



Direct5™  
LED

Direct8™  
LED



## LED T5 and T8 Tubes

TCP has a new generation of LED compatible replacement T5 and T8 tubes for linear fixtures. These T5 and T8 tubes are dimmable and feature multiple ballast compatibility including Instant Start, Rapid Start, and Programmed Start.

Limitless Options  
for the following applications:

- Offices
- Restaurants
- Retail Stores
- Lobbies
- Schools
- Hospitals



5 YEAR  
WARRANTY

we know light.™



Direct5™  
LED

Direct8™  
LED

## Features and Benefits

>50% energy savings (based on T8 NBF energy use)
Long 50,000 hour rated life — minimizes replacements and labor costs
Compatible with Instant, Rapid or Programmed Start ballasts and most traditional fluorescent ballasts
Dimmable (0-10v dimming ballasts recommended)
No rewiring of fixture — simply replace fluorescent lamp with LED lamp
Instant on/off
No mercury — great for all environments
Rated for enclosed fixtures
2', 3', 4' tubes and U6 tube options available
No UV

LED T5 Tube  
4 foot



LED T8 Tube  
4 foot



LED T8 Tube  
3 foot



LED T8 Tube  
2 foot



LED U-Bend T8 Tube  
6 inch



## Specifications

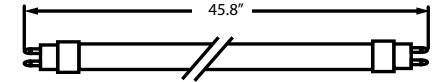
Item #	Min Starting Temp	Max Operating Temp	Voltage	NSF 2 Rated	Beam Angle	Field Angle*	PF	THD**
L12T8	-30c	55c	120-277, 347V	no	210°	325°	> .99	< 8%
L12T8-95	-30c	55c	120-277, 347V	no	210°	325°	> .99	< 8%
L11T8	-30c	55c	120-277, 347V	no	210°	325°	> .99	< 8%
L11T83	-30c	55c	120-277, 347V	no	210°	325°	> .99	< 8%
L9T8	-30c	55c	120-277, 347V	no	210°	325°	> .99	< 8%
L13T8U	-30c	55c	120-277, 347V	no	160°	325°	> .99	< 8%
L15T8-SC	-30c	45c	120-277, 347V	yes	160°	290°	> .99	< 8%
L25T5	-20C	45c	120-277, 347V	yes	160°	270°	> .99	< 5%
L13T5	-20C	45c	120-277, 347V	yes	160°	250°	> .99	< 5%

**NOTE: Use shunted sockets for Instant Start ballasts. Use unshunted sockets for Rapid, Programmed, and Dimmable ballasts.**

\*Calculated

\*\*At 120v, ballast dependent

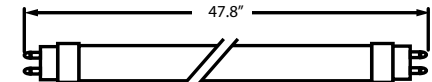
4 Foot T5 Dimensions



T5  
1.72"



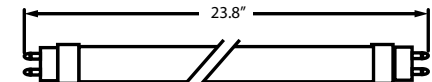
4 Foot T8 Dimensions



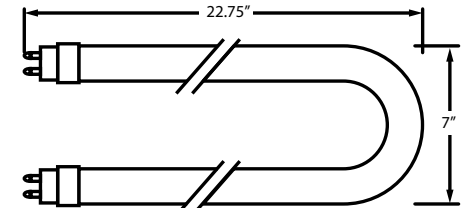
T8  
1.1"



2 Foot T8 Dimensions



U-Bend T8 Dimensions



## Listing

UL/cUL Listed – damp location rated

Approved for open and enclosed fixtures

## Warranty

Five years against defects in manufacturing



To view our DLC qualified products, please consult the DLC Qualified Products List at [www.designlights.org/qpl](http://www.designlights.org/qpl).



5 YEAR WARRANTY



# LED T8 Tubes

## LED DirecT8™ Instant Start/Rapid Start/Programmed Start Compatible

Item#	Description	DLC QPL*	Lamp Watts	Equip Watts	LBF System Watts	NBF System Watts	HBF System Watts	LBF Lumens	NBF Lumens	HBF Lumens	CCT	CRI	Base
<b>LED 12 WATT T8 TUBE – 4 FOOT GLASS MODEL# T8021</b>													
L12T8D5030K	LED 12W 4' T8 IS/RS 30K		12W	32W	13.0	14.9	21.5	1260	1700	2280	3000K	80	G13
L12T8D5035K	LED 12W 4' T8 IS/RS 35K	★	12W	32W	13.0	14.9	21.5	1300	1750	2340	3500K	80	G13
L12T8D5041K	LED 12W 4' T8 IS/RS 41K	★	12W	32W	13.0	14.9	21.5	1340	1800	2400	4100K	80	G13
L12T8D5050K	LED 12W 4' T8 IS/RS 50K	★	12W	32W	13.0	14.9	21.5	1380	1850	2480	5000K	80	G13
L12T8D5041KBP	LED 12W 4' T8 IS/RS 41K BULK PACK	★	12W	32W	13.0	14.9	21.5	1340	1800	2400	4100K	80	G13
L12T8D5050KBP	LED 12W 4' T8 IS/RS 50K BULK PACK	★	12W	32W	13.0	14.9	21.5	1380	1850	2480	5000K	80	G13
<b>LED 12 WATT HIGH CRI T8 TUBE – 4 FOOT GLASS MODEL# T8021</b>													
L12T8D5027K95	LED 12W 4' T8 IS/RS 27K 95		12W	32W	13.0	14.9	21.5	1300	1750	2340	3000K	90	G13
L12T8D5030K95	LED 12W 4' T8 IS/RS 30K 95		12W	32W	13.0	14.9	21.5	1340	1800	2400	3500K	90	G13
L12T8D5035K95	LED 12W 4' T8 IS/RS 35K 95		12W	32W	13.0	14.9	21.5	1340	1800	2400	4100K	90	G13
L12T8D5041K95	LED 12W 4' T8 IS/RS 41K 95		12W	32W	13.0	14.9	21.5	1360	1825	2425	5000K	90	G13
L12T8D5050K95	LED 12W 4' T8 IS/RS 50K 95		12W	32W	13.0	14.9	21.5	1380	1850	2480	4100K	90	G13
<b>LED 11 WATT HIGH EFFICACY T8 TUBE – 4 FOOT GLASS MODEL# T8024</b>													
L11T8D5030K	LED 11W 4' T8 HE IS/RS 30K		11W	32W	11.3	13.6	18.5	1340	1800	2410	3000K	80	G13
L11T8D5035K	LED 11W 4' T8 HE IS/RS 35K	★	11W	32W	11.3	13.6	18.5	1380	1850	2480	3500K	80	G13
L11T8D5041K	LED 11W 4' T8 HE IS/RS 41K	★	11W	32W	11.3	13.6	18.5	1410	1900	2540	4100K	80	G13
L11T8D5050K	LED 11W 4' T8 HE IS/RS 50K	★	11W	32W	11.3	13.6	18.5	1450	1950	2610	5000K	80	G13
<b>LED 11 WATT T8 TUBE – 3 FOOT GLASS MODEL# T8022</b>													
L11T8D5030K	LED 11W 3' T8 IS/RS 30K		11W	25W	11.6	13.5	19.2	1040	1400	1870	3000K	80	G13
L11T8D5035K	LED 11W 3' T8 IS/RS 35K		11W	25W	11.6	13.5	19.2	1080	1450	1940	3500K	80	G13
L11T8D5041K	LED 11W 3' T8 IS/RS 41K		11W	25W	11.6	13.5	19.2	1110	1500	2000	4100K	80	G13
L11T8D5050K	LED 11W 3' T8 IS/RS 50K		11W	25W	11.6	13.5	19.2	1150	1550	2070	5000K	80	G13
<b>LED 9 WATT T8 TUBE – 2 FOOT GLASS MODEL# T8023</b>													
L9T8D5030K	LED 9W 2' T8 IS/RS 30K		9W	17W	8.5	9.5	14.2	850	1150	1540	3000K	80	G13
L9T8D5035K	LED 9W 2' T8 IS/RS 35K	★	9W	17W	8.5	9.5	14.2	870	1175	1575	3500K	80	G13
L9T8D5041K	LED 9W 2' T8 IS/RS 41K	★	9W	17W	8.5	9.5	14.2	890	1200	1600	4100K	80	G13
L9T8D5050K	LED 9W 2' T8 IS/RS 50K	★	9W	17W	8.5	9.5	14.2	910	1225	1640	5000K	80	G13
<b>LED 13 WATT U-BEND T8 TUBE – 6 INCH PLASTIC MODEL# T8006</b>													
L13T8UD5030K	LED 13W U6 T8 IS/RS 30K	★	13W	32W	13.0	16.0	22.0	1400	1800	2500	3000K	83	2G13
L13T8UD5035K	LED 13W U6 T8 IS/RS 35K	★	13W	32W	13.0	16.0	22.0	1400	1800	2500	3500K	83	2G13
L13T8UD5041K	LED 13W U6 T8 IS/RS 41K	★	13W	32W	13.0	16.0	22.0	1450	1850	2550	4100K	83	2G13
L13T8UD5050K	LED 13W U6 T8 IS/RS 50K	★	13W	32W	13.0	16.0	22.0	1500	1900	2600	5000K	83	2G13

\* DLC qualified product at time of printing, consult [designlights.org](http://designlights.org) for the most up-to-date listing.

For the most up-to-date specs and warranty information, please visit [www.tcpi.com](http://www.tcpi.com)



## LED T8 Tubes

LED DirecT8™ SHATTERPROOF Instant Start/Rapid Start/Dimmable Electronic Compatible

Item#	Description	Lamp Watts	Equiv Watts	LBF System Watts	NBF System Watts	HBF System Watts	LBF Lumens	NBF Lumens	HBF Lumens	CCT	CRI	Base
<b>LED 15 WATT T8 TUBE – 4 FOOT SHATTERPROOF GLASS MODEL# T8032</b>												
L15T8D5030KSC	LED 15W 4' T8 IS/RS SC 30K	15W	32W	14.5	18	21.5	1600	2000	2350	3000K	80	G13
L15T8D5035KSC	LED 15W 4' T8 IS/RS SC 35K	15W	32W	14.5	18	21.5	1600	2000	2350	3500K	80	G13
L15T8D5041KSC	LED 15W 4' T8 IS/RS SC 41K	15W	32W	14.5	18	21.5	1650	2100	2450	4100K	80	G13
L15T8D5050KSC	LED 15W 4' T8 IS/RS SC 50K	15W	32W	14.5	18	21.5	1700	2200	2500	5000K	80	G13

## LED T5 Tubes

LED DirecT5™ SHATTERPROOF Electronic Ballast Compatible

Item#	Description	DLC QPL*	Lamp Watts	Equiv Watts	System Watts	System Lumens	CCT	CRI	Base
<b>LED 25.5 WATT T5 TUBE – 4 FOOT SHATTERPROOF GLASS MODEL# T8033</b>									
L25T5D5030K	LED 25W 4' T5 IS/RS SC 30K	★	25.5W	54W	28	3150	3000K	80	G5
L25T5D5035K	LED 25W 4' T5 IS/RS SC 35K	★	25.5W	54W	28	3150	3500K	80	G5
L25T5D5041K	LED 25W 4' T5 IS/RS SC 41K	★	25.5W	54W	28	3190	4100K	80	G5
L25T5D5050K	LED 25W 4' T5 IS/RS SC 50K	★	25.5W	54W	28	3280	5000K	80	G5
<b>LED 13 WATT T5 TUBE – 4 FOOT SHATTERPROOF GLASS MODEL# T8034</b>									
L13T5D5030K	LED 13W 4' T5 IS/RS SC 30K	★	13W	28W	16	1800	3000K	80	G5
L13T5D5035K	LED 13W 4' T5 IS/RS SC 35K	★	13W	28W	16	1800	3500K	80	G5
L13T5D5041K	LED 13W 4' T5 IS/RS SC 41K	★	13W	28W	16	1850	4100K	80	G5
L13T5D5050K	LED 13W 4' T5 IS/RS SC 50K	★	13W	28W	16	1900	5000K	80	G5

\* DLC qualified product at time of printing, consult [designlights.org](http://designlights.org) for the most up-to-date listing.



## LED T8 Ballast Compatibility Guides

### Instant Start Ballasts Compatible with LED Direct8™

Manufacturer	Model #	Voltage
GE	GE132MAX-L/ULTRA	UNV
	GE132MAX-P-N/ULTRA	UNV
	GE232MAX347-N	347
	GE232MAX-N/ULTRA	UNV
	GE232MAX-G-N	UNV
	GE232MAX-P-N/ULTRA	UNV
	GE232MAX-H/ULTRA	UNV
	GE232MAX-P-H/ULTRA	UNV
	GE332MAX-L/ULTRA	UNV
	GE332MAX-N/ULTRA	UNV
	GE332MAX-P-N/ULTRA	UNV
	GE332MAX-G-N	UNV
	GE332MAX-H/ULTRA	UNV
	GE432MAX-L/ULTRA	UNV
	GE432MAX-N/ULTRA	UNV
	GE432MAX-H/ULTRA	UNV
	GE432MAX-P-H/ULTRA	UNV
	Osram/Sylvania	QHE2X32T8/UNV ISN-SC
QHE2X32T8/UNV ISL-SC		UNV
QHE2X32T8/UNV ISH-SC		UNV
QHE2X32T8/347 ISN-SC		347
QHE4X32T8/UNV ISN-SC		UNV
QHE4X32T8/UNV ISL-SC		UNV
QHE4X32T8/UNV ISH-SC		UNV
QTP2X32T8/UNV ISN-SC		UNV
QTP3X32T8/UNV ISN-SC		UNV
QTP2X32T8/UNV ISL-SC		UNV
QTP3X32T8/UNV ISL-SC		UNV
QTP2X32T8/UNV ISH-SC		UNV
QTP3X32T8/UNV ISH-SC		UNV
ESPEN	VE2P32MVHIPE	UNV
	VE4P32MVHIPE	UNV

Manufacturer	Model #	Voltage
Philips/Advance	IOPA-2P32-LW-N	UNV
	IOPA-3P32-LW-N	UNV
	IOPA-4P32-LW-N	UNV
	IOPA-4P32-N	UNV
	IOPA-2P32-HL-N	UNV
	IOPA-3P32-HL-N	UNV
	IOPA-2P32-LW-SC	UNV
	IOPA-4P32-LW-SC	UNV
	IOP-2P32-LW-N	UNV
	IOP-3P32-LW-N	UNV
	IOP-4P32-LW-N	UNV
	IOP-3P32-N	UNV
	ICN-2P32-N	UNV
	ICN-3P32-N	UNV
	ICN-4P32-N	UNV
	GOPA-2P32-SC	347
	GOPA-4P32-SC	347
	REL-2P32-SC	UNV
VEL-4P32-SC	UNV	
IOP-3P32-HL-90L-SC	UNV	
TCP	E2P32ISUNVE	UNV
	E2P32ISUNVHE	UNV
	E2P32ISUNVLE	UNV
	E3P32ISUNVE	UNV
	E3P32ISUNVHE	UNV
	E3P32ISUNVLE	UNV
	E4P32ISUNVE	UNV
	E4P32ISUNVHE	UNV
	E4P32ISUNVLE	UNV
	E2P32IS120RES	UNV
Universal	B132IUNVHP-N	UNV
	B232IUNVHP-N	UNV
	B232I277RHA	277
	B332IUNVHPA	UNV

Instant Start Ballasts Not Recommended for use with LED Direct8 include:

Osram/Sylvania: QHE 4x32T8/UNV ISH

Philips/Advance: IOP-3P32-LW-SC, IOP-2P32-LW-SC, REL-2P32-RH-TP, VEL-2P32-SC

Ballast compatibility tests are performed under a controlled lab environment. Field conditions may vary from this type of environment. Ballasts may differ by age and could have undergone revisions under the same item number affecting compatibility. Compatibility may also extend beyond this list. TCP recommends trying a few ballast-lamp combinations in an on-site test to ensure compatibility and performance before a major installation.



## LED T8 Ballast Compatibility Guides

### Program Start Ballasts Compatible with LED DirecT8™

Manufacturer	Model #	Voltage
GE	GE-232-MVPS-N	UNV
	GE-232-MVPS-L	UNV
	GE-232MAXP-N/ULTRA	UNV
	GE232MAXH/ULTRA	UNV
	GE332-MVPS-N	UNV
	GE332-MVPS-H	UNV
	GE432-MVPS-N	UNV
	GE432-MVPS-H	UNV
	GE432-MVPS-L	UNV
	GE-432-MAX-N/ULTRA	UNV
Osram/Sylvania	QHE-2x32T8/UNV PSN-MC	UNV
	QHE-2x32T8/UNV PSH-HT	UNV
	QHE 3x32T8/UNV PSN-SC	UNV
	QHE 4x32T8/UNV PSN-SC	UNV
	QHE 4x32T8/UNV PSH-HT	UNV
	QTP2X32T8/UNV PSN-TC	UNV
Philips/Advance	IOP-2PSP32-N	UNV
	IOP-3PSP32-SC	UNV
	IOP-4PSP32-SC	UNV
	GOP-2PSP32-SC	UNV
	GOP-4PSP32-SC	UNV
	IOP-3S32-SC	UNV
TCP	E2P32PSUNVE	UNV
	E3P32PSUNVE	UNV
	E4P32PSUNVE	UNV
	E2P32PSUNVHE	UNV
	E3P32PSUNVHE	UNV
	E4P32PSUNVHE	UNV
	E2P32PSUNVLE	UNV
	E3P32PSUNVLE	UNV
	E4P32PSUNVLE	UNV
	2S32PSUNVHE	UNV
Universal	B232PUNVHE-B	UNV

### Program Start Dimmable Ballasts Compatible with LED DirecT8™

Manufacturer	Model #	Voltage
<b>BALLAST for 1 LAMP</b>		
Philips/Advance	IZT-132-SC	UNV
<b>BALLAST for 2 LAMPS</b>		
Philips/Advance	IZT-2S32-SC	UNV
	IZT-2PSP32-SC	UNV

### Emergency Ballasts Compatible with LED DirecT8™

Manufacturer	Model #	Voltage
IOTA	I-320	I-320
Bodine	B30	B30
	B50	B50



## LED T5 Ballast Compatibility Guides

### Electronic Ballasts Compatible with 25.5 watt LED Direct5™

BALLAST for FOUR LAMPS					
Brand	Model #	Four Lamp	Three Lamp	Two Lamp	One Lamp
ESPEN	VE454MVHRP	Y	Y	Y	N
KEYSTONE	KTEB-454HO-UV-PS	Y	Y	N	N
Osram/Sylvania	QHE 4x54T5HO/UNV PSN HT SCL	Y	Y	Y	Y
	QTP 4x54T5HO/UNV PSN HT W	Y	N	Y	N
	QHE 4x54T5HO/347-480 PSN HT SCL	Y	Y	Y	Y
Philips/Advance	ICN-4S54-90C-2LS-G	Y	Y	N	N
	HCN-4S54-90C-2LS-G	Y	Y	N	N
ROBERTSON	PSB454T5MV	Y	Y	Y	Y
UNIVERSAL	B454PUNVHBE	Y	Y	N	N
BALLAST for TWO LAMPS					
Brand	Model #	Two Lamp	One Lamp		
FULHAM	RHA-UNV-254-IT5	Y	Y		
KEYSTONE	KTEB-254HO-UV-PS-SL	Y	Y		
	KTEB-254HO-UV-PS/A	Y	Y		
Osram/Sylvania	QHE2x54T5HO/UNV PSN	Y	Y		
	QTP2x54T5HO/UNV PSN HT	Y	Y		
	QTP 2x54 T5HO/UNV PSN	Y	Y		
Philips/Advance	ICN-2S54-N	Y	Y		
	ICN-2S54-T	Y	Y		
	HCN-2S54-90C-WL	Y	Y		
	ICN-2S54	Y	Y		
	IZT-2S54-D	Y	Y		
	ICN-2S54-90C-N	Y	Y		
UNIVERSAL	B254PUNV-D	Y	Y		

### Electronic Ballasts Compatible with 13 watt LED Direct5™

BALLAST for TWO LAMPS			
Brand	Model #	Two Lamp	One Lamp
GE	GE 228 MVPSH-A	Y	Y
KEYSTONE	KTEB-221PS-1-TP/A	Y	Y
	KTEB-228HE-UV	Y	Y
Osram / Sylvania	QHE 2x25T5/UNV PSN	Y	Y
	QHT 2x28T5/UNV PSN	Y	Y
Philips/Advance	ICN-2828-N	Y	Y
	ICN-2S28-N	Y	Y
	ICN-2S28-T	Y	Y
	ISN-2S28-N	Y	Y
Racehorse	RHA-UNV-228-L T5	Y	Y
Robertson	PROFESSIONALQTP52x54	Y	Y
Universal	B228PU95S50D	Y	Y
	B228PUNVC	Y	Y
	B228PUNV-N	Y	Y
	D228PUNVC	Y	Y

### Dimmable Electronic Ballasts Compatible with 13 watt LED Direct5™

BALLAST for TWO LAMPS			
Brand	Model #	Two Lamp	One Lamp
Philips/Advance	IZT-2S-28-D	Y	Y
	IZT-128-D	N	Y

Electronic Ballasts Not Recommended for use with LED Direct5 include:

FULHAM: RHA-UNV-454-IT5, WH5-120-L

GE: GE454MVPS90-F

PHILIPS: IOP-2PSP54-SC

Philips/Advance: IOP-4PSP54-2LS-G

# TECHNOLOGY CAST IN A BEAUTIFUL LIGHT

For over 20 years, TCP has been designing, developing and delivering energy-efficient lighting into the market. Thanks to our cutting-edge technology and manufacturing expertise, we have shipped billions of high quality lighting products. With TCP, you can count on a lighting product that is designed to meet the needs of the market — that transforms your surroundings and envelopes you in warmth — lighting that generates beauty with every flip of the switch.

