**Electrical Specifications**

<table>
<thead>
<tr>
<th>Lamp Type</th>
<th>Num. of Lamps</th>
<th>Rated Lamp Watts</th>
<th>Min. Start Temp (°F/C)</th>
<th>Input Current (Amps)</th>
<th>Input Power (ANSI Watts)</th>
<th>Ballast Factor</th>
<th>MAX THD %</th>
<th>Power Factor</th>
<th>MAX Lamp Current Crest Factor</th>
<th>B.E.F.</th>
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</thead>
<tbody>
<tr>
<td>F21T5</td>
<td>2</td>
<td>21</td>
<td>0/-18</td>
<td>0.38</td>
<td>45</td>
<td>0.95</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>2.11</td>
</tr>
<tr>
<td>F28T5/ES@100 (25W)</td>
<td>2</td>
<td>25</td>
<td>32/00</td>
<td>0.46</td>
<td>55</td>
<td>0.95</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
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<td>0.35</td>
<td>10</td>
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<td>1.58</td>
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<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>2.50</td>
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</table>

### Wiring Diagram

- Line (black): inputs must be connected to the same phase of the line voltage.

**Diagram 173**

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*).

### Enclosure

**Enclosure Dimensions**

<table>
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<tr>
<th>OverAll (L)</th>
<th>Width (W)</th>
<th>Height (H)</th>
<th>Mounting (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.50 *</td>
<td>1.7 *</td>
<td>1.18 *</td>
<td>8.90 *</td>
</tr>
<tr>
<td>9 1/2</td>
<td>1 7/10</td>
<td>1 9/50</td>
<td>8 9/10</td>
</tr>
<tr>
<td>24.1 cm</td>
<td>4.3 cm</td>
<td>3 cm</td>
<td>22.6 cm</td>
</tr>
</tbody>
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**ADVANCE TRANSFORMER CO.**

O’HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018

Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 847-768-7768

Corporate Offices: Phone: 800-322-2086

Revised 09/12/12
**Electrical Specifications**

**Notes:**

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Section III - Regulatory
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3.7 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other
4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.
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4.3 Ballast designated 90C shall carry a three-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 90C.
4.4 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

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**Revised 09/12/12**

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<th>MAX Lamp Current Crest Factor</th>
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<td>F21T5</td>
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<td>0/-18</td>
<td>0.17</td>
<td>45</td>
<td>0.95</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>2.11</td>
</tr>
<tr>
<td>F28T5/ES@100 (25W)</td>
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<td>25</td>
<td>32/00</td>
<td>0.20</td>
<td>55</td>
<td>0.95</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>1.73</td>
</tr>
<tr>
<td>F28T5/ES@50 (25W)</td>
<td>2</td>
<td>25</td>
<td>32/00</td>
<td>0.11</td>
<td>26</td>
<td>0.35</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>1.35</td>
</tr>
<tr>
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<td>58</td>
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<td>32/00</td>
<td>0.11</td>
<td>28</td>
<td>0.35</td>
<td>15</td>
<td>0.98</td>
<td>1.7</td>
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<tr>
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<td>0.95</td>
<td>15</td>
<td>0.98</td>
<td>1.7</td>
<td>2.50</td>
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</table>

**Wiring Diagram**

Line (black) inputs must be connected to the same phase of the line voltage.

**Standard Lead Length (inches)**

<table>
<thead>
<tr>
<th>Color</th>
<th>Length (inches)</th>
<th>Length (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>22</td>
<td>55.9</td>
</tr>
<tr>
<td>White</td>
<td>22</td>
<td>55.9</td>
</tr>
<tr>
<td>Blue</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>Red</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>Yellow</td>
<td>36</td>
<td>91.4</td>
</tr>
<tr>
<td>Gray</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Violet</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Color Combos</th>
<th>Length (inches)</th>
<th>Length (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow/Blue</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Blue/White</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brown</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Orange</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Orange/Black</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Black/White</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Red/White</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
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**Rev: 09/12/12**

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ADVANCE TRANSFORMER CO.
O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD - ROSEMONT, ILLINOIS 60018
TELEPHONE: (847)390-5000 FAX: (847)768-7768
IOP2S2895SCSD@120V

Brand Name: OPTANIUM T5
Ballast Type: Electronic
Starting Method: Programmed Start
Series: 120-277
Input Voltage: 50/60 HZ
Input Frequency

Status: Active

Electrical Specifications

<table>
<thead>
<tr>
<th>Lamp Type</th>
<th>Num. of</th>
<th>Rated</th>
<th>Min. Start</th>
<th>Input Current</th>
<th>Input Power</th>
<th>Ballast</th>
<th>MAX THD</th>
<th>Power</th>
<th>MAX Lamp</th>
<th>B.E.F.</th>
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<tbody>
<tr>
<td></td>
<td>Lamps</td>
<td>Lamp Watts</td>
<td>Temp (° F/C)</td>
<td>(Amps)</td>
<td>(ANSI Watts)</td>
<td>Factor</td>
<td>%</td>
<td>Factor</td>
<td>Current Crest Factor</td>
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<tr>
<td>F21T5</td>
<td>2</td>
<td>21</td>
<td>0/-18</td>
<td>0.38</td>
<td>45</td>
<td>0.95</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>2.11</td>
</tr>
<tr>
<td>F28T5/ES@100</td>
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<td>25</td>
<td>32/00</td>
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<td>55</td>
<td>0.95</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>1.73</td>
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<td>1.7</td>
<td>1.25</td>
</tr>
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<td>32/00</td>
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<td>0.95</td>
<td>10</td>
<td>0.98</td>
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</tr>
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<td>28</td>
<td>0.35</td>
<td>15</td>
<td>0.98</td>
<td>1.7</td>
<td>1.25</td>
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<td>38</td>
<td>0.95</td>
<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>2.50</td>
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<td>22</td>
<td>55.9</td>
</tr>
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<td>White</td>
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</tr>
<tr>
<td>Blue</td>
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<th>Num. of Lamps</th>
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<th>Input Current (Amps)</th>
<th>Input Power (ANSI Watts)</th>
<th>Ballast Factor</th>
<th>MAX THD %</th>
<th>Power Factor</th>
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<td>10</td>
<td>0.98</td>
<td>1.7</td>
<td>1.35</td>
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<td>32/00</td>
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<td>15</td>
<td>0.98</td>
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<tr>
<td>*F35T5</td>
<td>1</td>
<td>35</td>
<td>0/-18</td>
<td>0.14</td>
<td>38</td>
<td>0.95</td>
<td>15</td>
<td>0.98</td>
<td>1.7</td>
<td>2.50</td>
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</table>

#### Wiring Diagram

- **Line (black) inputs must be connected to the same phase of the line voltage.**

#### Enclosure Dimensions

<table>
<thead>
<tr>
<th>OverAll (L)</th>
<th>Width (W)</th>
<th>Height (H)</th>
<th>Mounting (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.50 *</td>
<td>1.7 *</td>
<td>1.18 *</td>
<td>8.90 *</td>
</tr>
<tr>
<td>9 1/2</td>
<td>17/10</td>
<td>1 9/50</td>
<td>8 9/10</td>
</tr>
<tr>
<td>24.1 cm</td>
<td>4.3 cm</td>
<td>3 cm</td>
<td>22.6 cm</td>
</tr>
</tbody>
</table>

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Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

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ADVANCE TRANSFORMER CO.
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Corporate Offices: Phone: 800-322-2086

Revised 09/12/12
Electrical Specifications

Notes:

Section I - Physical Characteristics
1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance
2.1 Ballast shall be Programmed Start.
2.2 Ballast shall provide Independent Lamp Operation (ILO) for Programmed Start Parallel ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
2.4 Ballast shall operate from 50/60 Hz input source of __________ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency).
2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 KHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance Systems, such as anti-theft devices.
2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
2.7 Ballast shall have a ballast factor of 1.0 for primary T5HO lamps or a ballast factor of 0.95 or 1.15 for primary T5HE lamps at full light output.
2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.
2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line with primary lamp.
2.10 Ballast shall have a Class A sound rating.
2.11 Ballast shall have a minimum starting temperature of __________ (-18C (0F) or -29C (-20F) or 0C (32F)) for primary lamp. Consult lamp manufacturer for temperature versus light output characteristics.
2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.
2.13 Ballast shall provide Lamp EOL Protection Circuit.
2.14 Ballast for step-dim applications shall have a 50% control step where the input power is <=50% of the full light input power for the primary lamp.

Section III - Regulatory
3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
3.4 Ballast shall comply with ANSI C82.11 where applicable.
3.5 Ballast shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.
3.6 Ballast shall comply with UL Type CC rating.
3.7 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other
4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.
4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.
4.3 Ballast designated 90C shall carry a three-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 90C.
4.4 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

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