Table of Contents

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Helvar Ballasts for Fluorescent Lamps

Lamp type	ILCOS	W	Length (mm)	Cap	Magnetic Ballast (230V 50Hz)		Page	Standard electronic ballast		Page	Controllable electronic ballast		Page	Digital DALI electronic ballast		Page
T5 - Lamp **ø16mm**	**FD-H**	**4**	136	G5	**L 8 D**	**L 8 DL** 1)	11									
		6	212	G5	**L 8 D**	**L 8 DL** 1)	11									
		8	288	G5	**L 8 D** EL1/2x9-13TCs	**L 11 D**	11									
		13	517	G5	L 13 DL 1)		11									
		14	549	G5				**EL1x14-35s** **EL1x14-35s-u** **EL3/4x14s**	**EL2x14-35s** **EL2x14-35s-u** **EL3/4x14s-u**	29	**EL1x14sc**	**EL2x14sc** **EL4x14sc**	30	**EL1x14si**	**EL2x14si** **EL4x14si**	31
		21	849	G5				**EL1x14-35s** **EL1x14-35s-u**	**EL2x14-35s** **EL2x14-35s-u**	29	**EL1x21sc**	**EL2x21sc**	30	**EL1x21si**	**EL2x21si**	31
		24	549	G5				**EL1x24s**	**EL2x24s**	29	**EL1x24sc**	**EL2x24sc**	30	**EL1x24si**	**EL2x24si**	31
		28	1149	G5				**EL1x14-35s** **EL1x14-35s-u**	**EL2x14-35s** **EL2x14-35s-u**	29	**EL1x28sc**	**EL2x28sc**	30	**EL1x28si**	**EL2x28si**	31
		35	1449	G5				**EL1x14-35s** **EL1x14-35s-u**	**EL2x14-35s** **EL2x14-35s-u**	29	**EL1x35sc**	**EL2x35sc**	30	**EL1x35si**	**EL2x35si**	31
		39	849	G5				**EL1x39/36s**	**EL2x39/36s**	29	**EL1x39sc**	**EL2x39sc**	30	**EL1x39si**	**EL2x39si**	31
		49	1449	G5				**EL1x49s** **EL1x49s-u**	**EL2x49s** **EL2x49s-u**	29	**EL1x49sc**	**EL2x49sc**	30	**EL1x49si**	**EL2x49si**	31
		54	1149	G5				**EL1x54s**	**EL2x54s**	29	**EL1x54sc**	**EL2x54sc**	30	**EL1x54si**	**EL2x54si**	31
		80	1449	G5				**EL1x80s**		29	**EL1x80sc**		30	**EL1x80si**		31
T8 - Lamp **ø26mm**	**FD-E**	**18**	590	G13	**L 18 A-L** **L 18 A-K** **L 20 A-P** L 26 TS5 - 100mm L 26 TS5 - 105mm	**L 18 TLB2** **L 18 TL2** **L 18 TL3** **L 18 TL4**	7	**EL1x18s** **EL1x18HF** **EL3/4x18s** **EL3/4x18s-u**	**EL2x18s** **EL2x18HF**	32 33	**EL1x18sc**	**EL2x18sc** **EL4x18sc**	34			
		36	1200	G13	**L 36 A-T** **L 36 A-K** **L 40 A-L** **L 40 A-P**	**L 36 TL2** **L 36 TL3** **L 36 TL4** **L 36 TLB2** **L 36 TB2-100**	8	**EL1x36/40/18s** **EL1x36/40s-u** **EL1x36HF**	**EL2x36/40s** **EL2x36/40s-u** **EL2x36HF**	32 33	**EL1x36sc**	**EL2x36sc**	34	EL1x36si	EL2x36si	-
		58	1500	G13	**L 58 TL2** **L 58 TL3** **L 58 TL4** **L 58 TL4 - 220mm** **L 58 TLB2 - 180mm**	**L 58 A-S** **L 65 A-P** **L 58 A-K** **L 58 A-T**	8	**EL1x58s** **EL1x58s-u** **EL1x58HF**	**EL2x58s** **EL2x58s-u** **EL2x58HF**	32 33	**EL1x58sc**	**EL2x58sc**	34			
		70	1500	G13	L 75 A-S 2)	L 70 TL4 1)2)	9	EL1x70s	EL2x70s	32	EL1x70sc		34			

*Types printed **BOLD** are ENEC approved combinations.*
Other combinations mentioned are tested and recommended by Helvar
Please check CE compatibility and EEI classification from ballast datasheets.
1) Approved to EN 61347-2-8
2) 240V 50Hz

Linear shaped electronic ballasts:
EL-s, EL-s-u, EL-sc, EL-si and EL-HF
Square shaped electronic ballasts:
EL-TCs, EL-CHFC3, EL-CHFI

Helvar Ballasts for Fluorescent Lamps

Lamp type	ILCOS	W	Length (mm)	Cap	Magnetic Ballast (230V 50Hz)	Page	Standard electronic ballast	Page	Controllable electronic ballast	Page	Digital DALI electronic ballast	Page
T8-Lamp ø 26 mm	FD-E	15	450	G13	**L 15 A** **L 15 TL3** **L 15 A-P**	7		-				
		16	720	G13	**L 16 D** **L 16 DL**	7		-				
		23	970	G13	L 15 A-P	-		-				
		30	900	G13	**L 30 A** **L 30 TL2** **L 30 A-P**	7		-		-		
		36	970				EL1x36HF 1) EL2x36HF EL1x36/40/18s EL2x36/40s EL1x36/40s-u EL2x36/40s-u	-				
		36-1	970	G13	**L 42 T6**	8		-				
		38	1047	G13	L 36 TL2 L40 A-L L 36 TL4 L40 A-P L 36 TLB2 L 36 TB2-100 L 36 A-K **L 36 TL3** L 36 A-T	8	EL1x36/40/18s EL2x36/40s EL1x36HF EL2x36HF	-	EL1x36sc EL2x36sc	-		
T5 circular		22		2GX13			**EL1/2x18-42TCs**	37	**EL1x18-40CHFC3**	39	**EL1x18-40CHFI**	41
		40		2GX13			**EL1/2x18-42TCs** **EL2x32/42TCs** 2)	37	**EL1x18-40CHFC3** EL1x39sc EL2x39sc	39	**EL1x18-40CHFI** EL1x39si EL2x39si	41
Circline	FD-E	22		G10q	**L 30 TL2** L 30 A	14						
		32		G10q	**L 32 TB2**	14						
		40		G10q	L 36 TL2 L40 A-L L 36 TL3 L40 A-P L 36 TL4 L 36 TB2-100 L 36 TLB2 L 36 A-K L 36 A-T	-						
Mod-U-line	FU-E	40		G13	L 36 TL2 L40 A-L L 36 TL3 L40 A-P L 36 TL4 L 36 A-K L 36 TLB2 L 36 A-T L 36 TB2-100	-		-				

*Types printed **BOLD** are ENEC approved combinations.*
Other combinations mentioned are tested and recommended by Helvar
Please check CE compatibility and EEI classification from ballast datasheets.
1) Approved to EN 61347-2-3
2) For a combination of one 22W and one 40W circular lamp

Linear shaped electronic ballasts:
EL-s, EL-s-u, EL-sc, EL-si and EL-HF

Square shaped electronic ballasts:
EL-TCs, EL-CHFC3, EL-CHFI

Helvar Ballasts for Fluorescent Lamps

Lamp type	ILCOS	W	Cap	Magnetic Ballast (230V 50Hz)	Page	Standard electronic ballast	Page	Controllable electronic ballast	Page	Digital DALI electronic ballast	Page
TC-S 2 finger with starter	FSD-I	5	G23	**L11 D** L11 DL 1)	11						
		7	G23	**L11 D** **L11 DL 1)**	11						
		9	G23	**L11 D** **L11 DL 1)**	11						
		11	G23	**L11 D** **L11 DL 1)**	11						
TC-SE 2 finger without starter	FSD-E	9	2G7			**EL1/2x9-13TCs**	37				
		11	2G7			**EL1/2x9-13TCs**	37				
TC-D 4 finger with starter	FSQ-I	10	G24d-1	**L13 D** **L13 DL 1)**	14		8				
		13	G24d-1	**L13 D** **L13 DL 1)**	14						
		18	G24d-2	**L18 D** **L18 TLD-100mm** **L18 DL**	14						
		26	G24d-3	L18 TL2 L20 A-P L18 TL3 L18 A-L **L26 S-100mm** L18A-K **L26 TS5-105mm** **L18 TL4** **L26 TS5-100mm** **L18 TLB2**	14						
TC-DE 4 finger without starter	FSQ-E	10	G24q-1			**EL1/2x9-13TCs**	36				
		13	G24q-1			**EL1/2x9-13TCs**	36	**EL1x13CHFC3** **EL2x13CHFC3**	39		
		18	G24q-2			**EL1/2x18TCs**	36	**EL1x18CHFC3** **EL2x18CHFC3**	39	**EL1x18CHFI** **EL2x18CHFI**	41
		26	G24q-3			**EL1/2x18-42TCs**	36	**EL1x26-42CHFC3** **EL2x26CHFC3** **EL2x26-42CHFC3**	39	**EL1x26-42CHFI** **EL2x26-42CHFI**	41
TC-T 6 finger with starter	FSM-I	18	GX24d-2	L18 D L18 DL L18 TLD-100mm	-						
		26	GX24d-3	L18 TL2 L20 A-P L18 TL3 L18 A-L L26 TS5-105mm L18 A-K L26 TS5-100mm **L18 TL4** L18 TLB2	- -		-		-		-
TC-TE 6 finger without starter	FSM-E	13	GX24q-1			**EL1/2x9-13TCs**	37	**EL1x13CHFC3** **EL2x13CHFC3**	39		
		18	GX24q-2			**EL1/2x18TCs**	37	**EL1x18CHFC3** **EL2x18CHFC3**	39	**EL1x18CHFI** **EL2x18CHFI**	41
		26	GX24q-3			**EL1/2x18-42TCs**	37	**EL1x26-42CHFC3** **EL2x26CHFC3** **EL2x26-42CHFC3**	39	**EL1x26-42CHFI** **EL2x26-42CHFI**	41
		32	GX24q-3			**EL1/2x18-42TCs** **EL2x32/42TCs**	37	**EL1x26-42CHFC3** **EL2x26-42CHFC3**	39	**EL1x26-42CHFI** **EL2x26-42CHFI**	41
		42	GX24q-4			**EL1/2x18-42TCs** **EL2x32/42TCs**	37	**EL1x26-42CHFC3** **EL2x26-42CHFC3**	39	**EL1x26-42CHFI** **EL2x26-42CHFI**	41

*Types printed **BOLD** are ENEC approved combinations.*
Other combinations mentioned are tested and recommended by Helvar
Please check CE compatibility and EEI classification from ballast datasheets.
1) Approved to EN61347-2-8

Linear shaped electronic ballasts:
EL-s, EL-s-u, EL-sc, EL-si and EL-HF

Square shaped electronic ballasts:
EL-TCs, EL-CHFC3, EL-CHFI

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Helvar Ballasts for Fluorescent Lamps

Lamp type	ILCOS	W	Cap	Magnetic Ballast (230V 50Hz)	Page	Standard electronic ballast	Page	Controllable electronic ballast	Page	Digital DALI electronic ballast	Page
TC-DD **2D-lamp** **GR8, for magnetic ballast only** **GR10q, for electronic ballast or magnetic with external starter**	**FSS-E**	**10**	GR8, GR10q	L13 D L13 DL	13	EL1/2x9-13TCs	37				
		16	GR8, GR10q	**L16 D** 2) **L16 DL**	13	EL1/2x9-13TCs	37				
		21	GR8, GR10q	L21 TL2-100mm 1)	13	EL1/2x18-42TCs EL1x18HF	35				
		28	GR8, GR10q	L18 TL2 L20 A-P L18 TL3 L18 A-L L18 TLB2 L18 A-K **L18 TL4**	13	EL1/2x18-42TCs	37				
		38	GR8, GR10q	L36 TL2 L40 A-P L36 TL3 L36 A-K L36 TL4 L36 A-T L36 TLB2 L36 TB2-100	13	EL1x36HF	35				
TC-L **2 finger** **Ø 17.5**	**FSD-E**	**18**	2G11	L26 TS5-100mm **L18 TL4** L26 TS5-105mm **L18 TLB2** **L18 TL2** L20 A-P L18 TL3 L18 A-K L18 A-L	12	**EL1/2x18-42TCs** **EL1x36/40/18s** **EL1x36/40s-u**	36	**EL1x18-40CHFC3** **EL2x18/24CHFC3**	39	**EL1x18-40CHFI** **EL2x18/24CHFI**	41
		24	2G11	**L26 TS5-100mm** **L18 TL4** **L26 TS5-105mm** **L18 TLB2** L18 TL2 L20 A-P L18 TL3 L18 A-K L18 A-L	12	**EL1/2x18-42TCs** EL1x24s EL2x24s	35 36	**EL1x18-40CHFC3** **EL2x18/24CHFC3** EL1x24sc EL2x24sc	38 39	**EL1x18-40CHFI** **EL2x18/24CHFI** EL1x24si EL2x24si	40 41
		34	2G11			EL1x36HF					
		36	2G11	L36 TL2 L40 A-P L36 TL3 L36 A-T L36 TL4 L36 A-K **L36 TLB2** **L36 TB2-100**	13	**EL1x39/36s** EL1x36HF **EL2x39/36s** EL1/2x18-42TCs	35 36	**EL1x36sc** **EL2x36sc**	38	EL1x36si EL2x36si	40
		40	2G11			**EL1x36/40/18s** **EL2x36/40s** **EL1x36/40s-u** **EL2x36/40s-u** EL1x36HF 1) EL1/2x18-42TCs	35 36	EL1x36sc EL2x36sc EL1x39sc EL2x39sc	-	EL1x39si EL2x39si	40
		55	2G11			**EL1x55s** **EL2x55s**	35	**EL1x55sc** **EL2x55sc**	38	EL1x55si EL2x55si	40
		80	2G11			EL1x80s	35	EL1x80sc	38	EL1x80si	40

*Types printed **BOLD** are ENEC approved combinations.*
Other combinations mentioned are tested and recommended by Helvar
Please check CE compatibility and EEI classification from ballast datasheets.
1) Approved to EN61347-2-3
2) GR8 not ENEC approved

Linear shaped electronic ballasts:
EL-s, EL-s-u, EL-sc, EL-si and EL-HF

Square shaped electronic ballasts:
EL-TCs, EL-CHFC3, EL-CHFI

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Helvar Ballasts for Fluorescent Lamps

Lamp type	ILCOS	W	Cap	Magnetic Ballast (230V 50Hz)	Page	Standard electronic ballast	Page	Controllable electronic ballast	Page	Digital DALI electronic ballast	Page
TC-F **Flat 4 finger**	**FSS-E**	**18**	2G10	L18 TL2 L20 A-P L18 TL3 L18 A-L L18 TL4 L18 A-K L18 TLB2	11	**EL1/2x18-42TCs** EL1x36/40/18s EL1x36/40s-u EL1x18HF	35 36	**EL1x18-40CHFC3** **EL2x18/24CHFC3**	39	**EL1x18-40CHFI** **EL2x18/24CHFI**	41
		24	2G10	L18 TL2 L20 A-P L18 TL3 L18 A-L L18 TL4 L18 TLB2 L26 TS5-100mm L18 A-K L26 TS5-105mm		**EL1/2x18-42TCs**	36	**EL1x18-40CHFC3** **EL2x18/24CHFC3**	39	**EL1x18-40CHFI** **EL2x18/24CHFI**	41
		36	2G10	L36 TL2 L36 TL3 L36 TL4 L36 A-K L36 TLB2 L40 A-P L36 TB2-100 L36 A-T		EL1x39/36s EL2x39/36s EL1x36HF EL2x36HF EL1/2x18-42TCs	35 36	EL1x36sc EL2x36sc	38		

*Types printed **BOLD** are ENEC approved combinations.*
Other combinations mentioned are tested and recommended by Helvar
Please check CE compatibility and EEI classification from ballast datasheets.

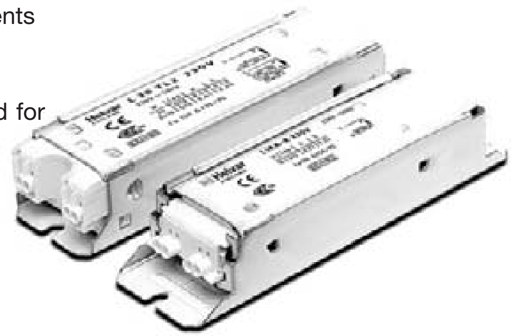
Linear shaped electronic ballasts:
EL-s, EL-s-u, EL-sc, EL-si and EL-HF

Square shaped electronic ballasts:
EL-TCs, EL-CHFC3, EL-CHFI

Magnetic ballasts for fluorescent T8 lamps

15-30W 230V 50Hz

- Meets EN 61347-2-8 & EN60921 requirements
- Low harmonics
- Low power losses
- Correctly trimmed lamp current guaranteed for entire lifetime
- 100% quality controlled
- Double wire terminals without screws
- Small size
- Long lifetime

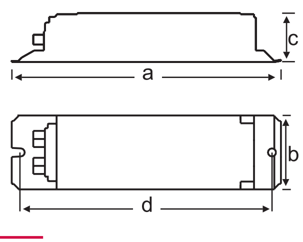


tw 130

Dimensions

NO.	1	2	3	4
DRAWING	A	B	B	C
LENGTH 'a' (mm)	150	150	110	85
WIDTH 'b' (mm)	42	42	42	41.5
HEIGHT 'c' (mm)	28	28.8	28.8	28
'd' (mm)	140	140	100	73

A



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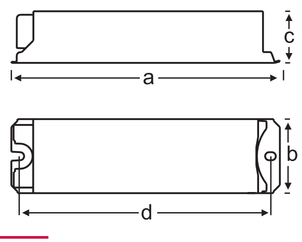

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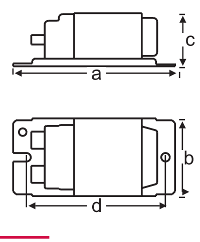
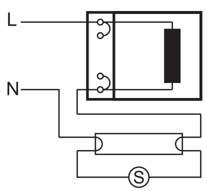


Connection diagrams

1.



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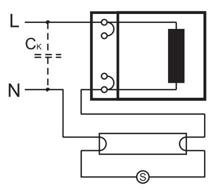

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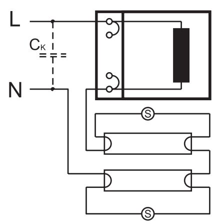


Lamp: Lamp type	Lamp: Lamp wattage (W)	Lamp: No. of lamps	Lamp: Lamp current (A)	Ballast: Ballast type	Ballast: EEI	Ballast: Delivery details p.53	Ballast: Dimensions No.	Ballast: Connection No.	Ballast: Net weight (kg)	Ballast: Inductive λ	Ballast: Temperature rise Δt (°C)	Compensat.: Parallel Ck 230/250V ±10% (µF)	Compensat.: Mains current (A)
T8 (G13)	15	1	0.31	L 15 TL3	B1	1	2	1,2	0.76	0.31	40/70	4.0	0.12
				L 15 A-P	B2	5	1	1,2	0.55	0.31	50/95	4.0	0.12
				L 15 A	B2	5	1	1,2	0.60	0.35	55/80	4.0	0.12
		2	0.31	L 30 TL2	B1	1	2	1,2	0.82	0.45	30/70	4.5	0.21
				L 30 A	B2	5	1	1,2	0.61	0.50	55/110	4.5	0.20
				L 30 A-P	B2	5	1	1,2	0.56	0.50	50/125	4.5	0.21
	16	1	0.20	L 16 DL	B1	7	4	1,2	0.32	0.43	60/150	2.0	0.11
				L 16 D	B2	7	4	1,2	0.32	0.46	65/150	2.0	0.11
	18	1	0.37	L 18 TL2	B1	1	2	1,2	0.83	0.30	35/60	4.5	0.14
				L 18 TL3	B1	1	2	1,2	0.76	0.30	40/70	4.5	0.14
				L 18 TL4	B2	1	2	1,2	0.65	0.30	45/80	4.5	0.14
				L 18 TLB2	B2	1	2	1,2	0.57	0.32	50/95	4.5	0.14
				L 18 A-K	B2	5	1	1,2	0.61	0.32	50/95	4.5	0.14
				L 20 A-P 1)	C	5	1	1,2	0.56	0.32	55/95	4.5	0.14
				L 18 A-L 1)	C	5	1	1,2	0.51	0.35	65/90	4.5	0.14
		2	0.37	L 36 TL2	B1	1	2	3	0.83	0.45	35/90	4.5	0.23
				L 36 TL3	B1	1	2	3	0.78	0.45	40/90	4.5	0.23
				L 36 TL4	B2	1	2	3	0.65	0.45	45/110	4.5	0.23
				L 36 TLB2	B2	1	2	3	0.57	0.48	50/140	4.5	0.23
				L 36 A-K	B2	5	1	3	0.61	0.50	50/145	4.5	0.23
				L 36 A-T	B2	5	1	3	0.57	0.50	50/155	4.5	0.23
				L 36 TB2-100	B2	2	3	3	0.53	0.48	55/155	4.5	0.23
				L 2x18 A-T	B2	5	1	3	0.56	0.55	55/155	4.5	0.23
				L 2x18 A-L	B2	5	1	3	0.50	0.55	65 / -	4.5	0.23
				L 40 A-P 1)	C	5	1	3	0.56	0.55	55/155	4.5	0.23
				L 40 A-L 1)	D	5	1	3	0.51	0.55	65/160	4.5	0.23
	25	1	0.29	L 15 TL3	B1	1	2	1,2	0.76	0.46	35/70	3.5	0.15
				L 15 A	B2	5	1	1,2	0.60	0.50	40/80	3.5	0.15
				L 15 A-P	B2	5	1	1,2	0.55	0.46	40/95	3.5	0.15
	30	1	0.365	L 30 TL2	B1	1	2	1,2	0.82	0.45	30/70	4.5	0.18
				L 30 A	B2	1	1	1,2	0.61	0.45	55/110	4.5	0.19
				L 30 A-P	B2	1	1	1,2	0.56	0.45	50/125	4.5	0.18

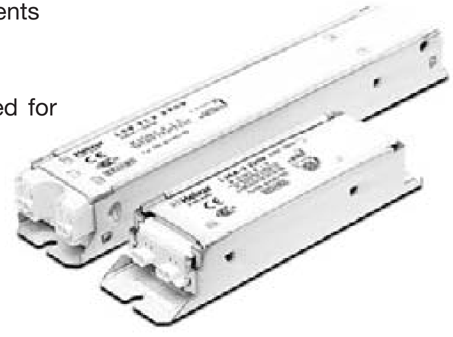
1) Not available for European Union market

Due to our continuing program of product development data subject to change without notice.

Magnetic ballasts for fluorescent T8 lamps

36-58W 230V 50Hz

- Meets EN 61347-2-8 & EN60921 requirements
- Low harmonics
- Low power losses
- Correctly trimmed lamp current guaranteed for entire lifetime
- 100% quality controlled
- Double wire terminals without screws
- Small size
- Long lifetime

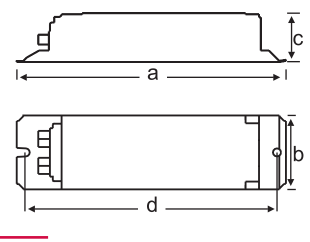


tw 130

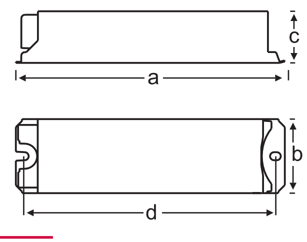
Dimensions

NO.	1	2	3	4	5	6
DRAWING	A	A	B	B	B	B
LENGTH 'a' (mm)	150	190	150	230	190	110
WIDTH 'b' (mm)	42	42	42	42	42	42
HEIGHT 'c' (mm)	28	28	28.8	28.8	28.8	28.8
'd' (mm)	140	180	140	220	180	100

A

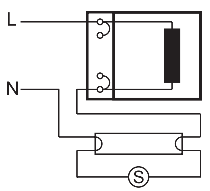


B

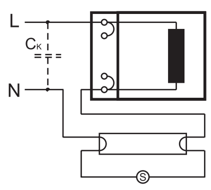


Connection diagrams

1.



2.



Lamp				Ballast								Compensat.	
Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (μF)	Mains current (A)
T8 (G13)	36	1	0.43	L 36 TL2	B1	1	3	1,2	0.83	0.43	35/90	4.5	0.23
				L 36 TL3	B1	1	3	1,2	0.78	0.43	40/90	4.5	0.23
				L 36 TL4	B2	1	3	1,2	0.65	0.43	45/110	4.5	0.23
				L 36 TLB2	B2	1	3	1,2	0.57	0.45	50/140	4.5	0.23
				L 36 A-K	B2	5	1	1,2	0.61	0.45	50/145	4.5	0.23
				L 36 A-T	B2	5	1	1,2	0.57	0.45	50/155	4.5	0.23
				L 36 TB2-100	B2	2	6	1,2	0.53	0.45	55/155	4.5	0.23
				L 40 A-P [1]	C	5	1	1,2	0.56	0.50	55/155	4.5	0.23
				L 40 A-L [1]	D	5	1	1,2	0.51	0.50	65/160	4.5	0.23
	36-1	1	0.53	L 42 T6	-	4	5	1,2	0.88	0.40	55/110	6.0	0.26
	38	1	0.43	L 36 TL2	B1	1	3	1,2	0.83	0.45	35/90	4.5	0.24
				L 36 TL3	B1	1	3	1,2	0.78	0.45	40/90	4.5	0.24
				L 36 TL4	B2	1	3	1,2	0.65	0.45	45/110	4.5	0.24
				L 36 TLB2	B2	1	3	1,2	0.57	0.45	50/140	4.5	0.24
				L 36 A-K	B2	5	1	1,2	0.61	0.48	50/145	4.5	0.24
				L 36 TB2-100	B2	2	6	1,2	0.53	0.45	55/155	4.5	0.24
				L 40 A-P [1]	C	5	1	1,2	0.56	0.48	55/155	4.5	0.24
				L 40 A-L [1]	D	5	1	1,2	0.51	0.48	75/160	4.5	0.24
	58	1	0.67	L 58 TL2	B1	4	4	1,2	1.36	0.45	35/95	7.0	0.34
				L 58 TL3	B1	4	4	1,2	1.30	0.45	40/95	7.0	0.34
				L 58TLB2-180mm	B2	4	5	1,2	0.88	0.47	50/135	7.0	0.34
				L 58 TL4-220mm	B2	4	4	1,2	1.09	0.45	40/110	7.0	0.34
				L 58 TL4	B2	4	5	1,2	1.06	0.45	40/110	7.0	0.34
				L 58 A-S	B2	6	2	1,2	1.00	0.48	45/130	7.0	0.34
				L 58 A-K	B2	6	2	1,2	0.92	0.48	45/135	7.0	0.34
				L 58 A-T	B2	6	2	1,2	0.88	0.48	50/145	7.0	0.34
				L 65 A-P [1]	C	6	2	1,2	0.87	0.50	55/145	7.0	0.34

1) Not available for European Union market

***Note:** Lamps excluded from the CELMA EEI directive do not have an EEI classification.*

Magnetic ballasts for fluorescent T8 lamps 15-125W 240V 50Hz

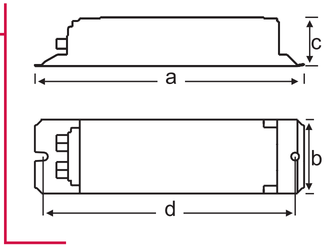
- Meets EN 61347-2-8 & EN60921 requirements
- Low harmonics
- Low power losses
- Correctly trimmed lamp current guaranteed for entire lifetime
- 100% quality controlled
- Double wire terminals without screws
- Small size
- Long lifetime

tw 130

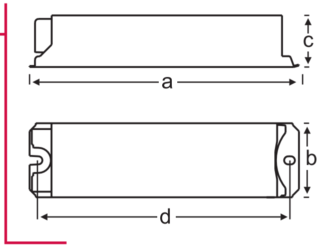
Dimensions

NO.	1	2	3	4	5	6
DRAWING	A	A	B	B	B	C
LENGTH 'a' (mm)	150	190	150	230	190	85
WIDTH 'b' (mm)	42	42	42	42	42	41,5
HEIGHT 'c' (mm)	28	28	28.8	28.8	28.8	28
'd' (mm)	140	180	140	220	180	73

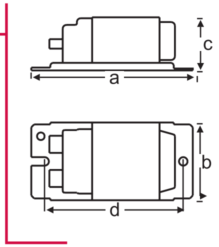
A



B

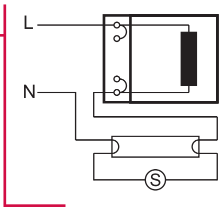


C



Connection diagrams

1.



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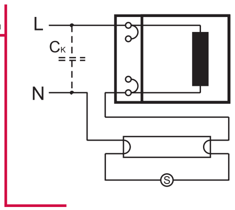

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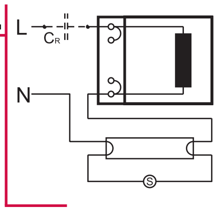

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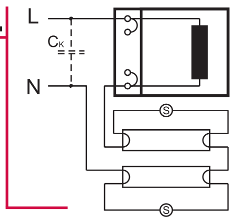


Lamp: Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast: Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Compensat.: Parallel Ck 240/250V ±10% (µF)	Mains current (A)
T8 (G13)	15	1	0.31	L 15 A	B2	5	1	1,2	0.60	0.35	55/80	4.0	0.11
		2	0.31	L 30 A-P	B2	5	1	4	0.56	0.45	55/125	4.0	0.17
				L 30 A	B2	5	1	4	0.61	0.45	55/125	4.0	0.17
	16	1	0.2	L 16 D	B2	7	6	2	0.32	0.45	65/160	2.0	0.10
	18	1	0.37	L 18 TL2	B1	1	3	1,2	0.83	0.30	40/65	4.0	0.14
				L 18 TL4	B2	1	3	1,2	0.65	0.29	45/80	4.0	0.14
				L 18 A-K	B2	5	1	1,2	0.61	0.32	55/90	4.0	0.13
				L 20 A-P [3]	C	5	1	1,2	0.56	0.35	60/90	4.0	0.13
		2	0.37	L 36 TL2	B1	1	3	4	0.83	0.44	35/95	4.0	0.22
				L 36 TL4	B2	1	3	4	0.65	0.44	45/115	4.0	0.22
				L 36 A-K	B2	5	1	4	0.61	0.50	55/155	4.0	0.22
				L 40 A-P [3]	C	5	1	4	0.56	0.53	70/160	4.0	0.22
	25	1	0.29	L 15 A	B2	5	1	1,2	0.60	0.45	55/90	3.0	0.14
	30	1	0.365	L 30 A	B2	5	1	1,2	0.61	0.45	55/125	4.0	0.17
				L 30 A-P	B2	5	1	1,2	0.56	0.45	55/125	4.0	0.17
	36	1	0.43	L 36 TL2	B1	1	3	1,2	0.83	0.42	35/95	4.5	0.22
				L 36 TL4	B2	1	3	1,2	0.65	0.42	45/115	4.5	0.22
				L 36 A-K	B2	5	1	1,2	0.61	0.45	55/155	4.5	0.22
				L 40 A-P [3]	C	5	1	1,2	0.56	0.50	70/160	4.5	0.22
	38	1	0.43	L 36 TL2	B1	1	3	1,2	0.83	0.44	35/95	4.0	0.22
				L 36 TL4	B2	1	3	1,2	0.65	0.44	45/115	4.0	0.22
				L 36 A-K	B2	5	1	1,2	0.61	0.45	55/155	4.0	0.23
				L 40 A-P [3]	C	5	1	1,2	0.56	0.52	70/160	4.0	0.23
	58	1	0.67	L 58 TL2	B1	4	4	1,2	1.36	0.42	35/95	7.0	0.32
				L 58 TL4	B2	4	4	1,2	1.06	0.42	45/115	7.0	0.32
				L 58 A-K	B2	6	2	1,2	0.92	0.48	50/145	7.0	0.32
				L 65 A-P [3]	C	6	2	1,2	0.88	0.50	60/145	7.0	0.32
	70	1	0.70	L 75 A-S	B2	6	2	1,2	1.00	0.51	60	6.0	0.41
				L 70 TL4	B2	4	5	1,2	1.09	0.50	45	6.0	0.40
	85	1	0.80	L 85 A-S	-	6	2	1,2	1.00	0.55	65	8.0	0.43
	100	1	0.96	L100 TE61	-	4	4	1,2	1.28	0.52	60/145	10.0	0.55
				L100 TE8	-	4	4	1,2	1.10	0.50	75/190	10.0	0.55
	125	1	0.94	L100 TE61	-	4	4	3	1.32	0.62c[2]	60/145	-[1]	-
				L100 TE8	-	4	4	3	1.32	0.60c[2]	75/190	-[1]	-

1) Essential: Series capacitor 7.2µF ±4% 440V

2) Capacitive

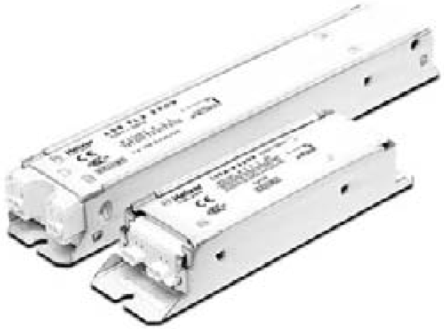
3) Not available for European Union market

***Note:** Lamps excluded from the CELMA EEI directive do not have an EEI classification.*

Magnetic ballasts for fluorescent T8 lamps 15-58W 220V 50Hz

- Meets EN 61347-2-8 & EN60921 requirements
- Low harmonics
- Low power losses
- Correctly trimmed lamp current guaranteed for entire lifetime
- 100% quality controlled
- Double wire terminals without screws
- Small size
- Long lifetime

tw 130



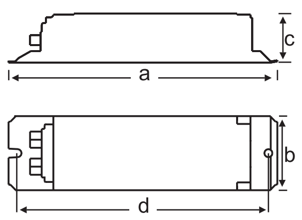
Lamp				Ballast								Compensat.	
Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
T8 (G13)	15	1	0.31	L 15A-P	B2	5	1	1,2	0.55	0.35	50/85	4.0	0.16
		2	0.31	L 30A-P	B2	5	1	3	0.56	0.50	45/110	4.5	0.21
	18	1	0.37	L 18 TL2	B1	1	2	1,2	0.83	0.30	35/50	4.5	0.16
				L 20 A-P 1)	C	5	1	1,2	0.56	0.35	55/85	4.5	0.16
				L 18 A-L 1)	C	5	1	1,2	0.51	0.35	65/90	4.5	0.16
		2	0.37	L 36 TL2	B1	1	2	3	0.83	0.49	35/90	4.5	0.24
				L 40 A-C 1)	C	5	1	3	0.52	0.53	55/150	4.5	0.24
				L 40 A-P 1)	C	5	1	3	0.56	0.53	55/155	4.5	0.24
				L 40 A-L 1)	C	5	1	3	0.51	0.55	65/160	4.5	0.24
	25	1	0.29	L 15 A-P	B2	5	1	1,2	0.55	0.50	50/85	3.5	0.15
	30	1	0.365	L 30 A-P	B2	5	1	1,2	0.56	0.50	45/110	4.5	0.21
	36	1	0.43	L 36 TL2	B1	1	2	1,2	0.83	0.43	35/90	4.5	0.24
				L 40 A-C 1)	C	5	1	1,2	0,52	0.50	55/150	4.5	0.24
				L 40 A-P 1)	C	5	1	1,2	0.56	0.50	55/155	4.5	0.24
				L 40 A-L 1)	D	5	1	1,2	0.51	0.50	65/160	4.5	0.24
	38	1	0.43	L 36 TL2	B1	1	2	1,2	0.83	0.45	35/90	4.5	0.24
				L 40 A-P 1)	C	5	1	1,2	0.56	0.49	55/155	4.5	0.24
				L 40 A-L 1)	D	5	1	1,2	0.51	0.49	65/160	4.5	0.24
	58	1	0.67	L 58 TL2	B2	1	3	1,2	1.36	0.47	35/95	7.0	0.35

1) Not available for European Union market

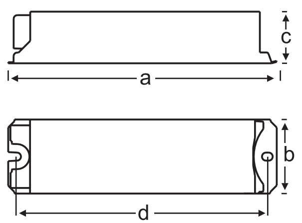
Dimensions

NO.	1	2	3
DRAWING	A	B	B
LENGTH 'a' (mm)	150	150	230
WIDTH 'b' (mm)	42	42	42
HEIGHT 'c' (mm)	28	28.8	28.8
'd' (mm)	140	140	220

A

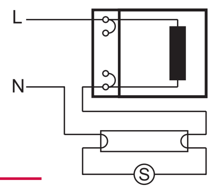


B



Connection diagrams

1.



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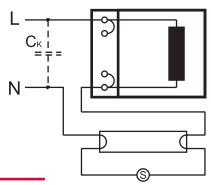

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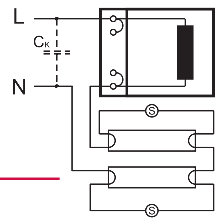


Magnetic ballasts for Compact Fluorescent Lamps 4-13W 230V 50Hz

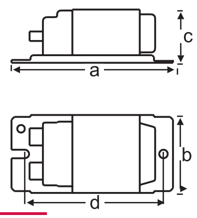
- Meets EN 61347-2-8 & EN 60921requirements
- Low power losses
- 100% quality controlled
- Double wire terminals without screws
- Low harmonics
- Very low magnetic field
- Small size
- Long lifetime

tw 130

Dimensions

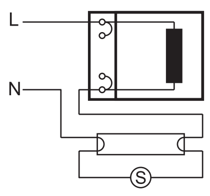
NO.	1
DRAWING	A
LENGTH 'a' (mm)	85
WIDTH 'b' (mm)	41,5
HEIGHT 'c' (mm)	28
'd' (mm)	73

A



Connection diagrams

1.



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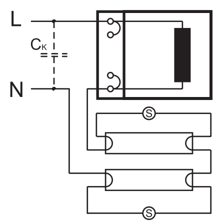

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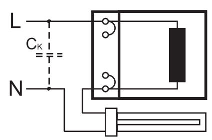
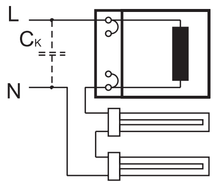


4.



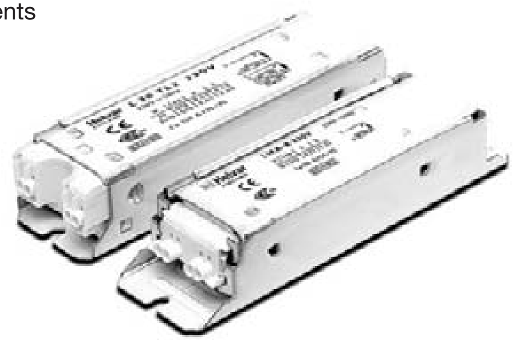
Lamp				Ballast								Compensat.	
Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
T5 (G5)	4	1	0.17	L8 DL	B2	7	1	1	0.32	0.25	55/95	2.0	0.06
				L8 D	B2	7	1	1	0.32	0.25	65/90	2.0	0.06
		2	0.17	L8 DL	B2	7	1	2	0.32	0.35	55/95	2.0	0.06
				L8 D	B2	7	1	2	0.32	0.35	65/90	2.0	0.06
	6	1	0.16	L8 DL	B2	7	1	1	0.32	0.30	55/95	2.0	0.06
				L8 D	B2	7	1	1	0.32	0.30	65/90	2.0	0.06
		2	0.16	L13 DL	B1	7	1	2	0.32	0.45	50/95	2.0	0.08
				L13 D	B1	7	1	2	0.32	0.45	65/120	2.0	0.08
	8	1	0.145	L8 DL	B2	7	1	1	0.32	0.35	55/95	2.0	0.06
				L8 D	B2	7	1	1	0.32	0.33	65/90	2.0	0.06
				L11 D	B2	7	1	1	0.32	0.33	60/85	2.0	0.06
		2	0.145	L13 DL	B1	7	1	2	0.32	0.50	50/95	2.0	0.10
				L16 DL	B1	7	1	2	0.32	0.43	60/150	2.0	0.11
				L16 D	B2	7	1	2	0.32	0.50	65/150	2.0	0.11
	13	1	0.165	L13 DL	B1	7	1	1	0.32	0.45	50/95	2.0	0.10
				L13 D	B1	7	1	1	0.32	0.45	65/120	2.0	0.10
TC-S (G23)	5	1	0.18	L11 DL	B2	7	1	3	0.32	0.28	60/95	2.0	0.07
				L11 D	B2	7	1	3	0.32	0.25	60/85	2.0	0.07
		2	0.18	L13 DL	B1	7	1	4	0.32	0.35	50/95	2.0	0.08
				L13 D	B1	7	1	4	0.32	0.40	65/120	2.0	0.08
	7	1	0.18	L11 DL	B1	7	1	3	0.32	0.30	60/95	2.0	0.07
				L11 D	B2	7	1	3	0.32	0.28	60/85	2.0	0.07
		2	0.18	L 13 DL	B1	7	1	4	0.32	0.45	50/95	2.0	0.09
				L 13 D	B1	7	1	4	0.32	0.45	65/120	2.0	0.09
	9	1	0.17	L11 DL	B1	7	1	3	0.32	0.32	60/95	2.0	0.07
				L11 D	B2	7	1	3	0.32	0.33	60/85	2.0	0.07
		2	0.17	L13 DL	B1	7	1	4	0.32	0.55	50/95	2.0	0.10
				L13 D	B1	7	1	4	0.32	0.55	65/120	2.0	0.10
	11	1	0.155	L11 DL	B1	7	1	3	0.32	0.43	60/95	2.0	0.08
				L11 D	B2	7	1	3	0.32	0.43	60/85	2.0	0.08

Note: *Lamps excluded from the CELMA EEI directive do not have an EEI classification.*

Due to our continuing program of product development data subject to change without notice.

Magnetic ballasts for Compact Fluorescent Lamps 18-24W 230V 50Hz

- Meets EN 61347-2-8 & EN 60921requirements
- Low power losses
- 100% quality controlled
- Double wire terminals without screws
- Low harmonics
- Very low magnetic field
- Small size
- Long lifetime

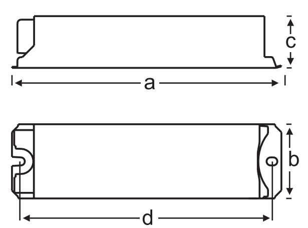


ENEC CE tw 130

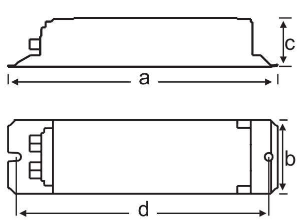
Dimensions

NO.	1	2	3	4
DRAWING	A	B	B	B
LENGTH 'a' (mm)	150	150	110	115
WIDTH 'b' (mm)	42	42	42	42
HEIGHT 'c' (mm)	28	28.8	28.8	28.8
'd' (mm)	140	140	100	105

A

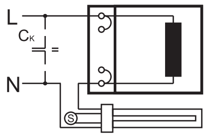


B

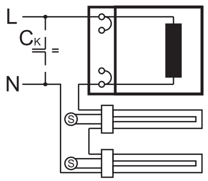


Connection diagrams

1.



2.

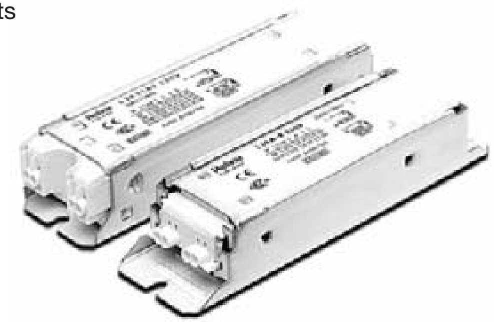


Lamp: Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast: Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Compensat.: Parallel Ck 230/250V ±10% (µF)	Mains current (A)
TC-L (2G11)	18	1	0.37	**L18 TL2**	B1	1	2	1	0.83	0.30	35/60	4.5	0.15
				L18 TL3	B1	1	2	1	0.78	0.30	40/70	4.5	0.15
				L18 TL4	B2	1	2	1	0.65	0.30	45/80	4.5	0.15
				L18 TLB2	B2	1	2	1	0.57	0.32	50/95	4.5	0.15
				L18 A-K	B2	5	1	1	0.61	0.32	55/95	4.5	0.15
				L20 A-P [1)]	C	5	1	1	0.56	0.32	55/95	4.5	0.15
				L18 A-L [1)]	C	5	1	1	0.51	0.35	65/90	4.5	0.15
		2	0.37	**L36 TL2**	B1	1	2	2	0.83	0.45	35/90	4.5	0.23
				L36 TL3	B1	1	2	2	0.78	0.45	40/90	4.5	0.23
				L36 TL4	B2	1	2	2	0.65	0.45	45/110	4.5	0.23
				L36 TLB2	B2	1	2	2	0.57	0.48	50/140	4.5	0.23
				L36 A-K	B2	5	1	2	0.61	0.50	50/145	4.5	0.23
				L36 A-T	B2	5	1	2	0.57	0.50	50/155	4.5	0.23
				L36 TB2-100	B2	2	3	2	0.53	0.48	55/155	4.5	0.23
				L36 A-S	B2	5	1	2	0.67	0.50	45/125	4.5	0.23
				L40 A-P [1)]	C	5	1	2	0.56	0.55	55/155	4.5	0.23
				L40 A-L [1)]	D	5	1	2	0.51	0.55	65/160	4.5	0.23
	24	1	0.345	**L18 TL2**	B1	1	2	1	0.83	0.38	35/60	4.0	0.16
				L18 TL3	B1	1	2	1	0.76	0.38	40/70	4.0	0.16
				L18 TL4	B1	1	2	1	0.65	0.41	45/80	4.0	0.16
				L18 TLB2	B2	1	2	1	0.57	0.41	50/95	4.0	0.16
				L18 A-K	B2	5	1	1	0.61	0.40	55/95	4.0	0.16
				L20 A-P	B2	5	1	1	0.56	0.42	50/95	4.0	0.16
				L26 TS5-100mm	B2	2	3	1	0.50	0.40	55/100	4.0	0.16
				L26 TS5-105mm	B2	2	4	1	0.50	0.40	55/100	4.0	0.16
				L18 A-L [1)]	C	2	5	1	0.51	0.42	65/90	4.0	0.16

1) Not available for European Union market

Magnetic ballasts for Compact Fluorescent Lamps 16-38W 230V 50Hz

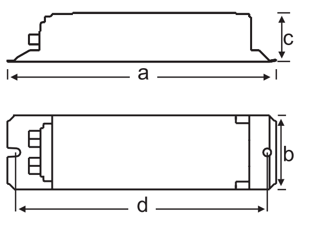
- Meets EN 61347-2-8 & EN 60921requirements
- Low power losses
- 100% quality controlled
- Double wire terminals without screws
- Low harmonics
- Very low magnetic field
- Small size
- Long lifetime

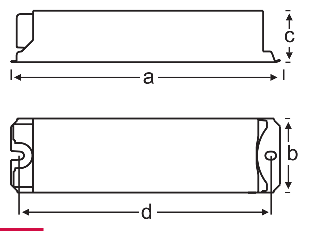


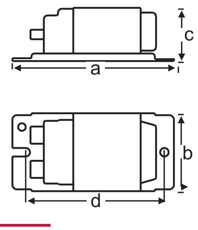
tw 130

Dimensions

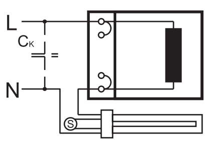
NO.	1	2	3	4
DRAWING	A	B	B	C
LENGTH 'a' (mm)	150	150	110	85
WIDTH 'b' (mm)	42	42	42	41,5
HEIGHT 'c' (mm)	28	28.8	28.8	28
'd' (mm)	140	140	100	73

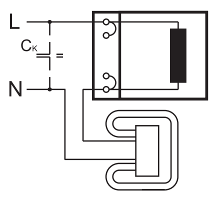
A


B


C


Connection diagrams

1.


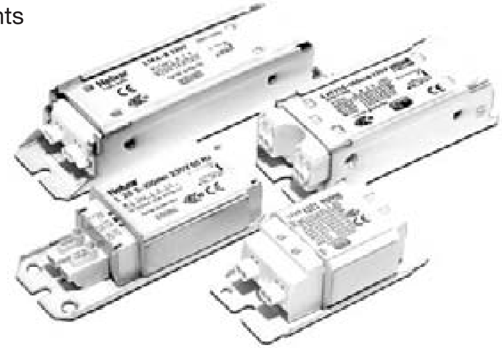
2.


Lamp: Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast: Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Compensat.: Parallel Ck 230/250V ±10% (μF)	Mains current (A)
TC-L (2G11)	36	1	0.43	L36 TL2	B1	1	2	1	0.83	0.43	35/90	4.5	0.23
				L36 TL3	B1	1	2	1	0.78	0.43	40/90	4.5	0.23
				L36 TL4	B2	1	2	1	0.65	0.43	45/110	4.5	0.23
				L36 TLB2	B2	1	2	1	0.57	0.45	50/140	4.5	0.23
				L36 A-K	B2	5	1	1	0.61	0.45	50/145	4.5	0.23
				L36 A-T	B2	5	1	1	0.57	0.45	50/155	4.5	0.23
				L36 TB2-100	B2	2	3	1	0.53	0.45	55/155	4.5	0.23
				L40 A-P [1]	C	5	1	1	0.56	0.50	55/155	4.5	0.23
				L40 A-L [1]	D	5	1	1	0.51	0.50	65/160	4.5	0.23
TC-DD (GR 8)[2]	16	1	0.20	L16 DL	B1	7	4	2	0.32	0.43	60/150	2.0	0.11
				L16 D	B2	7	4	2	0.32	0.46	65/150	2.0	0.11
	21	1	0.26	L21 TL2-100mm	B1	2	3	2	0.50	0.40	40/70	3.0	0.14
	28	1	0.325	L18 TL2	B1	1	2	2	0.83	0.48	35/60	3.5	0.20
				L18 TL3	B1	1	2	2	0.78	0.48	40/70	3.5	0.20
				L18 TL4	B2	1	2	2	0.65	0.44	45/80	3.5	0.20
				L18 TLB2	B2	1	2	2	0.57	0.48	50/95	3.5	0.20
				L20 A-P [1]	C	5	1	2	0.56	0.50	55/95	3.5	0.20
				L18 A-L	C	5	1	2	0.51	0.50	65/90	3.5	0.20
	38	1	0.43	L 36 TL2	B1	1	2	2	0.83	0.45	35/90	4.5	0.24
				L 36 TL3	B1	1	2	2	0.78	0.45	40/90	4.5	0.24
				L 36 TL4	B2	1	2	2	0.65	0.45	45/110	4.5	0.24
				L36 TLB2	B2	1	2	2	0.57	0.45	50/140	4.5	0.24
				L36 A-K	B2	5	1	2	0.61	0.48	50/145	4.5	0.24
				L36 A-T	B2	5	1	2	0.57	0.45	50/155	4.5	0.24
				L36 TB2-100	B2	2	3	2	0.53	0.45	55/155	4.5	0.24
				L40 A-P [1]	C	5	1	2	0.56	0.48	55/155	4.5	0.24
				L40 A-L [1]	D	5	1	2	0.51	0.48	65/160	4.5	0.24

1) Not available for European Union market
2) Also GR 10q; external starter required

Magnetic ballasts for Compact Fluorescent Lamps 10-32W 230V 50Hz

- Meets EN 61347-2-8 & EN 60921requirements
- Low power losses
- 100% quality controlled
- Double wire terminals without screws
- Low harmonics
- Very low magnetic field
- Small size
- Long lifetime



tw 130

Lamp				Ballast								Compensat.	
Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
T-R 1)	22	1	0.40	L30 TL2	B1	1	2	1	0.82	0.30	40/70	5.0	0.17
				L30 A 2)	C	5	1	1	0.61	0.35	60/110	5.0	0.17
	32	1	0.45	L32 TB2	B2	1	2	1	0.62	0.40	55/120	5.0	0.21
TC-D	10	1	0.19	L13 DL	B2	7	5	2	0.32	0.35	50/95	2.0	0.08
				L13 D	B2	7	5	2	0.32	0.35	65/120	2.0	0.08
	13	1	0.175	L13 DL	B1	7	5	2	0.32	0.45	50/95	2.0	0.08
				L13 D	B1	7	5	2	0.32	0.45	65/120	2.0	0.08
	18	1	0.22	L18 TLD-100mm	B1	2	3	2	0.50	0.45	30/60	2.0	0.12
				L18 DL	B1	7	5	2	0.32	0.45	60/150	2.0	0.12
				L18 D	B1	7	5	2	0.32	0.50	65/155	2.0	0.13
	26	1	0.325	L18 TL2	B1	1	2	2	0.83	0.43	35/60	3.5	0.18
				L18 TL3	B1	1	2	2	0.78	0.43	40/70	3.5	0.18
				L18 TL4	B2	1	2	2	0.65	0.45	45/80	3.5	0.18
				L18 TLB2	B2	1	2	2	0.57	0.45	50/95	3.5	0.18
				L20 A-P	B2	5	1	2	0.56	0.45	50/95	3.5	0.18
				L18 A-K	B2	5	1	2	0.61	0.45	55/95	3.5	0.18
				L26 TS5-100mm	B2	2	3	2	0.50	0.45	50/100	3.5	0.18
				L26 TS5-105mm	B2	2	4	2	0.50	0.45	50/100	3.5	0.18
				L26 S-100mm	B2	8	6	2	0.44	0.47	60/140	3.5	0.18
				L18 A-L 2)	C	1	1	2	0.51	0.45	75/90	3.5	0.18

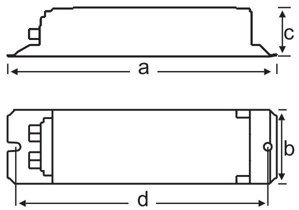
1) Cap G10q

2) Not available for European Union market

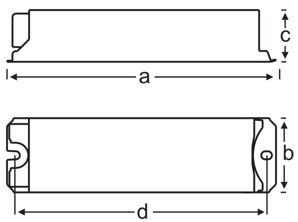
Dimensions

NO.	1	2	3	4	5	6
DRAWING	A	B	B	B	C	D
LENGTH 'a' (mm)	150	150	110	115	85	110
WIDTH 'b' (mm)	42	42	42	42	41,5	42
HEIGHT 'c' (mm)	28	28.8	28.8	28.8	28	26
'd' (mm)	140	140	100	105	73	100

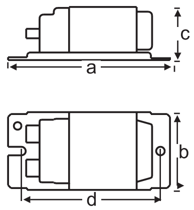
A



B



C



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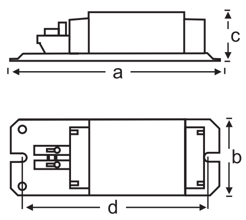
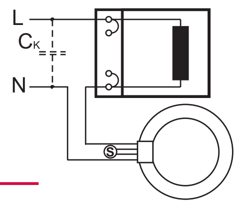
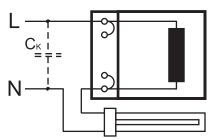


Connection diagrams

1.

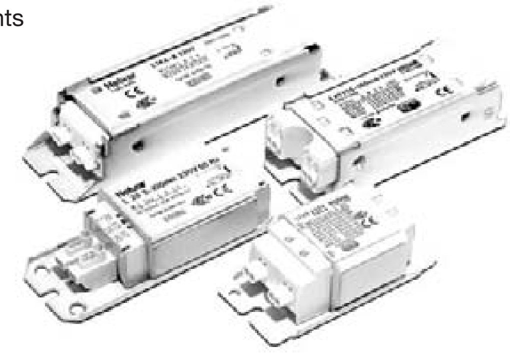


2.



Magnetic ballasts for Compact Fluorescent Lamps 4-26W 240V 50Hz

- Meets EN 61347-2-8 & EN 60921requirements
- Low power losses
- 100% quality controlled
- Double wire terminals without screws
- Low harmonics
- Very low magnetic field
- Small size
- Long lifetime

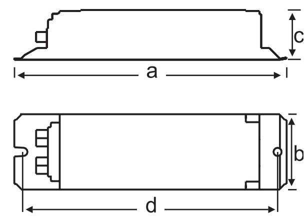


ENEC CE tw 130

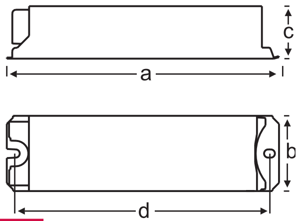
Dimensions

NO.	1	2	3	4	5	6
DRAWING	A	B	B	B	C	D
LENGTH 'a' (mm)	150	150	110	115	85	110
WIDTH 'b' (mm)	42	42	42	42	41,5	42
HEIGHT 'c' (mm)	28	28.8	28.8	28.8	28	26
'd' (mm)	140	140	100	105	73	100

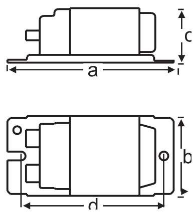
A



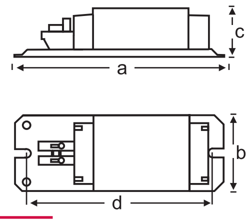
B



C

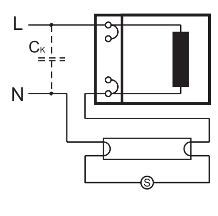


D

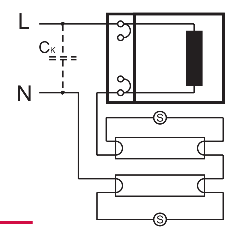


Connection diagrams

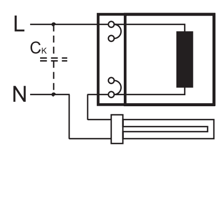
1.



2.



3.



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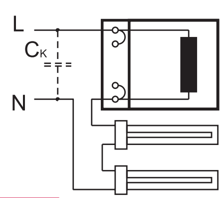

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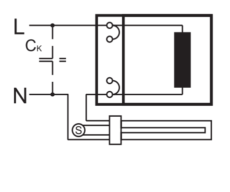
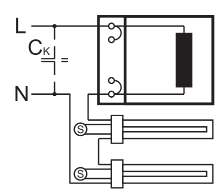


6.



Lamp				Ballast								Compensat.	
Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
T5 (G5)	**4**	1	0.17	**L 8 D**	B2	7	5	1	0.32	0.25	60/90	2.0	0.05
		2	0.17	**L 8 D**	B2	7	5	2	0.32	0.35	60/90	2.0	0.06
	6	1	0.16	**L 8 D**	B2	7	5	1	0.32	0.30	60/90	2.0	0.05
		2	0.16	**L 13 D**	B2	7	5	2	0.32	0.45	65/110	2.0	0.08
	8	1	0.145	**L 8 D**	B2	7	5	1	0.32	0.33	60/90	2.0	0.06
				L 11 D	B2	7	5	1	0.32	0.33	65/90	2.0	0.06
		2	0.145	**L 16 D**	B2	7	5	2	0.32	0.45	65/90	2.0	0.10
	13	1	0.165	**L 13 D**	B2	7	5	1	0.32	0.45	65/110	2.0	0.08
TC-S (G23)	**5**	1	0.18	**L 11 D**	B2	7	5	3	0.32	0.25	65/90	2.0	0.06
		2	0.18	**L 13 D**	B2	7	5	4	0.32	0.40	65/110	2.0	0.08
	7	1	0.18	**L 11 D**	B2	7	5	3	0.32	0.30	65/90	2.0	0.07
		2	0.18	**L 13 D**	B2	7	5	4	0.32	0.45	65/110	2.0	0.09
	9	1	0.17	**L 11 D**	B2	7	5	3	0.32	0.33	65/90	2.0	0.07
		2	0.17	**L 13 D**	B2	7	5	4	0.32	0.55	65/110	2.0	0.10
	11	1	0.155	**L 11 D**	B2	7	5	3	0.32	0.43	65/90	2.0	0.08
TC-D (G24d)	**10**	1	0.19	**L 13 D**	B2	7	5	3	0.32	0.35	65/110	2.0	0.08
	13	1	0.175	**L 13 D**	B2	7	5	3	0.32	0.45	65/110	2.0	0.08
	18	1	0.22	**L 18 D**	B1	7	5	3	0.32	0.45	65/155	2.0	0.12
	26	1	0.325	**L 18 TL2**	B1	1	2	3	0.83	0.43	40/65	3.5	0.17
				L 18 TL4	B2	1	2	3	0.65	0.42	45/80	3.5	0.17
				L 26 TS5-100	B2	2	3	3	0.50	0.43	50/110	3.5	0.17
				L 26 TS5-105	B2	2	4	3	0.50	0.43	50/110	3.5	0.17
				L 26 S-100	B2	8	6	3	0.44	0.45	60/150	3.5	0.17
				L 20 A-P 1)	C	5	1	3	0.56	0.45	60/90	3.0	0.17
TC-L (2 G11)	**18**	1	0.37	**L 18 TL2**	B1	1	2	5	0.83	0.30	40/65	4.0	0.15
				L 18 TL4	B2	1	2	5	0.65	0.29	45/80	4.0	0.15
				L 18 A-K	B2	5	1	5	0.61	0.32	55 /90	4.0	0.15
				L 20 A-P 1)	C	5	1	5	0.56	0.35	60/90	4.0	0.15
		2	0.37	**L 36 TL2**	B1	1	2	6	0.83	0.44	35/95	4.0	0.21
				L 36 TL4	B2	1	2	6	0.65	0.44	45/115	4.0	0.21
				L 36 A-K	B2	5	1	6	0.61	0.50	55/155	4.0	0.21
				L 40 A-P 1)	C	5	1	6	0.56	0.53	70/160	4.0	0.21

1) Not available for European Union market

***Note:** Lamps exlcuded from the CELMA EEI directive do not have an EEI classification.*

Due to our continuing program of product development data subject to change without notice.

Magnetic ballasts for Compact Fluorescent Lamps 16-36W 240V 50Hz

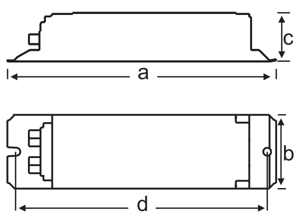
- Meets EN 61347-2-8 & EN 60921requirements
- Low power losses
- 100% quality controlled
- Double wire terminals without screws
- Low harmonics
- Very low magnetic field
- Small size
- Long lifetime

tw 130

Dimensions

NO.	1	2	3	4	5
DRAWING	A	B	B	B	C
LENGTH 'a' (mm)	150	150	110	115	85
WIDTH 'b' (mm)	42	42	42	42	41,5
HEIGHT 'c' (mm)	28	28.8	28.8	28.8	28
'd' (mm)	140	140	100	105	73

A



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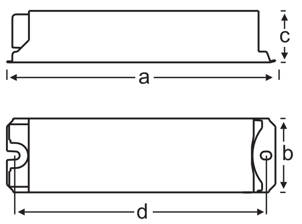
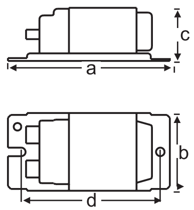
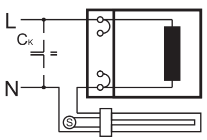


C



Connection diagrams

1.



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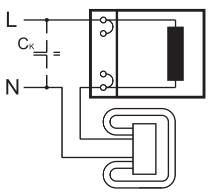

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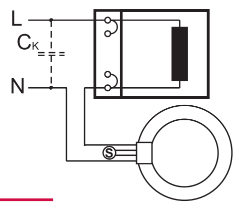


Lamp				Ballast								Compensat.	
Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (μF)	Mains current (A)
TC-L (2 G11)	24	1	0.345	**L 18 TL2**	B1	1	2	1	0.83	0.48	40/65	3.5	0.15
				L 18 TL4	B2	1	2	1	0.65	0.47	45/80	3.5	0.15
				L 26 TS5-100	B2	2	3	1	0.50	0.38	55/110	3.5	0.15
				L 26 TS5-105	B2	2	4	1	0.50	0.38	55/110	3.5	0.15
				L 20 A-P [3]	C	5	1	1	0.56	0.42	60/90	3.5	0.15
	36	1	0.43	**L 36 TL2**	B1	1	2	1	0.83	0.42	35/95	4.0	0.22
				L 36 TL4	B2	1	2	1	0.65	0.42	45/115	4.0	0.22
				L 36 A-K	B2	5	1	1	0.61	0.45	55/155	4.0	0.22
				L 40 A-P [3]	C	5	1	1	0.56	0.50	70/160	4.0	0.22
TC-DD[1]	16	1	0.195	**L 16 D**	B2	7	5	2	0.32	0.45	65/160	2.0	0.11
	28	1	0.32	**L 18 TL2**	B1	1	2	2	0.83	0.48	40/65	3.5	0.17
				L 18 TL4	B2	1	2	2	0.65	0.47	45/80	3.5	0.17
				L 20 A-P [3]	C	5	1	2	0.56	0.50	60/90	3.0	0.18
T-R[2]	22	1	0.40	**L 30 A**	B2	5	1	3	0.61	0.35	60/125	4.5	0.19

1) Cap GR8 (also GR 10q); external starter required
2) Cap G10q
3) Not available for European Union market

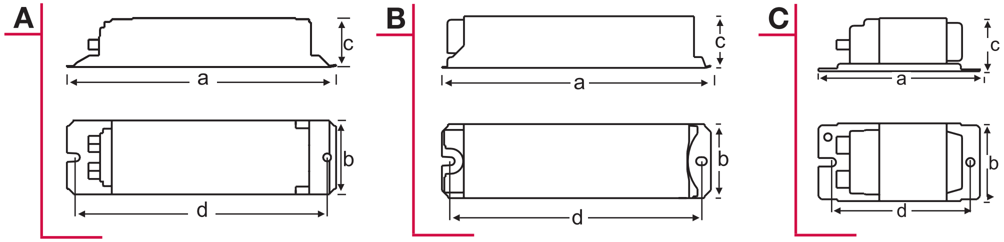
Magnetic ballasts for Compact Fluorescent Lamps 5-36W 220V 50Hz

- Meets EN 61347-2-8 & EN 60921requirements
- Low power losses
- 100% quality controlled
- Double wire terminals without screws
- Low harmonics
- Very low magnetic field
- Small size
- Long lifetime

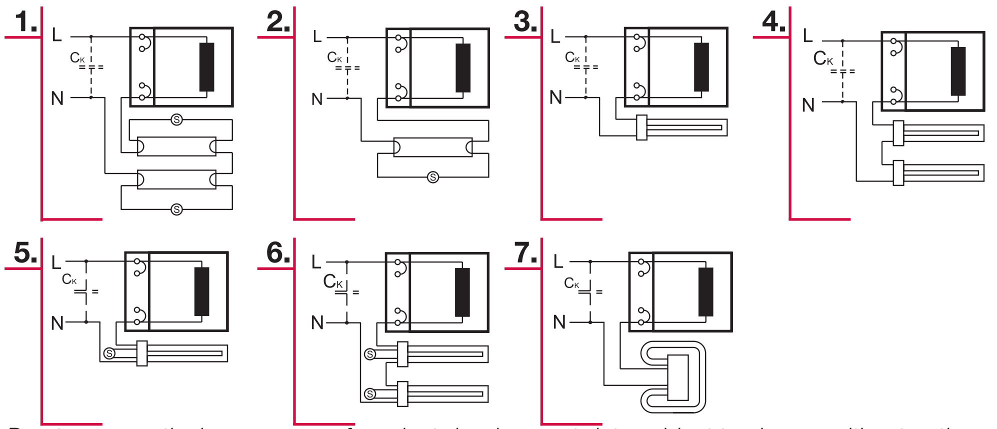
ENEC CE tw 130

Dimensions

NO.	1	2	3
DRAWING	A	B	C
LENGTH 'a' (mm)	150	150	85
WIDTH 'b' (mm)	42	42	41,5
HEIGHT 'c' (mm)	28	28.8	28
'd' (mm)	140	140	73



Connection diagrams



Lamp type	Lamp wattage (W)	No. of lamps	Lamp current (A)	Ballast type	EEI	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
	Lamp			Ballast								Compensat.	
T5 (G5)	6	2	0.16	L 13 D	B2	7	3	1	0.32	0.45	65/110	2.0	0.07
	8	1	0.145	L 11 D	B2	7	3	2	0.32	0.35	60/85	2.0	0.06
		2		L 16 D	B2	7	3	1	0.32	0.52	65/150	2.0	0.11
	13	1	0.165	L 13 D	B2	7	3	2	0.32	0.45	65/110	2.0	0.09
TC-S (G23)	5	1	0.18	L 11 D	B2	7	3	3	0.32	0.25	60/85	2.0	0.07
		2		L 13 D	-	7	3	4	0.32	0.40	65/110	2.0	0.09
	7	1	0.18	L 11 D	B2	7	3	3	0.32	0.30	60/85	2.0	0.07
		2		L 13 D	-	7	3	4	0.32	0.45	65/110	2.0	0.10
	9	1	0.17	L 11 D	B2	7	3	3	0.32	0.35	60/85	2.0	0.07
		2	0.14	L 13 D	-	7	3	4	0.32	0.55	65/110	2.0	0.10
	11	1	0.155	L 11 D	B2	7	3	3	0.32	0.45	60/85	2.0	0.08
TC-D (G24d)	10	1	0.19	L 13 D	B2	7	3	3	0.32	0.35	65/110	2.0	0.08
	13	1	0.175	L 13 D	B2	7	3	3	0.32	0.45	65/110	2.0	0.09
	18	1	0.22	L 18 D	B1	7	3	3	0.32	0.50	65/155	2.0	0.13
	26	1	0.31	L 18 TL2	B1	1	2	3	0.76	0.43	35/50	3.5	0.18
				L 20 A-P	B2	5	1	3	0.56	0.46	55/85	3.5	0.18
				L 18 A-L	B2	5	1	3	0.52	0.46	65/90	3.5	0.18
TC-L (2G11)	18	1	0.375	L 18 TL2	B1	1	2	5	0.76	0.30	35/50	4.5	0.14
			0.37	L 20 A-P [2]	C	5	1	5	0.56	0.35	55/85	4.5	0.14
			0.37	L 18 A-L [2]	C	5	1	5	0.52	0.35	65/90	4.5	0.14
		2	0.37	L 36 TL2	B1	1	2	6	0.76	0.49	35/90	4.5	0.24
				L 40 A-P [2]	-	5	1	6	0.56	0.53	55/155	4.5	0.24
				L 40 A-L [2]	-	5	1	6	0.52	0.55	65/160	4.5	0.24
	24	1	0.34	L 18 TL2	B1	1	2	5	0.76	0.38	35/50	4.0	0.18
				L 20 A-P	B2	5	1	5	0.56	0.43	55/85	4.0	0.18
				L 18 A-L	B2	5	1	5	0.52	0.43	65/90	4.0	0.18
	36	1	0.435	L 36 TL2	B1	1	2	5	0.76	0.43	35/90	4.5	0.23
			0.43	L 40 A-P [2]	C	5	1	5	0.56	0.50	55/155	4.5	0.23
			0.43	L 40 A-L [2]	-	5	1	5	0.52	0.50	65/160	4.5	0.23
TC-DD [1]	16	1	0.20	L 16 D	B2	7	3	7	0.32	0.48	65/150	2.0	0.11
	28	1	0.325	L 18 TL2	B1	1	2	7	0.76	0.48	35/50	3.5	0.19
				L 20 A-P [2]	-	5	1	7	0.56	0.50	55/85	3.5	0.19
				L 18 A-L [2]	-	5	1	7	0.52	0.50	65/90	3.5	0.19

1) Gap GR8, also GR 10q; external starter required

2) Not available for European Union market

***Note:** Lamps exlcuded from the CELMA EEI directive do not have an EEI classification.*

Due to our continuing program of product development data subject to change without notice.

Magnetic Ballasts For High Pressure Mercury Lamps 50-125W 230, 240, 230/240V 50Hz

- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime

tw 130

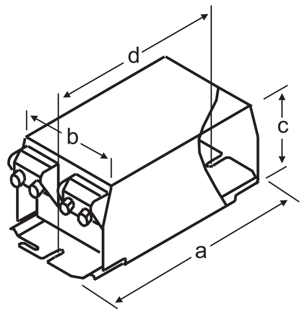
Lamp			Ballasts									Compensat.	
Lamp type	Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W)[1]	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
HM	**50**	0.62	**E 50 LU**	**230**	11.0	12	1	1	1.22	0.42	60	7.0	0.30
HM	**50**	0.62	**E 50 LU**	**240**	11.3	12	1	1	1.22	0.40	70	7.0	0.30
HM	**80**	0.80	**E 80 LU**	**230**	12.0	12	1	1	1.22	0.50	65	8.0	0.45
HM	**80**	0.80	**E 80 LU**	**240**	12.4	12	1	1	1.22	0.50	65	8.0	0.45
HM	**125**	1.15	**E 125 LU**	**230**	13.7	12	1	1	1.22	0.55	70	10.0	0.70
HM	**125**	1.15	**E 125 LU**	**240**	13.5	12	1	1	1.22	0.55	70	10.0	0.70
HM	**125**	1.15	**E 125 LU**	**230** **240**	12.9 13.5	12	1	2	1.22	0.55	70	10.0	0.70

1) Winding at 25°C

Dimensions

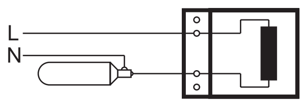
NO.	1
DRAWING	**A**
LENGTH 'a' (mm)	114
WIDTH 'b' (mm)	54
HEIGHT 'c' (mm)	45.5
'd' (mm)	95

A



Connection diagrams

1.



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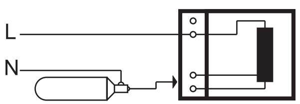
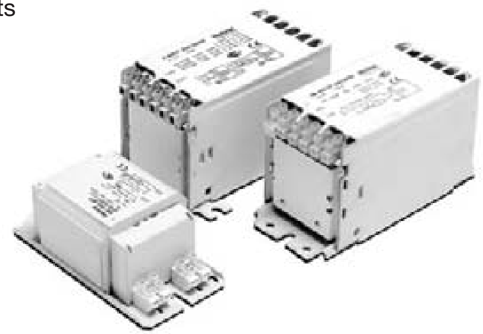


Magnetic Ballasts For High Pressure Mercury Lamps 250-400W 230, 240, 230/240V 50Hz

- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime
- Multiple fixing point variations



ENEC CE tw 130

Lamp			Ballasts										Compensat.	
Lamp type	Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W)1)	Delivery details p.53	Dimensions No.	Connection No.	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
HM	250	2.13	E 250 SE 3)	230	19.0	16	5	1	1.86	0.55	75	18.0	1.40
	250	2.13	E 250 SE 3)	240	20.0	16	5	1	1.86	0.55	75	18.0	1.40
	250	2.13	E 250 SEP 4)	230 240	19.0 20.0	16	5	2	1.86	0.55	75	18.0	1.40
	250	2.13	E 250 T,F 2) 4)	230	22.0	14,15	1,3	3	2.10	0.55	65	18.0	1.40
	250	2.13	E 250 T,F 2) 4)	240	23.0	14,15	1,3	4	2.10	0.55	70	18.0	1.40
	250	2.13	E 250 T,F 2) 4)	230 240	22.0 23.0	14,15	1,3	5	2.10	0.55	65 70	18.0	1.40
	400	3.25	E 400 SE 4)	230	28.0	16	6	1	3.00	0.57	75	25.0	2.15
	400	3.25	E 400 SE 4)	240	29.0	16	6	1	3.00	0.56	75	25.0	2.15
	400	3.25	E 400 SEP 4)	230 240	28.0 29.0	16	6	2	3.00	0.57 0.56	75	25.0	2.15
	400	3.25	E 400 T,F 2) 4)	230	25.4	14,15	2,4	3	3.16	0.60	65	25.0	2.15
	400	3.25	E 400 T,F 2) 4)	240	26.6	14,15	2,4	4	3.16	0.60	70	25.0	2.15
	400	3.25	E 400 T,F 2) 4)	230 240	25.4 26.6	14,15	2,4	5	3.16	0.60	65 70	25.0	2.15
	400	3.25	E 400 TP,FP 2) 4)	230 240	25.4 26.6	14,15	2,4	6	3.16	0.60	65 70	25.0	2.15

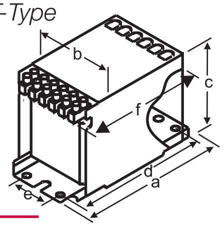
1) Winding at 25°C
2) T-type = two and four point fixing
F-type = four point fixing
3) With push-in terminals
4) With screw terminals

***Note:** P in ballast type name means built-in thermal protector (eg. E400 TP or NK70LUPK)*

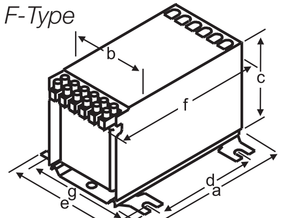
Dimensions

NO.	1	2	3	4	5	6
DRAWING	A	A	B	B	C	C
LENGTH 'a' (mm)	135	135	104	104	145	180
WIDTH 'b' (mm)	70	70	70	70	69	69
HEIGHT 'c' (mm)	85	85	85	85	53	53
'd' (mm)	120	120	90	90	120	155
'e' (mm)	35	35	90	90		
'f' (mm)	85	108	85	108		
'g' (mm)			80	80		

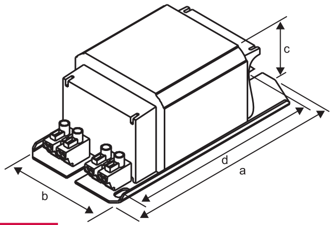
A *T-Type*



B *F-Type*

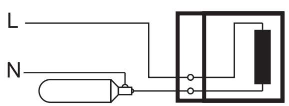


C



Connection diagrams

1.



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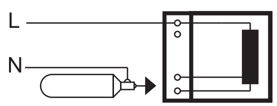

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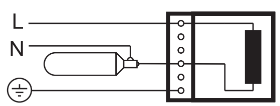

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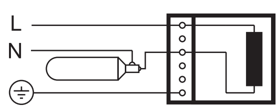

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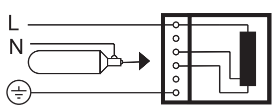

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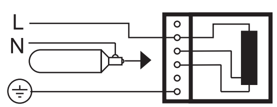


Magnetic Ballasts For High Pressure Mercury Lamps 80/50W 230, 240, 230/240V 50Hz

- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime

tw 130

Lamp		Ballast									Compensat.	
Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W)[1]	Delivery details p.53	Dimensions No	Connection No	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
80/50	0.80/0.62	**E80/50LU**	230	12.8/10.0	12	1	1	1.22	0.50/0.42	65/55	8.0	0.45/0.30
80/50	0.80/0.62	**E80/50LU**	240	13.3/10.5	12	1	1	1.22	0.50/0.42	70/60	8.0	0.45/0.30
80/50	0.80/0.62	**E80/50LU**	230 240	12.0/10.0 12.5/10.4	12	1	2	1.22	0.50/0.42	70/60	8.0	0.45/0.30
80/50	0.80/0.62	**E80/50LUP**	230	12.8/10.0	12	1	3	1.22	0.50/0.42	65/55	8.0	0.45/0.30
80/50	0.80/0.62	**E80/50LUP**	240	13.3/10.5	12	1	3	1.22	0.50/0.42	70/60	8.0	0.45/0.30

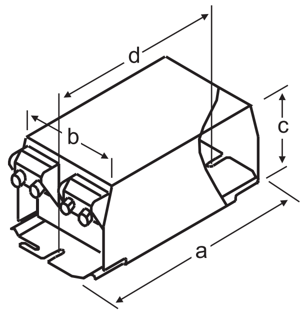
1) Winding at 25°C

Note: *P in ballast type name means built-in thermal protector (eg. E400 TP or NK70LUPK)*

Dimensions

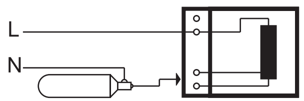
NO.	1
DRAWING	**A**
LENGTH 'a' (mm)	114
WIDTH 'b' (mm)	54
HEIGHT 'c' (mm)	45.5
'd' (mm)	95

A

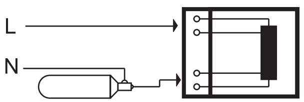


Connection diagrams

1.



2.



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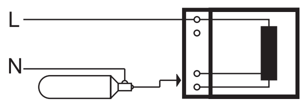


Magnetic Ballasts For High Pressure Mercury Lamps 125/80W 230, 240, 230/240V 50Hz

- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime

tw 130

Lamp		Ballast									Compensat.	
Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W)[1)]	Delivery details p.53	Dimensions No	Connection No	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
125/80	1.15/0.80	**E125/80LU**	230	14.5/11.5	12	1	1	1.22	0.55/0.50	70/60	10.0	0.70/0.45
125/80	1.15/0.80	**E125/80LU**	240	15.0/12.0	12	1	1	1.22	0.55/0.50	70/60	10.0	0.70/0.45
125/80	1.15/0.80	**E125/80LU**	230 240	13.4/11.0 14.0/11.6	12	1	2	1.22	0.55/0.50	70/60	10.0	0.70/0.45
125/80	1.15/0.80	**E125/80LUP**	230	14.5/12.5	12	1	3	1.22	0.55/0.50	70/60	10.0	0.70/0.45
125/80	1.15/0.80	**E125/80LUP**	240	15.0/12.0	12	1	3	1.22	0.55/0.50	70/60	10.0	0.70/0.45

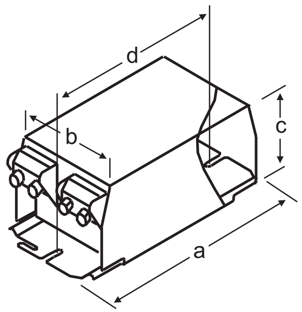
1) Winding at 25°C

Note: *P in ballast type name means built-in thermal protector (eg. E400 TP or NK70LUPK)*

Dimensions

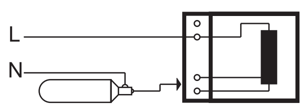
NO.	1
DRAWING	A
LENGTH 'a' (mm)	114
WIDTH 'b' (mm)	54
HEIGHT 'c' (mm)	45.5
'd' (mm)	95

A



Connection diagrams

1.



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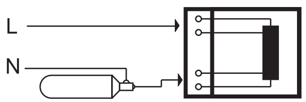

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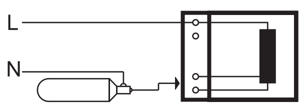


Due to our continuing program of product development data subject to change without notice.

Magnetic Ballasts For High Pressure Sodium Lamps 35-100W 230, 240, 230/240V 50Hz

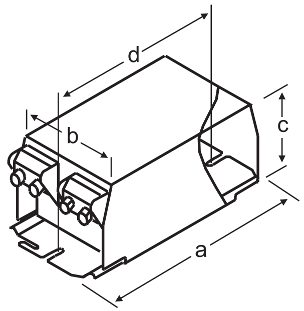
- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime

tw 130

Dimensions

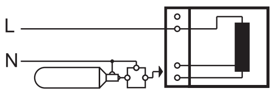
NO.	1
DRAWING	A
LENGTH 'a' (mm)	114
WIDTH 'b' (mm)	54
HEIGHT 'c' (mm)	45.5
'd' (mm)	95

A



Connection diagrams

1.



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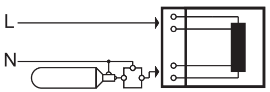

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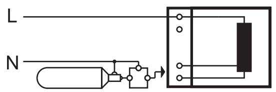


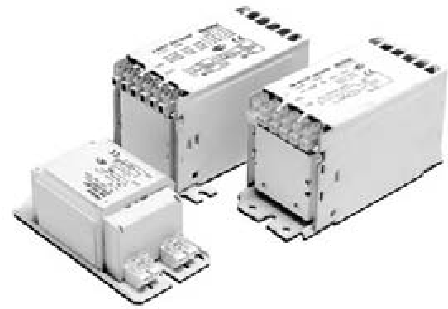
Lamp		Ballast									Compensat.	
Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W)[1]	Delivery details p.53	Dimensions No	Connection No	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
35	0.48	**NK 35 LUS [2]**	230 240	9.0 9.4	13	1	-	1.22	0.38	50	6.0	0.23
50	0.75	**NK 50 LU**	230 240	12.0 12.5	13	1	1	1.22	0.38	70	8.0	0.33
50	0.76	**NK 50 LUS [3]**	230 240	9.8 10.0	13	1	-	1.22	0.40	50	8.0	0.33
50	0.75	**NK 50 LUP**	230 240	12.0 12.5	13	1	3	1.22	0.38	70	8.0	0.33
70	1.0	**NK 70 LU**	230 240	14.8 15.0	13	1	1	1.22	0.39	70	12.0	0.43
70	1.0	**NK 70 LUP**	230 240	14.8 15.0	13	1	3	1.22	0.39	70	12.0	0.43
70	0.98	**NK 70 LUPK**	230 240	13.5 14.0	13	1	3	1.22	0.39	65	12.0	0.43
70/50	1.0/0.75	**NK 70/50 LU**	230 240	14.5/11.0 15.0/11.5	13	1	2	1.22	0.39/0.38	75/60	12.0/8.0	0.43/0.33
70/50	1.0/0.75	**NK 70/50 LUP**	230	14.5/11.0	13	1	3	1.22	0.39/0.38	75/60	12.0/8.0	0.43/0.33
70/50	1.0/0.75	**NK 70/50 LUP**	240	15.0/11.5	13	1	3	1.22	0.39/0.38	75/60	12.0/8.0	0.43/0.33
100	1.2	**NK 100 LU**	230 240	15.6 16.6	13	1	1	1.22	0.44	80	12.0	0.56
100	1.31	**NK 100 LUS [4]**	230 240	16.5 17.0	13	1	-	1.22	0.40	80	16.0	0.60
100	1.2	**NK 100 LUP**	230 240	15.6 16.6	13	1	3	1.22	0.44	80	12.0	0.56

1) Winding at 25°C
2) For Philips SDW-T 35 W lamps (Ignitor CSL 35)
3) For Philips SDW-T 50 W lamps (Ignitor CSL 50)
4) For Philips SDW-T 100 W lamps (Ignitor CSL 100)

Note: *P in ballast type name means built-in thermal protector (eg. E400 TP or NK70LUPK)*

Magnetic Ballasts For High Pressure Sodium Lamps 150-1000W 230, 240, 230/240V 50Hz

- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime
- Multiple fixing point variations

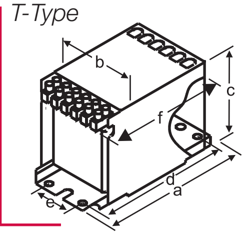


tw 130

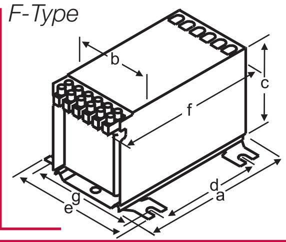
Dimensions

NO.	1	2	3	4	5	6	7
DRAWING	A	A	B	B	C	C	C
LENGTH 'a' (mm)	135	165	104	135	145	160	180
WIDTH 'b' (mm)	70	70	70	70	69	69	69
HEIGHT 'c' (mm)	85	85	85	85	53	53	53
'd' (mm)	120	150	90	100	120	140	155
'e' (mm)	35	35	90	100			
'f' (mm)	108	138	108	138			
'g' (mm)			80	90			

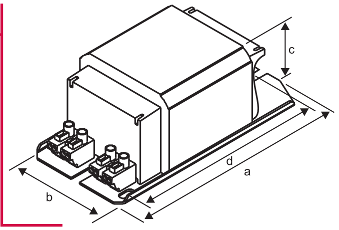
A *T-Type*



B *F-Type*

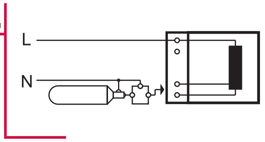


C



Connection diagrams

1.



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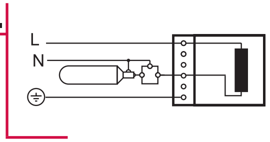

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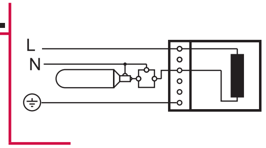

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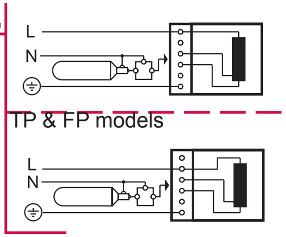
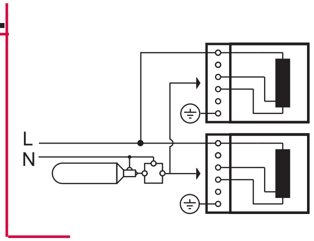


TP & FP models

5.



Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W)[1]	Delivery details p.53	Dimensions No	Connection No	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
		Ballast									**Compensat.**	
150	1.8	**NK 150 SE**	230 240	18.0 19.0	16	5	1	1.85	0.41	75	20	0.9
150	1.8	**NK 150 SEP** [4)]	230 240	18.0 19.0	16	5	1	1.85	0.41	75	20	0.9
150	1.8	**NK 150 SEPK**	230 240	17.5 18.5	16	6	1	2.6	0.40	65	20	0.9
250	3.0	**NK 250 SE**	230	29	16	7	1	3.00	0.40	70	32	1.4
250	3.0	**NK 250 SEP**	230 240	29 30	16	7	1	3.00	0.38	75	32	1.4
250	3.0	**NK 250 T,F** [2)]	230	28	16	1,3	2	3.15	0.42	70	32	1.4
250	3.0	**NK 250 T,F** [2)]	240	29	16	1,3	3	3.15	0.42	75	32	1.4
250	3.0	**NK 250 T,F** [2)]	230 240	28 29	14	1,3	4	3.15	0.42	70 75	32	1.4
250	3.0	**NK 250 TP,FP** [2)]	230 240	28 29	14	1,3	4	3.15	0.42	70 75	32	1.4
400	4.4	**NK 400 T,F** [2)]	230	32	16	2,4	2	4.4	0.40	70	50	2.2
400	4.4	**NK 400 T,F** [2)]	240	33	16	2,4	3	4.4	0.40	75	50	2.2
400	4.4	**NK 400 T,F** [2)]	230 240	32 33	15	2,4	4	4.4	0.40	70 75	50	2.2
400	4.4	**NK 400 TP,FP** [2)]	230 240	32 33	15	2,4	4	4.4	0.40	70 75	50	2.2
600	6.2	**NK 600 T/2** [2)3)]	230 240	60 62	17	3	5	6.3	0.44	75 80	65	3.0
1000	10.3	**NK 1000 F/2** [2)3)]	230 240	75 80	17	4	5	8.8	0.45	80	100	5.3 5.0

1) Winding at 25°C

2) T-type = two and four point fixing F-type = four point fixing

3) Supplied as 2 identical ballasts both with the dimensions indicated.
All other technical values are stated for the combined product operating one lamp.

4) Available also with bottom length 133mm

***Note:** P in ballast type name means built-in thermal protector (eg. E400 TP or NK70LUPK)*

Due to our continuing program of product development data subject to change without notice.

Magnetic Ballasts For Metal Halide Lamps

35-100W 230, 230/240V 50Hz

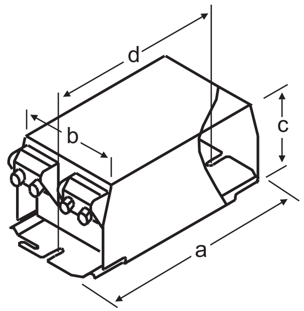
- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime

tw 130

Dimensions

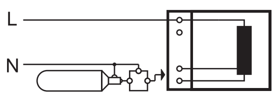
NO.	1
DRAWING	A
LENGTH 'a' (mm)	114
WIDTH 'b' (mm)	54
HEIGHT 'c' (mm)	45.5
'd' (mm)	95

A



Connection diagrams

1.



Lamp			Ballast									Compensat.	
Lamp type	Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W)1)	Delivery details p.53	Dimensions No	Connection No	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Parallel Ck 230/250V ±10% (µF)	Mains current (A)
HI	35	0.53	NK 35 LUP	230 240	9.0 9.4	8	1	1	1.22	0.38	50	6.0	0.23
HI	70	1.0	NK 70 LUP	230 240	14.8 15.0	8	1	1	1.22	0.39	70	12.0	0.43
HI	70	0.98	NK 70 LUPK	230 240	13.5 14.0	8	1	1	1.22	0.39	65	12.0	0.43
HI	100	1.1	NK 100 LUP	230 240	15.6 16.6	8	1	1	1.22	0.44	80	12.0	0.56

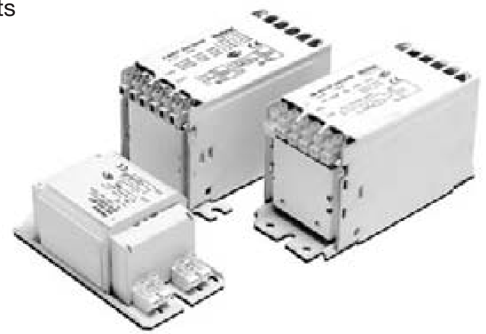
1) Winding at 25°C

***Note:** P in ballast type name means built-in thermal protector (eg. E400 TP or NK70LUPK)*

Magnetic Ballasts For Metal Halide Lamps

150-1000W 230/240V 50Hz

- Meets EN 61347-2-9 & EN 60923 requirements
- Very low magnetic field
- 100% quality controlled
- Low power losses
- Low harmonics
- Low noise
- Long lifetime
- Multiple fixing point variations

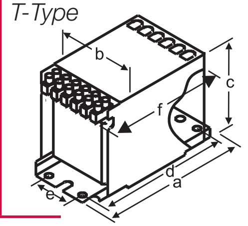


tw 130

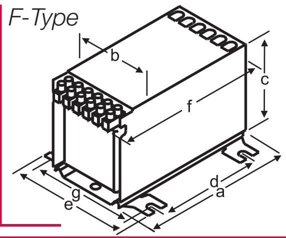
Dimensions

NO.	1	2	3	4	5	6	7
DRAWING	A	A	B	B	C	C	C
LENGTH 'a' (mm)	135	165	104	135	145	160	180
WIDTH 'b' (mm)	70	70	70	70	69	69	69
HEIGHT 'c' (mm)	85	85	85	85	53	53	53
'd' (mm)	120	150	90	100	120	140	155
'e' (mm)	35	35	90	100			
'f' (mm)	108	138	108	138			
'g' (mm)			80	90			

A *T-Type*



B *F-Type*



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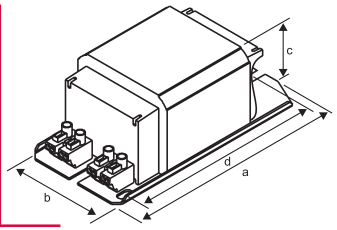
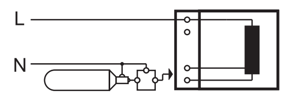


Connection diagrams

1.



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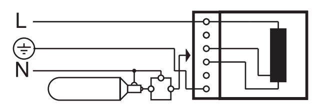

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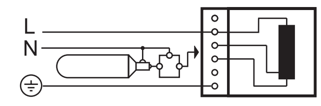

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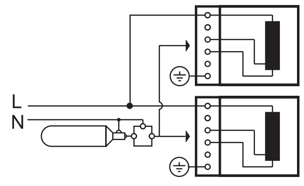


Lamp type	Lamp wattage (W)	Lamp current (A)	Ballast type	Voltage	Power losses (W) 1)	Delivery details p.53	Dimensions No	Connection No	Net weight (kg)	Inductive λ	Temperature rise Δt (°C)	Compensat. Parallel Ck 230/250V ±10% (μF)	Mains current (A)
HI	150	1.8	NK 150 SEP 5) 6)	230 240	18.0 19.0	12	5	1	1.85	0.41	75	20	0.9
	150	1.8	NK 150 SEPK 5)	230 240	17.5 18.5	12	6	1	2.6	0.40	65	20	0.9
	250	3.0	NK 250 SE	230	29	16	7	1	3.00	0.40	70	32	1.4
	250	3.0	NK 250 SEP	230 240	29 30	16	7	1	3.00	0.38	80	32	1.4
	250	3.0	NK 250 TP,FP 2)	230 240	28 29	11	1,3	3	3.15	0.42	70 75	32	1.4
	400	3.5	E 400 SE	230	29.0	16	7	1	3.00	0.51	80	35	2.2
	400	3.5	E 400 SE	240	30.0	16	7	1	3.00	0.49	80	35	2.2
	400	3.5	E 400 SEP	230 240	29.0 30.0	16	7	1	3.00	0.51 0.49	80	35	2.2
	400	4.1	NK 400 TP,FP 2)4)	230 240	32 33	10,11	2,4	3	4.40	0.40	70 75	45	2.2
	400	3.5	H 400 T,F 2)	230 240	24.9 26	10,11	2,4	2	3.18	0.48	70 75	35	2.2
	400	3.5	H 400 TP,FP 2)	230 240	24.9 26	10,11	2,4	3	3.18	0.48	70 75	35	2.2
	400	3.5	E 400 T,F 2)	230 240	25 26	10,11	2,4	2	3.16	0.49	80	35	2.15
	400	3.5	E 400 TP,FP 2)	230 240	25 26	10,11	2,4	3	3.16	0.49	80	35	2.15
	1000	9.5	H 1000 F/2 2)3)	230 240	75 80	17	4	4	8.8	0.49	85	100	4.6

1) Winding at 25°C
2) T-type = two and four point fixing
F-type = four point fixing
3) Supplied as 2 identical ballasts both with the dimensions indicated.
All other technical values are stated for the combined product operating one lamp.
4) Check lamp manufacturers data to ensure that they specify that the lamp is suitable for HPS ballast.
5) With push-in terminals
6) Available also with bottom length 133mm
***Note:** P in ballast type name means built-in thermal protector (eg. E400 TP or NK70LUPK)*

Due to our continuing program of product development data subject to change without notice.

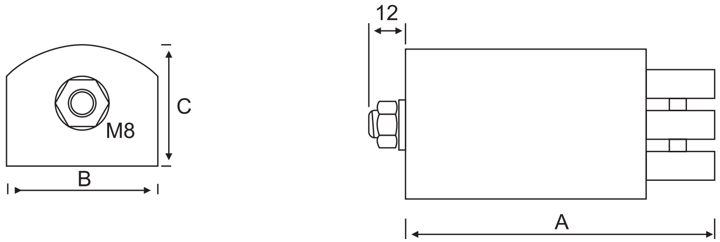
Electronic Superimposed Pulse Ignitors

Without timer 220-240V 50-60Hz

- Fully electronic
- Super-imposed pulse type
- Compact design
- Solid metal fixing screw
- Low inherent heating
- High thermal resistance
- Low power losses
- ENEC approved

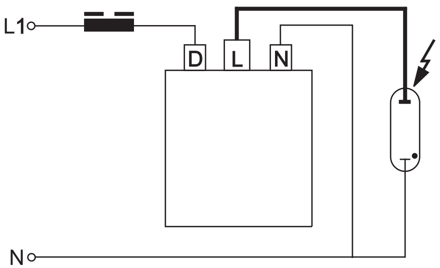
tw 130

Dimensions



Connection diagrams

Terminals: *3-pole D-L-N 2.5 mm^2 max*



	L-70	L-150	HI-400S	L-1000
Lamp: High pressure sodium (W)	35-70	100-150	100-400	400-1000
Metal halide 1) (W)	-	35-150	35-400	400-1000
Ceramic metal halide 1) (W)	-	35-150	35-400	-
Max. contin. lamp current (A)	1	1.8	4.6	12
Operating voltage (V)	198-264	198-264	198-264	198-264
Cut-out voltage (V)	≤ 170	≤ 170	≤ 170	≤ 170
Ignition voltage (kV)	1.9 ... 2.3	4.0 ... 4.5	4.0 ... 4.5	4.0 ... 4.5
Impulse width (µs)	2 (1.5 kV)	1.4 (2.0 kV)	1.0 (2.0 kV)	1.7 (2.5 kV)
Phasing (°el)	60-90 / 240-270	60-90 / 240-270	60-90 / 240-270	60-90 / 240-270
Pulses per half cycle	2	3	3	3
Max. load capacitance (pF)	200	100	100	100
Internal losses (W)	< 1.0 (25°C; 1A)	< 1.0 (25°C; 1.8A)	< 3.3 (25°C; 4.6A)	< 6.0 (25°C; 12A)
Max. housing temperature (°C)	105	105	105	105
Min. ambient temperature (°C)	-30	-30	-30	-30
Weight (g)	105	128	150	450
Dimensions AxBxC (mm)	88x34x28	88x34x28	92x39x33	108x55x43

Note: *Suitability for lamps refers to most common lamps acc. to EN standards. Check also lamp manufacturer information of proper ignitor selection.*
Not suitable for lamps with low ignition voltage (~1kV)
1) See also recommended combinations on page 28

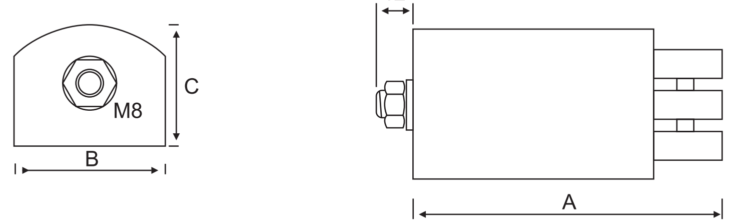
Electronic Superimposed Pulse Ignitors

With timer 220-240V 50-60Hz

- Fully electronic
- Super-imposed pulse type
- Compact design
- Solid metal fixing screw
- Low inherent heating
- High thermal resistance
- Low power losses
- ENEC approved

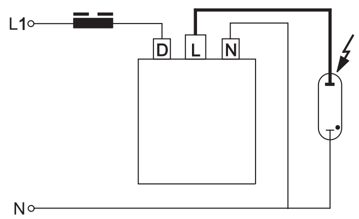
tw 130

Dimensions



Connection diagrams

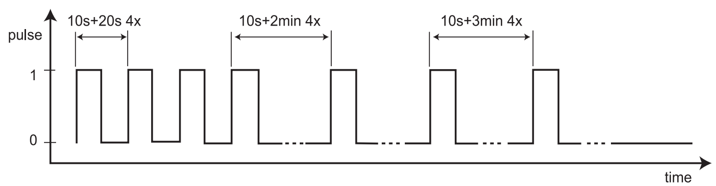
Terminals: *3-pole D-L-N 2.5 mm² max*



		LSI-70T1	LSI-150T20	LHI-400ST10	LSI-400ST20	LSI-1000T10
Lamp	High pressure sodium (W)	35-70	100-150	100-400	100-400	400-1000
	Metal halide [1] (W)	-	35-150	70-400	100-400	400-1000
	Ceramic metal halide [1] (W)	-	35-150	250-400	250-400	-
Max. contin. lamp current (A)		1	1.8	4.6	4.6	12
Cut out time (min)		2	20	16	DIGITAL [1]	18
Operating voltage (V)		198-264	198-264	198-264	198-264	198-264
Cut-out voltage (V)		≤ 170	≤ 170	≤ 170	< 170	≤ 170
Ignition voltage (kV)		1.9 ... 2.3	4.0 ... 4.5	3.5 ... 4.5	4.0 ... 4.5	4.0 ... 4.5
Impulse width (µs)		2 (1.5 kV)	1.4 (2.0 kV)	1.0 (2.0 kV)	0.9	1.7 (2.5 kV)
Phasing (°el)		60-90/ 240-270	60-90 / 240-270	60-90 / 240-270	60-90 / 240-270	60-90 / 240-270
Pulses per half cycle		2	3	3	3	3
Max. load capacitance (pF)		200	100	100	100	100
Internal losses (W)		<1.0 (25°C; 1A)	<1.0 (25°C;1.8A)	<3.0 (25°C; 4.6A)	<3.3	<6.0 (25°C; 12A)
Max. housing temp. (°C)		105	105	105	105	105
Min. ambient temp. (°C)		-30	-30	-30	-30	-30
Weight (g)		105	128	184	160	450
Dimensions AxBxC (mm)		88x34x28	88x34x28	92x39x33	93x38x32	108x55x43

Note: *Suitability for lamps refers to most common lamps acc. to EN standards. Check also lamp manufacturer information of proper ignitor selection.*
Not suitable for lamps with low ignition voltage (~1kV)
1) See also recommended combinations on page 28

1) Cut-out timing sequence for LSI-400ST20



Additional specifications for LSI-400ST20

- Intelligent timer with µC for light source protection and energy saving operation
- Protective against power-line overvoltage
- Lamp protection during ignition
- Continous lamp-state check
- Stable ignition over a wide temperature range
- Radio-frequency interference level 0,1% to standard timed version
- Long life performance
- Approval to EN 61347, EN 60927, EN 55014

Due to our continuing program of product development data subject to change without notice.

Helvar Ignitors For High Pressure Sodium- and Metal Halide Lamps

Ignitor	HIGH PRESSURE SODIUM									CERAMIC METAL HALIDE						METAL HALIDE [1]						
Watt	35	50	70	100	150	250	400	600	1000	35	70	100	150	250	400	35	70	100	150	250	400	1000
L-70	■	■	■																			
LSI-70T1	■	■	■																			
L-150				■	■					■	■	■	■			■	■	■	■			
LSI-150T20				■	■					■	■	■	■			■	■	■	■			
HI-400S				■	■	■	■			2)	2)	■	■	■	■	2)	2)	■	■	■	■	
LHI-400ST10				■	■	■	■			2)	2)	■	■	■	■	2)	2)	■	■	■	■	
LSI-400ST20				■	■	■	■			2)	2)	■	■	■	■	2)	2)	■	■	■	■	
L-1000							■	■	■												■	■
LSI-1000T10							■	■	■												■	■

■ *Recommended combination*

T1 Automatic cut-out 2 min
T10 Automatic cut-out 18 min
T20 Automatic cut-out 20 min

***Note:** Suitability for lamps refers to most common lamps acc. to EN standards. Check also lamp manufacturer information of proper ignitor selection.*
1) Not suitable for lamps with low ignition voltage (~1kV)
2) Used combination

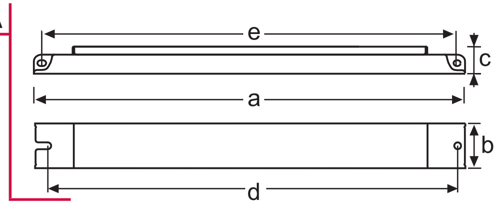
Standard electronic ballasts for T5 Fluorescent Lamps 14-80W 220-240V 50-60Hz

- OCC Optimum Cathode Control
- Only 21 mm high
- Optimal lamp operation
- Wide operational ambient temperature range
- Standard & sidemount possibilities
- Optional terminals for automatic wiring
- Low power losses
- Silent operation
- Stabilized flickerfree light
- High power factor

Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	280	360
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	21	21
'd' (mm)	270	350
'e' (mm)	270	350

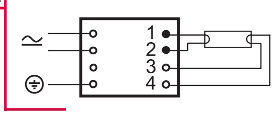
A



Connection diagrams

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

1.



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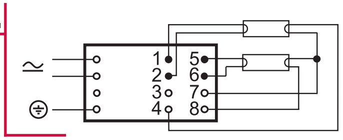

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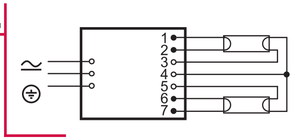

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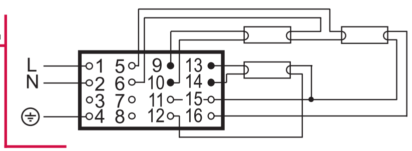

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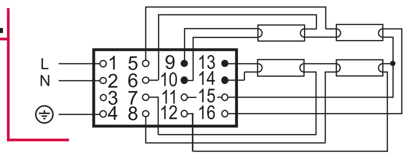

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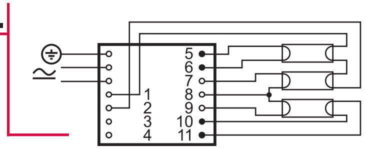

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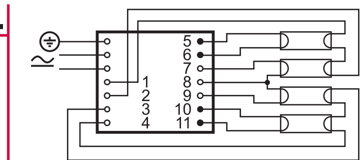


Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
T5	14	1	EL1x14-35s	A2	18	1	1	175	15.5	0.08-0.07	66	13.7
		1	EL1x14-35s-u**	A2	18	1	1	175	15.5	0.08-0.07	66	13.7
		2	EL2x14-35s	A2	19	2	2	250	31	0.15-0.13	63	13.7
		2	EL2x14-35s-u**	A2	19	2	3	250	31	0.15-0.13	63	13.7
		3	EL3/4x14s	A2	20	2	4	250	46	0.22-0.19	62	13.7
		3	EL3/4x14s-u**	A2	20	1	6	210	46	0.22-0.19	62	13.7
		4	EL3/4x14s	A2	20	2	5	250	62	0.29-0.26	62	13.7
		4	EL3/4x14s-u**	A2	20	1	7	210	62	0.29-0.26	62	13.7
	21	1	EL1x14-35s	A2	18	1	1	175	23	0.12-0.10	66	20.7
		1	EL1x14-35s-u**	A2	18	1	1	175	23	0.12-0.10	66	20.7
		2	EL2x14-35s	A2	19	2	2	250	45	0.20-0.18	63	20.7
		2	EL2x14-35s-u**	A2	19	2	3	250	45	0.20-0.18	63	20.7
	24	1	EL1x24s	A2	18	1	1	190	25	0.12-0.11	68	22,5
		2	EL2x24s	A2	19	2	2	230	49	0.24-0.21	67	22,5
	28	1	EL1x14-35s	A2	18	1	1	175	30	0.15-0.12	66	27.8
		1	EL1x14-35s-u**	A2	18	1	1	175	30	0.15-0.12	66	27.8
		2	EL2x14-35s	A2	19	2	2	250	60	0.27-0.25	63	27.8
		2	EL2x14-35s-u**	A2	19	2	3	250	60	0.27-0.25	63	27.8
	35	1	EL1x14-35s	A2	18	1	1	175	38	0.19-0.16	66	34.7
		1	EL1x14-35s-u**	A2	18	1	1	175	38	0.19-0.16	66	34.7
		2	EL2x14-35s	A2	19	2	2	250	75	0.34-0.31	63	34.7
		2	EL2x14-35s-u**	A2	19	2	3	250	75	0.34-0.31	63	34.7
	39	1	EL1x39/36s	A2	18	1	1	190	42	0.19-0.18	59	38
		2	EL2x39/36s	A2	19	2	2	245	81	0.36-0.32	62	38
	49	1	EL1x49s	A2	18	1	1	190	52.5	0.25-0.23	57	49.3
		1	EL1x49s-u**	A2	19	1	1	190	52.5	0.25-0.23	57	49.3
		2	EL2x49s	A2	18	2	2	260	104	0.50-0.46	47	49.3
		2	EL2x49s-u**	A2	19	2	2	260	104	0.50-0.46	47	49.3
	54	1	EL1x54s	A2	18	1	1	200	58	0.23-0.26	49	53.8
		2	EL2x54s	A2	19	2	2	260	114.5	0.50-0.45	48	53.8
	80	1	EL1x80s	A2	18	1	1	200	85	0.40-0.36	54	80

***) With terminals for both manual and automatic wiring(IDC & push-in)*

Note: *See page 43 for additional characteristics.*

Due to our continuing program of product development data subject to change without notice.

Controllable electronic ballasts for T5 Fluorescent Lamps 14-80W 220-240V 50-60Hz

- OCC Optimum Cathode Control
- Switch-Control / Analogue control *)
- Only 21 mm high
- Standard & Side mounting
- Dimming range 1-100% **)
- Microprocessor controlled
- User friendly, quick release connectors
- Extremely low energy consumption
- Stabilised, flickerfree light output

Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
T5	14	1	**EL1x14sc**	A1	22	1	1	270	17	0.07-0.06	50-110	13.7
		2	**EL2x14sc**	A1	23	2	2	340	31	0.15-0.14	50-100	13.7
		4	**EL4x14sc **)**	A1	23	2	3	340	62	0.29-0.27	50-70	13.7
	21	1	**EL1x21sc**	A1	22	1	1	270	24	0.11-0.10	40-90	20.7
		2	**EL2x21sc**	A1	23	2	2	340	46	0.22-0.20	50-90	20.7
	24	1	**EL1x24sc**	A1	22	1	1	270	26	0.13-0.12	40-80	22.5
		2	**EL2x24sc**	A1	23	2	2	340	50	0.24-0.20	40-110	22.5
	28	2	**EL1x28sc**	A1	22	1	1	270	31	0.15-0.14	50-80	27.8
		2	**EL2x28sc**	A1	23	2	2	340	64	0.30-0.28	50-90	27.8
	35	1	**EL1x35sc**	A1	22	1	1	270	39	0.18-0.17	50-70	34.7
		2	**EL2x35sc**	A1	23	2	2	340	78	0.36-0.34	50-70	34.7
	39	1	**EL1x39sc**	A1	22	1	1	270	42	0.20-0.18	70-110	38
		2	**EL2x39sc**	A1	23	2	2	340	83	0.40-0.36	60-110	38
	49	1	**EL1x49sc**	A1	22	1	1	270	54	0.25-0.23	40-90	49.3
		2	**EL2x49sc**	A1	23	2	2	340	106	0.50-0.46	50-110	49.3
	54	1	**EL1x54sc**	A1	22	1	1	270	60	0.28-0.26	40-100	53.8
		2	**EL2x54sc**	A1	23	2	2	340	116	0.53-0.49	50-110	53.8
	80	1	**EL1x80sc**	A1	22	1	1	270	88	0.41-0.38	40-110	80

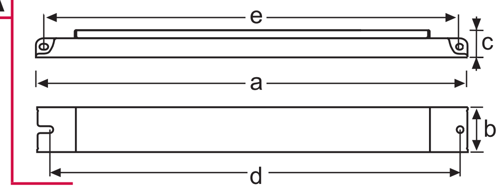
Note: *See page 43 for additional characteristics.*

**) Simultaneous lighting control by Switch-Control and Analogue control*
***) Dimming range 3-100% for EL 4x14sc*

Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	360	430
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	21	21
'd' (mm)	350	420
'e' (mm)	350	420

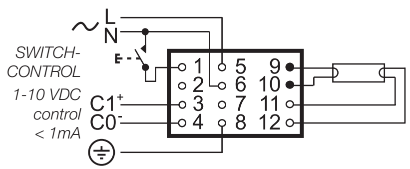
A



Connection diagrams

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

1.



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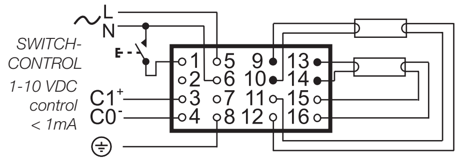

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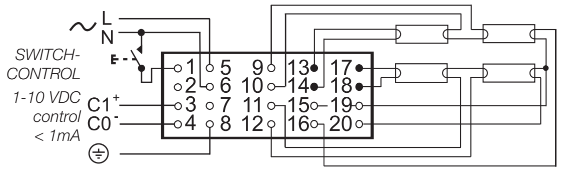


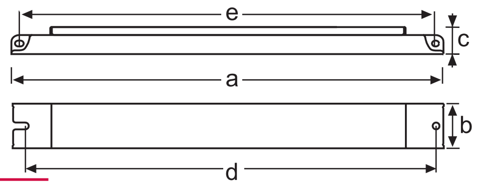
Digital electronic ballasts for T5 Fluorescent Lamps 14-80W 220-240V 50-60Hz

- ICC™ Optimum Cathode Control
- Digital DALI control
- Switch-Control / Digidim input
- Including DALI power supply 20mA
- Only 21 mm high
- Standard & Side mounting
- Dimming range 1-100% *)
- Microprocessor controlled
- User friendly, quick release connectors
- Extremely low energy consumption

Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	360	430
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	21	21
'd' (mm)	350	420
'e' (mm)	350	420

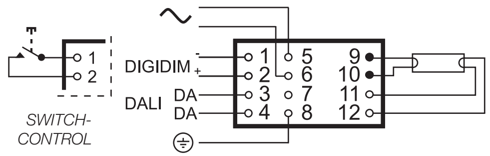
A



Connection diagrams

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

1.



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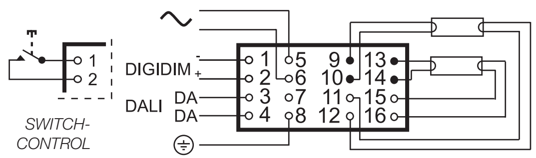

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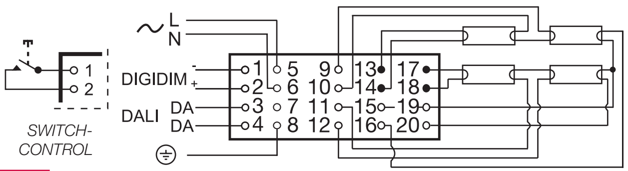


Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
T5	14	1	**EL1x14si**	A1	24	1	1	265	17	0.07-0.06	40-100	13.7
		2	**EL2x14si**	A1	25	2	2	350	31	0.14-0.13	40-100	13.7
		4	**EL4x14si**	A1	26	2	3	315	62	0.27-0.29	45-70	13.7
	21	1	**EL1x21si**	A1	24	1	1	265	24	0.11-0.10	40-100	20.7
		2	**EL2x21si**	A1	25	2	2	350	47	0.22-0.20	40-100	20.7
	24	1	**EL1x24si**	A1	24	1	1	265	28	0.13-0.12	50-80	22.5
		2	**EL2x24si**	A1	25	2	2	350	53	0.24-0.20	40-100	22.5
	28	2	**EL1x28si**	A1	24	1	1	265	31	0.15-0.14	50-80	27.8
		2	**EL2x28si**	A1	25	2	2	350	62	0.28-0.26	40-100	27.8
	35	1	**EL1x35si**	A1	24	1	1	265	39	0.18-0.17	40-100	34.7
		2	**EL2x35si**	A1	25	2	2	350	78	0.36-0.34	40-100	34.7
	39	1	**EL1x39si**	A1	24	1	1	265	44	0.20-0.18	60-100	38
		2	**EL2x39si**	A1	25	2	2	350	86	0.40-0.36	50-100	38
	49	1	**EL1x49si**	A1	24	1	1	265	54	0.25-0.23	50-90	49.3
		2	**EL2x49si**	A1	25	2	2	350	105	0.50-0.46	50-90	49.3
	54	1	**EL1x54si**	A1	24	1	1	265	61	0.28-0.26	40-100	53.8
		2	**EL2x54si**	A1	25	2	2	350	117	0.53-0.49	40-100	53.8
	80	1	**EL1x80si**	A1	24	1	1	265	88	0.41-0.38	40-100	80

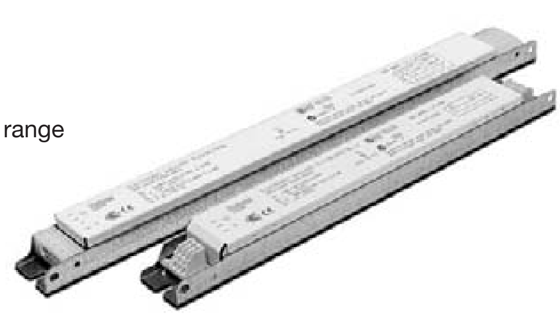
Note: *See page 43 for additional characteristics.*

** Dimming range 3-100% for EL4x14si*

Due to our continuing program of product development data subject to change without notice.

Standard electronic ballasts for T8 Fluorescent Lamps 18-70W 220-240V 50-60Hz

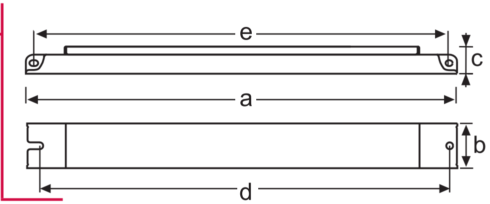
- OCC Optimum Cathode Control
- Only 21 mm high
- Optimal lamp operation
- Wide operational ambient temperature range
- Standard & sidemount possibilities
- Optional terminals for automatic wiring
- Low power losses
- Silent operation
- Stabilized flickerfree light
- High power factor



Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	280	360
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	21	21
'd' (mm)	270	350
'e' (mm)	270	350

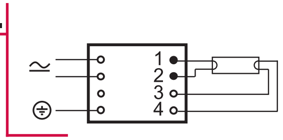
A



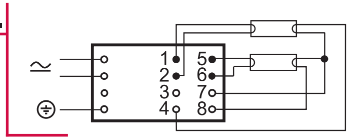
Connection diagrams

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

1.



2.



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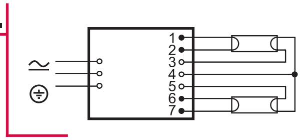

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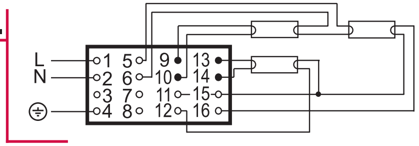

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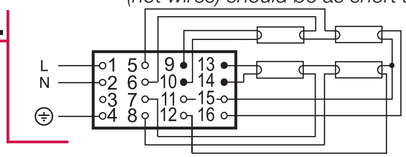
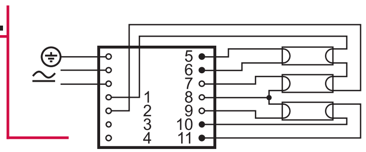
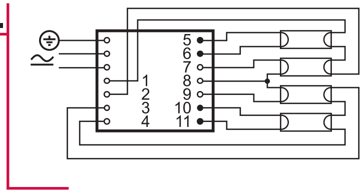


6.



7.



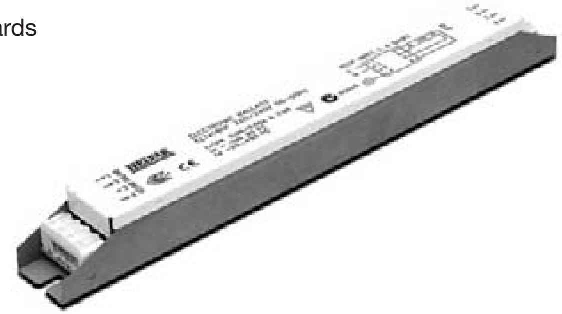
Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
T8	18	1	**EL1x18s**	A2	18	1	1	190	18	0.09-0.08	68	16
		2	**EL2x18s**	A2	19	2	2	230	34.5	0.16-0.15	67	16
		3	**EL3/4x18s**	A2	20	2	4	250	52	0.25-0.23	63	16
		3	**EL3/4x18s-u****	A2	20	1	6	210	52	0.25-0.23	63	16
		4	**EL3/4x18s**	A2	20	2	5	250	69	0.33-0.30	63	16
		4	**EL3/4x18s-u****	A2	20	1	7	210	69	0.33-0.30	63	16
	36	1	**EL1x36/40/18s**	A2	18	1	1	190	35	0.16-0.15	61	32
		1	**EL1x36/40s-u****	A2	18	1	1	190	35	0.16-0.15	61	32
		2	**EL2x36/40s**	A2	19	2	2	245	69	0.32-0.29	67	32
		2	**EL2x36/40s-u****	A2	19	2	3	245	69	0.32-0.29	67	32
	58	1	**EL1x58s**	A2	18	1	1	200	54	0.23-0.26	49	50
		1	**EL1x58s-u****	A2	18	1	1	200	54	0.23-0.26	49	50
		2	**EL2x58s**	A2	19	2	2	260	106.5	0.50-0.45	48	50
		2	**EL2x58s-u****	A2	19	2	3	260	106.5	0.50-0.45	48	50
	70	1	**EL1x70s**	A2	18	1	1	200	64.5	0.30-0.28	46	60
		2	**EL2x70s**	A2	19	2	2	260	128	0.59-0.54	48	60

***) With terminals for both manual and automatic wiring(IDC & push-in)*

Note: *See page 43 for additional characteristics.*

Standard electronic ballasts for T8 Fluorescent Lamps 18-58W 220-240V 50-60Hz

- Energy saving
- Warm Start according to lamp standards
- Flickerless light
- Covers EMC requirements
- Low harmonics
- Low power losses
- Stabilized output

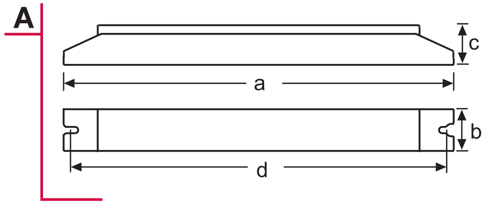


Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Wiring no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
T8	18	1	**EL1x18HF**	A2	27	1	1	270	19	0.09-0.08	68	16
		2	**EL2x18HF**	A2	28	2	2	340	36	0.16-0.15	46	16
	36	1	**EL1x36HF**	A2	27	1	1	270	36	0.16-0.15	60	32
		2	**EL2x36HF**	A2	28	2	2	340	70	0.32-0.29	55	32
	58	1	**EL1x58HF**	A2	27	1	1	270	56	0.26-0.23	44	50
		2	**EL2x58HF**	A2	28	2	2	340	108	0.49-0.45	42	50

Note: *See page 43 for additional characteristics.*

Dimensions

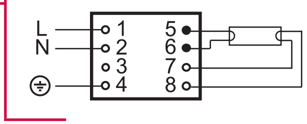
NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	280	360
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	28	28
'd' (mm)	270	350



Connection diagrams

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

1.



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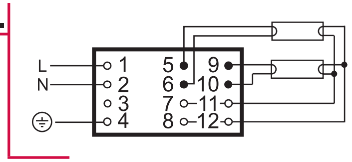


Due to our continuing program of product development data subject to change without notice.

Controllable electronic ballasts for T8 Fluorescent Lamps 18-70W 220-240V 50-60Hz

- OCC Optimum Cathode Control
- Switch-Control / Analogue control *)
- Only 21 mm high
- Standard & Side mounting
- Dimming range 1-100%**)
- Microprocessor controlled
- User friendly, quick release connectors
- Extremely low energy consumption
- Flickerless light

Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
T8	18	1	**EL1x18sc**	A1	18	1	1	270	19	0.09-0.08	50-110	16
		2	**EL2x18sc**	A1	19	2	2	340	37	0.18-0.15	53-125	16
		4	**EL4x18sc **)**	A1	21	2	3	340	72	0.33-0.30	40-70	16
	36	1	**EL1x36sc**	A1	18	1	1	270	37	0.17-0.16	55-115	32
		2	**EL2x36sc**	A1	19	2	2	340	71	0.33-0.30	55-115	32
	58	1	**EL1x58sc**	A1	18	1	1	270	55	0.28-0.26	50-110	50
		2	**EL2x58sc**	A1	19	2	2	340	108	0.50-0.48	50-110	50
	70	1	**EL1x70sc**	A1	18	1	1	270	65	0.31-0.27	50-100	60

Note: *See page 43 for additional characteristics.*

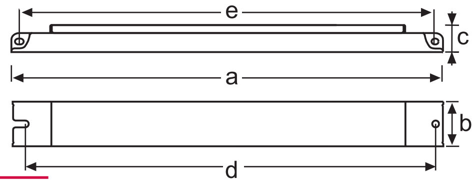
**) Simultaneous lighting control by Switch-Control and Analogue control*

***) Dimming range 3-100% for 4x18sc*

Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	360	430
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	21	21
'd' (mm)	350	420
'e' (mm)	350	420

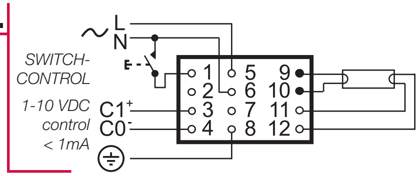
A



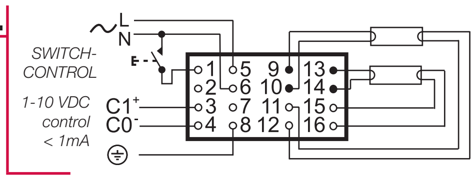
Connection diagrams

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

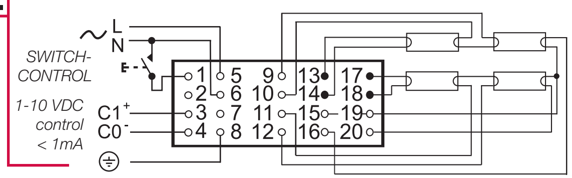
1.



2.

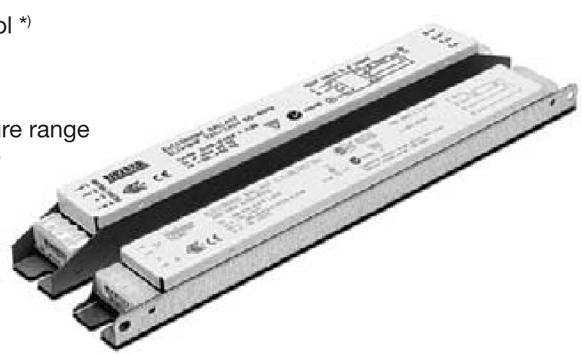


3.



Standard electronic ballasts for Compact Fluorescent Lamps 18-80W 220-240V 50-60Hz

- Optimum Cathode Control *)
- Only 21 mm high *)
- Optimal lamp operation
- Wide operational ambient temperature range
- Standard & sidemount possibilities *)
- Low power losses
- Silent operation
- Stabilized flickerfree light
- High power factor

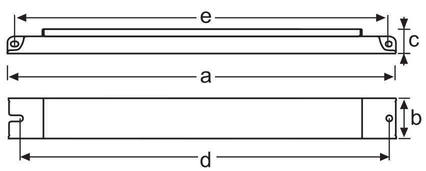


*) Not for EL-HF

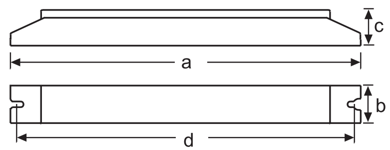
Dimensions

NO.	1	2	3
DRAWING	A	A	B
LENGTH 'a' (mm)	280	360	280
WIDTH 'b' (mm)	30	30	30
HEIGHT 'c' (mm)	21	21	28
'd' (mm)	270	350	270
'e' (mm)	270	350	

A



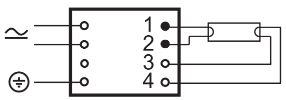
B



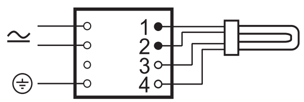
Connection diagrams

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

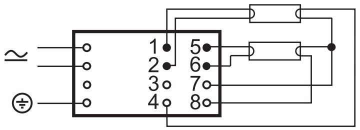
1.



2.



3.



Linear ballasts

Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
TC-L	18	1	EL1x36/40/18s	A2	18	1	1	190	18	0.09-0.08	61	16
			EL1x36/40s-u 1) 2)	A2	18	1	1	190	18	0.09-0.08	61	16
	24	1	EL1x24s	A2	18	1	1	190	25	0.12-0.11	68	22.5
		2	EL2x24s	A2	19	2	3	230	49	0.24-0.21	67	22.5
	34	1	EL1x36HF	A2	26	3	2	270	35	0.15	59	31
	36	1	EL1x39/36s	A2	18	1	1	190	35	0.16-0.15	59	32
		1	EL1x36HF	A2	26	3	2	270	36	0.15	59	32
		2	EL2x39/36s	A2	19	2	3	245	69	0.32-0.29	62	32
	40	1	EL1x36/40/18s	A2	18	1	1	190	45	0.20-0.18	61	40
		1	EL1x36/40s-u 1)	A2	18	1	1	190	45	0.20-0.18	61	40
		1	EL1x36HF	A2	26	3	2	270	39	0.15	59	34
		2	EL2x36/40s	A2	19	2	3	245	87	0.40-0.36	67	40
	55	1	EL1x55s	A2	18	1	1	200	59.5	0.28-0.25	57	55
		2	EL2x55s	A2	19	2	3	260	113.5	0.55-0.50	56	54
	80	1	EL1x80s	A2	18	1	1	200	85	0.40-0.36	54	80
TC-F	18	1	EL1x36/40/18s	A2	18	1	1	190	18	0.09-0.08	61	16
		1	EL1x36/40s-u 1) 2)	A2	18	1	1	190	18	0.09-0.08	61	16
		1	EL1x18HF	A3	26	3	2	270	17.5	0.08	68	15
	24	1	EL1x24s	A2	18	1	1	190	25	0.12-0.11	68	22.5
		2	EL2x24s	A2	19	2	3	230	49	0.24-0.21	67	22.5
	36	1	EL1x39/36s	A2	18	1	1	190	35	0.16-0.15	59	32
		2	EL2x39/36s	A2	19	2	3	245	69	0.32-0.29	62	32
TC-DD	21	1	EL1x18HF	A3	26	3	2	270	20	0.11	68	17
	38	1	EL1x36HF	A3	26	3	2	270	38	0.17	59	33

Note: *See page 43 for additional characteristics.*

1) With terminals for both manual and automatic wiring(IDC & push-in)
2) Tested and recommended by Helvar, not ENEC approved

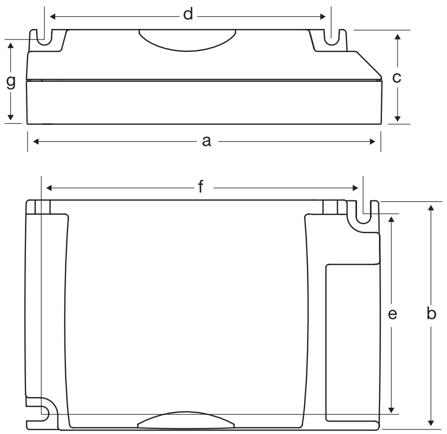
Standard electronic ballasts for Compact Fluorescent Lamps 9-42W 220-240V 50-60Hz

- OCC Optimum Cathode Control
- Slim only 28mm high
- Multilamp operation
- Single and twin lamp operation
- Low power losses
- One case size only

EEI=A2

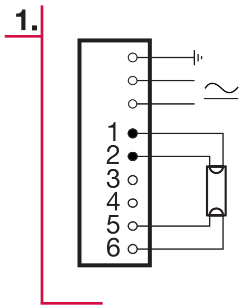
Dimensions

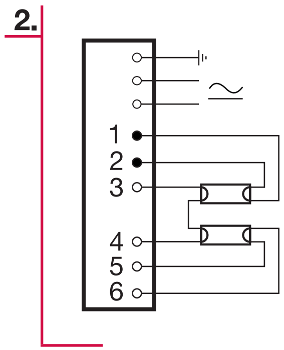
LENGTH 'a' (mm)	103,5
WIDTH 'b' (mm)	67
HEIGHT 'c' (mm)	28
'd' (mm)	83,5
'e' (mm)	57,5
'f' (mm)	93,5
'g' (mm)	25,5



Connection diagrams

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





Square shaped ballasts

Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Wiring no.	Weight (g)	Circuit power (W)	Mains current (A)	Power factor	Operating frequency (kHz)	Lamp power (W)
TC-L	18	1	EL1/2x18-42TCs	A2	29	1	132	17	0.08	0.94	70	14.8
		2	EL1/2x18-42TCs	A2	29	2	132	32	0.14	0.97	70	14.8
	24	1	EL1/2x18-42TCs	A2	29	1	132	26	0.12	0.95	70	23
		2	EL1/2x18-42TCs	A2	29	2	132	48	0.21	0.98	70	22.3
TC-F	18	1	EL1/2x18-42TCs	A2	29	1	132	17	0.08	0.94	70	14.8
		2	EL1/2x18-42TCs	A2	29	2	132	32	0.14	0.97	70	14.8
	24	1	EL1/2x18-42TCs	A2	29	1	132	26	0.12	0.95	70	23
		2	EL1/2x18-42TCs	A2	29	2	132	48	0.21	0.98	70	22.3
TC-DE	10	1	EL1/2x9-13TCs	A2	29	1	118	10	0.05	0.9	65	8.9
		2	EL1/2x9-13TCs	A2	29	2	118	20	0.09	0.97	65	8.9
	13	1	EL1/2x9-13TCs	A2	29	1	118	15	0.07	0.94	65	13.8
		2	EL1/2x9-13TCs	A2	29	2	118	28	0.13	0.98	65	13.5
	18	1	EL1/2x18TCs	A2	29	1	120	19	0.09	0.96	67	16.9
		2	EL1/2x18TCs	A2	29	2	120	36	0.16	0.98	67	16.9
	26	1	EL1/2x18-42TCs	A2	29	1	132	27	0.13	0.96	70	24.7
		2	EL1/2x18-42TCs	A2	29	2	132	51	0.23	0.98	70	23.8
TC-TE	13	1	EL1/2x9-13TCs	A2	29	1	118	15	0.07	0.94	65	13.8
		2	EL1/2x9-13TCs	A2	29	2	118	28	0.13	0.98	65	13.5
	18	1	EL1/2x18TCs	A2	29	1	120	19	0.09	0.96	67	16.9
		2	EL1/2x18TCs	A2	29	2	120	36	0.16	0.98	67	16.9
	26	1	EL1/2x18-42TCs	A2	29	1	132	27	0.13	0.96	70	24.7
		2	EL1/2x18-42TCs	A2	29	2	132	51	0.23	0.98	70	23.8
	32	1	EL1/2x18-42TCs	A2	29	1	132	32	0.15	0.97	70	29.4
		2	EL2x32/42TCs	A2	29	2	132	64	0.29	0.98	70	28.5
	42	1	EL1/2x18-42TCs	A2	29	1	132	44	0.2	0.98	70	42.2
		2	EL2x32/42TCs	A2	29	2	132	85	0.38	0.98	70	40.5
TC-SE	9	1	EL1/2x9-13TCs	A2	29	1	118	10	0.05	0.9	65	8.5
		2	EL1/2x9-13TCs	A2	29	2	118	18	0.08	0.96	65	8.5
	11	1	EL1/2x9-13TCs	A2	29	1	118	14	0.07	0.93	65	12.8
		2	EL1/2x9-13TCs	A2	29	2	118	27	0.12	0.98	65	12.9
TC-DD	10	1	EL1/2x9-13TCs *	A2	29	1	118	12	0.05	0.96	65	10.0
	16	1	EL1/2x9-13TCs *	A2	29	1	118	17	0.07	0.97	65	14.8
	21	1	EL1/2x18-42TCs *	A2	29	1	132	25	0.11	0.97	70	22.3
	28	1	EL1/2x18-42TCs *	A2	29	1	132	29	0.13	0.97	70	27.0
T5c	22	1	EL1/2x18-42TCs	A2	29	1	132	25	0.12	0.95	70	22.6
	40	1	EL1/2x18-42TCs	A2	29	1	132	41	0.19	0.98	70	38.6
	22+40	2	EL2x32/42TCs	A2	29	2	132	64	0.28	0.98	70	21.8 / 38

**) Tested and recommended by Helvar, not ENEC approved*

Note: See page 43 for additional characteristics.

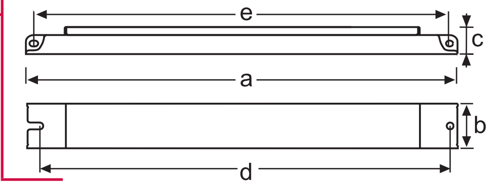
Controllable electronic ballasts for Compact Fluorescent Lamps 24-80W 220-240V 50-60Hz

- OCC Optimum Cathode Control
- Switch-Control / Analogue control **)
- Only 21 mm high
- Standard & Side mounting
- Dimming range 1-100%
- Microprocessor controlled
- User friendly, quick release connectors
- Extremely low energy consumption
- Flickerless light

Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	360	430
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	21	21
'd' (mm)	350	420
'e' (mm)	350	420

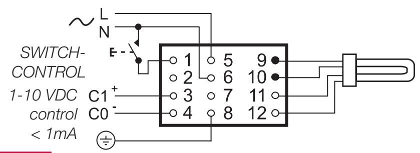
A



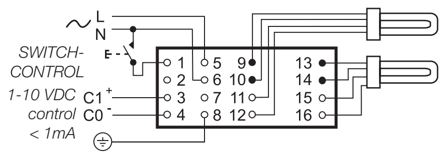
Connection diagrams

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

1.



2.



Linear shaped ballasts

Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
TC-L	24	1	**EL1x24sc***	A1	22	1	1	270	26	0.13-0.12	40-80	24
		2	**EL2x24sc***	A1	23	2	2	340	50	0.24-0.20	40-110	24
	36	1	**EL1x36sc**	A1	22	1	1	270	37	0.17-0.16	55-115	32
	36	2	**EL2x36sc**	A1	23	2	2	340	71	0.33-0.30	55-115	32
	40	1	**EL1x39sc ***	A1	22	1	1	270	44	0.20-0.18	70-110	40
		2	**EL2x39sc ***	A1	23	2	2	340	84	0.37-0.34	60-110	40
	55	1	**EL1x55sc**	A1	22	1	1	270	61	0.28-0.26	45-95	55
		2	**EL2x55sc**	A1	23	2	2	340	118	0.54-0.50	45-95	55
	80	1	**EL1x80sc***	A1	22	1	1	270	88	0.40-0.36	40-110	80
TC-F	24	1	**EL1x24sc***	A1	22	1	1	270	26	0.13-0.12	40-80	24
		2	**EL2x24sc***	A1	23	2	2	340	50	0.24-0.20	40-110	24
	36	1	**EL1x36sc***	A1	22	1	1	270	37	0.17-0.16	55-115	32
	36	2	**EL2x36sc***	A1	23	2	2	340	71	0.33-0.30	55-115	32
T5c	40	1	**EL1x39sc**	A1	22	1	1	270	43	0.20-0.18	70-110	40

Note: *See page 43 for additional characteristics.*

**) Tested and recommended by Helvar, not ENEC approved combination.*
***) Simultaneous lighting control by Switch-Control and Analogue control*

Controllable electronic ballasts for Compact Fluorescent Lamps 13-42W 220-240V 50-60Hz

- Warm start according to lamp standards
- Energy saving
- Low weight
- Flickerless light
- Covers EMC requirements
- Dimming range 3-100%
- Low harmonics
- Stabilized output
- Low earth leakage current

Square shaped ballasts

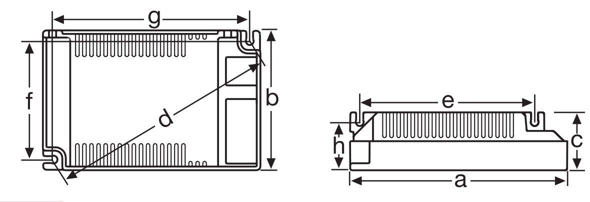
Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
TC-L	18	1	EL1x18-40CHFC3	A1	33	1	1	145	21	0.09	45-105	17.5
		2	EL2x18/24CHFC3	A1	34	2	2	225	41	0.17	45-125	17
	24	1	EL1x18-40CHFC3	A1	33	1	1	145	27.5	0.12	45-105	23.5
		2	EL2x18/24CHFC3	A1	34	2	2	225	53.5	0.23	45-125	23
TC-F	18	1	EL1x18-40CHFC3	A1	33	1	1	145	21	0.09	45-105	17.5
		2	EL2x18/24CHFC3	A1	34	2	2	225	41	0.17	45-125	17
	24	1	EL1x18-40CHFC3	A1	33	1	1	145	27.5	0.12	45-105	23.5
		2	EL2x18/24CHFC3	A1	34	2	2	225	53.5	0.23	45-125	23
TC-DE	13	1	EL1x13CHFC3	A1	33	1	1	145	15.4	0.07	50-80	13
		2	EL2x13CHFC3	A1	34	2	2	200	29	0.13	50-90	13
	18	1	EL1x18CHFC3	A1	33	1	1	145	21	0.10	40-80	18
		2	EL2x18CHFC3	A1	34	2	2	220	40	0.17	50-90	18
	26	1	EL1x26-42CHFC3	A1	33	1	1	145	29	0.13	45-85	26
		2	EL2x26CHFC3	A1	34	2	2	225	57	0.24	40-90	26
		2	EL2x26-42CHFC3	A1	34	3	2	260	56.5	0.24	40-120	26
TC-TE	13	1	EL1x13CHFC3	A1	33	1	1	145	15.4	0.07	50-80	13
		2	EL2x13CHFC3	A1	34	2	2	200	29	0.13	50-90	13
	18	1	EL1x18CHFC3	A1	33	1	1	140	21	0.10	40-80	18
		2	EL2x18CHFC3	A1	34	2	2	220	40	0.17	50-90	18
	26	1	EL1x26-42CHFC3	A1	33	1	1	145	29	0.13	45-85	25.5
		2	EL2x26CHFC3	A1	34	2	2	225	57	0.24	40-90	26
		2	EL2x26-42CHFC3	A1	34	3	2	260	56.5	0.24	40-120	26
	32	1	EL1x26-42CHFC3	A1	33	1	1	260	35	0.16	45-85	32
		2	EL2x26-42CHFC3	A1	34	3	2	260	69	0.31	40-120	32
	42	1	EL1x26-42CHFC3	A1	33	1	1	145	45.5	0.21	45-85	42
		2	EL2x26-42CHFC3	A1	34	3	2	260	90	0.40	40-120	42
T5c	22	1	EL1x18-40CHFC3	A1	33	1	1	145	25.5	0.11	45-105	22
	40	1	EL1x18-40CHFC3	A1	33	1	1	145	43.5	0.19	45-105	40

Note: *See page 43 for additional characteristics.*

Dimensions

NO.	1	2	3
DRAWING	A	A	A
LENGTH 'a' (mm)	103	123	123
WIDTH 'b' (mm)	67	79	102
HEIGHT 'c' (mm)	30	33	33
'd' (mm)	110	129,5	142,5
'e' (mm)	83,5	99	99
'f' (mm)	57,5	67	90
'g' (mm)	93,5	111	111

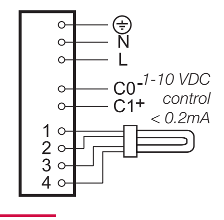
A



Connection diagrams

NOTE: *All wiring to the connectors marked with a black dot; • (hot wires) should be as short as possible. Hot wires are marked to the ballast case*

1.



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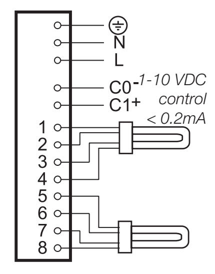


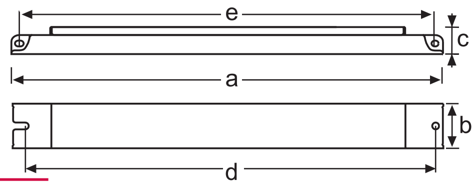
Digital electronic ballasts for Compact Fluorescent Lamps 24-80W 220-240V 50-60Hz

- OCC Optimum Cathode Control
- Digital DALI control
- Switch-Control / Digidim input
- Including DALI power supply 20mA
- Only 21 mm high
- Standard & Side mounting
- Dimming range 1-100%
- Microprocessor controlled
- User friendly, quick release connectors
- Extremely low energy consumption

Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	360	430
WIDTH 'b' (mm)	30	30
HEIGHT 'c' (mm)	21	21
'd' (mm)	350	420
'e' (mm)	350	420

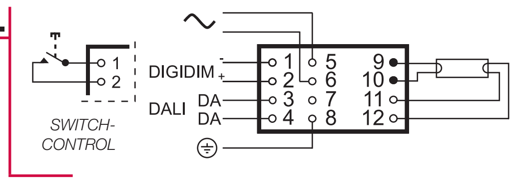
A



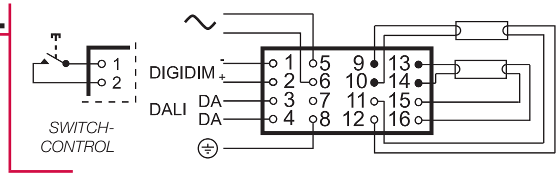
Connection diagrams

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

1.



2.



Linear shaped ballasts

Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
TC-L	24	1	**EL1x24si ***	A1	24	1	1	285	28	0.13-0.12	50-80	22.5
		2	**EL2x24si ***	A1	25	2	2	365	53	0.24-0.20	40-100	22.5
	36	1	**EL1x36si**	A1	24	1	1	285	37	0.17-0.16	65-105	32
		2	**EL2x36si**	A1	25	2	2	365	71	0.32-0.30	55-100	32
	40	1	**EL1x39si ***	A1	22	1	1	285	45	0.20-0.18	60-100	40
		2	**EL2x39si ***	A1	23	2	2	365	85	0.40-0.36	40-100	40
	55	1	**EL1x55si**	A1	24	1	1	285	62	0.28-0.24	48-90	55
		2	**EL2x55si**	A1	25	2	2	365	113	0.52-0.48	47-105	55
	80	1	**EL1x80si ***	A1	24	1	1	285	88	0.41-0.33	40-100	80
TC-F	24	1	**EL1x24si ***	A1	24	1	1	285	28	0.13-0.12	50-80	22.5
		2	**EL2x24si ***	A1	25	2	2	365	53	0.24-0.20	40-100	22.5
	36	1	**EL1x36si ***	A1	24	1	1	285	37	0.17-0.16	65-105	32
		2	**EL2x36si ***	A1	25	2	2	365	71	0.32-0.30	55-100	32

Note: *See page 43 for additional characteristics.*

**) Tested and recommended by Helvar, not ENEC approved combination.*

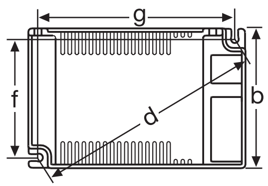
Digital electronic ballasts for Compact Fluorescent Lamps 18-80W 220-240V 50-60Hz

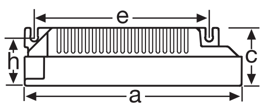
- Warm start according to lamp standards
- Energy saving
- Flickerless light
- Covers EMC requirements
- Low harmonics
- Dimming range 3-100%
- Stabilized output
- Low earth leakage current

Dimensions

NO.	1	2
DRAWING	A	A
LENGTH 'a' (mm)	123	123
WIDTH 'b' (mm)	79	102
HEIGHT 'c' (mm)	33	33
'd' (mm)	129,5	142,5
'e' (mm)	99	99
'f' (mm)	67	90
'g' (mm)	111	111

A

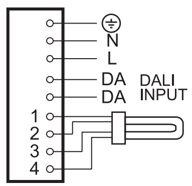




Connection diagrams

NOTE: *All wiring to the connectors marked with a black dot; • (hot wires) should be as short as possible. Hot wires are marked to the ballast case*

1.



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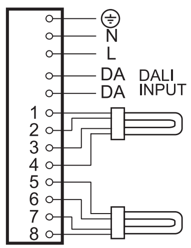


Square shaped ballasts

Lamp type	W	No. of lamps	Ballast	EEI	Delivery details p.53	Dimensions no.	Connection no.	Weight (g)	Circuit power (W)	Mains current (A)	Operating frequency (kHz)	Lamp power (W)
TC-L	18	1	EL1x18-40CHFI	A1	33	1	1	175	21	0.09	45-105	17.5
		2	EL2x18/24CHFI	A1	34	2	2	245	41	0.17	45-125	17
	24	1	EL1x18-40CHFI	A1	33	1	1	175	27.5	0.12	45-105	23.5
		2	EL2x18/24CHFI	A1	34	2	2	245	53.5	0.23	45-125	23
TC-F	18	1	EL1x18-40CHFI	A1	33	1	1	175	21	0.09	45-105	17.5
		2	EL2x18/24CHFI	A1	34	2	2	245	41	0.17	45-125	17
	24	1	EL1x18-40CHFI	A1	33	1	1	175	27.5	0.12	45-105	23.5
		2	EL2x18/24CHFI	A1	34	2	2	245	53.5	0.23	45-125	23
TC-DE	18	1	EL1x18CHFI	A1	33	1	1	175	21	0.10	40-80	18
		2	EL2x18CHFI	A1	34	2	2	245	40	0.17	50-90	18
	26	1	EL1x26-42CHFI	A1	33	1	1	175	29	0.13	45-85	26
		2	EL2x26-42CHFI	A1	34	2	2	255	56.5	0.24	40-120	26
TC-TE	18	1	EL1x18CHFI	A1	33	1	1	175	21	0.10	40-80	18
		2	EL2x18CHFI	A1	34	2	2	245	40	0.17	50-90	18
	26	1	EL1x26-42CHFI	A1	33	1	1	175	29	0.13	45-85	26
		2	EL2x26-42CHFI	A1	34	2	2	255	56.5	0.24	40-120	26
	32	1	EL1x26-42CHFI	A1	33	1	1	175	35	0.16	45-85	32
		2	EL2x26-42CHFI	A1	34	2	2	255	69	0.31	40-120	32
	42	1	EL1x26-42CHFI	A1	33	1	1	175	45.5	0.21	45-85	42
		2	EL2x26-42CHFI	A1	34	2	2	255	90	0.40	40-120	42
T5c	22	1	EL1x18-40CHFI	A1	33	1	1	175	26	0.11	40-120	23
	40	1	EL1x18-40CHFI	A1	33	1	1	175	44	0.19	40-120	38

Note: *See page 43 for additional characteristics.*

Electronic ballasts for Discharge lamps

20-150W 220-240V 50-60Hz

- For Indoor use only
- Anodised aluminium case
- Flickerless light
- Microprocessor controlled
- Protection class I
- HI, C-HI (and HS) lamps
- Protection against operation with no lamp, defective lamp or lamp at end of lifetime
- Overvoltage and overtemperature protection

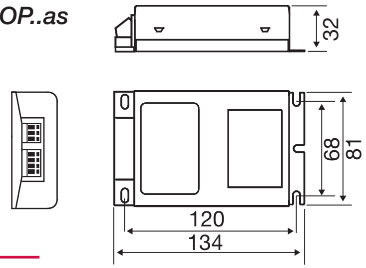
Lamp type	Lamp wattage (W)	Lamp power (W)	Ballast	Delivery details p.53	Dimensions (no.)	Connection (no.)	Weight (g)	Circuit power (W)	Current (A)	Power factor	Ignition voltage (kV pk)	Operating frequency (Hz)
HI & HS	**20**	20	**OP1x20as**	35	1	1	260	24	0.10	>0.95	2.5	200
			OP2x20bs	35	2	2	370	47	0.20	>0.95	2.5	160
	35	39	**OP1x35as**	35	1	1	260	43	0.18	>0.95	2.5	200
			OP2x35bs	35	2	2	390	87	0.36	>0.95	2.5	160
	70	72	**OP1x70as**	35	1	1	280	78	0.33	>0.95	2.5	200
	100	100	**OP1x100bs**	36	2	1	420	113	0.47	>0.95	2.5	200
	150	150	**OP1x150bs**	36	2	1	420	164	0.69	>0.95	2.5	200

- Mains voltage 220-240V
- Mains frequency 50-60Hz
- Square wave form lamp current
- Terminals suitable for: 0.75-2.54mm² wire
- Ballast lamp distance: 5m (max.)
- Ballast lifetime (90% survival): 50000h at 70°C Tc
- Ambient temperature range: -20...+50°C
- Max. housing temperature: 80°C
- Mains current harmonics, acc. to EN 61000-3-2
- General and safety, acc. to EN 61347-1:2001, EN 61347-2-12:2005
- Radio frequency interference, acc. to EN 55015
- Immunity standard, acc. to EN 61547

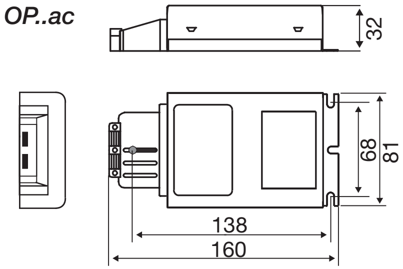
Note: *Not suitable for lamps with internal ignitor*

Dimensions

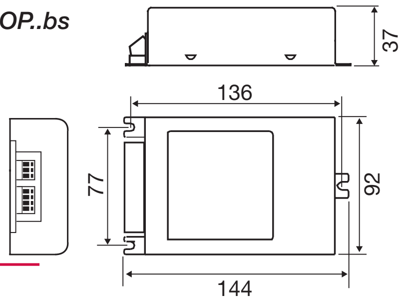
1 *OP..as*



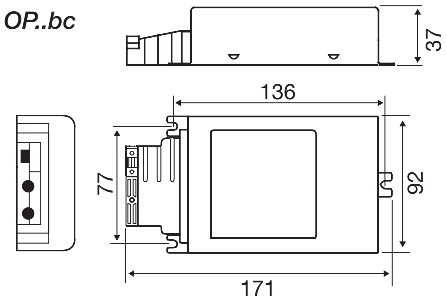
OP..ac



2 *OP..bs*



OP..bc



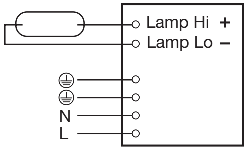
Product versions

Standard (s)	With cable grip (c)*	Open frame (p)
OP 1x20as	OP 1x20ac	OP 1x20ap
OP 1x35as	OP 1x35ac	OP 1x35ap
OP 1x70as	OP 1x70ac	OP 1x70ap
OP 2x20bs	OP 2x20bc	-
OP 2x35bs	OP 2x35bc	-
OP 1x100bs	OP 1x100bc	-
OP 1x150bs	OP 1x150bc	-

** For independent use*

Connection diagram

1.



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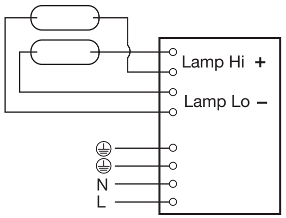


Due to our continuing program of product development data subject to change without notice.

More information at our website: http://www.helvar.com

Lamp compatibility

	20W OP1x20a... OP2x20b...	35W OP1x35a... OP2x35b...	70W OP1x70a...		100W OP1x100b...	150W OP1x150b...	
GE	CMH20	CMH 35/T CMH 35/TC CMH 35/PAR	ARC 70… LU 70	CMH70 T.. CMH 70 TD … CMH 70 T Mini CMH 70 PAR	MXR 100 CMH 100/C/U/830 LU100/X0	ARC 150…	LU150/X0
BLV	-	-	HIE...70...		MHR 100 HIE 100	MHR 150	
Iwasaki	-	-	MT 70 Color Arc	MHT 70 Color Arc		MT 150 Color Arc	
Osram	HCI-TC 20W/830	HCI-T 35… HQI-T 35W/WDL(/BU)	HCI-T 70 HCI-TS 70 HCI-TC 70W W/WDL	HQI-T 70… HQI-TS 70… HQI-E 70…	HQI-E 100	HQI-T 150… HQI-TS 150… HQI-E 150… HQI-R 150…	HCI-T 150… HCI-TS 150… HTI 150W
Philips	-	CDM-R 35W CDM-T 35W CDM-TC 35W CDM-R111	MHN-T 70W MHN-TD 70W MHW-TD 70W CDO-TT SON-T SON-E	CDM-TT 70W CDM-R 70W CDM-ET 70W CDM-T 70W CDM-TD 70W CDM-TC 70W	SONT PIA PLUS 100	MHN-T 150 MHW-TD 150 MHN-TD 150W MHT-T 150 SON-T PIA PLUS	CDM-T 150 CDM-TD 150 CDM-TT CDM-ET 150
Radium	-	RCI-T 35	RCI-T 70 RCI-TS 70	HRI-T 70… HRI-TS 70… HRI-E 70W...	HRI-E 100W	RCI-T 150… RCI-TS 150…	HRI-E 150… HRI-TS 150… HRI-T 150…
Sylvania	-	-	HIS-MP 75W HIS-T 70W HIS-TD 70W	CMI-T 70W/WDL	HSI-MP 100… HIS-TD 100… MP 100W/CL	HIS-TD 150W… HIS-T 150W…	CMI-T 150W / WDL
Venture	-	HIE 35/x/x	HIE 70/x/x		HIE 100/x/x	HIE 150/x/x	

Note: *Not suitable for lamps with internal ignitor*

Characteristics of Electronic Ballasts

Technical values

	EL-s	EL-sc	EL-si	EL-HF	EL-TCs	EL-CHFC3	EL-CHFI
Max.temperature at tc point	75°C [5) 5b)]	80°C	80°C	80 °C	75°C	65 / 70 / 75°C [2)]	65 / 70 / 75°C [2)]
Ambient temperature range	-20…+50°C [1)]	+10…+50°C [8)]	+10…+50°C [8)]	-20...+50°C	-20…+50°C	+5…+50°C	+5…+50°C
Storage temperature range	-40…+80°C	-40…+80°C	-40…+80°C	-40...+80 °C	-40…+80°C	-30…+80°C	-30…+80°C
Maximum relative humidity	no condensation	no condensation	no condensation	no condensation	no condensation	no condensation	no condensation
Number of starts per lamp	> 50 000	> 50 000	> 50 000	> 50 000	>50 000	> 20 000	> 20 000
Mains voltage tolerance	±10 % [6)7)]	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
DC range (starting voltage >190VDC)	176-280 VDC [6)]	176-280 VDC	176-280 VDC	176-280 VDC	176-280 VDC [3)]	176-276 VDC	176-276 VDC
Over voltage duration	320 VAC, 1h	320 VAC, 1h	320 VAC, 1h	320 VAC, 1 h	320 V / 1 h	380 V / 3 min	380 V / 3 min
Power factor (at maximum), typical	0.98	0.98	0.98	0.98	> 0.95	0.97	0.97
Earth leakage current	< 0.4 mA	< 0.4 mA	< 0.4 mA	< 0.5 mA	< 0.4 mA	< 0.4 mA	< 0.4 mA
Maximum working voltage (Uout)	400V	400V	400V	300 VAC	250V [4)]	400V	400V
Lifetime (90% survival)	50 000 h, at Tc max	50 000 h, at 70°C Tc	50 000 h, at 70°C Tc	50 000 h, at 70°C Tc	50 000 h, at Tc max	50 000 h, at Tc max	50 000 h, at Tc max
Max length of ballast to lamp wiring	2m	1.5m/2m (hot/cold)[10)]	1.5m/2m (hot/cold)[10)]	2m	1m/2 m (hot/cold)	1 m	1 m
Ignition time, typical	~1.0s	<1.3s	<1.5s	<1.5s	~1s	<1.5s	<1.5s

Standards

	EL-s	EL-sc	EL-si	EL-HF	EL-TCs	EL-CHFC3	EL-CHFI
CE marked	X	X	X	X	X	X	X
General and safety requirements EN 61347-2-3	X	X	X	X	X	X	X
Additional safety requirements for AC/DC supplied ballasts acc. To EN 61347-2-3 Annex J	X	-	-	-	X	-	-
Performance requirements EN 60929	X	X	X	X	X	X	X
Lamp life acc. to EN 60081 / EN 60901	X	X	X	X	X	X	X
Mains current harmonics, acc. To EN 61000-3-2	X	X	X	X	X	X	X
Radio Frequency Interference, acc. To EN 55015	X	X	X	X	X	X	X
Immunity standard, acc. To EN 61547	X	X	X	X	X	X	X
Vibration test EN 60068-2-64 test Fh	X	X	X	X	X	-	-
Bump test EN 60068-2-29 test Eb	X	X	X	X	X	-	-
Thermal protection class EN 61347, B.6.2e	X	X	X	X	X	X	X

1) Also available as parallel version with 0...+50^{o} for 24, 35, 39, 49, 54 & 80W lamps, until 05/08 (please check the details with Helvar represantative)
2) Depending upon type.
3) For 2x42W lamp, DC range is 190-280V
4) EL2x32/42TCs 300V
5) For EL 3/4x14s and EL 3/4x18s, T_{tc_max}= 80^{o}C
5b) Also available as parallel version with T_{tc_max}= 70^{o}C for 24, 35, 39, 49, 54 & 80W lamps, until 05/08 (please check the details with Helvar represantative)
6) Operating voltage range AC/DC 190-264V (for EL2x70s operating voltage range is AC/DC 204-264V)
7) Max. 6 hours operating time for the EL2x70s and EL2x55s in DC range 176-190V
8) To ensure stable operation of TC-L lamps in ambient temperatures below 18^{o}C it is not recommended to dim the light level below 3%
9) EN 60081 for T5 & T8 fluorescent lamps, EN 60901 for compact fluorescent lamps
10) For TC-L lamps 1m/2m (hot/cold lamp wires)

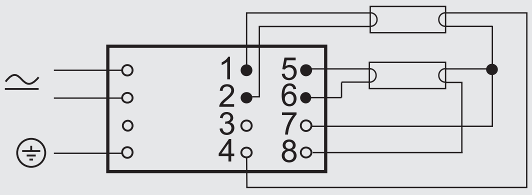
Due to our continuing program of product development data subject to change without notice.

EL-s wiring options

Connection examples

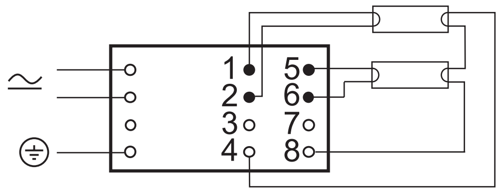
Standard connection
(shown on product label)

All new EL2x..s
(T5, T8 & TC-L)

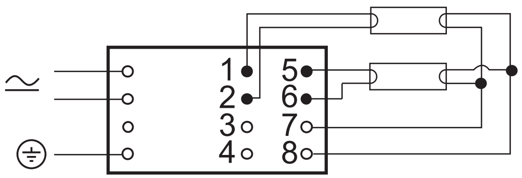


Option (6 wires)

All new EL2x..s
(Except EL2x14-35s & EL2x49s)

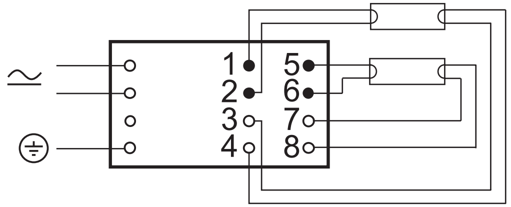


EL2x14-35s & EL2x49s



Option (8 wires)

All new EL2x..s
(T5, T8 & TC-L)



Connection equal to previous ballast-lamp wiring for T5 and TC-L.

Note: *T8 not compatible with previous EL-HF connection.*

Helvar ballast and ignitors are designed to be built into luminaires. Safe and reliable operation of the components requires that the luminaire complies with the relevant standards and regulations (e.g. IEC 60598-1). The luminaire shall be designed to adequately protect the control gear from dust, moisture and pollution.
The luminaire manufacturer remains responsible for the correct choice and installation of the control gear according to the application. Specifications of the control gear shall not be exceeded when it is used in the luminaire in the actual operating conditions. The ballast shall not be used outside the luminaire.

Wiring considerations

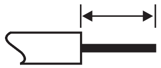
1. Fluorescent and HID (High Intensity Discharge) lamp ballasts

Wire type
- **Push in terminals:** Solid core conductor only
- **Screw terminals:** Solid core or stranded conductor

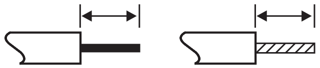
Wiring insulation According to recommendations in EN 60598

Wire cross section dimensions
- **Push in terminals:** 0.5 - 1.0mm² (0.5 - 1.5mm² for HID lamp ballasts)
- **Screw terminals:** 1.5 - 3.0 mm²

Wire preparation
- **Push in terminals:** Strip length 8.0 - 9.0mm



- **Screw terminals:** Strip length 7.0mm ± 1mm



Wire connections As shown on the ballast label and the Wiring Diagram datasheets

Mineral insulated cable Not advised

Wire release from ballast
- **Push in terminals:** Use a 1mm² solid pin (or similar)
- **Screw terminals:** Flat blade screwdriver

More detailed release instructions on page 51

Wiring layout
- Keep all wiring as short as possible
- Mains wiring and lamp should always be kept as far as possible from each-other
- Mains wiring should not be bunched together with lamp wiring
- Avoid wiring ‘loops’ (to minimise magnetic coupling effect)
- Avoid long parallel cable runs

2. Ignitors for HID lamps

Wire type Solid core or stranded conductor

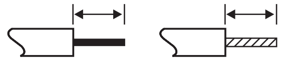
Wiring insulation According to recommendations in EN 60598

Wire cross section dimensions
- 1.5 - 3.0 mm² or 2.0 - 4.0 mm² (depending upon ignitor type)
- 2.5 - 5.0 mm² (1000W ignitors)

Wire connections As shown on the ignitor label and datasheet

Mineral insulated cable Not advised

Wire preparation Strip length 7.0mm ± 1mm



Wire release from ignitor Flat blade screwdriver

Wiring layout Keep wiring from the ignitor to the lamp as short as possible

Installation & operational considerations

Ballast earthing
- Required for safety

Lifetime
- Reliable operation and lifetime is only guaranteed if the maximum winding temperature of tw 130ºC is not exceeded under the conditions of normal use

Ballast mounting
- The ballast must be located in such a position as to ensure that its maximum winding temperature of tw 130ºC is not exceeded under the conditions of normal use
- Mount the ballast against a flat surface to ensure good heat dissipation

Starting aid
- For reliable starting (and electrical safety) all metal parts of the fitting must be at the same electrical potential as the ballast case

Fitting components
- Ensure the correct electrical ratings for the lamps being used

Ignitor choice
- Helvar ballasts for Metal Halide or High Pressure Sodium lamps are only suitable for use with superimposed pulse type ignitors
- Pulsar type ignitors (where a high starting voltage is applied to the ballast windings) are not suitable for Helvar ballasts. If used, the ballast winding insulation will be subjected to increased load. This will drastically shorten the ballast lifetime

Reflector position
- Situating a reflector or metal plate very close to the lamp may increase RFI emissions and cause excessive leakage current of the fitting

Protection against lamp rectification
- Metal Halide & High-Pressure Sodium lamps can begin to rectify as they reach the end of their operational lifetime. This can cause excessive temperature in a fitting. As such, it is recommended that thermal protection be fitted in these luminaires
- A thermal protection device should be fitted inside the luminaire
- Helvar ballasts for Metal Halide & High-Pressure Sodium lamps are available also with internal thermal protectors (P-types)
- Use of ignitors with a timer facility also provide some protection against lamp rectification. Use in conjunction with a thermal protector

Noise avoidance
- Ensure the ballast is securely fixed within the luminaire
- Fix the ballast at a minimum distance of 3mm from the side of the fitting
- Ensure that the fitting is of rigid construction (especially at the point where the ballast is fitted)
- In large fittings the ballast should be separated from the fitting by mounting it on an aluminium plate (approx. 2mm thick)
- Mount as few ballasts as possible in one fitting
- If using multiple ballasts in a fitting, ensure that the ballasts are mounted as far as possible from each other

Site considerations

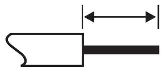
Mixed technology on the same electrical circuit
- Magnetic and electronic ballasts should not be connected to the same electrical circuit. The energy spikes produced by magnetic ballasts may result in damage to the electronic ballasts

Miniature Circuit Breakers
- ‘Type C’ MCB’s having trip characteristics in accordance with EN 60898 are recommended.
- ‘Type B’ MCB’s are not recommended due to their sensitivity. If used, they must only be loaded to 60% of the equivalent ‘Type C’ MCB

Instructions for use - Electronic ballasts

Helvar ballast and ignitors are designed to be built into luminaires. Safe and reliable operation of the components requires that the luminaire complies with the relevant standards and regulations (e.g. IEC 60598-1). The luminaire shall be designed to adequately protect the control gear from dust, moisture and pollution.
The luminaire manufacturer remains responsible for the correct choice and installation of the control gear according to the application. Specifications of the control gear shall not be exceeded when it is used in the luminaire in the actual operating conditions. The ballast shall not be used outside the luminaire.

Wiring considerations

Wire type	Solid core conductor only
Wire cross section dimensions	0.5 - 1.5mm²
Wiring insulation	According to recommendations in EN 60598
Maximum wire lengths	See Characteristics datasheets
Wire connections	As shown on the ballast label and the Wiring Diagram datasheets
Wire preparation	Strip length 7.5mm ± 1mm 
Wiring capacitance	80pF / metre (max. for adviced wire lengths)
Wire insertion force	8 Newtons (typical)

Wire release from ballast **(More detailed release instructions on page 51)**
- Terminals have quick release push buttons
- Some ballasts require the use of a 1mm² solid pin (or similar).

Wiring layout
- Keep all wiring as short as possible (particularly the ‘Hot’ wires - see Wiring Diagrams datasheets)
- ‘Hot’ wires should be of equal length
- ‘Cold’ wires should be of equal length
- Always run mains wiring, lamp wiring and low voltage control wiring separate from each other
- Do not run hot and cold lamp wires bunched together
- Lamp wires of two or more separate ballast should not be run together

Installation & operational considerations

Ballast earthing
- EL-s and EL-TCs ranges are suitable for both Class I & II fittings (no earth required)
- All other Helvar electronic ballasts require a protective earth to be connected to ensure reliable operation

Maximum tc temperature
- Reliable operation and lifetime is only guaranteed if the maximum tc point temperature is not exceeded under the conditions of use

Frequent switching
- Helvar warm start ballasts may be used in conjunction with occupancy sensors as long as the ‘on’ period is greater than 20 minutes. Shorter switching period may reduce lamp life

Master / Slave connection
- Not advised

Switching off one lamp via lamp wires
- Not permitted

Starting aid
- For reliable starting (and electrical safety) all metal parts of the fitting must be at the same electrical potential as the ballast case

Reflector position
- Situating a reflector or metal plate very close to the lamp may increase RFI emissions and cause excessive leakage current of the fitting

Fitting components
- Ensure the correct electrical ratings for the lamps being used (e.g. 500V rated lampholders are required for T5 lamps)

Ballast mounting position
- Ensure that the entire length of the ballast is against a flat surface to ensure good heat dissipation

Installation & operational considerations

Class II luminaires:
Helvar electronic ballasts can be used in suitably designed class II luminaires. The following points must be very carefully noted:

1) Luminaire standard EN 60598 provides full details of the requirements for class II luminaires.
2) Class II luminaires are designed to ensure any exposed metal parts cannot become live.
3) If a starting aid to ensure reliable lamp performance is required, the starting aid can be connected to an earth wire. However, luminaire construction must be such that it is impossible to touch any earthed parts.
4) Helvar dimming ballasts must have an earth connected for reliable dimming and EMC performance. Luminaire construction must be such that it is impossible to touch any exposed metal parts (e.g. ballast case).
5) In case of EL-s or EL-TCs ballasts are not connected to the protective earth a starting aid should be used to ensure reliable EMC performance. The starting aid should be at the same electrical potential as the ballast case or ballast earth connector. Luminaire construction must be such that it is impossible to touch any exposed metal parts (e.g. ballast case).
6) The luminaire manufacturer has responsibility to ensure the class II luminaire is suitably designed in order to provide reliable lamp performance and protection against electric shock.

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.

Stand-by function

The stand-by function is designed specifically as a protection for the ballast. It will switch the lamps off when an ‘end of lifetime’ condition occurs. Lamps can also fail in many other ways. As such, the exact operating state of the ballast under other lamp fault conditions depends on the specific failure. The ballast will not be harmed under any normal lamp failure condition. Ballasts can be reset from stand-by either by switching the mains supply off and then on, or by replacing the faulty lamps.

Lamp ‘end of lifetime’

- **Behaviour of the ballast at end of lamp life time: IEC 61347-2-3 17.2.**
- If the lamp electrical characteristics (e.g. lamp voltage) exceed the ballast internal preset values, the ballast will recognise that a lamp/s has reached the end of its useful operational life. The ballast will then switch off the supply to the lamps to prevent unnecessary stress to the circuit.

Emergency inverter units

Due to our continuing program of product development and improvement, Helvar ballast designs are evolving constantly. This natural evolution may affect compatibility between our electronic ballasts and emergency conversion modules. It is therefore the responsibility of either the fitting manufacturer, emergency unit supplier and/or system integrator to ensure the used combination is fully compatible.

Emergency inverter unit recommendations

- Use a 4 pole changeover device, with all 4 poles being used to disconnect the lamp.
- Disconnect the mains supply from the ballast before disconnecting the emergency lamp, and prior to the lamps connection to the emergency unit.
- Reconnect the emergency lamp to the ballast before applying the mains supply.
- For multiple lamp ballasts, the wiring lengths for emergency and non-emergency lamps should be equal.

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 (Please refer page 50.)

- ‘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.

Switch-Control Information

Switch-Control provides ON/OFF switching and UP/DOWN dimming functionality from one or more simple switches. Switch-Control can be used together and simultaneously with other compatible control devices.
• EL-si ballasts, Helvar Minisensor and DALI control.
• EL-sc ballasts and analogue 1-10V control.

Suitable switch:
• Automatic return type. Mains rated (Mains is still present at the ballast terminals if the lamps are switched off from Switch-Control).
• The switch should withstand a short circuit current of:
- 25mA per ballast (EL-si) or
- 0.2mA per ballast (EL-sc)

Connection:
• EL-sc ballasts: Between the Switch-Control input and N (or L).
• EL-si ballasts: To the DIGIDIM input.
• Wire length: 200m maximum.
• Ballasts per switch: 50 (observe above).
• Ensure all ballasts and associated switches are connected to the same mains phase.

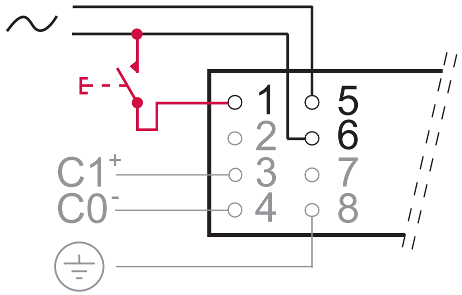
Operation:
• Switch off: Short push of the switch (<0.4 second).
• Switch on: Short push of the switch (<0.4 second).
  • Re-strike within 3 seconds of switch off is prevented to ensure optimal lamp warm start.
  • EL-si ballasts will switch on to the last set level.
  • EL-sc ballasts will switch on to the analogue control 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.

Regaining analogue control (EL-sc only) when Switch-Control is active:
• Dim the analogue control device from min. to max. and back to minimum within 1 second.

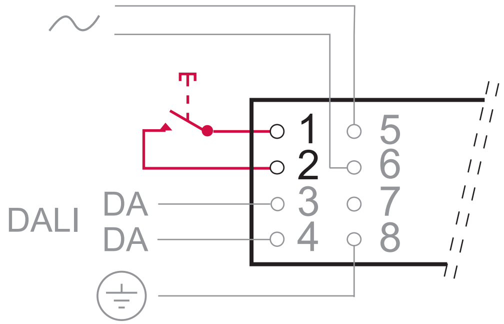
Correction of out of sequence operation:
• Switch the mains supply off and on, or…
• Long push (until all lamps are on), then a short push (all lamps off), then wait 3 seconds and switch on (short push).

Compatibility:
Some ballasts manufacturers have functionality similar to Helvar Switch-Control. In most cases these methods are NOT COMPATIBLE with each other.

Connection to EL-sc ballast
• Between the Switch-Control input and L (or N).



Connection to EL-si ballast
• To the DIGIDIM input.



Quantity of ballasts for Type C miniature circuit breakers (MCB's)

STANDARD NON DIMMING

Lamp(s)	EL-s (T5)	MCB rating 10A	16A	20A
1x14	EL1x14-35s *	88	140	175
2x14	EL2x14-35s *	44	70	88
3x14	EL3/4x14s *	33	53	66
4x14	EL3/4x14s *	25	40	50
1x21	EL2x14-35s *	58	93	117
2x21	EL2x14-35s *	30	49	61
1x28	EL2x14-35s *	47	75	93
2x28	EL2x14-35s *	23	37	47
1x35	EL2x14-35s *	37	59	74
2x35	EL2x14-35s *	18	29	37
1x24	EL1x24s	54	86	108
2x24	EL2x24s	28	45	56
1x39	EL1x39s	30	49	61
2x39	EL2x39s	17	27	33
1x49	EL1x49s *	26	41	52
2x49	EL2x49s *	13	22	27
1x54	EL1x54s	23	37	47
2x54	EL2x54s	12	19	24
1x80	EL1x80s	16	25	32

Lamp(s)	EL-s (T8)	10A	16A	20A
1x18	EL1x18s	78	124	156
2x18	EL2x18s	39	62	78
3x18	EL3/4x18s *	29	46	58
4x18	EL3/4x18s *	21	35	43
1x36	EL1x36/40/18s *	39	62	78
2x36	EL2x36/40s *	19	31	39
1x58	EL1x58s *	25	40	50
2x58	EL2x58s *	13	20	26
1x70	EL1x70s	21	33	42
2x70	EL2x70s	11	17	22

Lamp(s)	EL-s (TCL)	10A	16A	20A
1x18	EL1x36/40/18s	78	124	156
1x24	EL1x24s	54	86	108
2x24	EL2x24s	28	45	56
1x36	EL1x39/36s	37	59	74
2x36	EL2x39/36s	19	31	39
1x40	EL1x36/40/18s	30	49	61
2x40	EL2x36/40s	16	25	32
1x55	EL1x55s	23	36	45
2x55	EL2x55s	12	19	24
1x80	EL1x80s	16	25	32

Lamp(s)	EL-HF (T8)	MCB rating 10A	16A	20A
1 x 18	EL 1 x 18 HF	70	110	140
2 x 18	EL 2 x 18 HF	38	60	75
1 x 36	EL 1 x 36 HF	38	60	75
2 x 36	EL 2 x 36 HF	18	30	39
1 x 58	EL 1 x 58 HF	24	39	50
2 x 58	EL 2 x 58 HF	10	18	23
1 x 70	EL 1 x 70 HF	18	30	39
2 x 70	EL 2 x 70 HF	9	14	18

Lamp(s)	EL-TCs	10A	16A	20A
1x9W TC-SE	1/2x9-13TCs	136	218	273
1x11W TC-SE	1/2x9-13TCs	100	160	201
1x10W TC-DE	1/2x9-13TCs	127	204	255
1x13W TC-DE/TE	1/2x9-13TCs	96	154	193
2x9W TC-SE	1/2x9-13TCs	78	125	156
2x11W TC-SE	1/2x9-13TCs	54	87	109
2x10W TC-DE	1/2x9-13TCs	71	113	142
2x13W TC-DE/TE	1/2x9-13TCs	51	82	103
1x18W TC-DE/TE	1/2x18TCs	79	127	159
2x18W TC-DE/TE	1/2x18TCs	42	67	84
1x18W TC-L/F	1/2x18-42TCs	77	124	155
1x24W TC-L/F	1/2x18-42TCs	58	93	116
1x26W TC-DE/TE	1/2x18-42TCs	54	87	109
1x32W TC-TE	1/2x18-42TCs	43	69	87
1x42W TC-TE	1/2x18-42TCs	32	52	65
1x22W TC-T5c	1/2x18-42TCs	58	93	116
1x40W TC-T5c	1/2x18-42TCs	35	56	70
2x18W TC-L/F	1/2x18-42TCs	43	69	86
2x24W TC-L/F	1/2x18-42TCs	30	49	61
2x26W TC-DE/TE	1/2x18-42TCs	28	44	56
2x32W TC-TE	2x32/42TCs	22	36	45
2x42W TC-TE	2x32/42TCs	17	27	34
22+40W TC-T5c	2x32/42TCs	23	37	46

1-10V CONTROLLABLE

EL-sc (T5)	MCB rating 10A	16A	20A
EL 1x14 sc	54	87	110
EL 2x14 sc	30	47	57
EL 4x14 sc	20	34	43
EL 1x21 sc	45	70	87
EL 2x21 sc	23	36	45
EL 1x24 sc	40	61	72
EL 2x24 sc	27	40	50
EL 1x28 sc	30	49	60
EL 2x28 sc	21	34	43
EL 1x35 sc	29	45	56
EL 2x35 sc	16	25	32
EL 1x39 sc	29	43	54
EL 2x39 sc	16	23	31
EL 1x49 sc	19	28	36
EL 2x49 sc	13	19	24
EL 1x54 sc	16	25	31
EL 2x54 sc	12	17	22
EL 1x80 sc	15	21	27

EL-sc (T8 / TC-L)	10A	16A	20A
EL 1 x 18 sc	50	78	100
EL 2 x 18 sc	29	45	56
EL 4 x 18 sc	19	32	40
EL 1 x 36 sc	29	45	56
EL 2 x 36 sc	16	25	32
EL 1 x 58 sc	16	25	31
EL 2 x 58 sc	12	17	22
EL 1 x 70 sc	19	32	40
EL 1 x 55 sc	16	25	31
EL 2 x 55 sc	12	17	22

EL-CHFC	10A	16A	20A
EL 1 x 13 CHFC3	29	48	80
EL 2 x 13 CHFC3	24	39	58
EL 1 x 18 CHFC3	29	48	80
EL 2 x 18 CHFC3	24	39	58
EL 1 x 18-40 CHFC3	29	48	80
EL 2 x 18/24 CHFC3	24	39	58
EL 1 x 26-42 CHFC3	29	48	80
EL 2 x 26 CHFC3	17	27	45
EL 2 x 26-42 CHFC3	17	27	45

DALI DIGITAL

EL-si (T5)	MCB rating 10A	16A	20A
EL 1x14 si	54	87	110
EL 2x14 si	30	47	57
EL 4x14 si	20	34	43
EL 1x21 si	45	70	87
EL 2x21 si	23	36	45
EL 1x24 si	40	61	72
EL 2x24 si	27	40	50
EL 1x28 si	30	49	60
EL 2x28 si	21	34	43
EL 1x35 si	29	45	56
EL 2x35 si	16	25	32
EL 1x39 si	29	43	54
EL 2x39 si	16	23	31
EL 1x49 si	19	28	36
EL 2x49 si	13	19	24
EL 1x54 si	16	25	31
EL 2x54 si	12	17	22
EL 1x80 si	15	21	27

EL-CHFI	10A	16A	20A
EL 1 x 18 CHFI	29	48	80
EL 2 x 18 CHFI	24	39	58
EL 1 x 26-42 CHFI	29	48	80
EL 2 x 26-42 CHFI	17	27	45
EL 1 x 18-40 CHFI	29	48	80
EL 2 x 18/24 CHFI	24	39	58

Type C MCB's are strongly recommended to use with fluorescent lighting.

- *Other types can prove unsuitable due to their tripping properties.*
- *If using Type B MCB's, derate the above figures by 40%.*
- *All above values are typical calculated values only. Variations may occur.*
- *Practical quantities will depend strongly on the reactance of the actual circuit.*
- *If using multipole MCB's, derate the above figures by 20%*

** Also valid for EL-s-u variant*

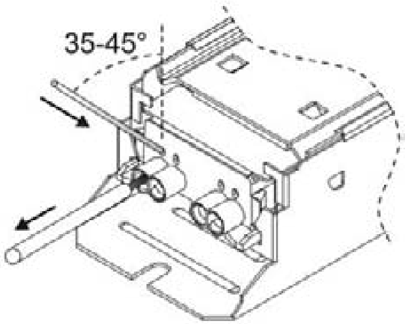
Wire release instructions

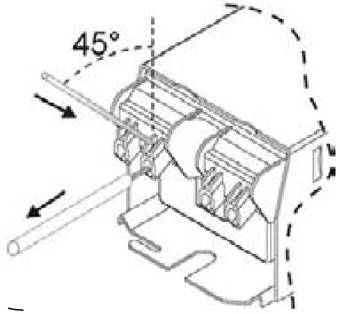
These instructions provide details of how to remove wires from the terminals of Helvar ballasts without damaging the terminals.
Ensure mains supply is switched off before attempting any wire removal.

Magnetic ballasts

… with push in terminals

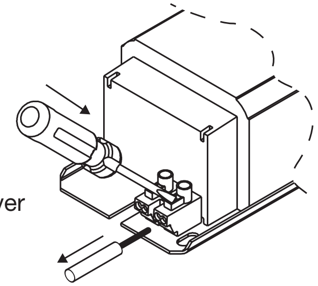
Use a 1mm² solid pin (or similar)





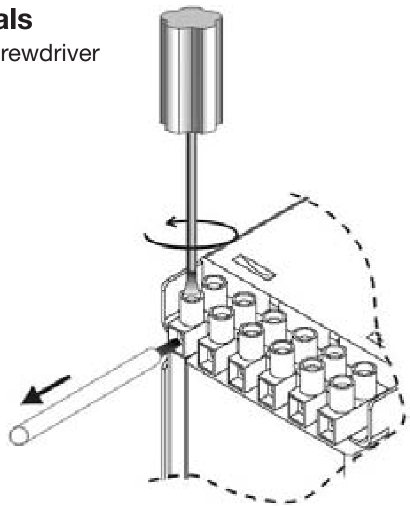
… NK/E...SE & L26S types

Use a flat blade screwdriver



… with screw terminals

Use a flat blade screwdriver

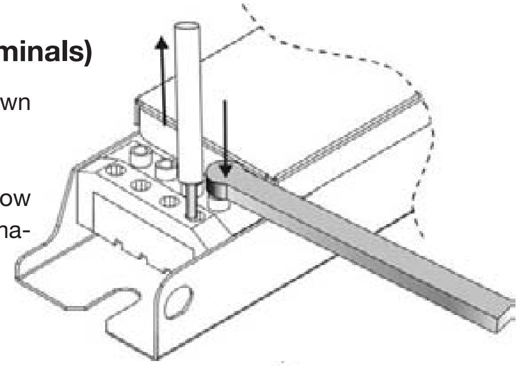


Electronic ballasts

… with 21mm high case, (quick release vertical push-in terminals)

Use a blunt tool (example shown) to push down gently on the built in push button.

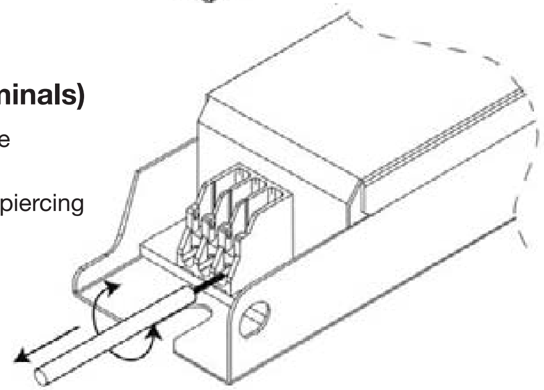
Note: Removal using a solid pin (as shown below for the 28mm case) is not advised since permanent damage to the connector may occur.



… with 21mm high case, (IDC & horizontal push-in terminals)

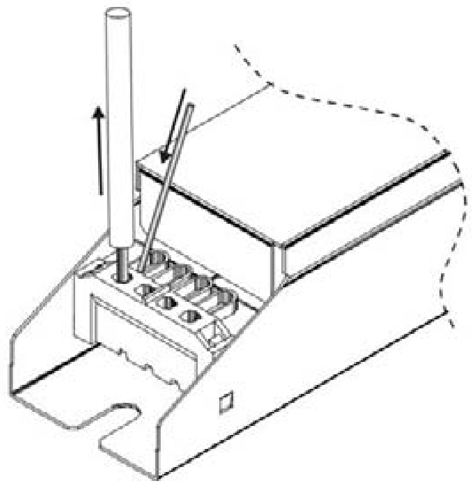
Gently twist and pull wire at the same time

Note: Wire removal from insulation piercing contact is only possible with force.



… with 28mm high case

Use a 1mm² solid pin (or similar).



Markings of Lamp Types

Marking	Cap	Sylvania	Osram	Philips	Thorn	Tungsram	GE
Fluorescent lamps							
T26 (T8)	G13	F	L	TL	F		F
T16 (T5)	G5	F	L	TL	F		F
Compact fluorescent lamps							
TC-S	G23	LYNX-S	Dulux S	PL-S	-	FD	Biax™ S
TC-SE	2 G 7	LYNX-SE	Dulux SE	PL-S	-	FD/E	Biax™ SE
TC - D	G 24 d	LYNX-D	Dulux D	PL-C	-	FD-D	Biax™ D
TC-DE	G 24 q	LYNX-DE	Dulux D/E	PL-C	-	FD-D/E	Biax™ D/E
TC-T	GX 24 d	LYNX-T	Dulux T	PL-T	-	-	Biax™ T
TC-TE	GX 24 q	LYNX-TE	Dulux T/E	PL-T	-	-	Biax™ T/E,QE
TC-L	2 G 11	LYNX-L,-LE	Dulux L	PL-L	2L	FD-L	Biax™ L
TC-DD	GR8,GR10q	-	-	-	2D	-	Biax™ 2D™
T-R,28/30,T9	G 10 q	FC	FC	TL-E	-	-	Circline®
T-R,16,T5	2GX13	FC	FC	TL 5 C	-	-	-
TC-F	2 G 10	LYNX-F	Dulux F	-	-	-	-

Marking	Cap	Sylvania	Osram	Philips	Thorn	Tungsram	GE
High pressure mercury lamps							
HME	E27, E 40	HSL	HQL	HPL	MBF	HqLI	HqLI
HMG	E27	-	HQL-B	HPL-B	-	-	-
HMR	E27, E40	HSR-BW	HQL-R	HPL-R	MBFR	-	MBFR
High pressure sodium lamps							
HST	E 27, E40	SHP-T	NAV-T	SON-T	SON-T	TCF	SON-T
HSE	E 27, E40	SHP-E	NAV-E	SON	SON-E	TCL	SON-E
HSE-I	E 27, E40	SHP/I	NAV-E	SON	-	-	Lucalox I
HST-DE	R 7 S, Fc 2	-	NAV-TS	-	SON-TD	-	SON-TD
Substitutive high pressure sodium lamps							
HSE-X	E27, E 40	SHX	NAV-E	SON-H	-	-	SON-
Metal halide lamps							
HIT	G 12	HIS-T	HQI-T	MHN-T (PG12)	MBI-T/ BOH	-	MBI-T
HIT	E 40	HIS-T	HQI-T	HPI-TD	MQI-T	HqMIF	MBIF
HIT-DE	R 7 S, Fc 2	HIS-TD	HQI-TS	MHN-TD HPI-TD	MBIL	HqMIS	MQI
HIT-I	E40	-	HQI-T	HPI-BUS	-	-	MBI-T
HIE	E27, E 40	M (E27)	HQI-E	HPI	MBI	HqMIL	MBI
HIR	E40	-	HQI-R	-	-	HqMIR	-

Packing details

Magnetic ballasts & Ignitors

no.	UNIT PACKAGE: Ballast type	UNIT PACKAGE: Minimum delivery amount	UNIT PACKAGE: Plastic binding strip	UNIT PACKAGE: Carton Box	TRANSPORTATION PACKAGE: Eur-Pallet 800X1200 pcs.	ONE WAY PALLET, Pallet dimensions: 770X1080 pcs.	ONE WAY PALLET, Pallet dimensions: 730X650 pcs.	ONE WAY PALLET, Pallet dimensions: 730X1120 pcs.	Pallet weight kg	Pallet height cm
1	**L 18 - 36TL**	10	X		1250	1400	840		720-1190	53
2	**L...TS / TLD, L 21TL**	10	X		2100	1500	-		1010-1159	63
3	**L 13 TL**	10	X		1200	-	-		605	38
4	**L 42 - 100 T/TL/TE**	10	X		750	750	-		1080	45
5	**L 15 - 40 A...**	10	X		2000 1000	2000	960		A/AK 602-1256 AP/AT 545-1135	68 68
6	**L 58. - 85 A...**	10	X		1200	1200	720		720-1215	58
7	**L...D / DL**	30		X	1800	-	-	1800	612	40
8	**L 26 S-100mm**	8	X		2016	-	-		925	46
12 13	**E...LU/LUP/LUS** **NK ...LU/LUP/LUS**	4	X				432	960	527-1170	50
14	**E250 - 400T,** **H400T** **NK250T**	5		X				300	530-750	48
15	**E250 - 400F,** **H400F** **NK250F** **NK400T/F**	4		X				240	530-1060	48
16	**E...SE/SEP** **NK...SE/SEP**	3	X		360- 450- 630				860-910	50
17	**NK600 T,F/2** **NK1000 T,F/2** **H1000 F/2**	2*		X				120 (240)	760-1060	48
	IGNITORS	50**								

*) Actual package contains 4 separate ballasts.

**) L-1000 minimum delivery amount 30pcs.

Electronic ballasts

no.	UNIT PACKAGE: Ballast type	UNIT PACKAGE: Minimum delivery amount	UNIT PACKAGE: Plastic binding strip	UNIT PACKAGE: Carton Box	TRANSPORTATION PACKAGE: Eur- Pallet 800X1200 pcs.	ONE WAY PALLET, Pallet dimensions: 1200X820 pcs.	Pallet weight kg	Pallet height cm
18	**EL1 x s**	10	X		1000	2000 [1]	250 / 500	40 / 56
19	**EL2 x s**	10	X		980	1500 [1]	320 / 480	40 / 56
20	**EL3/4 x 14s**	10	X		980	1500 [1]	320 / 480	40
21	**EL3/4 x 18s**	10	X		980	1500 [1]	320 / 480	40
22	**EL1 x sc**	10	X		980	-	320	40
23	**EL2 x sc**	10	X		840	-	360	43
24	**EL1 x si**	10	X		980	-	320	40
25	**EL2 x si**	10	X		840	-	360	43
26	**EL4 x 14 si**	10	X		840	-	290	43
27	**EL1 x HF**	10	X		1000	1600 [3]	300 / 480	43 - 60
28	**EL2 x HF**	10	X		980	1200 [4]	370 / 450	60
29	**EL-TCs**	60		X	-	2700	440	105
33	**EL1 x CHFC3**	50		X				
34	**EL2 x CHFC3**	50		X				
35	**OP 1 x...a / OP 2x...b**	60		X				
36	**OP 1 x ...b**	40		X				

1) Also EL-s-u variant

3) Not EL 1x70HF

4) Not EL 2x70HF

Due to our continuing program of product development data subject to change without notice.

MIMO2 constant light sensor

MIMO2 offers simple, automatic daylight control of fluorescent luminaires achieving maximum energy savings in offices, schools, factories, airports and shopping centres.

MIMO2 is a cylindrical light sensor that can be fitted into a luminaire casing. By using the T5 or T8 mounting brackets the MIMO2 can also be retro fitted to existing luminaires. MIMO2 connects directly to the control input of Helvar CHFC3/sc 1-10V controllable ballasts only.

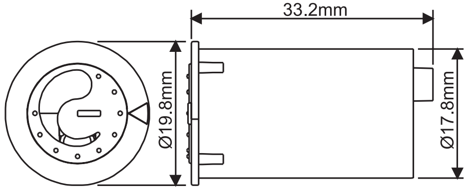
Key features

- Easy installation into the luminaire
- Simple setting of the constant light level
- Start up at full level
- Controls up to 15 Helvar electronic ballasts
- Supply voltage derived from the ballast
- Response delay (hysterisis) approximately 2 minutes
- Compatible with Helvar EL-sc, EL-CHFC3

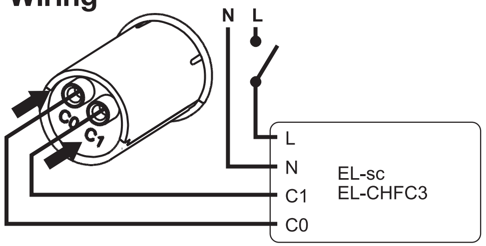
Product Order Codes

- HES37420 Mimo 2
- HES37421 T8 Mounting Bracket
- HES37422 T5 Mounting Bracket

Dimensions



Wiring



Technical spesifications

- **Control voltage** 1-10Vdc (EN60929)
- **Wire spesification** Solid core 0.5 - 1.5mm², stripping length 7mm
- **Ambient Temperature** 0°C . . . 55°C
- **Storage Temperature** -40°C . . . 70°C
- **Relative Humidity** 0 . . . 80% non-condensing
- **IP rating** 20
- **Measuring Range** 200 . . . 600 Lux at sensor set 2m above

- **Safety** EN 60 669-2-1

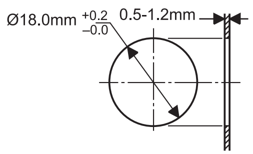
EMC

- **Emission** EN 50 081 part 1
- **Immunity** EN 50 082 part 1
- **RFI** EN 55 015

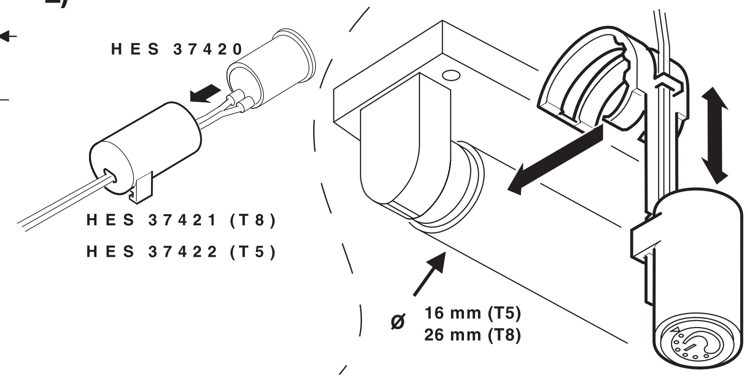
Installation

MIMO2 must be installed in one of the luminaires to be controlled. Fixing hole details for direct installation in figure 1. Alternative installation style with mountig brackets shown in figure 2.

1)



2)



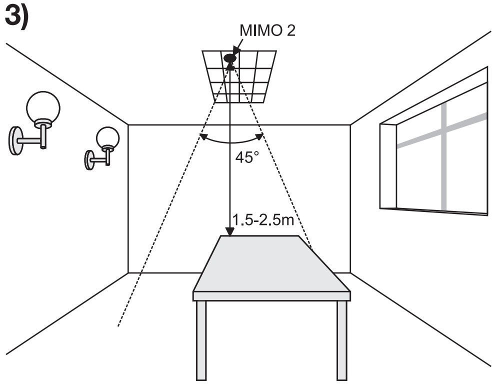
Configuration

Position MIMO2 so that it sees both natural and artificial light, but neither should be dominant. Do not position MIMO2 where a direct light source (lamp, sun, reflection etc.) is within the MIMO2's viewing angle 45° (see figure 3).

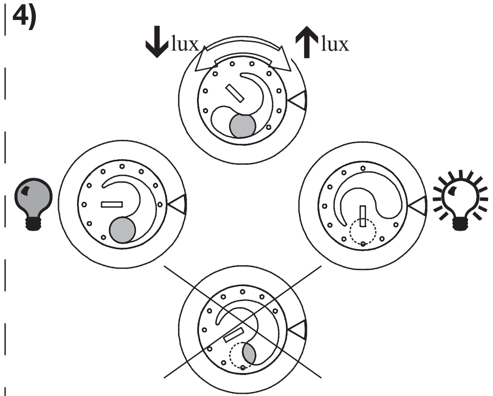
When installed correctly, MIMO2 will monitor both natural and artificial light, and adjust the lighting to maintain a constant overall lighting level. Adjust the rotary disc to set the desired light level (see figure 4).

Note: Take care when adjusting the rotary disc, as it is able to rotate freely through 360°. For example, when adjusting for a darker light level, turning the disc too far anticlockwise will result in a brighter setting (see figure 4).

3)



4)



TK 4 modular ballast controller

Helvar's modular ballast controller offers EN 60929 (1-10V) ballast control together with a mains power switch. The TK4 is styled to compliment the Helvar DIGIDIM panel range and offers the same flexibility that the modular concept provides which allows any mix of TK4 and DIGIDIM control panels.

The TK4 is available in the following standard finishes:

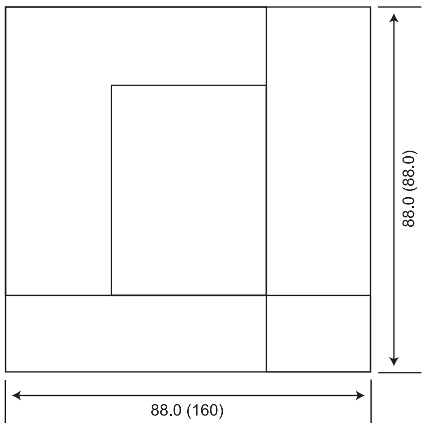
- Satin white plastic
- Lacquered polished brass
- Satin stainless steel
- Stainless Steel & Grey Insert

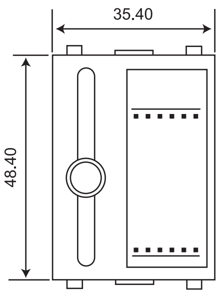
Product Order Codes

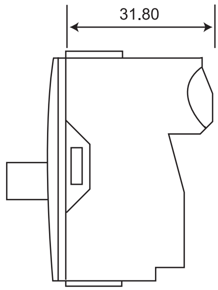
- 140 200 Satin White Plastic Single Gang
- 140 201 Lacquered Polished Brass
- 140 202 Satin Stainless Steel
- 140 203 Stainless Steel & Grey Insert

For double gang panel variants please consult our sales office.

Dimensions

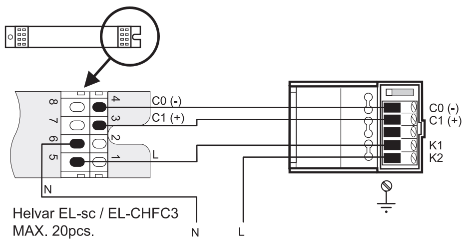


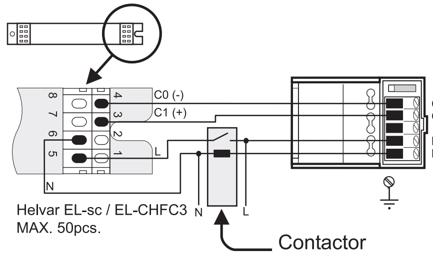




Wiring diagrams

For loads over 20 ballasts use a contactor.





Technical details

Connections

1 - 10V Control:	2 wire 0.5 mm² - 1.5 mm², stranded or solid
Mains:	2 wire 1.0 mm² - 2.5 mm², stranded or solid

Power

Switch Rating:	10 A (resistive) VAC
Switch Load Capacity:	Up to 20 Helvar CHFC3/sc ballasts

Operating Conditions

Ambient Temperature:	0 . . . 35°C
Relative Humidity:	90% max, non-condensing
Storage Temp:	-10°C . . . 70°C

Mechanical Data

Module dimensions:	Standard DIN and UK backboxes with a minimum depth of 35 mm

Conformity & Standards

Emission:	EN 55 015
Immunity:	EN 61 547

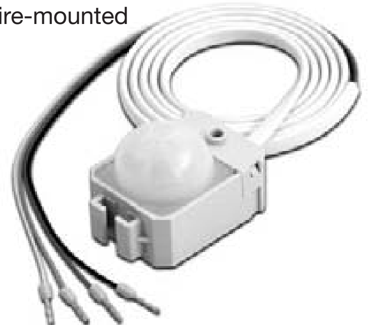
Safety

Safety:	EN 60 669
IP Rating:	30
Isolation:	4kV

Minisensor2

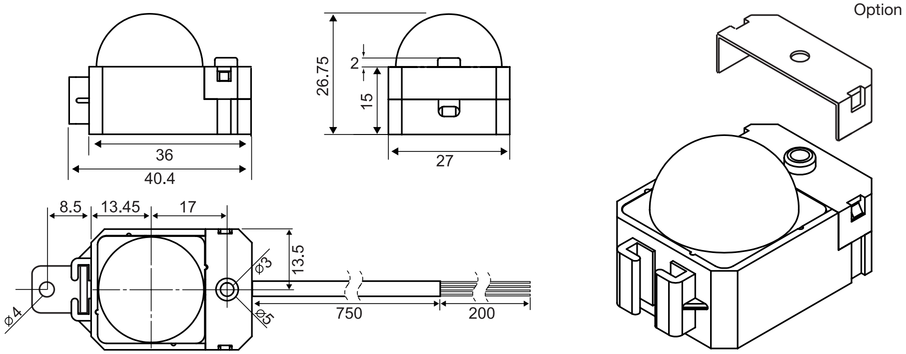
The Helvar Minisensor2 is a two channel luminaire-mounted component containing three integrated sensors:

- Presence detector (PIR)
- Constant light sensor
- Infrared (IR) receiver.

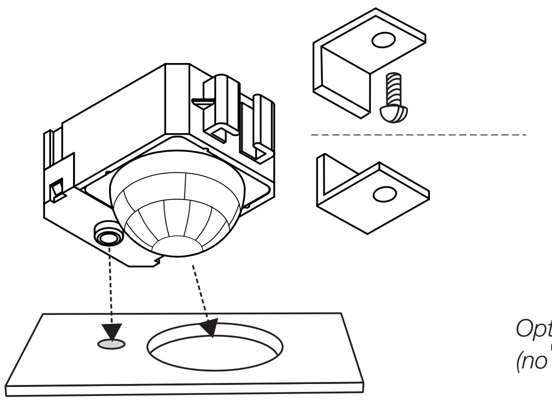


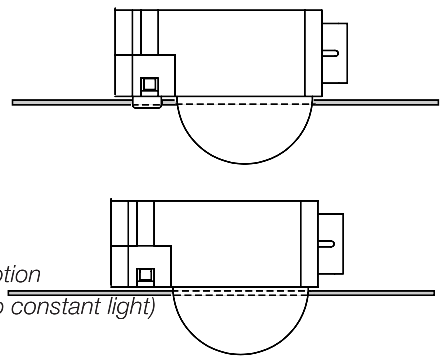
The two separate channels (A & B) enable scene setting & lighting control. The constant light sensor only adjusts the output from channel A, where-as presence detection & infrared control affect both channels.
The Minisensor2 is only compatible with the Helvar EL-si electronic DALI ballast range. Sensor set-up & programming is achieved using the Helvar Digidim infrared remote control. For further information please see Minisensor2 user guide, ref: F13 102 1

Dimensions



Installation





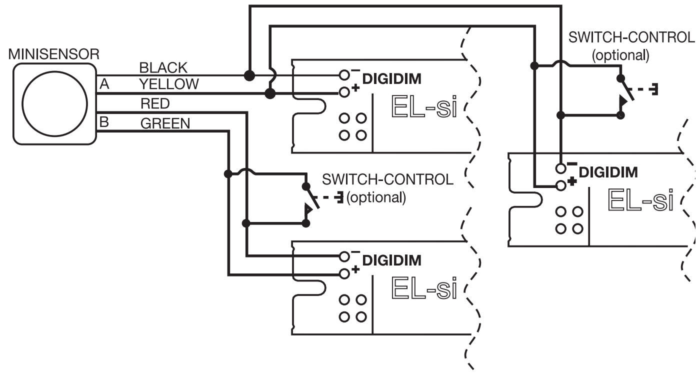
Option
(no constant light)

Wiring diagrams

Up to 4 ballasts per Minisensor2. Connection combinations are found from the following table.

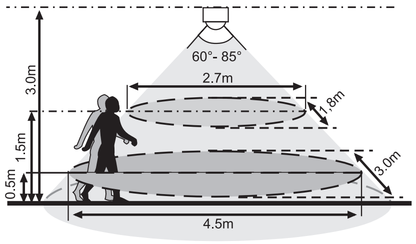
	Channel			
	A		B	
Lead color	Yel	Bl	Gr	Rd
Polarity	+	-	+	-
No. of ballasts	0		4	
	1		3	
	2		2	
	3		1	
	4		0	

Example connection Ch A: 2pcs, Ch B: 1pcs

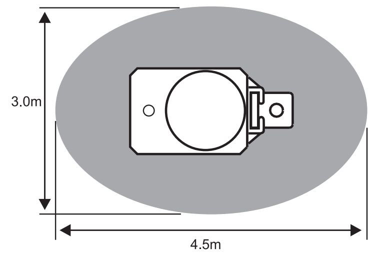


Reception areas

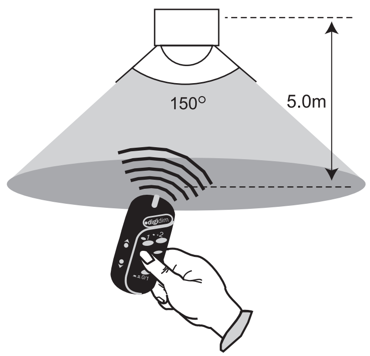
Presence detector (PIR)



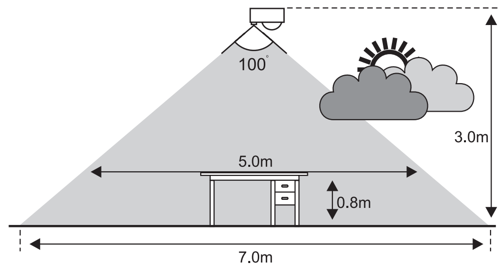
Orientation (PIR)



Infrared (IR) control



Constant light sensor(pipe version)



Operating modes

1) Automatic PIR with delay times of 15min / 20s

2) PIR with manual switch ON / automatic OFF, having delay times of 15min / 20s

3) PIR with delay times of 15min / 20s, having the constant light function activated

4) PIR with manual switch ON / automatic OFF, having delay times of 15min / 20s, having the constant light function activated

Optional functionality

- Programmable PIR ON / OFF / Min level functionality

- Selectable delay times for PIR
    - 30min / 20s
    - 1min / 30min

- Test mode for functionality testing (10 times faster response)

- 14 selectable IR-channels

- Power-on last level function

Technical Specifications

Constant light sensor

Reception area: 100°
Measuring range: 100-1500 lux

IR-receiver

Frequency 36kHz

Presence detector

Detection area 4.5 x 3.0m (mounting height 3.0m)

Electric data

Internal communication with Helvar EL-si electronic ballast

Operation conditions

Ambient temperature range	0°C to 50°C
Storage temperature range	-10°C to 70°C
Relative humidity	90% maximum, non-condensing

Conformity & Standards

Safety:	Only valid if sensor is mounted in the same fitting as the ballasts
Safety	EN61347-2-11, EN61347-1, EN60598-1
IP rating	21
Electric strength	1.5kV

Finishing:

Thermoplastic

Protection:

Single insulation

Wire length:

Max. from Minisensor2 to furthest ballast 15m

Note:

• The Minisensor2 is not designed for installation outside of a luminaire

Digidim Products

For further information on Helvar‘s lighting control product range, please see the Helvar website at www.helvar.com

Remote Control (303)

The remote control is designed to operate basic system functions. The remote has the following functions:

- On/off button
- Raise (modifier button)
- Lower (modifier button)
- Four scene recall buttons

Multisensor (312)

The Multisensor module contains the required sensors to provide the energy saving benefits of an automated lighting control system; a passive infra-red presence detector and infra-red remote control receiver.

PIR Detector	Omni-directional
External Diamete	65.00mm
Fixing Aperture	52.00mm for 0.5 2.0mm tile
	55.00mm for >2.0mm tile

Solutions Cabinet (603/606)

Using our in-house project engineering team we have developed a range of DALI Standard Solutions, which enable us to offer a complete packaged solution to all your DALI requirements. This just leaves you to fit the cabinet to the wall and make the necessary control and load connections.

Dimensions:
603: 450mm x 402mm x 115mm (H,W,D)
606: 795mm x 402mm x 115mm (H,W,D)

Mini Input Unit (444)

Allows the connection of customer specified switches (latching or momentary), time clocks or other on/off control devices to be incorporated into a Digidim system.

No of Input Channels	4
Cable Length	200mm
Product Dimensions	30mm x 20mm x 10mm

Note: Cable length must not be increased.

16A Digital Dimmer (416)

Single channel thyristor dimmer (leading edge) suitable for tungsten, tungsten halogen, wirewound (inductive) fed low voltage tungsten or neon loads.

Supply Voltage	80-264VAC
Supply Frequency	48-52 or 58-62Hz
Maximum Load	16A
Output Relay	Single pole 16A
Product Dimensions	274mm x 200mm x 72mm

25A Digital Dimmer (425)

Single channel thyristor dimmer (leading edge) suitable for tungsten, tungsten halogen, wirewound (inductive) fed low voltage tungsten or neon lighting loads.

Supply Voltage	180-264VAC
Supply Frequency	48-52 or 58-62Hz
Maximum Load	25A
Output Relay	Single pole 25A
Product Dimensions	274mm x 200mm x 72mm

1kW Universal Dimmer (452)

Single channel universal dimmer suitable for any type of load by selecting the appropriate operating mode (leading or trailing edge).

Supply Voltage	90-264VAC
Supply Frequency	48-62Hz
Maximum Load	1000W
Product Dimensions	90mm x 70mm x 58mm

DIGIDIM4 (8040/1/2/3)

DIGIDIM4 consists of a four-circuit 10 Amp dimmer unit, a pushbutton control panel and an infra-remote control in a single package. The pushbutton control panel comes with an optional choice of finishes; satin white plastic, polished brass, brushed stainless steel or brushed stainless steel & grey insert.

Supply Voltage	197-264VAC
Supply Frequency	48-62Hz
Maximum Load	10A
No of Channels	4

SDIM Converter (460)

Each DALI-SDIM converter allows up to 16 channels of AmbienceTM or ImagineTM dimmers, output units or relay units to be connected to a DALI system. This gives dimming capacities of up to 40A per channel.

Supply Voltage	197-264VAC
Supply Frequency	48-62Hz
DALI power supply	250mA maximum
SDIM channels	1-16
Product Dimensions	90mm x 70mm x 58mm

1-10V/DSI Converter (472)

DALI to 1-10V and DSI converter suitable for controlling electronic ballasts thus enabling a DIGIDIM system to operate and to integrate into analogue or DSI systems.

Supply Voltage	90-264VAC
Supply Frequency	48-62Hz
Output Relay Rating	Single pole 10A resistive load (max15 HFC ballasts)
Product Dimensions	90mm x 70mm x 58mm

Blinds Controller (490)

Provides 2 independent control channels each with two single pole, volt free contacts for switching up/down or power/direction motors from a DIGIDIM system. Each channel has a programmable “blind travel time” which is set using Toolbox software.

No of Control Channels	2
Each Channel comprises	2x Single pole, single throw, normally open
Supply Voltage	197-264VAC
Supply Frequency	48-62Hz
Max Motor Load	550Wper contact
Product Dimensions	90mm x 88mm x 58mm

Relay Unit (494)

Provides 4 independent single pole, volt free contacts for switching external devices from a DIGIDIM system.

No of Output Channels	4 single pole, normally open
Supply Voltage	197-264VAC (absolute)
Supply Frequency	48-62Hz
Output Relay Rating	10A resistive / 5A inductive
Product Dimensions	90mm x 88mm x 58mm

Input Unit (440)

Allows the connection of customer specified switches (latching or momentary), time clocks or other on/off control devices to be incorporated into a Digidim system.

No of input channels	8
Cable length	50m (max)
Product Dimensions	90mm x 71mm x 58mm

250mA Power Supply (402)

A DIN rail mounted power supply for DALI control systems.

Supply Voltage	90-264 VAC
Supply Frequency	48-62 Hz
DALI Power Supplied	250mA
Product Dimensions	90mm x 35mm x 58mm

Note: If a power supply unit is connected to a system no other source of power may be used.

Power Supply (401)

A ceiling mounted power supply for DALI control systems.

Supply Voltage	220-240 VAC
Supply Frequency	50-60 Hz
DALI Power Supplied	250mA (maximum)
Product Dimensions	100mm x 63mm x 51mm

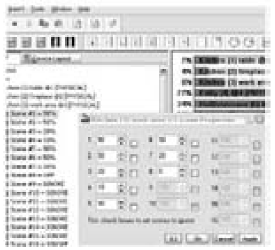
Note: If a power supply unit is connected to a system no other source of power may be used.

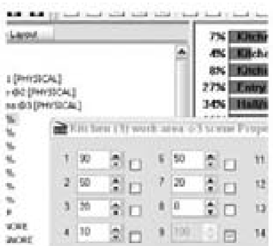
Due to our continuing program of product development data subject to change without notice.

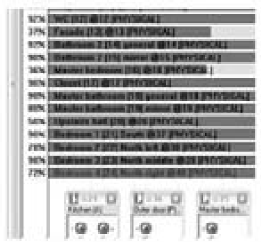
RS232 AV Interface(503)

Allows the connection of RS232 devices such as an AV Touch Screen to a DALI system. The interface modules power requirements are derived from the connecting systems.

Isolation (RS232 & DALI)	3 kV
Byte Format	19,200 Baud
	8 data bits (no parity,1stop bit)
DALI power	Supplied via DALI (10 mA)
RS232 power	Supplied via RS232 (3mA).







DIGIDIM Toolbox (502)

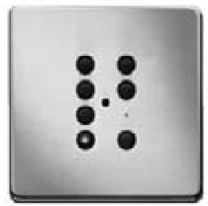
The DIGIDIM Toolbox is a Microsoft® Windows based application that provides a simple method of configuring DIGIDIM systems. Includes serial interface and programming point.

Graphical User Interface
Based on the look and feel of Windows Explorer
Devices created with a single click of a button
Configure devices by simple drag and drop operations

On-line Mode
Directly connected to the DIGIDIM system
Changes effective immediately
Useful for fine tuning of system

Off-line Mode
Allows simulations of DIGIDIM systems
Using virtual devices system can be configured prior to installation
Design can be simply transferred to real system when built

System Configuration
All devices in the system can be given meaningful names
When on-line Toolbox displays a representation of all devices
Toolbox tracks actual system status in real time



Modular Panels
Single Gang Panels

The Modular control panels are a fully DALI compatible range of user interfaces that allow basic control of the system. The range includes pushbutton, rotary and slider controls in a range of panel finishes. Each panel is fitted with an indicator LED and an infrared receiver that gives the option of remote operation using the DIGIDIM hand held remote (303).
Control panels fit into standard UK and most European backboxes.

Double Gang Panels

The double gang panel options contain up to any three control module combinations.
They are available as standard in Satin White Plastic or Grey + Satin Stainless Steel. The panels are also available to special order in Lacquered Polished Brass or Satin Stainless Steel.
Please see the Modular Panel data sheet for further details of the available panel configurations.

TouchPanel 924

The TouchPanel is a touch sensitive full color LCD screen that can be used for controlling and programming a Helvar lighting control system.

The LCD TouchPanel offers Helvar's renowned build quality combined with cutting-edge design flair. Key criteria for the consumer market such as ease-of-use and installation have been fully incorporated. With a full color 3.5" high resolution touch screen the TouchPanel also offers first-class display quality combined with attractive looks that further boost the panels appeal. A range of fascia plate finishes are available to suit any modern décor style.

Compatible with Helvar's DIGIDIM and IMAGINE systems, the TouchPanel can be configured easily to meet individual customer lighting control requirements.