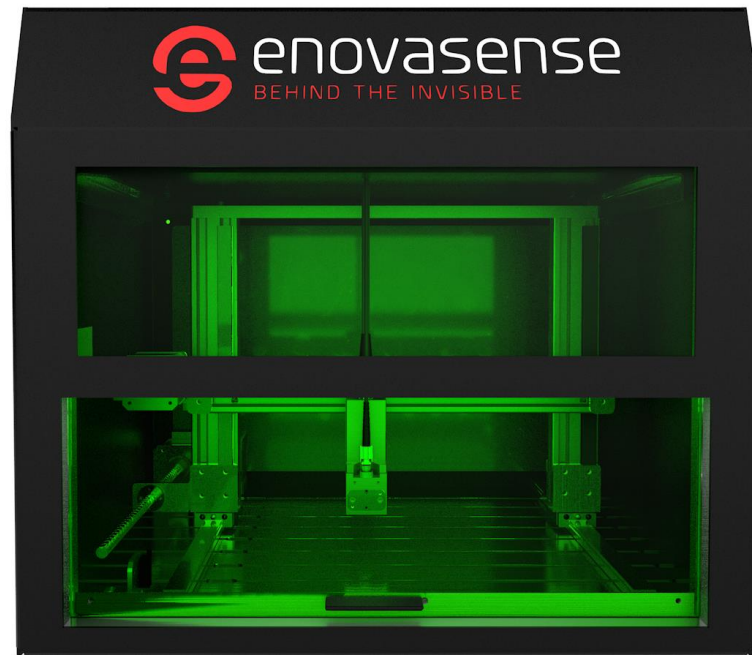


Industrial Control stations
HAKO – S
AUTOMATED 3D
MEASUREMENT DEVICE

INT01 – HAKO – S



This machine allows automated 3D measurements of parts using XYZ axis. Mapping of surfaces and complex shapes is made easy using the configurable software. Connection to a pc allows an efficient control and data analysis.

Optional include automated part positioning (additional vision system) and part vision.

 **Features**

- 3D scanning
- Real-time thickness control
- 100% scanning of the part
- Laser Class 1

 **Applications**

- Industrial coating
- Semiconductor
- Electronics
- Research
- At-Line lab

Key values¹

Parameter	Symbol	Value (typical)	Unit
Measurable thickness range	E_p	0.1 - 1000	μm
Accuracy	σ_{E_p}	< 3% of measured thickness	μm
Measurement duration (1 point)	t_m	< 1s	s
Operating temperature	T_n	-5 to +40	$^{\circ}\text{C}$
Maximum part weight	m_m	20	kg
Maximum part size	$X_m * Y_m * Z_m$	0.2*0.2*0.1	m^3
Axis Strokes	$X_s * Y_s * Z_s$	0.2*0.2*0.12	m^3

Repeatability by thickness range¹

Thickness range (μm)	Typical RMS repeatability in 1 point (μm)		Application process
	Paint, Adhesives, polymer coatings...	Metallic, ceramic... coatings	
0.01-0.1	± 0.01	± 0.01	PVD, CVD, PACVD, Electroplating
0.1-1	± 0.05	± 0.05	PVD, CVD, PACVD, Electroplating, Screen printing
1-5	± 0.1	± 0.3	PVD, CVD, PACVD, Electroplating, Anodizing, Spray, Screen printing
5-50	± 0.3	± 1	Anodizing, Electroplating, Galvanizing, Spray, Screen printing
50-300	± 1	± 2	Thermal spray, Cold spray, Galvanizing, Spray
300-1000	± 3	± 5	Thermal spray, Cold spray

Electrical supply

Parameter	Symbol	Value	Unit
Supply voltage	V_p	1AC 100-240V	V
Supply voltage frequency	f_p	50 - 60	Hz
Supply Power	P_p	0.6	kW

Optical characteristics ($T_a = 23^{\circ}\text{C}$)

Parameter	Symbol	Value	Unit
Optical power	P	0.01 - 150	W
Wavelength	λ	455 - 1550	nm
Laser class	LC	1	

Mechanical characteristics ($T_a = 23^{\circ}\text{C}$)

Parameter	Symbol	Value	Unit
Measuring head diameter	Φ_H	50	mm
Machine Weight	M_m	25	Kg
Machine dimensions	$L_m \times W_m \times H_m$	0.46 x 0.44 x 0.42	m
Maximum part size	$X_p * Y_p * Z_p$	0.2*0.2*0.1	m^3
Axis Strokes	$X_s * Y_s * Z_s$	0.2*0.2*0.12	m^3
Axis precision	σ_a	20	μm
Maximum part weight	m_m	20	kg

Available spot sizes and measurement distances

Spot diameter (mm)	Measurement distance (mm)	Reference of the front lens	Typical tolerances on distance (mm) ¹	
			Paint, adhesives, polymer coatings...	Metallic, ceramic... coatings
0.3	20	SP03-FL-WD20-SD0.3	±2	±0.5
0.7	20	SP03-FL-WD20-SD0.7	±2	±0.5
2.5	20	SP03-FL-WD20-SD2.5	±2	±0.5
4.9	20	SP03-FL-WD20-SD4.9	±2	±0.5
6.5	20	SP03-FL-WD20-SD6.5	±2	±0.5
0.8	40	SP03-FL-WD40-SD0.8	±4	±1
2.3	40	SP03-FL-WD40-SD2.3	±4	±1
3.3	40	SP03-FL-WD40-SD3.3	±4	±1
10	40	SP03-FL-WD40-SD10.0	±4	±1
12	40	SP03-FL-WD40-SD12.0	±4	±1
8.8	100	SP03-FL-WD100-SD8.3	±10	±4
11.8	150	SP03-FL-WD150-SD11.8	±20	±10

Machine global disposition

The machine is constituted of 2 main areas described below. The measurement area features a

1. Loading door
2. Electrical cabinet




2D Scan software

Emergency

Default

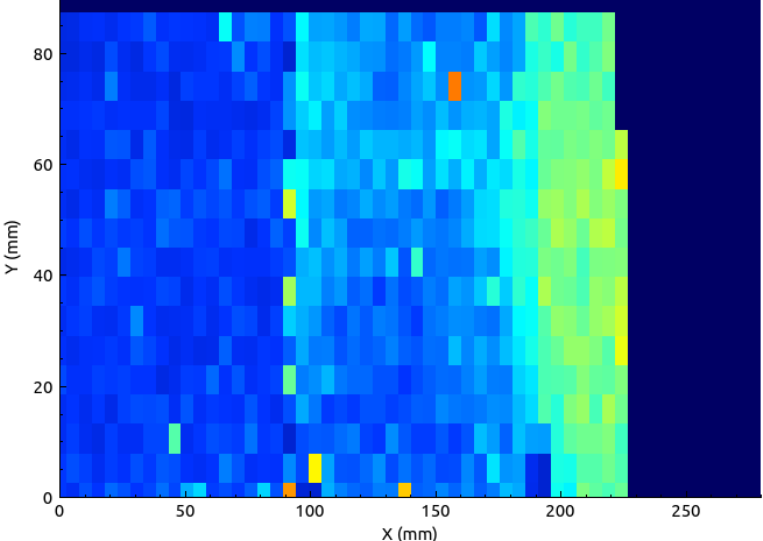
START OK
 START OK
 DEBUG>O
 K>in
 confirm :
 START



enovasense

BEHIND THE INVISIBLE

BACK



Thickness:

Average:

Standard deviation:

Name:

Current calibration:

Mode

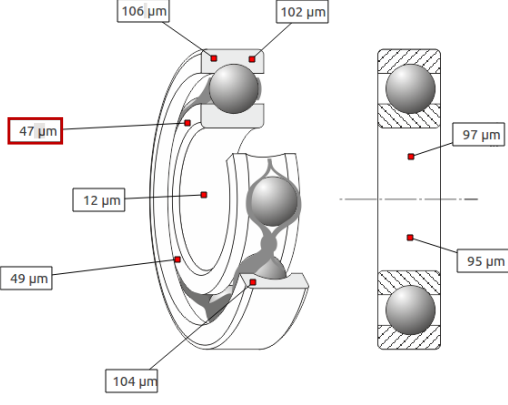
Mode manuel

A partir d'un fichier

Définition de la surface à mesurer

	Top-Right	Step	Bottom-Left
X :	<input type="text" value="0.0"/>	<input type="text" value="5.0"/>	<input type="text" value="280.0"/>
Y :	<input type="text" value="0.0"/>	<input type="text" value="5.0"/>	<input type="text" value="90.0"/>

Production Monitoring Software



Positions Groupes

Position 1

Thickness:

Average:

Standard deviation:

Axe X

Home Acquitter Statut OK, homing required.

Mouvement absolu **Mouvement relatif**

Vitesse : 100,0 +

Position cible : 0,0 Pas : 5,0

Move -

Position actuelle : 225,0

Axe Y

Home Acquitter Statut OK, homing required.

Mouvement absolu **Mouvement relatif**

Vitesse : 100,0 +

Position cible : 0,0 Pas : 5,0

Move -

Position actuelle : 65,0

Axe Z

Home Acquitter Statut OK, homing required.

Positionnement : Manuel Automatique

Mouvement absolu **Mouvement relatif**

Vitesse : 100,0 +

Position cible : 0,0 Pas : 5,0

Move -

Position actuelle : 295,0

Aller à une position spécifique

Move

Misc.

Actualiser les positions spécifiques

Reconnecter

Logs et alarmes

Contrôlé de l'extérieur.
Axe n°1 : 0
Axe n°2 : 0
Axe n°3 : 0

FERMER

¹Performances values given in this document are typical values obtained with this device but can vary from one application to another. For a diagnosis of those performances on specific samples, please contact Enovasense.

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