

efficiency • intelligence • easiness



EL-iDim User Manual

DALI electronic ballasts

EL-iDim DALI ballasts are designed for a broad range of applications – from the smallest intelligent luminaires to major lighting installations in large building complexes. What's more, they offer the important advantage of enabling everything to be achieved with the same ballasts. EL-iDim DALI ballasts are also fully compatible with Helvar iDim sensors, the combination creating the latest high-tech innovation available to the lighting market.

With out-of-box functionality, the Helvar system is moreover, easy to install and use, and maintenance costs are always kept to a minimum.

In the design of EL-iDim, customer input played a crucial role – leading to superior features such as:

- OCC technology, guaranteeing the highest possible EEI = A1 BAT
- The lowest stand-by power in the market, which even today meets the upcoming EuP directives of 2012
- Smooth and stepless dimming from 100% to 1%
- Multi-lamp operation, allowing one ballast to drive all HE-T5 lamps

The ballasts also have an in-built data register capable of storing information on running hours, energy consumption, mains voltage, lamp voltage etc. This can be very useful in large installations where the control and maintenance of lighting is centralized in one monitoring room.

Digital DALI electronic ballasts for T5 fluorescent lamps



14-80 W 220-240V 50-60Hz

- Digital DALI control
- Switch-Control
- Stand-by consumption 0.3 W
- Dimming range 1-100% *)
- Only 21 mm high
- Microprocessor controlled
- Standard & Side mounting
- User friendly, quick release connectors



EEL = A1 BAT

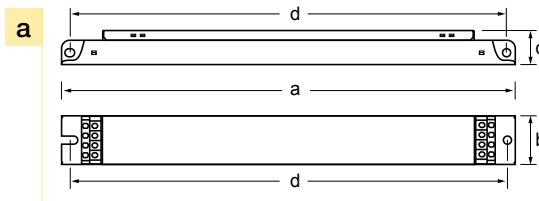
2. Technical Data

Lamp type	Wattage	No. of lamps	Ballast	EEL	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.30)	(g)	(W)	(A)	(W)
	14	1	EL1x14-35iDim	A1 BAT	1	1	250	17	0.08-0.07	13.7
	14	2	EL2x14-35iDim	A1 BAT	2	2	330	32.5	0.15-0.14	13.7
	14	3	EL3x14iDim	A1 BAT	2	3	310	47.5	0.22-0.20	13.7
	14	4	EL4x14iDim	A1 BAT	2	4	330	62	0.29-0.27	13.7
	21	1	EL1x14-35iDim	A1 BAT	1	1	250	23.5	0.11-0.10	20.7
	21	2	EL2x14-35iDim	A1 BAT	2	2	330	46	0.22-0.20	20.7
	24	1	EL1x24iDim	A1 BAT	1	1	250	25.5	0.12-0.10	22.5
	24	2	EL2x24iDim	A1 BAT	2	2	330	50.5	0.23-0.21	22.5
	28	1	EL1x14-35iDim	A1 BAT	1	1	250	32	0.15-0.14	27.8
	28	2	EL2x14-35iDim	A1 BAT	2	2	330	62	0.28-0.26	27.8
	35	1	EL1x14-35iDim	A1 BAT	1	1	250	39	0.18-0.17	34.7
	35	2	EL2x14-35iDim	A1 BAT	2	2	330	73.5	0.36-0.30	34.7
	39	1	EL1x39iDim	A1 BAT	1	1	250	42.5	0.20-0.18	38
	39	2	EL2x39iDim	A1 BAT	2	2	330	82.5	0.38-0.35	38
	49	1	EL1x49iDim	A1 BAT	1	1	250	55	0.25-0.23	49.3
	49	2	EL2x49iDim	A1 BAT	2	2	330	107.5	0.49-0.45	49.3
54	1	EL1x54iDim	A1 BAT	1	1	250	59	0.27-0.25	53.8	
54	2	EL2x54iDim	A1 BAT	2	2	330	117	0.53-0.49	53.8	
80	1	EL1x80iDim	A1 BAT	1	1	250	86	0.39-0.36	80	

Note: See pages 7-8 for connection diagrams and additional characteristics.

* Dimming range 3-100% for EL3x14iDim & EL4x14iDim

Dimensions	1	2
Lenght 'a' (mm)	360	430
Width 'b' (mm)	30	30
Height 'c' (mm)	21	21
'd' (mm)	350	420



Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	EUR pallet 1200 x 800 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x iDim	10	●	980	300	40
EL2 x iDim	10	●	840	325	43
EL3 x iDim	10	●	840	325	43
EL4 x iDim	10	●	840	325	43

Right to use German patent DE19757295 of Tridonic Atco

Data is subject to change without notice. More information at: www.helvar.com

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Digital DALI electronic ballasts for T8 fluorescent lamps



- Digital DALI control
- Switch-Control
- Stand-by consumption 0.3 W
- Dimming range 1-100%
- Only 21 mm high
- Microprocessor controlled
- Standard & Side mounting
- User friendly, quick release connectors



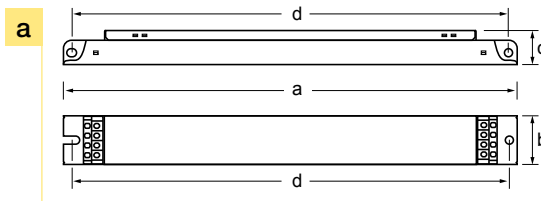
EEI = A1 BAT

2. Technical Data

Lamp type	Wattage	No. of lamps	Ballast	EEI	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.7)	(g)	(W)	(A)	(W)
T8	36	1	EL1x36iDim	A1 BAT	1	1	250	35.5	0.17-0.15	32
	36	2	EL2x36iDim	A1 BAT	2	2	330	70.5	0.32-0.30	32

Note: See pages 7-8 for connection diagrams and additional characteristics.

Dimensions	1	2
Lenght 'a' (mm)	360	430
Width 'b' (mm)	30	30
Height 'c' (mm)	21	21
'd' (mm)	350	420



Delivery information					
Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	EUR pallet 1200 x 800 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x iDim	10	●	980	300	40
EL2 x iDim	10	●	840	325	43

Digital DALI electronic ballasts for compact fluorescent lamps



24 - 80 W 220-240V 50-60Hz

- Digital DALI control
- Switch-Control
- Stand-by consumption 0.3 W
- Dimming range 1-100%
- Only 21 mm high
- Microprocessor controlled
- Standard & Side mounting
- User friendly, quick release connectors



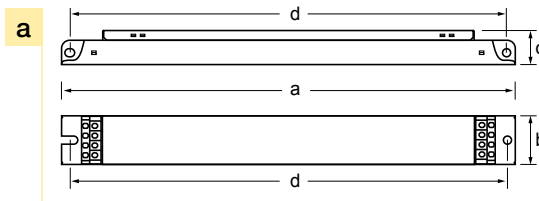
EEL = A1 BAT

2. Technical Data

Lamp type	Wattage	No. of lamps	Ballast	EEL	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.7)	(g)	(W)	(A)	(W)
TC-L	24	1	EL1x24iDim	A1 BAT	1	1	250	25.5	0.12-0.10	22.5
	24	2	EL2x24iDim	A1 BAT	2	2	330	50.5	0.23-0.21	22.5
	36	1	EL1x36iDim	A1 BAT	1	1	250	35.5	0.17-0.15	32
	36	2	EL2x36iDim	A1 BAT	2	2	330	70.5	0.32-0.30	32
	55	1	EL1x55iDim	A1 BAT	1	1	250	59.5	0.27-0.25	55
	55	2	EL2x55iDim	A1 BAT	2	2	330	119	0.55-0.50	55
	80	1	EL1x80iDim	A1 BAT	1	1	250	86	0.39-0.36	80

Note: See pages 7-8 for connection diagrams and additional characteristics.

Dimensions	1	2
Lenght 'a' (mm)	360	430
Width 'b' (mm)	30	30
Height 'c' (mm)	21	21
'd' (mm)	350	420



Delivery information					
Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	EUR pallet 1200 x 800 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x iDim	10	●	980	300	40
EL2 x iDim	10	●	840	325	43

Digital DALI electronic ballasts for compact fluorescent lamps



18 - 42 W 220-240V 50-60Hz

- Digital DALI control
- Switch-Control
- Stand-by consumption 0.3 W
- Dimming range 3-100%
- Multilamp operation
- Single and twin lamp operation



A1 BAT

2. Technical Data

Lamp type	Wattage	No. of lamps	Ballast	EEL	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.30)	(g)	(W)	(A)	(W)
TC-L/ TC-F	18	1	EL1/2x18/24iDim-c *	A1 BAT	123x79x28	5	155	18	0.1	15.5
	18	2	EL1/2x18/24iDim-c *	A1 BAT	123x79x28	6	155	34	0.16	15.5
	24	1	EL1/2x18/24iDim-c *	A1 BAT	123x79x28	5	155	26	0.13	23
	24	2	EL1/2x18/24iDim-c *	A1 BAT	123x79x28	6	155	51	0.23	23.5
T5c	22	1	EL1/2x18/24iDim-c *	A1 BAT	123x79x28	5	155	26.5	0.13	23
	40	1	EL1/2x18/24iDim-c *	A1 BAT	123x79x28	5	155	42.5	0.19	39.5
TC-DE/ TC-TE	18	1	EL1/2x18iDim-c	A1 BAT	123x79x28	5	155	20	0.09	16.5
	18	2	EL1/2x18iDim-c	A1 BAT	123x79x28	6	155	38	0.17	16.5
	26	1	EL1/2x26-42iDim-c	A1 BAT	123x79x28	5	155	28	0.13	23
	26	2	EL1/2x26-42iDim-c	A1 BAT	123x79x28	6	155	56	0.25	23.5
	26	2	EL2x26-42iDim-c *	A1 BAT	123x79x28	7	175	54	0.24	24
	32	1	EL1/2x26-42iDim-c	A1 BAT	123x79x28	5	155	35	0.16	31
	32	2	EL2x26-42iDim-c *	A1 BAT	123x79x28	7	175	70	0.30	32
	42	1	EL1/2x26-42iDim-c	A1 BAT	123x79x28	5	155	46	0.2	41.5
	42	2	EL2x26-42iDim-c *	A1 BAT	123x79x28	7	175	93	0.40	43

*) EL1/2x18/24iDim-c & EL2x26-42iDim-c information preliminary, products to be released in autumn 2011

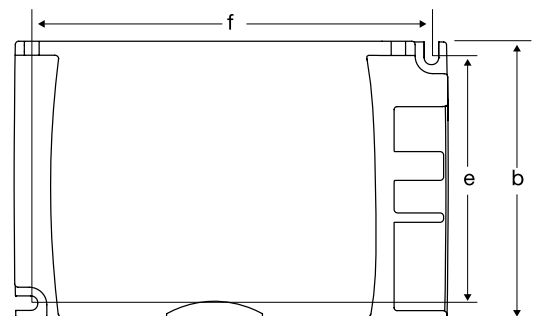
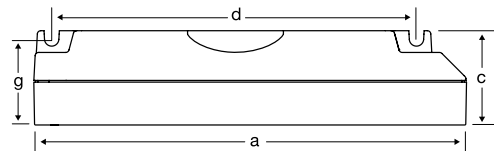
Note: See pages 7-8 for connection diagrams and additional characteristics.

Dimensions

Length 'a' (mm)	123.0
Width 'b' (mm)	79.0
Height 'c' (mm)	28.0
'd' (mm)	100.5
'e' (mm)	65.0
'f' (mm)	111.0
'g' (mm)	25.5

Delivery information

Ballast	Unit package		Transportation package		
	Minimum delivery amount	Carton Box	Pallet 820 x 1280 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL-iDim-c	40	●	800	148	48



Right to use German patent DE19757295 of Tridonic Atco

Characteristics

	EL-iDim	EL-iDim-c
Max.temperature at t_c point	75°C ³⁾⁵⁾	TBD
Ambient temperature range	+10...+50°C ¹⁾	+10...+50°C
Storage temperature range	-40...+80°C	-40...+80°C
Maximum relative humidity	no condensation	no condensation
Number of starts per lamp	> 50 000	> 50 000
AC Range	198-264 VAC	198-264 VAC
DC range (starting voltage >198VDC)	176-280 VDC	176-280 VDC
Over voltage duration	320 VAC, 1h	320 VAC, 1h
EBLF (Emergency Ballast Lumen Factor)	N/A	> 0.5
BLF (Ballast Lumen Factor), steady state	~1	~1
Programmable light output for DC operation	yes	yes
Power factor (at maximum), typical	0.96	0.96
Earth leakage current	< 0.4 mA	< 0.4 mA
Maximum working voltage (Uout)	400 V	400 V
Lifetime (90% survival)	50 000 h, at t_c	50 000 h, at t_c
Max length of ballast to lamp wiring	1.5 m / 2 m (hot / cold) ²⁾⁴⁾	1 m / 1 m (hot / cold) ⁴⁾
Ignition time, typical	1.0 s	1.0 s
Type of starting	Preheat (warm start)	Preheat (warm start)

1) To ensure stable operation of TC-L lamps in ambient temperatures below 18°C it is not recommended to dim the light level below 3%

2) For TC-L lamps 1 m / 2 m (hot/cold lamp wires)

3) For EL 3x14iDim, $t_c = 65^\circ\text{C}$

4) Minimise lamp wire length variations in order to avoid imbalance in light output.

5) When using EL3x14iDim and EL4x14iDim ballasts in ambient temperatures below 15°C it is not recommended to dim the light level below 10% to ensure stable lamp operation.

Standards

	EL-iDim	EL-iDim-c
General and safety requirements EN61347-2-3	●	●
Additional safety requirements for AC/DC supplied ballasts acc. to EN61347-2-3 Annex J	●	●
Performance requirements EN60929	●	●
Lamp life acc. to EN60081 / EN60901 ^{*)}	●	●
Mains current harmonics, acc. to EN61000-3-2	●	●
Radio Frequency Interference, acc. to EN55015	●	●
Immunity standard, acc.to EN61547	●	●
Vibration test EN60068-2-64 test Fh	●	●
Bump test EN60068-2-29 test Eb	●	●
Thermal protection class EN61347, C5e	●	●

* EN 60081 for T5 & T8 fluorescent lamps, EN 60901 for compact fluorescent lamps

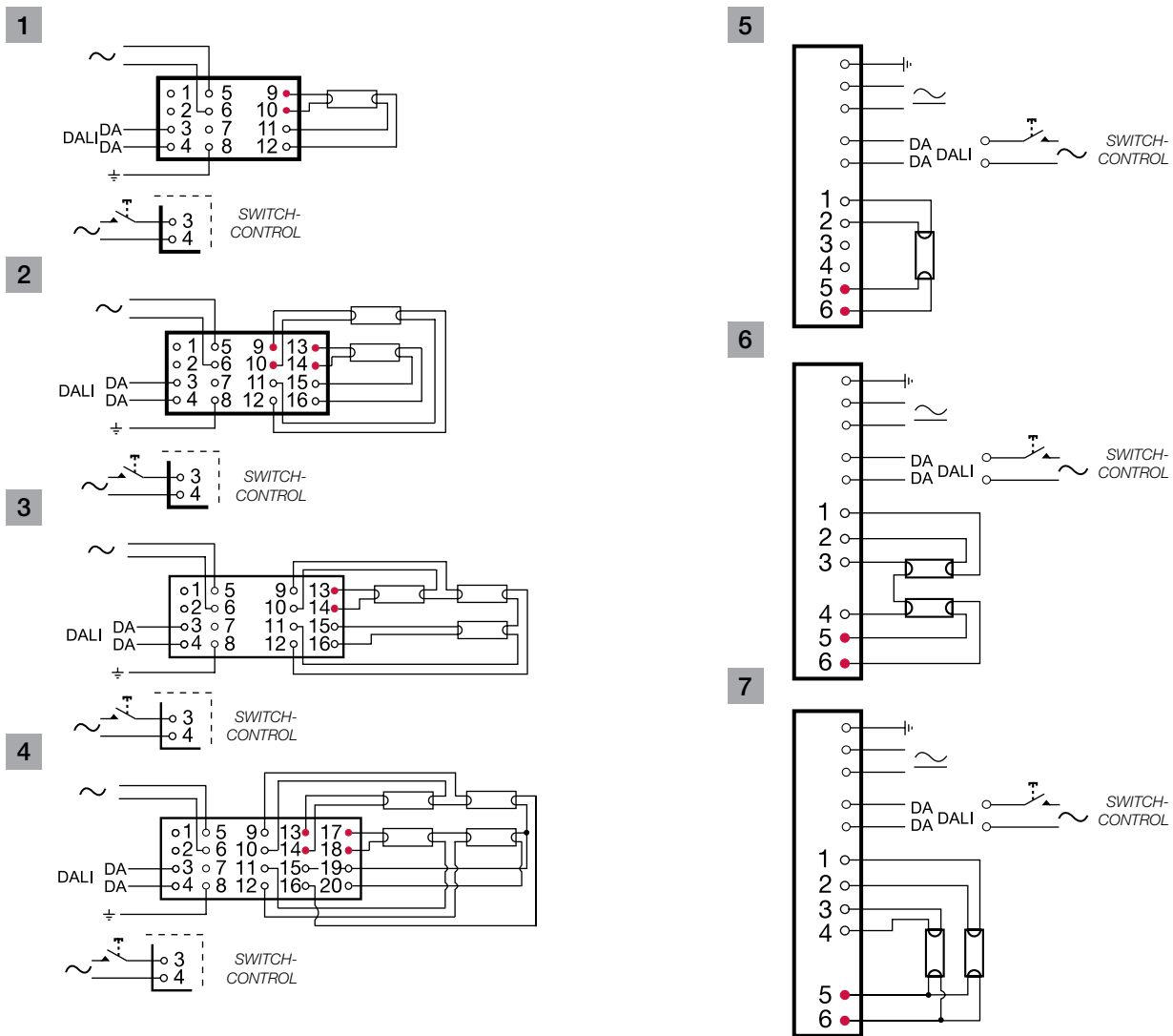
Wiring diagrams

EL-iDim

The iDim ballasts are designed for both manual and automatic wiring

- Use only solid core wire
- The wire cross section should be 0.5..1.5mm²
- The wiring insulation requirements are defined in the EN60598, use mains rated cable also for the control wires
- Wire capacitance should be maximum 80 pF
- Wire connections as in the table
- Wire preparation, strip 7.5 +/- 1 mm
- Typical insertion force is 8 N
- The connectors are designed for a single wire only per position
- Do not daisy chain
- Keep all wires as short as possible, especially the hot "wires"
- "Hot" wires should be of equal length
- "Cold" wires should be of equal length
- Run the lamp, mains and control wires separate. Do not bunch the cold and hot wires together
- Do not run lamp wires of more than one ballast together
- Maximum lengths are 1.5 m / 2 m (hot / cold respectively), for TC/L lamps, 1 m / 2 m (hot / cold respectively)
- For switch control, see page 8

NOTE: All wiring to the connectors marked with a red dot (hot wires) should be as short as possible.



1	EL1x ...iDim
2	EL2x ...iDim
3	EL3x ...iDim
4	EL4x ...iDim
5	EL1/2x...iDim-c
6	EL1/2x...iDim-c, EL2x...iDim-c

Switch-Control Information, EL-iDim ballasts

Switch-Control provides ON/OFF switching and UP/DOWN dimming functionality from one or more simple switches.

Switch-Control and DALI can not be connected to the iDim ballast at the same time.

Suitable switch:

- Automatic return type.
- Mains rated

Connection:

- EL-iDim ballasts: To the DALI input
- Wire length: 25 m maximum. diagram A
25 - 200 m, use a capacitor (1 μ F, 275 V) diagram B
- Ballasts per switch: 50 (observe above)
- Ensure all ballasts and associated switches are connected to the same mains phase

Operation:

- Switch off: Short push of the switch (<0.4 second)
- Switch on: Short push of the switch (<0.4 second)
- EL-iDim ballasts will switch on to the last set level
- Dimming: Long push of the switch (>0.5 second)
 - If lamps are off, the ballast dims up from minimum
 - If lamps are on, the ballast dims in the opposite direction to previously
 - The first dimming direction is dimming down

Correction of out of sequence operation:

- Switch the mains supply off and on, or...
- Long push (until all lamps are on), then a short push (all lamps off), then switch on

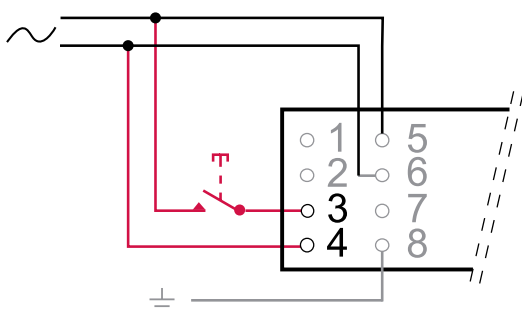
Compatibility:

- Some ballasts manufacturers have functionality similar to Helvar Switch-Control. These methods are NOT COMPATIBLE with each other
- The iDim and si ballast switch controls are not compatible

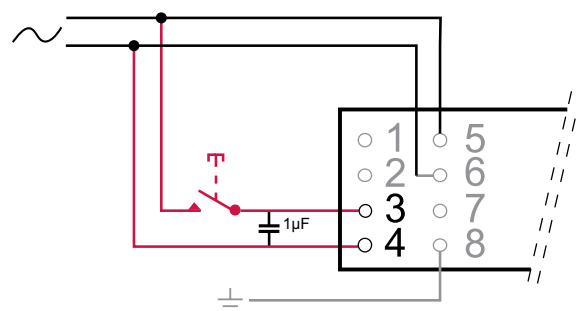
Connection

- To the DALI input

A) 0-25m



B) 25-200m



Usage Considerations

iDim Ballast Stand-by

The ballast stand-by triggering is designed to meet the IEC61347-2-3 and IEC60929 standards. The ballast will go to stand-by if:

- The ballast identifies the lamp to be broken or too old so it no longer meets specific IEC60081 / IEC6091 lamp standard requirements
- The lamp is loose
- A cathode is broken
- The lamp type wattage is incorrect
- The mains voltage is too low

Resetting the ballast from stand-by

First ensure that none of the root causes for stand-by are no longer present. The ballast can be reset by:

- Removing and refitting the lamp. With 4-lamp ballasts this can only be done from the lamps that are on the cold side (see ballast label). In practice the user may have to try several lamps
- Switching off and on the mains power. One may have to wait a while to allow the capacitors to discharge before switching on
- By DALI command

Temperature

- The Tc temperature of the ballast must not exceed the marked value (75°C). This is important for both the ballast performance and its expected lifetime. The warranty is not valid if the maximum Tc temperature has been exceeded
- The Ta temperature range defines the allowed ambient temperatures for the ballast, not the fitting. Please note that when testing a new fitting design, it should be ensured that the ballast Tc temperature is not exceeded in the highest allowed ambient temperature for the fitting
- The ballast surface temperature will not exceed 120 degrees

Voltage Range

- The ballast will start at minimum 198 V (AC / DC). However, the ballast can start at a lower voltage than this
- Too maximum and minimum operating voltage ranges are 198...264 VAC and 176 VDC...280 VDC
- Continuous operation at voltages that deviate from the standard 230 V can result in reduced ballast life
- Operation outside the specified ranges can result in a sudden failure of the ballast
- If the AC voltage drops below 165 VAC, the ballast will shut itself off

Earthing

- The iDim ballast will function without earth connection but the EMC performance is not guaranteed
- Earth plane for the lamp may be required for reliable starting
- Class I & II fitting safety requirements must be observed

PIR operation

Set the minimum on time to 20 minutes. Some lamps' life may otherwise be reduced.

Mounting

- Ensure that the entire ballast is flat against a surface to ensure good heat dissipation
- Mount the ballast in the coolest place possible in the fitting to maximise the ballast life

Lamp "burn in"

Brand new lamps may occasionally have an uneven distribution of internal gases. This can lead to unreliable starting or uneven light distribution from the lamp. Helvar recommend that new lamps are operated at full output ("burnt in") for a number of hours prior to being dimmed.

Power On to last level

When powering the ballast ON (mains on) this feature recalls the light level prior to having powered the ballast OFF. Light at zero level is as well a light level that can be recalled in this case. This feature is deactivated as a default dictated by the DALI standard but can later be activated by programming the ballast.

Helvars EL-iDim and EL-iDim-c ballasts have an inbuilt feature allowing for a manual activation of the "power on to last level" using the Switch-Control.

To activate the feature switch the light ON and carry out following switching sequence:

- 1 x long press (20.0...24.9s)
- 3 x short press (90...360ms)
- 1 x long press (20.0...24.9s)

Between the presses, approximately 2 seconds of delay is allowed.

For deactivation of the feature switch OFF the light and repeat the sequence.

DALI controls

The DALI standard only currently governs ballast compatibility. For other units, like sensors and control devices, the compatibility assurance is in process. Until the standard for these is finalised, the total system compatibility must be ensured at the system design stage.

Site Considerations

Insulation resistance testing on an installation

- Carry out insulation resistance testing with the fittings disconnected from the mains supply (the fitting has already been tested by the manufacturer)
- If fittings are connected to the mains supply during an insulation resistance test, all Live phases and Neutral must be connected together before the test is carried out.
- Ensure correct re-connection before the mains supply is re-applied.

Mixed technology on the same electrical circuit

- Do not mix magnetic and electronic ballasts on the same electrical circuit. The energy spikes from magnetic ballasts may damage electronic ballasts.

Infra-red (IR) system

- Fluorescent lamps emit not only visible light, but also infra-red light. In some cases this may cause interference to IR systems. To minimise problems the IR system should have a reduced receiving area. To guarantee successful functionality the manufacturer of the IR system should be contacted prior to installation. Helvar ballasts typically operate at frequencies rarely used in IR applications.

3-phase supplies

- Do not apply power to the ballast / fitting without the Neutral conductor connected.
- Do not disconnect the Neutral conductor unless the supply is off.

Miniature Circuit Breakers

- 'Type C' MCB's with trip characteristics in according to EN 60898 are recommended.
- 'Type B' MCB's are not recommended due to their sensitivity. If used, load only to 60% of the equivalent 'Type C' MCB.

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