Specifications

XLS40

500
102
134
68.5

XLS80

200 (300)
170
790 (890)
60

XLS150

430 (630)
282.5
~1100 (~1300)
140
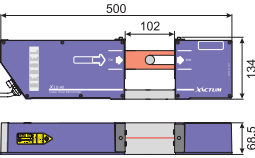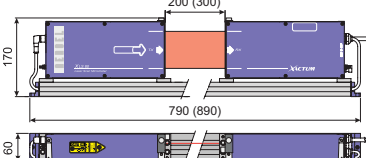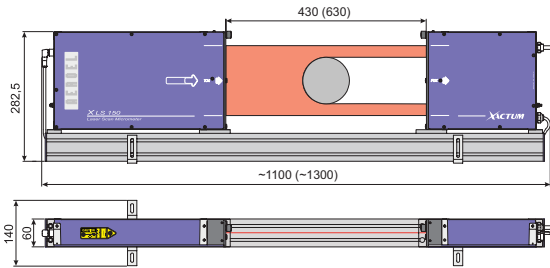60

All dimensions are in mm.

Type of gauge			XLS40/1500	XLS80/1500	XLS80D/1500	XLS150D/1500
Vertical Measuring Field	(mm)		40	80		150
Side Measuring Field [1]	(mm)		± 10	± 40		± 100
Measurable Diameters	(mm)	mod. /A	0.1 ÷ 38	0.75 ÷ 78		0.8 ÷ 149
		mod. /B	0.06 ÷ 38			
Resolution (Selectable)	(µm)		10 / 1 / 0.1 / 0.01			
Linearity (Centred Product)	(µm)		± 0.5 [2]	± 1 [3]		± 3 [4]
Linearity (in the Meas. Plane) [5]	(µm)		± 0.5	± 1	± 2	± 4
Side Linearity [6]	(µm/mm)		± 0.5	± 0.7	± 0.05	± 0.08
Repeatability (T=1s, ±2σ) [7]	(µm)		± 0.07	± 0.2		± 0.4
Beam Spot Size (s,l) [8]	(mm)	mod. /A	0.08 x 2	0.4 x 3.5		0.5 x 4
		mod. /B	0.06 x 0.1	0.4 x 0.2		0.5 x 0.3
Side Dither of the Scanning Plane	(mm)		± 0.02	± 0.05		± 0.08
Scanning Frequency	(Hz)		1500			
Scanning Speed	(m/s)		300	588		940
Thermal Coefficient [9]	(µm/mm°C)		-11.5			
Power Supply			24 VDC; 0.3 A (1 A peak)			
Laser Source			VLD (Visible Laser Diode); λ=650 nm			
Dimensions [10]	(mm)		500 x 134 x 68.5	790 (890) x 170 x 60		~1100 (1300) x 282.5 x 140
Weight [10]	(kg)		4.2	7 (7.2)		15 (15.7)
Operating Temperature Range	(°C)		0 ÷ 50			
Storage Temperature	(°C)		-20 ÷ +70			
Atmosferic Humidity			Max 85% (non-condensing)			
Altitude	(m)		0 ÷ 3000 over sea level			
Protection			IP65			

Notes

Two standard models are available for the XLS80 and XLS150 sensors: the first with head gap 200 and 430 mm and the second with head gap 300 and 630 mm.

[1] Maximum allowed side displacement of the part axis.

[2] For Ø ≤ 25 mm. For Ø > 25 mm the linearity is ± 0.75 µm. The value is inclusive of the Aeroel's masters uncertainty (± 0.3 µm)

[3] For Ø ≤ 40 mm. For Ø > 40 mm the linearity is ± 1.5 µm. The value is inclusive of the Aeroel's masters uncertainty (± 0.3 µm)

[4] For Ø ≤ 70 mm. For Ø > 70 mm the linearity is ± 5 µm. The value is inclusive of the Aeroel's masters uncertainty (± 0.3 µm)

[5] Maximum error, when a master is moved in the measuring plane, checked with Ø = 8 mm (XLS40), Ø = 20 mm (XLS80) or Ø = 38 mm (XLS150). The measuring plane is located halfway between transmitter and receiver.
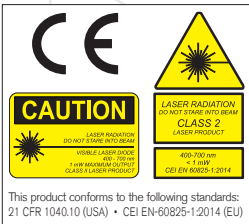
[6] Maximum error, for a side displacement of the master out of the measuring plane.

[7] Single shot repeatability (± 2σ) is ± 1.5 µm (XLS40), ± 3.5 µm (XLS80) and ± 5 µm (XLS 150)

[8] Elliptical spot: "s" is the thickness and "l" is the width.

[9] This is the measuring error due to a change in the ambient temperature when measuring a part with zero thermal expansion coefficient (INVAR). This is specified for gauges using a software PRESET for the NO-VAR option and when the rate of change of the ambient temperature is lower than 3°/h. When the NO-VAR option is ENABLED, the gauge thermal expansion coefficient is programmable by the user.

[10] The connecting cable is not included. The figures between brackets are related to the model with head separation 300 mm (XLS80) or 630 mm (XLS150).

Specifications subject to change without notice

CE

CAUTION
LASER RADIATION
DO NOT STARE INTO BEAM
400 – 700 nm
1 mW MAXIMUM OUTPUT
CLASS 2 LASER PRODUCT

LASER RADIATION
DO NOT STARE INTO BEAM
CLASS 2
LASER PRODUCT
400–700 nm
< 1 mW
CEI EN 60825-1:2014

This product conforms to the following standards:
21 CFR 1040.10 (USA) • CEI EN-60825-1:2014 (EU)

MARPOSS
AEROEL

csq
ISO 9001:2015

IQNet
CERTIFIED MANAGEMENT SYSTEM

AEROEL
XLS40 XLS80 XLS150

Single axis Laser Micrometers for very high accuracy diameter measurement
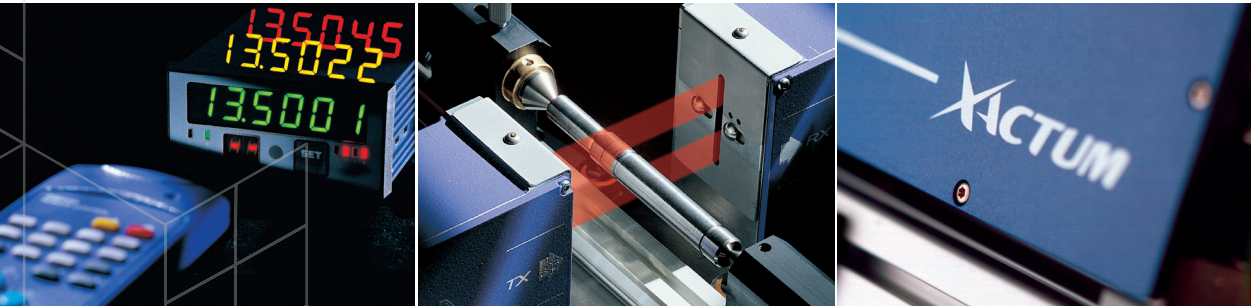
Ultra accurate, high speed Laser Gauges for contact-less diameter measurement, featuring built-in electronics and Ethernet/Rs232/Rs485 interface

- Up to 150 mm measuring range
- Multiple measuring modes and types
- Up to 0.07 µm repeatability
- 1500 Hz scanning frequency
- Outstanding single shot repeatability
- Excellent linearity
- Permanent self calibration
- Fully re-programmable
- Direct connection to PC, PLC e NC
- Motor with Fluid Dynamic Bearing Technology **NEW**
- NO-VAR: active thermal compensation
- Direct connection to Internet Browser
- Capability to store different application programs
- Inputs for reading and synchronizing quadrature encoders

It's an ideal Intelligent Diameter Sensor for the on-line control of products like:

- Ground or turned parts
- Metal tubes and bars
- Plastic extruded tubes
- Electric cables and conductors
- Rolled or extruded profiles
- Hot rolled products
- Glass tubes and rods

MARPOSS

The Sensor Software

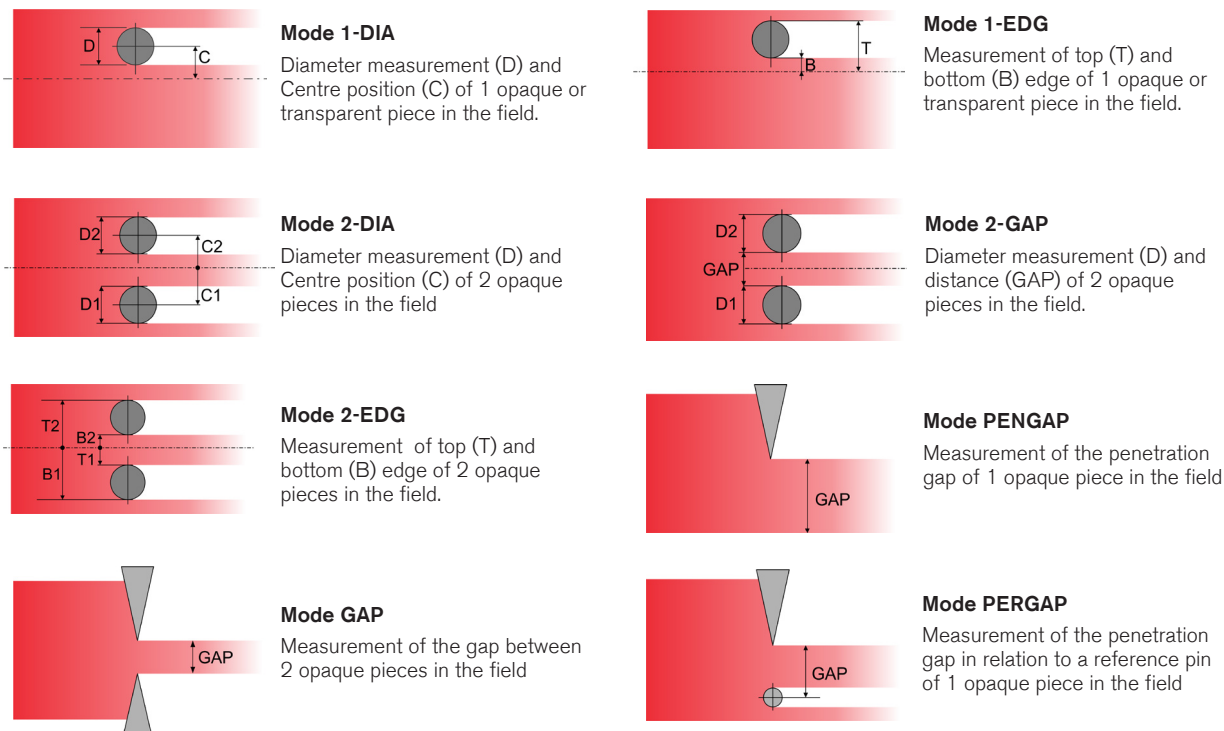The XLS sensors are equipped with a pre-loaded software to perform different types of measurements and in several modes, to meet a number of applications. In general the instrument performs just as an Intelligent Sensor, transmitting the measured data to an external device, through its serial ports. The tolerance checking or other more sophisticated features are not included, these are performed by the user's device or by the available Aeroel Dedicated Systems.

Types of measures

Mode 1-DIA
Diameter measurement (D) and Centre position (C) of 1 opaque or transparent piece in the field.

Mode 1-EDG
Measurement of top (T) and bottom (B) edge of 1 opaque or transparent piece in the field.

Mode 2-DIA
Diameter measurement (D) and Centre position (C) of 2 opaque pieces in the field

Mode 2-GAP
Diameter measurement (D) and distance (GAP) of 2 opaque pieces in the field.

Mode 2-EDG
Measurement of top (T) and bottom (B) edge of 2 opaque pieces in the field.

Mode PENGAP
Measurement of the penetration gap of 1 opaque piece in the field

Mode GAP
Measurement of the gap between 2 opaque pieces in the field

Mode PERGAP
Measurement of the penetration gap in relation to a reference pin of 1 opaque piece in the field

Note: not all the measuring modes included in the standard software are enabled in other types of software, designed for specific applications. Check the detailed specifications of any application software.

XLS40   XLS80   XLS150

Measuring transparent objects

Using the measuring modes 1-DIA and 1-EDG and enabling the Glass-Logic, it is possible to check also transparent parts. In all other modes the parts being measured must be opaque.

Single face scanning

It is possible to use 1 mirror face only, to cancel the side dither of the scanning plane: when this option is selected, the scanning rate is reduced to 125 Hz.

Measurement processing

Instant values: simple average over n scans, being n ≥ 1 programmable

Extreme values: Average, Max, Min over k Instant Values, being k ≥ 1 programmable

Measurement mode

Free-Running: it processes continuously groups of k instant values to compute the related Extreme Values.

On-Command, Single-Shot: after an external command, it processes only 1 group of k instant values to compute the related Extreme Values. The external command is a rising edge on a digital input or a command message via Ethernet/RS232.

On-Command, Continuous: during a time interval set by an external command, it processes all the measured Instant Values, to compute their Extreme values. The measuring time is set by a logic high level on a digital input and/or by Start/Stop messages via Ethernet/RS232.

Auto-Sync: like On-Command, Single-Shot, but the measurement is automatically triggered by a valid measurement condition (1 part in the measuring field).

## Exclusive Aeroel features

AEROEL EXCLUSIVE

- The scanning motor **without ball bearing** works perfectly, with no wear.
- **The NO-VAR option** allows you to automatically compensate for the expansion of the part when room temperature changes. The user only needs to program the proper coefficient of thermal expansion of the part.
- **The Web Server** allows you to connect the sensor through the Ethernet line to any Internet browser and "see it" as a website, where you can view the measures, enable an application program may be installed, set-up and program the gauge and even display the video signal (light pulse).
- In the memory of the sensor you can store **up to 3 different application programs**. The program change is possible only by connecting a PC to the Ethernet port and using a special Aeroel software utility or the Web Server function.
- The two sensor inputs **can be programmed** to read the signals of a quadrature encoder and i.e. synchronizing the gauge measurements with the position measured along the axis of the piece.

Programming and set-up

The sensor Set-up and programming are possible through the **RS232**, **RS485** or **Ethernet** ports, using the Aeroel protocol and dedicated commands. In addition, there are several possibilities for using the sensor without writing any specific communication software:

- The **Web Server** allows you to connect the sensor through the Ethernet line to any Internet browser and "see it" as a website
- The **VT100 terminal mode** (through the RS232 port) makes it possible the connection of the sensor to a PC using the Windows (*) Hyperterminal program
- You can use an optional hand-held VT-100 terminal.
- Using an optional **DM-200 display** module with IR Remote Control, you can display the measurement data and program the sensor
- **GageXcom** software running on PC, to program the sensor and to get the measured data through Excel (*) spreadsheets.
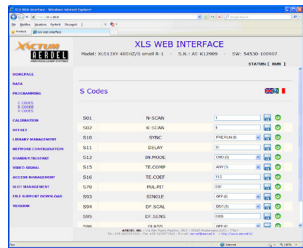
Input/Output and Interfacing

- 2 optocoupled digital inputs, 10 – 30 Vdc, (5 - 15 mA). The two inputs can be programmed for different functions:
  - Start/Stop measurement and Send Data via RS232
  - Pulse counter and Reset command for meter counting function
  - To read the signals from a quadrature encoder, to synchronize the measures with the part position
  - Pulse counter and Reset command for the synchronization of several sensors
- Rs232, max 115.2 Kbaud, Master or Slave, for sensor programming, data transmission and commands (Aeroel protocol)
- Rs485, max115.2 Kbaud, used in Master mode to drive Aeroel Units (i.e. Display Module) or in Slave mode to network the sensor (Aeroel protocol)
- Ethernet 10 Base-T, TCP/IP protocol for for sensor programming, data transmission, commands and networking
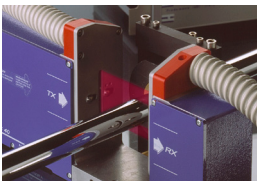
Accessories

DM-200, 6 digit Multicolor LED display module to display the measured data and to program the sensor through its IR Remote Control.
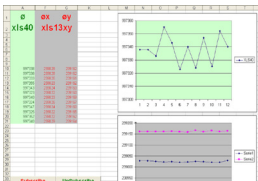
GageXcom software running on PC, to program the sensor and to get the measured data through Excel (*) spreadsheets.

Air compressed windows to protect the optics in heavy-duty environment

- IR Remote Control to program the sensor and to drive the display module.
- Devices and fixture to hold and transport the part being measured.
- Devices to clean the product being measured.
- RS232/Profibus or RS232/Profinet bidirectional converter modules
- XLS-NCB, connecting box with universal power supply and sockets for network connection through Ethernet or RS485 ports and RS232 connection.
- Connecting cables and extensions.
- PC software for driving an Ethernet network of sensors.
- Calibration report.

(*) Windows and Excel are registered trademarks of Microsoft Corporation

MARPOSS AEROEL