

## CMD2

### Condensation Management Device (CMD)

#### CMD 12V

Preserve the clarity, brilliance, and service life of today's high-value automotive headlamps.

#### **New Level of Protection**

For decades, OEMs and Tier suppliers have relied on technical advances that more effectively facilitated the release of moisture from headlamps. Now the new AML Condensation Management Device takes a different approach: rather than simply reducing moisture and clearing time, it actively removes moisture from lamp housings!

This new technology combines two levels of field-proven protection and never-before-achieved "third level".

This unprecedented combination sets new standards for reliably maintaining headlamp performance and longevity, with:

- Field-proven: Protection from dust, dirt, and water ingress.
- Field-proven: More responsive equalization of external and internal housing pressures.
- New Level of Protection: Active, ongoing moisture removal.

#### **True Condensation Control**

This technology is based on the principle of an ongoing pumping cycle:

- When the CMD is turned off, the device adsorbs moisture from the plastic housing, the air inside the housing, the headlamp's internal components and from the lens.
- When the CMD is turned on and the headlamp housing temperature is increasing, this technology desorbs moisture from the device and expels it to the environment.
- This active condensation control technology requires multiple cycles to bring the lamp to a steady dry state.
- The number of cycles will depend upon factors such as lamp size, type of plastic, and prevailing environmental conditions.

Once the CMD is installed, the headlamp is fully protected from dust, dirt, and water ingress.

## Performance

|                                |                                                |
|--------------------------------|------------------------------------------------|
| Temperature range of operation | -40 to 105°C                                   |
| Current consumption            | Peak ~1A / steady state 0,3A (@23°C)           |
| Weight                         | 55g                                            |
| Moisture removal               | Condensation prevention by dew point reduction |
| Durability                     | 15 years vehicle life                          |
| Typical operation cycle        | 30 minutes on, 11,5 hours off                  |

## Electrical connection & control

|                                               |                                                    |
|-----------------------------------------------|----------------------------------------------------|
| Voltage range / nominal                       | 9V to 16V, according to specifications / 13,5V     |
| Connection                                    | Tyco 1-968699-1A                                   |
| Operation mode                                | ON: +13,5V / OFF: open circuit                     |
| Solder                                        | No soldering                                       |
| EMC                                           | To be checked according to customer specifications |
| Connection cut and short cut to power/ ground | Moves in off position                              |

## Design features (see drawing for details)

|                      |                                                 |
|----------------------|-------------------------------------------------|
| Fixation on headlamp | Bayonet                                         |
| Dimensions           | Ø 59 x 33 mm                                    |
| Protection           | IPX4K, device sealed when assembled on headlamp |

Compare the benefits of this new AML CMD to the limits inherent in anti-fog coatings:

| CMD                                                                                                                                                                                                                             | Anti-Fog Coatings                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>actively reduces condensation</li><li>allows complete headlamp design flexibility: fully compatible with the most complex designs</li><li>device is stand-alone and serviceable</li></ul> | <ul style="list-style-type: none"><li>can only mask moisture/condensation</li><li>may limit design flexibility, as complex designs may be difficult to coat</li><li>may have lifetimes shorter than the warranty period</li></ul> |

This new AML CMD actively controls condensation, can be integrated into virtually any type of headlamp assembly, and offers extended performance life. These performance attributes make this technology particularly beneficial to high-value lamps... and higher customer expectations for extended and reliable performance.

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