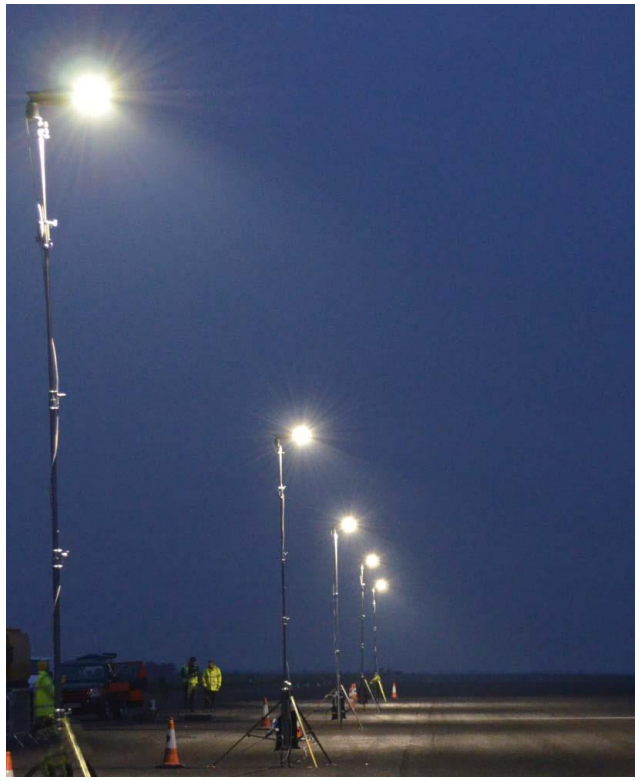


MD-SL Euro NCAP lighting system

“Imparting Knowledge”

Night test lighting introduction

AEB VRU 2018 night testing

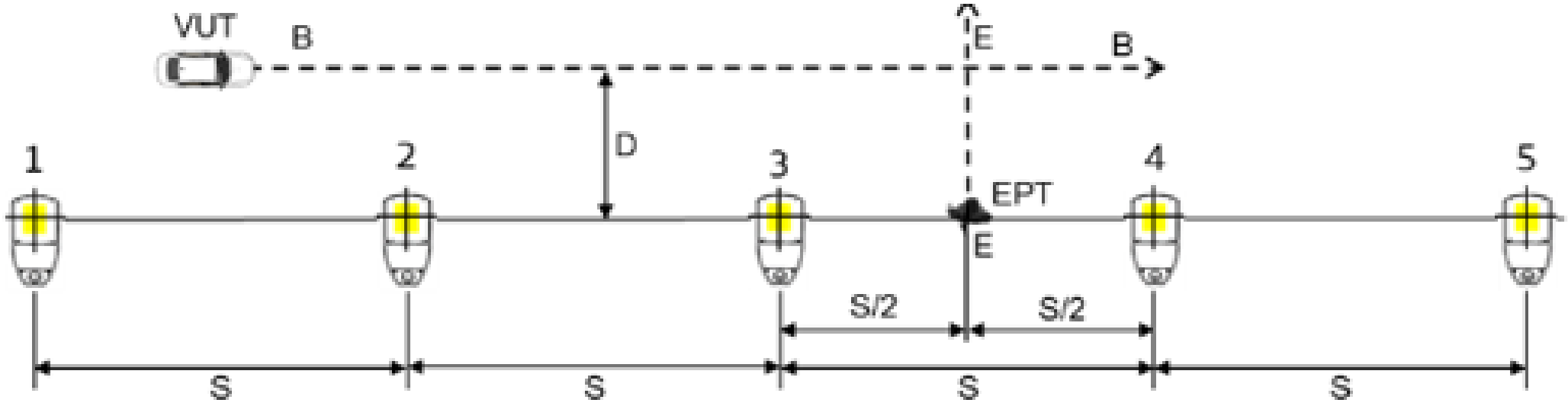
The AEB, FCW VRU testing protocol calls for some of the VRU testing to take place in night-time conditions.

The test is for the Vehicle Under Test (VUT) pedestrians (EPTa Adult/EPTc child), bicyclist and bike target (EBT)
All to be carried out according to lighting conditions that are set to strict tolerances.

Moshon Data (MD) have worked very hard to put together a lighting solution that will not only meet the lighting specification for the night test, but will provide a system allowing you to accurately align everything to the exacting tolerances.

The following slides will show how the MD lighting system addresses the challenges we face to meet the protocol.

The Euro NCAP test scenario



The MD-SL Lamp system is designed to fully create this test scenario out of the box…

Luminaires - specifications

- Zeta SmartScape Nano is a tuneable/dimmable LED designed to accurately meet Euro NCAP specification in variable night-time conditions

- A range of light colour temperatures are available upon request, ranging from 2700K - 6500K

- Schuch 48 is an LED luminaire with a fixed light output.

- Light colour 4000 K

- Referenced in the Euro NCAP protocol – but **not** a demand!!

	Zeta SmartScape Nano (L02 lens)	Schuch 48 2403 ABX CL*
Luminaire power	8-60 W	48 W
Luminous Efficacy	140 lm/W	138 lm/W
Luminous flux	6720 lm (@48 W)	6600 lm
Ambient temperature	-20 to +50 °C	-40 to +50 °C
Input Voltage	240 V or 12 V	240 V

Masts – Keyed and Standard

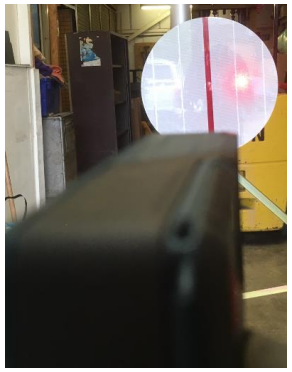
1. **Standard solution - Standard portable pneumatic mast –**
   - Each one very robust, constructed using 2 mm anodised aluminium.
   - Simple to deploy by a single person in under two minutes.
   - Extends to 5 m height (6 m option if required)
2. **Premier Solution - Keyed portable pneumatic mast –**

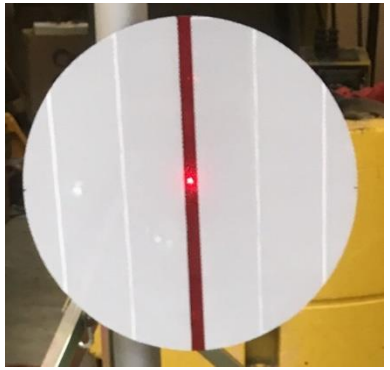
   > ***Same as Standard but:***

   - Constructed using 3.5mm anodised aluminium providing maximum strength and durability.
   - ***Is 'Keyed'*** – Refers to the 'Keyway' which runs the entire length of the mast to prevent the individual tube sections from turning independently. This allows alignment adjustment from the base using a graticule marker.
   - Includes a laser alignment kit to help align all 5 lamp heads to each other and perpendicular to the test track.

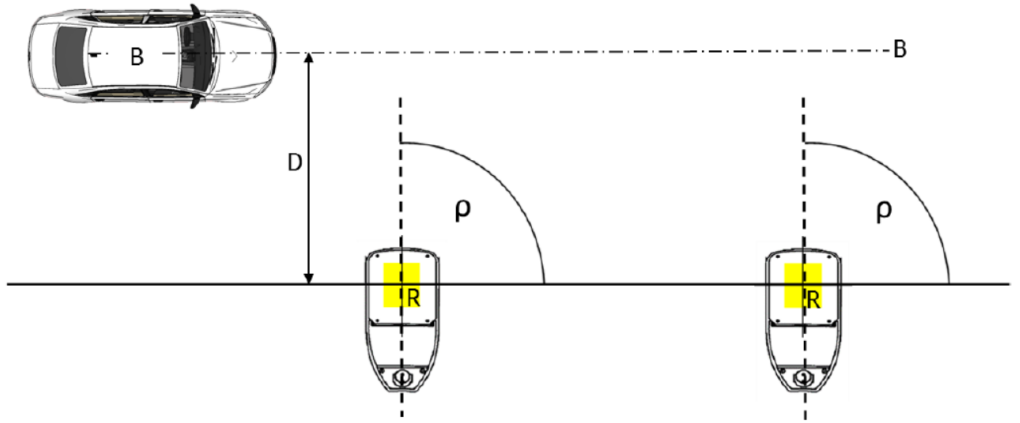
Orientation of lamp

- The Moshon Data lamp system uses a laser alignment tool that allows the orientation of each of the 5 lamps to be perfectly aligned to each other, and perpendicular to the test track.
- A highly machined graticule bearing on the turn able mast base ensures ease of lamp rotation and alignment to 0.1°





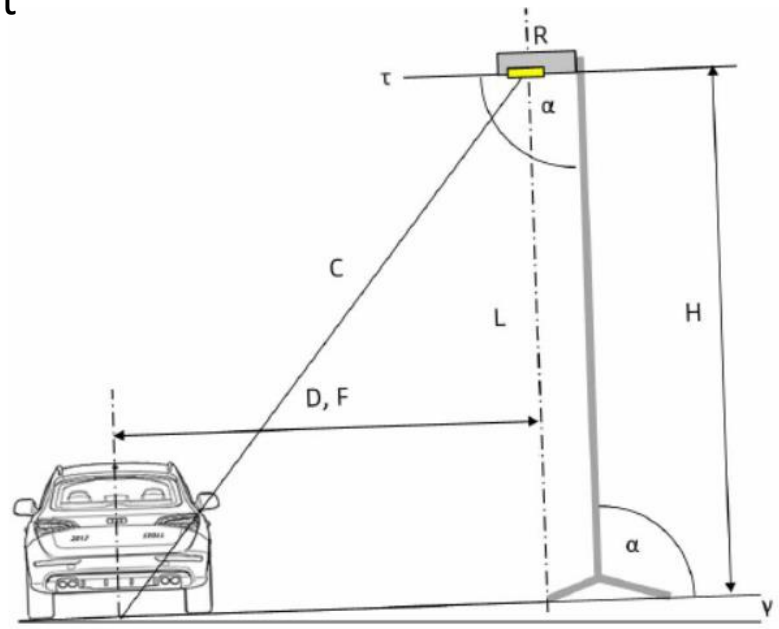
Orientation of lamp
In order to get well balanced light distribution, it is necessary that the rotation of the lamp in a range of:
ρ: 90° ± 0,1°



Alignment to the ground – lamp head

- A Wheeled base ready to be filled with concrete ensures the mast is already aligned accurately to the ground.
  - Adjustment is possible if required.

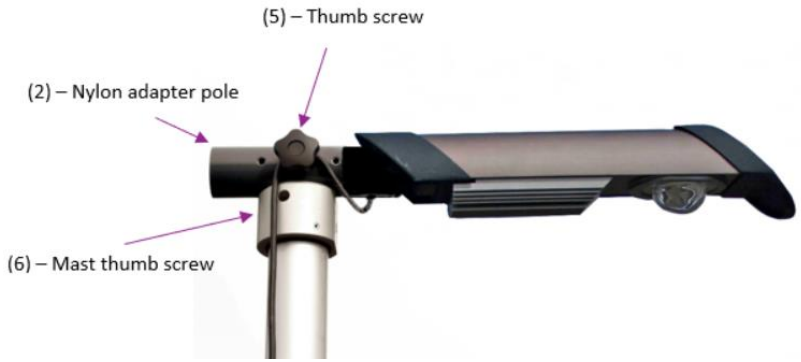
- With the portable Q-Pod option, mast can be aligned using a 90 deg set square to the ground.



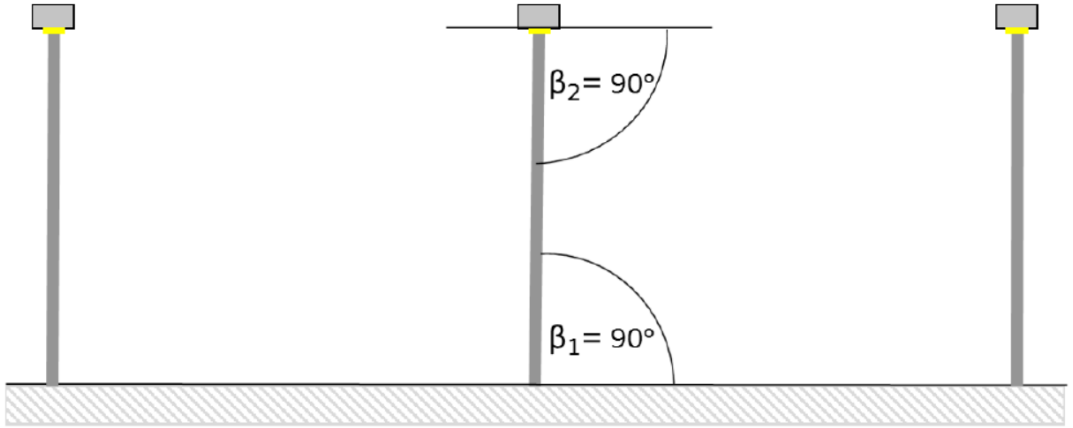
Longitudinal inclination of lamp

The inclination of the lamp on the pole rotation is required to be accurate to 0.5 deg.

- Each lamp head (Zeta or Schuch) sits on a 90 degree spigot, accurately machined to make alignment tolerances better than 0.5 deg
  - It is possible to refine this adjustment if required.



Longitudinal inclination of lamp
In order to get well balanced light distribution, it is necessary that the inclination of the lamp is in a range of:
β1,2: 90° ± 0.5°

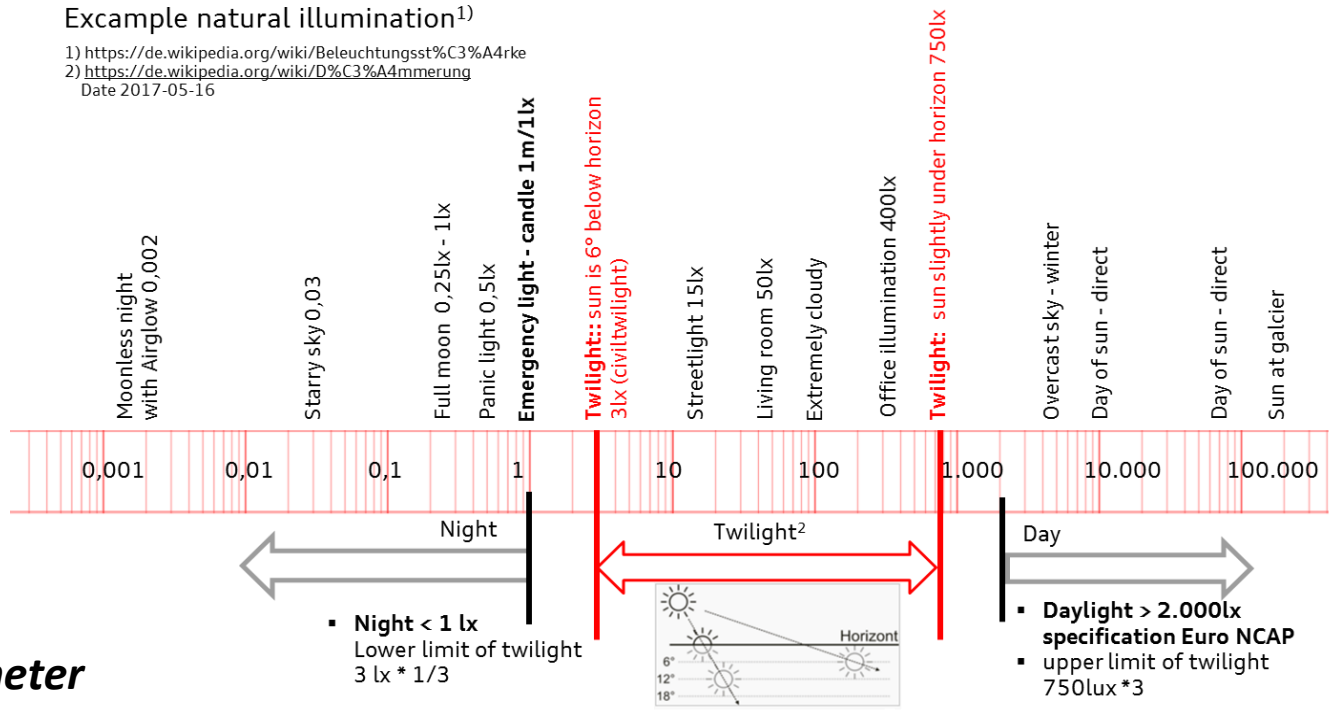


β1: inclination of lamp to ground
β2: inclination of lamp to pole

Light condition

Background illuminance
The background illumination is an additive value to the streetlight illumination.

Maximum of the background illumination on a test area during night shall be less than: < 1 lux



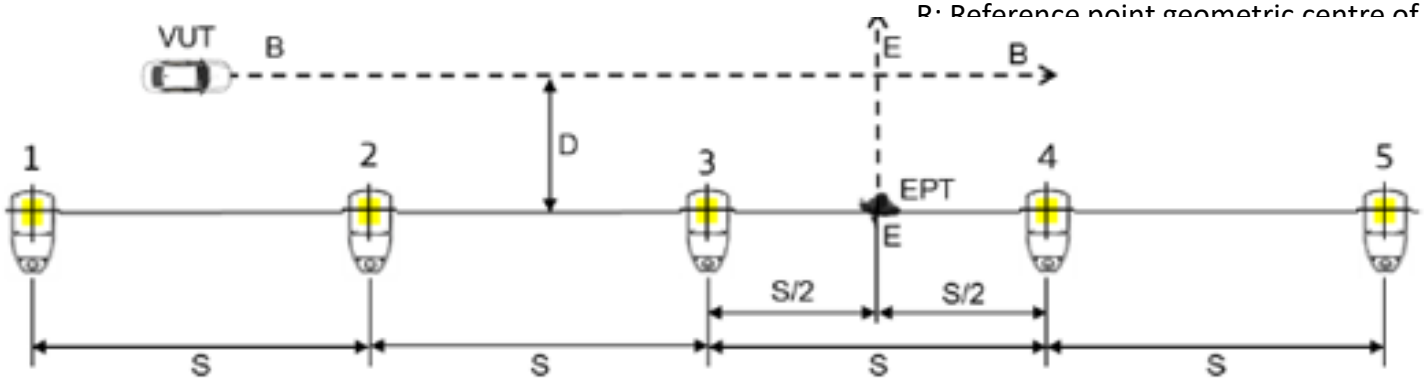
Konica-Minolta T-10A Lightmeter

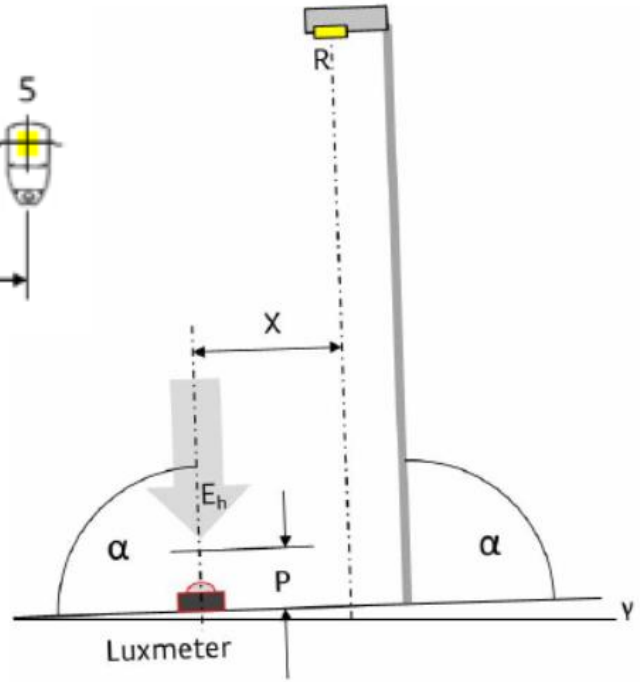
- ***Optional, but highly recommended if you don't have one:***
  - ***Will check that background luminance is in night range < 1 lux.***

Light condition

Eh: horizontal illumination

R: Reference point geometric centre of the light





The Konica Minolta T-10A will also help check that each test point on the VUT and EPT path is within the average tolerance …

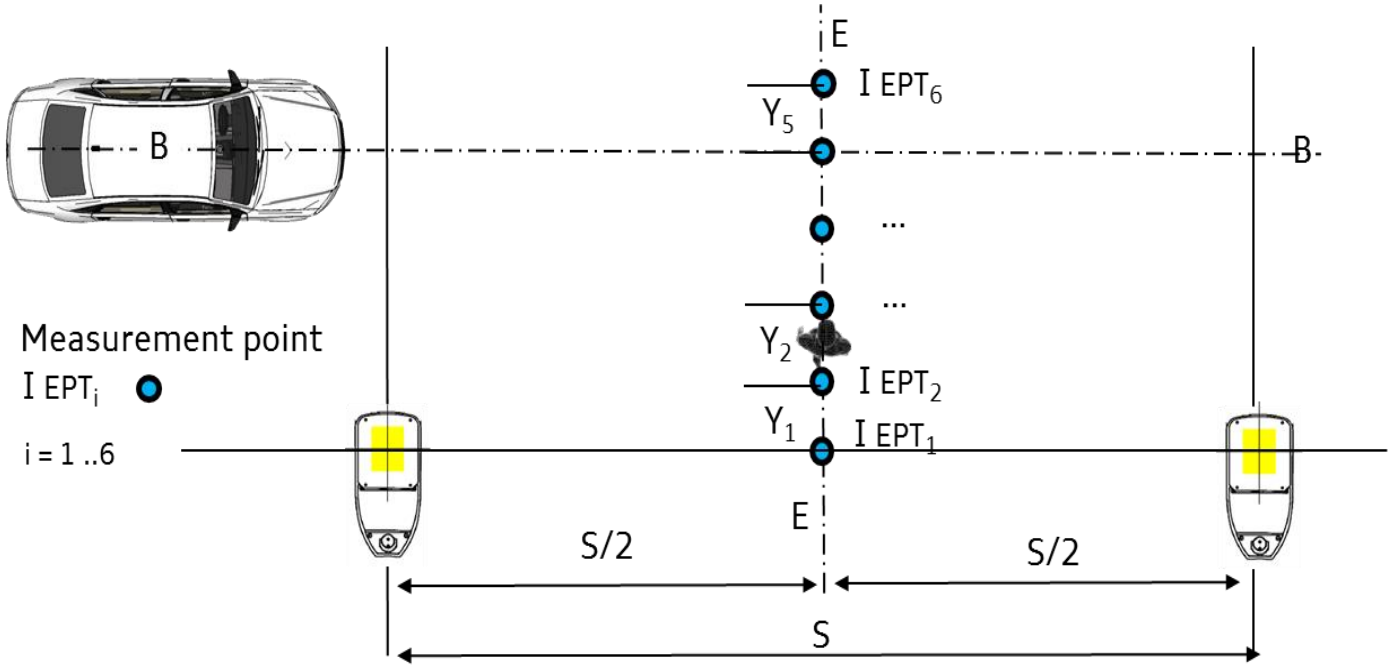
Light condition

Illuminance at EPT path

(Euro NCAP Pedestrian Target)

The illuminance along the EPT path, trajectory **EE** shall be at least **> 5 lux**

EE = Axis of centreline of pedestrian dummy

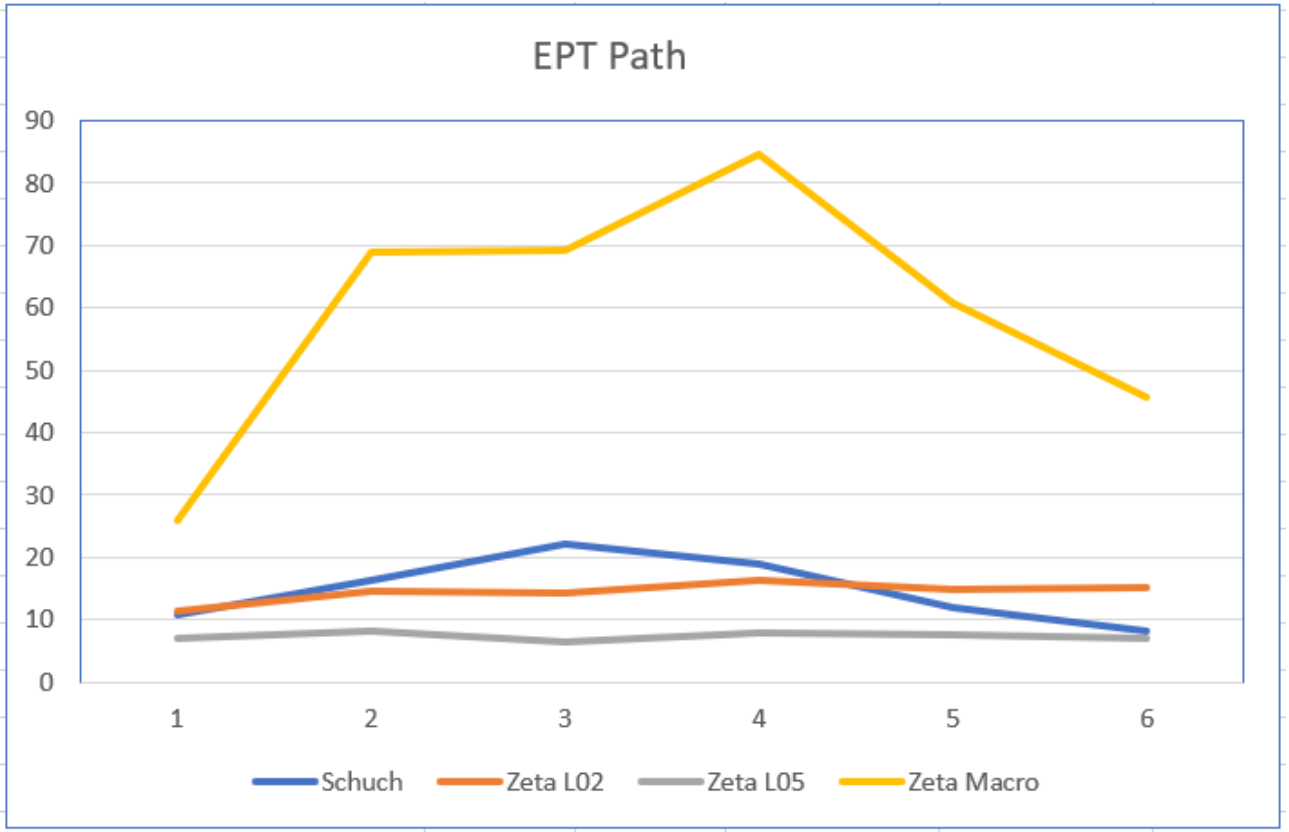


MD Luminaire comparison test results

EPT Path – specification > 5 lux

- All are in specification here

EPT Path			
Schuch	Zeta L02	Zeta L05	Zeta Macro
10.9	11.28	6.94	25.84
16.3	14.44	8.1	68.8
22.08	14.4	6.5	69.2
18.8	16.26	7.9	84.6
11.9	14.86	7.66	60.8
8.04	15.2	7.06	45.76
14.7	14.4	7.4	65.8



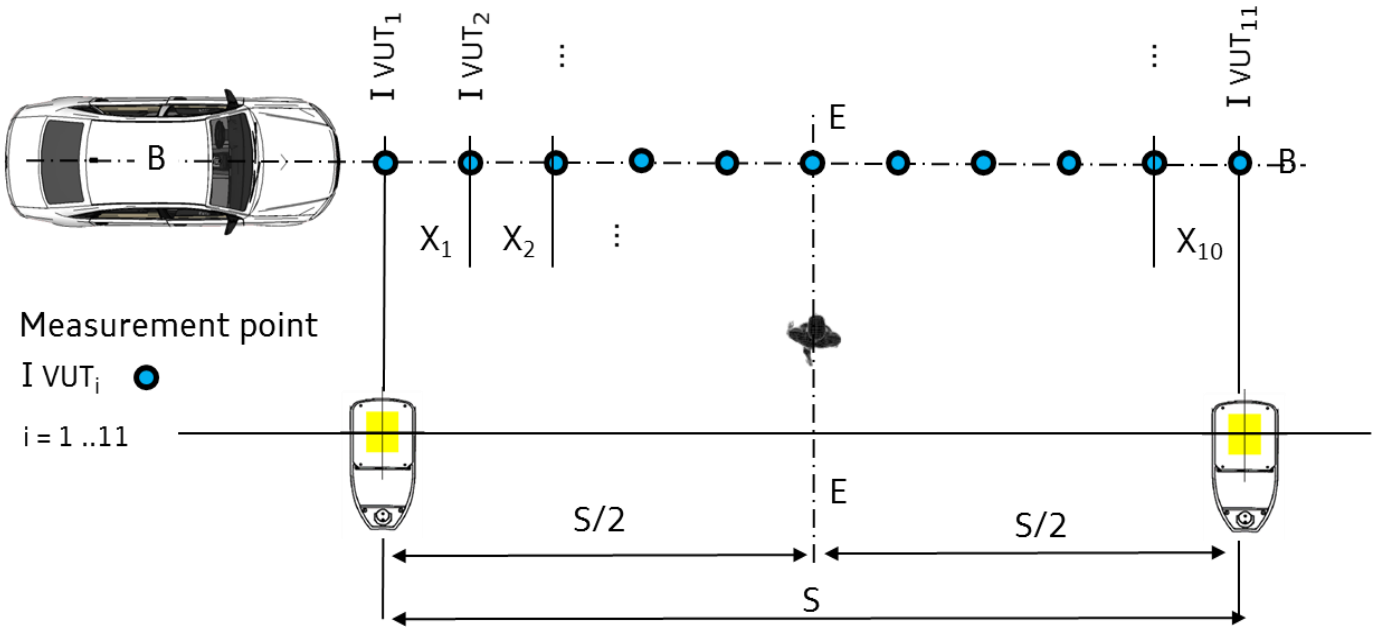
Light condition

Illuminance at VUT (test vehicle) path

The illuminance of VUT path (¯(I VUT)) is defined as an average of illuminance measurement points along the VUT path, trajectory **BB.**

BB = Axis of centreline of Vehicle under Test

The average illuminance shall be in a range of: **19 lux ± 3 lux**

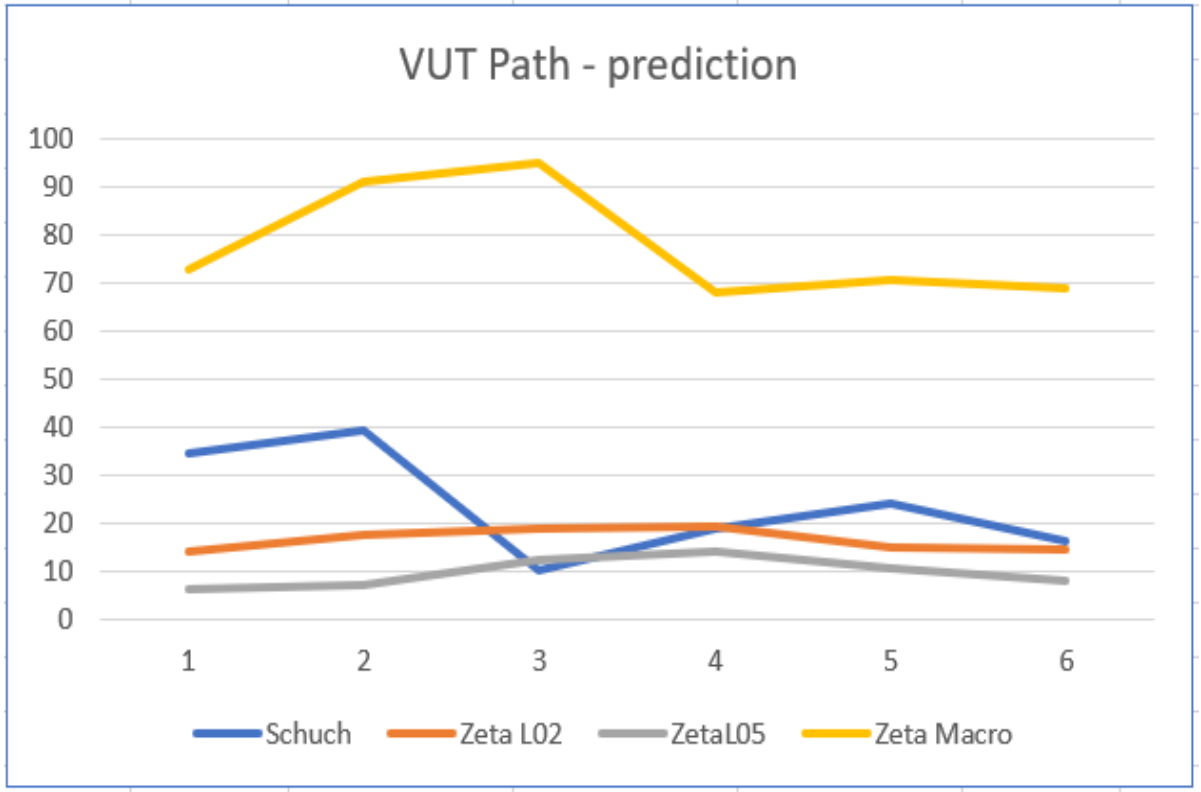


MD Luminaire comparison test results

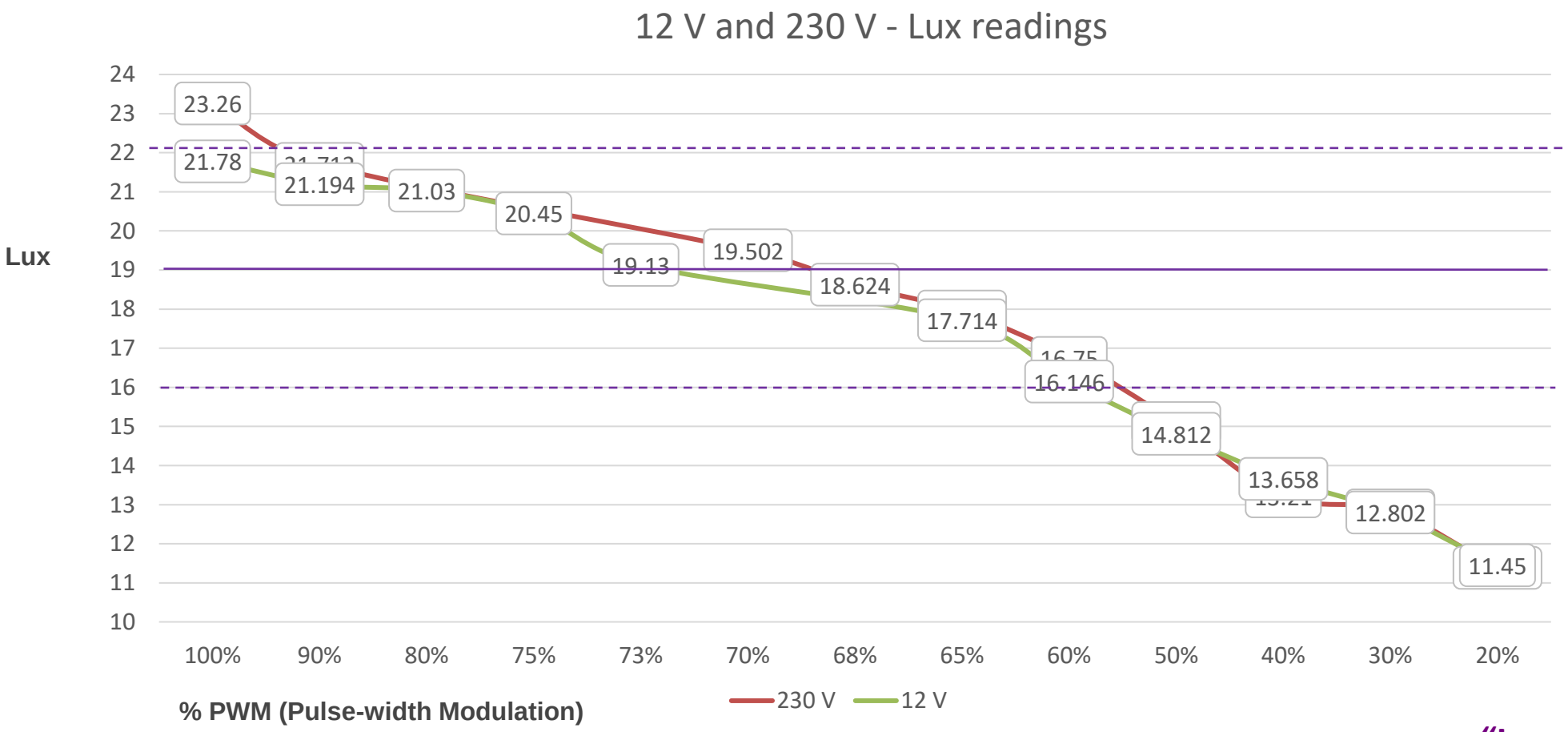
VUT Path – specification 19 +/- 3 lux

- Zeta (orange line) with the L02 lens in specification on three points (VUT2,3,4)
- Schuch (blue line) within specification on 2 points (VUT4,6).
    - *Full report is available from the MD website*
- *Further real world NCAP data has been collected in tests conducted by Thatcham UK from March 2018*

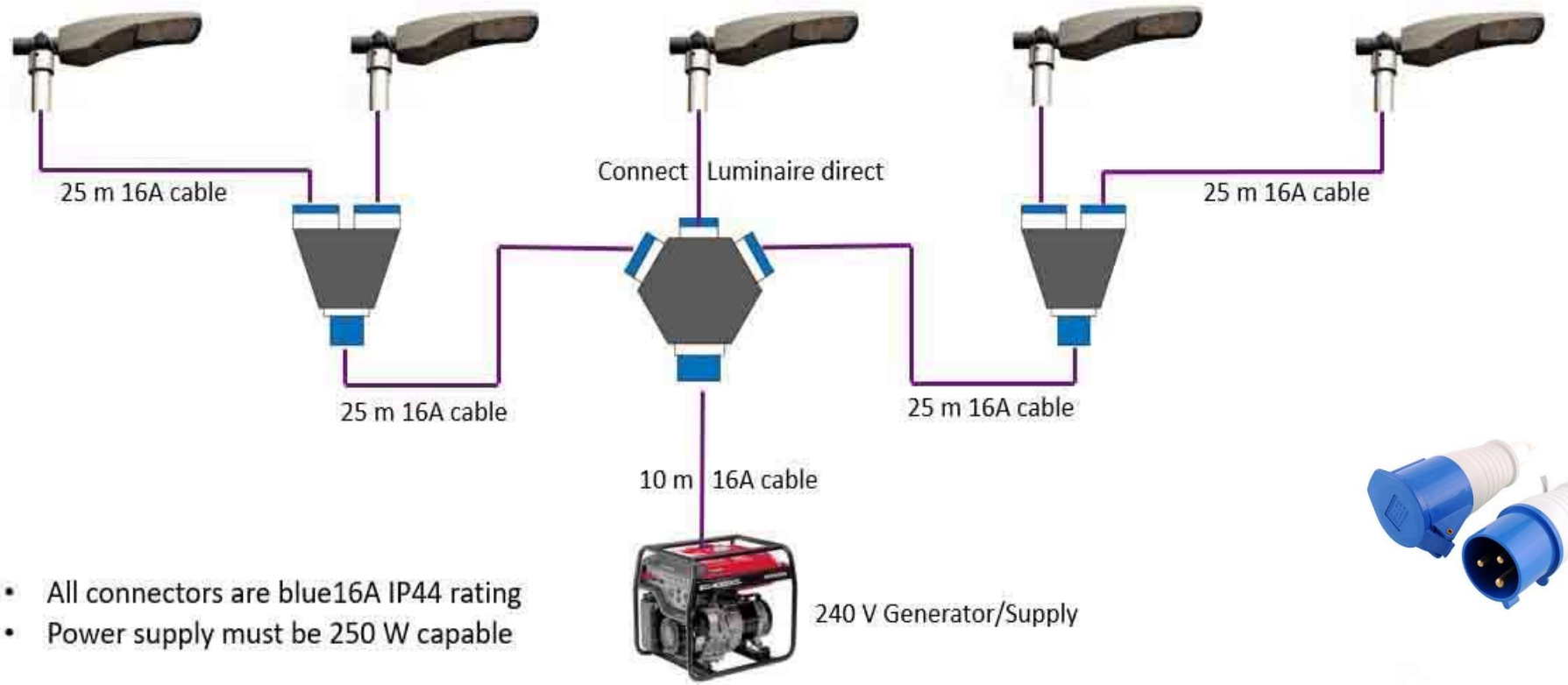
VUT Path					
Test point	Schuch	Zeta L02	ZetaL05	Zeta Macro	Notes
VUT1	34.6	14.25	6.23	72.8	no reduction - normal light from onelamp
VUT2	39.36	17.436	7.296	90.96	80% reduction on extra light overlap
VUT3	10.43	19.068	12.46	94.92	60% reduction on extra light overlap
VUT4	18.992	19.552	14.08	67.84	40% reduction on extra light overlap
VUT5	24.21	14.814	10.71	70.74	20% reduction on extra light overlap
VUT6	16.3	14.44	8.1	68.8	double
	24.0	16.6	10.5	78.7	



Zeta light output by % PWM chart



Cabling solution included



- All connectors are blue16A IP44 rating
- Power supply must be 250 W capable

MD-SL Lighting Products/Solutions

	Premier		Standard		Cost-Effective
Parameter	**MD-SLKZ**	**MD-SLKS**	**MD-SLZ**	**MD-SLS**	**MD-SL-PU**
Luminaire type	**Zeta SmartScape Nano (L02 lens)**	**Schuch 48 2403 ABX CL**	**Zeta SmartScape Nano (L02 lens)**	**Schuch 48 2403 ABX CL**	**Zeta (L02 lens)**
Mast type	**Keyed Pneumatic** *Same as Standard, but all sections stay aligned when turning from the base, graticule allows degree marked adjustment)*		**Standard Pneumatic** *integral hand pump, clampable collars, quick release air outtake valve*		**Push-Up** *Each section raised by pushing up manually and locking*
Laser Alignment kit included?	**YES**		**NO**		**NO**
Maximum wind speed resistance	**56 mph**		**56 mph**		**-**
IP Water ingress rating	**IP66 (head), IP44 (Connectors)**				
Base type	**Choice of Wheeled MD-MastBase or Q-Pod tripod**				**Integrated tripod included. Or optional Q-Pod or wheeled MD-Base**

Moshon DATA

Thank-you!