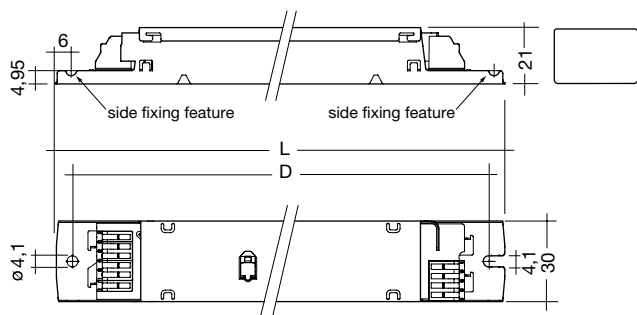
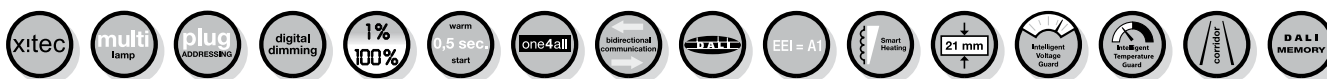


PCA T5 EXCEL one4all Ip x!tec 14–80 W 220–240 V 50/60/0 Hz



- world first: first processor-controlled ballast with x!tec inside
- operation of T5 lamps of the same length (e.g. FH 28 W and 54 W)
- automatic lamp detection and operation with correct lamp parameters
- dimming range from 1–100 %
- lamp friendly warm start within 0.5 s with AC and 0.2 s with DC
- power consumption in standby mode < 0.5 W
- disturbance free precise control with a digital signal (DSI), switchDIM or DALI (Digital Addressable Lighting Interface)
- fully digital lamp management for flash-free starting at any dimming level
- operating frequency ~40–100 kHz

- integrated SMART interface
- Intelligent Voltage Guard (overvoltage indication and undervoltage protection)
- Intelligent Temperature Guard (Protection against thermal failure)
- automatically triggered adjustable emergency light value for DC and rectified AC voltage
- SMART Heating Concept for optimum filament electrode at any dimming level and disconnectable heating in operation for maximum energy efficiency
- plugADDRESSING

- extensive diagnostic options
- the emergency light value can be set between 1 % and 100 %
- backwards compatibility adjustable
- DALI-MEMORY and corridorFUNCTION

Packaging:
360 mm housing
box of 10
76 boxes/pallet
760 pieces/pallet

425 mm housing
box of 25
33 boxes/pallet
825 pieces/pallet

Certified:
EN 55015
EN 55022
EN 60929
EN 61000-3-2
EN 61347-2-3
EN 61547
Suitable for emergency installations according to EN 50172

Extensive feedback functions and adjustable parameters:

- OEM-specific reserved memory for storing customer data in the ballast

Lamp	Ballast	article number	length L mm	fixing centres D mm	weight kg	circuit power W @	lamp power W @	current at 230 V / 50 Hz A @	λ at 230 V / 50 Hz	tc point °C	temperature range °C ①
1x14	PCA 1x14/24 T5 EXCEL one4all Ip x!tec	22176178	360	350	0.25	16.3	14	0.08	0.95	80	-25 → +60
2x14	PCA 2x14/24 T5 EXCEL one4all Ip x!tec	22176179	360	350	0.28	31.7	2x14	0.15	0.97	80	-25 → +60
1x24	PCA 1x14/24 T5 EXCEL one4all Ip x!tec	22176178	360	350	0.25	25.8	23	0.12	0.97	80	-25 → +60
2x24	PCA 2x14/24 T5 EXCEL one4all Ip x!tec	22176179	360	350	0.28	52.1	2x23	0.23	0.98	85	-25 → +60
1x21	PCA 1x21/39 T5 EXCEL one4all Ip x!tec	22176176	360	350	0.25	23.8	21	0.11	0.95	85	-25 → +60
2x21	PCA 2x21/39 T5 EXCEL one4all Ip x!tec	22176177	425	415	0.35	46.0	2x21	0.21	0.97	80	-25 → +60
1x39	PCA 1x21/39 T5 EXCEL one4all Ip x!tec	22176176	360	350	0.25	42.3	38	0.20	0.97	85	-25 → +60
2x39	PCA 2x21/39 T5 EXCEL one4all Ip x!tec	22176177	425	415	0.35	84.1	2x38	0.38	0.99	85	-25 → +60
1x28	PCA 1x28/54 T5 EXCEL one4all Ip x!tec	22176174	360	350	0.26	30.9	28	0.15	0.95	80	-25 → +60
2x28	PCA 2x28/54 T5 EXCEL one4all Ip x!tec	22176175	425	415	0.35	62.1	2x28	0.28	0.97	80	-25 → +60
1x54	PCA 1x28/54 T5 EXCEL one4all Ip x!tec	22176174	360	350	0.26	60.0	54	0.27	0.98	85	-25 → +60
2x54	PCA 2x28/54 T5 EXCEL one4all Ip x!tec	22176175	425	415	0.35	118.4	2x54	0.53	0.99	85	-25 → +55
1x35	PCA 1x35/49/80 T5 EXCEL one4all Ip x!tec	22176172	360	350	0.27	38.8	35	0.18	0.97	80	-25 → +60
2x35	PCA 2x35/49 T5 EXCEL one4all Ip x!tec	22176173	425	415	0.34	76.4	2x35	0.33	0.97	80	-25 → +60
1x49	PCA 1x35/49/80 T5 EXCEL one4all Ip x!tec	22176172	360	350	0.27	53.7	49	0.24	0.97	80	-25 → +60
2x49	PCA 2x35/49 T5 EXCEL one4all Ip x!tec	22176173	425	415	0.34	105.6	2x49	0.47	0.98	85	-25 → +60
1x80	PCA 1x35/49/80 T5 EXCEL one4all Ip x!tec	22176172	360	350	0.37	86.9	79	0.39	0.98	85	-25 → +60

① 10 °C to ta max: normal diming operation

-25 °C to +10 °C: dimming operation from 100 % to 30 %.

-25 °C to +10 °C, dimming below 30 %: Ballast could shut down but will not cause failure. This applies to AC and DC operation.

② valid at 100 % light output

**Electronic ballasts for dimming to 1 %
Linear lamps T5, 16 mm high efficiency, high output**

Lamp starting characteristics:

Warm start
Starting time 0.5 s with AC
Starting time 0.2 s with DC
Start at any dimming level

AC operation:

Mains voltage
220–240V 50/60 Hz
198–264V 50/60 Hz including safety
tolerance ($\pm 10\%$)
202–254V 50/60 Hz including performance
tolerance ($+6\% / -8\%$)

DC operation:

220–240V 0 Hz
198–280V 0 Hz certain lamp start
176–280V 0 Hz operating range
Use in emergency lighting installations according to
EN 50172 or for emergency luminaires according
to EN 61347-2-3 appendix J.

Emergency units:

The "PCA T5 EXCEL one4all lp x!tec" ballasts are compatible with all emergency units from TridonicAtco. See the table in the data sheet. Also all "5-pole" emergency units can be used. When used with other emergency units tests are necessary.

Temperature range:

Unlimited dimming range from 10 °C to ta max.
-25 °C to +10 °C: dimming operation from 100 % to 30 %. If dimm level goes below 30 % malfunction possible, but no electronic ballast damage.
This applies to AC and DC operation.

Mains currents in DC operation (at 70 % light output):

wattage W	Ballast type	Mains current at $U_n = 220 V_{dc}$	Mains current at $U_n = 240 V_{dc}$
1x14	PCA 1x14/24 T5 EXCEL one4all lp x!tec	0.06 A	0.06 A
2x14	PCA 2x14/24 T5 EXCEL one4all lp x!tec	0.12 A	0.12 A
1x24	PCA 1x14/24 T5 EXCEL one4all lp x!tec	0.10 A	0.09 A
2x24	PCA 2x14/24 T5 EXCEL one4all lp x!tec	0.20 A	0.18 A
1x21	PCA 1x21/39 T5 EXCEL one4all lp x!tec	0.09 A	0.08 A
2x21	PCA 2x21/39 T5 EXCEL one4all lp x!tec	0.17 A	0.16 A
1x39	PCA 1x21/39 T5 EXCEL one4all lp x!tec	0.15 A	0.14 A
2x39	PCA 2x21/39 T5 EXCEL one4all lp x!tec	0.30 A	0.28 A
1x28	PCA 1x28/54 T5 EXCEL one4all lp x!tec	0.11 A	0.11 A
2x28	PCA 2x28/54 T5 EXCEL one4all lp x!tec	0.21 A	0.20 A
1x54	PCA 1x28/54 T5 EXCEL one4all lp x!tec	0.21 A	0.20 A
2x54	PCA 2x28/54 T5 EXCEL one4all lp x!tec	0.42 A	0.38 A
1x35	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	0.14 A	0.13 A
2x35	PCA 2x35/49 T5 EXCEL one4all lp x!tec	0.26 A	0.24 A
1x49	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	0.18 A	0.17 A
2x49	PCA 2x35/49 T5 EXCEL one4all lp x!tec	0.36 A	0.33 A
1x80	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	0.30 A	0.27 A

Ballast lumen factor AC operation (AC-BLF) EN 60929 8.1:

wattage W	Ballast type	AC-BLF at $U_n = 230 V_{AC}$
1x14	PCA 1x14/24 T5 EXCEL one4all lp x!tec	1.00
2x14	PCA 2x14/24 T5 EXCEL one4all lp x!tec	0.99
1x24	PCA 1x14/24 T5 EXCEL one4all lp x!tec	1.01
2x24	PCA 2x14/24 T5 EXCEL one4all lp x!tec	1.02
1x21	PCA 1x21/39 T5 EXCEL one4all lp x!tec	1.03
2x21	PCA 2x21/39 T5 EXCEL one4all lp x!tec	1.02
1x39	PCA 1x21/39 T5 EXCEL one4all lp x!tec	1.02
2x39	PCA 2x21/39 T5 EXCEL one4all lp x!tec	1.02
1x28	PCA 1x28/54 T5 EXCEL one4all lp x!tec	1.00
2x28	PCA 2x28/54 T5 EXCEL one4all lp x!tec	1.01
1x54	PCA 1x28/54 T5 EXCEL one4all lp x!tec	1.00
2x54	PCA 2x28/54 T5 EXCEL one4all lp x!tec	1.01
1x35	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	0.99
2x35	PCA 2x35/49 T5 EXCEL one4all lp x!tec	0.98
1x49	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	1.02
2x49	PCA 2x35/49 T5 EXCEL one4all lp x!tec	1.00
1x80	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	1.02

The ballast lumen factor for AC operation (AC-BLF) does not alter from $U_n = 198 V_{AC}$ to $U_n = 254 V_{AC}$.
The ballast lumen factor for DC operation (DC-BLF) on the basis of an automatic power reduction of the ballasts (default value is 70 %) will be smaller than AC. It does not alter in the DC operating range (198–280Vdc).

Harmonic distortion in the mains supply (at 230V/50 Hz):

wattage W	Ballast type	THD	3	5	7	9	11
1x14	PCA 1x14/24 T5 EXCEL one4all lp x!tec	10.2	5.4	6.1	3.2	2.2	1.6
2x14	PCA 2x14/24 T5 EXCEL one4all lp x!tec	7.8	4.3	2.5	2.5	2.7	2.2
1x24	PCA 1x14/24 T5 EXCEL one4all lp x!tec	6.1	4.6	1.1	1.2	1.2	1.2
2x24	PCA 2x14/24 T5 EXCEL one4all lp x!tec	4.8	3.2	1.4	2.0	1.3	1.2
1x21	PCA 1x21/39 T5 EXCEL one4all lp x!tec	8.1	5.9	2.4	2.5	2.5	1.6
2x21	PCA 2x21/39 T5 EXCEL one4all lp x!tec	7.2	3.6	4.4	2.5	1.5	1.5
1x39	PCA 1x21/39 T5 EXCEL one4all lp x!tec	7.0	5.5	1.1	2.1	1.5	1.3
2x39	PCA 2x21/39 T5 EXCEL one4all lp x!tec	5.3	4.0	2.5	1.8	0.6	0.9
1x28	PCA 1x28/54 T5 EXCEL one4all lp x!tec	9.1	3.1	3.1	3.4	3.3	3.3
2x28	PCA 2x28/54 T5 EXCEL one4all lp x!tec	10.0	7.3	1.7	2.1	2.2	1.9
1x54	PCA 1x28/54 T5 EXCEL one4all lp x!tec	5.6	3.5	1.5	1.6	1.1	1.3
2x54	PCA 2x28/54 T5 EXCEL one4all lp x!tec	8.9	8.5	1.4	1.5	0.7	0.7
1x35	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	9.1	6.0	4.2	2.2	1.9	1.8
2x35	PCA 2x35/49 T5 EXCEL one4all lp x!tec	8.7	7.2	1.4	1.4	1.4	0.9
1x49	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	9.6	7.8	4.3	1.8	1.0	1.0
2x49	PCA 2x35/49 T5 EXCEL one4all lp x!tec	7.8	7.5	0.6	1.1	0.6	0.7
1x80	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	8.1	7.8	1.6	0.6	0.5	0.6

Dimming:

Dimming curve is adapted to the eye sensitiveness.
Dimming range 1 % to 100 %

Digital control with:

- DSI signal: 8 bit Manchester Code
Speed 1 % to 100 % in 1.4 s
- DALI signal: 16 bit Manchester Code
Maximum speed 1 % to 100 % in 550 ms
(adjustable between 50 ms and 90 s)
Programmable parameter:
Minimum dimming level
Maximum dimming level
Default minimum = 1 %
Default maximum = 100 %

Control input (DA/D1, DA/D2):

Digital DALI signal or a push-to-make switch (switchDIM) can be wired on the same terminals (DA and DA).

Digital signal DALI/DSI:

The control input is non-polar and protected against accidental connection with a mains voltage up to 264V. The control signal is not SELV. Control cable has to be installed in accordance to the requirements of low voltage installations.
Different functions depending on each module.

SMART interface:

An additional interface for the direct connection of the SMART-LS II Ip¹⁾ light sensor. The sensor registers actual ambient light and maintains the individually defined lux level.

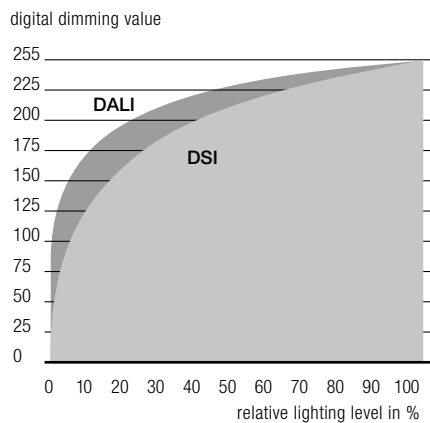
After every mains reset the SMART interface automatically checks for an installed sensor. With the sensor installed the PCA T5 EXCEL one4all Ip x:tec automatically runs in the constant lux level mode.
ON/OFF switch via mains, switchDIM or DALI/DSI signal.

DALI/DSI signal = 0 switches off,
DALI/DSI signal ≥ 1 switches on.
With relative DALI dimming commands (e.g. up, down etc.) or switchDIM signals it is possible to change the controlled light level temporarily.
Temporarily means that after a switching cycle OFF/ON command the ballast will start at the preset value determined by the SMART-LS II Ip. The installation of the two wire bus is according to the appropriate low voltage regulations.

¹⁾ SMART-LS II Ip: article number 86458258

Dimming characteristics

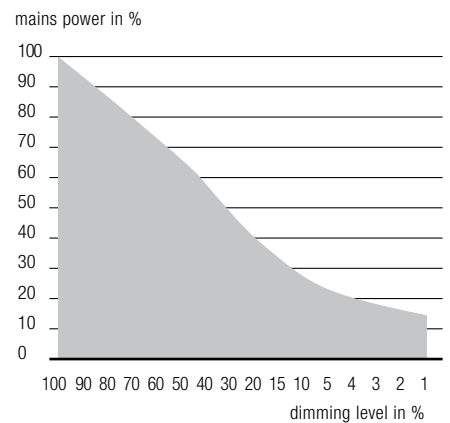
PCA T5 EXCEL one4all Ip x:tec



Dimming characteristics as seen by the human eye

Energy saving

PCA T5 EXCEL one4all Ip x:tec

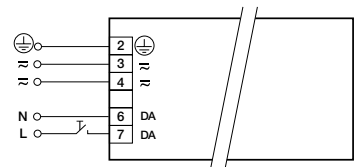


switchDIM:

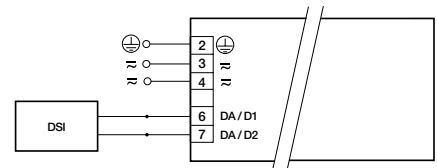
Integrated switchDIM function allows a direct connection of a push to make switch for dimming and switching.
Brief push (< 0.6 s) switches ballast ON and OFF. The ballasts switch-ON at light level set at switch-OFF.
When the push to make switch is held, PCA ballasts are dimmed. After repush the PCA is dimmed in the opposite direction.
The switchDIM fade time is set to 3 s from min. to max. in the factory settings. With a 20 s push to the push to make switch this fade time can be changed to 6 s. In this instance the switchDIM application will be synchronized to 50 % light level after 10 s and after 20 s the light level rises to 100 % with the new fade time.
At every synchronization (10 s keystroke) the device will reset to 3 s (factory setting)
In installations with PCAs with different dimming levels or opposite dimming directions (e.g. after a system extension), all PCAs can be synchronized to 50 % dimming level by a 10 s push.
Use of push to make switch with indicator lamp is not permitted.

Backwards compatibility:

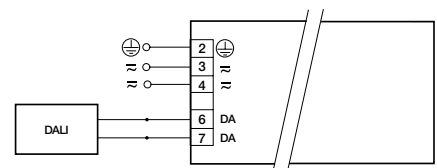
With a simple key combination a PCA T5 EXCEL one4all Ip x:tec can be reset as a normal PCA EXCEL Ip from the previous generation. Synchronisation simply has to take place three times within one minute (3 x 10 s).
To activate the "x:tec" settings again, synchronisation has to take place four times within one minute.



switchDIM PCA T5 EXCEL one4all Ip x:tec



DSI PCA T5 EXCEL one4all Ip x:tec



DALI PCA T5 EXCEL one4all Ip x:tec

Loading of automatic circuit breakers:

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20
Installation Ø	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²
PCA 1x14/24 T5 EXCEL one4all Ip x:tec	50	80	150	180	25	40	75	90
PCA 2x14/24 T5 EXCEL one4all Ip x:tec	24	34	48	52	12	17	24	26
PCA 1x21/39 T5 EXCEL one4all Ip x:tec	34	50	76	86	17	25	38	43
PCA 2x21/39 T5 EXCEL one4all Ip x:tec	16	22	30	36	8	11	15	18
PCA 1x28/54 T5 EXCEL one4all Ip x:tec	24	34	48	52	12	17	24	26
PCA 2x28/54 T5 EXCEL one4all Ip x:tec	14	20	26	32	7	10	13	16
PCA 1x35/49/80 T5 EXCEL one4all Ip x:tec	16	22	30	34	8	11	15	17
PCA 2x35/49 T5 EXCEL one4all Ip x:tec	14	20	26	32	7	10	13	16

Continuous operation: to calculate the protective safety switch see main current, page 1



Intelligent Voltage Guard

Intelligent Voltage Guard is the name of the new electronic monitor from TridonicAtco. This innovative feature of the PCA family of control gear from TridonicAtco immediately shows if the mains voltage rises above or falls below certain thresholds. Measures can then be taken quickly to prevent damage to the control gear.

- If the mains voltage rises above approx. 305V (voltage depends on the ballast type), the lamp starts flashing on and off.
- This signal “demands” disconnection of the power supply to the lighting system.
- The active-current-control of these control gears is protected against failure caused by the high mains currents generated as a result of mains undervoltage. The switch off level depends on lamp wattage and is typically < 140V.



corridorFUNCTION

The corridorFUNCTION can be programmed in two different ways.

To program the corridorFUNCTION by means of software a DALI-USB interface is needed in combination with a DALI PS. The software can be the configTOOL, the pcaCONFIGURATOR or the corridorFUNCTION CONFIGURATOR.

To activate the corridorFUNCTION without using software a voltage of 230V simply has to be applied for five minutes at the switchDIM connection. The unit will then switch automatically to the corridorFUNCTION.

Note: If the corridorFUNCTION is wrongly activated in a switchDIM system (for example a switch is used instead of pushbutton), there is the option of installing a pushbutton and deactivating the corridorFUNCTION mode by five short pushes of the button within three seconds.



Intelligent Temperature Guard

The intelligent temperature guard protects the PCA T5 EXCEL one4all lp x!tec from thermal failure by reducing output power or switching off in case of operation above the thermal limits of the luminaire or ballast. Depending on the luminaire design, the ITG operates at about 5 to 10 °C above Tc temperature.



plugADDRESSING – simple handling, commissioning and wiring

The new plug&play solution simplifies handling. By attaching different colored marked plugs to the SMART-Interface, group addresses are assigned to the PCA T5 EXCEL one4all lp x!tec. This supersedes a single addressing and the devices can be put into operation without any additional programming. Another significant advantage of this concept is in case of exchange and no limits to 64 DALI addresses. Ideal for RGB applications and cost-effective system solutions with simple controllers. Simple – Quick – Plug & Play!

Operating voltage:

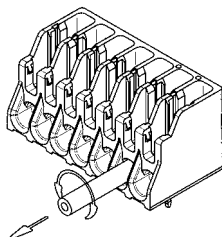
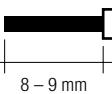
Wattage W	Ballast type	U _{out}
1x14	PCA 1x14/24 T5 EXCEL one4all lp x!tec	400 V
2x14	PCA 2x14/24 T5 EXCEL one4all lp x!tec	400 V
1x24	PCA 1x14/24 T5 EXCEL one4all lp x!tec	400 V
2x24	PCA 2x14/24 T5 EXCEL one4all lp x!tec	400 V
1x21	PCA 1x21/39 T5 EXCEL one4all lp x!tec	400 V
2x21	PCA 2x21/39 T5 EXCEL one4all lp x!tec	400 V
1x39	PCA 1x21/39 T5 EXCEL one4all lp x!tec	400 V
2x39	PCA 2x21/39 T5 EXCEL one4all lp x!tec	400 V
1x28	PCA 1x28/54 T5 EXCEL one4all lp x!tec	430 V
2x28	PCA 2x28/54 T5 EXCEL one4all lp x!tec	430 V
1x54	PCA 1x28/54 T5 EXCEL one4all lp x!tec	430 V
2x54	PCA 2x28/54 T5 EXCEL one4all lp x!tec	430 V
1x35	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	430 V
2x35	PCA 2x35/49 T5 EXCEL one4all lp x!tec	430 V
1x49	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	430 V
2x49	PCA 2x35/49 T5 EXCEL one4all lp x!tec	430 V
1x80	PCA 1x35/49/80 T5 EXCEL one4all lp x!tec	430 V

Installation instructions:

Wiring type and cross section:

The wiring can be solid cable with a cross section of 0.5 to 0.75 mm² for push terminal and 0.5 mm² for IDC terminal. For the push-wire connection you have to strip the insulation (8–9 mm).

wire preparation:
0.5 – 0.75 □



Loosen wire through
twisting and pulling

Wiring advice:

The lead length is dependent on the capacitance of the cable.

Ballast Type	Terminal		Maximum capacitance allowed	
	Cold	Hot	Cold	Hot
PCA 1/xx T5 EXCEL one4all lp x!tec	11, 12	9, 10	200 pF	100 pF
PCA 2/xx T5 EXCEL one4all lp x!tec	11, 12, 13, 14	9, 10, 15, 16	200 pF	100 pF

With standard solid wire 0.5/0.75 mm² the capacitance of the lead is 30–80 pF/m.

This value is influenced by the way the wiring is made.

Lamp connection should be made with symmetrical wiring.

Hot leads (9, 10, 15, 16) and cold leads (11, 12, 13, 14) should be separated as much as possible.

When using two or more dimmable ballasts in one luminaire with separate dimming controls, the lamp leads must be kept separate.

Dimmable ballasts from TridonicAtco have to be earthed.

