Polygon mirror scanner PM series

Ultrafast 2D beam deflection / High aperture / Power applications

MOEWE's polygon mirror scanners (PM) are designed for ultra-fast high-power laser processing. The system is realized as two-dimensional beam deflection unit available for 2D, 2.5D and 3D processing. The high-end PM scanners stands out with a with a free aperture of 30 mm and a real-time on-board data processing allowing highest accuracy for macro and micro processing on never seen throughputs.

Key Features

- Patented low distortion double polygon mirror
- Large free aperture of 30 mm
- High laser power of 5 kW cw
- Ultra-fast scan speeds on the entire scanning field (no acceleration loss)
- Full digital, FPGA on-board data processing
- Bitmaps, vector graphics, STL-file
- Real-time laser switching for highest accuracy

Your Advantages

- Two-dimensional beam deflection allows sand-alone utilization or machine integration (axis, roll-to-roll)
- Multiple digital and analog I/O connectors, Ethernet for communication, encoding, process control
- Applications: Laser marking, Micro structuring, Sur face cleaning, Drilling, Cutting, Engraving (2.5D), Spot welding, Additive manufacturing (3D), ...

Options and variants

Optics
- Changeable objectives (standard or customized)
- 167, 255 and 420 mm f-Θ-objectives available

Hardware
- 10 MHz modulation of cw beams with AOM
- Synchronization of multiple scanners
- Phase correction for lasers with fixed pulse repetition rate

Software
- Parameter, bitmap and vector graphics mode
- 8-bit greyscale processing, engraving 2.5D
- 3D real-time slicer (STL-files)
- Synchronization of scanners and external axis

General specifications

Power supply	Voltage	+(30±2) V_{DC}, GND
	Current	max. 15 A
	Ripple/Noise	max. 200 mVpp
Operating temperature		+18 ... +30°C
Humidity		20 ... 90 % rel.H.
Mass		13 kg
Size (LxWxH) in mm		281 x 226 x 253
Input aperture		29.5 mm
Beam displacement		0 mm

Optical specifications

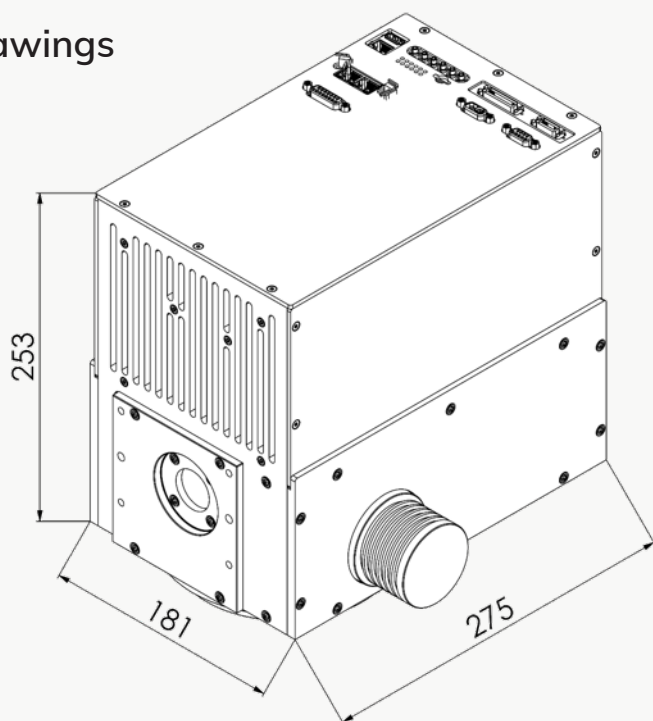|	Polygon mirror Primary axis	Galvo mirror Secondary axis
Max. deflection	± 0.454 rad	± 0.698 rad
Resolution	< 2 µrad (24-bit)	< 4 µrad (20 bit)
Repeatability		< 1 µrad (RMS)
Temp. Drift		< 5 µrad/K
Max. Lines / s	1,333 Hz @ 10,000 rpm	
Max. scan speed	> 800 m/s @ 10,000 rpm, 420 mm f-θ	
Wavelength	NIR > 1,000 nm (Au)	
	VIS 400 - 650 nm (enhanced Al, Ag)	
	UV 350 - 365 nm (UV enhanced Al)	

Input / Output

Data transfer	1x	Ethernet
Digital Out	3x	5 V @ 120 MHz
Analog Out	2x	0...5 V @ 3 MHz
Analog In	1x	0...5 V
Axis I/O	36 pin	D-Sub-Micro-D
Sync I/O	Master/slave	Ethernet
GPIO I/O	20 pin	D-Sub-Micro-D
Aux. I/O	9 and 15 pin	D-Sub
USB 2.0 A		5 V, max. 0.5 A

Real-time FPGA processing

On-board memory	1 GByte (optional 2 GByte)
Scanning field	90,000 x 90,000 pixel
FPGA frequency	200 MHz (5 ns)
2D b/w bitmaps (1-bit)	BMP
2.5D grey bitmaps (8 bit)	BMP
Vector-graphics	DXF
3D real-time-slicer	STL, VRML

Drawings

A: M5 for objective adapter ring, max. screw-in 10 mm
B: M6 for scanner mounting, max. Screw in 10 mm
C: Ø 6 H7 x 20 for dowel pins ISO 2338-6 m6