

| AUTOMATIC VISION MEASURING MACHINE

# 全自动影像仪

## SC-300VC

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## 技术规格

TECHNICAL MANUAL

精准·稳定·便携·高效



# 技术参数 / Technical Parameters

## 产品介绍

VC 系列悬臂式全自动影像测量仪具有高精度、高可靠性、结构设计合理、造型美观、操作使用简单，维修方便等特点，其卓越的性能得益于该仪器选用的大理石仪器底座、优质的光学系统、操作简便的测量软件。该机 X、Y、Z 三轴 CNC 电机驱动；具有自动测量编程软件，因此，该机可应用于精密零部件的内、外径，直角坐标尺寸和极坐标尺寸的测量，能完成对被测工件的形状误差和位置误差的测量评定等；主要应用于产品及相关零部件几何尺寸的精密测量，该设备最大的优势在于可批量快速进行自动编程测量，并可精准自动对焦、实现更精准的更快速的测量工作、减少人工测量误差。

VC series vision measuring machine boasts high precision, reliability, rational structure, elegant design, easy operation and convenient maintenance. Its superior performance comes from a granite base, high-quality optical system and user-friendly measuring software. Driven by CNC motors on the X, Y, Z axes and equipped with automatic measurement programming, it accurately measures inner/outer diameters, Cartesian and polar dimensions of precision components, and evaluates form and position errors of workpieces. Primarily used for precise geometric dimension measurement, its key advantage is rapid automatic programmed batch measurement with precise auto-focusing, enabling faster, more accurate inspection and minimizing manual measurement errors.

# 技术参数

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## 基本参数

| 项目                                                     | 配置                                                                                                      |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 设备型号<br>Model                                          | SC300-VC                                                                                                |
| 测量范围(mm)<br>Measurement Range(mm)                      | 300X300X200                                                                                             |
| 外型尺寸 (mm)<br>Overall Dimensions (mm)                   | 900X1330X1710                                                                                           |
| 玻璃台面尺寸 (mm)<br>Glass Stage Size (mm)                   | 370X370                                                                                                 |
| 带侧桌外型尺寸(mm)<br>Overall Dimensions with Side Table (mm) | 1950X1330X1710                                                                                          |
| 设备净重(kg)<br>Net Weight (kg)                            | 210                                                                                                     |
| 载物台承重 (kg)<br>Stage Loading Capacity (kg)              | 25                                                                                                      |
| 光学放大倍率<br>Optical Magnification                        | 0.6-5.0X                                                                                                |
| 影像放大倍率<br>Image Magnification Ratio                    | 39-328X                                                                                                 |
| XY轴精度 (μm)<br>X/Y Axis Accuracy (μm)                   | 2.2+L/200 (L 为被测工件长度, 单位: mm)<br>2.2+L/200(L = measured workpiece length, unit: mm)                     |
| Z轴精度 (μm)<br>Z Axis Accuracy (μm)                      | 3.5+L/200 (3X 以上倍率)<br>3.5+L/200(Magnification ≥3X)                                                     |
| 机台运行速度<br>Test Speed                                   | X/Y轴最大运行速度 : 300mm/s<br>Max Speed (X-Y Axis): 300 mm/s                                                  |
|                                                        | Z轴最大运行速度: 100mm/s<br>Max Speed (Z Axis): 100 mm/s                                                       |
| 环境<br>Environment                                      | 温度20±2 °C, 温度变化≤2°C/hr, 湿度30 ~ 80%<br>Temperature: 20 ± 2 °C, variation ≤ 2 °C/hr Humidity: 30 – 80% RH |
| 电源<br>Power Supply                                     | AC200-240V,50/60Hz,1600W功率<br>AC200-240V, 50/60Hz, 1600W                                                |



# 技术参数 / Technical Parameters

## 主要配置清单

| 序号<br>NO. | 系统<br>System               | 组件<br>Component               | 规格及参数<br>Specification                                                                                                       |
|-----------|----------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1         | 设备主体<br>Main Unit          | 机械结构<br>Mechanical Structure  | 大理石主体结构，膨胀系数小，物理特性稳定<br>Granite Main Structure With A Low Coefficient Of thermal Expansion And Excellent Physical Stability. |
| 2         |                            | 载物台<br>Working Stage          | 光学玻璃<br>Optical Glass                                                                                                        |
| 3         |                            | 光栅尺<br>Scale                  | 0.5μm高精度金属光栅尺<br>0.5μm High-Precision Linear Scale                                                                           |
| 4         |                            | 导轨<br>Guide                   | X/Y轴：V型导轨<br>X/Y Axis: V-Type Guide                                                                                          |
|           |                            |                               | Z轴：直线导轨<br>Z Axis: Linear guide                                                                                              |
| 5         |                            | 丝杆<br>Ball Screw              | 精密滚珠丝杆<br>Precision Ball Screw                                                                                               |
| 6         | 光学系统<br>Optical System     | 相机<br>Camera                  | 1/1.8 英寸 600 万像素彩色数字相机 (GigE)<br>1/1.8" 6MP Digital Camera (Color) (GigE)                                                    |
| 7         |                            | 镜头<br>Lens                    | 0.6-5.0X自动变倍镜头带同轴光<br>0.6-5.0X Automatic Zoom Lens With Coaxial Light                                                        |
| 8         |                            | 影像放大倍率<br>Image Magnification | 39-328X (24寸显示器)<br>39-328X (24" Monitor)                                                                                    |
| 9         |                            | 视野范围<br>Field of View         | 1.5 mm × 1.1 mm - 12.3 mm × 9.3 mm                                                                                           |
| 10        |                            | 底部透射光源<br>Bottom Light        | 球积分平行光路LED透射光源 (255级任意可调)<br>Ball-Integrating Parallel Optical Path LED Bottom Light (255-Level Stepless Adjustable)         |
| 11        |                            | 表面光源<br>Surface Light         | 4环8区程控LED反射光源 (255级任意可调)<br>4-Ring 8-zone Programmable LED (255-Level Adjustable)                                            |
|           |                            |                               | LED同轴照明 (5V 10W)<br>LED Coaxial Light (5V 10W)                                                                               |
| 12        | 电控系统<br>Electronic Control | 控制器<br>Controller             | SC-300 (全闭环)<br>SC-300 (Full Closed-Loop)                                                                                    |
| 13        |                            | 电机<br>Motor                   | 日本“尼德科”伺服电机<br>Japan Nidec Servo Motor                                                                                       |
| 14        |                            | 摇杆<br>Joystick                | SC-A型摇杆<br>SC-A Joystick                                                                                                     |
| 15        | 软件系统                       | 测量软件<br>Measuring Software    | ISOBIT自动测量软件<br>ISOBIT Automatic Vision Measurement Software                                                                 |



# 技术参数

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|    |                   |                              |                                                               |
|----|-------------------|------------------------------|---------------------------------------------------------------|
|    | Software System   |                              |                                                               |
| 16 | 附件<br>Accessories | 校正块<br>Calibration Standard  | 光刻标准元素校正块<br>Mask Standard Element Correction Block           |
| 17 |                   | 出厂合格证<br>Factory Certificate | 出厂合格证<br>Factory Qualification Certificate                    |
| 18 |                   | 出厂检验报告<br>Inspection Report  | 出厂检验报告<br>Factory Inspection Report                           |
| 19 |                   | 说明书<br>Manual                | 硬件说明书、软件说明书<br>Hardware & Software Manuals                    |
| 20 | 可选配置<br>Optional  | 探针系统<br>Probe System         | Renishaw MCP探针、PH+TP20探针<br>Renishaw MCP, PH+TP20 probe       |
| 21 |                   | 传感器<br>Sensor                | 点激光传感器、光谱共焦传感器<br>Point Laser Sensor、Spectral Confocal Sensor |
| 22 |                   | 其它镜头<br>Lens                 | 自动变倍镜头、自动变倍导航镜头<br>Auto Zoom Lens, Auto Zoom Navigation Lens  |
| 23 |                   | 辅助物镜<br>Auxiliary Objective  | 0.6X辅助物镜<br>0.6X Auxiliary Objective                          |
| 24 |                   | Z轴加高<br>Z-axis Extension     | Z轴行程加高至300mm<br>Z Range Extended To 300mm                     |

电脑配置清单

| 名称                      | 型号                                         | 名称                       | 型号                                           |
|-------------------------|--------------------------------------------|--------------------------|----------------------------------------------|
| CPU                     | I5-12400<br>Intel Core I5-12400            | 主 板<br>Mainboard         | H610M3 工控主板<br>H610M3 Industrial Motherboard |
| 硬盘<br>Hard disk         | 金士顿 240G M.2 SSD<br>Kingston 240GB SSD     | 内存<br>RAM/ Memory        | 金士顿16GB DDR4<br>Kingston 16GB DDR4 Memory    |
| 显示器<br>Monitor          | 飞利浦-24寸显示器<br>Philips 24" LED Monitor      | 显卡<br>Video card         | CPU 集成核显<br>On-board Integrated Graphics     |
| 键盘/鼠标<br>Keyboard/Mouse | 双飞燕-键盘/光电鼠标<br>A4Tech USB Keyboard & Mouse | 操作系统<br>Operating System | Win11<br>Windows 11 Professional             |

# 技术参数 / Technical Parameters

## 软件测量功能

| 序号    | 内容                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | 基本测量功能 Basic Measurement Functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.1   | <p>可测几何量：点、线、圆（最大、最小和平均）、弧、多样曲线周长和面积、椭圆、矩形、四边形、槽、R角、环、间距、距离、点群、直径等。</p> <p>Measurable geometric elements: Points, lines, circles (max/min/average), arcs, perimeter and area of complex curves, ellipses, rectangles, quadrilaterals, slots, radii (R angles), rings, pitch, distance, point clouds, diameters, etc.</p>                                                                                                                                                                                                                                                                             |
| 1.2   | <p>可构造测量：平移、旋转、提取、组合、平行、垂直、镜像、对称、相交、相切等元素构造功能；实现中心点、极值点、端点、交点、两点连线、平行线、垂线、切线、平分线、中心线、合并、轮廓分割、半径画圆、三线内切圆、两线半径内切圆等。</p> <p>Constructive measurement: Translation, rotation, extraction, combination, parallel, perpendicular, mirror, symmetry, intersection, tangency and other element construction functions; supports center points, extreme points, endpoints, intersections, two-point lines, parallel lines, perpendiculars, tangents, bisectors, centerlines, merging, contour segmentation, radius-defined circles, three-line inscribed circles, two-line radius inscribed circles, etc.</p> |
| 1.3   | <p>形位公差：直线度、平面度、圆度、垂直度、倾斜度、平行度、位置度、对称度、同心度等。</p> <p>Geometric tolerances: Straightness, flatness, roundness, perpendicularity, angularity, parallelism, position, symmetry, concentricity, etc.</p>                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.4   | <p>坐标系：点线、两点X、两点Y、三点、两线、图像配准坐标系；平移、旋转、手工调整坐标系。</p> <p>Coordinate systems: Point-line, two-point X, two-point Y, three-point, two-line, image registration coordinate systems; coordinate system translation, rotation, and manual adjustment.</p>                                                                                                                                                                                                                                                                                                                                                    |
| 1.5   | <p>标注功能：半径标注、直径标注、角度标注、线性标注、对齐标注、文字标注、坐标标注。</p> <p>Dimensioning functions: Radius dimension, diameter dimension, angle dimension, linear dimension, aligned dimension, text annotation, coordinate dimension.</p>                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.6   | <p>自动寻边功能：鼠标自动找直线、点选圆、框选区域测圆、自动圆、自动圆弧。</p> <p>Auto-edge detection: Automatic line detection by mouse, point-to-select circle, box-select region for circle measurement, auto-circle, auto-arc.</p>                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.7   | 自动聚焦功能 Auto-focus function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.7.1 | <p>可以实现自动对焦（避免手动对焦带来的误差，每个人眼睛的视力是不一样的，对出来的清晰度就有差异。）</p> <p>Automatic focusing (eliminates errors caused by manual focusing; differences in individual eyesight lead to inconsistent sharpness).</p>                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.7.2 | <p>光学测高和平面度精度相比手动机而言精度更高。</p> <p>Higher accuracy in optical height and flatness measurement compared to manual machines.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1.7.3 | <p>重复性好，不同人员测量同样尺寸使用自动对焦后测量数据几乎一样，解决手动机聚焦换人测量数据差别大。</p> <p>Excellent repeatability; measurement results for the same dimension are nearly identical across different operators with auto-focus, eliminating large data variations common in manual focusing.</p>                                                                                                                                                                                                                                                                                                                                     |
| 2     | 特色功能 Special Features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2.1   | <p>变倍同步显示：切换倍率时，软件自动同步更新倍率的显示。</p> <p>Magnification synchronization: The software automatically updates the magnification display when switching magnifications.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2.2   | <p>手动 CNC 功能：手动测量机也能实现程序化编程测量，解决不同测量人员测量数据差异。</p> <p>Manual CNC function: Enables program-controlled measurement on manual machines, eliminating measurement data variations between operators.</p>                                                                                                                                                                                                                                                                                                                                                                                                  |

# 技术参数

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|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.3 | 实现软件调光：可以实现软件调光，具有数字记录灯光亮度值（避免手动旋钮调光带来的人为误差）。<br>Software-controlled lighting: Digital adjustment and recording of light intensity values (eliminates human error from manual knob adjustment).                                                                          |
| 2.4 | 逆向图纸导入导出：CAD 图形导入导出双向操作，可比对测量，可出逆向导图，灵活使用。<br>Reverse drawing import/export: Bidirectional CAD file import/export for comparison measurement and reverse engineering, with flexible usage.                                                                               |
| 2.5 | 输出及数据统计：可输出 Word、Excel、HTML、TXT 报表和 AutoCAD 文件。<br>Report and data export: Supports Word, Excel, HTML, TXT reports and AutoCAD file output.                                                                                                                              |
| 2.6 | 自定义报表输出：支持手动输出至 excel 模版，可定制模版。<br>Custom report output: Supports export to Excel templates with customizable formats.                                                                                                                                                   |
| 2.7 | SPC 统计功能：可输出 CPK、CA、CP 等进行有效品控管制，软件设置报表及图形区将超差项显示。<br>SPC statistical functions: Outputs Cpk, Ca, Cp, etc., for quality control; out-of-tolerance items are highlighted in reports and graphs.                                                                           |
| 2.8 | 支持多语言：软件包括多种语言，语言更换方便（中英）；支持定制语言包。<br>Multi-language support: Built-in multiple languages (including Chinese/English) with easy switching; custom language packs supported.                                                                                              |
| 2.9 | 图片保存：可进行高清图片保存。<br>Image capture: Saves high-resolution images.                                                                                                                                                                                                          |
| 3   | 增强功能 Enhanced Functions                                                                                                                                                                                                                                                  |
| 3.1 | 函数运算功能：实现函数运算，直接快速得到结果。<br>Formula calculation: Direct function operations for fast result output.                                                                                                                                                                       |
| 3.2 | 支持宏测量：可预设测量工具，实现取元素后直接输出结果。<br>Macro measurement support: Predefined measurement tools for direct result output after element acquisition.                                                                                                                               |
| 3.3 | 支持模板测量：十字线模板、同心圆模板等，实现对比快速测量。<br>Template-based measurement: Crosshair, concentric circle and other templates for fast comparative measurement.                                                                                                                          |
| 3.4 | 平面度测量：配备 Z 轴光栅尺进行可进行影像高倍率下对焦平面度测量、高度差、深度测量，或选配增加探针进行接触式平面度、高度测量。<br>Flatness measurement: Z-axis linear scale enables focus-based flatness, height difference and depth measurement at high magnification; optional touch probe for contact flatness/height measurement. |
| 3.5 | 拍照并标注：软件可对工件进行拍照拼接，形成大地图并可显示标注尺寸。<br>Image stitching and dimensioning: Captures and stitches workpiece images into a panoramic view with dimension annotations.                                                                                                          |
| 3.6 | 模板闪测：支持模板测量：通过创建模板进行一键测量。<br>Template-based rapid measurement: One-click measurement using predefined templates.                                                                                                                                                         |
| 3.7 | 预置元素：可以由命令行直接输入坐标信息，生成点、直线、圆、圆弧等，满足特殊需要。<br>Predefined elements: Direct coordinate input via command line to generate points, lines, circles, arcs, etc., for special requirements.                                                                                      |
| 3.8 | 导航功能：可选配带导航镜筒，轻松实现快速导航定位测量位置。<br>Navigation function: Optional navigation lens for quick positioning of measurement locations.                                                                                                                                           |
| 3.9 | 数据加密：支持输出加密 EXCEL 数据。<br>Data encryption: Supports encrypted Excel data output.                                                                                                                                                                                          |

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|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.10 | 轮廓扫描：可手动进行扫描工件外型轮廓图形，导入 CAD 中或保存 DXF 格式。<br>Contour scanning: Manual scanning of workpiece outer contours for CAD import or DXF format saving.                                                                                             |
| 3.11 | 辅助对焦：帮助找到最清晰时候的 Z 位置（辅助调焦提高测量精度）<br>Auto-focus assistant: Assists in finding the sharpest Z position (improves measurement accuracy).                                                                                                      |
| 3.12 | 软件程序权限管理：具有管理员设定参数权限设定，程序编辑权限设定。<br>Software access control: Administrator-defined parameter and program editing permissions.                                                                                                              |
| 3.13 | 图像窗口调整：可根据需求进行图像窗口调整比，满足不同客户的使用需求。<br>Image window adjustment: Customizable image window scaling to meet different user requirements.                                                                                                      |
| 3.14 | 扫码识别功能：半自动测量软件支持扫条码、二维码，可调用测试程序，同时可按工件型号、工件名称、检测日期、工件识别码等进行存储。<br>Barcode scanning support: Semi-automatic software supports barcode/QR code scanning to call test programs and store data by part number, name, inspection date, ID, etc. |
| 3.15 | 微调手轮：兼容自动聚焦与手动微调，方便操作 Z 轴升降，可调速、可根据需要切换调节移动速度。<br>Fine adjustment handwheel: Supports both auto-focus and manual fine adjustment for Z-axis movement with variable speed control.                                                          |



# 技术参数 / Technical Parameters

## 培训与验收

| 序号  | 内容                                                                                                                                                                                                                                                                       |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 培训 Training                                                                                                                                                                                                                                                              |
| 1.1 | 参加培训的人员应具备计量基础知识和计算机基本操作常识。<br>Trainees should have basic metrology knowledge and computer operation skills.                                                                                                                                                             |
| 1.2 | 供方在客户现场负责对用户操作人员进行设备系统理论、实际操作和常规保养的基本培训。完成培训后做现场考核，合格后方可操作设备。<br>The supplier provides on-site training for operators on equipment theory, practical operation and routine maintenance. A post-training assessment is required before equipment operation authorization. |
| 1.3 | 时间：1~2 个工作日。<br>Duration: 1-2 working days.                                                                                                                                                                                                                              |
| 1.4 | 参加人数：≤3 人。<br>Number of participants: ≤ 3 persons.                                                                                                                                                                                                                       |
| 2   | 验收 Acceptance                                                                                                                                                                                                                                                            |
| 2.1 | 现场开箱后，核对设备的型号、配件的规格数量；确认外观有无划伤或掉漆；确认各部件有无损坏或异常。<br>Upon on-site unpacking, verify the equipment model, accessory specifications and quantity; inspect for scratches, paint loss or component damage/abnormalities.                                                       |
| 2.2 | 使用专用玻璃标准器进行设备的校准，确认仪器符合技术协议的要求。<br>Calibrate the equipment using COBEKK dedicated glass standards to verify compliance with the technical agreement.                                                                                                                     |
| 2.3 | 验收标准参照现行国家（或行业）标准以及本技术协议为准。<br>Acceptance criteria refer to current national (or industry) standards and this technical agreement.                                                                                                                                       |
| 2.4 | 验收合格后，供方和需方签订《产品验收报告》。<br>After successful acceptance, both parties sign the Product Acceptance Report.                                                                                                                                                                  |



# 技术参数 / Technical Parameters

## 售后服务

| 序号 | 内容                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 承诺所提供给客户的产品质量保证期为 12个月，自交付之日起计算。<br>COBEKK Instruments provides a 12-month product warranty from the date of delivery.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2  | 供方在接到故障信息后，3 小时内回应，包括电话、通讯聊天软件、传真、邮件等方式进行远程指导用户排除故障。若故障仍不能排除，供方将在 72 小时内进行售后上门服务。<br>The supplier responds to fault reports within 3 hours via phone, instant messaging, fax or email for remote troubleshooting. If unresolved, on-site service will be provided within 72 hour                                                                                                                                                                                                                                                                                     |
| 3  | 旨在为客户提供及时优质的服务，用户在设备发生故障时应及时详细地提供故障相关信息。<br>To ensure prompt and quality service, users must provide detailed fault information when issues occur.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4  | 质保期内，实行 “三包”，设备在正常使用过程中出现产品质量问题，客户有权要求供方免费维修及更换，易损易耗件（载物台玻璃）除外，当设备需要升级时免费升级。若设备属于人为损坏、非产品质量问题、自然灾害等不可抗力造成的损害，则不在保修范围内，也应及时提供售后服务，但客户需承担供方人员差旅费与材料维修费用。<br>During the warranty period, the "Three Guarantees" policy applies: free repair and replacement for quality defects under normal use, excluding consumables (stage glass). Free software upgrades are included. Damage from human error, non-quality issues or force majeure is not covered by warranty, but COBEKK will still provide after-sales service at the customer's cost for travel and materials. |
| 5  | 设备属于精密测量仪器，对使用环境和安装有严格要求，为确保设备的正常使用，质保期内未经供方允许，客户不得擅自进行设备的搬迁、拆解和改装，因客户以上行为而造成的一切不良后果，将由客户自行承担。<br>As precision measuring equipment requires strict installation and environmental conditions, unauthorized relocation, disassembly or modification during the warranty period is prohibited. All consequences of such actions shall be borne by the customer.                                                                                                                                                                                                        |
| 6  | 质保期外，提供长期优惠的有偿服务和技术支持。<br>Beyond the warranty period, COBEKK provides long-term paid service and technical support at preferential rates.                                                                                                                                                                                                                                                                                                                                                                                                                            |