

Electronic ballasts for T5 fluorescent lamps

1



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

- Only 21 mm high
- Optimal lamp operation
- Wide operational ambient temperature range
- Standard & sidemount possibilities
- Low power losses
- Silent operation
- Stabilised flickerfree light
- High power factor



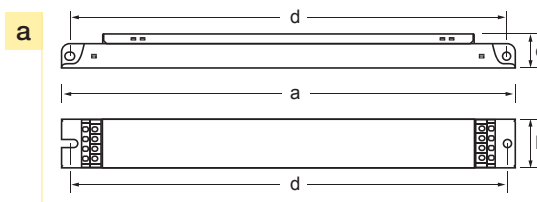
EEL = A2

Lamp type	Wattage	No. of lamps	Ballast	EEL	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.14)	(g)	(W)	(A)	(W)
	14	1	EL1x14-35s	A2	1	1	175	15.5	0.08-0.07	13.7
	14	2	EL2x14-35s	A2	2	3	250	31	0.15-0.13	13.7
	14	3	EL3/4x14s	A2	2	5	250	46	0.22-0.19	13.7
	14	4	EL3/4x14s	A2	2	6	250	62	0.29-0.26	13.7
	21	1	EL1x14-35s	A2	1	1	175	23	0.12-0.10	20.7
	21	2	EL2x14-35s	A2	2	3	250	45	0.22-0.19	20.7
	24	1	EL1x24s	A2	1	1	190	25	0.12-0.11	22,5
	24	2	EL2x24s	A2	2	2	230	49	0.24-0.21	22,5
	28	1	EL1x14-35s	A2	1	1	175	30	0.15-0.12	27.8
	28	2	EL2x14-35s	A2	2	3	250	60	0.29-0.25	27.8
	35	1	EL1x14-35s	A2	1	1	175	38	0.18-0.16	34.7
	35	2	EL2x14-35s	A2	2	3	250	75	0.35-0.31	34.7
	39	1	EL1x39/36s	A2	1	1	190	42	0.19-0.18	38
	39	2	EL2x39/36s	A2	2	2	245	81	0.36-0.32	38
	49	1	EL1x49s	A2	1	1	190	52.5	0.25-0.23	49.3
	49	2	EL2x49s	A2	2	3	260	104	0.50-0.45	49.3
	54	1	EL1x54s	A2	1	1	200	58	0.26-0.24	53.8
	54	2	EL2x54s	A2	2	2	260	114.5	0.53-0.48	53.8
	80	1	EL1x80s	A2	1	1	200	85	0.40-0.36	80



Note: See pages 14-15 for connection diagrams and additional characteristics.

Dimensions	1	2
Length 'a' (mm)	280	360
Width 'b' (mm)	30	30
Height 'c' (mm)	21	21
'd' (mm)	270	350



Delivery information					
Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	One-way pallet 1200 x 820 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x s	10	●	2000	350 - 420	57
EL2 x s	10	●	1500	395	57
EL3/4 x s	10	●	1500	390	57

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- Only 21 mm high
- Optimal lamp operation
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- Standard & sidemount possibilities
- With terminals for both manual and automatic wiring (IDC & push-in)
- Low power losses
- Silent operation
- Stabilized flickerfree light
- High power factor



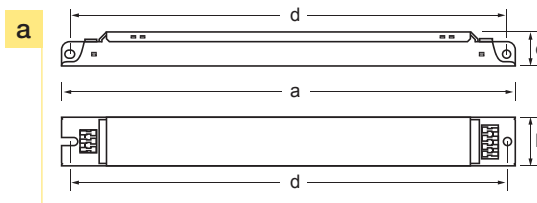
EEI = A2

Lamp type	Wattage	No. of lamps	Ballast	EEI	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
							(g)	(W)	(A)	(W)
	14	1	EL1x14-35s-u	A2	1	1	175	15.5	0.08-0.07	13.7
	14	2	EL2x14-35s-u	A2	2	4	250	31	0.15-0.13	13.7
	14	3	EL3/4x14s-u	A2	1	7	210	46	0.22-0.19	13.7
	14	4	EL3/4x14s-u	A2	1	8	210	62	0.29-0.26	13.7
	21	1	EL1x14-35s-u	A2	1	1	175	23	0.12-0.10	20.7
	21	2	EL2x14-35s-u	A2	2	4	250	45	0.22-0.19	20.7
	24	3	EL3/4x24s-u	A2 BAT	1	7	215	73	0.34-0.30	22.5
	24	4	EL3/4x24s-u	A2 BAT	1	8	215	97	0.44-0.40	22.5
	28	1	EL1x14-35s-u	A2	1	1	175	30	0.15-0.12	27.8
	28	2	EL2x14-35s-u	A2	2	4	250	60	0.29-0.25	27.8
	35	1	EL1x14-35s-u	A2	1	1	175	38	0.18-0.16	34.7
	35	2	EL2x14-35s-u	A2	2	4	250	75	0.35-0.31	34.7
	49	1	EL1x49s-u	A2	1	1	190	52.5	0.25-0.23	49.3
	49	2	EL2x49s-u	A2	2	4	260	104	0.50-0.45	49.3
	80	2	EL2x80s-u	A2 BAT	2	4	305	170	0.80-0.73	80



Note: See pages 14-15 for connection diagrams and additional characteristics.

Dimensions	1	2
Length 'a' (mm)	280	360
Width 'b' (mm)	30	30
Height 'c' (mm)	21	21
'd' (mm)	270	350



Delivery information					
Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	One-way pallet 1200 x 820 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x s-u	10	●	2000	350 - 420	57
EL2 x s-u	10	●	1500	395	57
EL3/4 x s-u	10	●	1500	390	57

Electronic ballasts for T8 fluorescent lamps

1




18-70 W 220-240V 50-60Hz

- 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



EEL = A2

Lamp type	Wattage	No. of lamps	Ballast	EEL	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.14)	(g)	(W)	(A)	(W)
	18	1	EL1x18s	A2	1	1	190	18	0.09-0.08	16
	18	2	EL2x18s	A2	2	2	230	34.5	0.16-0.15	16
	18	3	EL3/4x18s	A2	2	5	250	52	0.25-0.23	16
	18	3	EL3/4x18s-u**	A2	3	7	210	52	0.25-0.23	16
	18	4	EL3/4x18s	A2	2	6	250	69	0.33-0.30	16
	18	4	EL3/4x18s-u**	A2	3	8	210	69	0.33-0.30	16
	36	1	EL1x36/40/18s	A2	1	1	190	35	0.16-0.15	32
	36	1	EL1x36/40s-u**	A2	3	1	190	35	0.16-0.15	32
	36	2	EL2x36/40s	A2	2	2	245	69	0.32-0.29	32
	36	2	EL2x36/40s-u**	A2	4	4	245	69	0.32-0.29	32
	58	1	EL1x58s	A2	1	1	200	54	0.26-0.23	50
	58	1	EL1x58s-u**	A2	3	1	200	54	0.26-0.23	50
	58	2	EL2x58s	A2	2	2	260	106.5	0.50-0.45	50
	58	2	EL2x58s-u**	A2	4	4	260	106.5	0.50-0.45	50
	70	1	EL1x70s	A2	1	1	200	64.5	0.30-0.28	60
	70	2	EL2x70s	A2	2	2	260	128	0.59-0.54	60

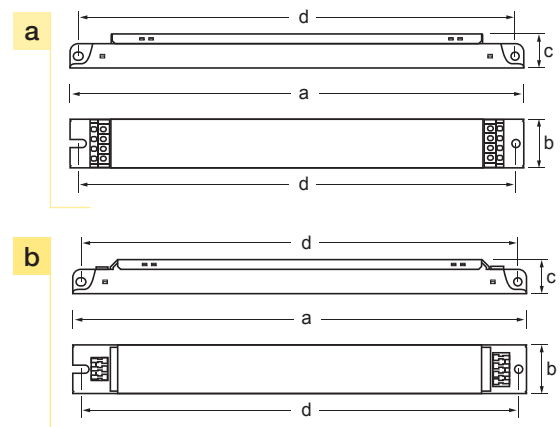
Note: See pages 14-15 for connection diagrams and additional characteristics.

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

Dimensions	1	2	3	4
drawing	a	a	b	b
Length 'a' (mm)	280	360	280	360
Width 'b' (mm)	30	30	30	30
Height 'c' (mm)	21	21	21	21
'd' (mm)	270	350	270	350

Delivery information

Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	One-way pallet 1200 x 820 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x s	10	●	2000	350 - 420	57
EL2 x s	10	●	1500	395	57
EL3/4 x s	10	●	1500	385	57



Electronic ballasts for T8 fluorescent lamps




18-58 W 220-240V 50-60Hz

1

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

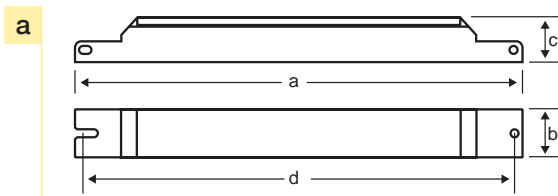


EEL = A2

Lamp type	Wattage	No. of lamps	Ballast	EEL	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.14)	(g)	(W)	(A)	(W)
	18	1	EL1x18ngn	A2	1	1	190	19	0.09-0.08	16
	18	2	EL2x18ngn	A2	1	9	200	37	0.16-0.15	16
	18	4	EL4x18ngn	A2	1	10	200	72	0.33-0.30	16
	36	1	EL1x36ngn	A2	1	1	191	36	0.16-0.15	32
	36	2	EL2x36ngn	A2	1	9	205	71	0.32-0.29	32
	58	1	EL1x58ngn	A2	1	1	193	55	0.26-0.23	50
	58	2	EL2x58ngn	A2	1	9	218	108	0.50-0.45	50

Note: See pages 14-15 for connection diagrams and additional characteristics.

Dimensions	1
Length 'a' (mm)	280
Width 'b' (mm)	30
Height 'c' (mm)	28
'd' (mm)	270



Delivery information					
Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	One-way pallet 1200 x 820 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x ngn	10	●	1600	330	60
EL2 x ngn	10	●	1600	320-360	60
EL4 x ngn	10	●	1600	370	60

Electronic ballasts for compact fluorescent lamps

1



18-80 W 220-240V 50-60Hz

- 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



EEI = A2

Lamp type	Wattage	No. of lamps	Ballast	EEI	Dimensions	Connection	Weight	Circuit power	Mains current	Lamp power
						(p.14)	(g)	(W)	(A)	(W)
TC-L	18	1	EL1x36/40/18s	A2	1	1	190	18	0.08	16
	18	1	EL1x36/40s-u ¹⁾²⁾	A2	3	1	190	18	0.08	16
	24	1	EL1x24s	A2	1	1	190	25	0.12-0.11	22.5
	24	2	EL2x24s	A2	2	2	230	49	0.24-0.21	22.5
	24	3	EL3/4x24s-u ¹⁾	A2 BAT	3	7	215	73	0.34-0.30	22.5
	24	4	EL3/4x24s-u ¹⁾	A2 BAT	3	8	215	97	0.44-0.40	22.5
	36	1	EL1x39/36s	A2	1	1	190	35	0.16-0.15	32
	36	2	EL2x39/36s	A2	2	2	245	69	0.32-0.29	32
	40	1	EL1x36/40/18s	A2	1	1	190	45	0.20-0.18	40
	40	1	EL1x36/40s-u ¹⁾	A2	3	1	190	45	0.20-0.18	40
	40	2	EL2x36/40s	A2	2	2	245	87	0.40-0.36	40
	55	1	EL1x55s	A2	1	1	200	59.5	0.28-0.25	55
	55	2	EL2x55s	A2	2	2	260	117	0.55-0.50	55
	80	1	EL1x80s	A2	1	1	200	85	0.40-0.36	80
80	1	EL2x80s-u ¹⁾	A2 BAT	4	4	305	170	0.80-0.73	80	
TC-F	18	1	EL1x36/40/18s	A2	1	1	190	18	0.08	16
	18	1	EL1x36/40s-u ¹⁾²⁾	A2	3	1	190	18	0.08	16
	24	1	EL1x24s	A2	1	1	190	25	0.12-0.11	22.5
	24	2	EL2x24s	A2	2	2	230	49	0.24-0.21	22.5
	36	1	EL1x39/36s	A2	1	1	190	35	0.16-0.15	32
	36	2	EL2x39/36s	A2	2	2	245	69	0.32-0.29	32

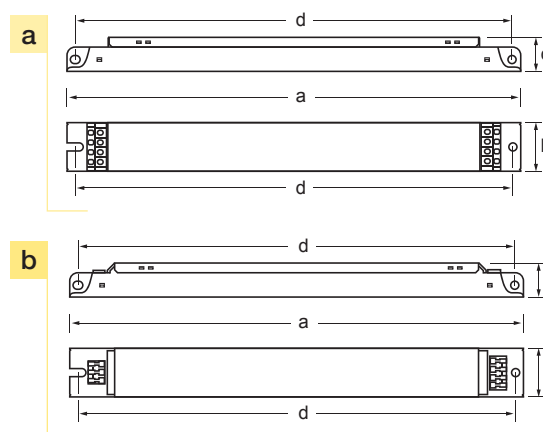
Note: See pages 14-15 for connection diagrams and additional characteristics.

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

Dimensions	1	2	3	4
drawing	a	a	b	b
Length 'a' (mm)	280	360	280	360
Width 'b' (mm)	30	30	30	30
Height 'c' (mm)	21	21	21	21
'd' (mm)	270	350	270	350

Delivery information

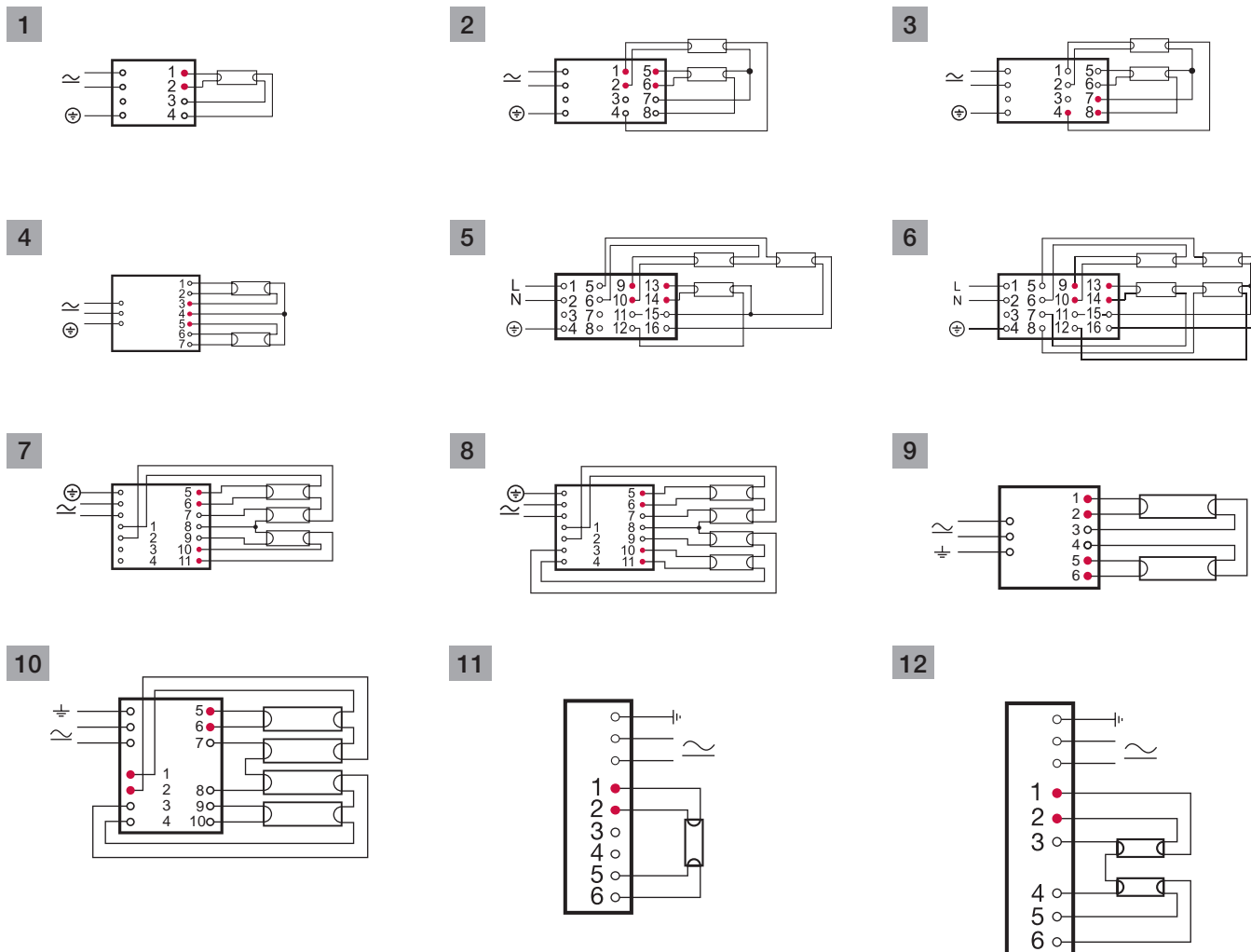
Ballast	Unit package		Transportation package		
	Minimum delivery amount	Plastic binding strip	One-way pallet 1200 x 820 (pcs.)	Pallet weight (kg)	Pallet height (cm)
EL1 x s	10	●	2000	350 - 420	57
EL2 x s	10	●	1500	395	57
EL3/4 x s	10	●	1500	390	57



Connection diagrams

1 EL-s, EL-su, EL-ngn, EL-TCs

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



1	EL1x ...s, EL1x...ngn
2	EL2x18s, EL2x24s, EL2x36/40s, EL2x39/36s, EL2x54s, EL2x55s, EL2x58s, EL2x70s
3	EL2x14-35s, EL2x49s
4	EL2x14-35s-u, EL2x36/40s-u, EL2x49s-u, EL2x58s-u, EL2x80s-u
5	EL3/4x14s, EL3/4x18s (three lamp connection)
6	EL3/4x14s, EL3/4x18s (four lamp connection)
7	EL3/4x14s-u, EL3/4x18s-u, EL3/4x24s-u (three lamp connection)
8	EL3/4x14s-u, EL3/4x18s-u, EL3/4x24s-u (four lamp connection)
9	EL2x18ngn, EL2x36ngn, EL2x58ngn
10	EL4x18ngn
11	EL1/2x14/17TCs, EL1/2x18-42TCs, EL1/2x18TCs, EL1/2x9-13TCs, EL1/2x36/38TCs
12	EL1/2x14/17TCs, EL1/2x18-42TCs, EL1/2x18TCs, EL1/2x9-13TCs, EL2x32/42TCs, EL1/2x36/38TCs

Characteristics

1

	EL-s / EL-su	EL-ngn	EL-TCs
Max.temperature at t _c point	75°C ^{3) 4)}	75 °C	75°C
Ambient temperature range	-20...+50°C	-20...+50°C	-20...+50°C
Storage temperature range	-40...+80°C	-40...+80 °C	-40...+80°C
Maximum relative humidity	no condensation	no condensation	no condensation
Number of starts per lamp	> 50 000	> 50 000	> 50 000
AC Range	198-264 VAC ⁵⁾⁶⁾	198-264 VAC	198-264 VAC
DC range (starting voltage >190VDC)	176-280 VDC ⁶⁾	176-280 VDC	176-280 VDC ¹⁾
Over voltage duration	320 VAC, 1 h	320 VAC, 1 h	320 V / 1 h
Power factor (at maximum), typical	0.98	0.98	> 0.95
Earth leakage current	< 0.4 mA	< 0.4 mA	< 0.4 mA
Maximum working voltage (U _{out})	400 V	350 V	250 V ²⁾
Lifetime (90% survival)	50 000 h, at t _c	50 000 h, at t _c	50 000 h, at t _c
Max length of ballast to lamp wiring	2 m	1.5 m	1 m/2 m (hot/cold)
Ignition time, typical	~1.0 s	< 1 s	~1 s

1) For 2x42W lamp, DC range is 190-280V

2) EL2x32/42TCs 300V

3) For EL 3/4x14s and EL 3/4x18s, t_c = 80°C

4) For EL 2x70s, t_c = 70°C

5) For EL2x70s and EL2x80s-u AC range is 204-264V

6) EL2x70s, EL2x55s and EL2x80s-u max 6 hours at 176-190VDC

Standards

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

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