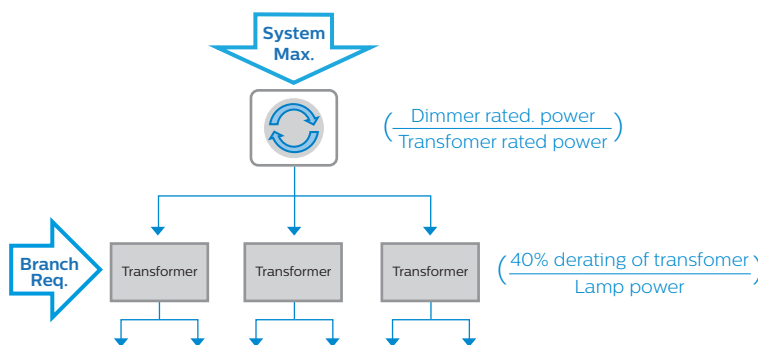
1. W (or VA) \*40% of ET to determine max. lamps per transformer



Transformer: ET-S60  
 Pout: 60W max  
 $60W \times 40\%/7W \sim 3$   
 3 x 7W lamps max. per transformer

2. The rated power of the dimmer and the transformer is to determine the max. numbers of the transformers per dimmer

Max. number of transformers:  
 $200W/60W = 3.33 \rightarrow 3$  transformer per dimmer



## Transformer Compatibility

*PHILIPS 12V MASTER LED MR16 lamp has a unique, patented, electronic solution embedded that makes this LED Replacement lamp compatible with the broadest possible range of standard 12VAC Halogen electronic transformers in the global market place except for some IC-base transformers WHEN the whole system is without dimmers. Compatibility with electromagnetic transformers is guaranteed as well.*

*To determine the maximum number of these LED MR16 lamps to be connected to a standard halogen transformer, is by simply dividing 40% of the rated power of the transformer by LED lamp wattage. Thus, a 60W Halogen transformer will hold LED MR16 up to  $INT(60W * 40\% / LED W) = \#$  of LED lamps.*



# Compatibility list

|                                 |           | Transformer   |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|---------------------------------|-----------|---------------|--------|--------|--------|--------|--------|---------------|----------------|--------|----------|--------|---------|---------|--------|--------------|-------|----------|--------|-----------|-------|-----------|------------|---------|---------|-------|--|
| Brand                           |           | Philips       |        |        |        |        |        |               |                |        |          | OSRAM  |         |         |        |              |       | Tridonic |        |           | LONON | NVC       | Panasonic  | Koizumi | ENDO    | Daiko |  |
| Model                           |           | ET-E10        | ET-E15 | ET-E30 | ET-E60 | ET-S30 | ET-S60 | ET-E105       | ET-C60         | ET-S15 | EHC 150F | HTM 70 | HTM 105 | HTM 150 | ET-P60 | Redback 60VA | VIPER | Speedy   | POSSUM | LNDET -50 | ET60E | HNK 00844 | AEE 690157 | X224B   | DP36283 |       |  |
| ET compatibility without Dimmer |           | PASS          | PASS   | PASS   | PASS   | PASS   | PASS   | Fail (1 lamp) | PASS (>1 lamp) | PASS   | PASS     | PASS   | PASS    | PASS    | PASS   | PASS         | PASS  | PASS     | PASS   | PASS      | PASS  | PASS      | PASS       | PASS    | PASS    |       |  |
| Brand                           | Model     |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| Dimmer                          | Clipsal   | 32E450UDM     |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 |           | 32E450TM      |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 |           | 32E2CFLDM     |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 |           | 250Volt 500VA |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 |           | KB31RD400     |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | HPM       | Cat 400L      |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 |           | Cat 400T      |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | Philips   | LRD8020       |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | TCL       | V8051         |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 |           | A8051         |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| TNC                             | Z62-M12   |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| PDL                             | 624TMWH   |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| KIWI                            | K004U     |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | K005T     |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| ANAM                            | D700      |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| Schneider                       | 3031H360M |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | E3031HD   |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | 559       |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| WEG                             | WEG57816  |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | WEG57813  |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | WEC57518  |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | WMS 549   |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | Panasonic | NQ20203T      |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| WNS75211K                       |           |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| NQ20615                         |           |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| NOF 20571                       |           |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| WTAF 57016CH                    |           |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| Koizumi                         | AEE690180 |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| ENDO                            | X-220W    |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| ERE 电工                          | 110V      |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
| 中一电工                            | 110V      |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |
|                                 | 220V      |               |        |        |        |        |        |               |                |        |          |        |         |         |        |              |       |          |        |           |       |           |            |         |         |       |  |

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