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Requirements for electronic non-dimmable control gears for fluorescent lamps and LED

Version 13

Manufacturer: **Inventronics GmbH** **Parkring 31-33** **85748 Garching - Germany**	Type / Description: ECG-type: OT 60/220-240/24 P; EAN: 4052899545960 Date: 15/11/2024		**Manufacturer information Complies: YES/NO**
Specifications:	**CEAG data:**	**Explanation:**	
Control gear suitable for a DC voltage range:	**186V - 260V DC (for Lead-Battery)**	Possible voltage range of the battery in emergency mode. *(Not for AT-S+ Systems required)*	Yes
Control gear compatible with the switch-over time of the system?	**Switch-over time:** **180 ms - 450 ms**	Typical switch-over time of CEAG systems between mains supply and emergency power supply	Yes
Starting behavior of the control gear:	**Stable current consumption after less than 1.6 sec. maximum.**	A stable operation of the control gear after 1.6 seconds of start up is required for the right functionality of the individual monitoring. With max. 20 luminaires for one current circuit: ∆ I in sum < 250 mA are allowed	Yes
Control gear compatible with CEAG STAR-Technology:	**Phase-cut telegram (PAT):** **max. 30 phases (half waves) with max. 60° phase-cuts**	During the CEAG STAR switching process, up to 30 half-waves are cut at a maximum of 60°. The control gear must not exhibit any malfunctions such as switching off, flickering	Yes
only for flourescent lamps: Control gear complies with the standard:	**DIN EN 60929**	AC and/or DC-supplied electronic control gear for tubular fluorescent lamps - Performance requirements	Not Relevant
only for flourescent lamps: Control gear complies with the standard:	**DIN EN 61347-2-3 (incl. Attachment J)**	Particular requirements for AC and/or DC supplied electronic control gear for fluorescent lamps	Not Relevant
only for LED: Control gear complies with the standard:	**DIN EN 62384**	AC or DC supplied electronic control gear for LED modules - Performance requirements	Yes
only for LED: Control gear complies with the standard:	**DIN EN 61347-2-13**	Particular requirements for AC or DC supplied electronic control gear for LED modules	Yes
Control gear complies with the standard:	**DIN EN 55015** **(Measured in AC and DC)**	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	Yes
Control gear complies with the standard:	**DIN EN 61000-3-2**	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)	Yes
Control gear complies with the standard:	**DIN EN 61000-3-2, Pkt. 7.3 a.)**	**see *Important note!**	Yes
Control gear complies with the standard:	**DIN EN 61547**	Equipment for general lighting purposes - EMC immunity requirements	Yes

Note: The labeling "according to VDE 0108" is not meaningful, because this is not a control gear standard!

Specifications:	**CEAG data:**	**Explanation:**	**Manufacturer information:**
Important for functiontest: Voltage-dependent Input current of the control gear incl. LED in DC and AC operation:	**V-CG-S2: >9,4 mA or >12,7 mA = OK** **V-CG-S: >16 mA or >47 mA = OK** **V-CG-SE: >16 mA or >47 mA = OK** **V-CG-SUW: >47 mA = OK** **CG-K: >16 mA or >47 mA = OK**	Minimum current of the LED driver with LED module to GOOD detection via the monitoring module. In the voltage range of 189 - 264V AC on AT-S+ or 186 - 260V DC on ZB-S/LP-STAR the input current must be higher than the specified current values. **see *Important note!**	**see table**
Important for functiontest: Voltage-dependent No-load current of the control gear (without or defect LED module) in DC and AC - operation*:	**V-CG-S2: <5,8 mA or <7,9 mA = n.OK** **V-CG-S: <10 mA or <28 mA = n.OK** **V-CG-SE: <10 mA or <28 mA = n.OK** **V-CG-SUW: <28 mA = n.OK** **CG-K: <10 mA or <28 mA = n.OK**	Maximal current of the LED driver with LED module for BAD detection via the monitoring module. In the voltage range of 189 - 264V AC on AT-S+ or 186 - 260V DC on ZB-S/LP-STAR the input current must be lower than the specified current values. **see *Important note!**	**see table**
Important for the power consumption of addressable ballast:	**V-CG-S2 = 30 A** **V-CG-S = 30 A** **V-CG-SE = 30 A** **V-CG-SUW = 80 A** **CG-K = 30 A**	The max. inrush current of each monitoring module has to be considered!	**30A/150us**

Note: Important for the planning - Max. no. Of luminiares per circuit

Important for the contact load SKU: Max. inrush current of each luminaire in AC operation	**Max. permitted inrush current per circuit:** **SKU 2 x 3A (CG) => 120 A** **SKU 1 x 6A (CG) => 180 A** **SKU 4 x 1,5A CG-S => 60 A** **SKU 2 x 3A CG-S => 250 A** **SKU 1 x 6A CG-S => 250 A** **SOU CG-S // S+ => 250 A** **SU S+ => 250 A**	The declaration of the inrush current of the luminaire above is important, to calculate the max. possible luminaires on one circuit, to consider the max. contact load limitation of the circuit.

Luminaires for emergency lighting must comply with DIN EN 60598-2-22
(Particular requirements -Luminaires for emergency lighting)

***Important note!**

For AT-S+ systems and for battery systems (ZB-S / LP-STAR) with active preliminary time for AC about 300 seconds (EOL detection of T5 lamps) for the function test, the current consumption must be sinusoidal, t.m. all control gears (<25W as well) must have an active PFC (Power Factor Correction)!

See DIN EN 61000-3-2, Pkt. 7.3 a.)

Note EOL (End of Life) detection (T5 > 14Watt): The AC preliminary time is valid for the complete system (e.g. ZB-S), not possible for individual circuits.

The modules of the V-CG-S series monitor the current consumption on the primary side of the control gear for LED modules within the specified limits. Failures of individual LEDs (low-impedance) on the secondary side do not inevitably lead to a modification of current consumption on the primary side, and in such cases cannot be detected as a failure.

20-Mar-20

Notes

1. Control of DALI-SV-Module to the DALI driver is 100% done via DALI-commands according to IEC 62386-101/-102, so the DALI driver must sign with the DALI logo.
2. For calculation the inrush current of the monitoring module must be considered!
3. Not to be used in high risk areas, special release required
4. The light input level is locked in DC-operation. Factory setting is 15% of the maximum level. It is possible to change the behavior of the controlgear in DC-operation.
5. Only 1 DALI- Driver DT8 (1 address/2 channels) or DT6 (1 address/1 channel) to wire with one Dali-SV-Module oniy 1 address possible with one Dali-SV-Module.

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Table 1

			AC-operation				DC-Operation (For DALI Devices @ default DC Dim level e.g. 15%)			
Values for load range			**189VAC/50Hz Itrms_in (mA)**	**230VAC/50Hz Itrms_in (mA)**	**240VAC/50Hz Itrms_in (mA)**	**264VAC/50Hz Itrms_in (mA)**	**186VDC Idc_in (mA)**	**216VDC Idc_in (mA)**	**240VDC Idc_in (mA)**	**260VDC Idc_in (mA)**
Min. Load /mA	Uout=	23.85 V	378.55	309.43	297.31	274.42	373.99	316.08	282.18	258.99
	Iout=	2471.98 mA								
	P=	58.97 W	PF: 0.98	PF: 0.97	PF: 0.96	PF: 0.94	PF: NA	PF: NA	PF: NA	PF: NA
Mid. Load /mA	Uout=	24.04 V	261.56	215.88	205.51	190.00	255.72	213.88	188.82	171.61
	Iout=	1627.56 mA								
	P=	39.13 W	PF: 0.97	PF: 0.94	PF: 0.93	PF: 0.90	PF: NA	PF: NA	PF: NA	PF: NA
Max. Load /mA	Uout=	24.10 V	219.68	186.23	180.24	169.23	214.83	183.69	164.95	152.11
	Iout=	1432.94 mA								
	P=	34.53 W	PF: 0.97	PF: 0.93	PF: 0.92	PF: 0.89	PF: NA	PF: NA	PF: NA	PF: NA
Short/Open Load			11.55	12.10	13.67	13.54	1.50	1.42	1.36	1.59
			PF: 0.19	PF: 0.15	PF: 0.15	PF: 0.13	PF: NA	PF: NA	PF: NA	PF: NA

Remarks:

1.) This table shows the currents consumption of the driver at three different operating points (Pmax, Pmid, Pmin) for AC and DC operation.
2.) This table is intended for rough design desicions . It is not a replacement for individual functional measurments!