GRIN Endoscopic Rod Lens Systems

GRIN endoscopic systems, which combine a GRIN objective lens, a GRIN relay lens and a GRIN eyepiece. Combining the system with a prism enables the change of the direction of view (see Fig. 2). Standard diameters are 0.5, 1.0 und 2.0 mm. We offer the systems in two different principle design options:

A. The objective lens creates a reduced intermediate image at the exit surface of the objective lens, which will be imaged by the relay lens 1:1 (if the lens length of the relay lens is a multiple of the period) or - 1:1 (if the lens length of the relay lens is an odd multiple of the half period) to the exit surface of the relay lens.

B. The objective lens creates a reduced intermediate image at the exit surface of the objective lens, which will be imaged by the relay lens (including the eyepiece in form of a ¼ pitch-lens (e.g. 0.75 pitch, 1.25 pitch, 1.75 pitch etc.) at infinity. Such a lens system is a complete endoscopic imaging system. It allows the direct observation with the human eye or the use of a conventional camera system (including camera lens).

Schematic view of the two designs:

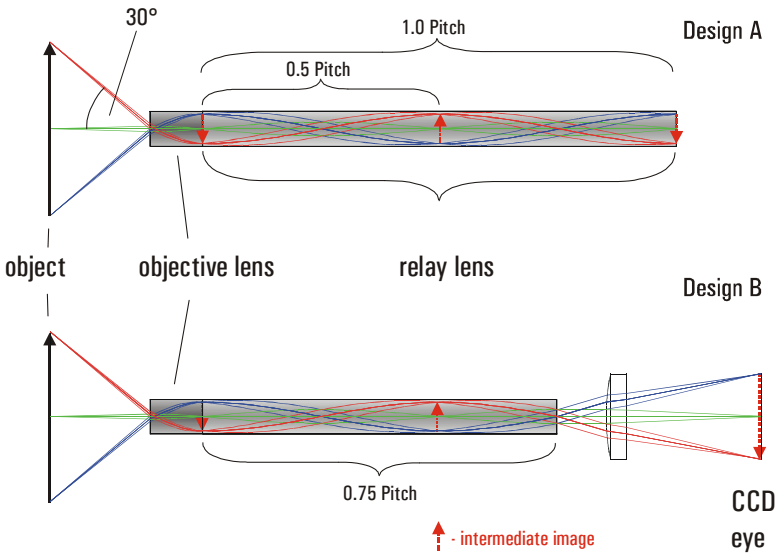

Fig. 1: Examples of designs for GRINTECH endoscopic systems. The pitch length can be increased by a whole number of the half pitch length in dependence on the requested endoscope length. Details are shown in table 1.

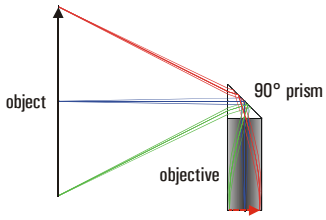

Fig. 2: Changing the direction of view of a GRIN lens by a 90° prism

Table 1: Example configurations of endoscopic systems

Design [Ø - pitch]	Diameter [mm]	Image orientation	System length [mm]	Comment
0.5 - 0.75	0.5	like Design B	approx. 23.9	with eyepiece
0.5 - 1.0	0.5	like Design A	approx. 31.5	without eyepiece
0.5 - 1.25	0.5	inverted to Design B	approx. 39.1	with eyepiece
0.5 - 1.5	0.5	inverted to Design A	approx. 46.6	without eyepiece
0.5 - 1.75	0.5	like Design B	approx. 54.1	with eyepiece
1.0 - 0.75	1.0	like Design B	approx. 36.0	with eyepiece
1.0 - 1.0	1.0	like Design A	approx. 47.0	without eyepiece
1.0 - 1.25	1.0	inverted to Design B	approx. 58.5	with eyepiece
1.0 - 1.5	1.0	inverted to Design A	approx. 69.5	without eyepiece
1.0 - 1.75	1.0	like Design B	approx. 80.0	with eyepiece
2.0 - 0.75	2.0	like Design B	approx. 81.0	with eyepiece
2.0 - 1.00	2.0	like Design A	approx. 106.5	without eyepiece
2.0 - 1.25	2.0	inverted to Design B	approx. 132.0	with eyepiece
2.0 - 1.5	2.0	inverted to Design A	approx. 157.0	without eyepiece
2.0 - 1.75	2.0	like Design B	approx. 183.0	with eyepiece

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We are happy to advise you. Please contact us.

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