sylvac

User's Guide

English

SYLVAC-SCAN

REFLEX-CLICK 52

Optical Measuring
System

CONTENTS

1. INTRODUCTION

1.1 General

Right of modifi cation

The content of this manual together with all product related specifi cations may be subject to changes without prior notice. All other rights are reserved.

The full range of optical measuring systems from SYLVAC SA for non-contact measurement is based on
a well-tested technology used in a wide variety of common and sophisticated systems.

The SYLVAC-SCAN 52 REFLEX-Click optical system is controlled through the SYLVAC-REFLEX Scan software running under Windows 7 Professional.
This User's Guide provides the needed information on the system along with all specifi cations.

Copyright

Warning

To make sure the machine will operate securely and get accurate measurement results, carefully read this User's Guide, but also the copy of the DVD delivered with the SYLVAC-REFLEX Scan software before operation.

1.2 Safety rules and precautions

The SYLVAC-SCAN 52 REFLEX-Click has been designed with safety in mind. However, incorrect handling during installation or operation may be a source of damages for the machine. All safety rules and precautions stated herein must be observed to ensure effective use of the machine.

1.2.1 Strict adherence to the User's Guide

The French version (original) of this User's Guide serves as reference. All other language versions are translated versions only. In any case, you should have one original in your hand.

All those working on the machine should adhere to this User's Guide, especially to the the safety precautions.

Rules and other procedures in force on the installation site to prevent injury to personnel must be strictly observed.

1.2.2 User's liabilities

The user ensures that only the personnel and operators stated hereafter has the ability to operate the machine :

- All those who are familiar with the safety rules and precautions, but also the safety devices and operation of the machine.
- All those who have read the section dealing with the safety instructions and warnings contained in this manual.

1.2.3 Personnel liabilities

All those entrusted with the task to operate the machine shall commit themselves to strictly adhere to the following beforehand:

- Take all safety precautions to prevent any injury.
- Read the section dealing with the safety instructions and warnings contained in this manual.

1.2.4 Physical and material risks

The SYLVAC-SCAN 52 REFLEX-Click has been produced based on the current knowledge as regards engineering, also in compliance with the safety rules in force. However, its operation may prove to be dangerous to the personnel and/or cause damages to the machine or its components. Therefore, the machine must only be used as intended whilst being perfectly protected. Any failure susceptible to adversely affect the security must be immediately eliminated.

1.2.5 Intended use of the machine

The machine is to be used for non-contact measurement solely. Any other use will be regarded as improper use and SYLVAC shall not be responsible for any incurred damages. Furthermore, the use as intended involves that:

- All operating instructions contained in this manual are strictly observed;
- All checking and maintenance operations are executed as set forth in this manual.

1.2.6 Guarantee and liability

Our General Terms of Delivery are applicable to the whole range of our products. These terms will be provided to the Customer upon signature of an agreement at the latest. In no event shall we be liable for personnel injury and/or damages due to either of the following causes:

- Improper use of the machine.
- Inappropriate assembly, installation, operation or preventive maintenance of the machine.
- Machine operation though defective safety guards due to incorrect or inefficient assembly.
- Failure to follow all shipping, storage, assembly, preparation, start-up and maintenance instructions
- Modifications to the machine without our written consent and approval.
- Lack of inspection for the machine parts subjected to wear.
- Incorrect execution of repair works.
- Cases where damages are due to interacting particles or force majeure

1.2.7 Individual protection

- The customer is liable to provide the equipment required to ensure individual protection of the personnel.
- All existing safety guards and devices must be regularly inspected.

1.2.8 Safety guards and covers

- All safety guards and covers must be correctly mounted for safe operation prior to booting up the machine.
- Never operate the machine with removed safety guards and covers unless the machine has been switched off and adequately secured against inadvertent start.
- In the event that only a part of the components have been delivered, the customer is responsible for mounting and fastening all safety guards securely as instructed.

1.2.9 Informal safety precautions

- The User's manual must be permanently within reach at the machine's location.
- All informal and local safety rules along with the requirements dealing with environmental protection must be made available and fully respected.
- Keep all safety and warning labels on the machine visible all the times.

1.2.10 Personnel training

- Only trained and instructed personnel, aware of the safe operating procedures, is allowed to work on the machine.
- Personnel abilities for the machine assembly, installation, preparation, operation and maintenance must be clearly defi ned.
- The personnel in the course of training is not allowed to execute any work on the machine unless a skilled operator is present.

1.2.11 Operating the machine

- Never attempt to make any software-oriented changes on the machine!
- Electrical power of the machine is isolated by the ON/OFF switch located on the front face of the machine.
- The operating command can only be enabled by personnel with the necessary experience.

1.2.12 Safety practices in normal use

- Never use the machine unless all safety devices can ensure a safe operating.
- Make sure nobody is expose to a shock hazard before powering up the machine.
- Check all safety devices for effectiveness and possible damages at least once per teamwork period.
- Never connect/disconnect the cables used to link the machine to the electronic controls with the PC/controller powered up.
- Do not touch the mobile parts of the machine as long as the measurement process having be started up isn't completed.
- Do not switch the machine back again.

1.2.13 Risks of electrical shock

- Any alteration to the power supply can only be done by a qualifi ed personnel.
- Electrical equipment of the machine needs to be checked regularly. Loosened or damaged cables must be removed.
- if works on components connected to the mains are necessary, call someone else to activate the main switch.

1.2.14 Maintenance, repair work and troubleshooting

- Always execute any recommended work for setting, maintaining and inspecting the machine without delay.
- Have the transmission mechanism be maintained solely by a qualifi ed personnel, formally accredited
- by SYLVAC SA.
- Ensure the parts in front and at the rear of the machine against untimely start.
- Turn off the machine and make sure the main switch remains in the off position before undertaking
- any maintenance, repair or inspection work.
- When replacing heavy components or large parts of the machine, use a lifting equipment to ensure a correct handling.
- Check that all unscrewed elements are set aside securely.
- Inspect the safety devices for good and proper operation as soon as the preventive maintenance could be performed.

1.2.15 Changes to the machine construction

- No modification, add-on or transformation can be made to the machine without previous approval of SYLVAC SA.
- Any intention to make drastic changes to the machine requires the written consent of SYLVAC SA.
- Worn building parts of the machine must be replaced at once.
- Use only spare-parts or wearing parts of origin.
- No guarantee can be given for secondhand spareparts that they are designed and manufactured to meet the requirements and the convenient security level.

1.2.16 Cleaning and recycling

Used hazardous materials and chemicals should be processed and recycled according to the local regulations as regards waste management, especially:

- During maintenance work on lubricating systems and devices.
- During cleaning work requiring the use of solvents.

1.3 Description of the machine

The SYLVAC-SCAN 52 REFLEX-Click designed by SYLVAC is aimed at providing Users with the best solution for fast and easy measurement of turned parts.

The machine is made to inspect any measurable feature statically (length, diameters, angles, radii and the like) or dynamically (e.g. runout, coaxiality, accross fl ats) for the model equipped with a rotating headstock (optional).

Running the SYLVAC-REFLEX Scan software, a single press on the REFLEX-Click button allows automatic measurement of main part features such as lengths and diameters.

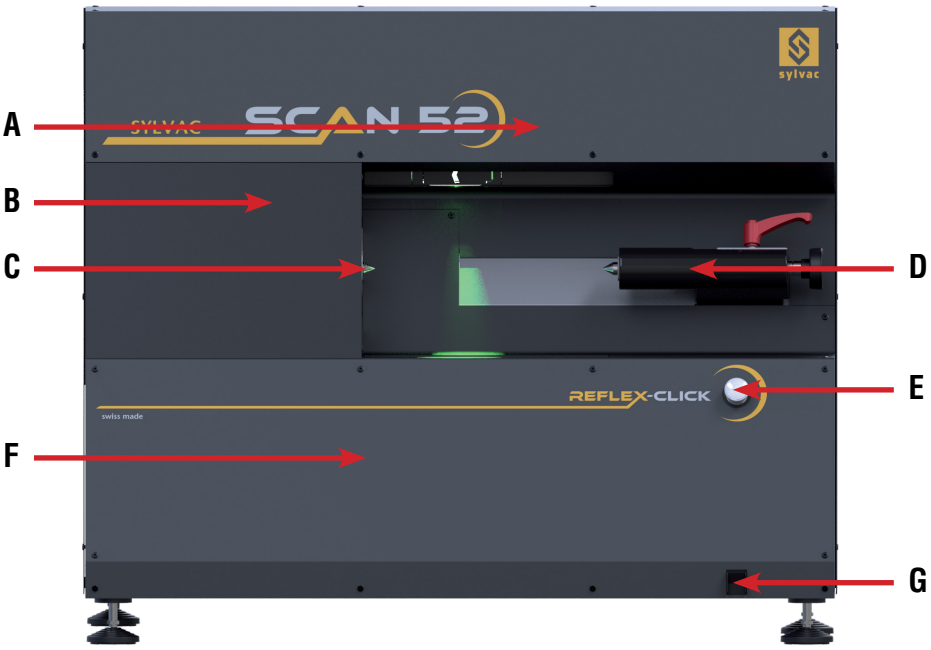
In addition, the SYLVAC-REFLEX Click mode will detect whether a programme matching the part geometry already exists, thus rendering all inspection operations much easier.

The mounting carriage of the machine includes the headstock (either static or rotating) along with the tailstock, which enables varying part lengths to be conveniently adjusted.

As the measurement is being taken, the part is maintained on the carriage while the area around the data point is illuminated with a green parallel light. A part image is then projected on the highresolution CCD linear sensors, acting as light detectors. All emitted signals are then analysed and computed as measured values.

The motorised carriage is controlled over the PC. The system uses an incremental glass scale to check its displacement.

The measuring system together with the PC are the machine's main components.

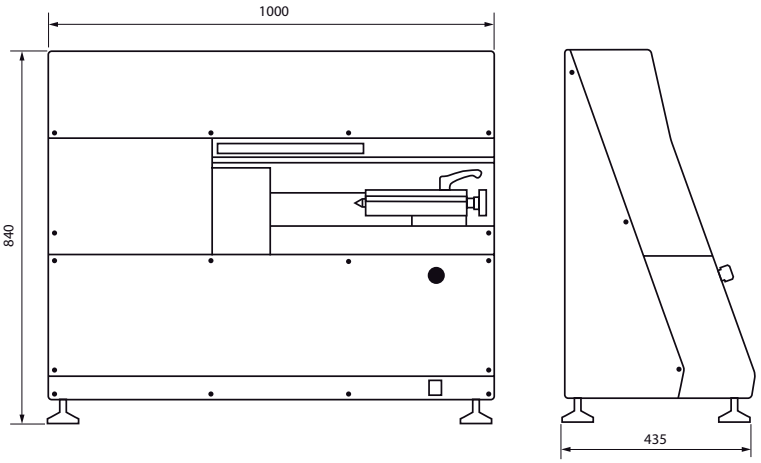


A	Top cover protecting the light sources
B	Setting master (located under the cover)
C	Headstock (static or rotating)
D	Tailstock
E	REFLEX-Click button
F	Optics cover.
G	Main ON/OFF switch

1.4
Specifications

SPECIFICATIONS	Metric	Inches
Overall Dimensions		
Machine (H x L x P)	840 x 1000 x 435 mm	33.1 x 39.4 x 17.1 in
Mass		
Machine with centres	≈ 105 kg	≈ 230 lbs
Packed Machine	≈ 165 kg	≈ 360 lbs
Operating temperature		
Storage temperature	5 to 45 °C	40 to 115 °F
Relative humidity (storage)	80% max	80% max
Operating temperature	10 to 40 °C	50 to 105 °F
Relative humidity (operating) (non-condensing)	80% max	80% max
Power supply	24 VDC, 5 A (external powering provided with the machine: 100-240 VAC / 24 VDC)	
Performances (at 20° ±1°C) *Resolution*		
Monitor	0,0001 mm	0.000004 in
Highest repeatability (2s = 95%)		
Lengths	2,5 µm	0.0001 in
Diameters	1,0 µm	0.00004 in
Precision MPE (D and L in mm)		
Lengths	±(4 + L/100) µm	± (0.16+L/100)/1000 in
Diameters	±(1.5 + D/100) µm	± (0.06+D/100)/1000 in
Additional data		
Load capacity (between centres)	Ø 100 mm x L 300 mm	Ø 3.9 in x L 11.8 in
Weight of the part	Ø 0,5 - Ø 52 mm x L 300 mm	Ø 0.02 - Ø 2.05 in x L 11.8 in
Masse de la pièce	< 4 kg	< 8.8 lbs
Displacement		
Main displacement speed (X-axis)	200 mm/s	
Displacement in rotation	1 t/s	
Duration of a normal cycle (static measurement of 10 dimensions)	15 – 25 s	
Noise level	LpA <70 dB (A)	

All indicated values are based on the results obtained from clean and ground components measured at 20°C. They may be altered by the component shape and surface finish.



2. INSTALLATION

2.1 Equipment

The components of the main system are listed in the tables below.

Mechanical components and cables	Sylvac-SCAN 52 REFLEX-CLICK	
Measuring centre	902.5520	902.5521
Cables (power cord, USB and RS232)	yes	yes
Two MK2 male centres	902.6250	902.6250

Hardware and software	Order number
PC, keyboard, mouse, Windows 7 Professional multilingual operating system	H047600230S
SYLVAC-REFLEX Scan application software	H02460100
20-inch flat screen (mains cable included)	H04760091

2.1.1 Local system configuration

The machine is controlled over a PC running Windows 7 Professional. This multilingual version from Windows makes it possible for the system to be configured according to local attributes.

Check that all listed components are present. If so, report any damage to SYLVAC SA immediately. Should the whole system be temporarily stored before installation, make sure that it is safely packed and efficiently protected indoors. For the system confi guration, access the Control Panel and click Regional and Language Options within the Windows menu.

Avoid high humidity (over 80%) or extreme temperature (below 5°C or above 45°C).

2.2 Lifting the machine

The machine should be lifted manually from both lateral sides. This is done in strict adherence with the local safety rules.

A lifting device can also be positioned below the machine for installation.

2.3 Installing the machine

For a further information on the required ambient conditions, refer to the Specifi cations, section 1.4. The machine should be installed on a fl at stable surface, capable of supporting the machine's weight. Once the installation is completed, remove all protective foams under the tailstock and close to the qualifi cation plate. Finally, set the machine levelling feet accordingly.

The machine uses a single-phase power. Normal noise levels are acceptable, but high spikes in voltage resulting from overloaded current must be avoided.

Warning

Check that the mains supply matches that of the PC and the monitor before connecting both of them.

Never attempt to alter the voltage of the PC/Controller. In the event the voltage used for servicing the machine is unlike the mains supply, contact your local SYLVAC's agent.

2.4 Establishing cable connections

All cable connections are made with the machine switched off.

The wiring plan showing a typical environment may vary according to the PC used.

The physical position of each connection to the PC depends on the properties of the PC type.

A Mains power

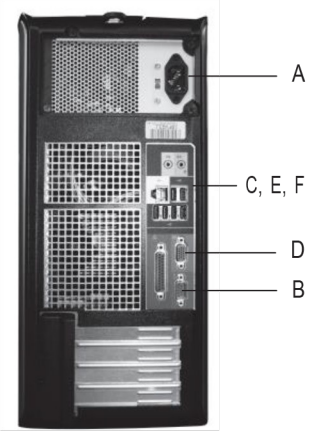
B RS232 serial port (control of the motors)

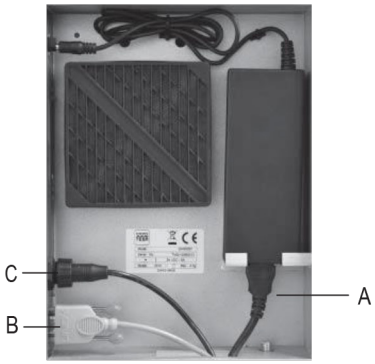
C USB cable (connected to the machine)

D Monitor connection

E Keyboard connection

F Mouse connection





3. ASSEMBLY

3.1 General

The part to be measured is held in a workholding located into both headstock and tailstock mounted on the carriage. The whole assembly is pictured below.

3.2 Headstock

The static or rotating headstock is fi xed into position on the left-hand side of the bench, before being exactly centred in order to ensure the highest measuring accuracy.

3.3 Tailstock

The tailstock is mounted on the carriage, and then precisely centred thanks to the guiding rails on the granite machine's base.

The clamp system has been specially designed to eliminate any play and to ensure optimum centring.

The tailstock position can be changed to accommodate workpieces having different lengths.

1 Move the tailstock until the whole length of the part is matched, while turning the handle toward the right.

2 Load the part to be measured.

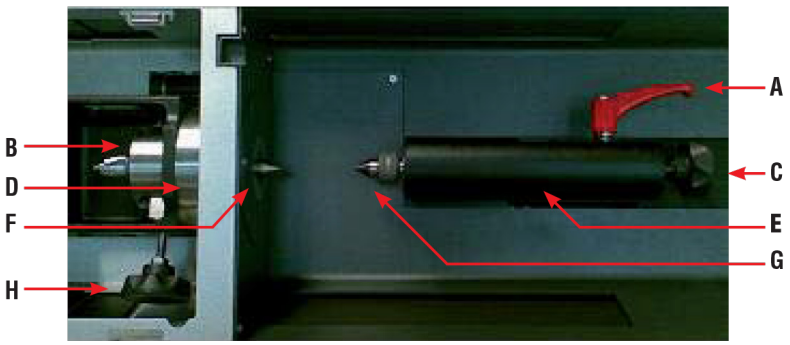
3 Turn the handle toward the right laterally, while rotating it through to 180° to ensure fi rm holding of the part.

3.4 Workholding

The workholding is an industry standard Morse 2 used for centring the headstock and tailstock. To insert tooling properly, use only a gentle movement until the taper locks.

If locking failed, check the part, the headstock and tailstock for cleanliness. Make sure the tooling release screws are retracted, and use them to release the centres.

Do not use excessive force or shock loads as this might result in damages to the sliding mechanism.



A Clamp handle

B Daily setting master

C Tooling release screw

D Headstock

E Tailstock

F Morse 2 taper body

G Morse 2 taper end

H Tooling release screw

4. QUICK OPERATION GUIDE

4.1 Measuring system

The measuring system consists of light sensitive cells (CCD arrays) used for image analysis of the workpiece being measured.

The workpiece is first illuminated, and then scanned using a parallel (collimated) green light from the optics, which is moved by means of a DC servomotor coupled with a belt drive. The movements of the carriage are controlled through the incremental glass scale.

Long term accuracy is assured by the use of a setting master provided with the system for its calibration at start up. This feature is stored into the machine, near the headstock.

4.2 Getting started

- Ensure that all electrical connections are made, and that there's no CD in the CD-ROM drive.
- Turn the power ON by means of the switch located on the front face of the machine.
- Shut the PC and the monitor up.

The system runs a series of self-tests, and then starts loading the Windows 7 Professional operating system. Once Windows has initialised, the SYLVAC-REFLEX Scan icon appears on the desktop. Double click this icon to let the application be loaded and get the tool bars ready for use once entirely loaded.

Note

Should you get an error message, write it down, switch off (doing so, pay a special attention to the options of the shutting down windows, if any), wait at least 15 seconds before switching on again. If the problem persists, contact the Help service of the supplier for assistance.

4.3 Calibrating the machine

Before starting measuring, the machine needs to be calibrated for SYLVAC-REFLEX Scan and the peripheral devices to be booted up. To have this done, press the REFLEX-Click button on the front face of the machine. A message prompts you to start the calibration process. Validate this on-screen prompt.

Once the system has boot up, the programme establishes the references on the incremental glass scale. Next, the functions of the CCD arrays are checked and the machine calibrated.

As soon as all operations are completed, display shows Successful Calibration below the menubased icons.

In the event the calibration failed, re-start the whole process. Successive failures tell the operator that there are fatal errors causing the measuring system or the peripheral device to abort.

4.4 Calibration error

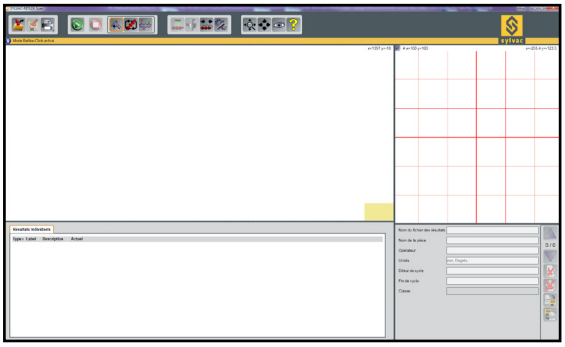
Dirty setting master is the most likely ground for a faulty calibration.

Clean the setting master and re-start the calibration process. You may also remove this feature from its support, if necessary.

Should the problem recur, contact SYLVAC's After-Sales service.

4.5 Measuring

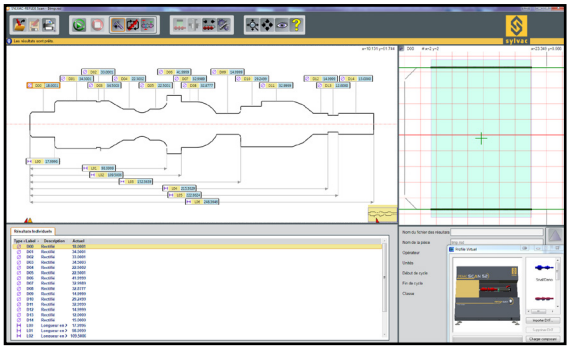
1 The user's interface as shown opposite will not appear unless SYLVAC-REFLEX Scan has been booted up and the calibration process completed.



REFLEX-Click is the default mode

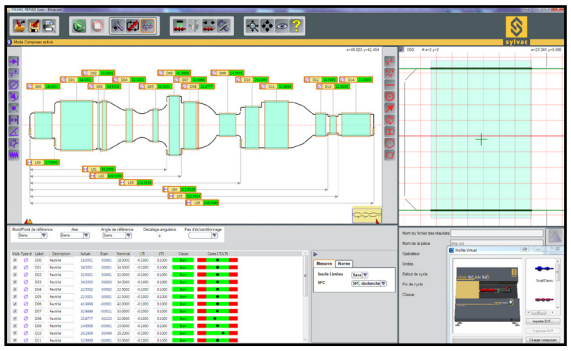
.

2 Load a workpiece in the workholding and press again the REFLEX-Click button on the machine's front face. Wait a few seconds for the fi rst measurement results to be automatically displayed.



3 To edit a programme sequence allowing for nominal values to be input for comparaison with the measured values, press the Edit button.

4 After all changes have been entered, save the programme and press the REFLEX-Click button to let it be started up.



Note
For more information on the way to run SYLVACREFLEX Scan, report to its User's manual.

4.6 Shutting down

When shutting down the system, closing all applications and Windows properly is important. Once closed, select Shut down from the Start menu on the Windows Task bar. As soon as the Shutdown Windows box appears, choose Shut down the computer? and click Yes. Finally, switch off the machine.

It is important for all applications and Windows itself to be closed following this procedure. Failure to do so may result in hard disk corruption and, consequently, bring about that of the whole system.

5. MAINTENANCE

5.1 Maintenance schedule

Monthly

- Clean all external machine's parts with a soft cloth. Do not use abrasive solvents containing methylene chloride or cellulose.
- Clean all windows with a soft cloth. Avoid abrasive solvents that may scratch the glass. For this operation, the optics needs to be moved to the
- Cleaning position (with respect to this, report to the SYLVAC-REFLEX Scan User's manual).

Once the optics is correctly positioned, raise the protective cover in front of the optical window and follow on-screen instructions for cleaning.

Yearly

Only a trained personnel accredited by SYLVAC SA is allowed to execute all maintenance operations on a yearly basis.

- The machine must be recalibrated using a full set of length and diameter standards.
- We recommend recalibrating each machine used on the shop fl oor every six months, or annually for those installed in a temperature-controlled operating environment like that of any inspection laboratory.

Servicing intervals

- As a general rule, a visit for servicing once a year or every 4000 operating hours are advisable.

Replacement of components subjected to wear

- The frequency of replacing the motor belts is every 3 years or after 17'000 operating hours of the machine.

5.2 Cleaning

The machine's covers must be regularly cleaned with a soft dry cloth. Common solvents can be used to remove the grease, except methylene chloride or cellulose.

Do not remove any cover as this may impair the purity of the optics with a surge of dust particles among other impurities.

5.3 Mechanical part

Tailstock

If the tailstock becomes loose instead of fixed into position, the mechanism needs to be appropriately set. For this purpose, raise the clamp handle vertically and twist it until optimum setting is achieved.

6. TROUBLESHOOTING

6.1 In case of failure

All SYLVAC-SCAN have been designed for ease of use and trouble-free operation.

This section described problems that might occur when starting up the system, whilst also listing some error messages appearing when running the software.

6.2 Problems at start up

1 The system shows no signs of life :

- Check the power supply and connections, including those to the PC and monitor.
- Check that the PC and monitor are turned on.

2 The PC starts but the LED does not light up.

- Check all cable connections.
- Contact your local SYLVAC's agent.

3 The system starts but does not calibrate.

- Clean the setting piece with a clean, dry cloth.
- Check that the setting piece is properly loaded in the tooling.

7. GUARANTEE

7.1 Limited Warranty Policy

All the Sylvac optical measuring machines are covered against defects in design, materials and workmanship for a period of 2 years, from the date of delivery from our factory.

During the warranty period, Sylvac SA will repair or replace the defective product free of charge.

This manufacturer's warranty does not cover:

- Aging or normal wear and tear
- Any damage resulting from incorrect or abnormal use of the product, and non-observance of the user manual provided by Sylvac SA
- Indirect or consequential damages of any kind resulting from the use, the non-functioning, the defects or the inaccuracy of the product
- Any repairs not done by an authorized qualified service partner, e.g. the disassembly of the product done by a person non-authorized by Sylvac SA
- The periodic check-ups, the adjustments or the maintenance

Sylvac SA owns all parts removed from repaired products. If Sylvac SA repairs or replaces a part of a product, its warranty term is not extended. In case of replacement the new component has a warranty of 1 year, without effect on the initial warranty period.

Any further claim against Sylvac SA, e.g. for damages additional to the above described warranty is expressed excluded.

8 DECLARATION OF CONFORMITY

Name of the manufacturer
SYLVAC SA

Address of the manufacturer
Chemin du Closalet 16
CH-1023 Crissier
Suisse

who declares herein, that the product

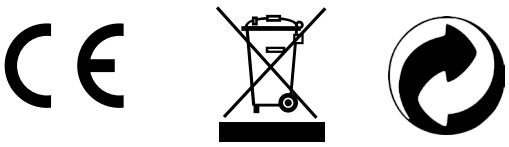
Product
SYLVAC-SCAN 52
Optical Measuring System for turned parts

Order number	Description	Stock	Software
902.5520	SYLVAC-SCAN 52	Head	Sylvac-Reflex-Scan
902.5521	SYLVAC-SCAN 52	Tail	Sylvac-Reflex-Scan

Serial number
see on the machine

is in compliance with the following provisions
– European Guidelines 2006/42/CE, 2004/108/CE, 2006/95/CE
– European Standards EN 12100-2, EN 60204-1, EN 61326-1
– as well as with all technical data contained in our sales literature.

SYLVAC SA
CH-1023 Crissier
Suisse



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