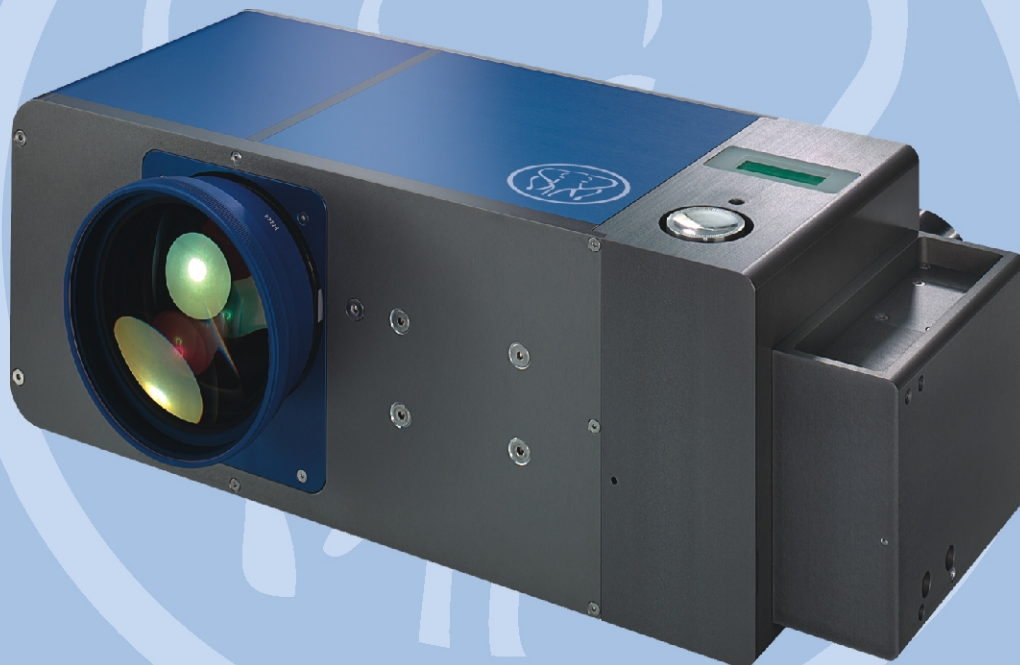




FIBER ELEPHANT

compact scan head series



FIBER ELEPHANT shown with optional VISION BOX

The ARGES scan head product line is available with a variety of apertures, mirror coatings and f-theta lenses as complete scan solution for industrial system manufacturers and integrators.

The electronic design in state of the art surface mount technology maximizes thermal stability, static and dynamic optical performance in robust housings.

The compact scan head series can be purchased with various interfaces: standard analog inputs, standard XY2-100 protocol but with up to 4 axes simultaneously or the ARGES proprietary interface implementing new features and Plug&Play operation.

The new ARGES scan heads are putting class leading performance into a series of functional designed and ultra compact housings.

For achromatic vision applications flat field lenses exhibit reduced performance and are very expensive or not available at all, e.g. for apertures higher than 31 mm.

The effective aperture of the FIBER ELEPHANT is up to 48 mm.

The FIBER ELEPHANT is a scan system integrating a fast, precise and tilt-free galvanometer controlled beam expander. The FIBER ELEPHANT is capable of adjusting the laser spot size on the target and lancing new emerging 3D applications.

The beam expander is mounted on an industry standard precision optical rail. Off-the-shelf optical elements can easily be added for beam shaping.

The FIBER ELEPHANT is specially designed for coupling fibers. The fiber mount is customized to the laser type. The FIBER ELEPHANT features a built in collimator with a focal length of 77 or 150 mm (other focal lengths on request). The distance between fiber end and collimator can be changed by a motorized axis.



- ① Customized fiber mount
- ② Optional VISION BOX with mount for CCD camera



FIBER ELEPHANT

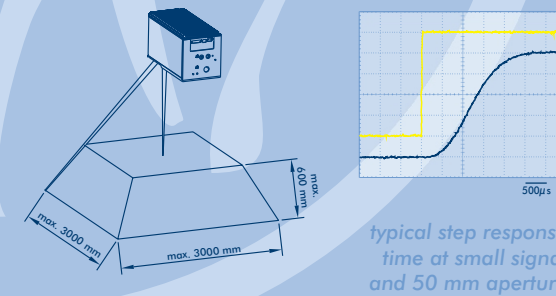
specifications

FIBER ELEPHANT aperture [mm]	24	36	50
step response time 1% of full scale [ms]	0.65	1.00	2.50
	1.05	2.50	4.00
	12	18	30
typical tracking error [ms]	0.50	0.90	1.50
repeatability [μ rad]	<20		
long term offset drift [mrad] (const. ambient and operating conditions over 8 hours)	<0.3		
typical scan angle [rad]	0.87		
gain drift [ppm/K]	20		
offset drift [μ rad/K]	30		
skew [mrad]	<1.2		
linearity [%]	>99.9		
operating temperature range [°C] (non-condensing conditions)	10 to 40		
approx. weight (lens excluded) [kg]	4-8		
power supply voltage DC [V]	± 24 (± 13.5 to 28)		
standby power consumption [W]	<24		
max. average current per axis [A] (all angles in optical degrees)	2		

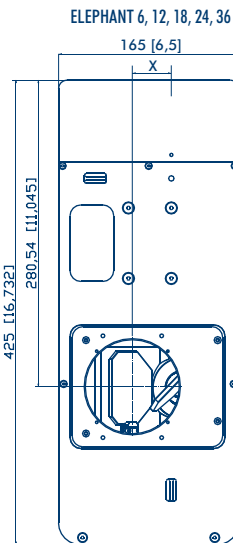
options (and additional approximate weight)
vision box (1.5 kg) with c-mount or cs-mount
water cooling (0.3 kg)
thermal stabilization (50 g)
high dynamic 31/28 and 45/42 mirror set
Beryllium mirrors
protection window
extension box with:
• beam expander
• ultra fast attenuator
• polarization angle control
• water cooled beam dump shutter

interfaces (for more information see data sheet INTERFACES)		
digital	16 bit unidirectional	standard XY2-100 protocol – and – SPDIF protocol
	16 bit bidirectional	
	20 bit unidirectional	
	20 bit bidirectional	

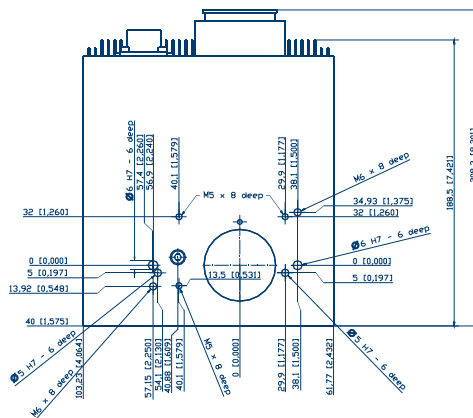
mirror coatings (for more information see data sheet MIRRORS AND COATINGS)	
CO ₂	10600 nm, dielectric or enhanced Au on silicon substrate
Nd:YAG	1064/630-670, 1064/532/355, 532 (high power), 355, 266 nm, all Nd:YAG coatings are ion plated
Excimer	248 nm
Diode	808/940/980 (ultra high power), 808 (high power) nm
VIS	400-1200 nm, enhanced Al coating
other coatings on request	



mechanical dimensions in mm [inches]



aperture Ø A [mm]	6	12	18	24	36
beam displacement X [mm]	6.8	12.6	18.4	24.2	35.7



typical internal beam expander configurations

Flat field lenses are available for apertures up to 36 mm. For typical flat field lenses see data sheet RHINO. The FIBER ELEPHANT is a scan system substituting the flat field lens by a galvanometer controlled internal beam expander. The position of the small beam expansion lens is controlled fast and precisely with a galvanometer.

FIBER ELEPHANT	aperture [mm] effective aperture [mm]	24				36				50	
		23				36				48	
Nd:YAG laser 1064, 532, 355 nm	internal beam expander	1.5	2.0	3.0	5.0	1.5	2.0	3.0	5.0	2.7	
	beam entrance [mm]	8.5	8.5	8.5	6.5	8.5	8.5	8.5	6.5	16.5	
	max. cw laser power [kW]	0.75	0.75	0.75	0.75	3.0	3.0	0.6	0.6	3.0	

REMOTE WELDING ELEPHANT Scan Head

The REMOTE WELDING ELEPHANT is a scan head using post objective scanning. The objective a fast, precise and tilt-free galvanometer controlled beam expander with diffraction limited design is capable of adjusting the laser spot size on the target and lancing new emerging 3D applications.

The scan heads 50 mm aperture dedicates it for high power fiber or fiber coupled lasers. The standard QBH fiber coupling module can be easily replaced by others.

A new feature for heavy duty use is the cross jet nozzle. It significantly reduces contamination and debris on the protection windows prolonging the service interval, thus reducing running cost. Auxiliary nozzles help to remove fume from the working area. Additionally the protection window is now mounted in a removable drawer for fast replacement.

To improve the teach-in procedures the scan head can be equipped with up to two camera devices. One camera provides an overall view of the scan field, the other one delivers a magnified picture of the processing area and can be used for precise aligning. An additional aiming cross laser assists in targeting the focal plane.

The easily detachable robot flange is available for robots of all major manufacturers.



REMOTE WELDING ELEPHANT with cross jet nozzle, vision and robot flange

Typical setups for remote welding with 600 µm focus diameter

other setups on request

wavelength	nm	1020	1080		
fiber coupling		Optoskand QBH (others on request)			
transmission	%	> 97			
laser power	kW	3	4, 5, 6	8	10, 15, 20
min. feeding fiber	µm	20	50	100	
XY-field *)	mm	4000 × 4000	1600 × 1600	800 × 800	
Z-stroke *)	mm	925	370	185	
working distance	mm	5000	2000	1000	
min. processing fiber	µm	50	100	150	200
XY-field *)	mm	1800 × 1800	900 × 900	600 × 600	450 × 450
Z-stroke *)	mm	400	200	140	100
working distance	mm	2200	1100	750	550

*) optical

Dynamical Performance

positioning time *)		
1% of XY-field	ms	2.5
10% of XY-field	ms	4
100% of XY-field	ms	30
1% of Z-stroke	ms	5
10% of Z-stroke	ms	10
100% of Z-stroke	ms	60
typical tracking error	ms	1.5
repeatability	μrad	< 10
long term offset drift **)	mrad	< 0.3
typical scan angle	rad	0.87
gain drift	ppm/K	20
offset drift	μrad/K	30
skew	mrad	< 1.2
linearity	%	>99.9

all angles in optical degrees *) settling accuracy 0.1% of full scale **) constant ambient and load over 8 hours

Dimensions and Supply

width × depth × height *)	mm ³	246 × 379 × 550
weight *)	kg	25
electrical		DC ± 24 V, max. 4 A
pneumatics		
cooling **)		
water flow rate	l/min	3
temperature	°C	15 35
control		ASC or NCC system controller and InScript software

*) approximately, depending on configuration **) avoiding condensation