Equipment of machinery for contract manufacturing

Milling Technology:  
- CNC micro milling and micro drilling  
- High-precision milling in μ-range  
- Standard milling (24/7 processing)

EDM Technology:  
- Wire EDM  
- EDM die sinking  
- Hole drilling EDM and precision drilling

Grinding and Lapping Technology:  
- Surface grinding  
- Jig grinding  
- One-disc-lapping

Laser Technology:  
- Laser marking and micro-labels

Measurement Technology:  
- Tactile 3D-metrology  
- Optical metrology of dimension and surface

KERN-competencies:
- Manufacturing of micro parts and micro structures  
- High precision machining in μ-range  
- Automated serial manufacturing  
- Hard milling  
- Surface quality down to Ra 0.05  
- Complete manufacturing with different processing technologies  
- High-End metrology  
- Design and manufacturing of sub-assemblies

Processing the following materials:
- Variety of steel alloys for example stainless steels or tool steels in the hardened state  
- Copper and copper materials such as brass, bronze, nickel silver, tungsten copper  
- Aluminium and aluminium alloys  
- Titanium and titanium alloys  
- Tungsten carbide and heavy metals such as molybdenum, tungsten  
- Nickel-based alloys such as Inconel, Hastelloy and Nitinol  
- Special alloys such as Kovar, Invar  
- Plastics, particular Vespel  
- Machinable ceramics such as Macor or boron nitrides  
- Sintered ceramics such as zirconium oxide or aluminium oxide (hard ceramics)  
- Possibly precious metals such as gold, platinum and silver
Machines:
Micro milling and micro machining:

Centrally controlled robot cell for serial production:

2x KERN Evo 5-axis-CNC- micro machining center

and

2x KERN Micro 5- axis-CNC- micro machining center

CNC micro milling:

Micro milling and micro drilling with individual automation

8x KERN Evo 5-axes CNC micro machining center
travels: X 300, Y 280, Z 250
spindle speed 50,000 rpm
with System 3R 60-fold work piece changer,
laser tool measurement and infrared touch probe

2x KERN Evo 3-axes CNC micro machining center
travels: X 300, Y 280, Z 250,
spindle speed 50,000 rpm
with System 3R 10-fold work piece changer,
laser tool measurement and infrared touch probe

High Precision machining centres:

High precision milling, 5-axes simultaneous machining and options of jig grinding

1x KERN Triton 5-axes CNC -Nano high precision machining center
hydrostatic guide ways
travels: X 500, Y 500, Z 400
spindle speed 42 000 rpm
with System 3R 10-fold work piece changer,
laser tool measurement and infrared touch probe
1x  **KERN Micro 5-axes CNC high precision machining center**
spindle speed 50 000 rpm
HSK25 tool magazine with 99 positions,
Integrated 30-fold workpiece changer

1x  **KERN Micro HD 5-axes CNC high precision machining center**
hydrostatic guide ways, integrated linear motor drives
travels: X 350, Y 220, Z 250
spindle speed 42 000 $\frac{1}{\text{min}}$
 c-axis 360° endles, $200 \frac{1}{\text{min}}$; b-axis 200°
HSK40 tool magazine with 184 positions
with Erowa Robot Compact 75-position pallet changer,
laser- tool measurement and infrared touch probe

2x  **KERN Micro 5-axes CNC high precision machining center**
travels: X 350, Y 220, Z 250
spindle speed 42 000 $\frac{1}{\text{min}}$
 c-axis 360° endles, $200 \frac{1}{\text{min}}$; b-axis 200°
HSK40 tool magazine with 184 positions
with Erowa Robot Compact 75-position pallet changer,
laser- tool measurement and infrared touch probe

**Laser marking:**

1x  **TruMark Station 5000 with TruMark 3230**
travels: X 300, Y 300, Z 500 with axis of rotation
wave length 532nm, focus diameter 24μm
Wire EDM:

1x AGIE CHARMILLES Cut 3000 Twin-Wire
travels: X500, Y 350, Z 256
thinnest wire Ø0,03; two-wire system for processing with standard wires and fine wires in one operation
best surface quality of Ra0,05
accuracy of contour ±0,0015, AGIE 3D touch system

1x AGIE CHARMILLES Vertex 3F
travels: X500, Y 350, Z 256
thinnest wire Ø0,03
best surface quality of Ra0,05
accuracy of contour ±0,0015, AGIE 3D touch system

1x MITSUBISHI FA20S
travels: X 500, Y 350, Z 300; max cutting height 295
with axis of rotation

Sink EDM:

1x ZIMMER & KREIM GENIUS 850
travels: X 565, Y 400, Z 415
16-fold electrode changer, system 3R clamping system,
dynamic Z-axis and micro generator
Fine plain generator for surface values Ra 0,2.
Hole drilling EDM:

1x AGIE CNC Präzidrill
hole drilling EDM from Ø0.23 up to Ø3
depth up to 250mm, or 300 x Ø

One-disc-lapping:

1x STÄHLI LTS-RF-600 Lapping machine
outer Ø of lapping disc 610 mm
3-ring system with dressing ring inner Ø248 mm
disc of cast steel, spiral grooved allows an Rz-value of 0.67
Based on the Bi-Composite disc an even finer surface finish can be reached, as basic for polishing metallic sealing surfaces.

Flat and parallel grinding:

2x JUNG JF 520 flat grinding machine
grinding length 600mm, traversal 200 mm

Sand Blasting:

1X HGH 6040-DUO sand blasting cabin
2-steps-sand-blasting-procedure
Sharp-edged corundum (50-70µm corn size)
Ball-corundum (30µm corn size)
Two work-places of: 590 x 400 x 250 mm

Measurement Technology:

1x ZEISS Prismo 3D-coordinate measuring machine
travels: X 900, Y 1200, Z 600
VAST XT touch probe system
automatic touch probe changer
1x ZEISS O-Inspect 3D-coordinate measuring machine
travels: X 400, Y 400, Z 200
optical and tactile measurement
automatic touch probe changer
smallest touch probe Ø0,3mm
with topographic 3D-demonstration per white light sensor as well able for transparent materials

1x ZEISS O-Inspect 3D-coordinate measuring machine
travels: X 400, Y 400, Z 200
optical and tactile measurement
automatic touch probe changer
smallest touch probe Ø0,3mm

1x ZEISS F25 3D-coordinate measuring machine
travels: X 100, Y 100, Z 100
touch probe Ø0,3mm and Ø0,12mm
measurement accuracy 0,25µm

2x ZEISS Duramax 3D-coordinate measuring machine
Travels: X 500, Y 500, Z 500

1X CONVOFIS DUO Vario surface measuring device
High-precision measurement in the nanometer range objectively tower 50 x 0,95
measuring of Rz- und Ra-values up to 6 nm

1x Video measuring microscope MM01
with automatic edge detection
measurement area: X 200, Y 100, Z 100
1x MITUTOYO QUICK VISION 3D-CNC-optical measurement machine  travels: X 200, Y 200, Z 150

1x Dr. Schneider WM2BV measurement projector
data processing in 2D (dxf, dwg), travels: X 250, Y 140, Z 200

1x ZEISS TSK SURFCOM 130A surface measuring instrument
surface quality according to Ra, Rz, Rmax

2x ZEISS ZKM 01-250D optical 2D-coordinate measuring unit
travels: X 250, Y 125

5x Heidenhain height measuring instrument with macro video
measurement area : Z 12.5 -25mm , accuracy of 1 micron

5x ZEISS stereo microscopes
magnification  8-32 fold

1x MITUTOYO Mess-Profilprojektor
magnification 100-20-100fach

We have more than 1500 units of measuring and test equipment which are regularly checked and calibrated.