

**Product description**
Lightweight, highfrequency electronic standard ballast for TL5 fluorescent lamps, ideal for applications with low switching frequency.

**Features and benefits**
- The combination of EB-Economy and TL5 lamps offers opportunities for miniaturization and reduced cost of ownership, thanks to the limited dimensions and the high system efficacy
- Low energy consumption
- Flicker-free start, ideal for areas with low switching frequency (maximum 3 times a day)

**Applications**
Typical areas of application include:
- Small shops
- Small offices
- Home sites

**Philips quality**
This assures optimum quality regarding:
- System supplier
  As manufacturers of lamps and electronic control gear, Philips ensures that, from the earliest development stage, optimum lamp/ballast performance is maintained

**Compliances and approvals**
- RFI < 30 MHz EN 55015
- Harmonics EN 61000-3-2
- Safety EN 61347-2-3
- Vibration & bump tests IEC 68-2-6 FC IEC 68-2-29 Eb
- Quality standard ISO 9001
- Environmental standard ISO 14001
- CCC

**Dimensions in mm**

<table>
<thead>
<tr>
<th>Product ID</th>
<th>L1</th>
<th>L2</th>
<th>W</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>174</td>
<td>167</td>
<td>175</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>214</td>
<td>276</td>
<td>266</td>
<td>30</td>
<td>28.5</td>
</tr>
<tr>
<td>121</td>
<td>187</td>
<td>175</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>128</td>
<td>211</td>
<td>201</td>
<td>30</td>
<td>28.5</td>
</tr>
<tr>
<td>228</td>
<td>276</td>
<td>266</td>
<td>30</td>
<td>28.5</td>
</tr>
</tbody>
</table>
Electronics

Fluorescent and compact fluorescent lamps control gear

EB-Economy TL5

Fig. 1

Fig. 2

**Technical data in relation to energy saving**

<table>
<thead>
<tr>
<th>Lamp</th>
<th>Qty. of Lamps</th>
<th>Ballast</th>
<th>System Power* W</th>
<th>Lamp Power W</th>
<th>Efficacy lm/W</th>
<th>Lumen* lm</th>
<th>Ballast Losses W</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL5 14W 1</td>
<td>EB-E 114 TL5 220-230</td>
<td>17</td>
<td>14</td>
<td>89</td>
<td>1240</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>TL5 14W 2</td>
<td>EB-E 214 TL5 220-230</td>
<td>32</td>
<td>14</td>
<td>89</td>
<td>1240</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TL5 21W 1</td>
<td>EB-E 121 TL5 220-230</td>
<td>24</td>
<td>21</td>
<td>92</td>
<td>1930</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>TL5 28W 1</td>
<td>EB-E 128 TL5 220-230</td>
<td>33</td>
<td>28</td>
<td>95</td>
<td>2670</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>TL5 28W 2</td>
<td>EB-E 228 TL5 220-230</td>
<td>63</td>
<td>28</td>
<td>95</td>
<td>2670</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

* Typical values for /830 and /840 colors

**Technical data for installation**

**Mains operation**

- Rated mains voltage: 220 – 230V
- With tolerances for safety: +15% -20%
- With tolerances for performance: +6%-8%
- Mains frequency: 50 Hz
- Operation frequency: EB-E 114/121 20 -30 KHz, EB-E 128/214/228 > 40 KHz
- Power factor: EB-E 114/121 0.60, EB-E 128/214/228 > 0.90

**Earth leakage current**

- < 0.7 mA peak per ballast
- < 2 s

**Over voltage protection**

- 12 hrs at 270V AC

**Dual fixture master-slave operation**

- Possible, in general maximum 2m length of lamp wires between ballast and lamp

**Cable capacity**

- Max. 120pF between lamp wires and earth

**Automatic restart after lamp replacement**

- No

**Insulation resistance test**

- 500V DC from Line/Neutral to Earth (not between Line and Neutral)
- Note: Ensure that the neutral is reconnected again after above mentioned test is carried out and before the installation is put into operation.

**Mains current at 220V**

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Input current A</th>
</tr>
</thead>
<tbody>
<tr>
<td>EB-E 114 TL5 220-230</td>
<td>0.12</td>
</tr>
<tr>
<td>EB-E 214 TL5 220-230</td>
<td>0.15</td>
</tr>
<tr>
<td>EB-E 121 TL5 220-230</td>
<td>0.19</td>
</tr>
<tr>
<td>EB-E 128 TL5 220-230</td>
<td>0.15</td>
</tr>
<tr>
<td>EB-E 228 TL5 220-230</td>
<td>0.30</td>
</tr>
</tbody>
</table>

**Inrush current**

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Max. quantity of ballasts per Miniature Circuit Breaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>EB-E 114 TL5 220-230</td>
<td>18</td>
</tr>
<tr>
<td>EB-E 214 TL5 220-230</td>
<td>18</td>
</tr>
<tr>
<td>EB-E 121 TL5 220-230</td>
<td>18</td>
</tr>
<tr>
<td>EB-E 128 TL5 220-230</td>
<td>18</td>
</tr>
<tr>
<td>EB-E 228 TL5 220-230</td>
<td>18</td>
</tr>
</tbody>
</table>

**Technical data for design and mounting ballasts in fixtures**

**Temperatures**

- Temperature range to ignite lamp with ignition aid
- Max. t° case
- for -5°C to 50°C for 114/121
- for 0°C to 50°C for 214/128/228
- 65°C

**Hum and noise level**

- < 30dB at 1m distance

**Permitted humidity**

- Tested according to EN61347-2-3 par. 11.
- Note that no moisture or condensation may enter the ballast.

**Connection wiring**

- greatly simplified by use of insert contacts with push buttons

**Wire cross-section:**

- On the mains side: 0.5 – 1.5mm²
- On the lamp side: 0.5 – 1.5mm²

**Strip length:**

- 7.5 – 8.5mm

6.85 Fluorescent and compact fluorescent lamps control gear Lamps and Gear
Electronics

Notes
1. Data is based on a mains supply with an impedance of 400 mΩ (equal to 15 m cable of 2.5 mm² and another 20 m to the middle of the power distribution), under worst case conditions. With an impedance of 800 mΩ the number of ballasts can be increased by 10%.
2. Measurements will be verified in real installations; therefore data are subject to change.
3. In some cases the maximum number of ballasts is not determined by the MCB but by the maximum electrical load of the lighting installation.
4. Note that the maximum number of ballasts is given when these are all switched on the same moment, i.e. by a wall switch.
5. Measurements were carried out on single-pole MCB’s. For multi-pole MCB’s it is advisable to reduce the number of ballasts by 20%.
6. Data is measured with merlin jerin C45N/C10.

Caution:
After finishing system installation, please check carefully before you turn the power on.
1. Check whether lamp, ballast model and wiring are compatible according to Philips EB-Economy TL5 datasheet.
2. Be sure the ground terminal of ballast are connected with metal luminaries or batten and earthed.

Ordering and packing data

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Ordering number</th>
<th>Single unit</th>
<th>Carton packing</th>
<th>Pallet unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>EB-E 114 TL5 220-230</td>
<td>9137 100 632.</td>
<td>0.11 kg</td>
<td>50 pcs</td>
<td>20.3 x 20.0 x 13.0 cm</td>
</tr>
<tr>
<td>EB-E 214 TL5 220-230</td>
<td>9137 100 633.</td>
<td>0.13 kg</td>
<td>20 pcs</td>
<td>35.4 x 32.4 x 7.9 cm</td>
</tr>
<tr>
<td>EB-E 121 TL5 220-230</td>
<td>9137 100 634.</td>
<td>0.11 kg</td>
<td>50 pcs</td>
<td>20.3 x 20.0 x 13.0 cm</td>
</tr>
<tr>
<td>EB-E 128 TL5 220-230</td>
<td>9137 100 635.</td>
<td>0.20 kg</td>
<td>20 pcs</td>
<td>32.4 x 28.8 x 7.9 cm</td>
</tr>
<tr>
<td>EB-E 228 TL5 220-230</td>
<td>9137 100 636.</td>
<td>0.13 kg</td>
<td>20 pcs</td>
<td>35.4 x 32.4 x 7.9 cm</td>
</tr>
</tbody>
</table>
## Product description
Compact, lightweight, highfrequency electronic standard ballast for TLE TL5 fluorescent lamps, for applications with low switching frequency.

## Features and benefits
- Flicker-free rapid start, ideal for areas with low switching frequency (maximum 3 times a day)
- Up to 20% reduction in energy consumption at equal luminous flux compared with conventional gear.

## Applications
Typical areas of application include:
- Department stores, shops, supermarkets with long lamp burning hours
- Industrial premises with long lamp burning hours
- Kitchens
- Bathrooms
- Corridors
- Outdoor lighting; in general suitable for class 1 applications

## Philips quality
This assures optimum quality regarding:
- System supplier
  As manufacturers of lamps and electronic control gear, Philips ensures that, from the earliest development stage, optimum lamp/ballast performance is maintained

## Compliances and approvals
- RFI < 30 MHz EN 55015
- Harmonics EN 61000-3-2
- Safety EN 61347-2-3
- Vibration & bump tests IEC 68-2-6 FC
- IEC 68-2-29 Eb
- Quality standard ISO 9001
- Environmental standard ISO 14001
- CCC marking

### Dimensions in mm

<table>
<thead>
<tr>
<th>Product ID</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>W</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>125</td>
<td>108</td>
<td>116.6</td>
<td>61</td>
<td>25</td>
</tr>
<tr>
<td>132</td>
<td>125</td>
<td>108</td>
<td>116.6</td>
<td>61</td>
<td>25</td>
</tr>
</tbody>
</table>
Technical data in relation to energy saving

<table>
<thead>
<tr>
<th>Lamp</th>
<th>Qty. of Lamps</th>
<th>Ballast</th>
<th>System Power W</th>
<th>Lamp Power W</th>
<th>Efficacy lm/W</th>
<th>Lumen* lm</th>
<th>Ballast Losses W</th>
<th>Wiring diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLE 22W</td>
<td>1</td>
<td>EB-E 122 TLE 220-230</td>
<td>23/24</td>
<td>20/21</td>
<td>50</td>
<td>1000/1050</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>TLE 32W</td>
<td>1</td>
<td>EB-E 132 TLE 220-230</td>
<td>35/37</td>
<td>30/32</td>
<td>52</td>
<td>1500/1660</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

* Typical values for Philips 1830 and 1840 colors

Technical data for installation

Mains operation
- Rated mains voltage: 220 – 230V
- With tolerances for safety: +15% -20%
- With tolerances for performance: +6%-6%
- Mains frequency: 50/60 Hz
- Operation frequency: > 42 kHz
- Power factor: 0.95

Earth leakage current: < 0.5 mA per ballast
Ignition time: < 1 s
Over voltage protection: 48 hrs at 270V AC
Dual fixture master-slave operation: possible, in general maximum 2m length of lamp wires between ballast and lamp

Cable capacity: max. 150μF between lamp wires and earth
Automatic restart after lamp lamp replacement: yes
Insulation resistance test: 500 V DC from Line/Neutral to Earth (not between Line and Neutral)

Note: Ensure that the neutral is reconnected again after above mentioned test is carried out and before the installation is put into operation.

Mains current at 220V

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Input current *TLE A</th>
</tr>
</thead>
<tbody>
<tr>
<td>EB-E 122 TLE 220-230</td>
<td>0.10</td>
</tr>
<tr>
<td>EB-E 132 TLE 220-230</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Inrush current

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Max. quantity of ballasts per Miniature Circuit Breaker 16A</th>
</tr>
</thead>
<tbody>
<tr>
<td>EB-E 122 TLE 220-230</td>
<td>28</td>
</tr>
<tr>
<td>EB-E 132 TLE 220-230</td>
<td>28</td>
</tr>
</tbody>
</table>

Technical data for design and mounting ballasts in fixtures

Temperatures
- Temperature range to ignite lamp with ignition aid: -0°C to 50°C
- Max t case: 70°C
Hum and noise level: inaudible

Permitted humidity is tested according to EN61347-2-3 par. 11.
Note that no moisture or condensation may enter the ballast.

Connection wiring is greatly simplified by the use of insert contacts with push buttons

Wire cross-section:
- On the mains side: 0.5 – 1.5mm²
- On the lamp side: 0.5 – 1.5mm²

Strip length: 9 – 10mm
Notes
1. Data is based on a mains supply with an impedance of 400 mΩ (equal to 15 m cable of 2.5 mm² and another 20 m to the middle of the power distribution), under worst case conditions. With an impedance of 800 mΩ the number of ballasts can be increased by 10%.
2. Measurements will be verified in real installations; therefore data are subject to change.
3. In some cases the maximum number of ballasts is not determined by the MCB but by the maximum electrical load of the lighting installation.
4. Note that the maximum number of ballasts is given when these are all switched on the same moment, i.e. by a wall switch.
5. Measurements were carried out on single-pole MCB’s. For multi-pole MCB’s it is advisable to reduce the number of ballasts by 20%.
6. The maximum number of ballasts which can be connected to one Residual Current Detector of 30 mA is 30.
7. Data is measured with merlin jerin C45N/C10.

Caution:
After finishing system installation, please check carefully before you turn the power on.
1. Check whether lamp, ballast model and wiring are compatible according to Philips EB-Economy datasheet.
2. Be sure the ground terminal of ballast are connected with metal luminaries or batten and earthed.

Ordering and packing data

<table>
<thead>
<tr>
<th>Ballast</th>
<th>Ordering number</th>
<th>Single unit</th>
<th>Carton packing</th>
<th>Pallet unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>EB-E122 TLE 220-230</td>
<td>9137 100 608.</td>
<td>0.22</td>
<td>20 pcs</td>
<td>120/2400</td>
</tr>
<tr>
<td>EB-E132 TLE 220-230</td>
<td>9137 100 609.</td>
<td>0.22</td>
<td>20 pcs</td>
<td>120/2400</td>
</tr>
</tbody>
</table>
Electromanetic

BTA standard EM ballasts for TL florescent lamps

**Product description**
- All "BTA" ballasts to be applied in circuits for TL, TLD, TLE fluorescent lamps and operating on nominal mains supply as indicated.

**Features and benefits**
- Reliable electrical and mechanical performance
- Long life
- Compact dimensions
- Quick and easy wiring
- Optimum lamp performance under optimum temperature conditions

**Features**
- Complies with IEC 82-1973 and TIS 23-1978
- Tw marking 130°C
- Screw and Insert contact with high quality
- Embossed mounting plate for noise reduction
- CE marking

**Applications**
- Home
- Department stores, shops, supermarkets
- Office buildings
- Industry
- Airports, railway stations

**Philips quality**
This implies optimum quality regarding
- System supplier:
  As manufacturers of lamps and control gear, Philips ensures that from the earliest development stage, optimum lamp/ballast performance is maintained
- International standards
  Philips BTA electromagnetic ballasts comply with all relevant international rules and regulations.

Dimensions in mm

<table>
<thead>
<tr>
<th>Product ID</th>
<th>A1</th>
<th>A2</th>
<th>B1</th>
<th>C1</th>
</tr>
</thead>
<tbody>
<tr>
<td>18W</td>
<td>155</td>
<td>140</td>
<td>39</td>
<td>28</td>
</tr>
<tr>
<td>32W</td>
<td>155</td>
<td>140</td>
<td>39</td>
<td>28</td>
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<tr>
<td>36W</td>
<td>155</td>
<td>140</td>
<td>39</td>
<td>28</td>
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<tr>
<td>58W</td>
<td>193</td>
<td>180</td>
<td>39</td>
<td>28</td>
</tr>
</tbody>
</table>
**Technical data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Lamp(s)</th>
<th>Electrical connection</th>
<th>Power Factor</th>
<th>Main current during operation</th>
<th>Losses at $t = 20 , ^\circ C$ W</th>
<th>$T_w^{(1)} , ^\circ C$</th>
<th>$T_s , ^\circ C$</th>
<th>Parallel compensation(^{(2)})</th>
<th>Wiring diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>220V/50Hz</td>
<td>BTA18L04</td>
<td>1xTL20W/TLD18W</td>
<td>Screw 0.35</td>
<td>0.37</td>
<td>8.0</td>
<td>130</td>
<td>55</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA18L04 P</td>
<td>1xTL20W/TLD18W</td>
<td>Screw 0.35</td>
<td>0.37</td>
<td>8.0</td>
<td>130</td>
<td>55</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA21L05</td>
<td>1xTL20W/TLD18W</td>
<td>Insert 0.35</td>
<td>0.37</td>
<td>8.0</td>
<td>130</td>
<td>55</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA21L05</td>
<td>1xTLE32W</td>
<td>Screw 0.43</td>
<td>0.45</td>
<td>8.5</td>
<td>130</td>
<td>50</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA21L05</td>
<td>1xTLE32W</td>
<td>Insert 0.43</td>
<td>0.45</td>
<td>8.5</td>
<td>130</td>
<td>50</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA36L04</td>
<td>1xTL40W/TLD36W</td>
<td>Screw 0.50</td>
<td>0.43</td>
<td>8.5</td>
<td>130</td>
<td>55</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA36L04P</td>
<td>1xTL40W/TLD36W</td>
<td>Screw 0.50</td>
<td>0.43</td>
<td>8.5</td>
<td>130</td>
<td>55</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA36L05</td>
<td>1xTL40W/TLD36W</td>
<td>Insert 0.50</td>
<td>0.43</td>
<td>8.5</td>
<td>130</td>
<td>55</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA36L05</td>
<td>1xTL40W/TLD36W</td>
<td>Insert 0.50</td>
<td>0.43</td>
<td>8.5</td>
<td>130</td>
<td>55</td>
<td>4.0</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA58L04</td>
<td>1xTL65W/TLD58W</td>
<td>Screw 0.50</td>
<td>0.67</td>
<td>12.0</td>
<td>130</td>
<td>55</td>
<td>6.5</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA58L04</td>
<td>1xTL65W/TLD58W</td>
<td>Screw 0.50</td>
<td>0.67</td>
<td>12.0</td>
<td>130</td>
<td>55</td>
<td>6.5</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA58L04P</td>
<td>1xTL65W/TLD58W</td>
<td>Screw 0.50</td>
<td>0.67</td>
<td>12.0</td>
<td>130</td>
<td>55</td>
<td>6.5</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>BTA58L05</td>
<td>1xTL65W/TLD58W</td>
<td>Screw 0.50</td>
<td>0.67</td>
<td>12.0</td>
<td>130</td>
<td>55</td>
<td>6.5</td>
<td>250</td>
</tr>
</tbody>
</table>

1) In accordance with IEC 82 (3rd edition) $T_w$ indicates the maximum permissible temperature of the windings.
2) To obtain High Power Factor (PF ≥ 0.85)