



for T8, T5/HO, 4-Pin CFL and 40W Long Twin Tube Lamps

## Mark X® Powerline Electronic Fluorescent Dimming Ballasts



100% light output to...



Ballast for T8 Linear, 40W Long Twin Tube, and 4-Pin CFL Lamps

Ballast for T5/HO Lamps



... 5% light output

### Product Profile

The Advance Mark X® Powerline ballast is the full-range electronic dimming ballast for fluorescent lighting systems. The Mark X® Powerline combines the long life and energy efficiency of fluorescent lamps with the controllability and full-range dimming capabilities of incandescent systems. The Mark X® Powerline requires no additional wiring, making it an easy-to-install retrofit option.

### Applications

New construction and retrofit installations where dimming is desired:

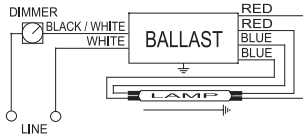
- Private and Executive Offices
- Conference Rooms and Boardrooms
- Hotels
- Auditoriums and Training Areas
- Restaurants
- Houses of Worship
- Healthcare Facilities
- Department Stores and Specialty Stores
- Schools

### Design Highlights

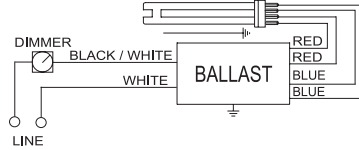
- 100% - 5% full range continuous dimming (T5/HO to 1%)
  - Adds flexibility to system
  - Improves visual comfort
- Energy efficient
  - Provides up to 65% energy savings over standard fixed output T8 ballasts
- No additional control leads
  - Easy to install - requires no extra wiring
  - Flexibility - operates with wide choice of controls from over 20 control manufacturers
- Programmed-start operation
  - Optimizes lamp life in frequent starting conditions
- Lamp ignition at any light setting, including the 5% dim level (1% in T5/HO)
  - Eliminates the need to ramp up to 100% light output when starting
- Operates above 40 kHz
  - Minimizes risk of interference with infrared remote control systems and provides continuous flicker free dimming
- Lamp End-of-Life (EOL) detection system (CFL, T5/HO and long twin tube models only)
  - Safely removes power from lamp at end of life
  - Prevents lamp overheating

electronic dimming ballast

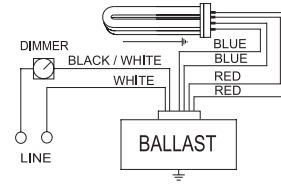
Single Lamp T-8 Ballast - Fig. 20



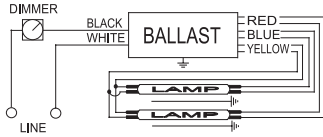
Single Lamp FT40W Ballast - Fig. 93B



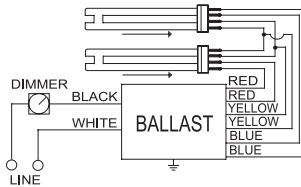
Single Lamp Triple Tube - Fig. 40



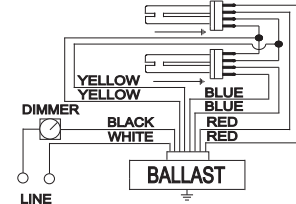
2-Lamp T-8 Ballast - Fig. 21



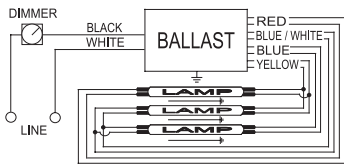
2-Lamp FT40W Ballast - Fig. 94B



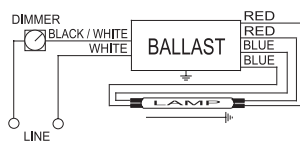
2-Lamp 26W Quad Ballast - Fig. 41



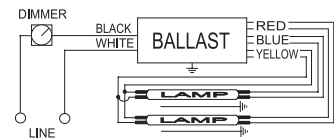
3-Lamp T-8 Ballast - Fig. 30



Single Lamp T5/H0 Ballast - Fig. 55



2-Lamp T5/H0 Ballast - Fig. 56



## Control Types

The desired light level can be controlled using the following:

- Wallbox Dimmer
- Wallbox/Occupancy Dimmer
- Architectural Dimmer
- Occupancy Sensor
- Total Building Lighting Control System
- Theatrical Control Panel
- Remote Control via Computer

T8 Linear



Long Twin Tube



T5/H0



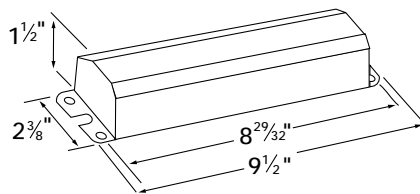
Triple Tube 4-Pin CFL



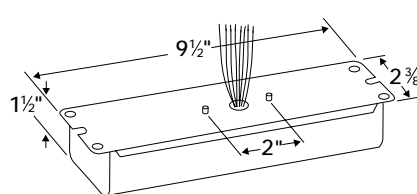
Quad Tube 4-Pin CFL



T-8 and Long Twin Tube Ballast Dimensions - Fig. A

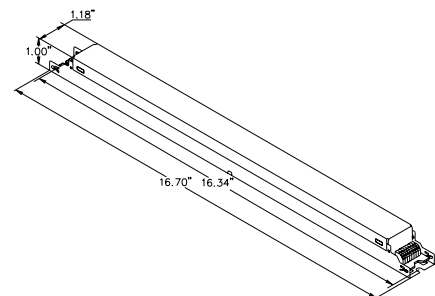


CFL Ballast Dimensions - Fig. B



(Quad & Triple Tube, Stud Mount Bottom Lead)

T5/H0 Ballast Dimensions - Fig. C



- NOTE:**
1. One and Two-lamp ballasts may be remote mounted up to six feet away from lamps. Three lamp ballasts may not be remote mounted.
  2. 15/8" and 6" U-bend lamps also acceptable.
  3. Lamps must be mounted within 3/4" of a ground plane.

Lamp Data		Min. Starting Temp. (°F/°C)	Input Volts	Catalog Number	Certifications		Input Power ANSI (Watts) max/min	Ballast Factor max/min	Max. THD % (at full light output)	Min. Power Factor	Dim./ Wiring Diagram
Number	Watts				UL	ETP					

### T8 Linear and "U" Lamps

F25T8 STRAIGHT & "U" LAMPS: Length = 3 ft.											
1	25	50/10	120	REZ-132	✓	✓	30-8	1.05-0.05	10	0.98	Fig A./20
			277	VEZ-132	✓	✓					
2	25	50/10	120	REZ-2S32	✓	✓	59-14	1.05-0.05	10	0.99	Fig A./21
			277	VEZ-2S32	✓	✓					
3	25	50/10	120	REZ-3S32	✓	✓	87-18	1.05-0.05	10	0.99	Fig A./30
			277	VEZ-3S32	✓	✓					
F32T8 STRAIGHT & "U" LAMPS: Length = 4 ft.											
1	32	50/10	120	REZ-132	✓	✓	35-9	1.00/ 0.05	10	0.99	Fig A./20
			277	VEZ-132	✓	✓					
2	32	50/10	120	REZ-2S32	✓	✓	70-16	1.00/ 0.05	10	0.99	Fig A./21
			277	VEZ-2S32	✓	✓					
3	32	50/10	120	REZ-3S32	✓	✓	104-20	1.00/ 0.05	10	0.99	Fig A./30
			277	VEZ-3S32	✓	✓					

### 40W Long Twin Tube Lamps

FT40W/2G11/RS: Length = 22.5 in.											
1	40	50/10	120	REZ-1TTS40	✓	✓	41-10	1.00-0.05	10	0.98	Fig. A/93B
			277	VEZ-1TTS40	✓	✓					
2	40	50/10	120	REZ-2TTS40	✓	✓	80-17	1.00-0.05	10	0.98	Fig. A/94B
			277	VEZ-2TTS40	✓	✓					

### Triple Tube 4-Pin Compact Lamps

CFM26W/GX24q: Length = 5.5 in.											
1	26	50/10	120	REZ-1T32	✓	✓	31-8	1.05-0.05	10	0.98	Fig. B/40
			277	VEZ-1T32	✓	✓					
2	26	50/10	120	REZ-2Q26	✓	✓	58-16	1.00-0.05	10	0.98	Fig.B/41
			277	VEZ-2Q26	✓	✓					
CFM32W/GX24q: Length = 5.5 in.											
1	32	50/10	120	REZ-1T32	✓	✓	38-9	1.00-0.05	10	0.98	Fig. B/40
			277	VEZ-1T32	✓	✓					
CFM42W/GX24q: Length = 5.5 in.											
1	42	50/10	120	REZ-1T42	✓	✓	49-10	1.00-0.05	10	0.98	Fig. B/40
			277	VEZ-1T42	✓	✓					

### Quad Tube 4-Pin Compact Lamps

CFQ26W/GX24q: Length = 6.5 in.											
1	26	50/10	120	REZ-1T32	✓	✓	31-8	1.00-0.05	10	0.98	Fig. B/40
			277	REZ-2T32	✓	✓					
2	26	50/10	120	REZ-2Q26	✓	✓	58-16	1.00-0.05	10	0.98	Fig. B/41
			277	VEZ-2Q26	✓	✓					

### T5/HO Linear Lamps

F54T5/HO: Length = 46 in.											
1	54	50/10	120	REZ-154	✓	✓	63-12.5	1.00-0.03	10	0.98	Fig. C/55
2	54	50/10	277	REZ-2S54	✓	✓	125-24	1.00-0.03	10	0.98	Fig. C/56
1	54	50/10	120	VEZ-154	✓	✓	63-12.5	1.00-0.03	10	0.98	Fig. C/55
2	54	50/10	277	VEZ-2S54	✓	✓	125-24	1.00-0.03	10	0.98	Fig. C/56

Burn in new lamps 100 hours at full light output before dimming.

# Advance Mark X® Powerline Ballast Specifications

## Section I - Physical Characteristics

- 1.1 The ballast shall be physically interchangeable with a standard electromagnetic or standard electronic ballast.
- 1.2 The electronic ballast shall be provided with integral leads or color-coded connectors that comply with ANSI standard C82.11 (latest revision).

## Section II - Performance Requirements

- 2.1 Ballast shall operate from a nominal line voltage of 120 or 277 volts, +/-10%, 60Hz.
- 2.2 For T8 and CFL, ballast shall control lamp light output from a ballast factor of 1.0 to .05 (100% - 5% relative light output). For T5/HO, ballast shall control lamp light output from a ballast factor of 1.0 to 0.03 (100% - 1% relative light output).
- 2.3 Ballast ANSI input wattage must be listed clearly in the catalog, and be 35, 70 and 104 watts or less for 1, 2 and 3 F32T8 applications, respectively.
- 2.4 Ballast shall maintain constant light output for a line voltage variation of +/-10%.
- 2.5 The electronic ballast's input current shall have a Total Harmonic Distortion (THD) of less than 10% at maximum light-output.
- 2.6 The electronic ballast shall have a Power Factor greater than 98% when used with primary lamp.
- 2.7 The electronic ballast shall have Lamp Current Crest Factor of less than 1.7 throughout the dimming range.
- 2.8 The electronic ballast shall withstand a sustained short to ground or open circuit of any output leads.
- 2.9 The electronic ballast shall be sound rated A.

- 2.10 Ballast output frequency to the lamps shall be above 40kHz to minimize interference with infrared control systems, and eliminate visible flicker.
- 2.11 Ballast for compact fluorescent lamps shall have lamp end-of-life detection and shut down circuitry that meets proposed ANSI/IEC standard.
- 2.12 Ballast shall ignite the lamps at any light output setting selected without having to go to full "on" first.
- 2.13 Ballast shall be controlled by a Mark X® Powerline two-wire or other compatible dimmer.

## Section III - Regulatory Requirements

- 3.1 Ballast shall meet the requirements of the Federal Communications Commission rules and regulations, part 18, for Non-Consumer equipment.
- 3.2 The electronic ballast shall meet ANSI C82.11 standards regarding harmonic distortion.
- 3.3 Ballast shall meet ANSI C62.41 Cat. A for transient protection.
- 3.4 The electronic ballast shall comply with all applicable state and federal efficiency standards.
- 3.5 The electronic ballast shall be Underwriters Laboratories (UL) listed (Class P) and CSA Certified where applicable.

## Section IV - Other

- 4.1 The electronic ballast shall not contain Polychlorinated Biphenyl (PCB's).
- 4.2 The electronic ballast shall carry a five year warranty when its case temperature does not exceed 70°C.
- 4.3 Ballast manufacturer shall have a 10 year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be produced in a factory certified to ISO 9002 Quality System Standards.

