The tactile sensor guides the focusing module for laser welding or laser brazing. The focus then directly follows the sensor probe.

An adjustable rotational force can be used to safely position the sensor at the edge geometry of the components to be joined.

This rotational force can be varied in direction and value. It can also be modified during the laser application according to the geometry of the components.

PDT terminal: optimum parameterization for the individual application

Cover slide drawer: quick and easy cover slide exchange

CCD camera with viewing system: visualizing the process in set-up and production

PDT with pressure wheel: seam tracking and integrated clamping technology, the advantages of two systems in one processing head
Laser Processing Head PDT
Target-Oriented, Uncomplicated and Versatile

These are the properties which allow the HIGHYAG PDT to tap into new applications for time- and cost-saving laser brazing and welding. With this self-controlled laser machining head, it is now possible to utilize rational laser technology without technological effort, e.g., for welding trunk lids, for roof and sealing duct brazing or for brazing and welding overlap joints (flange welds and fillet welds).

The problem-free use of the PDT is based on a tactile servo motor assisted seam tracking, which is integrated in the machining optical system. This involves a tactile sensor finger, optionally with or without a wire, via an innovative optic-mechanical rotary motion that is directly coupled with the focus guidance system.

The processing head can traverse the laser focus to the precise welding or brazing position and then safely and accurately guide it over the workpiece during the process. This compensates for tolerances of the component part and inaccuracies of either the programming or the handling machine. The path can remain unchanged, thus significantly simplifying control.

With the help of a PC-based user interface, a parameterization of the head (control functions, inputs and outputs) is possible.

The modular optic and mechanical design of the head enables versatile use through the wide range of components offered. For the corresponding modules, this makes it possible to set different scales of figures for welding and brazing and use different types of lasers.

Applications

- Laser welding or laser brazing of fillet and edge-formed seams

System Features

Optimized modular optical systems:
- Laser brazing
- Laser welding
- Optic modules with focus forming

Tactile seam tracking with servo motor support
- Accurate adjustment of wire/tactile sensor
- Wide angular sensor range for optimized component access
- Absolute values for process point
- Direct control via Interbus (or similar)
- PC program for parameter set-up

Cross jet for extended cover slide life time
CCTV viewing system with integrated illumination of process point
Robot adaptation with crash sensor
Interface to PLC
Modular Design
Laser Processing Head PDT

- 90° Beam bandig module
- Extension module
- Base module
- Zoom collimation
- Collimation for YAG laser and fiber laser
- Collimation for diode laser
- Focusing module for diode laser
- Cover slide drawer
- Cross jet module
Beam bandig module

Collimation for YAG laser and fiber laser

Control unit

Robot adaptation

Crash sensor

Media adaptor

Cross jet module

Focusing module for YAG laser and fiber laser

Integrated CCTV camera

Cover slide drawer

Tactile sensor

Wire feeder

Integrated CCTV camera

Extension module

Base module

Zoom collimation

Collimation for diode laser

Integrated CCTV camera

With wire / with shielding gas

With wire / without shielding gas

Without wire / with shielding gas

Without wire / without shielding gas
## Optical System

| Focusing system (magnification @ focal length) | 0.75 @ 150 mm, 1.00 @ 200 mm, 1.70 @ 340 mm, 3.30 @ 660 mm* |
| Collimation system (magnification @ focal length) | 1.8 @ 110 mm, 2.0 @ 100 mm, 2.3 @ 90 mm, 3.0 @ 70 mm* |

| Max. average laser power | 6 kW |
| Max. beam parameter acceptance (half angle) of laser light exiting fiber | 97% power content within 125 or 210 mrad |
| Wave length | 800 - 950 nm, 1020 - 1080 nm |
| Transmission | > 95% |
| Core diameter laser light cable | 300 - 1000 µm (typical) |
| Laser light cable receiver | HIGHYAG LLK, LLK-Auto, Trumpf LLK-B, Optoskand QBH* |

## Seam Tracking

| Swiveling angle of focusing unit | 200° |
| Useable Z stroke (tactile sensor, focus position): | |
| · welding | 5 mm (10mm with auto focus) |
| · brazing | 15 mm |

| Adjustable range of laser light cable receiver | 360° |

## Wire Feeding System

| Support for wire feeder | On request, e.g. Binzel, Fronius |
| Suitable for hot wire up to | 200 A |

## Dimensions

| WxDxH, examples: |
| · PDT with integrated peripheral equipment | Approx. 800 x 430 x 540 mm³ |
| · PDT in compact design | Approx. 410 x 180 x 540 mm³ |
| Weight | Approx. 11 - 25 kg (depending on configuration) |

## Supply

| Electrical | DC 24 V, 5 A* |
| Pneumatics | ≤ 1.0 MPa |
| Cross jet: | ≤ 1.0 MPa, approx. 500 l/min @ 0.6 MPa |
| Shielding gas | On request, approx. 5 - 40 l/min, 0.6 MPa |
| Cooling | Flow rate 2 l/min, temperature 15 – 35 °C (avoiding condensation) |
| PLC / field bus system | Hard wired* |

Subject to change without prior notice

*Others on request

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