



HEIDENHAIN



Product Information

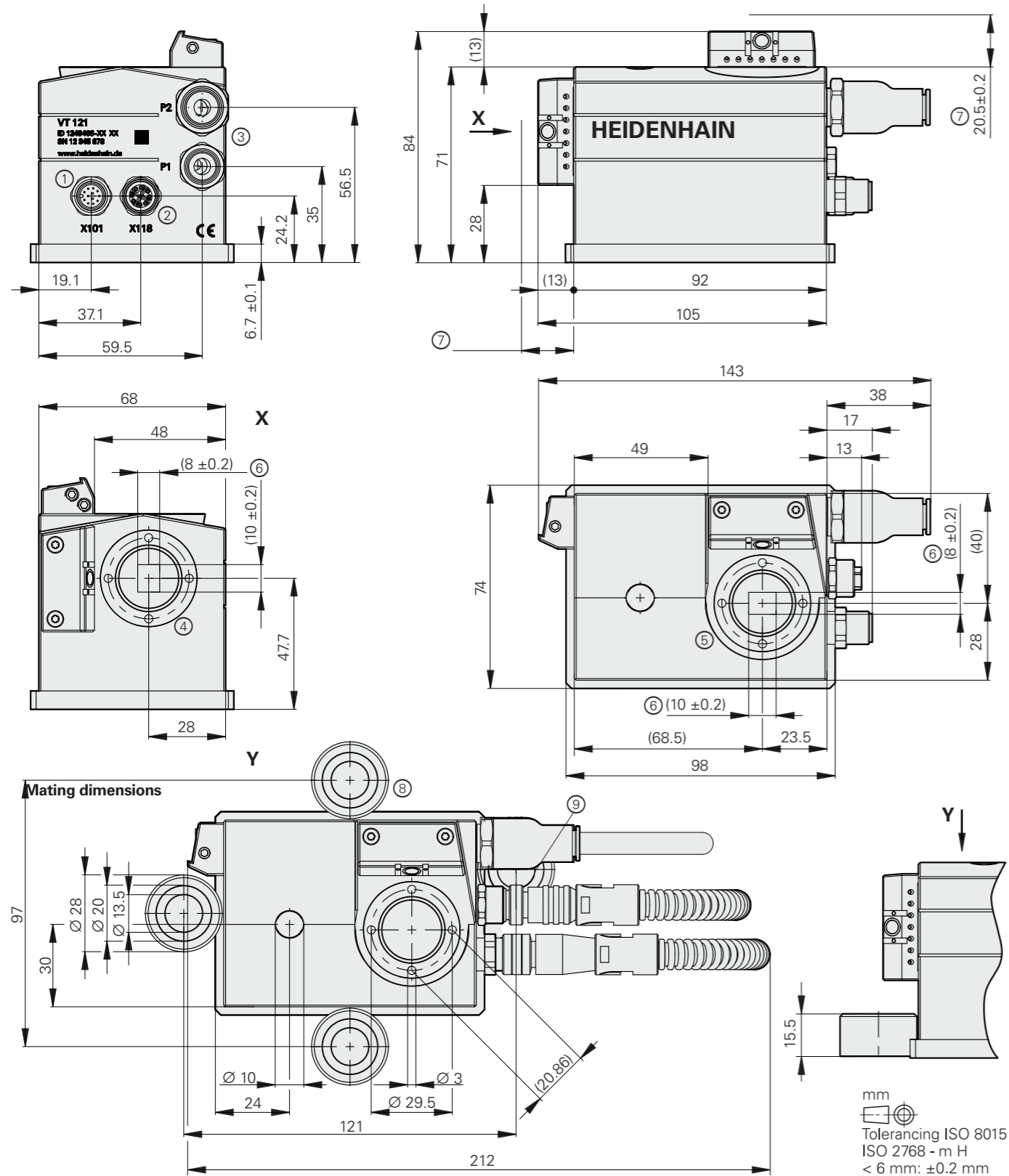
VT 121

VTC

Vision System for
Tool Inspection

VT 121 with VTC

Vision system for tool inspection



- 1 = Connection for supply voltage
- 2 = Data interface
- 3 = Connections for compressed air
- 4 = Camera 1
- 5 = Camera 2
- 6 = Camera field of view
- 7 = Focal plane
- 8 = Attached with at least two diagonally positioned fixing clamps (ID 329454-02)
- 9 = Fixing clamp difficult to use due to electrical connections

Specifications	VT 121 vision system with VTC	
Camera	Two 1.3-megapixel cameras <ul style="list-style-type: none"> • Monochrome • Each with a ring light and lateral LED (settings via PC software) • 8 mm compressed air inlet for pulse cleaning of tool and cover lenses (optional: two 6 mm inlets available) 	
Image size	8 mm x 10 mm	
Supply voltage	19.2 V to 30 V (EN 61131-2)	
Electrical connection (supply voltage)	12-pin A-coded M12 flange socket (male)	
Camera interface	Gigabit Ethernet (CAT 5e or later)	
Electrical connection (camera interface)	8-pin X-coded M12 flange socket (female)	
Operating distance	20.5 mm	
Protection rating	IP66/68	
Operating temperature	0 °C to 45 °C	
Type of mounting	Attached with fixing clamps	
VTC functions	<ul style="list-style-type: none"> • Manual inspection • Panorama imaging (automatable as software option) • Tool evaluation with inspection view • Breakage control 	
Tools (only right-handed)	Functions	Required parameters in the tool table
Ball-nose cutter, toroid cutter	<ul style="list-style-type: none"> • Breakage inspection: Ø 0.5 mm to Ø 30 mm • Imaging from below: Ø 0.2 mm to Ø 30 mm • Lateral imaging: Ø 4 mm to Ø 30 mm (with tool angle of 30° to 60°) 	R, L, R2, CUT
Drill	<ul style="list-style-type: none"> • Breakage inspection: min. Ø 0.5 mm • Imaging from below: min. Ø 0.2 mm (maximum diameter depending on diameter and angle of point) 	TANGLE, R, L
Cylindrical cutter	<ul style="list-style-type: none"> • Breakage inspection: min Ø 0.5 mm • Imaging from below: min Ø 0.2 mm • Lateral imaging: Ø 1.9 mm 	R, L, CUT
Control	TNC 640 HSCI and other controls (including non-TNC): manual inspection and panorama imaging	
NC software version	340590-10 or later (with software option 46)	
Cycles	Configuration; manual inspection; panoramic, frontal and lateral view of inserts; single or mosaic view of end-face edges; breakage inspection	
Installation	By machine manufacturer	

The vision system for tool inspection consists of two components:

- Camera with two objectives (VT 121)
- Touch-operated PC software (VTC)

The vision system enables tool imaging during machining. Besides documenting tool status and wear, the following applications are possible as well:

- Tool inspection before critical machining steps
- Optimization of cutting parameters
- Optimization of NC programs
- Breakage inspection
- Tool inspection after service life

The camera takes close-up images of each tooth as well as detailed panoramic images of the entire tool circumference. During inspection with the VTC, the lighting angle can be varied for these panoramic images, enabling optimal illumination of individual teeth. Tools can also be imaged from below. The VTC can run automatically during unattended shifts (with TNC 640 cycles). Via an interface to the TNC's tool table, the PC software can even lock tools as needed.

Tool inspection is performed conveniently on the control's display screen. Inspections can also be performed offline at a later time with the PC software (requires appropriate software options).

The VTC vision system for tool inspection helps you avoid damage to tools, workpieces and machines. You can even lower tool costs over time by minimizing wear. The vision system also provides the following benefits:

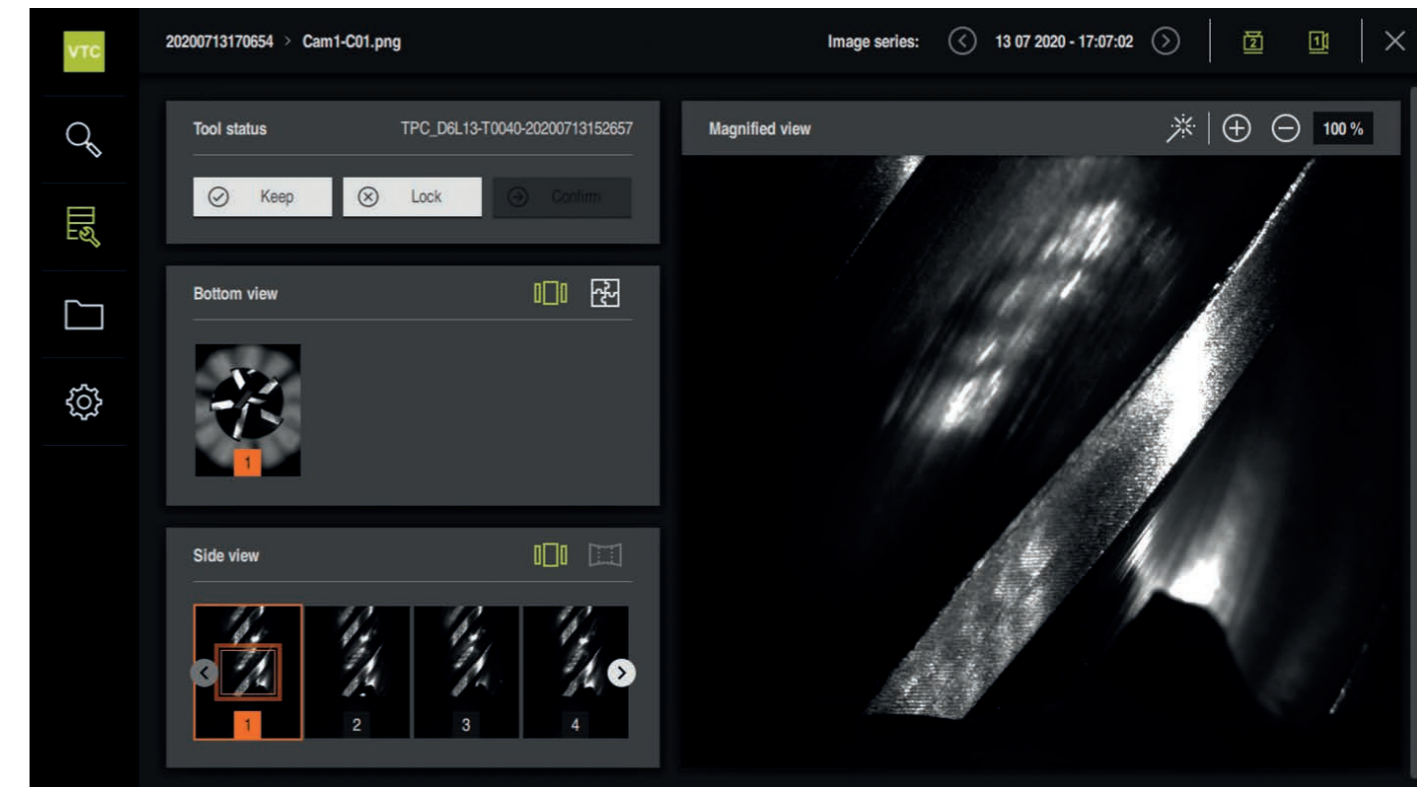
- Automated imaging during machining
- Time savings through keeping the tool in the machine
- PC software (can be used on its own for later inspection)
- Compact system usable for even large tools
- Rugged design
- Controlled compressed-air cleaning

The VT 121 camera has designated probing surfaces for automated setup with a touch probe. An imaging cycle lets you define which views are to be imaged once the tool has been cleaned. Names can be assigned to the resulting image series, allowing you to use the VTC software for systematic evaluations. Tools with a large number of teeth are easy to inspect thanks to an inspection overview feature, allowing you to navigate through the image series with a zoom window for greater detail. This overview allows you to directly lock and enable tools as needed.

The sealed and highly rugged VT 121 vision system is designed to be installed inside the machine's work envelope. It requires compressed air only during tool clearing cycles. The vision system can be used regardless of whether cooling lubricant or dry machining is performed. Compressed air from the integrated jets cleans the tools and the camera's cover lenses. An optimal cleaning strategy ensures removal of nearly all chips. The camera system can be connected via its Gigabit Ethernet interface.

Further information:





For information about mounting the vision system, please refer to the Operating Instructions (ID 1322444).



Tool evaluation with inspection view

Electrical connection

Adapter cable and connecting cables

PUR 4 x (2 x 0.16 mm ²)			
PUR 6 x (2 x 0.19 mm ²); A _P = 0.19 mm ²		Ø 6 mm ¹⁾	Ø 6.9 mm ²⁾
Adapter cable for camera interface, partially in metal armor, 8-pin M12 X-coded coupling (male) and 8-pin RJ45 connector (IP20)		–	1313965-xx ³⁾
Connecting cable for power supply, partially in metal armor, 12-pin M12 connector (female) and stripped cable end		1325985-xx ³⁾	–
Connecting cable with 12-pin M12 connector (female) and stripped cable end		801285-xx ⁴⁾	–
Connecting cable with 12-pin M12 connector (female) and 12-pin M12 coupling (male)		1109993-xx ⁴⁾	–

1) Metal armor Ø: 10 mm

2) Metal armor Ø: 11.1 mm

3) Cable length: 5 m to 30 m

4) Cable length: 1 m to 20 m

A_P: Cross section of power supply lines

Accessories

Mounting

Fixing clamps (included in items supplied)
ID 329454-02

Installation

- Compressed air inlets: 6 mm (optional)
- Power pack
- Compressed air tubing
ID 207881-09 or
ID 207881-35
- Metal armor for compressed air tubing
- Compressed air filter (optional)
- Compressed air valves

Maintenance

VT 121 cover glass replacement kit
ID 1321963-01

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This Product Information document supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information document edition valid when the order is placed.



More information:

Comply with the requirements described in the following documents to ensure correct and intended operation:

- Brochure: *Cables and Connectors* 1206109-xx
- Brochure: *TNC 640 HSCI* 896020-xx
- Operating Instructions 1322444-xx