HEXAGON
MANUFACTURING INTELLIGENCE

DATA SHEET

OPTIV CLASSIC 322

PRODUCT DESCRIPTION

The Optiv Classic 322 combines optical and tactile measurement in one system (optional touch-trigger probe). The system supports multi-sensor measurements using the Vision sensor (CMOS colour camera, motorised CNC zoom) and the touch-trigger probe HP-TM. The Optiv Classic 322 provides easy pallet station integration with good accessibility to the measuring table from all sides. Measurement software is PC-DMIS.

FIELDS OF APPLICATION

- Shop floor and inspection room
- Versatile geometry measurements and GD&T analysis

DESIGN

Design principle : Benchtop unit of proven cross-table design with a solid metal base frame as a standard
Guides : Mechanical linear guides on all axes, counterbalance on Z axis
Drives : DC servo motors, power transmission via plain shafts in conjunction with rolling ring drives
Length measuring system : Incremental, optoelectronic length measuring system
Resolution of the scales : 0.05 µm

MEASURING RANGE (X x Y x Z)

OPTIV CLASSIC 322

	Measuring range Vision sensor	Measuring range touch-trigger probe	Mutual measuring range(1)
X	300 mm (11.5 in.)	256 mm (10 in.)	256 mm (10 in.)
Y	200 mm (7.5 in.)	175 mm (6.5 in.)	175 mm (6.5 in.)
Z	200 mm (7.5 in.)(2)	200 mm (7.5 in.)(2)	200 mm (7.5 in.)(2)

(1) Vision sensor <—> Touch-trigger probe, see page 6. (2) At a maximum workpiece depth in Y of 140 mm, otherwise Z = 80 mm.

LOADING CAPACITY

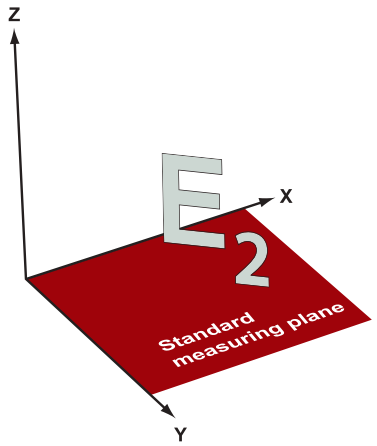
- Load-bearing capacity of the table up to 16 kg

DIMENSIONS IN MM AND WEIGHTS IN KG

- Dimensions see machine layout on page 5
- Machine weight 260 kg + base frame 45 kg

MEASURING ACCURACY(3)

At 20°C, according to ISO 10360-7, with Vision sensor, at highest zoom magnification, standard measuring plane(3)	At 20°C, with touch-trigger probe(3)
XY measuring accuracy MPE (Exy) = (2.8 + L/150) µm	XY measuring accuracy MPE (Exy) = (2.8 + L/150) µm
Z measuring accuracy MPE (Ez) = (5.0 + L/150) µm	Z measuring accuracy MPE (Ez) = (5.0 + L/150) µm



(3) The conditions of acceptance of Hexagon Metrology Vision apply. L = measurement length in mm.

AIRBORNE NOISE EMISSIONS

• The A-weighted emission sound pressure level at operator's position is less than 70 db(A).

ENVIRONMENTAL REQUIREMENTS

• Air humidity 45 % - 75 % RL, non-condensing
• Environmental temperature 20 °C ± 2 °C
• Permissible temperature gradient 1.0 °C/h, 2.0 °C/d, 1.0 °C/m
• Max. installation height 2000 m above sea level

THROUGHPUT

• Max. traversing speed : X, Y = 165 mm/s, Z = 60 mm/s

VISION SENSOR

Technical description :

• Sensor for non-contact measurement of smallest and closely toleranced features
  - High resolution digital 1/1.8-inch CMOS colour camera with Gigabit Ethernet interface, for interference-free, low noise image reproduction
  - Maximum optical precision due to low distortion optics : Motorised CNC zoom
  - Powerful image processing
    > Fast, precision video autofocus
    > Automatic feature detection, geometry and bad pixel video filters
    > Contour scanning mode : Sophisticated set of user-selectable algorithms to setup edge detection, intelligent, automatic selection of the most suitable setting for the measurement
    > Best fit routines
    > AutoTune : Transferability of measuring programs between machines of the same type
    > MultiCapture : MultiCapture allows all 2D features within a field of view to be captured simultaneously, regardless of the feature type. Inspection speeds can be increased by 35 % or more, depending on the feature size and density. The capture sequence for groups of features using MultiCapture is also automatically optimised, creating the most efficient possible path with the fewest number of stage movements.
    > RGB Sensitivity Adjustments for colour cameras : Software controls for Red/Green/Blue (RGB) sensitivity in images from a colour camera allow for fine control adjustment over image contrast. This capability improves overall consistency in vision inspection in general and is especially useful for coloured parts where edges can be difficult to capture with grayscale or lighting modifications alone.

Illumination for Vision sensor :

• Coaxial LED top light
• LED back light
• Multi-segment LED ring light : 4 quadrants
• Laserpointer (simplifies navigation during the measuring program generation)

CNC zoom :

• Motorised zoom, for a continuous adjustment of field of view and resolution : Standard: 6.5x
• High resolution digital 1/1.8-inch CMOS colour camera (H 1280 x V 1024) with Gigabit Ethernet interface

MAGNIFICATION VARIANTS OF THE 6.5X CNC ZOOM(1)

Lens	Magnification(2)	Working distance (mm)	Max. workpiece height (mm)(3)	Max. field of view (mm)	Min. field of view (mm)	Pixel size (µm/pixel)	Screen magnification (4)
Standard	0.74x to 4.4x	92	0 to 130	9.2 x 7.3	1.53 x 1.22	7.2 bis 1.2	49x to 295x

(1) Values rounded. (2) Optical. (3) Without multi-segment LED ring light (When using a multi-segment LED ring light, these values are reduced by the amount of the overall height of the ring light (approx. 30 mm).). (4) On a 22-inch (16:9) monitor, PC-DMIS "Scale to Fit" —> OFF.

TOUCH-TRIGGER PROBE HP-TM (OPTIONAL)

Technical description	Measuring directions	Mounting	Stylus holding modules	Probe repeatability 1D	Probe repeatability 2D	Trigger force	Overtravel	Optional stylus module changing rack
• The 5-way touch-trigger probe consists of the sensor body and the stylus holding module that are magnetically connected to each other. • The stylus holding modules are available in four versions with different trigger forces.	±X, ±Y, +Z	M8 thread (probe body), M2 thread (styli)	**Four:** • LF low force • SF standard force • MF medium force • EF extended force	0.35 µm (LF module), 0.35 µm (SF module), 0.50 µm (MF module), 0.65 µm (EF module)	± 0.60 µm (LF module), ± 0.80 µm (SF module), ± 1.00 µm (MF module), ± 2.00 µm (EF module)	0.055 N, L = 10 mm (LF module), 0.08 N, L = 10 mm (SF module), 0.10 N, L = 25 mm (MF module), 0.10 N, L = 50 mm (EF module)	X/Y = +/- 16°, Z = + 5 mm	HR-P with 4 slots

Mutual measuring range Vision sensor <—> Touch-trigger probe, see page 6.

CONTROL SYSTEM AND SAFETY REGULATIONS

- Machine control unit: DELL computer system with Microsoft Windows 10 Professional (64 bit)
- CNC controller: Microprocessor CNC with vector path control
- Safety equipment:
  - Emergency-Stop circuit with Emergency-Stop button
  - Axis drive via rolling ring drive with safety slip clutch
  - Scale signal monitoring
  - Protective covers for the axes' drives
  - Collision protection for touch-trigger probes
- Safety regulations:
  - DIN EN ISO 12100-1 and -2 (Safety of machinery)
  - DIN EN 60204-1 (Safety of machinery - Electrical equipment of machines)
  - DIN EN ISO 13849-1 (Safety of machinery - Safety-related parts of control systems)
  - DIN EN 61000-4-2 and -4 (Electromagnetic compatibility EMC, immunity of machines)
  - DIN EN 55011 (Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics)

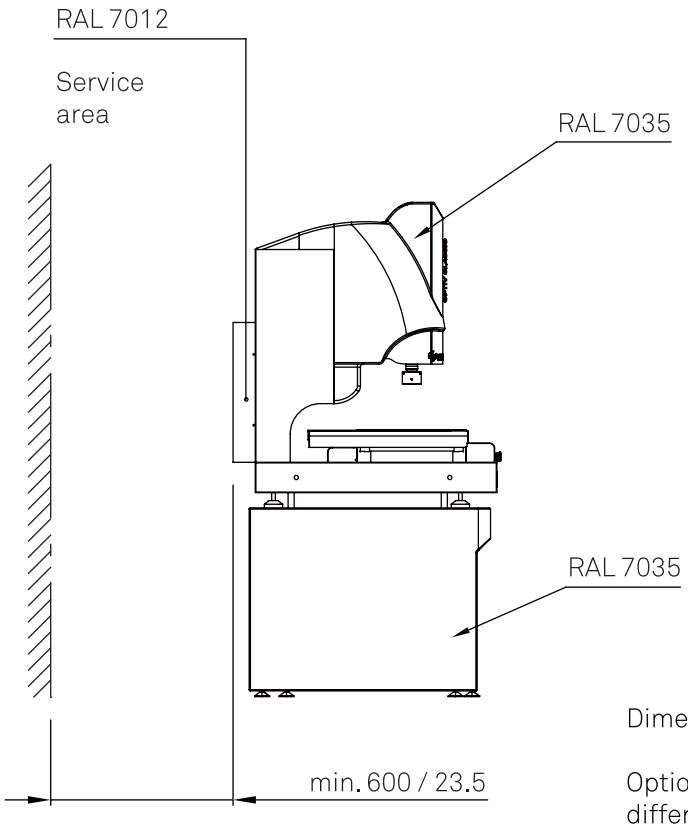
SUPPLY DATA

- Input voltage power supply 115-230 V ± 10%
- Frequency 50/60 Hz ± 5%
- Power consumption (max.) 690 W

OPTIONAL EQUIPMENT

- Touch-trigger probe HP-TM
- Stylus module changing rack HR-P with 4 slots
- Rotary indexing table
- Periphery:
  - Worktable
  - Printers, monitors

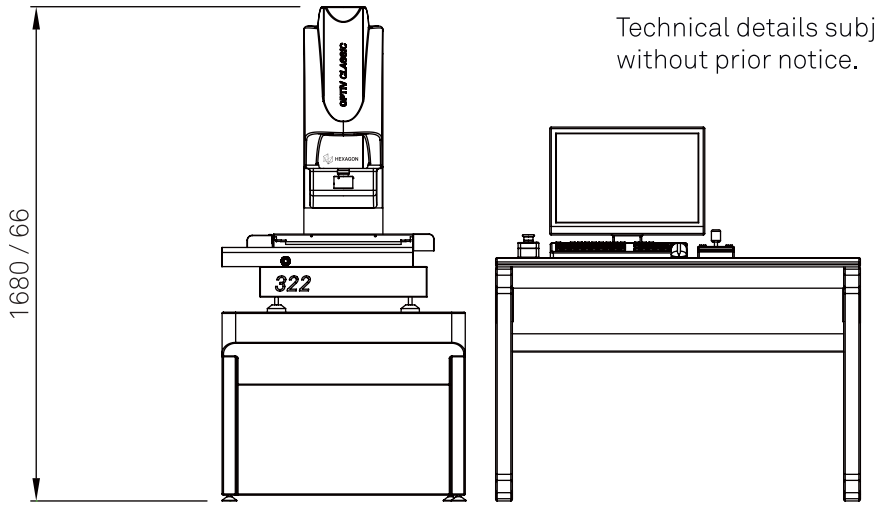
MACHINE LAYOUT

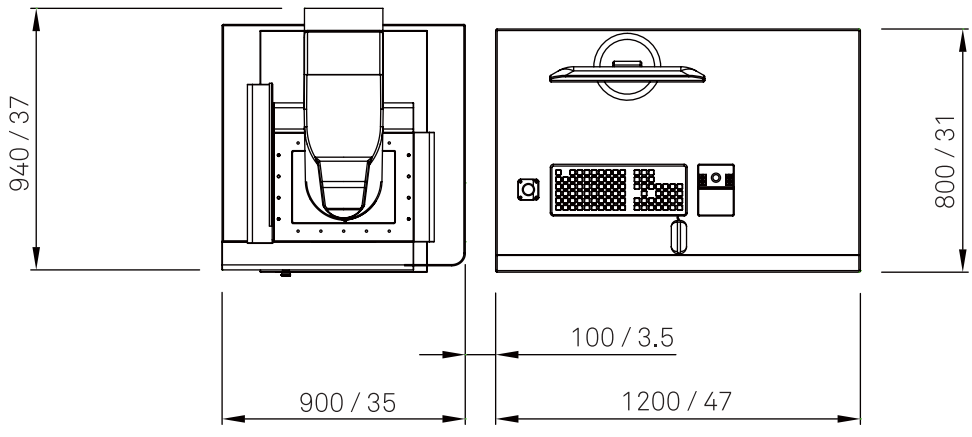


Dimensions in mm / inch

Optional worktable and monitor(s), differing variants possible.

Technical details subject to change without prior notice.





STAGE LAYOUT

Classic 322

Dimensions in mm / inch

Technical details subject to change without prior notice.

Size of all threads M8-19 deep

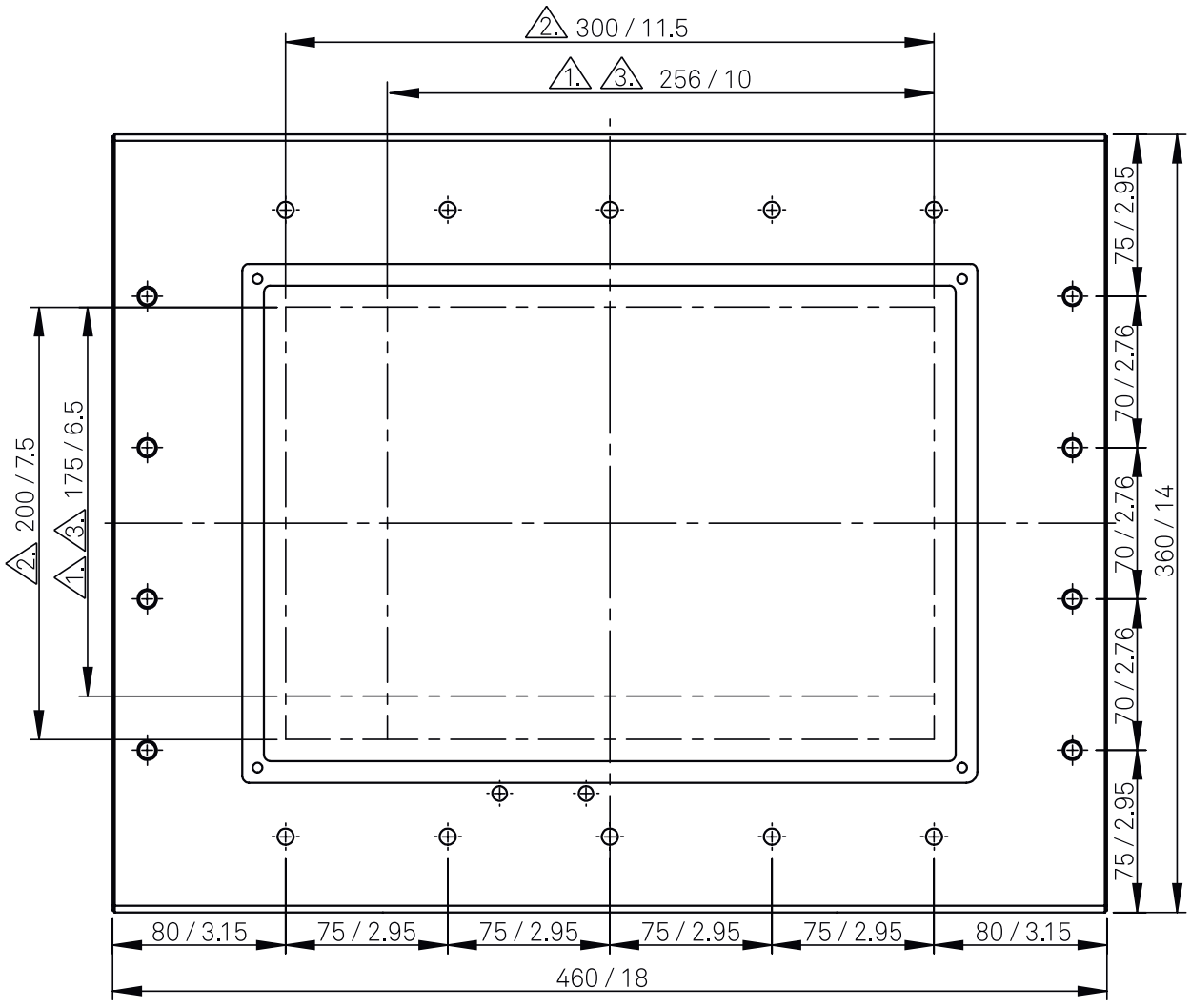
Offset camera + touch-trigger probe in X direction
44 mm / 1.5 inch

Offset camera + touch-trigger probe in Y direction
25 mm / 1 inch

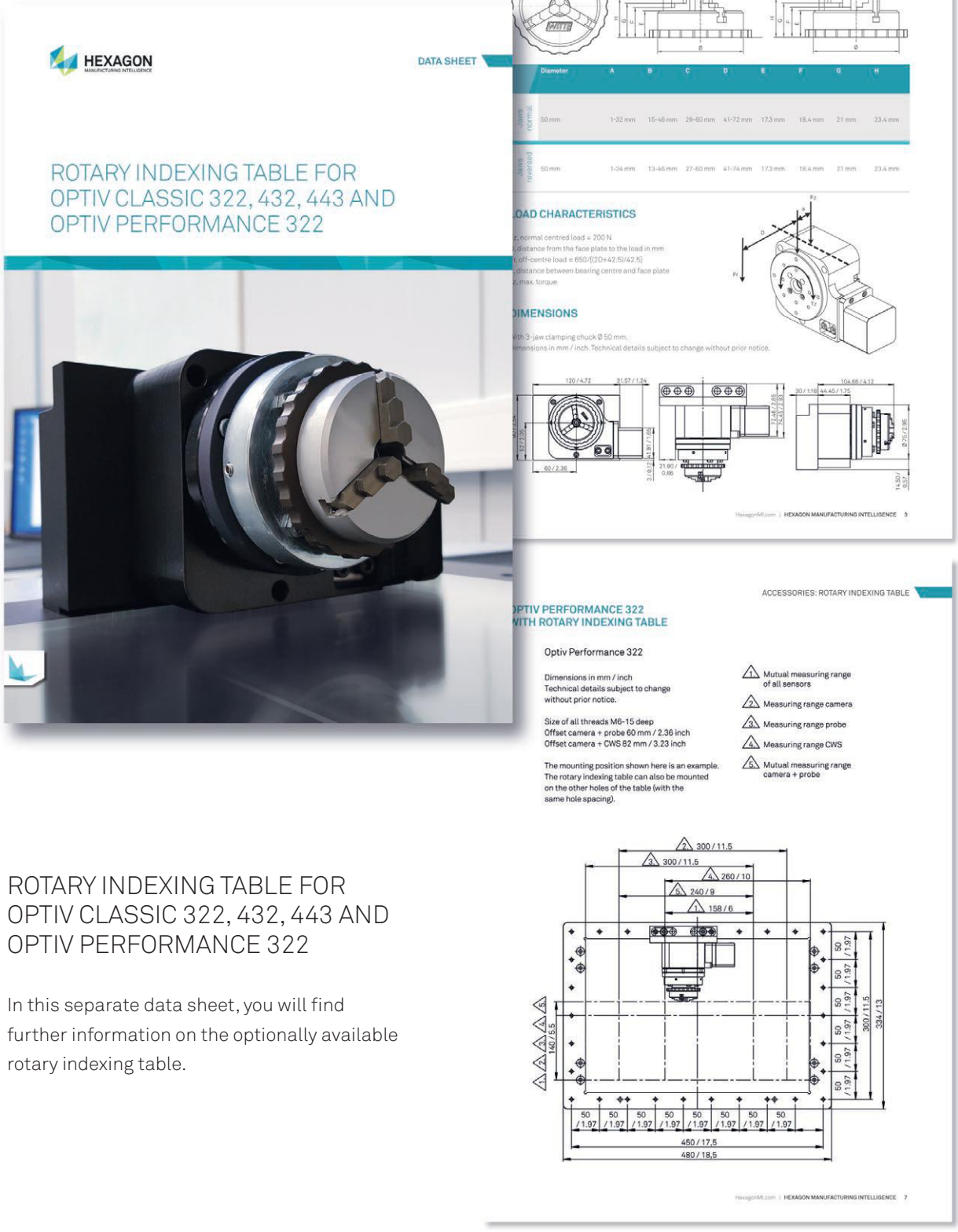
1. Mutual measuring range

2. Measuring range camera

3. Measuring range touch-trigger probe



ROTARY INDEXING TABLE (OPTIONAL)



ROTARY INDEXING TABLE FOR OPTIV CLASSIC 322, 432, 443 AND OPTIV PERFORMANCE 322

In this separate data sheet, you will find further information on the optionally available rotary indexing table.

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MANUFACTURING INTELLIGENCE

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