

# Mark 7<sup>®</sup> 0-10V

for Linear Fluorescent and 4-pin CFL Lamps



## ELECTRONIC FLUORESCENT

### PRODUCT OVERVIEW :

Advance's **Mark 7 0-10V** ballasts are highly versatile and cost-effective choice for 4-wire dimmable lighting installations. Designed to operate both linear fluorescent and 4-pin compact fluorescent lamps, the **Mark 7 0-10V** family of dimmable electronic ballasts satisfies the need for an affordable, flexible and versatile controllable lighting solution. Newer CFL models provide operation for up to six lamp types from any line voltage. This flexibility is achieved through design breakthroughs, such as lamp recognition — the ability to “sense” and operate the lamp at optimal performance.

The units dim lamps directly from a variety of compatible 0-10V controls, including occupancy sensors, ambient light sensors, and other automatic and manual controls. They are ideal for use with the most sophisticated total building management control systems, optimizing such popular techniques as daylight harvesting and load shedding to drive maximum energy cost savings. The ballasts' design allows for lighting control across branch circuits, reducing the number of controls required and maximizing flexibility of application.

Ballast for T8 Linear and 40W Long Twin Tube Lamps



Ballast for T5/HO Lamps



Ballast for 4-Pin Compact Fluorescent Lamps

### *Programmed Start Electronic Fluorescent Dimming Ballasts*

### DESIGN HIGHLIGHTS:

- 100% - 5% full range continuous dimming (T5/HO to 1%)
  - Increase flexibility and enhances visual comfort
- Energy-efficient design
  - Provides up to 65% energy savings over standard fixed output T8 ballasts (e.g., REL-2P32-SC)
- Direct operation from a 0-10V DC control signal
  - Enables the need for fewer controls
  - Allows for a single control across branch circuits
- IntelliVolt<sup>®</sup> multiple-voltage technology enabling operation at any input voltage from 120 to 277 volts, 50/60 Hz
  - Enhances accuracy of ordering and reduces SKU
- End-of-Lamp Life (EOLL) protection circuit (except on 1, 2, and 3 lamp T8)
  - Safely removes power from lamp at end of life
- Programmed Start operation
  - Provides extended lamp life in frequent starting applications

### APPLICATIONS:

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

### 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	120-277 IntelliVolt	PS	Mark 7 0-10V	IZT-132-SC	20/7	1.00/0.03	10	0.16-0.07	50/10	B	55A
2				IZT-2S32-SC	36/11			0.30-0.13			56A
3				IZT-3S32-SC	56/18			0.46-0.20			57A
<b>F25T8, FBO24T8 (25W)</b>											
1	120-277 IntelliVolt	PS	Mark 7 0-10V	IZT-132-SC	28/8	1.00/0.03	10	0.24-0.11	50/10	B	55A
2				IZT-2S32-SC	52/12			0.43-0.19			56A
3				IZT-3S32-SC	79/19			0.65-0.28			57A
4				IZT-4S32	96/22	0.88/0.03	0.77-0.35	D	16A		
<b>F32T8, FBO31T8, F32T8/U6 (32W)</b>											
1	120-277 IntelliVolt	PS	Mark 7 0-10V	IZT-132-SC	35/8	1.00/0.03	10	0.30-0.13	50/10	B	55A
2				IZT-2S32-SC	70/14			0.57-0.24			56A
3				IZT-3S32-SC	102/20			0.86-0.37			57A
4	277	PS	Mark 7 0-10V	VZT-4S32-G	116/25	0.88/0.05	10	0.42	50/10	G	16A
	120-277 IntelliVolt			VZT-4S32-HL	149/27	1.18/0.05		0.54			16A
				IZT-4S32	116/25	0.88/0.03		0.98-0.42			D

Ballasts utilizing poke-in connectors can accept wire gauge AWG 16-20.

For ballast dimensions and wiring diagrams see page 3

# HIGH FREQUENCY ELECTRONIC BALLASTS

## For 54 - 80W T5HO 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>F54T5/HO (54W)</b>											
1	120	PS	Mark 7 0-10V	RZT-154	63/13	1.00/0.03	10	0.53	50/10	D	55A
	277			VZT-154				0.23			
2	120			RZT-2S54	125/24			1.05			56A
	277			VZT-2S54				0.45			
<b>F80T5/HO (80W)</b>											
1	277	PS	Mark 7 0-10V	VZT-180	94/18	1.00/0.03	10	0.34	50/10	D	55A
<b>FC12T5/HO (55W)</b>											
1	120	PS	Mark 7 0-10V	RZT-154	59/13	0.90/0.03	10	0.50	50/10	D	55A
	277			VZT-154				0.22			
2	120			RZT-2S54	114/24			0.96			56A
	277			VZT-2S54				0.42			

Ballasts utilizing poke-in connectors can accept wire gauge AWG 16-20.

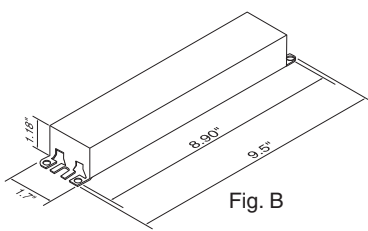


Fig. B

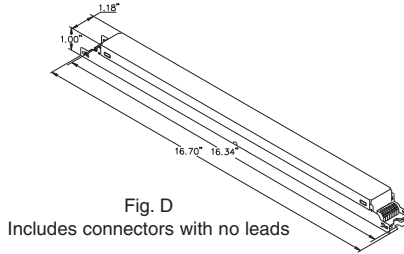


Fig. D

Includes connectors with no leads

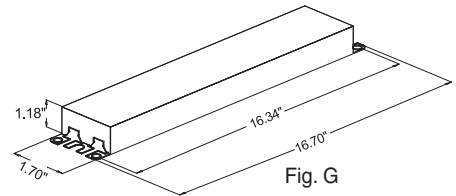
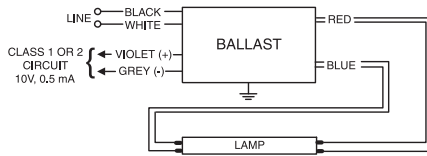
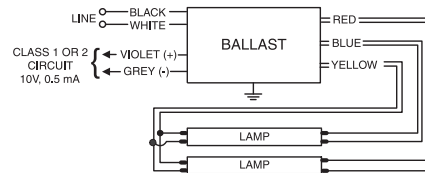


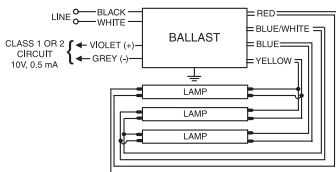
Fig. G



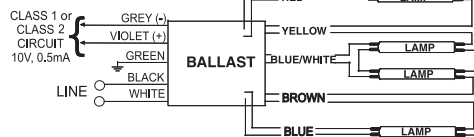
Diag. 55A



Diag. 56A



Diag. 57A



Diag. 16A

### For 13 - 70W T4 Lamps

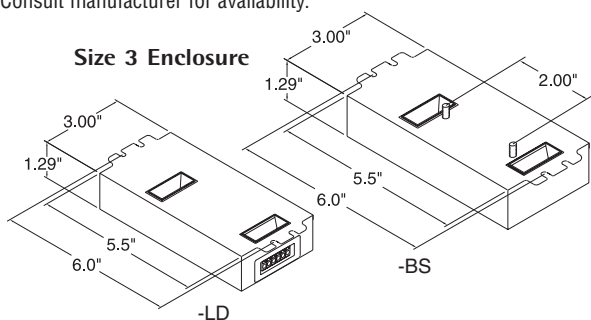
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
<b>CFQ13W/G24q - 13W CFL Quad Tube Lamp (PL-C13W/4P, F13DBX/4P, CF13DD/E)</b> <b>CFTR13W/GX24q - 13W CFL Triple Tube Lamp (F13TBX/4P, CF13DT/E)</b>											
1	120-277 IntelliVolt	PS	Mark 7 0-10V	I-ZT-2S26-M5-BS	18/6	1.00/0.03	10	0.15-0.07	50/10	Size 5	58A
2				I-ZT-2S26-M5-LD	33/19			0.28-0.12			59A
<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	120-277 IntelliVolt	PS	Mark 7 0-10V	I-ZT-2S26-M5-BS	23/7	1.00/0.03	10	0.19-0.09	50/10	Size 5	58A
2				I-ZT-2S26-M5-LD	41/11			0.34-0.15			59A
<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	120-277 IntelliVolt	PS	Mark 7 0-10V	I-ZT-2S26-M5-BS	30/8	1.00/0.03	10	0.25-0.11	50/10	Size 5	58A
2				I-ZT-2S26-M5-LD	55/13			0.46-0.20			59A
<b>CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)</b>											
1	120-277 IntelliVolt	PS	Mark 7 0-10V	I-ZT-2S26-M5-BS	36/9	1.00/0.03	10	0.30-0.13	50/10	Size 5	58A
2				I-ZT-2T42-M5-BS*	75/19			0.63-0.21			59A
<b>CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)</b>											
1	120-277 IntelliVolt	PS	Mark 7 0-10V	I-ZT-2S26-M5-BS	47/9	1.00/0.03	10	0.39-0.17	50/10	Size 5	58A
2				I-ZT-2T42-M5-BS*	98/18			0.82-0.36			59A
<b>CFTR57W/GX24q - 57W CFL Triple Tube Lamp (PL-T57W, F57QBX/4P, CF57DT/E)</b>											
1	120-277 IntelliVolt	PS	Mark 7 0-10V	I-ZT-2T42-M5-BS*	65/16	1.00/0.03	10	0.55-0.24	50/10	Size 5	58A
				I-ZT-2T42-M5-LD*							
<b>CFTR70W/GX24q - 70W CFL Triple Tube Lamp (F70QBX/4P, CF70DT/E)</b>											
1	120-277 IntelliVolt	PS	Mark 7 0-10V	I-ZT-2T42-M5-BS*	75/16	1.00/0.03	10	0.63-0.27	50/10	Size 5	58A
				I-ZT-2T42-M5-LD*							

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.

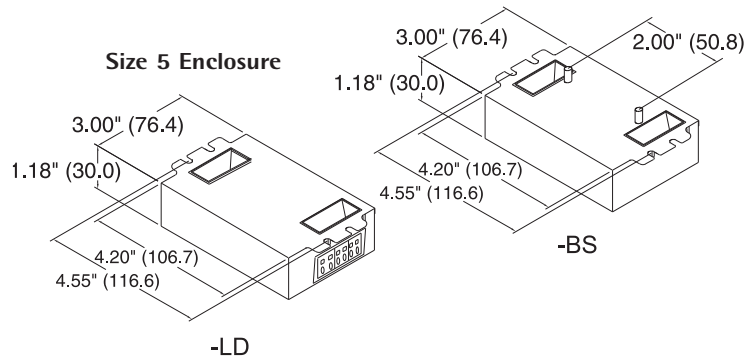
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

\* Consult manufacturer for availability.

For wiring diagrams see page 5



(Dual connector for input only)



# HIGH FREQUENCY ELECTRONIC BALLASTS

## For 36 - 80W T5 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>FT36W/2G11 - 36/39W Long Twin Tube Lamp (PL-L36W, F39BX/RS, FT36DL)</b>											
2	120-277 IntelliVolt	PS	Mark 7 0-10V	IZT-2TTS40-SC	75/16	1.00/0.03	10	0.64-0.27	50/10	B	59A
<b>FT40W/2G11/RS - 40W Long Twin Tube Lamp (PL-L40W, F40BX, FT40DL/RS)</b>											
1	120	PS	Mark 7 0-10V	RZT-1TTS40	38/11	1.00/0.05	10	0.32	50/10	A	58A
2	120-277 IntelliVolt			IZT-2TTS40-SC	76/16	1.00/0.03		0.64-0.28		B	59A
<b>FT55W/2G11 - 55W Long Twin Tube Lamp (PL-L55W, F55BX, FT55DL)</b>											
1	120	PS	Mark 7 0-10V	RZT-154	59/13	0.90/0.03	10	0.50	50/10	D	58A
	277			VZT-154				0.22			
2	120			RZT-2S54	114/24			0.96			59A
	277			VZT-2S54				0.42			
<b>FT80W/2G11 - 80W Long Twin Tube Lamp (PL-L80W, FT80DL)</b>											
1	277	PS	Mark 7 0-10V	VZT-180	94/16	1.00/0.03	10	0.34	50/10	D	58A

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

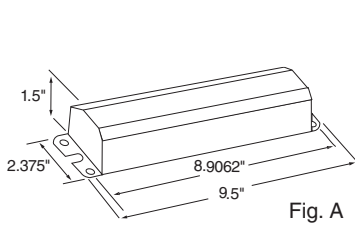


Fig. A

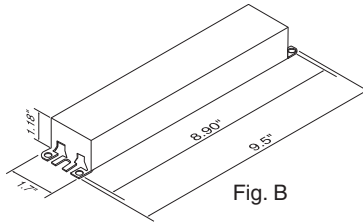


Fig. B

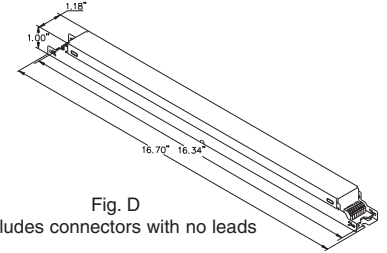
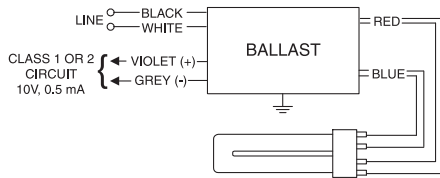
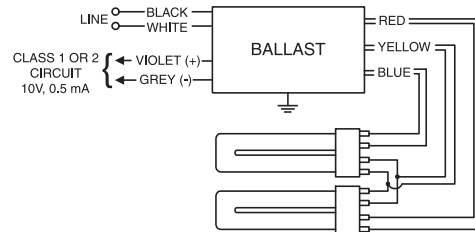


Fig. D

Includes connectors with no leads



Diag. 58A



Diag. 59A

## BALLAST SPECIFICATIONS

### Mark 7® 0-10V

#### 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 be provided with integral protection circuitry to withstand connection of low voltage control leads to mains power supply. In this event, ballast shall default to maximum light output.
- 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 or 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast. IntelliVolt models shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 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.
- 2.6 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.
- 2.7 Ballast shall have a minimum ballast factor of 1.00 (1.18 for HL version) at maximum light output and 0.03 at minimum light output for primary lamp.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less throughout the dimming range in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

- 2.10 Ballast shall have a Class A sound rating.
- 2.11 Ballast shall have a minimum starting temperature of 10C (50F) for primary lamp.
- 2.12 Ballast shall provide Lamp EOL Protection Circuit for all T5, T5/HO, and CFL lamps.
- 2.13 Ballast shall control lamp light output from 100% - 3% relative light output for T8 and CFL lamps and 100% - 1% relative light output for T5/HO lamps.
- 2.14 Ballast shall ignite the lamps at any light output setting without first going to another output setting.
- 2.15 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 Class 1 or Class 2 low voltage 0-10VDC controller.
- 4.5 Ballast shall be Advance part # \_\_\_\_\_ or approved equal.



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