



## ORBIS+

# PROFILE MEASUREMENT OF ROD AND BAR STEEL PRODUCTS

The Orbis+ is a rotating gauge system, designed to continually measure the profile diameter per unit length of hot steel in rod and bar rolling mills.

Reducing setup times and ensuring tight product-dimension tolerances are vital, for the efficient operation of the mill. Both requirements call for a gauge system that can perform highly accurate, full profile measurements. The solution is Orbis+ by Primetals Technologies.

The Orbis+ is designed to continually and accurately measure and display the dimensions of rod and bar products regardless of the orientation.

The shapes of steel bars and reinforcing steel, that the gauge can profile are rounds, flats, rebar/debar, square, octagonal and hexagonal cross-sections.

### CONSTRUCTION

The Orbis+ system consists of an in-line gauge head, an interface box and an operator workstation. The head is installed in the production line, with the interface box located nearby. The gauge can be mounted either on a rigid base or a trolley, and is equipped with both air purging and water-cooling systems to safeguard it from dust and high temperatures. Measurement data from the gauge head is transmitted to the workstation which is in the main pulpit, via a wireless data link and high-speed cable.

The optical system is mounted on a rotating assembly, which consists of a collimated light source and line scan cameras. This assembly is sealed off from the mill to ensure its protection.

PROVEN  
TECHNOLOGY

200+ REFERENCES  
GLOBALLY

## OPERATING PRINCIPLE

The optical system rotates around the bar, scanning the entire profile. Using an LED light source positioned at the focus of a collimating lens, the system produces a parallel beam of light that is projected on the zone where the bar is passing. The bar casts a shadow, which is focused onto a CCD array where the shadowed photo sites are counted electronically to provide the bar's diameter at a given angular position.

An optional optical pyrometer can measure the bar temperature. This data can be utilized to convert the dimensions determined in the hot state into cold-corrected measurements. These values displayed in numerical or graphical forms includes both a linear trace and a polar plot, highlighting the bar defects such as overfill, underfill, roll cross, enabling quick identification of potential problems in the rolling process.

## OPERATING DATA

Performance	Orbis1+	Orbis2+
Product size (mm)	4 - 30	4 - 120
Product size (inches)	5/32 - 1 5/8	5/32 - 4 23/32
Accuracy (mm)	+/- 0.01	+/- 0.02
Accuracy (inches)	+/- 0.0005	+/- 0.0008
Rotation speed (RPM)	200	100
Full profile time (sec)	0.15	0.3
Measurements/sec	4,000	2,000

Orbis 1+ is single camera system and Orbis 2+ is dual camera system

## UTILITIES

System - 110/220V ac @ 10A	Large Figure Display
Water - 35L/Min @1 - 1.5 Bar	Statistical Process Control Package (SPC)
Air - Instrument: ISO8573.1:1-2, 4m3 /Hr @ 1 Bar	Mill Data Link Connectivity (TCP/IP)
Air - Mill: ISO8573.1:1-3, 4m3 /Hr @ 2 Bar	Remote Monitor expansion
	Trolley assembly

## OPTIONS



Orbis+

## MAIN BENEFITS

- Early detection of defects and size changes, resulting in reduced scrap and increased yield
- Early indication of roll wear
- Improved product quality
- Reduced manual inspection
- Lowers energy consumption and further processing, by avoiding out-of-tolerance products
- Maximum accuracy of  $\pm 0.01$  mm

**Primetals Technologies Ltd**  
A Group Company of Mitsubishi Heavy Industries

9 Enterprise Way | Christchurch | Dorset | BH23 6EW | United Kingdom  
[primetals.com](http://primetals.com)

Order No. T04-0-N098-L9-P-V3-EN  
Printed in Linz | © 2023

The information (including, e.g., figures and numbers) provided in this document contains merely general descriptions or characteristics of performance based on estimates and assumptions which have not been verified. These estimates and assumptions have to be analyzed on a case-to-case basis and might change as a result of further product development. It is no representation, does not constitute and/or evidence a contract or an offer to enter into a contract to any extent and is not binding upon the parties. Any obligation to provide and/or demonstrate respective characteristics shall only exist if expressly agreed in the terms of the contract.

Primetals Technologies excludes any liability whatsoever under or in connection with any provided information, estimates and assumptions. The provided information estimates and assumptions shall be without prejudice to any possible future offer and/or contract.

Any information provided by Primetals Technologies to the recipient shall be subject to applicable confidentiality obligations and shall be used by the recipient at their own convenience and at their sole risk.

Primetals is a trademark of Primetals Technologies Ltd.