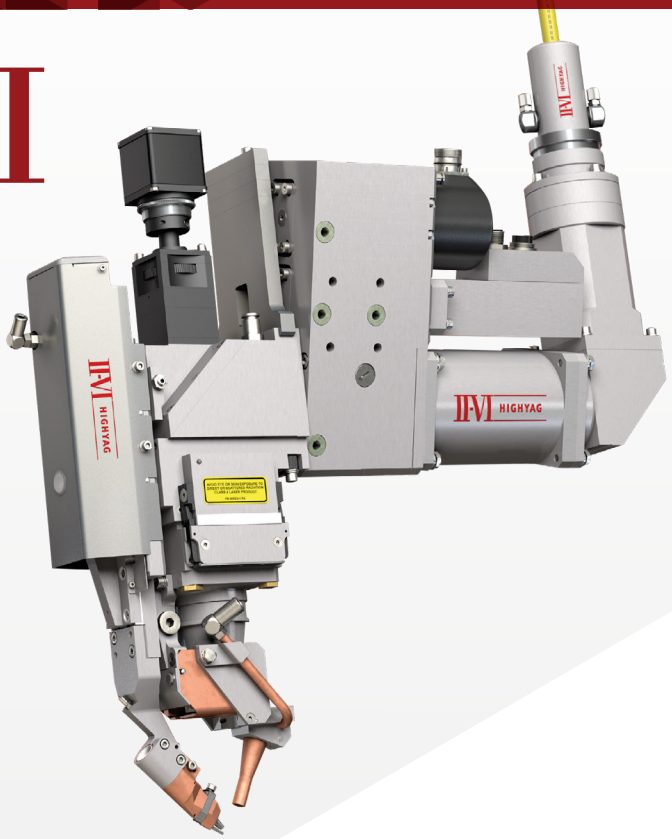


Laser Processing Heads

PDT

ON THE LEADING EDGE

These are the properties which allow the II-VI PDT to tap into applications for time- and cost-saving laser brazing and welding. With this self-controlled laser machining head, it is 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 optic-mechanical rotary motion that is directly coupled with the focus guidance system. This industry proven technology make the PDT first choice for highly dynamic 1 µm laser material processing applications such as body-in-white welding.

Laser Processing Heads PDT

Target-Oriented, Uncomplicated and Versatile

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 parmeterization of the head (control functions, inputs and outputs) is possible.

System Features

Optimized modular optical systems

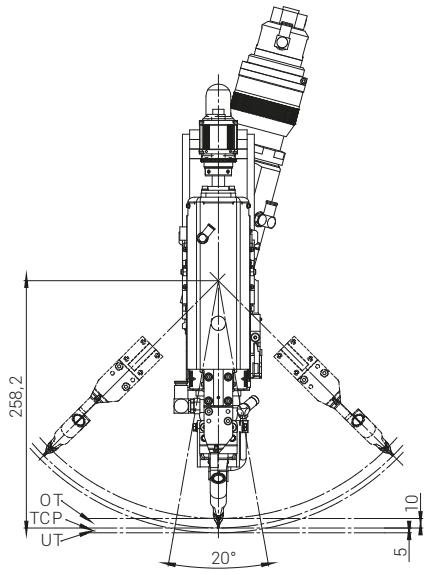
- Laser brazing
- Laser welding
- Optic modules with focus forming

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

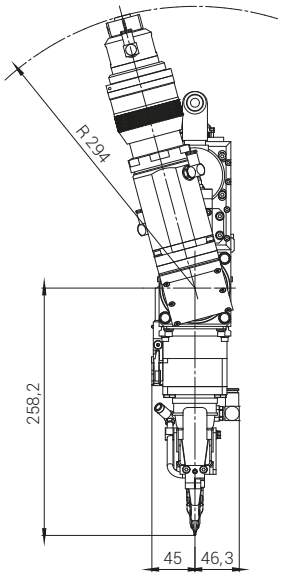
System integration

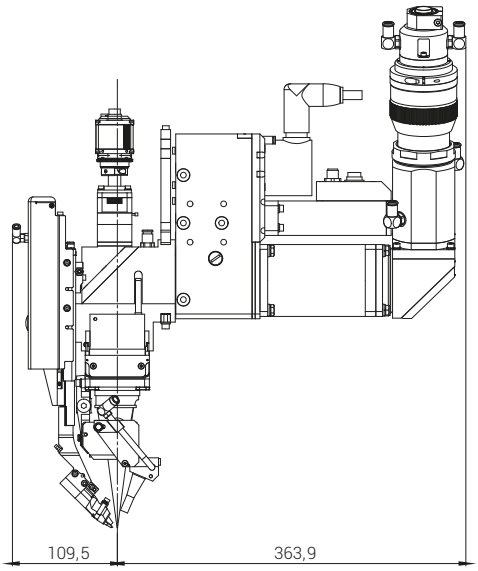
- Cross jet for extended cover slide life time
- CCTV viewing system with integrated illumination of process point
- Robot adaptation with crash sensor
- Interface to PLC



Applications

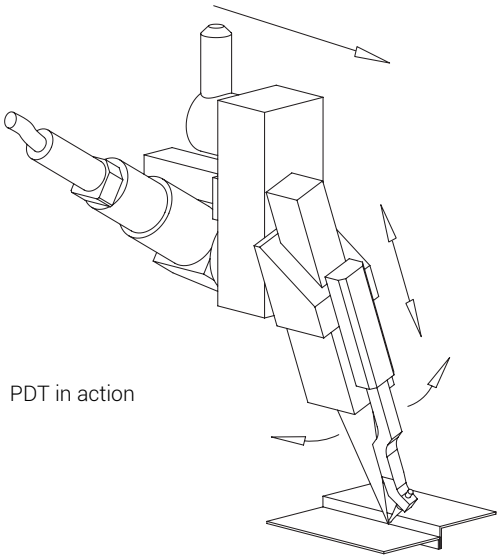
- Laser welding or laser brazing of fillet and edge-formed seams



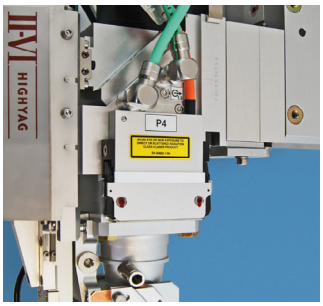


Laser Processing Heads PDT

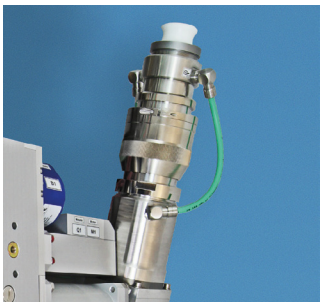
Modules



PDT in action

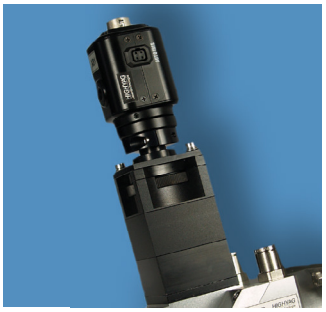


Focusing module: all laser power is focused into one point



Zoom collimation: variable set-up of focus diameter without change in focus position

Cover slide drawer: quick and easy cover slide exchange

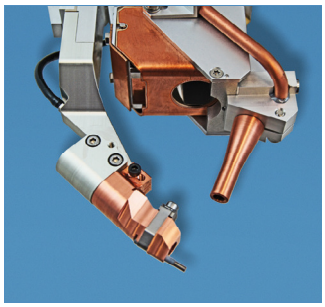


CCD camera with viewing system: visualizing the process in set-up and production

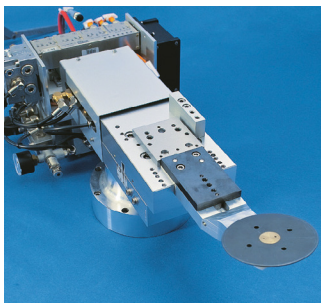
The tactile sensor guides the focusing module for laser welding or laser razing. The focus then directly follows the sensor probe.

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

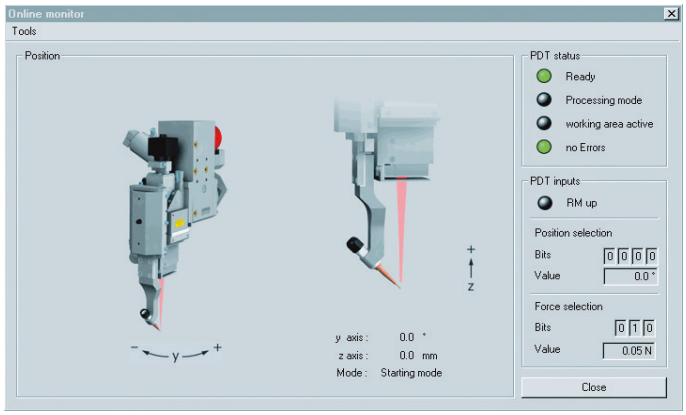
This rotatable force can be varied in direction and value. It can also be modified during the laser application according to the geometry of the components.



Tactile sensor: guides the laser focus



PDT with pressure wheel: seam tracking and integrated clamping technology, the advantages of two systems in one processing head

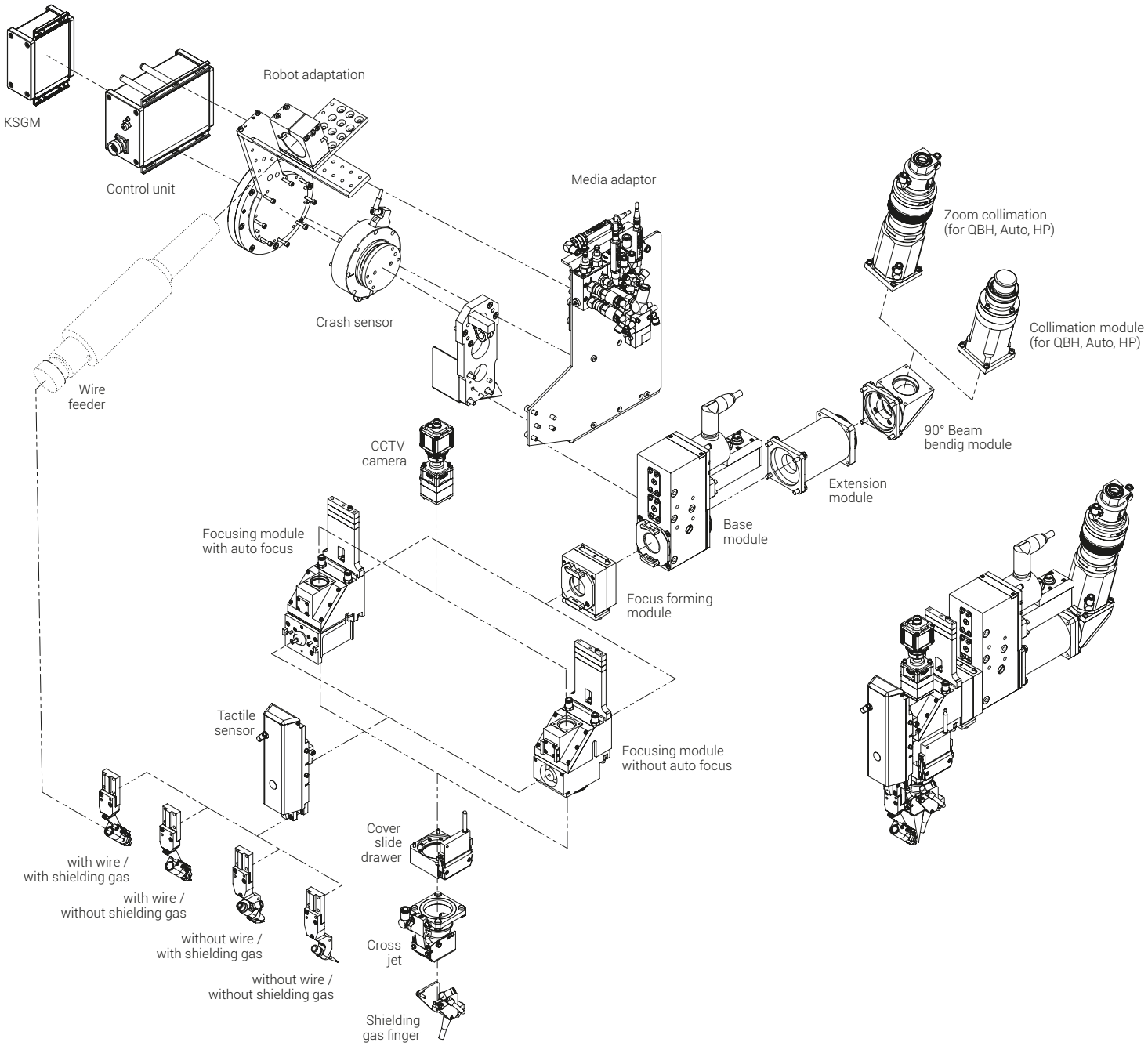


PDT terminal: optimum parameterization for the individual application

Laser Processing Heads PDT

Modular Design

Laser Processing Head PDT



Laser Processing Heads PDT

Technical Data

Optical System

Focusing system (magnification @ focal length)	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)	97% power content within 125 or 210 mrad, *
Wavelength	900 - 1060 nm (e.g. for diode lasers), * 1025 - 1080 nm (e.g. for YAG. fi bre and disc lasers)
Transmission	> 94% @ 1064 nm
Core diameter laser light cable	200 - 1000 µm (typical), *
Laser light cable receiver	HIGHYAG LLK-HP, LLK-Auto, LLK-B, LLK-D, QBH, *

Seam Tracking

Swiveling angle of focusing unit	200°
Useable Z stroke (tactile sensor, focus position):	
· welding	5 mm (10 mm 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, Dinse
Suitable for hot wire up to	200 A, *

CCTV-Viewing

Interface CCTV viewing	C-Mount
Optional camera system	Ethernet, *

Dimensions

W x D x H, examples:	
· PDT with integrated peripheral equipment	Approx. 800 mm x 430 mm x 540 mm
· PDT in compact design	Approx. 410 mm x 180 mm x 540 mm
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, Interbus, Profibus, DeviceNet, *

*Others on request