



HEIDENHAIN



VT 121

Installation Instructions

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1

Fundamentals

1.1 Overview

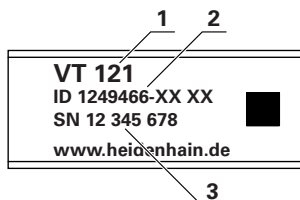
This chapter contains information about the product and this document.

1.2 Information on the product

Product designation	Part number (ID)
VT 121	1249466-xx

1.2.1 ID label

The ID label is provided on the side panel that houses the connections:



- 1 Product designation
- 2 Product ID / Part number (ID)
- 3 Serial number

1.2.2 Software for the product

In order to use the product, you need to install the Visual Tool Check (VTC) software on an IPC industrial computer with Microsoft Windows operating system. For information on how to install and use the software, please refer to the VTC User's Manual (ID 1322445).



Cycle packages are available for the HEIDENHAIN TNC7 and TNC 640 controls with NC software 34059x-10 and later.

1.3 Documentation on the product

1.3.1 Applicability of the documentation

Prior to using the documentation and the product, check whether the documentation and product match.



If the product IDs and ID numbers do not match so that the documentation is not valid, you will find the current documentation at www.heidenhain.com.

1.3.2 Notes on reading the documentation

 WARNING
Fatal accidents, personal injury or property damage caused by non-compliance with the documentation! Failure to comply with the documentation may result in fatal accidents, personal injury or property damage. ▶ Read the documentation carefully from beginning to end ▶ Keep the documentation for future reference

The following table lists the various parts of the documentation in their order of reading priority.

Documentation	Description
Addendum	An Addendum supplements or supersedes the corresponding contents of the Operating Instructions and Installation Instructions. If an Addendum is included in the shipment, it has the highest reading priority. All other documentation content retains its validity.
Operating Instructions	The Operating Instructions contain all of the information and safety instructions for the proper and intended operation of the product. The Operating Instructions are included in delivery. The Operating Instructions have the second highest reading priority.
Installation Instructions	The Installation Instructions contain all the information and safety precautions needed for the proper mounting and installation of the product. The Installation Instructions can be downloaded from the download area at www.heidenhain.com . The Installation Instructions have the third highest reading priority.
VTC User's Manual	The documentation on operating the product with the Visual Tool Check (VTC) can be downloaded from the download area at www.heidenhain.com .

Would you like any changes, or have you found any errors?

We are continuously striving to improve our documentation for you. Please help us by sending your suggestions to the following e-mail address:

userdoc@heidenhain.de

1.3.3 Storage and distribution of the documentation

The instructions must be kept in the immediate vicinity of the workplace and must be available to all personnel at all times. The operating company must inform the personnel where these instructions are kept. If the instructions have become illegible, the operating company must obtain a new copy from the manufacturer.

If the product is given or resold to any other party, the following documents must be passed on to the new owner:

- Addendum (if supplied)
- Operating Instructions

1.4 About these instructions

These instructions provide all the information and safety precautions needed for the proper mounting and installation of the product.

1.4.1 Target groups of the instructions

These instructions must be read and complied with by every person who performs any of the following tasks:

- Installation
- Service and maintenance

1.4.2 Notes in this documentation

Safety precautions

Precautionary statements warn of hazards in handling the product and provide information on their prevention. Precautionary statements are classified by hazard severity and divided into the following groups:

DANGER

Danger indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **will result in death or severe injury**.

WARNING

Warning indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in death or serious injury**.

CAUTION

Caution indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in minor or moderate injury**.

NOTICE

Notice indicates danger to material or data. If you do not follow the avoidance instructions, the hazard **could result in property damage**.

Informational notes

Informational notes ensure reliable and efficient operation of the product. Informational notes are divided into the following groups:



The information symbol indicates a **tip**.
A tip provides important additional or supplementary information.



The gear symbol indicates a function that **depends on the machine**.
The function described depends on the machine if, for example:

- Your machine features a required software or hardware option
- The behavior of the functions depends on the configurable machine settings



The book symbol indicates a **cross reference**.
A cross reference leads to external documentation, for example the documentation of your machine manufacturer or other supplier.

1.4.3 Symbols and fonts used for marking text

Format	Meaning
▶ ... > ...	Identifies an action and the result of this action Example: ▶ Tap OK > The message is closed
■ ... ■ ...	Identifies an item of a list Example: ■ TTL interface ■ EnDat interface ■ ...

2

Safety

2.1 Overview

This chapter provides important safety information needed for the proper mounting and installation of the product.

2.2 General safety precautions

Generally accepted safety precautions, in particular the applicable precautions relating to the handling of live electrical equipment, must be followed when operating the system. Failure to observe these precautions could result in damage to the device, or injury to personnel.

It is understood that safety rules within individual companies vary. If a conflict exists between the material contained in these instructions and the rules of a company using this system, the more stringent rules take precedence.

2.3 Intended use

The VT 121 vision system with the VTC software is intended solely for the following use:

- In-process measurement of tools in machining centers
- Inspection and visual measurement of tools in machining centers

2.4 Improper use

Any use not specified in 'Intended use' is considered improper use. The machine manufacturer and the company operating the machine are solely liable for any damage resulting from improper use.

Especially its use as part of a safety function is not permitted.

2.5 Personnel qualification

The personnel required for the individual activities to be performed on the product are indicated in the respective sections of these instructions.

The personnel groups are specified in detail as follows with regard to their qualifications and tasks.

Qualified personnel

The qualified personnel are trained by the operating company to perform advanced operation and parameterization. The qualified personnel have the required technical training, knowledge and experience and know the applicable regulations, and are thus capable of performing the assigned work regarding the application concerned and of proactively identifying and avoiding potential risks.

Electrical specialist

The electrical specialist has the required technical training, knowledge and experience and knows the applicable standards and regulations, and is thus capable of performing work on electrical systems and of proactively identifying and avoiding potential risks. Electrical specialists have been specially trained for the environment they work in.

Electrical specialists must comply with the provisions of the applicable legal regulations on accident prevention.

2.6 Obligations of the operating company

The operating company owns or leases the device and the peripherals. At all times, the operating company is responsible for ensuring that the intended use is complied with.

The operating company must:

- Assign the different tasks to be performed on the device to suitable, qualified and authorized personnel
- Verifiably train the personnel in the authorizations and tasks
- Provide all materials and means necessary in order for the personnel to complete the assigned tasks
- Ensure that the device is operated only when in perfect technical condition
- Ensure that the device is protected from unauthorized use

2.7 General safety precautions



The safety of any system incorporating the use of this product is the responsibility of the assembler or installer of the system.

The specific safety precautions required for the individual activities to be performed on the product are indicated in the respective sections of these instructions.

2.7.1 Electrical safety precautions

WARNING

Risk of injury due to dangerous contact with live parts when opening the product!

If you touch live parts, this may result in electric shock, burns, or death.

- ▶ Never open the housing
- ▶ Only the manufacturer is permitted to access the inside of the product

WARNING

Hazard of dangerous amount of electricity passing through the human body upon direct or indirect contact with live electrical parts!

This may result in electric shock, burns or death.

- ▶ Work on the electrical system and live electrical components is to be performed only by trained specialists
- ▶ For power connection and all interface connections, use only cables and connectors that comply with applicable standards
- ▶ Have the manufacturer exchange defective electrical components immediately
- ▶ Regularly inspect all connected cables and all connections on the product. Defects, such as loose connections or scorched cables, must be removed immediately

NOTICE

Damage to internal components when opening the product!

If you open the product, internal components may get damaged, and the warranty and the guarantee will become void.

- ▶ Never open the housing
- ▶ Only the product manufacturer is permitted to access the inside of the product

3

**Transport and
storage**

3.1 Overview

This chapter contains information on the transportation and storage of the product and provides an overview of the items supplied and the available accessories for the product.



The following steps must be performed only by qualified personnel.

Further information: "Personnel qualification", Page 12

3.2 Unpacking

- ▶ Open the top lid of the box
- ▶ Remove the packaging materials
- ▶ Unpack the contents
- ▶ Check the delivery for completeness
- ▶ Check the delivery for damage

3.3 Items supplied and accessories

3.3.1 Items supplied

The following items are included in the shipment:

- Vision system VT 121
- Operating Instructions
- Addendum (optional)
- Two fixing clamps for mounting (variant -01)

3.3.2 Accessories

The following accessories are optionally available and can be ordered from HEIDENHAIN:

Accessory	Designation	ID
For mounting		
	Fixing clamps	329454-02
For installation		
	Connecting cable for power supply, with metal armor	1325985-xx
	Connecting cable for power supply	801285-xx
	Adapter cable for camera interface, with metal armor	1313965-xx
	Adapter cable for camera interface	1436254-xx
	Pressure tube (25 m) 6 x 1 (D _i = 4 mm)	207881-41
	Pressure tube (25 m) 8 x 1.25 (D _i = 5.5 mm)	207881-42
	Pneumatic check valve (6 mm)	1290627-02

Accessory	Designation	ID
	UTI 491 optocoupler relay	802467-01

HEIDENHAIN recommends using the following accessories that can be ordered from external suppliers:

Accessory	Designation	Item no.
For installation		
	Pneumatic check valve (6 mm) Manufacturer: Parker Legris	7984 06 10
	Pneumatic check valve (8 mm) Manufacturer: Parker Legris	7984 08 10
	24 V 2/2-way valve DN10 Manufacturer: Buschjost	8253000.8001.02400



You can order replacement parts from HEIDENHAIN for product maintenance.

Further information: "Replacement parts", Page 37

3.4 In case of damage in transit

- ▶ Have the shipping agent confirm the damage
- ▶ Keep the packaging materials for inspection
- ▶ Contact and inform the sender about the damage

This applies also if damage occurred to requested replacement parts during transit.

3.5 Repackaging and storage

Repackage and store the product carefully in accordance with the conditions stated below.

3.5.1 Repackaging

Repackaging should correspond to the original packaging as closely as possible.

- ▶ Re-attach all mounting parts and dust protection caps to the product as received from the factory, or repackage them in the original packaging as received from the factory
- ▶ Repackage the product in such a way that
 - it is protected from impact and vibration during transit
 - it is protected from the ingress of dust or humidity
- ▶ Place all accessories that were included in the shipment in the original packaging
Further information: "Items supplied", Page 16
- ▶ Enclose all the documentation that was included in the original packaging
Further information: "Storage and distribution of the documentation", Page 7



If the product is returned for repair to the HEIDENHAIN Service department:

- ▶ Ship the product without accessories

3.5.2 Storage of the product

- ▶ Package the device as described in the chapter on "Repackaging", Page 18
- ▶ Observe the specified ambient conditions
Further information: "Specifications", Page 41
- ▶ Inspect the product for damage after any transport or longer storage times

4

Mounting

4.1 Overview

This chapter describes the mounting of the product. It contains product views and information on how to correctly mount the product.



The following steps must be performed only by qualified personnel.

Further information: "Personnel qualification", Page 12

4.2 Product views

Side view

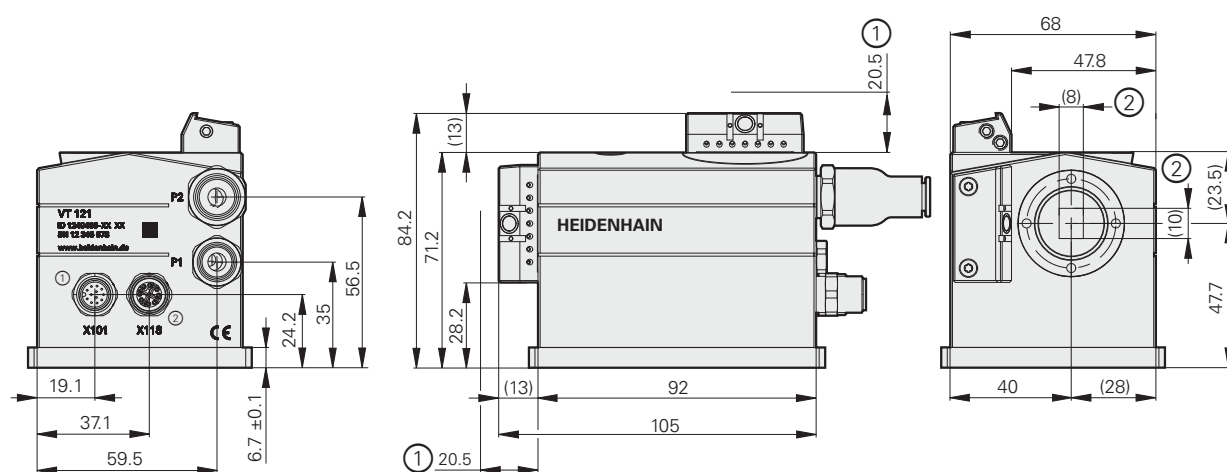


Figure 1: Side view

(1) Focal plane

(2) Image size

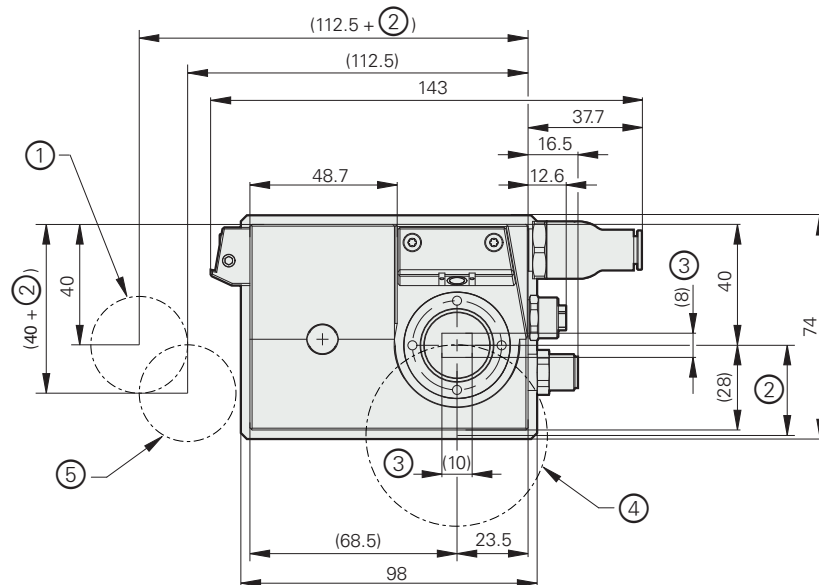
Plan view

Figure 2: Plan view

- (1)** Tool position for image acquisition, example with tool radius R 16
- (2)** Tool radius (example: R 16)
- (3)** Image size
- (4)** Tool position for measuring the cutting edge angle, example with tool radius R 30
- (5)** Tool position for profile view, example with tool radius R 16

4.3 Mounting the product**⚠ WARNING****Crushing and impact hazards due to moving parts!**

When mounting work is performed inside a machine's working space, moving parts may lead to crushing or impact.

- ▶ Switch off the machine before installing the product
- ▶ Secure all movable parts
- ▶ Wear protective gear



In order to ensure the correct and intended operation of the product, it must be mounted in the machine so that it cannot move out of place.

Further information: "Side view ", Page 20

Mounting the product

- ▶ Ensure that the mounting surface is clean
- ▶ Mount camera 1 at the largest possible distance from the outside wall of the machine tool
- ▶ Ensure sufficient distance between the product and the limit switches
- ▶ Align the product and the mounting surface as perpendicularly as possible with respect to the tool axis
- ▶ To protect the product from flying chips, orient the product such that the jet blocks are facing in the direction opposite to the machining area
- ▶ Secure the product in the machine tool so that it cannot move out of place
Variant -01: Position the supplied fixing clamps on opposite sides

i Use a touch probe cycle to determine the exact alignment and position of the housing.

Position inside the machine tool

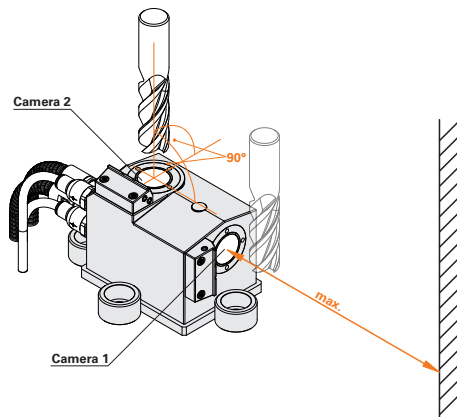


Figure 3: Position inside the machine tool

Mounting notes

Here you will find information on the bending radii, fixing clamps, and maintenance of the cover glass.

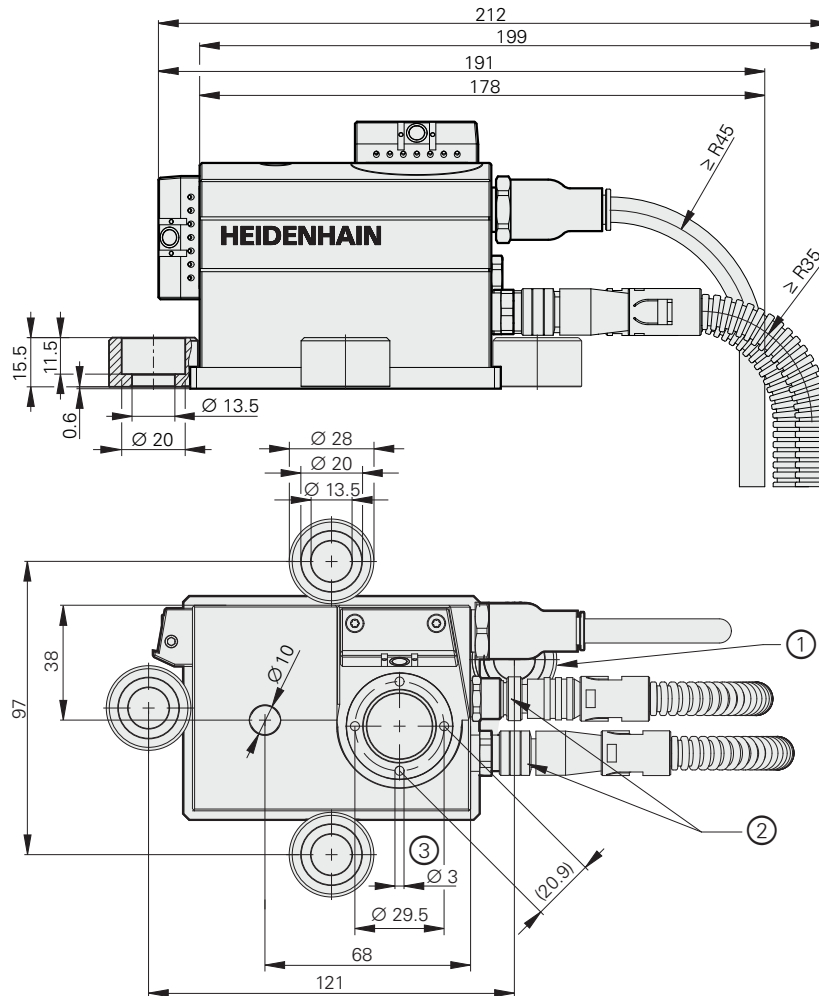


Figure 4: Mounting instructions

- (1) Fixing clamp difficult to mount due to cable/tube connections
- (2) Tightening torque of M12 connectors: 0.6 Nm to 0.8 Nm
- (3) Replacement of cover glass with a commercially available, adjustable face spanner with 3 mm pins: screw in as far as possible, spare part number 1321963-02

5

Installation

5.1 Overview

This chapter describes the installation of the product. It contains information about the connections and instructions about how to correctly connect the product.



The following steps must be performed only by qualified personnel.

Further information: "Personnel qualification", Page 12

5.2 General information

CAUTION

Risk of injury due to high noise level inside the machine's working space!

When the compressed air is on and the door is open, you may be exposed to loud noise while working inside the machine's working space.

- ▶ Wear hearing protection

CAUTION

Risk of injury due to ejected dirt particles!

Possible harm to the eyes: when compressed air is active and the door is open, dirt particles may be ejected from the camera jets.

- ▶ Wear protective glasses

CAUTION

Risk of injury due to optical radiation – LED Risk Group 1 in error mode!

An eye exposure of more than seven minutes may cause damage to the eyes.

- ▶ Avoid direct eye contact with the light source
- ▶ Turn off the LEDs while working on the product or machine



Keep in mind that exposing your eyes to the light source may temporarily blind you. This temporary blinding can occur during error mode or normal operation.

NOTICE

Damage to the device from the engaging and disengaging of connecting elements during operation!

Damage to internal components may result.

- ▶ Do not engage or disengage any connecting elements while the unit is under power

NOTICE**Property damage due to electrostatic discharge (ESD)!**

This product contains electrostatically sensitive components that can be destroyed by electrostatic discharge (ESD).

- ▶ It is essential to observe the safety precautions for handling ESD-sensitive components
- ▶ Never touch connector pins without ensuring proper grounding
- ▶ Wear a grounded ESD wristband when handling the connections of the product

NOTICE**Damage to the product due to incorrect wiring!**

The incorrect wiring of inputs or outputs can cause damage to the product or to peripheral devices.

- ▶ Comply with the pin layouts and specifications of the product
- ▶ Assign only pins or wires that will be used

Further information: "Specifications", Page 41

NOTICE**Damage due to incorrect cables!**

Damage to the product or machine may result from using the wrong cables to connect the product to the control.

- ▶ Use suitable HEIDENHAIN cables

NOTICE**Moisture damage to cables from capillary action!**

Capillary action may cause liquid to seep out from the end of the cables' metal armor.

- ▶ When routing the cables, ensure that any liquid that may be present is drained off appropriately

NOTICE**Interference due to non-compliance with the minimum clearances**

When mounting the product, maintain the specified minimum distances from the sources of interference to prevent the occurrence of interference.

- ▶ When mounting the product, ensure that the specified clearances are maintained

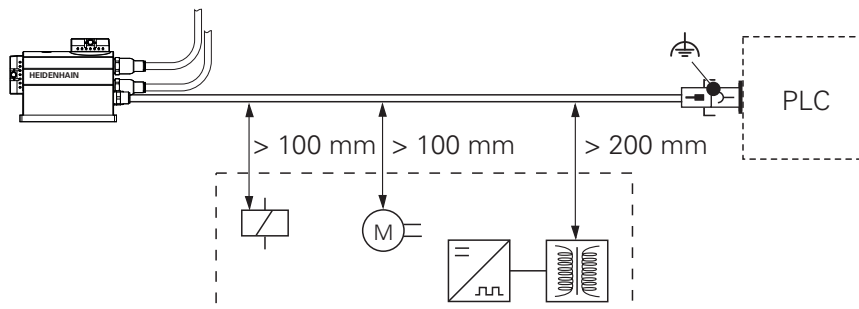


Figure 5: Sources of interference and signal-to-noise ratios

5.3 Connection overview

NOTICE**Reduced ingress protection due to missing protective caps!**

If there are no cables connected or protective caps attached to the product's connections, the tightness of the product cannot be guaranteed while it is inside the machine's working space.

- ▶ Remove the protective caps only for connecting a cable
- ▶ Attach the protective cap to the connection immediately after disconnecting a cable

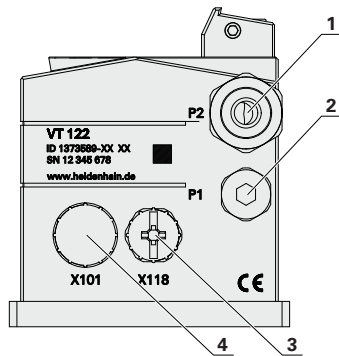
Side view with dust protection caps

Figure 6: Side view with dust protection caps

Connections:

- 1 P2:** compressed air for both cameras
Threaded plug connection for 8 mm tube
Optional: threaded plug connection for 6 mm tube
- 2 P1:** filler plug
Optional: threaded plug connection for 6 mm tube
- 3 X118:** camera interface
8-pin X-coded M12 flange socket (female)
- 4 X101:** supply voltage
12-pin A-coded M12 flange socket (male)

5.4 Connecting the supply voltage**⚠ WARNING****Fire hazard due to wrong power cable!**

Use of a power cable that does not meet the requirements of the mounting location may cause a fire hazard.

- Use only a power cable that meets at least the national requirements of the respective country in which the product is mounted

Shielding

Connect the housing of the encoder, the connecting elements and the downstream electronics via the cable shield.

To ensure optimal electromagnetic shielding, provide a full-surface circumferential (360°) shield connection.

Power supply unit with current limitation

The device fulfills the requirements of standard IEC 61010-1 if power is supplied from a secondary circuit with current limitation as per IEC 61010-1^{3rd Ed.}, Section 9.4, or from a Class 2 secondary circuit as specified in UL1310.

In place of IEC 61010-1^{3rd Ed.} Section 9.4, the corresponding sections of the standards DIN EN 61010-1, EN 61010-1, UL 61010-1 and CAN/CSA-C22.2 No. 61010-1 can be used as well.

PELV system

The product must be powered through a PELV System (for a definition, see EN 60204-1).

Connecting

- ▶ Comply with the pin layout
- ▶ Remove and save the dust protection caps
- ▶ Route the cables based on the mounting variant
- ▶ Check the seals of the connection or cable
- ▶ Connect the connector to connection X101

Pin layout of X101

1	2	3	4	5	6	7	8	9	10	11	12
/	/	/	/	U _P	Ext–	/	/	Ext+	/	/	0 V
BNGN	GN	GY	PC	WH	VT	RD	BK	YE	BN	BU	WHGN

Shield on housing; **U_P** = Power supply
 Vacant pins or wires must not be used.

5.5 Connecting the camera interface

- ▶ Comply with the pin layout
- ▶ Remove and save the dust protection caps
- ▶ Route the cables based on the mounting variant
- ▶ Check the seals of the connection or cable
- ▶ Connect the connector to connection X118
- ▶ The product automatically detects the pin layout of the Ethernet cable being used (auto-crossover).

Pin layout of X118

							
1	2	3	4	5	6	7	8
D1+ (TX+)	D1- (TX-)	D2+ (RX+)	D2- (RX-)	D4+	D4-	D3-	D3+

Shield on housing

5.6 Connecting the compressed air

The cover glasses of the cameras are cleaned with compressed air. You can either use one 8 mm pressure tube or two 6 mm pressure tubes.

i For operation with two 6 mm pressure tubes, you must also use two on-off valves and ensure that they are actuated simultaneously. It is not sufficient to use only one valve with a downstream Y manifold.

Before connecting the pressure tubing, inspect the check valves for contamination (e.g., residues of the packaging or dust).

To use an 8 mm pressure tube:

- ▶ Route the pressure tube based on the mounting variant
- ▶ Connect the product to the compressed air unit via the P2 threaded plug connection

To use two 6 mm pressure tubes:

- ▶ Route the pressure tubes based on the mounting variant
- ▶ Remove the filler plug from P1
- ▶ Attach the threaded plug connection for the 6 mm tube to P1
- ▶ Replace the threaded plug connection at P2 for the 8 mm tube with the threaded plug connection for the 6 mm tube
- ▶ Connect the product to the compressed air unit via the P1 and P2 threaded plug connections

Further information: "Accessories", Page 16

5.7 Connecting the compressed-air valve

The compressed-air valve can be controlled by the camera or VTC. The camera system can thus be installed without changes to the PLC program.

The EXT camera output must be connected to the compressed-air valve via an optocoupler. The camera output is controlled by the control via VTC and the OPC UA interface.

Circuit diagram

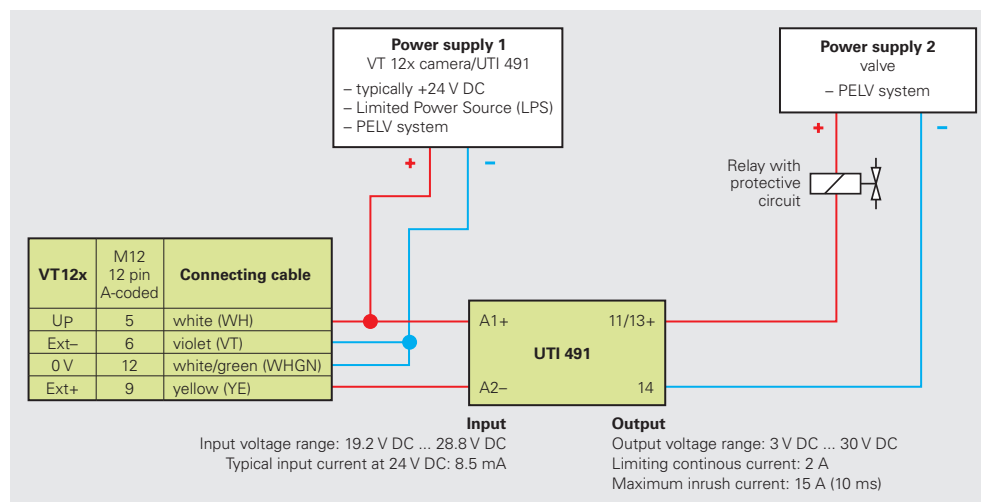


Figure 7: Connecting the compressed-air valve to the camera circuit diagram

6

**Service and
maintenance**

6.1 Overview

This chapter describes the general maintenance work on the product.



The following steps must be performed only by qualified personnel.

Further information: "Personnel qualification", Page 12



This chapter contains a description of maintenance work for the product only. Any maintenance work on peripheral devices is not described in this chapter.

Further information: Manufacturer's documentation for the respective peripheral devices

6.2 Maintenance schedule

NOTICE

Operation of defective devices!

Operating defective devices may result in serious consequential damage.

- ▶ Do not repair or operate the device if it is damaged
- ▶ Replace defective devices immediately or contact a HEIDENHAIN service agency

Maintenance step	Qualification	Interval	Corrective action
▶ Check all markings, labels and symbols provided on the product for readability	Electrical specialist	Annually	▶ Contact a HEIDENHAIN service agency
▶ Inspect electrical connections for damage and check their function	Electrical specialist	Annually	▶ Replace defective cables. Contact a HEIDENHAIN service agency if required
▶ Inspect the cover glasses, and clean them or replace them, if necessary	Operator	Daily	▶ Remove metal chips and contamination from the cover glasses Further information: "Cleaning", Page 36
▶ Use the cleaning function	Operator	Daily	▶ Regularly use the cleaning function to avoid obstruction
▶ Check the compressed air inlets	Operator	Annually	▶ Inspect for proper connection and, if necessary, attach them so that they are fully engaged

6.3 Cleaning

⚠ CAUTION

Irritation from isopropyl alcohol

Contact with isopropyl alcohol or inhaling isopropyl alcohol fumes can cause irritation affecting the skin, eyes, or respiratory system.

- ▶ Wear protective gloves and safety goggles
- ▶ Wear respiratory protection
- ▶ Keep the workplace well ventilated
- ▶ Comply with the manufacturer's safety data sheets

NOTICE

Damage from incorrect cleaning!

If you clean the product with sharp-edged objects or aggressive cleaning agents, the product may become damaged.

- ▶ Never use abrasive or aggressive cleaners, and never use strong detergents or solvents
- ▶ Do not use sharp-edged objects to remove persistent contamination

NOTICE

Scratching of cover glasses by metal chips!

Incorrect cleaning may damage the cover glasses.

- ▶ Before manual cleaning, remove visible metal chips with jets of compressed air. You need to wear safety goggles for this.
- ▶ Apply light pressure to clean the cover glasses

Cleaning the cover glasses

HEIDENHAIN recommends daily cleaning of the cover glasses. After completing machining, clean the cover glasses so as to prevent fluids from drying on them.

- You can use clean cooling lubricant, isopropyl alcohol or a standard window cleaner for cleaning
- Clean the cover glasses with a damp, soft, and lint-free cloth

6.4 Checking the function

Checking the lighting

You can check each of the ring light LEDs and the lateral LED individually with the Visual Tool Check (VTC) software.



The VTC User's Manual can be downloaded from www.heidenhain.com.

6.5 Replacement parts

You can order the following replacement parts for product maintenance:

Designation	ID
Replacement parts kit for the cover glass	1321963-02

6.6 Replacing the cover glasses

Required materials:

- Face spanner (3 mm)
- Replacement cover glass
- O-ring (included in the spare parts kit from HEIDENHAIN)

CAUTION

Irritation from isopropyl alcohol

Contact with isopropyl alcohol or inhaling isopropyl alcohol fumes can cause irritation affecting the skin, eyes, or respiratory system.

- ▶ Wear protective gloves and safety goggles
- ▶ Wear respiratory protection
- ▶ Keep the workplace well ventilated
- ▶ Comply with the manufacturer's safety data sheets



Ideally, replace the cover glasses in a dry and clean environment outside the machine's working space.
Do not use compressed air in the machine's working space.

- ▶ Use the face spanner to loosen the cover glass
- ▶ Remove the cover glass
- ▶ Remove the O-ring
- ▶ Carefully remove any contamination from the installation space
If there are drops of cooling lubricant in the installation space, remove them with isopropyl alcohol or commercially available window cleaner.
- ▶ Insert the new O-ring
- ▶ Insert the new cover glass
- ▶ Use the face spanner to screw in the cover glass so that it is fully engaged



Please note the information on cleaning.
Further information: "Cleaning", Page 36

6.7 Resuming operation

When operation is resumed, for example when the product is reinstalled after repair or when it is remounted, the same measures and personnel requirements apply as for mounting and installing the product.

Further information: "Mounting", Page 19

Further information: "Installation", Page 25

The operating company must ensure safe resumption of operation and assign authorized and appropriately qualified personnel to the task.

Further information: "Obligations of the operating company", Page 13

7

**Removal and
disposal**

7.1 Overview

This chapter contains information and environmental protection specifications that must be observed for correct disassembly and disposal of the device.

7.2 Removal



The following steps must be performed only by qualified personnel.

Further information: "Personnel qualification", Page 12

Depending on the connected peripherals, the product may need to be removed by an electrical specialist.

In addition, the same safety precautions that apply to the mounting and installation of the respective components must be taken.

Further information: "General safety precautions", Page 14 ff.

Further information: "Installation", Page 25

Removing the product

To remove the product, follow the installation and mounting steps in the reverse order.

Further information: "Mounting", Page 19

Further information: "Installation", Page 25

Storage after removal

If the product is stored temporarily after removal, the information on repackaging and the specified ambient conditions must be complied with.

Further information: "Repackaging and storage", Page 18

Further information: "Transport and storage", Page 15

Further information: "Specifications", Page 41

7.3 Disposal

This chapter contains information and environmental protection specifications for the disposal of the product.

NOTICE

Environmental damage due to improper disposal of the product!

If you do not dispose of the product correctly, this can cause environmental damage.

- ▶ Do not dispose of electrical waste and electronic components in domestic waste
- ▶ Forward the product to recycling in accordance with the applicable local disposal regulations

- ▶ If you have any questions about the disposal of the product, please contact a HEIDENHAIN service agency

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Specifications

Product

Housing	■ Milled aluminum housing ■ Stainless steel base plate
Housing dimensions	98 mm x 74 mm x 84 mm
Type of mounting	Mounting with two fixing clamps 329454-02

Electrical data

Cable length	≤ 25 m
Supply voltage	■ DC 19.2 V to 30 V (typical: DC 24 V) ■ Input power: max. 8.7 W ■ Reverse-polarity protection ■ X101: 12-pin A-coded M12 flange connector (male)

HEIDENHAIN vision systems must be powered through LPS and PELV systems (for a definition, see EN 60204-1).

Further information: "Connecting the supply voltage", Page 29

Camera interface	■ Ethernet, 1 Gbit/s (auto-crossover) ■ X118: 8-pin X-coded M12 flange socket (female)
Optocoupler output	EXT+, EXT- for connecting the UTI 491 ■ Relay with protective circuit required ■ For control of compressed air valves via VTC ■ X101: 12-pin A-coded M12 flange socket (male)

Camera

Resolution	1.31-megapixel, monochrome CMOS image sensor
Operating distance	Camera 1: 20.5 mm Camera 2: 20.5 mm
Image size	10 mm x 8 mm
Cover glasses	Replaceable (3 mm face spanner)
Light source	■ Separately controllable LEDs ■ Ring light with 12 separately controllable LEDs

Compressed air

Connection	Threaded-plug connection for 8 mm tube ■ P2: camera 1 + 2 Optional: threaded plug connection for 6 mm tube ■ P1: camera 1 + 2 ■ P2: camera 1 + 2
Pressure	Max. 10 bars (145 psi) ≥ 6 bars recommended
Quality	Min. ISO 8573-1:2010 [4:4:4]

Compressed air

Blower jets	Camera 1 + 2 ■ For each camera: one jet block with seven jets for cleaning the cover glass ■ For each camera: one jet block with two jets for cleaning the tool
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Ambient conditions

Operating temperature	0 °C to +45 °C
Storage temperature	–20 °C to +60 °C
Altitude	≤ 2000 m
Vibration	≤ 200 m/s ² (in accordance with EN 60068-2-6)
Shock	≤ 300 m/s ² (in accordance with EN 60068-2-27)
Sound level	> 85 db(A) inside the working space
Pollution degree	4 (in accordance with IEC 61010-1)
IP rating EN 60529 (when engaged)	IP 66/68

General information

Directives	CE, UKCA
Mass	≤ 1.6 kg

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