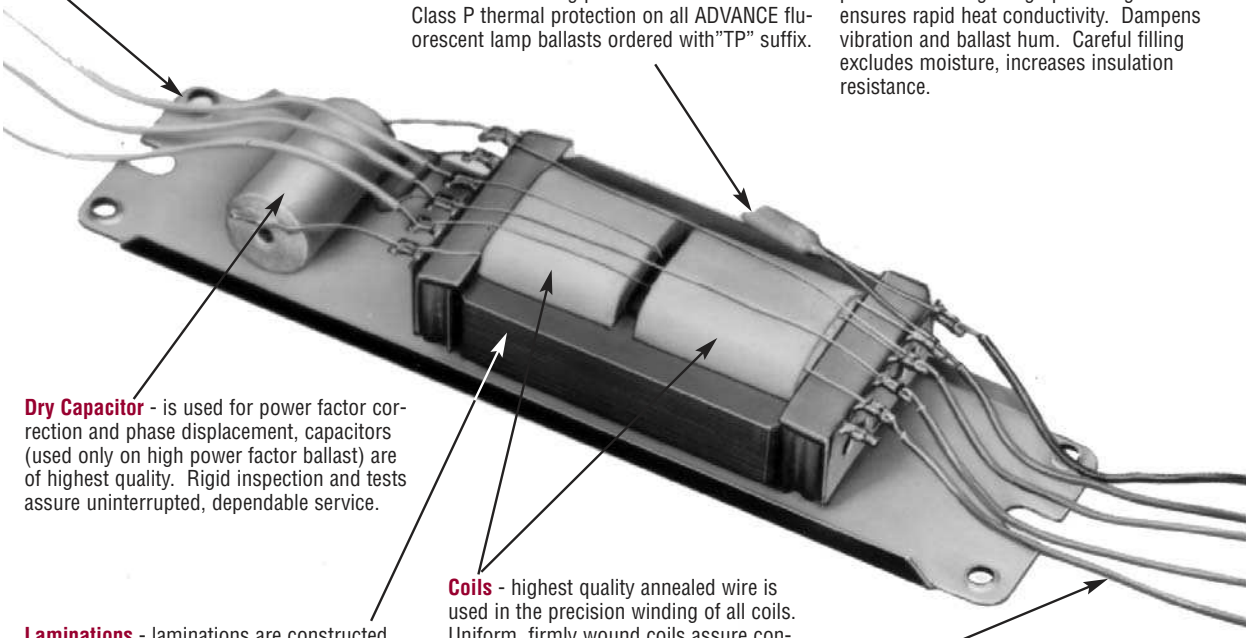


Case - rugged steel ballast case

Thermal Protector - exclusive ADVAN-guard® automatic reclosing protective device affords Class P thermal protection on all ADVANCE fluorescent lamp ballasts ordered with"TP" suffix.

Compound - special thermal-pliable compound containing a high percentage of silica ensures rapid heat conductivity. Dampens vibration and ballast hum. Careful filling excludes moisture, increases insulation resistance.

Dry Capacitor - is used for power factor correction and phase displacement, capacitors (used only on high power factor ballast) are of highest quality. Rigid inspection and tests assure uninterrupted, dependable service.

Laminations - laminations are constructed of high-grade steel, annealed and treated to assure lowest wattage losses. They are precision stamped with carbide steel dies for positive, tight stacking to provide consistent electrical characteristics.

Coils - highest quality annealed wire is used in the precision winding of all coils. Uniform, firmly wound coils assure consistent operating characteristics. Complete core & coil assembly is vacuum impregnated with an exclusive Advance asphalt-wax impregnant.

Lead Wire - PVC covered solid lead wire is firmly anchored to the coils to facilitate positive and permanent connections.

Supply Voltage and Frequency

Each ballast is designed to operate at the nominal voltage shown on the ADVANCE label. Abnormal deviation from these values will result in damage to either the ballast or lamp or both. It is therefore necessary that the voltage applied to ballasts be maintained within the respective limits shown in the adjoining table.

A ballast subjected to higher than nominal voltages will operate at increased temperatures. This will result in reduced ballast life. Low voltage can cause premature lamp failures as well as unreliable lamp starting.

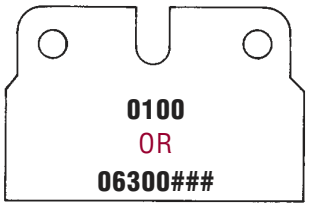
All ballasts are designed for single frequency operation. Therefore, best results will be obtained when that ballast is used on the frequency shown on the ballast label. Frequency limitations are as follows:

Nominal	Frequency Limits
60HZ	57.5 to 62.5
50HZ	47.5 to 52.5

Prefix Code Letters	Normal Voltage	Applied Voltage Limits	Color Label Identification
H	120	112-127	YELLOW
R	120	112-127	YELLOW
L	120	112-127	YELLOW
S	120	112-127	YELLOW
X	220	210-230	GREEN
M	220/250	210-230 / 235-260	—
Y	240	225-250	ORANGE
V	277	255-290	RED
G	347	322-365	GRAY

Ballast Date Codes

Advance electromagnetic fluorescent lamp ballasts are date stamped on the ballast cover to designate month and year of manufacture. The month is indicated first, followed by the year. In the example shown 0100, the manufacturing date is January, 2000. In 2006 a new date stamp was implemented. The year is indicated first, followed by the calendar day of year and closes with an internal number (06 300 ###). See page 8-ii for warranty information.



See catalog table of contents for important change Certifications

Indicates ballast is listed with Underwriters Laboratories, Inc. and complies with UL935 Standard for Fluorescent -Lamp Ballasts (File No. E14927).

U.L. RECOGNIZED

Indicates ballast is component recognized with UL. and complies with UL935 Standard for Fluorescent -Lamp Ballasts (File No. E14927).

Visit www.ul.com to find a current listing of Advance ballasts under File No. E14927.

Indicates ballast is certified by Canadian Standards Association and complies with CSA-22.2 File No. 74 for Fluorescent-Lamp Ballasts (File No. 007310).

Visit www.csa.ca to find a current listing of Advance ballasts under File No. 007310

Indicates ballast complies with U.S. Energy Standards.

Indicates ballast complies with Canadian Energy Standards.

Advance fluorescent ballasts are designed and manufactured in accordance with the American National Standards Institute standard for fluorescent ballasts, ANSI C82.1.

Class P Ballasts — Section 410-73(e) of the National Electrical Code (NEC) requires that all indoor fluorescent fixtures shall incorporate ballast protection. Those fixtures employing a simple reactive type ballast are exempted.

The protector is located within the ballast case to prevent physical damage and tampering.

Advance electromagnetic ballasts ordered with ADVAN-guard® Class P ballast protection (TP suffix) are equipped with a thermally actuated automatic reclosing protective device. This revolutionary development was originally designed and introduced by Advance, and today this Class P device is a requirement of the National Electrical Code in all indoor lighting installations.

Safety

The National Electrical Code requires grounding of fluorescent fixtures. The fluorescent ballast case must be grounded either to the fluorescent fixture or, if remote mounted, by other means such as a wire from the ballast case to ground. Without proper fixture and ballast grounding, a shock hazard may exist due to the fluorescent fixture becoming energized by an internal ballast failure to case. Also, all ballasts have normal leakage current. When the ballast is properly grounded, the leakage current does not constitute a hazard.

Starting

The metal of a fluorescent fixture is a starting aid when properly grounded. T12 Fluorescent lamps rated at 40 watts or less used for rapid or trigger start operation must be mounted within 1/2" of a grounded metal surface. T8 Lamps must be mounted within 3/4" of a grounded metal surface. All other lamps must be mounted within 1" of a grounded metal surface.

An important additional factor for proper lamps starting is polarity. The white ballast lead must be connected to the ground of the power supply (neutral) and the black lead to the hot line wire. A reversal of polarity may result in lamp damage or improper lamp starting.

Cold Weather Operation

Lumen ratings of fluorescent lamps apply for operation in still air at a temperature of 77°F. While many fluorescent lamps and fluorescent lamp ballasts are designed to give their best performance at 77°F, they will provide reasonably good light output down to 50°F. Further decreases in ambient temperature will result in decreased light output.

Variables such as humidity, line voltage, fixture design and variations within the particular design of the lamp and the fluorescent lamp ballast play an important part in determining the low temperature starting limit.

These are the two considerations for low temperature application:

1. **Starting of the lamps**
   Low temperatures change the electrical starting characteristics of a fluorescent lamp. As the fluorescent lamp becomes colder, it becomes more difficult to start. Therefore, a fluorescent ballast must have a higher starting voltage; thus, follow the temperature recommendations shown in the tables. **Ballasts designed for low temperature use ensure reliable starting only and not the light output.**

2. **Operating the lamps**
   The light output of any fluorescent lamp depends on the mercury vapor pressure within the lamp. Maximum light output for most fluorescent lamps occurs when the bulb temperature is about 100°F. As bulb wall temperature goes above 100°F the mercury vapor pressure within the tube increases and the light output decreases.

   Interestingly enough, at lower bulb-wall temperatures, the mercury condenses on the tube, pressure drops and the light output again decreases. This is inherent in all fluorescent lamps. In order to prevent reduction in light output at low temperatures the lamp should be enclosed so it has a chance to overcome the low bulb-wall temperature by the heat generated by the lamp.

In general, outdoor lighting installations have tended toward 800 and 1500mA lamps since the additional heat generated by these lamps will provide better illumination in cold weather than can be obtained with 430mA lamps. The 430mA lamps are not recommended by the lamp manufacturer for starting conditions below 0°F. Above this temperature,shielding is required to a greater degree than with the more heavily loaded lamps. Special low temperature lamps, which may be purchased with shields, are available for 1500mA operation.

Ballast Sound

The slight hum present in fluorescent lighting installations originates from the inherent magnetic action in the core & coil assembly of the ballasts. This hum may be amplified by the method of mounting the ballast in the fixture...the fixture design...and, more often than not, this hum is amplified by the resonant qualities of the ceiling, walls, floors and furniture. In planning a lighting installation, careful consideration must be given to the selection of the fluorescent lamp ballast, the lighting fixture and room components. These precautions will ensure the quietest installation possible.

The choice of fluorescent lamp ballast should be made on the basis of selecting the one rated quietest for a specific location or interior as some ballast have a more discernable hum due to basic construction features and electrical ratings.

SOUND RATINGS

For any Installation in:	Average Ambient Noise Level Of Interior	Sound Level Rating*
TV or Radio Station, Library, Reception or Reading Room, Church, School Study Hall	**20-24** DECIBELS	**A**
Residence, Quiet Office, Night School Classroom	**25-30** DECIBELS	**B**
General Office Area, Commercial Building, Storeroom	**31-36** DECIBELS	**C**
Manufacturing Facility, Retail Store, Noisy Office	**37-42** DECIBELS	**D**

*These sound ratings are based on measurements of **Average Ambient** noise levels during conditions of normal occupancy. Audible ballast hum may appear amplified during exceptionally quiet periods and at times when area is unoccupied.

Temperature and Ventilation

Underwriters' Laboratories, Inc. stipulates that the temperature limitation of a fluorescent lamp ballast using Class A insulation at normal operation should have a maximum ballast coil temperature of 105°C (221°F) and maximum ballast case temperature of 90°C (194°F) at its hottest spot. Ballast life will be reduced if it is operated at a temperature above these limits.

A fluorescent lamp ballast, like other electrical equipment, generates heat during normal operation. If not maintained within prescribed limits, this heat will become the primary cause of reduced ballast life. Heat generated in the conventional ballast is transferred to the case through a silica compound which totally surrounds the internal components and is then dissipated to the surrounding air or mounting surface by conduction, convection or radiation.

It is therefore essential that a ballast which is placed in an enclosure be suitably ventilated. Where more than one ballast is installed in an enclosure, the ballast should be positioned far enough apart to provide adequate heat dissipation.

To assist in limiting the temperature rise of ballasts, the following procedures are recommended:

- **Mount ballast with maximum number of sides in direct contact with the metal channel of fixture. Radiators are an excellent way of dissipating heat.**
- **Provide fixture ventilation.**
- **Paint the unpainted fixture channels with a non-metallic finish to increase radiation.**
- **Place ballast in a cooler location outside the fixture.**
- **Place fixture to attain maximum dissipation of heat by conduction, convection or radiation.**

BALLAST TYPE

Magnetic = Standard electromagnetic core and coil construction continues to provide reliable service and economy over a wide variety of lighting system applications. Operates lamps at 60 Hz.

Mark III = Energy-saving electromagnetic ballast designed to provide 10% energy savings over corresponding standard magnetic units while maintaining equivalent full light output. Operates lamps at 60 Hz. (e.g. RQM-2S40-TP vs R-2S40-TP).

E-PAK = Energy-saving electromagnetic ballast specifically optimized for energy saving lamps to provide 17% energy savings over corresponding standard magnetic units while maintaining equivalent light output. Operates lamps at 60 Hz (e.g. RQM-2S40-TP vs R-2S40-TP) .