Faster than the eye

profileobserver compact

ENGINEERING QUALITY WORLDWIDE

plasmo

The profileobserver compact

The high performance quality assurance system for automated production.

Initial Situation

The inspection procedures implemented in production are manifold, but not always suitable for inline inspection. For a whole range of reasons optical 3D inspection procedures are gaining more and more in significance. With their help e.g. assembly errors, incorrect geometric shapes, surface defects etc. can already be detected and identified in the production line, making troubleshooting considerably easier.

Challenge

Reliable detection, measuring and documentation of geometries and surface defects, e.g. a weld seam, solder seam and other geometric profiles. At fast processing speeds of up to 30m/min and more as well as a resolution of 10µm in harsh industrial environments.

Solution

The plasmo profileobserver product family stands for highest precision in the fast and reliable detection of surface defects such as seam elevation, edge notches, cracks, splashes, seam width, seam position pores and other geometric forms.

Features/Benefits

- Non-contact and non-destructive (NDA)
- High-speed vision system (max. 30,000 images/s)
- Precise measuring results with high dynamics
- Almost independent of the surface
- Reduction of the production costs through early detection of defects.
- Reliable detection of the surface defects:
  - Seam elevation/dips
  - Edge notches
  - Cracks
  - Splashes
  - Seam width
  - Seam position
  - Pores
  - Changes in laserpower
  - Changes in welding speed
- Statistics modules and trend analysis modules
- Subsequent traceability up to the seam
- Seamtracking

Customers

The reliable quality assurance systems from plasmo have proven themselves reliable every single day in national and international industrial organizations.

The customers come from the most varied of branches such as automotive, aviation, machine tool industry, steel industry and electronics. In other words customers, who have and need integrated quality management.

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30,000 Images per Second

The profileobserver is faster than the eye and therefore becomes an indispensable component of the quality inspection.

Measuring Principle

The plasmo profileobserver is based according to the laser triangulation principle.

The image is acquired by means of a high-speed CMOS-Sensor with a speed of max. 30,000 images/s.

The CMOS-Chip converts the recorded laser line directly into measured values of height. These are forwarded to an industrial PC over a GigE-Bus. In the industrial PC the seam geometry is evaluated according to parameterized quality characteristics in real time.

At the end of a measuring cycle the result (IO = in order/NIO = not in order), the type of defect and the location of the defect are displayed on the monitor and forwarded to the installation PLC over a digital output or a bus system.

The software can be configured accordingly for the analysis of the measured data and for the control of the measuring sequence.

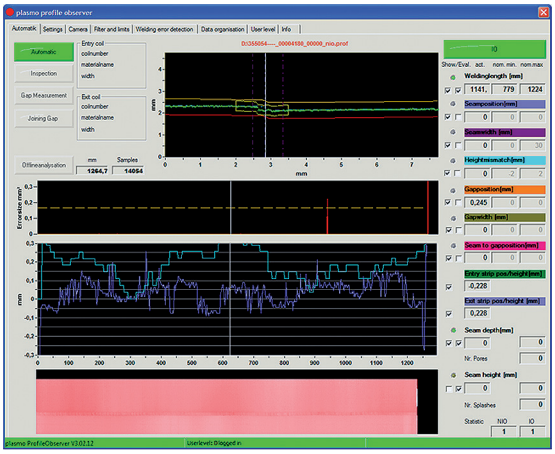
Individually Adaptable

With the profileobserver, not only the height profile but also a grayscale image is recorded at the same measuring speed. Optionally the possibility exists, that in the industrial PC the grayscale value is evaluated in addition to the 3D information and additional characteristics detected.

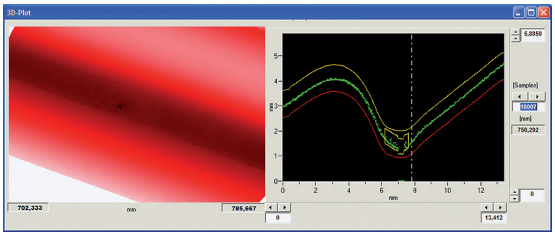
At a Glance

The online software of the plasmo profileobserver convinces through the extremely simple operation.

Comprehensive graphical support also allows untrained users to configure the system to their requirements.



Weld seam monitoring. The software offers comprehensive graphical support.



The assessment according to the defined assessment criteria takes place in the PC in real time.

Picture right: The CMOS-Sensor detects the line characteristic and forwards max. 30,000 images per second to the PC over the GigE-Bus.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ProfileObserver

The Software

The special software calculates in a flash, whether the deviations are within the tolerances and evaluates the result.

Weld Seam Monitoring

The surface geometry of a weld seam is displayed in real time. All seam parameters determined (excessive increases in seam height, seam dipping, angle and position) as well as surface pores are displayed as a graphic. In addition a parameter-settable IO/NIO evaluation of the seam is performed.

Monitoring of Solder Seams

The surface geometry of a solder seam is displayed in real time. All seam parameters determined, such as form and position of the solder seam, are visualized. Special algorithms are used for the stable detection of surface pores in the 0.1 mm range. A parameter-settable IO/NIO evaluation of the solder seam is performed.

Monitoring of Adhesive Beads

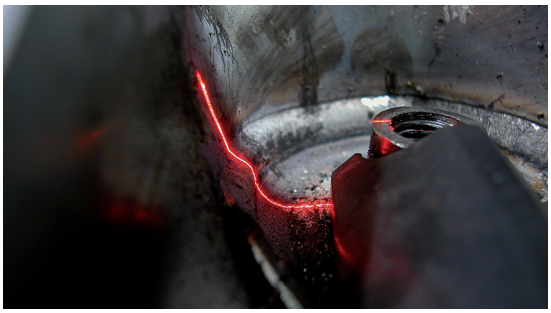
The surface profile of an adhesive beading is displayed in real time. All parameter determined, such as bead height, position and volume, are displayed as a graphic and a parameter-settable IO/NIO evaluation of the adhesive bead is performed.

Seamtracking

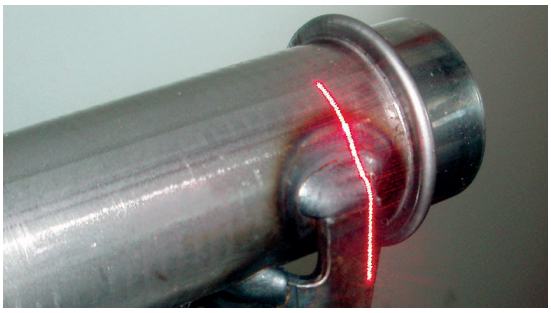
An online determination of the joint gap position is carried out. The deviation of the position determined can be output analogical or digitally via an interface.

Joint Gap, Zero Gap Measurement

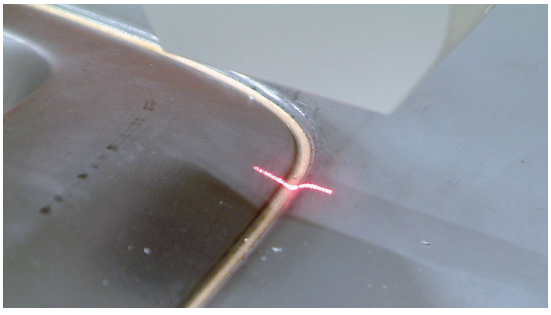
An online determination of the joint gap up to the technical zero gap is performed. The gap width, position and the thickness gap of the sheets are measured over the entire length of the seam and the runs visualized or forwarded via bus system. A parameter-settable IO/NIO evaluation of the joint gap is performed.



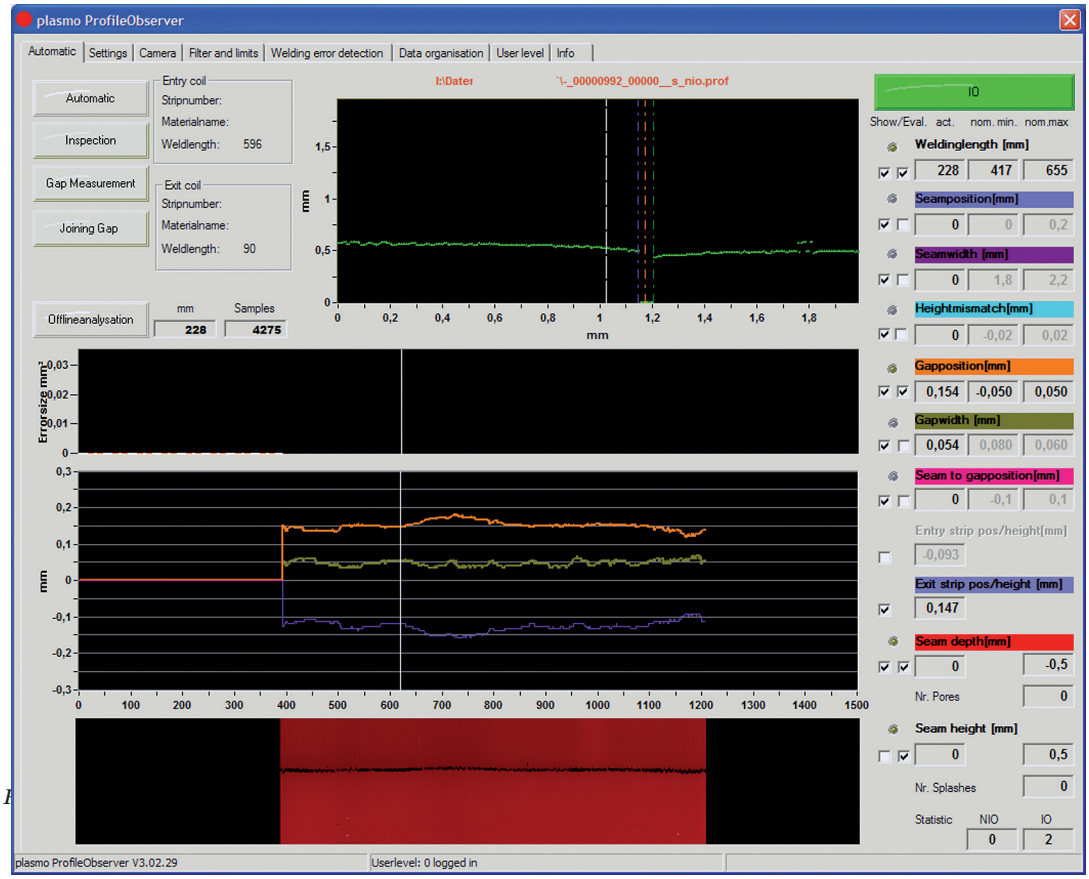
Inspection of a weld seam



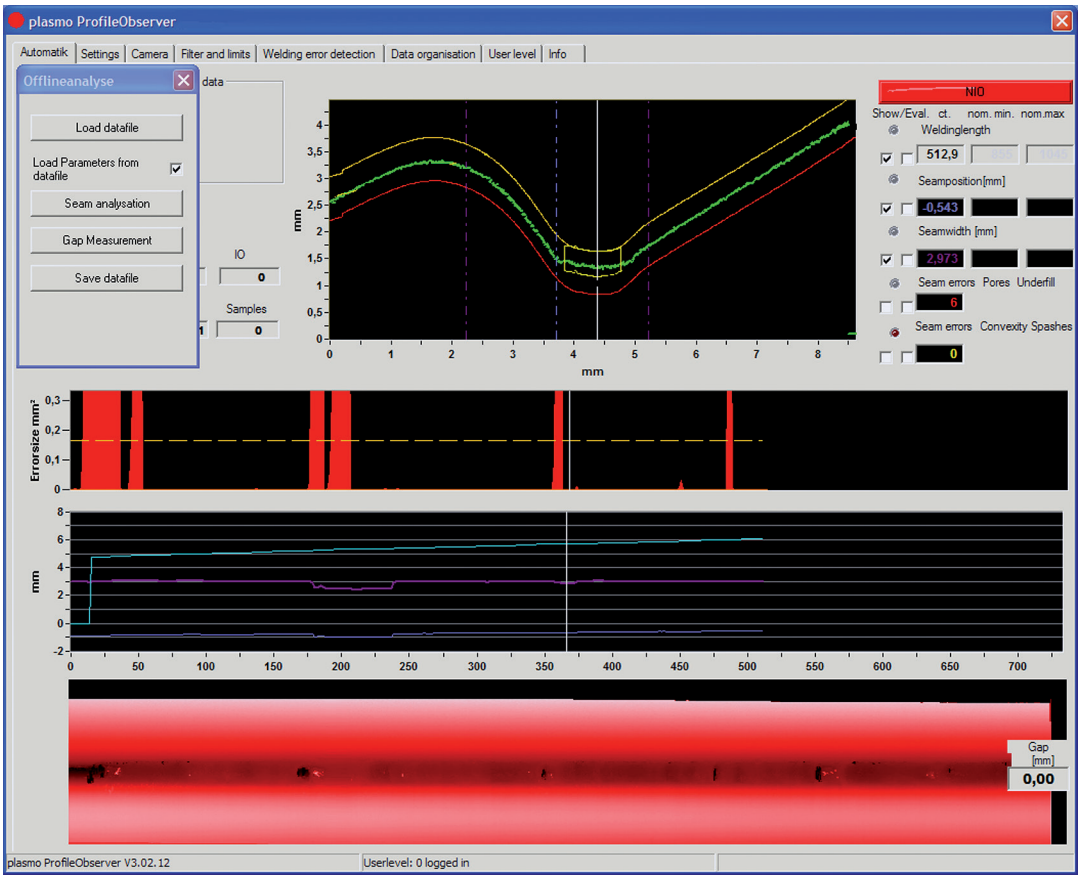
A tube component is inspected.



Monitoring of a solder seam



Representation of the height profiles, upper and lower limit ranges, as well as pores and solder splashes as peaks.



Technical specifications profileobse

	profile**observer** compact 115/81
Unit of measurement	
Sensor	CMOS 1.536 x 512
Scanner frequency [1]	4.000 Hz
Field of measurement [2]	11 x 5 mm
Resolution width	0,007
Resolution hight	0,01
Resolution Scanning Direction (4.000 Hz, 6m/min)	0,025 mm
Laser protection class [3]	class 3B
Measuring distance	81 mm
Deviation in Height	± 1,5
Controlled additional axis for greater measuring range	+5 mm (optional: +10 mm)
Communication and bus system [4]	
Digital inputs/outputs	optional 16E/16A
DeviceNet	optional
Can Bus	optional
Profibus	optional
Interbus	optional
Connection and dimensions	
Dimensions [5]	60 x 66 x 240 mm (60 x 66 x 380 mm with FO-converter)
Weight	2,0 kg (2,5 kg with FO-converter)
Operating temperature	10°C to 50°C
Storage temperature	-20°C to 70°C
Humidity in operation [6 7]	93% RH at 40°C
Humidity in storage [6 7]	93% RH at 40°C
Voltage support	12-24V DC 8W 1,25A, 5V DC 1W 0,2A
Degree of protection	IP 53 (optional: IP 64)
Shock-, impact resistance	5g/6ms (IEC 68-2-29)
Vibration	2g/20Hz-500Hz (IEC 68-2-6)
Software	
Weld seam monitoring	yes
Endless processes (profiles, tubes)	yes
Adhesive beads	yes
Gap measurement up to zero gap	yes
Component visualization and parameterization	yes
Offline parameterization	yes
Segmentation	yes
Seam number transfer	yes

[1] higher scanning frequency on request
[2] other fields of measurement on request
[3] acc. IEC 60825-1
[4] other bus systems on request
[5] other dimensions on request
[6] acc. IEC 60078-2-78
[7] higher air humidity on request

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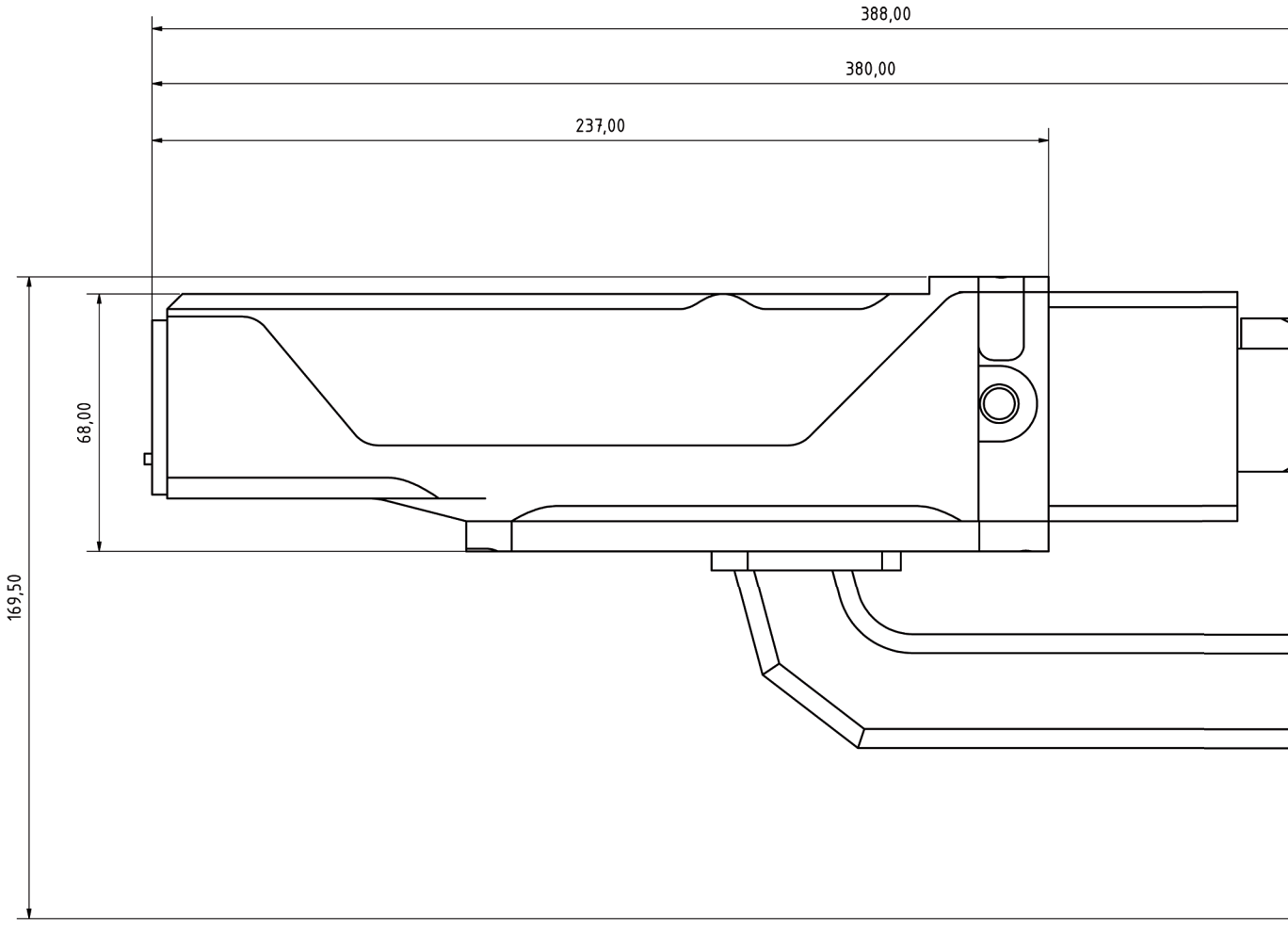
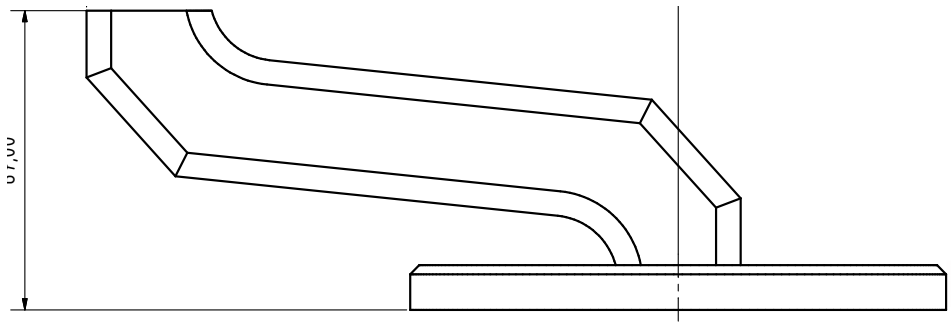
profile**observer** compact 167/30, 167/91	profile**observer** compact 309/94
CMOS 1.536 x 512	CMOS 1.536 x 512
4.000 Hz	4.000 Hz
16 x 7 mm	30 x 9 mm
0,01	0,02
0,018	0,02
0,025 mm	0,025 mm
class 3B	class 3B
30 mm, 91 mm	94 mm
± 2,3	± 2,3
+5 mm (optional: +10 mm)	+5 mm (optional: +10 mm)
optional 16E/16A	optional 16E/16A
optional	optional
optional	optional
optional	optional
optional	optional
60 x 66 x 240 mm (60 x 66 x 380 mm with FO-converter)	60 x 66 x 240 mm (60 x 66 x 380 mm with FO-converter)
2,0 kg (2,5 kg with FO-converter)	2,0 kg (2,5 kg with FO-converter)
10°C to 50°C	10°C to 50°C
-20°C to 70°C	-20°C to 70°C
93% RH at 40°C	93% RH at 40°C
93% RH at 40°C	93% RH at 40°C
12-24V DC 8W 1,25A, 5V DC 1W 0,2A	12-24V DC 8W 1,25A, 5V DC 1W 0,2A
IP 53 (optional: IP 64)	IP 53 (optional: IP 64)
5g/6ms (IEC 68-2-29)	5g/6ms (IEC 68-2-29)
2g/20Hz-500Hz (IEC 68-2-6)	2g/20Hz-500Hz (IEC 68-2-6)
yes	yes
yes	yes
yes	yes
yes	yes
yes	yes
yes	yes
yes	yes
yes	yes

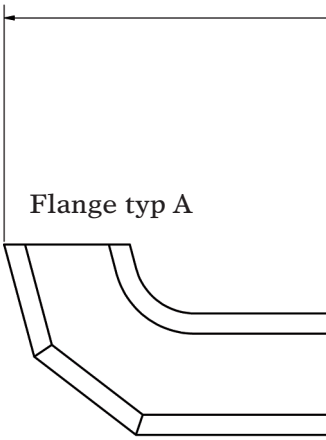
Dimensions

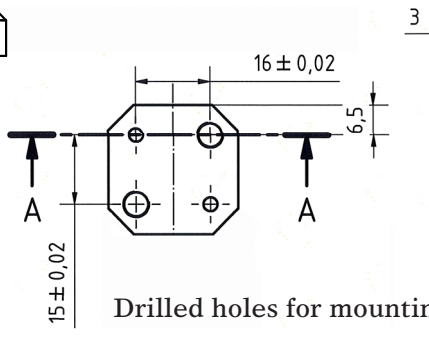


Flange typ B

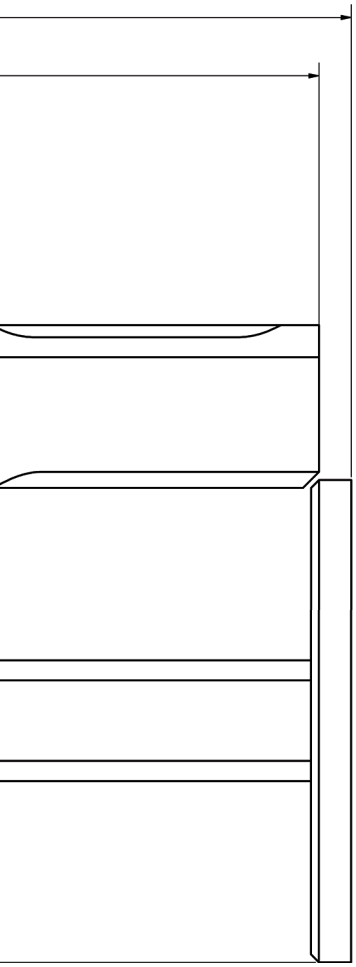


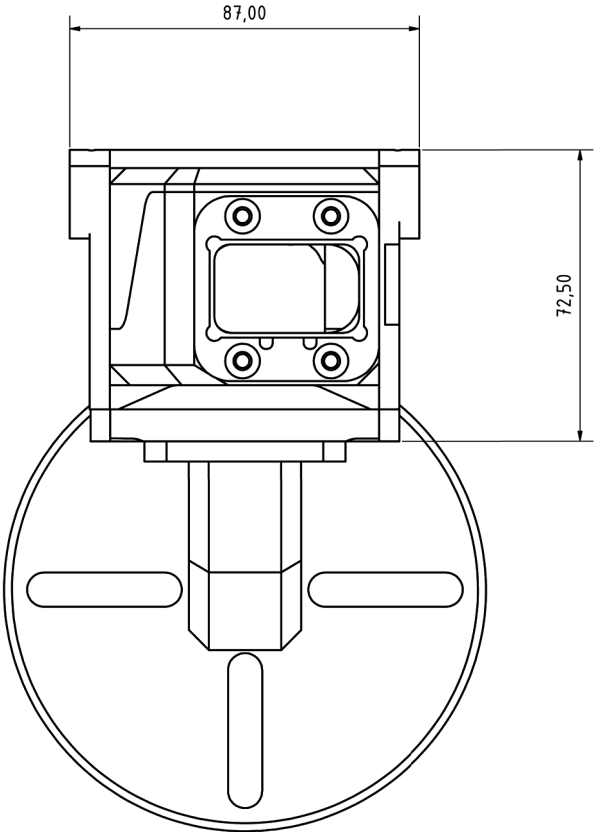
Flange typ A

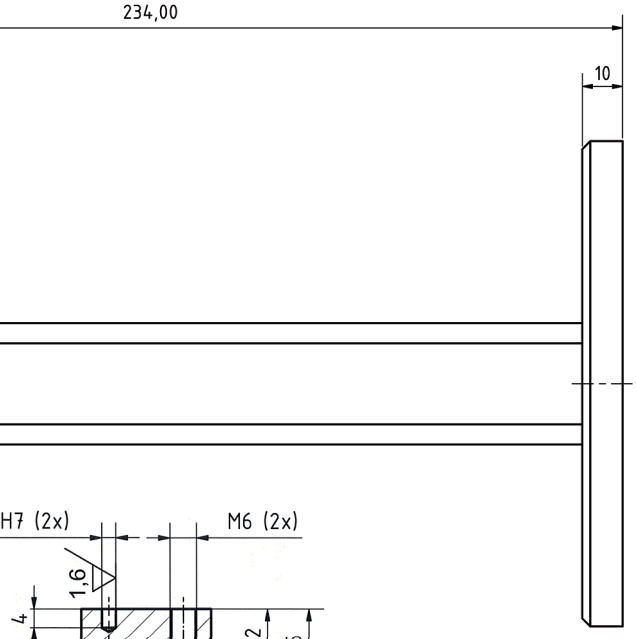


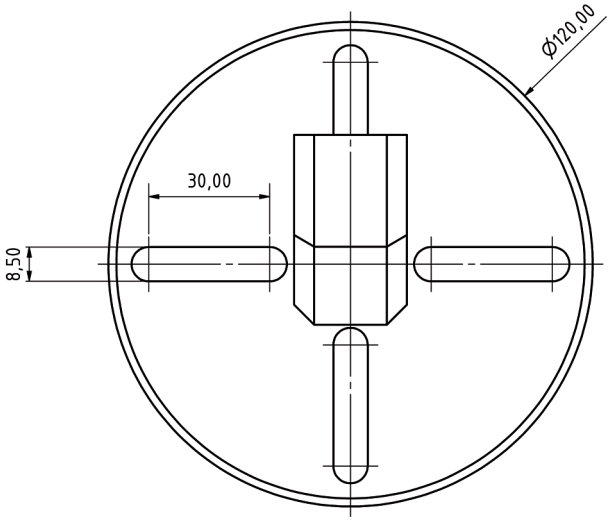


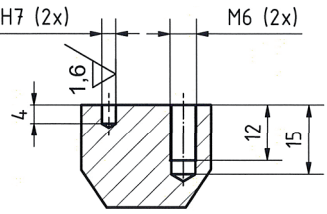
Drilled holes for mountin











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