



## ELECTRONIC FLUORESCENT

### PRODUCT OVERVIEW:

**Mark 10 Powerline** ballasts for linear fluorescent, 4-pin CFL, and T5HO lamps are the ideal choice for 2-wire dimmable lighting installations. Without the need of additional control leads, the **Mark 10 Powerline** makes controllable fluorescent lighting systems as fast and as easy to install as fixed output systems - while being up to 80% more energy efficient than incandescent systems.

The **Mark 10 Powerline** ballasts programmed start design optimizes lamp and dimming performance by monitoring system performance and making continuous adjustments. Plus the **Mark 10 Powerline** does not have to ramp up to full light output and then dim. The ballast will start lamps at the minimum dimming level, increasing comfort levels for area occupants.

# Mark 10<sup>®</sup> Powerline

for Linear Fluorescent and 4-pin CFL Lamps



### DESIGN HIGHLIGHTS:

- 100% - 5% full range continuous dimming (T5HO to 1%)
  - Increase flexibility and enhances visual comfort
- Energy efficient
  - Provides up to 65% energy savings over standard fixed output T8 ballasts (e.g., REL-2P32-SC)
- Absence of additional control leads
  - Enhances ease of installation - requires no extra wiring
  - Highly flexible and compatible with a wide variety of controls by a broad range of 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 T5HO)
  - Eliminates the need to ramp up to 100% light output when starting
- Operates above 42 kHz
  - Minimizes risk of interference with infrared remote control systems and provides continuous flicker-free dimming
- End-of-Lamp (EOLL) life protection circuit (CFL and T5/HO models only)
  - Safely removes power from lamp at end of life

### APPLICATIONS:

- **General Lighting**
- **Conference Rooms**
- **Board Rooms**
- **Meeting Rooms**
- **Executive Offices**
- **Auditoriums**

HIGH FREQUENCY ELECTRONIC BALLASTS

For 17 - 32W T8 Lamps

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
<b>F17T8, FBO16T8 (17W)</b>											
1	120	PS	Mark 10 Powerline	REZ-132-SC	24/7	1.05/0.05	10	0.20	50/10	B	152
	277			VEZ-132-SC				0.09			
2	120			REZ-2S32-SC	38/13			0.32			
	277			VEZ-2S32-SC				0.14			
3	120			REZ-3S32-SC	56/18			0.47			
	277			VEZ-3S32-SC				0.21			
<b>F25T8, FBO24T8 (25W)</b>											
1	120	PS	Mark 10 Powerline	REZ-132-SC	30/7	1.05/0.05	10	0.26	50/10	B	152
	277			VEZ-132-SC				0.11			
2	120			REZ-2S32-SC	55/13			0.46			
	277			VEZ-2S32-SC				0.20			
3	120			REZ-3S32-SC	79/19			0.66			
	277			VEZ-3S32-SC				0.29			
<b>F32T8, FBO31T8, F32T8/U6 (32W)</b>											
1	120	PS	Mark 10 Powerline	REZ-132-SC	35/9	1.00/0.05	10	0.29	50/10	B	152
	277			VEZ-132-SC				0.13			
2	120			REZ-2S32-SC	68/15			0.57			
	277			VEZ-2S32-SC				0.25			
3	120			REZ-3S32-SC	102/20			0.86			
	277			VEZ-3S32-SC				0.37			

For ballast dimensions and wiring diagrams see page 5

HIGH FREQUENCY ELECTRONIC BALLASTS

For 24 - 55W T5/HO Lamps

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
<b>F24T5/HO (24W)</b>											
2	120-277 IntelliVolt	PS	Mark 10 Powerline	IEZ-2S24-D	57/16	1.00/0.05	10	0.48-0.21	50/10	D	153
<b>F54T5/HO (54W)</b>											
1	120	PS	Mark 10 Powerline	REZ-154	63/13	1.00/0.03	10	0.53	50/10	D	152
	277			VEZ-154				0.23			
2	120			REZ-2S54	125/24			1.05			
	277			VEZ-2S54				0.45			
<b>FC12T5/HO (55W)</b>											
1	120	PS	Mark 10 Powerline	REZ-154	59/13	0.90/0.03	10	0.50	50/10	D	152
	277			VEZ-154				0.22			
2	120			REZ-2S54	114/24			0.96			
	277			VEZ-2S54				0.42			

For ballast dimensions and wiring diagrams see page 5

# HIGH FREQUENCY ELECTRONIC BALLASTS

## For 18 - 70W T4 Lamps

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
<b>CFQ18W/G24q - 18W CFL Quad Tube Lamp (PL-C18W/4P, F18DBX/4P, CF18DD/E)</b>											
<b>CFTR18W/GX24q - 18W CFL Triple Tube Lamp (PL-T18W, F18TBX/4P, CF18DT/E)</b>											
1	120	PS	Mark 10 Powerline	REZ-1Q18-M2-BS	22/7	1.00/0.05	10	0.18	50/10	Size 2	134
	277			REZ-1Q18-M2-LD				0.07			
2	120			REZ-2Q18-M2-BS	43/14			0.36			
	277			REZ-2Q18-M2-LD				0.16			
<b>CFQ26W/G24q - 26W CFL Quad Tube Lamp (PL-C26W/4P, F26DBX/4P, CF26DD/E)</b>											
<b>CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)</b>											
1	120	PS	Mark 10 Powerline	REZ-1T42-M2-BS	31/8	1.00/0.05	10	0.26	50/10	Size 2	134
	277			REZ-1T42-M2-LD				0.11			
2	120			REZ-2Q26-M2-BS	58/16			0.48			
	277			REZ-2Q26-M2-LD				0.21			
<b>CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)</b>											
1	120	PS	Mark 10 Powerline	REZ-1T42-M2-BS	38/9	1.00/0.05	10	0.32	50/10	Size 2	134
	277			REZ-1T42-M2-LD				0.14			
2	120			REZ-2T42-M3-BS	76/20			0.64		Size 3	132
	277			REZ-2T42-M3-LD				0.28			
<b>CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)</b>											
1	120	PS	Mark 10 Powerline	REZ-1T42-M2-BS	49/10	1.00/0.05	10	0.41	50/10	Size 2	134
	277			REZ-1T42-M2-LD				0.18			
2	120			REZ-2T42-M3-BS	98/20			0.82		Size 3	132
	277			REZ-2T42-M3-LD				0.36			
<b>CFTR57W/GX24q - 57W CFL Triple Tube Lamp (PL-T57W, F57QBX/4P, CF57DT/E)</b>											
1	120	PS	Mark 10 Powerline	REZ-2T42-M3-BS	66/18	1.00/0.05	10	0.55	50/10	Size 3	134
	277			REZ-2T42-M3-LD				0.24			
<b>CFTR70W/GX24q - 70W CFL Triple Tube Lamp (F70QBX/4P, CF70DT/E)</b>											
1	120	PS	Mark 10 Powerline	REZ-2T42-M3-BS	80/18	1.00/0.05	10	0.67	50/10	Size 3	134
	277			REZ-2T42-M3-LD				0.29			

Note: **Ⓢ** Replacement/Retrofit Ballast Kits indicated by **Bold Type** with suffix -K are available to distributors. Refer to page1-24 for details.

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.  
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

For ballast dimensions and wiring diagrams see page 5

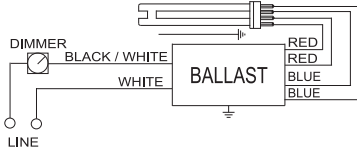
For 24 - 55W FT5 Lamps

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (F/C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
<b>FT24W/2G11 - 24/27WW Long Twin Tube Lamp (PL-L24W, F27BX/RS, FT24DL)</b>											
2	120-277 IntelliVolt	PS	Mark 10 Powerline	IEZ-2S24-D	57/16	1.00/0.05	10	0.48-0.21	50/10	D	132
<b>FT36W/2G11 - 36/39W Long Twin Tube Lamp (PL-L36W, F39BX/RS, FT36DL)</b>											
1	120	PS	Mark 10 Powerline	REZ-1TTS40-SC	38/9	1.00/0.05	10	0.32	50/10	B	134
	277			VEZ-1TTS40-SC				0.14			
2	120			REZ-2TTS40-SC	75/16			0.64			132
	277			VEZ-2TTS40-SC				0.27			
<b>FT40W/2G11/RS - 40W Long Twin Tube Lamp (PL-L40W, F40BX, FT40DL/RS)</b>											
1	120	PS	Mark 10 Powerline	REZ-1TTS40-SC	41/10	1.00/0.05	10	0.32	50/10	B	134
	277			VEZ-1TTS40-SC				0.15			
2	120			REZ-2TTS40-SC	80/17			0.68			132
	277			VEZ-2TTS40-SC				0.30			
<b>FT55W/2G11 - 55W Long Twin Tube Lamp (PL-L55W, F55BX, FT55DL)</b>											
1	120	PS	Mark 10 Powerline	REZ-154	59/13	0.90/0.05	10	0.50	50/10	D	134
	277			VEZ-154				0.22			
2	120			REZ-2S54	114/24			0.96			132
	277			VEZ-2S54				0.42			

Burn in new lamps 100 hours at full light before dimming.  
Ballasts utilizing poke-in connectors can accept wire gauge AWG 16-20.

For ballast dimensions and wiring diagrams see page 5

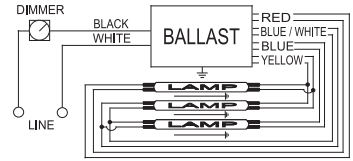
1-Lamp FT40W Ballast - Fig. 134



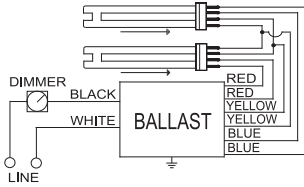
1-Lamp T8 Ballast - Fig. 152



3-Lamp T8 Ballast - Fig. 155



2-Lamp FT40W Ballast - Fig. 132



2-Lamp T8 Ballast - Fig. 153

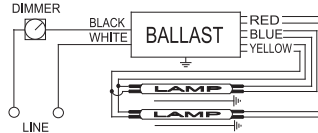
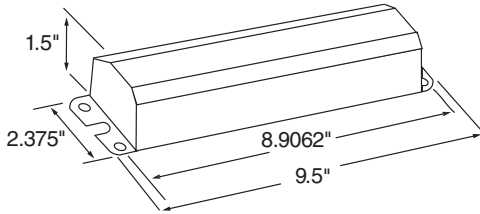
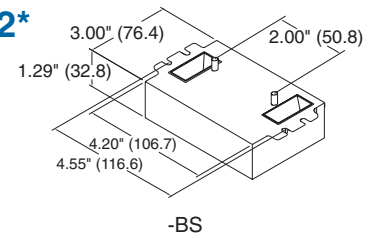
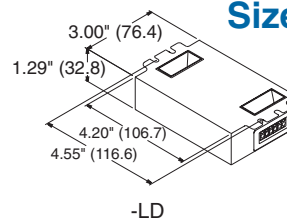


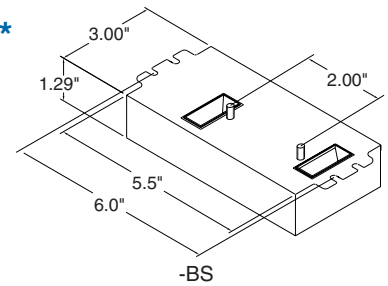
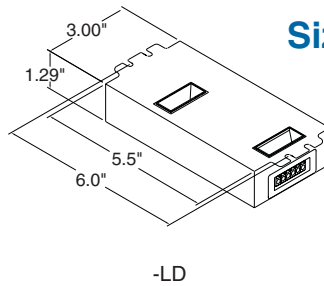
Fig. A



Size 2\*

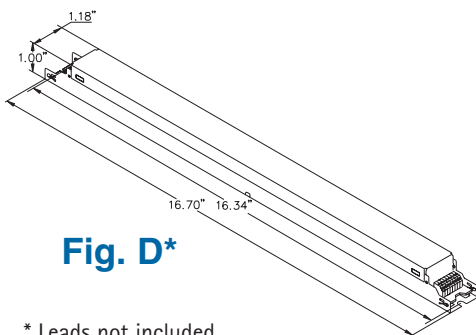


Size 3\*



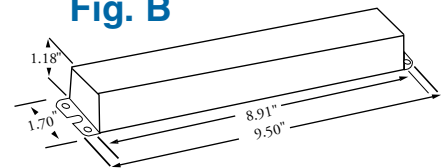
Dual Connector for Input Only

Fig. D\*



\* Leads not included

Fig. B



- 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. 1<sup>5</sup>/<sub>8</sub>" and 6" U-bend lamps also acceptable.  
 3. Lamps must be mounted within 3/4" of a ground plane.

## BALLAST SPECIFICATIONS

### Mark 10® Powerline

#### 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 available in a plastic/metal can or all metal can construction to meet all plenum requirements.
- 1.3 Ballast shall be provided with poke-in wire trap connectors or integral leads color coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 at full light output and greater than 0.90 throughout the dimming range for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 at maximum light output and 0.05 at minimum light output for primary lamp.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less throughout the dimming range in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% at maximum light output when operated at nominal line voltage with primary lamp. Total Harmonic Current (THC) at minimum light output shall not exceed THC at maximum light output.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of 10C (50F) for primary lamp.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit for all T5, T5/HO, and CFL lamps.
- 2.12 Ballast shall control lamp light output from 100% - 5% relative light output for T8 and CFL lamps and 100% - 1% relative light output for T5/HO lamps.
- 2.13 Ballast shall ignite the lamps at any light output setting without first going to another output setting.
- 2.14 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

#### Section III - Regulatory Requirements

- 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 the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

#### Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a \_\_\_\_\_ warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of \_\_\_\_\_ (Go to our web site for up-to-date warranty information: [www.advancetransformer.com/warranty](http://www.advancetransformer.com/warranty)).
- 4.3 Manufacturer shall have a fifteen year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be controlled by a compatible Mark 10 Powerline two-wire dimmer.
- 4.5 Ballast shall be Advance part # \_\_\_\_\_ or approved equal.



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