



**PETER HIRT GmbH**

INNOVATIVE  
MEASUREMENT  
TECHNOLOGY LTD.



# Manual Halfbridge Transducer

Series T070, T100, T300 and T500



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# Precision through Innovation

@IMTmetrology

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## Introduction

Halfbridge transducers base on the inductive core measurement principle. The probes are characterised by absolut position measurement and high mechanical robustness.

This manual covers the underneath listed products. The handling of customer specific parts may deviate from the description in this manual. The corresponding datasheet inform about additional handling instructions.

### *Transducer T070 series*

| <b>Article number</b> | <b>Description</b> | <b>Properties</b>              |
|-----------------------|--------------------|--------------------------------|
| 1000016               | T071F              | Spring push, +/- 1 mm stroke   |
| 1003293               | T072F              | Spring push, +/- 1 mm stroke   |
| 1000030               | T072V              | Vacuum retract +/- 1 mm stroke |
| 1000029               | T072P              | Pneumatic push +/- 1 mm stroke |
| 1003378               | T072L              | Pneumatic push +/- 1 mm stroke |

### *Transducer T100 series*

| <b>Article number</b> | <b>Description</b> | <b>Properties</b>              |
|-----------------------|--------------------|--------------------------------|
| 1000940               | T101F              | Spring push, +/- 1 mm stroke   |
| 1001103               | T102F              | Spring push, +/- 1 mm stroke   |
| 1001069               | T101V              | Vacuum retract +/- 1 mm stroke |
| 1001220               | T102V              | Vacuum retract +/- 1 mm stroke |
| 1001034               | T101P              | Pneumatic push +/- 1 mm stroke |
| 1001184               | T102P              | Pneumatic push +/- 1 mm stroke |
| 1001000               | T101L              | Pneumatic push +/- 1 mm stroke |
| 1001151               | T102L              | Pneumatic push +/- 1 mm stroke |

### *Transducer T300 series*

| <b>Article number</b> | <b>Description</b> | <b>Properties</b>              |
|-----------------------|--------------------|--------------------------------|
| 1001524               | T301F              | Spring push, +/- 2 mm stroke   |
| 1001598               | T302F              | Spring push, +/- 2 mm stroke   |
| 1001580               | T301V              | Vacuum retract +/- 2 mm stroke |
| 1001651               | T302V              | Vacuum retract +/- 2 mm stroke |
| 1001562               | T301P              | Pneumatic push +/- 2 mm stroke |
| 1001634               | T302P              | Pneumatic push +/- 2 mm stroke |

|         |       |                                |
|---------|-------|--------------------------------|
| 1001544 | T301L | Pneumatic push +/- 2 mm stroke |
| 1001617 | T302L | Pneumatic push +/- 2 mm stroke |

*Transducer T500 series*

| Article number | Description | Properties                     |
|----------------|-------------|--------------------------------|
| 1001734        | T501F       | Spring push, +/- 5 mm stroke   |
| 1001816        | T502F       | Spring push, +/- 5 mm stroke   |
| 1001798        | T501V       | Vacuum retract +/- 5 mm stroke |
| 1001879        | T502V       | Vacuum retract +/- 5 mm stroke |
| 1001778        | T501P       | Pneumatic push +/- 5 mm stroke |
| 1001860        | T502P       | Pneumatic push +/- 5 mm stroke |
| 1001760        | T501L       | Pneumatic push +/- 5 mm stroke |
| 1001842        | T502L       | Pneumatic push +/- 5 mm stroke |

*Transducer T521/T522 series*

| Article number | Description | Properties                     |
|----------------|-------------|--------------------------------|
| 1001897        | T521F       | Spring push, +/- 2 mm stroke   |
| 1001969        | T522F       | Spring push, +/- 2 mm stroke   |
| 1001951        | T521V       | Vacuum retract +/- 2 mm stroke |
| 1002020        | T522V       | Vacuum retract +/- 2 mm stroke |
| 1001933        | T521P       | Pneumatic push +/- 2 mm stroke |
| 1002003        | T522P       | Pneumatic push +/- 2 mm stroke |
| 1001915        | T521L       | Pneumatic push +/- 2 mm stroke |
| 1001986        | T522L       | Pneumatic push +/- 2 mm stroke |

*Transducer T523/T524 series*

| Article number | Description | Properties                     |
|----------------|-------------|--------------------------------|
| 1002039        | T523F       | Spring push, +/- 1 mm stroke   |
| 1002113        | T524F       | Spring push, +/- 1 mm stroke   |
| 1002095        | T523V       | Vacuum retract +/- 1 mm stroke |
| 1002165        | T524V       | Vacuum retract +/- 1 mm stroke |
| 1002075        | T523P       | Pneumatic push +/- 1 mm stroke |
| 1002148        | T524P       | Pneumatic push +/- 1 mm stroke |

|         |       |                                |
|---------|-------|--------------------------------|
| 1002057 | T523L | Pneumatic push +/- 1 mm stroke |
| 1002131 | T524L | Pneumatic push +/- 1 mm stroke |

Technical specifications can be found on our webpage [www.peterhirt.ch](http://www.peterhirt.ch) or in the main catalogue.

## Security advices

Faulty transducers potentially create wrong measurements. To prevent from this periodical plausibility checks must be foreseen. A well defined master piece to check the transducer's functionality shall be used.

## Maintenance

### Periodical check

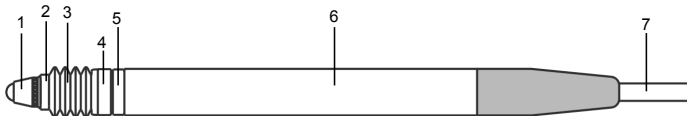
To assure the transducer's functionality and its measuring ability, every year the device should be checked. Properties to be verified are

- a well mechanical behaviour
- metrology abilities as linearity, repeatability and measure value stability

This check can be done by either the manufacturer or a well trained and equipped metrology laboratory.

## Installation

### The main parts of the transducer



| Number | Description       | Functionality   |
|--------|-------------------|---|
| 1      | Tip M2.5          | Tip with M2.5 thread. Can be exchanged with supplied special wrench.  |
| 2      | Small gaiter ring | Holds the bellow in position in the front area.   |
| 3      | Bellow            | Bellow to protect the linear ball bearing from dust and particles. On P-models it also closes the pneumatic push cylinder. L-models aren't equipped with a bellow, instead they have an air gap seal. |
| 4      | Large gaiter ring | Fix the position of the bellow on the ball bearing.   |

|   |             |  |
|---|-------------|--|
| 5 | Counter nut | Fully tightened to the body it protects the linear ball bearing from turning outwards. |
| 6 | Body        | 8h6 body to clamp the transducer.  |
| 7 | Cable       | Cable with three signal lines in, shield connected to the main body.                   |

### *M2.5 tip change*

When in application, the tip must be tightened. To change the tip the following steps shall be processed

- Push back the bellow (3) by holding the front ring (2) with your fingers and moving this towards the body (6). You will see two areas on the shaft
- Hold with the supplied special wrench the two flats on the shaft
- Release the tip (1) with an appropriate plier
- Change the tip (1)
- Tight the new tip (1) with an appropriate plier
- Bring back the bellow (3) to its initial position. Keep attention to not twist it, that all wrinkles are properly formed and that the small gaiter ring (2) is well fitted

### *Bellow change*

To change the bellow process the following steps

- Disassemble the tip (1) (as to „M2.5 tip change“)
- Screw the bellow ring (4) backwards
- Slide the bellow (3) with the small ring (2) off the shaft
- Reverse this procedure to mount the new bellow

Check afterwards that the bellow (3) is clean, is without cracks and sits firmly.

### *Pretravel setting*

The pretravel is ex works set to the datasheet specification. To change this setting do the following steps.

- Use the supplied wrench to unlock the counter nut (5)
- Connect the transducer to a compatible display unit
- Rotate the tip (1) until you reach the desired pretravel setting. The shaft has to be in the fully outward position.
- Tight the counter nut (5).

### *Spring change to set a new measuring force*

To adapt the measuring force the transducer's spring can be exchanged. Although, this leads to a pretravel adjustment and a full transducer metrology ability check. Therefore you best order your transducer ex works with another spring force as option. If you need a change on an already delivered product contact the manufacturer or your local dealer to fulfil this procedure.

### *Fixing the transducer*

The transducer can be clamped on all shaft positions. Take attention to not overtighten what could influence the linear bearing preload. The clamping elements must spread the force as good as possible to a wide area.

### *Extension cable*

Extension cables influence the analog transducer signals and therefore induce small changes in the sensitivity and linearity error characteristics. For more details please contact the manufacturer directly.

## **Application**

### *Sensitivity Setting*

HIRT halfbridge transducers are compatible with the TESA (R) standard. Electronics used to drive and read the transducer therefore also must fulfil the standard requirements. Every transducer is checked on 21 measuring points against sensitivity and linearity error. A, with the product enclosed, protocol inform you about these test results.

### *Pneumatic advanced transducers*

Pneumatically pushed transducers have the following specified maximum pressure

- P models - 1.5 bar
- L models - 4.5 bar

Application of pneumatic air to push forward the tip is allowed only when contacting a workpiece. Otherwise the stroke limitation of the linear ball bearing can permanently be destroyed!

The applied air must be free of oil and appropriately filtered (passby < 1 micrometer).



## Conformity

HIRT transducers are conform to country and region specific guidelines and laws. Underneath the conformities are listed.

Guideline 2014/30/EU (CE conformity EMC)

| Standard      | Test   |
|---------------|--|
| IEC 61000-4-2 | Electrostatic Discharges (ESD)               |
| IEC 61000-4-3 | Radiated RF electromagnetic Fields           |
| IEC 61000-4-4 | Electrical Fast Transients and bursts        |
| IEC 61000-4-6 | Conducted Disturbances, induced by RF fields |
| IEC 61000-4-8 | Power-frequency Magnetic Fields              |

Guideline 2011/65/EU (RoHS Guideline)

HIRT transducers do not consist any materials which exceed the maximum allowed concentration as to 2011/65/EU

Conflict minerals (Dodd Frank Act)

The on the transducer mounted tip consists of wolfram. Its source and the detailed supply chain is provided by the manufacturer upon request.

## Change log

| Date       | Change          | new revision |
|------------|-----------------|--------------|
| 15.05.2018 | Create document | 000          |

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