# intelli*SCAN* FT

**Smart Welding**

This 2D scan system including an aperture of 30 mm was designed for static welding applications as well as for gantry machines to guide the laser beam fast and precise on a 2D contour.
Due to its compact 30 mm design, supporting both straight and 90 degree collimators, the intelli*SCAN* FT can be easily integrated into machines with limited space. Its optics are optimized for fiber-coupled disk and fiber lasers with powers up to 8 kW.
The intelli*SCAN* FT is based on SCANLAB's fully digital i*DRIVE* technology and allows real-time monitoring of all important scan head status parameters.
The head is equipped with an additional internal sensor system for automatic self-calibration (ASC). This reference system enables a fast calibration of the galvo drives' positioning systems in order to compensate drift effects.

**Principle of Operation**

The laser beam is fiber-delivered to the scan system's water-cooled collimator and then directed to the scan system's deflection mirrors. Focusing of the beam onto the working plane is achieved at this pre-objective-scanning-head via F-Theta optics.
Using the beam splitter at the 90 degree collimator, a camera or process sensor can be coupled coaxially.

**System Features**

**Robustness**

- lens protection via replaceable cover slide
- replaceable collimator cover slide
- extensive accessories for optic-protection (Crossjet etc.)

**Precision**

- custom image field calibration
- ASC sensor for drift compensation

**Dynamic**

- proprietary galvos and complementary mirror-design
- high-precision processing and fast positioning
- free programmable oscillation with high frequency (wobble)

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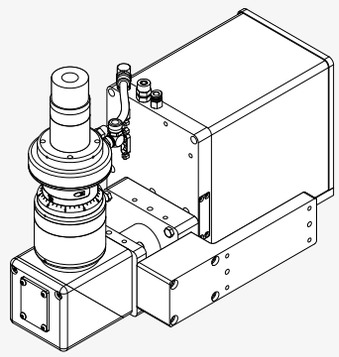
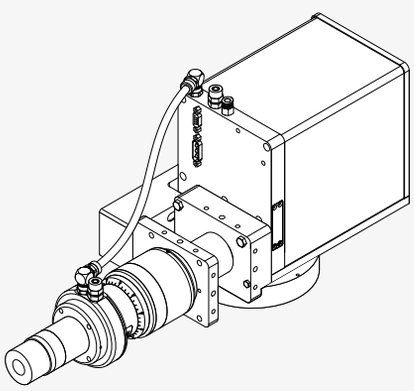
# Technical specifications

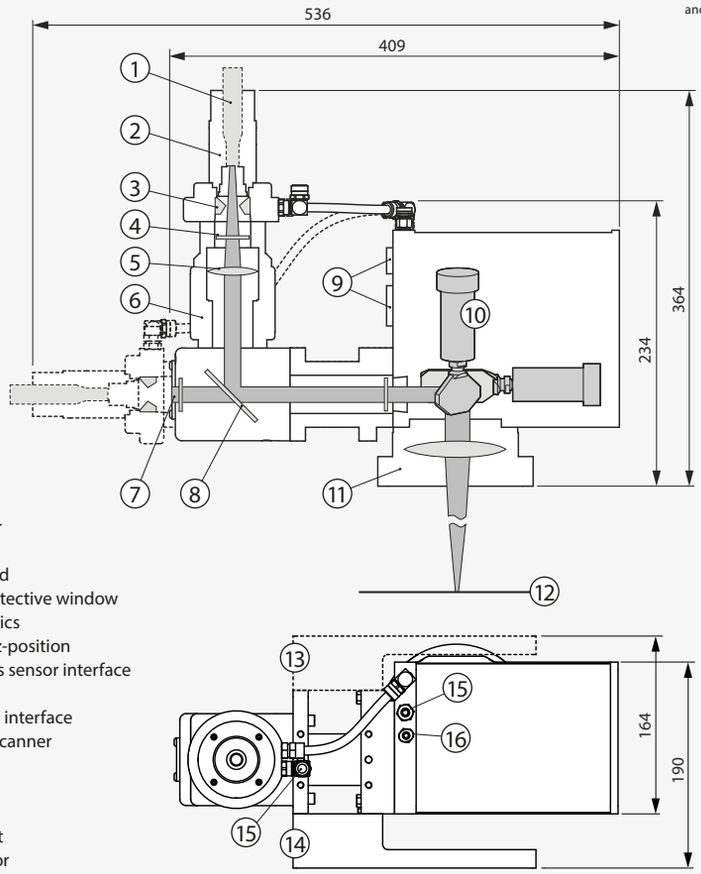
dimensions for lens f = 460 mm
and QBH fiber adapter

### intelli*SCAN* FT with 90° collimator



### intelli*SCAN* FT with 180° collimator









**Legend**

1 Fiber connector
2 Fiber adapter
3 Aperture, cooled
4 Collimation protective window
5 Collimation optics
6 Adjusting ring z-position
7 Camera/process sensor interface
8 Beam splitter
9 Power and data interface
10 Galvanometerscanner
11 Objective
12 Focal plane
13 Mounting, left
14 Mounting, right
15 Water connector
16 Air connector

all dimensions in mm

## Technical specifications for intelli*SCAN* FT

### Optical Specifications

| | | | | | | |
|---|---|---|---|---|---|---|
| **Wavelength** | 1030 nm - 1085 nm[1] | | | | | |
| **Maximum laser power** | 8 kW[2] | | | | | |
| Average laser power | 5 kW / 4 kW[3] | | | | | |
| **Fiber adapter** | QBH, Q5/LLK-B, QD/LLK-D | | | | | |
| **Focal length, focusing optics** | 163 mm | | 255 mm | | 460 mm | |
| **Focal length, collimator** | 132 mm | 116 mm | 132 mm | 116 mm | 132 mm | 116 mm |
| **Limiting NA (half angle)** | 0.11 | 0.125 | 0.11 | 0.125 | 0.11 | 0.125 |
| **Image ratio** | 1 : 1.2 | 1 : 1.4 | 1 : 1.9 | 1 : 2.2 | 1 : 3.5 | 1 : 4.0 |
| Focus diameter | 120 µm[4] | 140 µm[4] | 190 µm[4] | 220 µm[4] | 350 µm[4] | 400 µm[4] |
| **Fiber diameter** | ≥ 50 µm | | ≥ 50 µm | | ≥ 100 µm | |
| **Operation distance to cover slide** | 205 mm | | 304 mm | | 509 mm | |
| **Image field size (elliptical)** | ca. 120 x 75 mm² | | ca. 170 x 105 mm² | | ca. 380 x 290 mm² | |

[1] Mirror coatings are currently available for 1030 nm and 1055 - 1085 nm
[2] Depending on duty cycle, see diagram below
[3] Vision coating; R > 80% for 800 nm - 1030 nm resp. 800 nm - 1055 nm
[4] With 100 µm fiber
[5] Angles are in optical degree

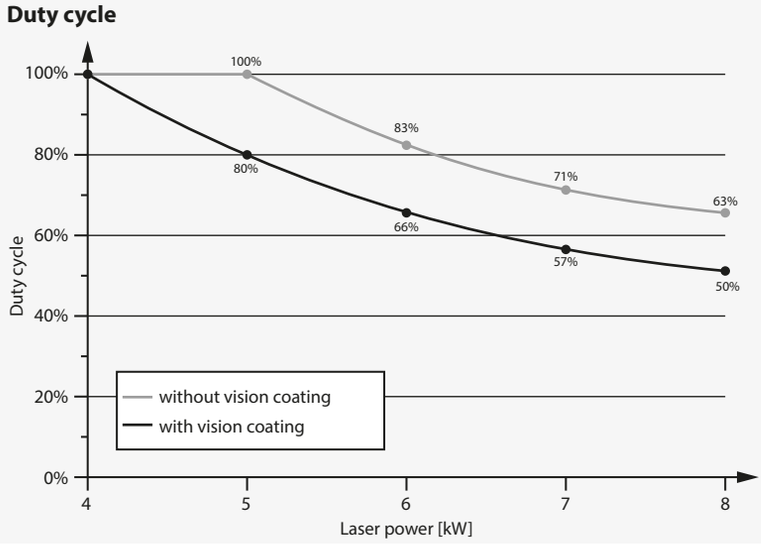
### Dynamic Specification

| | |
|---|---|
| **Step response time** (with step tuning)<br>(settling to 1/1000 of full scale) | |
| 1% of full scale | 1.2 ms |
| 10% of full scale | 3.5 ms |
| 100% of full scale | 11 ms |
| **Tracking error** | < 0.2 mm |
| **Repeatability (RMS)** | < 2 µrad[5] |
| **Long-term drift over 8 h**<br>(with ASC, after warm-up) | < 0.2 mrad[5] |

### Supply

| | |
|---|---|
| **Power requirements** | 30 V DC (29 - 33 V), max. 8 A each |
| **Input and output signals** | SL2-100 |
| **Weight** | 14 - 21 kg |
| **Operating temperature** | 25°C ± 10°C |
| **Typical water requirements** | 5 l/min at 20°C and Δp < 0.1 bar, p < 4 bar |
| **Typical air requirements** | 20 l/min at Δp < 0.1 bar, ISO 8573.1:2001, class 1.6.1 |

### Duty cycle



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