HEIDENHAIN

Product Information

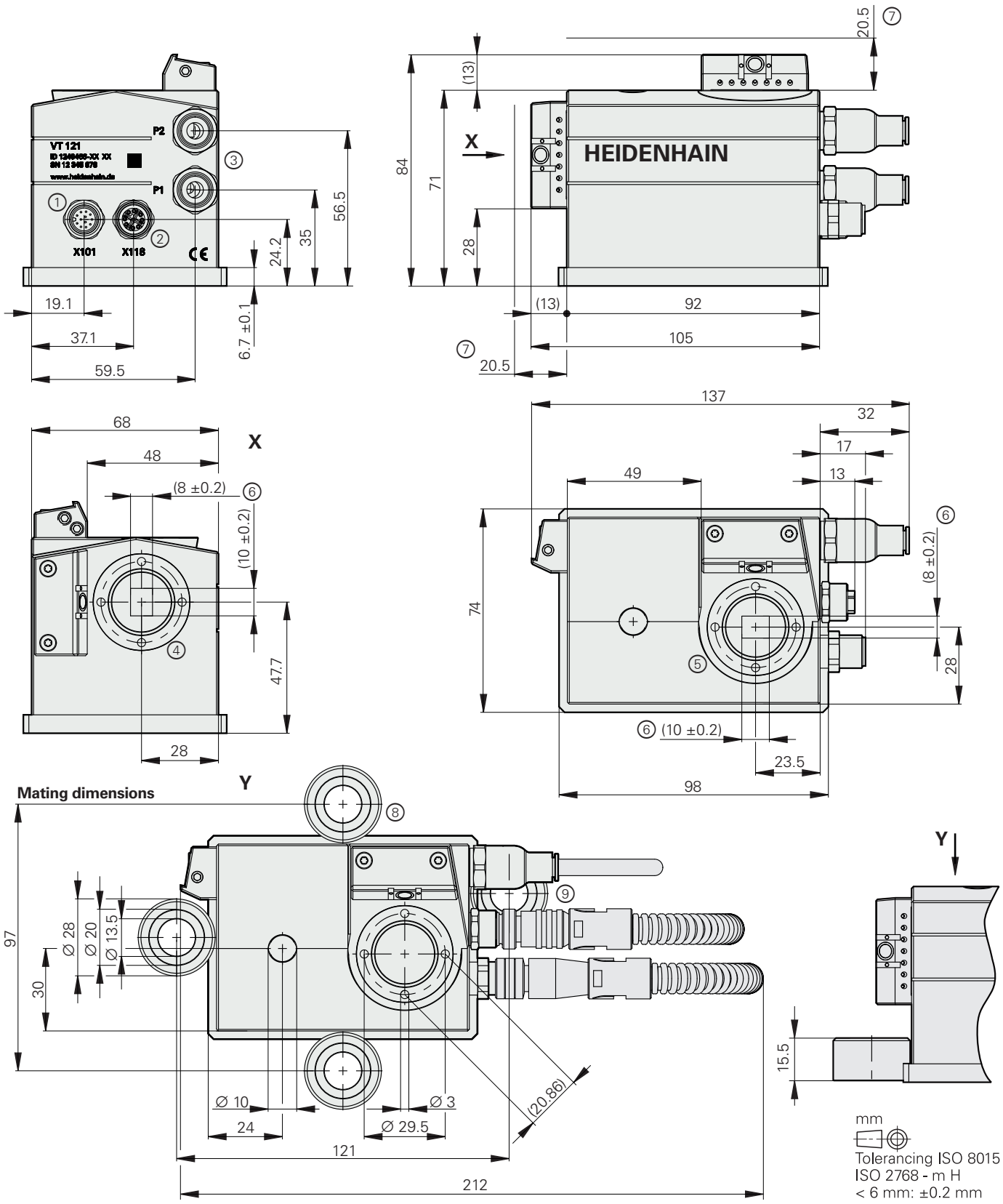
VT 121
VTC

Camera System for
Tool Inspection

03/2021

VT 121, VTC

Camera 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 mutually diagonal fixing clamps (ID 329454-02)
9 = Mounting of fixing clamp difficult due to connections

Specifications	VT 121 camera system, VTC
Camera system	Two 1.3-megapixel cameras • Monochrome • Each with a ring light and lateral LED (adjustable via software) • Two 6 mm compressed air inlets for pulsed cleaning of tool and cover glasses
Image size	8 mm x 10 mm[1)]
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 (with Cat 5e or higher)
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 70 °C
Type of mounting	Attached with fixing clamps
VTC functions	• Manual inspection • Panoramic images (can optionally be automated) • Tool evaluation with inspection view • Breakage check
Control	TNC 640 HSCI
NC software version	Starting from 340590-10 (with software option 46)
Cycles	Configuration, manual inspection, imaging, breakage check
Installation	By machine tool builder

[1)] Tool diameters (cylindrical) starting from 1.9 mm; breakage check for diameters as small as 0.1 mm

The camera system for tool inspection consists of two components:
- Camera with two objectives (VT 121)
- Software with touch operation (VTC)

The camera system permits imaging of tools during operation. Along with the documentation of the tool status and wear, the following applications are also possible:
- Tool inspection before critical machining steps
- Optimization of cutting parameters
- Optimization of NC programs
- Breakage check
- Tool inspection after expiration of tool life

The camera takes close-up images of each tooth as well as detailed panoramic images of the entire tool circumference. For inspection with VTC, the illumination angle of these panoramic images can be varied so that the individual teeth are optimally illuminated. Tools can also be imaged from below. VTC can operate fully autonomously (for example, during unattended shifts with the help of cycles for the TNC 640). The software can even block specific tools, thanks to an interface to the TNC's tool table.

The tool can conveniently be inspected on the control's screen. Later evaluations can sometimes even be performed offline. These are enabled via software options.

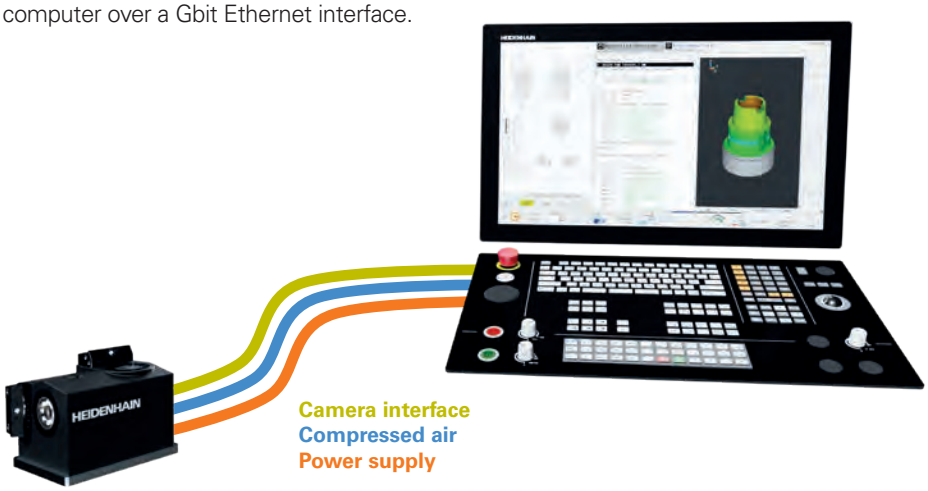
The camera system for tool inspection not only helps you avoid expensive damage to the tool, workpiece, and machine, but even the tool costs themselves can be reduced in the long term through targeted minimization of tool wear. The camera system also provides the following benefits:
- Automated imaging during machining
- Time savings, since the tool stays in the machine
- Compact system, even usable with very large tools
- Sturdy design
- Selective use of compressed air
- Software for configuration and evaluation directly on the TNC

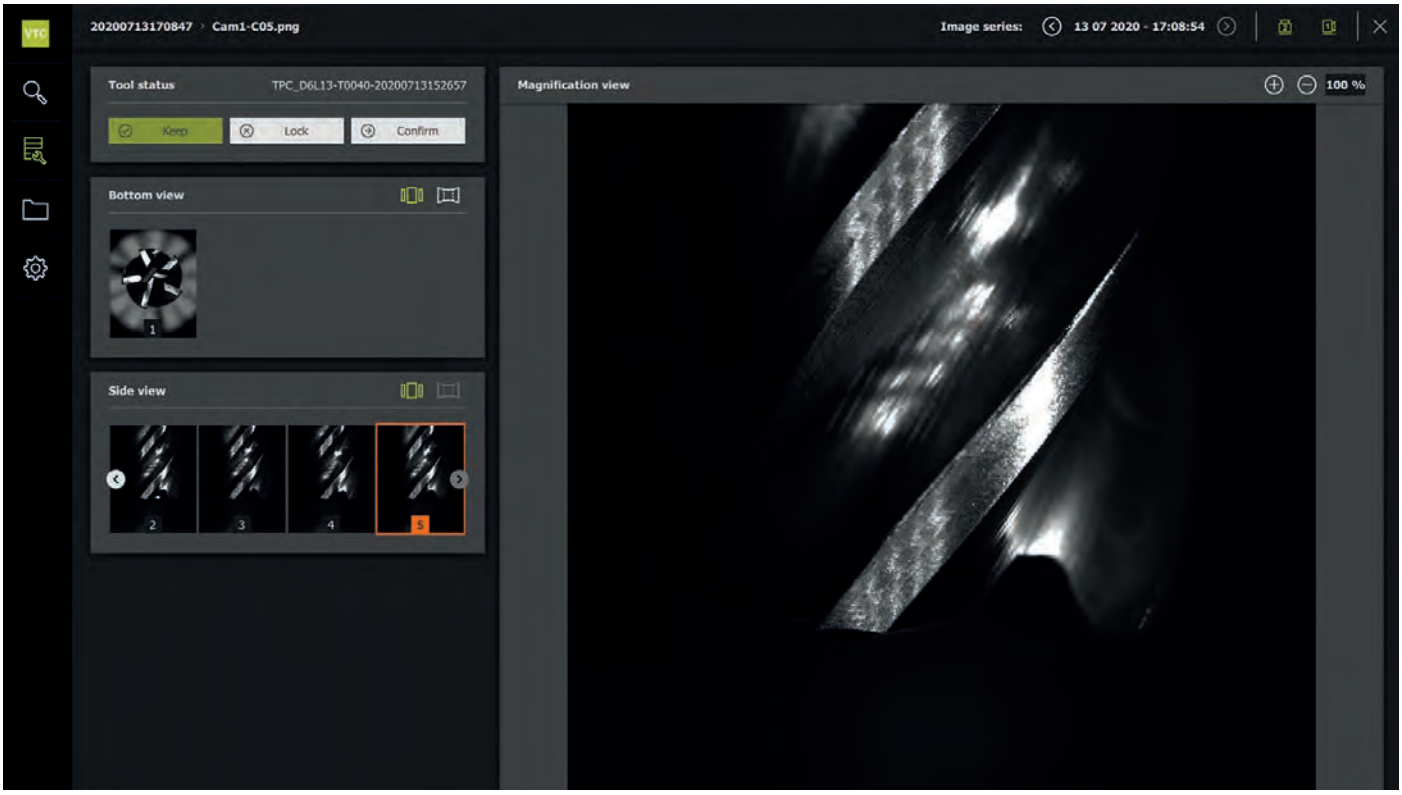
The VT 121 camera features dedicated probing surfaces for automated setup with a touch probe. In the imaging cycle you can define which views are to be captured once the tool has been cleaned. Names can be assigned to the series of images. Structured working with VTC makes systematic evaluation of the images possible. Especially for tools with a large number of teeth, the inspection overview makes sense: in the magnification view you can see details in a series of individual images. In this overview the tools can be blocked and then released again.

The sealed and highly rugged VT 121 camera system is designed to be installed inside the machine's working space. It requires compressed air only during the cycles for cleaning the workpiece or tool. The camera system can be used in operation with cooling lubricant as well as with dry machining. Compressed air from the integrated jets cleans the tools as well as the camera's cover glasses. An optimal cleaning strategy enables removal of nearly all chips. The camera system can be connected directly to the control's main computer over a Gbit Ethernet interface.

Further information:

You'll find information about mounting the camera in the operating instructions (ID 1322444).





Tool evaluation with inspection view

Electrical connection

Adapter cable and connecting cables

PUR 4 x (2 x 0.16 mm²)			
PUR 6 x (2 x 0.19 mm²); A_P = 0.19 mm²		Ø 6 mm[1]	Ø 6.9 mm[2]
Adapter cable for camera interface, partially in metal armor, 8-pin X-coded M12 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: 8 mm (optional)
- Power pack
- Pressure tubing
  ID 207881-09 or ID 207881-35
- Metal armor for pressure 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 made.

Further information:

To ensure proper and intended use, comply with the specifications in the following documents:

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