

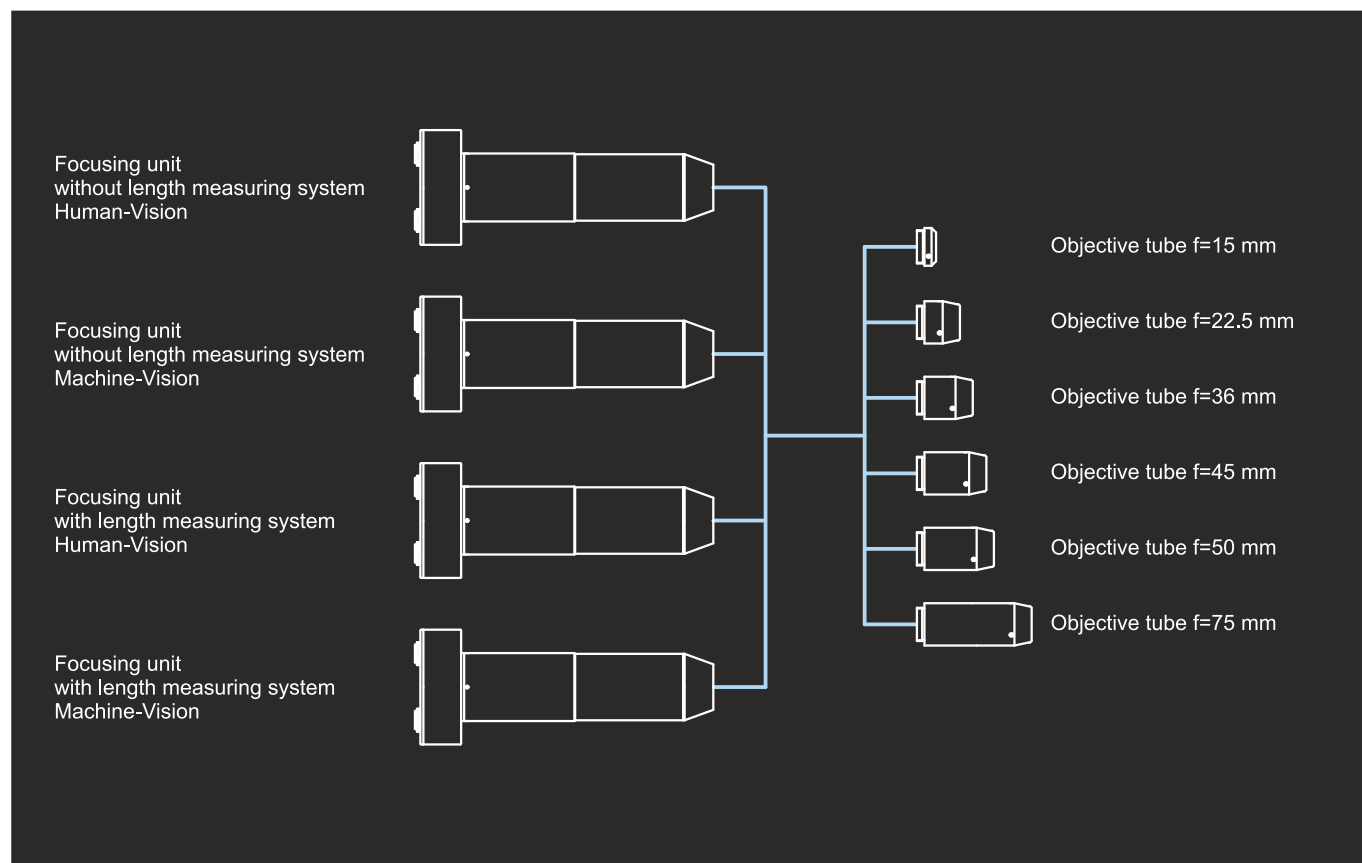
KM Product Line
Motorized Collimators



www.moeller-wedel-optical.com

Overview

The new motorized collimators from MÖLLER-WEDEL OPTICAL GmbH were developed for the "Active Alignment" of cameras for the automotive industry. A high-precision linear motion guide with a travel range of ± 9 mm is integrated in all collimators of the product line. As standard, the collimators are equipped with a reticle for MTF measurement (bright crossline on dark background, line width 10 μm). There are 6 different focal lengths available. These allow an ideal adaptation of the achievable image distances to the optics to be tested. Depending on the focal length, image distances from $+0.1$ m to $+\infty$ and from $-\infty$ to -0.1 m can be generated. Beside the focal length you can choose between a white light filter (color temperature approx. 5700K) for "Machine Vision" or a "Photopic Eye" filter (spectral centroid at approx. 520 nm) for "Human Vision" applications. For increased requirements on position reproducibility and repeatability, the system can be additionally equipped with a linear measuring system. This results 24 different collimator variants.



Due to the modular design of the collimators, the filter or the lens focal length can be exchanged by MÖLLER-WEDEL OPTICAL GmbH for any type of filter or lens and thus adapted to changing testing tasks.

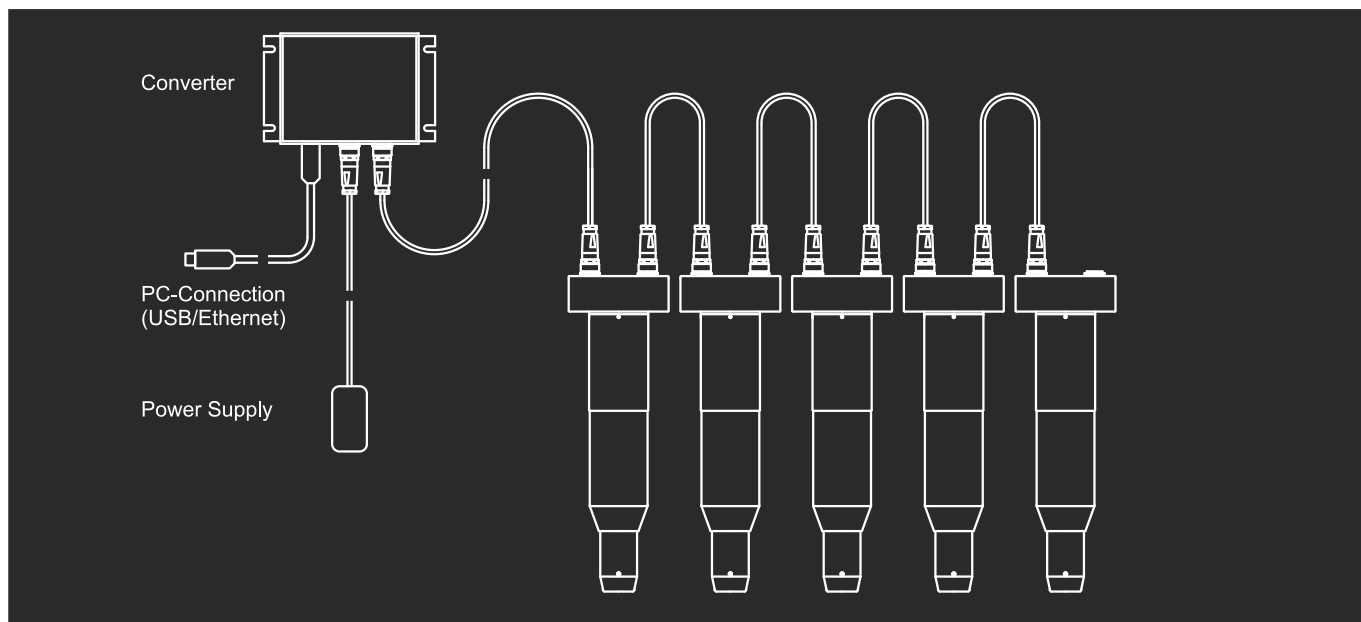
The achievable positioning accuracy (A), reproducibility (R1) and repeatability (R2) of the motorized collimators for unidirectional or bidirectional positioning depends on whether a length measurement system is used or not.

Collimator Type	Unidirectional (A/R1/R2)	Bidirectional (A/R1/R2)
with length measuring system (KMM)	$\pm 2 \mu\text{m} / 1 \mu\text{m} / 1 \mu\text{m}$	$\pm 3 \mu\text{m} / 1 \mu\text{m} / 1 \mu\text{m}$
without length measuring system (KMO)	$\pm 5 \mu\text{m} / 2 \mu\text{m} / 1 \mu\text{m}$	$\pm 10 \mu\text{m} / 2 \mu\text{m} / 1 \mu\text{m}$

The calibration procedure used for focus determination and the high positioning accuracy of the linear motion guide make it possible to adjust the reticle at the factory to $\pm 5 \mu\text{m}$ exactly into the focus of the objective used and to calibrate the average deviation from the ideal focus position as a zero reference for the system. Each collimator is delivered with a calibration certificate stating the positioning reproducibility, repeatability and the achieved infinity setting of the objective.

Hardware and Software Integration

The illumination unit and the complete control and evaluation electronics are located inside the collimator. Up to 98 collimators can be addressed, connected in series and controlled via a converter. The control commands can be integrated into the respective customer software and transmitted to the connected converter at a baud rate of 115200 Baud.



In addition to the simple software implementation, the series connection enables uncomplicated cabling and the possibility of quickly replacing collimators during maintenance. In the case of a replacement collimator, the address of the removed collimator must be transferred to the new collimator. The exchange can thus be carried out in the shortest possible time and without great effort. Each Collimator is delivered with one RS-485 connection cable.



Converter

One converter is required for each collimator system. The converter is supplied with the power supply and the connection cable (Ethernet/USB 2.0) to the PC/switch box.

Technical Data

Data Connection	Collimator – Converter: RS-485 Converter – PC: USB or Ethernet
Power Supply	8..24V, 3W
Connector on the Collimator	Binder 712 4-pol. socket current and data summarized
Format	UART, RS-485 level
Data rate	115200 Baud, 8N1

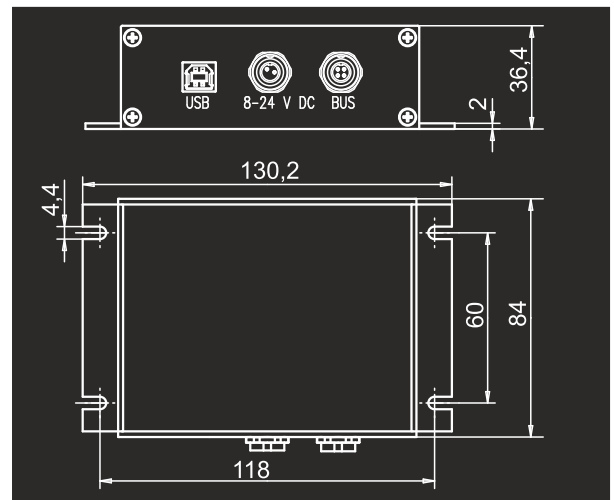


Dimensions

Focal length (mm)	L (mm)	D (mm)
15	8	25
22,5	14	25
36	27	25
45	36	25
50	41	25
75	69	30



The clamping range and clamping diameter is the same for all variants. This means that the user can continue to use the existing mechanical mounts even after the collimators have been modified to a different focal length by MÖLLER-WEDEL OPTICAL GmbH.



The converter is the same for all collimators. It can be supplied with a USB or Ethernet interface according to customer requirements.

Order Note

Product Line _____ **KMM 50/MV**

KM - collimator motorized

Measuring system _____

M - with length measuring system

0 - without length measuring system

Focal length _____

15 mm

22,5 mm

36 mm

45 mm

50 mm

75 mm

Filter _____

MV - Machine Vision

HV - Human Vision