

PFO 33

Remote welding for every application

01

Higly productive

02

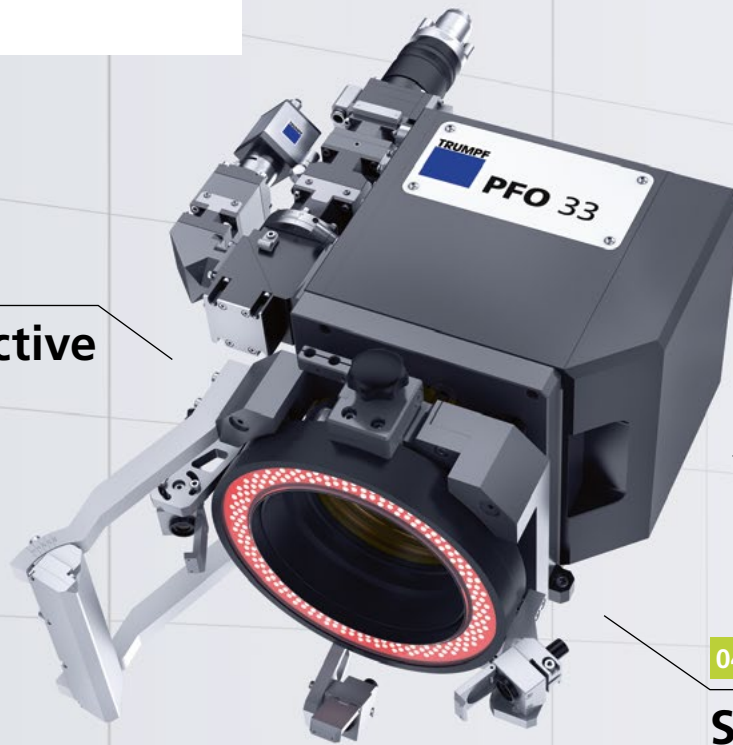
Robust

03

Flexible

04

Smart



01

Highly productive

The third generation of the programmable focusing optics PFO 33 features lightweight mirrors and a new galvo architecture enabling high welding speed and accuracy as well as a short jump time. With up to 12 kW laser power, the design of remote welding processes can be pushed to new limits. At the same time, additional features such as protective glass monitoring enable a reliable operation in challenging environments.

02

Robust

The robustness of the new PFO is characterized by three factors: the collimator, the protective glass concept and the digital galvo architecture. The collimator has been completely redesigned with a quartz aperture and an optimized base body increasing the resistance against back-reflections. In addition, scattered light sensors protect the equipment against back-reflections. The protective glass built into the collimator reduces the lens contamination and thus increases the robustness in handling. And finally, the digital galvo architecture enables the lowest drift rates and real-time monitoring of galvo positions.

03

Flexible

The large variety of objective lenses makes the PFO 33 a very flexible tool and enables adaptations to the applications and the different part requirements. Furthermore, various laser sources, wavelengths and beam qualities are supported and can be used with the PFO 33, e.g. by utilizing the advantages of special high-brightness objectives. Also, sensors and other options of TRUMPF can be easily integrated besides the established interfaces for third-party sensors.

04

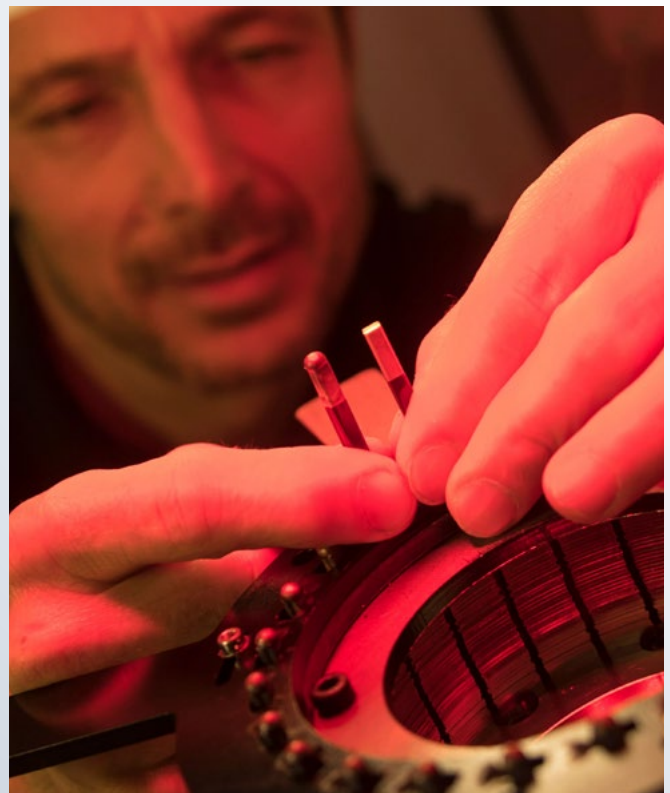
Smart

The third generation of PFO 33 comes with different monitoring options, which give you more transparency about your optics. Protective glass monitoring enables you to do condition-based exchanges. TRUMPF Condition Monitoring rounds up the smart features of the optic by enabling predictive maintenance with its data analysis.

For industrial applications with the highest demands on productivity



Busbar welding.



Hairpin welding.

With the numerous options for the PFO 33, you enjoy even more benefits for a smoother production.



Protective glass monitoring*

The condition-based exchange of the protective glass enables a higher production stability

An initial check via an RFID tag ensures that the protective glass is inserted and the correct glass is used. The degree of contamination of the protective glass is measured and monitored during welding. The warning and error limits can be set in TruControl to adapt to the specific requirements of the process. When the limit value is exceeded, a message for replacing the protective glass appears, which ensures a stable process under series-production conditions at an optimized protective glass consumption as well as a long service life of your optics.



High-brightness objectives

Best imaging quality for high-beam-quality laser sources

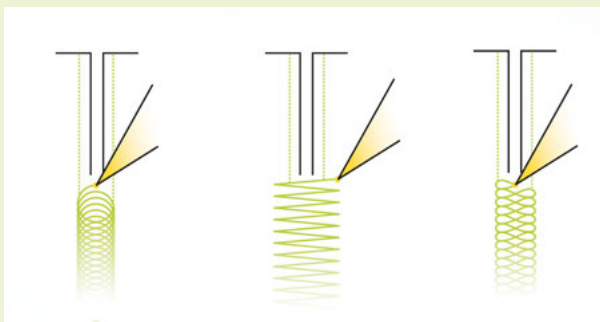
The third generation of the PFO 33 is designed to be used with high laser power of up to 12 kW and with laser sources of highest beam quality. To fully utilize the advantages of high-brilliance laser sources, the PFO 33 offers many objectives specifically designed to maintain the beam properties in the whole working field.



Wobbling templates

Easy programming and power ramps along the wobble geometry

The PFO is capable of superpositioning a standard PFO program like line or circle with a wobble geometry. To make programming as easy as possible, TruControl offers a template-based programming editor to define the wobble parameters. Via Optolink, the PFO 33 transmits power set values in 10 μ s to the laser which enables power ramps along the wobble geometry to avoid inhomogeneous weld depth.



Condition Monitoring

Full transparency

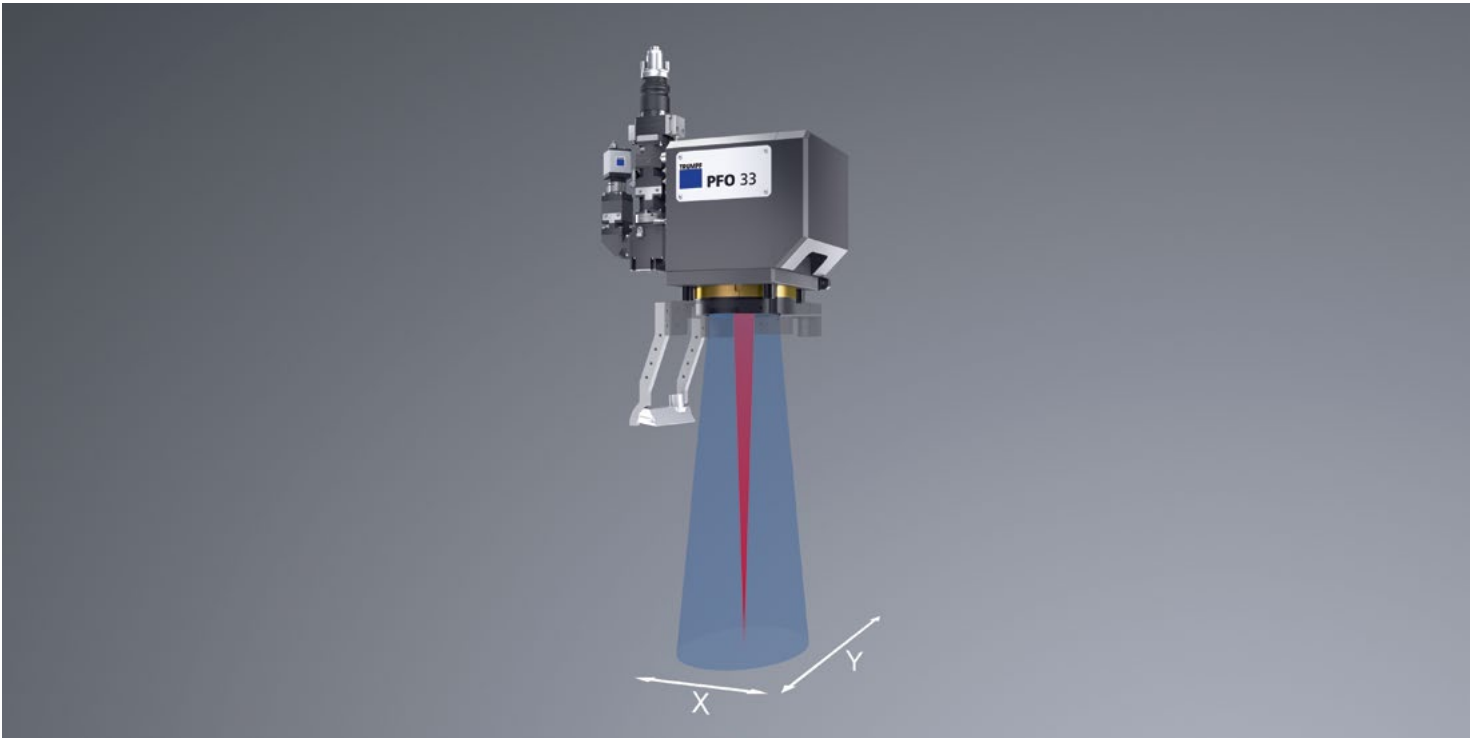
Parameters such as motor temperature, cooling water temperature, scattered light and many more are constantly monitored by the PFO. This data is also available in the TRUMPF Condition Monitoring Center. Here TRUMPF experts and algorithms monitor the system. The resulting insights provide shorter reaction times, plannable maintenance downtimes or simply more transparency for production. In case of a finding, the TRUMPF Condition Monitoring Center informs the customer proactively.



* Only available for TruDisk, TruFiber.

Technical data		
Maximum power	kW	up to 12 (cw)
Numerical aperture		typ 0.11, max 0.12
Standard collimation	mm	140 (TruDisk and TruFiber Multiple Mode, TruMicro) 150 200 300 (TruFiber Single Mode)
Available focal lengths	mm	255 345 450 (Standard) 160 265 345 450 550 (High brightness)
Field size for focal length		See table below
Available lasers		TruDisk, TruFiber, TruMicro
Laser light cable type		LLK-D
Available sensor system		VisionLine Cam, Basic, Detect; VisionLine OCT Detect; CalibrationLine Power and Focus
Available options		Protective glass monitoring, crossjet, MDE nozzle, smoke bell, camera observation, sensor interface, lighting
Available software options		TruTops PFO, PFO Smart Teach app
Dimensions	mm	336 × 340 × 227 (configuration example with fc140 and f450)
Weight	kg	< 35, < 38 with OCT scanner

Subject to alteration. Only specifications in our offer and order confirmation are binding.



Focusing lens				
		Scan field size (Y × X)		
Focal lengths	mm	515	1030	1075
f160 HB	mm ²	77 × 57	80 × 57	80 × 57
f255	mm ²	172 × 108	180 × 112	–
f265 HB	mm ²	140 × 102	140 × 102	140 × 102
f345	mm ²	234 × 145	244 × 150	–
f345 HB	mm ²	202 × 144	208 × 152	208 × 152
f450	mm ²	312 × 190	320 × 196	–
f450 HB	mm ²	–	306 × 208	306 × 208
f550 HB	mm ²	–	388 × 257	388 × 257