

## **LOAD COMPATIBILITY**

It is essential that the Dimming System and the lighting loads be matched for safe operation and optimum control. Whilst we have our own range of Lamps, Transformers, Ballasts and Fittings, we recognise that for wide customer choice we must research all possible combinations and advise on the compatibility of various other manufacturer's products. We constantly update the list that appears in this section – the most up to date version can be found on our web site. Alternatively contact us and we will assist you with your enquiry.

In order that the compatibility list makes as much sense as possible, a brief description follows of all the different lamp types and what control equipment can be used with it.

## **TUNGSTEN LOADS**

### **1. Mains Voltage - Tungsten, Halogen and Quartz Lamps**

These types of lamps dim across the output range 0-100%. A soft-start feature protects cold filaments and avoids nuisance MCB tripping due to high in-rush currents.

### **2. Transformer Fed Low Voltage Tungsten Halogen and Xenon Halogen**

Again, these types of lamps may be dimmed across the output range 0-100%. Polaron Dimmers use a true hard-firing technique to ensure that the inductive nature of the load does not affect Thyristor turn-off, thus keeping the voltage waveform supplied to the load symmetrical. Please note that not all dimmers use hard-firing and use of them will cause damage to the transformers.

Our experience in dealing with Transformers from a variety of companies has provided us with a short list of do's and don'ts:

- Wire wound transformers vary in quality greatly. In general, the cheaper the transformer, the worse the core material. A poor core material will result in a very large in-rush current caused by the core saturating. Please check with us for whether we have experience of the wire wound transformer you are thinking of using.
- Transformers vibrate and can resonate when connected to a hard surface. This can lead to excessive audible noise in a room.
- Make sure you account for the losses in the transformer when calculating loading on Dimmer Channels. Depending on the transformer, de-rate by up to 30%.
- Ideally use only one transformer per lamp. In the event of a transformer failure only one lamp will cease to operate.
- If transformers are used to drive more than one lamp, be careful about keeping illumination levels constant. Voltage drop over distance can be a real problem – especially with electronic transformers.
- Ensure electronic transformers are correctly loaded for dimming - some manufacturers specify a load for the transformer to be dimmable.
- Ensure electronic transformers are mounted close to the lamp to keep RFI to a minimum.

Polaron's range of Electronic Transformers include products ranging from 50W up to 300W and are available at either 230V, 220V, 110V, 120V or 127V.

## **FLUORESCENT**

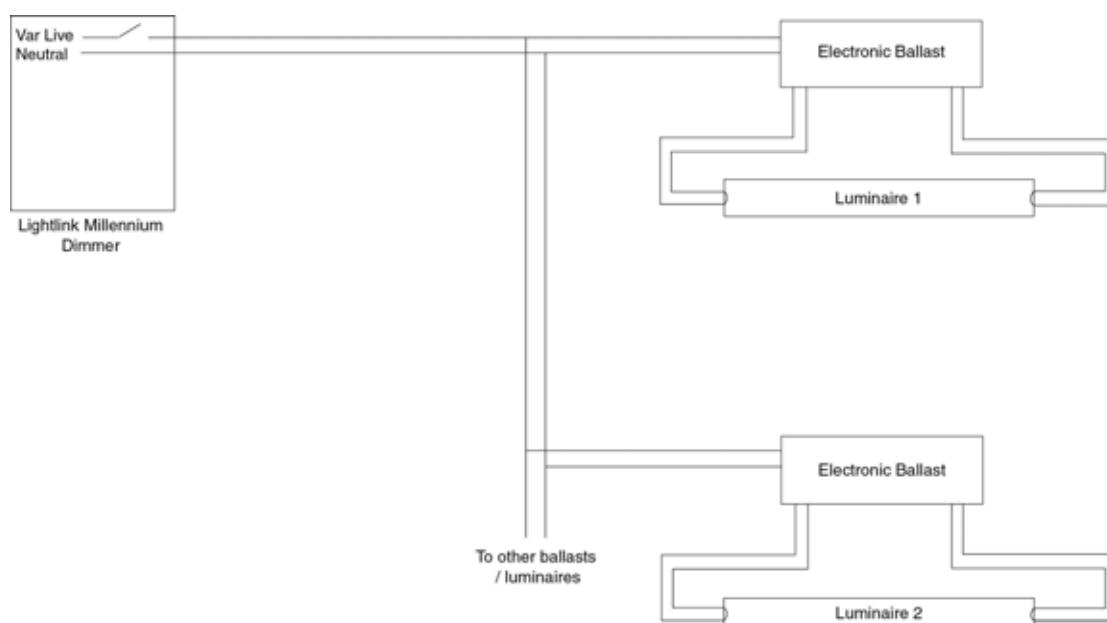
There are a variety of fluorescent lamps on the market. The Dimming range of these lamps is dependent on the lamp itself and the type of ballast used. The compatibility table in this section provides detailed information on a wide range of available combinations. In terms of ballast technology, there are three different types: -

### **1. Electronic HF Dimmable Ballasts (2 Wire)**

The major benefit of this technology is that no special wiring is required. Polaron's own ballasts are available for the control of single or twin fittings. For other manufacturer's compatibility see the compatibility table. The wiring diagram is shown below.

Some important points to note:

- The minimum level of the Dimmer must be set-up during commissioning to match the specified minimum level of the ballast. If Polaron supply the fittings including the ballasts, this procedure will be performed in our factory.
- The Dimming performance is usually in the range of 10% or 20% to 100%.
- When calculating load power, assume a power factor of 0.9 for the ballasts.
- Dimming performance is greatly enhanced if the lamps are aged properly by running at full brightness for 100 hours before using the Dimmer. This can be achieved easily with our plug-in power modules by use of the override switch.

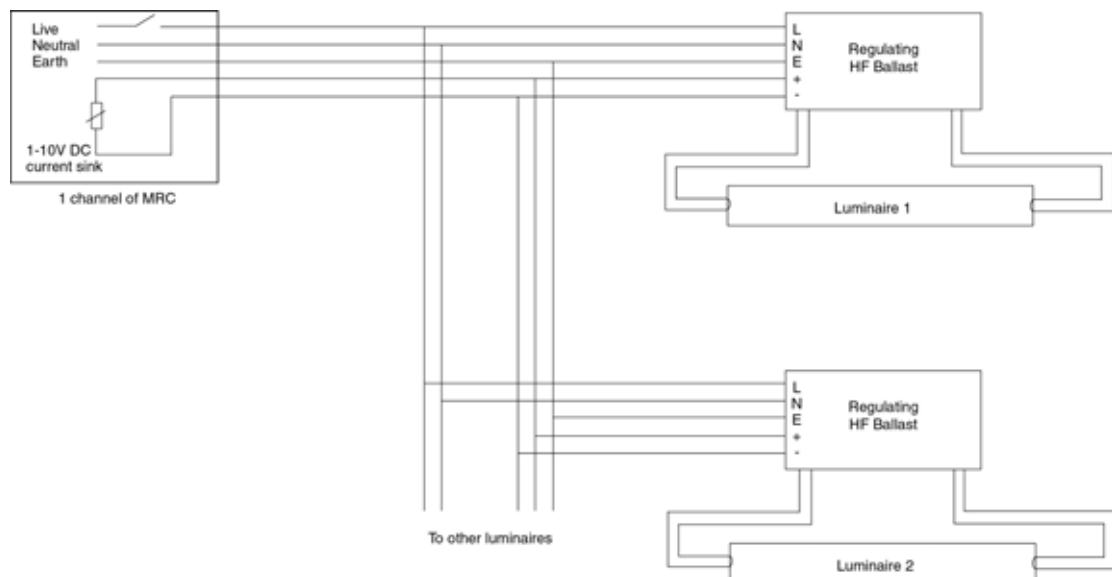


## 2. HF Ballasts with 1-10V (Regulating Ballasts)

These ballasts are very popular and are available from a large number of suppliers. They must not be connected to a phase control dimmer, but are instead controllable with a 1-10 Volt DC signal. This is connected to the ballast via a separate pair of conductors. Polaron supplies a Regulating Ballast Interface Unit that will provide control for up to 12 channels of such lighting (or up to 64 channels on a custom rack). Each channel can support up to 50 ballasts assuming a typical ballast current requirement of 2mA. For disconnection of the mains supply to the luminaires, each channel is provided complete with a 10 Amp relay. The minimum level for 1-10V DC Regulating Ballasts is set within the ballast, generally around 5% and in some cases down to 1%.

Some important points to note:

- Check with the ballast manufacturer the maximum quantity of ballasts that can be switched with a 10 Amp type C MCB in order that the correct number of ballasts are used per channel.
- Age the lamps correctly by leaving on at full brightness for 100 hours before dimming.



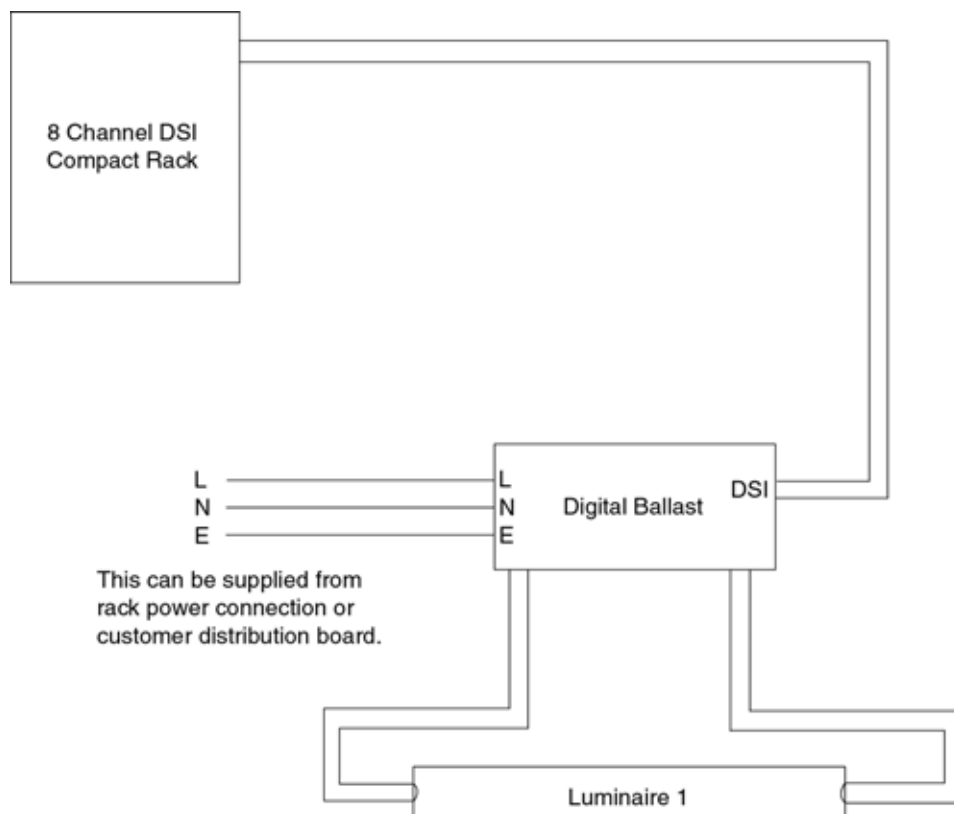
### 3. Manchester Encoded Ballasts

Manchester Encoded Ballasts use a digital signal that is encoded using the “Manchester Code” algorithm. The advantage of the digital signal is that the control signal seen by the ballasts is noise immune, thereby giving identical output performance for each ballast and in turn each fitting.

#### 3a. DSI Ballasts

One type of Manchester Encoded Ballast is the DSI (Digital Serial Interface) Ballast. These ballasts are available from a number of manufacturers including Tridonic, Osram and Philips.

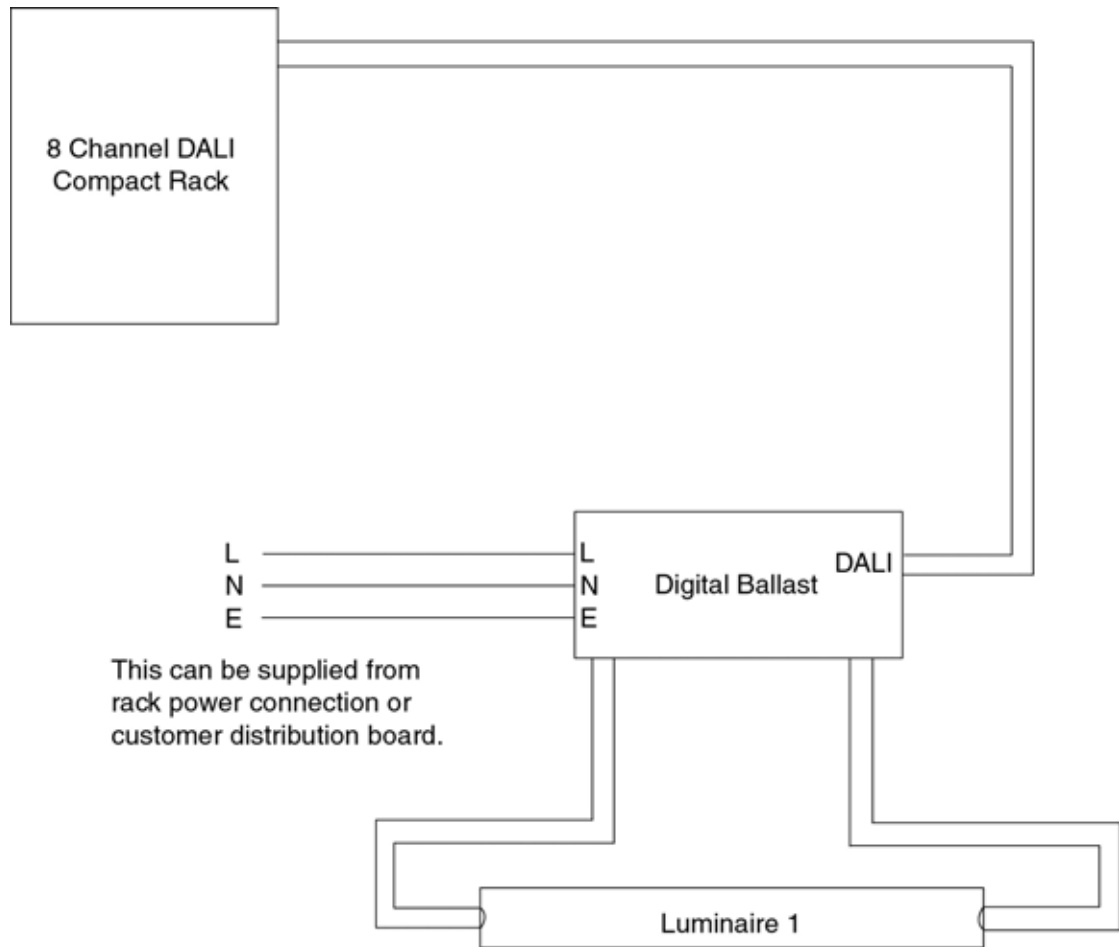
The method of connection to our system is via an AD-DSI Analogue to Digital converter and our 8 channel DSI compact rack. The wiring diagram is illustrated below.



The signal wires are not polarity sensitive. Unlike 1-10V DC ballasts, the mains supply does not need to be switched to ensure that the light goes off.

### 3b. DALI Ballasts

DALI is a variation on DSI signal encoding. The method of connection to our system is via an AD-DALI Analogue to Digital converter and our 8 channel DALI compact rack. The wiring diagram is illustrated below. DALI has been designed as a small area control system. The Polaron DALI interface uses broadcast messages to set lighting levels.



## **EMERGENCY LIGHTING**

In many cases, dimmers are required in areas where it is mandatory to employ both a Normal mains supply and a maintained Emergency supply. There are three ways of dealing with maintained power.

### **1. Load Shed**

The dimming system can be programmed so that after a mains failure a special 'load shed' scene can be activated which locks out all MCP usage until the normal mains is restored.

### **2. Central Emergency Generator – Channel Based**

In this configuration, only a few selected channels are switched to full when the non-maintained supply fails. A normally-closed contactor is required per maintained channel such that when the non-maintained supply fails, the contactor disconnects the load from the Rack and connects it to the maintained supply. Alternatively, an MIU/3 Multipurpose Interface Unit can be used to select and hold an emergency scene when mains failure is detected.

### **3. Emergency Battery Pack for LV Tungsten and Fluorescent Fittings**

The most common arrangement is for a certain number of luminaires to be specified as "Emergency" type. Each Emergency luminaire includes a Battery Pack and extra input terminal. A permanent unswitched mains feed is connected to the extra terminal that under normal conditions provides a constant trickle charge for the battery. The normal input terminal to the luminaire is connected to the dimmer in the usual way. In the event that the normal supply fails, the luminaire detects loss of the unswitched feed and automatically transfers to Battery feed, turning on at full light. When normal power is restored, the Battery Pack returns to trickle charge and the luminaire is again under the control of the dimmer.

## **FLUORESCENT DIMMING BALLAST COMPATIBILITY TABLE<sup>1</sup>**

### **LAMP Type: T26 (formally T8)**

Wattage	Base Type	Type	Suitable Ballast's	Dimming Range
1 x 18	G13	4-Wire	Osram HF1x18DIM	1 - >100%
		4-Wire	Huco 09 7173	5 - >100%
		4-Wire	Philips HF-R 118 TLD	3 - >100%
		4-Wire	Magnatek DBT118	1 - >100%
		4-Wire	Helvar EL1x18HFC	5 - >100%
		Digital	Tridonic PCA 18 EXCEL	1 - >100%
		2-Wire	Helvar EL1x18FD	10 - >100%
2 x 18	G13	4-Wire	Osram HF2x18DIM	1 - >100%
		4-Wire	Huco 09 7183	5 - >100%
		4-Wire	Philips HF-R 218 TLD	3 - >100%
		4-Wire	Magnatek DBT218	1 - >100%
		4-Wire	Helvar EL2x18HFC	5 - >100%
		Digital	Tridonic PCA 2/18 EXCEL	1 - >100%
		2-Wire	Helvar EL1x36/2x18FD	10 - >100%
1 x 36	G13	4-Wire	Osram HF1x36DIM	1 - >100%
		4-Wire	Huco 09 7174	5 - >100%
		4-Wire	Philips HF-R 136 TLD	3 - >100%
		4-Wire	Magnatek DBT136	1 - >100%
		4-Wire	Helvar EL1x36HFC	10 - >100%
		Digital	Tridonic PCA 36 EXCEL	1 - >100%
		2-Wire	Helvar EL1x36/2x18FD	10 - >100%
2 x 36	G13	4-Wire	Osram HF2x36DIM	1 - >100%
		4-Wire	Huco 09 7184	5 - >100%
		4-Wire	Philips HF-R 236 TLD	3 - >100%
		4-Wire	Magnatek DBT236	1 - >100%
		4-Wire	Helvar EL2x36HFC	5 - >100%
		Digital	Tridonic PCA 2/36 EXCEL	1 - >100%
		2-Wire	Helvar EL2x36FD	10 - >100%
1 x 58	G13	4-Wire	Osram HF1x58DIM	1 - >100%
		4-Wire	Huco 09 7175	5 - >100%
		4-Wire	Philips HF-R 158 TLD	3 - >100%
		4-Wire	Magnatek DBT158	1 - >100%
		4-Wire	Helvar EL1x58HFC	5 - >100%
		Digital	Tridonic PCA 58 EXCEL	1 - >100%
		2-Wire	Helvar EL1x58FD	10 - >100%

<sup>1</sup> The information in this section is taken from manufacturers' literature. Polaron Controls Ltd does not guarantee that the lamp and or ballast manufacturers will not change their specifications

**LAMP Type: T26 (formally T8) (cont.)**

Wattage	Base Type	Type	Suitable Ballast's	Dimming Range
2 x 58	G13	4-Wire	Osram HF2x58DIM	1 - >100%
		4-Wire	Huco 09 7185	5 - >100%
		4-Wire	Philips HF-R 258 TLD	3->100 %
		4-Wire	Magnatek DBT258	1 - >100%
		4-Wire	Helvar EL2x58HFC	10 - >100%
		Digital	Tridonic PCA 2/58 EXCEL	1 - >100%
1 x 70	G13	2-Wire	Helvar EL2x58FD	10 - >100%
		4-wire	Helvar EL1x70HFC	5 - >100%
2 x 70	G13	2-wire	Helvar EL1x70FD	10 - >100%
		4-wire	Helvar EL2x70HFC	5 - >100%
		2-wire	Helvar EL2x70FD	10 - >100%

**Lamp Type: TC-L (Single ended 2 limb)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
1 x 18	2G11	4-Wire	Huco 09 7015	5 - >100%
		4-Wire	Helvar EL1x18CHFC-L/F	5 - >100%
		Digital	Tridonic PC 16-A011	1 - >100%
		2-Wire	Helvar EL1x18FD2F	10 - >100%
2 x 18	2G11	4-Wire	Huco 09 7025	5 - >100%
		4-Wire	Helvar EL2x18CHFC-L/F	5 - >100%
		Digital	Tridonic PC 2x 16 -A011	1 - >100%
		2-Wire	Helvar EL1x36/2x18FD2F	10 - >100%
1 x 24	2G11	4-Wire	Huco 09 7016	5 - >100%
		4-Wire	Helvar EL1x24CHFC-L/F	5 - >100%
		Digital	Tridonic PC 24TCL-A011	1 - >100%
		2-Wire	Helvar EL1x24FD2F	10 - >100%
2 x 24	2G11	4-Wire	Huco 09 7026	5 - >100%
		4-Wire	Helvar EL2x24CHFC-L/F	5 - >100%
		Digital	Tridonic PC2x24TCL-A011	1 - >100%
		2-Wire	Helvar EL2x24FD2F	10 - >100%
1 x 36	2G11	4-Wire	Osram HF1x36DIM	2 - >100%
		4-Wire	Huco 09 7075	5 - >100%
		4-Wire	Philips HF-R 136 PLL	3 - >100%
		4-Wire	Helvar EL1x36HFC2F	5 - >100%
		Digital	Tridonic PC36TCL-A011	1 - >100%
		2-Wire	Helvar EL1x36/2x18FD2F	10 - >100%

**Lamp Type: TC-L (Single ended 2 limb) (cont.)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
2 x 36	2G11	4-Wire 4-Wire 4-Wire Digital 4-Wire 2-Wire	Osram HF2x36DIM Huco 09 7085 Philips HF-R 236 PLL Tridonic PC2x36TCL-A011 Helvar EL2x36HFC2F Helvar EL2x36FD2F	2 - >100% 5 - >100% 3 - >100% 1 - >100% 5 - >100% 10 - >100%
1 x 40	2G11	4-wire 4-wire Digital 4-wire	Philips HF-R 140 PLL Huco 09 7076 Tridonic PC40TCL-A011 Helvar EL2x36HFC2F	3 - >100% 5 - >100% 1 - >100% 5 - >100%
2 x 40	2G11	4-wire Digital	Philips HF-R 240 PLL Tridonic PC2x40TCL-A011	3 - >100% 1 - >100%
1 x 55	2G11	4-Wire 4-Wire 4-Wire 4-Wire Digital	Osram HF1x55DIM Philips HF-R 155 PLL Huco 09 7077 Helvar EL1x55HFC2F Tridonic PC55TCL-A011	2 - >100% 3 - >100% 5 - >100% 5 - >100% 1 - >100%
2 x 55	2G11	4-Wire 4-Wire 4-Wire 4-Wire Digital	Osram HF2x55DIM Huco 09 7087 Philips HF-R 255 PLL Helvar EL2x55HFC2F Tridonic PC2x55TCL-A011	2 - >100% 5 - >100% 3 - >100% 5 - >100% 1 - >100%

**Lamp Type: TC-F (4 limb side by side)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
1 x 18	2G10	4-Wire 4-Wire	Huco 09 7015 Helvar EL1x18CHFC-L/F	5 - >100% 5 - >100%
2 x 18	2G10	4-Wire 4-Wire	Huco 09 7025 Helvar EL2x18CHFC-L/F	5 - >100% 5 - >100%
1 x 24	2G10	4-Wire 4-Wire	Huco 09 7016 Helvar EL1x24CHFC-L/F	5 - >100% 5 - >100%
2 x 24	2G10	4-Wire 4-Wire	Huco 09 7026 Helvar EL2x24CHFC-L/F	5 - >100% 5 - >100%
1 x 36	2G10	4-Wire 4-Wire 2-Wire	Osram HF1x36DIM Helvar EL1x36CHFC-L/F Helvar EL1x36/2x18FD	2 - >100% 5 - >100% 10 - >100%
2 x 36	2G10	4-Wire 2-Wire	Osram QT2x36DIM Helvar EL2x36FD	2 - >100% 10 - >100%

**Lamp Type: TC-DD (2 pin types, Common name 2D)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
16	GR8 (2-pin)	Non-Dim		
28	GR8 (2-pin)	Non-Dim		

**Lamp Type: TC-DD (4-pin types, Common name 2D)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
10	GR10(4-pin)		None Known	
16	GR10(4-pin)		None Known	
21	GR10(4-pin)		None Known	
28	GR10(4-pin)	4-Wire 2-Wire	Huco 09 7476 Helvar EL1x24FD2F	10 - >100% 10 - >100%
38	GR10(4-pin)	4-Wire 2-Wire	Huco 09 7477 Helvar EL1x36/2x18FD	10 - >100% 10 - >100%
55	GR10(4-pin)	4-Wire	Huco 09 7478	10 - >100%

**Lamp Type: TC – (Short 2-limb, Common name PL)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
5, 7, 9, & 11	G23 (2-pin)	Non-Dim		
2x5,2x 7,2x 9 & 2x11	2G7 (4-pin)	4-Wire	Huco 09 6983	10 - >100%

**Lamp Type: TC – D ( 4-limb, 2-pin, Common name PL-C)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
10 & 13	G24d-1	Non-Dim		
18	G24d-2	Non-Dim		
26	G24d-3	Non-Dim		

**Lamp Type: TC-DE ( 4-limb, Common name PL-C – 4 Pin )**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
1 x 13	G24q-1	4-Wire 4-Wire Digital	Huco 09 6974 Helvar EL1x10/13CHFC Tridonic PC13TCD –A111	10 - >100% 10 - >100% 3 - >100%

**Lamp Type: TC-DE ( 4-limb, Common name PL-C – 4 Pin ) (cont.)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
2 x 13	G24q-1	4-Wire 4-Wire Digital	Huco 09 6984 Helvar EL2x10/13CHFC Tridonic PC2x13TCD – A111	10 - >100% 10 - >100% 3 - >100%
1 x 18	G24q-2	4-Wire 4-Wire 4-Wire Digital	Osram QT-D/E1x18DIM Huco 09 6975 Helvar EL1x18CHFC Tridonic PC18TCD –A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%
2 x 18	G24q-2	4-Wire 4-Wire Digital	Huco 09 6985 Helvar EL2x18CHFC Tridonic PC2x18TCD – A111	10 - >100% 10 - >100% 3 - >100%
1 x 26	G24q-3	4-Wire 4-Wire 4-Wire Digital	Osram QT-DE1x26DIM Huco 09 6976 Helvar EL1x26CHFC Tridonic PC26TCD –A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%
2 x 26	G24q-3	4-Wire 4-Wire 4-Wire Digital	Osram QT-DE2x18DIM Huco 09 6986 Helvar EL2x26CHFC Tridonic PC2x26TCD – A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%

**Lamp Type: TC – EL (4 or 6-limb, Usually domestic use only)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
5, 11	ES or BC	Non-Dim		
15, 20, 23	ES or BC	Non-Dim		

**Lamp Type: TC – TE ( 6-limb, 4 pin)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
1 x 13	GX24q-1	4-Wire 4-Wire	Huco 09 6974 Helvar EL1x10/13 CHFC	10 - >100% 10 - >100%
2 x 13	GX24q-1	4-Wire 4-Wire	Huco 09 6984 Helvar EL2x10/13 CHFC	10 - >100% 10 - >100%
1 x 18	GX24q-2	4-Wire 4-Wire 4-Wire Digital	Osram QT-DE1x18DIM Huco 09 6975 Helvar EL1x18CHFC Tridonic PC18TCD –A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%

**Lamp Type: TC – TE ( 6-limb, 4 pin) (cont.)**

Wattage	Base Type	Dimmable Type	Suitable Ballast's	Dimming Range
2 x 18	GX24q-2	4-Wire 4-Wire 4-Wire Digital	Osram QT-DE2x18DIM Huco 09 6985 Helvar EL2x18CHFC Tridonic PC2x18TCD – A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%
1 x 26	GX24q-3	4-Wire 4-Wire 4-Wire Digital	Osram QT-D/E1x26DIM Huco 09 6976 Helvar EL1x26CHFC Tridonic PC26TCD –A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%
2 x 26	GX24q-3	4-Wire 4-Wire 4-Wire Digital	Osram QT-DE2x26DIM Huco 09 6986 Helvar EL2x26CHFC Tridonic PC2x26TCD – A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%
1 x 32	GX24q-3	4-Wire 4-Wire 4-Wire Digital	Osram QT-T/E1x32DIM Huco 09 6977 Helvar EL1x32CHFC Tridonic PC32TCT –A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%
2 x 32	GX24q-3	4-Wire 4-Wire	Huco 90 6987 Helvar EL2x32CHFC	10 - >100% 10 - >100%
1 x 42	GX24q-4	4-Wire 4-Wire 4-Wire Digital	Osram QT-D/E1x42DIM Huco 09 6978 Helvar EL1x42CHFC Tridonic PC42TCT –A111	10 - >100% 10 - >100% 10 - >100% 3 - >100%
2 x 42	GX24q-4	4-Wire	Huco 09 6988	10 - >100%