



TECHNICAL DATA SECTION 10.5

ULO Optics

MULTI-ELEMENT ZNSE SCANNING LENSES, ZSD-15 & ZST-15 SERIES



Introduction

These doublet and triplet scanning lenses are intended to work with the same configuration of scanning mirrors and beam sizes as the 48TSL single-element lenses, but are offered at the shorter focal lengths where better performance is possible. The doublets have focal lengths from 75 to 300mm. Above 300mm the benefits of using a doublet are not great. The triplets are offered in two focal lengths, 75 and 100mm. These give diffraction limited performance and even further improvement over the corresponding doublet.

All the lenses are made from Laser Grade ZnSe, so offer a high power alternative to the original MSL/2/15 series doublets which contain a Germanium element.

Each of the lenses comes in a black anodised Aluminium mount and can also be fitted with a ZnSe protection window as an option.

Specifications

Material:	All elements and protection window made from Laser Grade ZnSe.
Mount details:	See Figure 10.51.
Beam diameter:	Up to 15mm (12mm $1/e^2$)
Optical scan field:	$\pm 20^\circ$ in X and Y.
Performance:	See Table 10.52 and Figure 10.53.
Focal length:	Within 1%.
Absorption:	< 0.25% per element.
Transmission:	> 99.6% per element coated AR/AR for 10.6 μ m.
Damage threshold:	CW 3000W/mm at 10.6 μ m.
Telecentricity:	The ZST-15-75 is nearly telecentric with a maximum beam inclination of 4.3 $^\circ$ to the normal.

See Table 10.53 for part numbers, focal lengths, working distances and performance.

Custom designs

The designs listed below are for a specific set of conditions that may not suit everyone's requirement. If you need a lens for another set of conditions, such as, a larger beam, different field size or focal length, or a telecentric design, then please contact us.

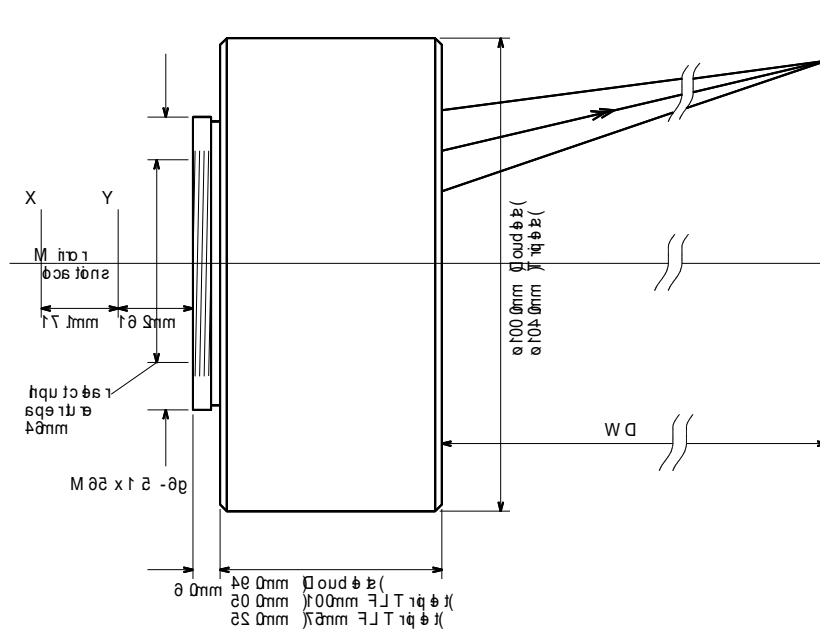


Fig. 10.51: Mount details.

Part no	Field size (mm sq)	Focal length (mm)	Average focused spot dia (μm)	Standard deviation of spot dia (μm)	Working distance, WD (mm)		Max. F θ error (%)	
					no window	with window	X axis	Y axis
ZSD-15-75	50	75.0	118	25	60.27	62.03	-2.4	-2.4
ZSD-15-100	70	100.0	139	22	87.57	89.34	-1.5	-1.4
ZSD-15-150	105	151.4	171	0	149.06	150.84	0.9	0.9
ZSD-15-200	140	200.0	225	0	213.94	215.73	1	1
ZSD-15-250	175	250.0	282	0	261.36	263.17	1.3	1.3
ZSD-15-300	210	300.0	338	0	312.06	313.87	1.5	1.5
ZST-15-75	50	75.3	89	4	78.52	80.37	-0.4	-0.5
ZST-15-100	70	100.0	113	1	107.14	108.90	0.03	0.02

Table 10.52: Performance data

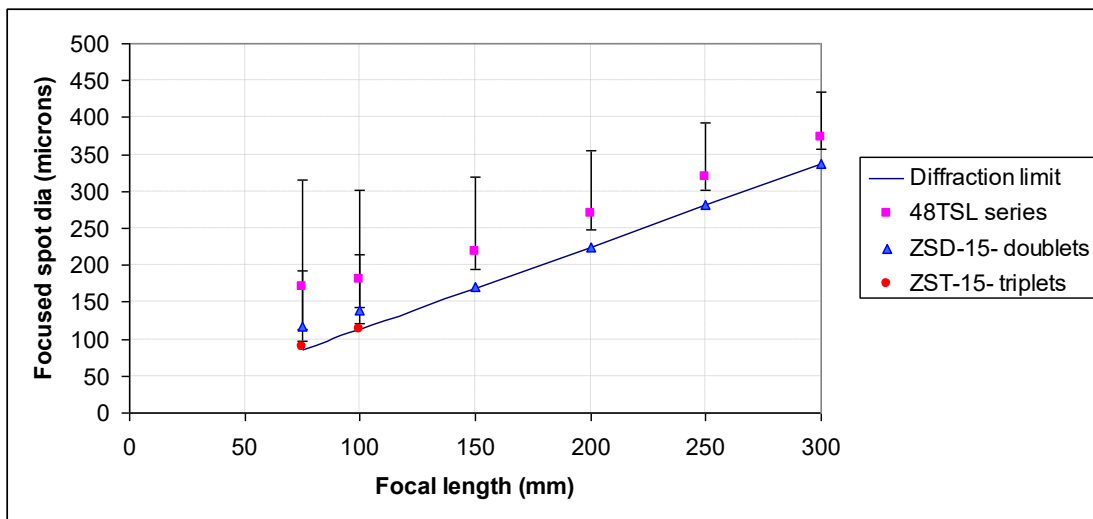


Figure 10.53: Focused spot size comparison