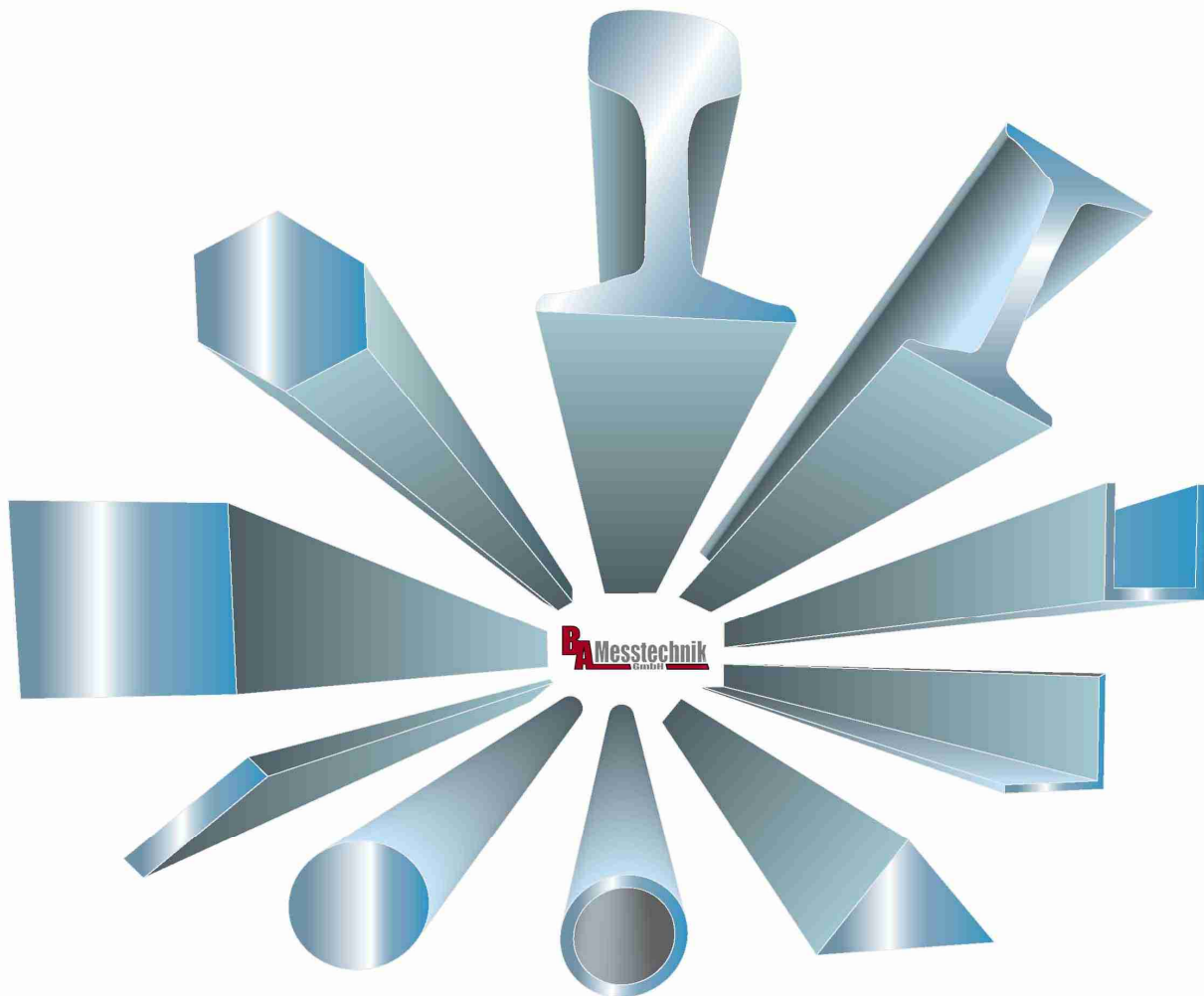


in-line dimensional measurement

in steel and metal industries



about us

The company BA-Messtechnik (former Bruno Richter) is one of the leading manufactures of gauges for in-line dimensional measurement in steel and metal industries.

We measure in line

in cold and hot rolling mills


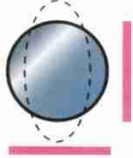
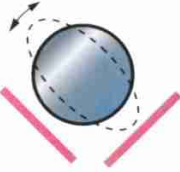
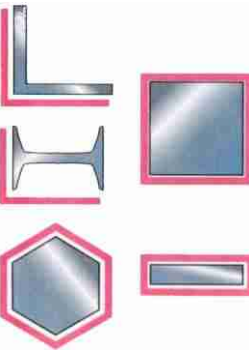
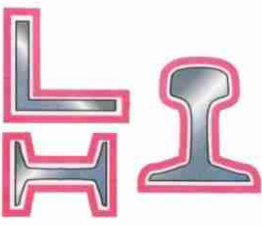
- the DIAMETER and PROFILE of wire, bars, profiles, tubes, pipes...
from 0,1 mm dia to 1000 mm dia. and more
- the WIDTH of sheet metals, stripes...
from 1 mm to 3000 mm
- the THICKNESS of sheet metals and flat materials from 0,02 mm
to 200 mm

With a reputation in measuring technics of more than 40 years, we are one of the pioneers in the field of laser application for contactless dimensional inspection of long products. Our gauges are in service working worldwide in hot and cold mills.

We have a solution for each measuring problem. From the static one-axis shadow gauge with a display only up to the rotating gauge with combined light section/shadow measurement technics including up to date data processing and Statistic Process Control.

For each application, we can offer the optimum customer specific configuration.

gauge selection

	Required Measuring	Recommended Gauge
	Diameter of round material	fixed one-axis shadow gauge, type DO
	Diameter and ovality of round material, position of min./max. diameter is constant	fixed two-axis shadow gauge, type DO
	Diameter and ovality of round material, position of min./max. diameter is changing	fixed 4- or 6-axis shadow gauge type DO or oscillating DO-Gauge or rotating DO-Gauge depends on the accuracy of profile measurement vs. dynamics of measurement
	"outer" Dimensions of profiles	oscillating DO-gauge or rotating DO-gauge the rotating DO-gauge is much faster = more dimensional data per sec.
	"inner" and "outer" Dimensions of profiles	DO-gauge combined with "light section" sensors

Special features of our gauges type DO

Special features of the diameter gauges type DO – beside the self-evident high accuracy – are:

- Easy maintenance – e. g. for cleaning quick exchange windows can be removed in a few seconds.
- Low running costs – e. g. the gauges produce the necessary cooling and purging air themselves by integrated fans, compressed air from the plant is not necessary.
- High reliability in service – e.g. the rotating gauges have a wireless data transmission, not a sensitive sliding contact.
- Long service life – e. g. DO gauges, delivered 20 years ago, are still in use. Of course, we do have spare parts in stock for these gauges and serve them.

Additionally to the diameter gauges type DO, we do have other contactless dimensional measuring devices in our program. The devices we manufacture are also based on laser technics, like distance sensors, triangulation sensors a. s. o.. Among others, we offer systems for the measurement of

- Width measurement of strips and sheet metals
- Thickness measurement of strips and sheet metals
- Measuring the evenness of profiles
- Position measurement of tubes, bars etc...

The gauges are modularly designed and are customer specificly integrated in systems. Data transfer is made by standard interfaces.

Data indication and handling can be from a simple display up to complex data processing and visualization by an industrial PC.

Remote displays, connection to HOST-computers and integration to networks are available.

Gauges type DO

The significant advantage of the rotating gauge is measuring the entire circumference of the rod / bar. In case of a gauge with 4 or 6 fixed axis it is always possible, a failure e. g. a overflow between the single measurement axis is not seen. As the bars are twisting usually coming out of the stand, singularities are not detected by a preset fixed axis systems.

The gauges are available for cold and hot applications:
(oscillating gauges available for cold appl. only)

Gauges for hot rolling mills have special features like cooling and purging air, heat shields, water cooling, 2 wave pyrometers, a. s. o.

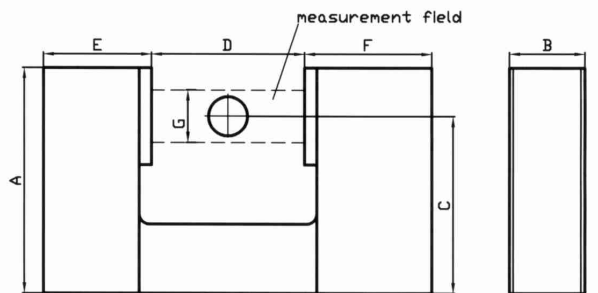
The diameter gauge heads type DO can be combined to 2-axis (=xy), to 4- or even to 6-axis measuring systems.

For circumferential measurements, the DO gauge heads are integrated in rotating systems: The rotating gauges have data transmission by Industrialized Wireless LAN technic.

Gauges type DO

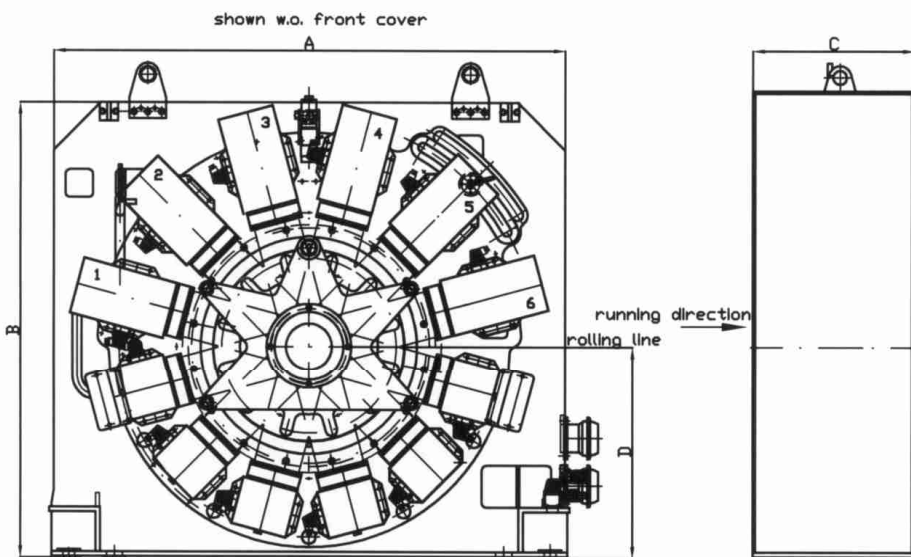
Fixed axis laser gauges:

Each gauge head has a measurement rate of 500 scans/s



	DO 40	DO 100	DO 150	DO 200	DO 300
A	173	232	302	245	380
B	58	58	63	194	270
C	136	160	200	129	200
D	60-210	120-270	170-320	220-3000	320-3000
E	84	161	240	420	530
F	98	194	260	420	400
G	40	100	150	200	300

D) acc. customer's spec dimensions in mm



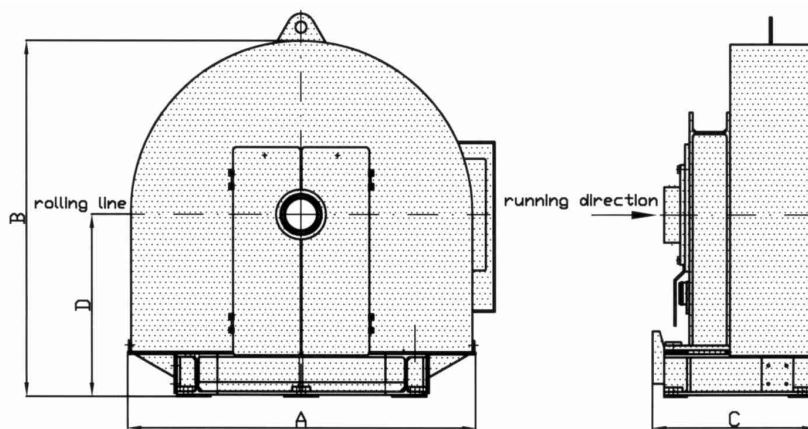
	DO40 (2-4axis)	DO100 (6axis)	DO100 (2-4axis)	DO100 (6axis)	DO200 (2-4axis)	DO200 (6axis)	DO300 (2-4axis)
A	800	1000	1200	1600	1870	2200	2200
B	800	1000	1200	1600	1680	1965	1965
C	450	450	450	450	590	700	700
Dmin.	400	500	600	800	710	915	915

dimensions in mm

Gauges type DO

Rotating laser gauges

Each gauge head has a scan rate of 500/s. The rotating system can be Equipped with up to 3 gauge heads, so multiplying the measurement rate.



dimensions in mm

	DD40/DD100	DD150/DD200	DD300/DD400
A	1000	1540	1940
B	900	1570	2155
C	440	720	1100
Dmin.	422	750	940
Speed rpm	120	60	30

Rotating 3 gauge head system DO 150 RO-Tri

A new development is the rotating 3 gauge head DO 150 RO-Tri. This system is specially designed for in line measurement of triangular shaped bars ("Kocks Block"). Because of the rotating principle, the "inner and outer circle" of the cross section of the bars is precisely measured even at twisting products.

In-Line measuring of sheets and plates in hot and cold rolling mills

- BA-Messtechnik (former Bruno Richter) – more than a 40 years reputation in measuring technics.
- BA-Messtechnik is introducing a new in-line gauge for measuring of the **THICKNESS** of hot and cold rolled sheets and plates. The measurements are made by High Precision Laser Sensors.
- BA-Messtechnik is introducing a new in-line gauge for measuring of the **WIDTH** of hot and cold rolled sheets and plates. The measurements are made by a High Precision Laser / Camera – system



LASER gauge AMK 2800 for measurement of thickness (5-50 mm) and width (1500-2800 mm) of sheets in a hot rolling mill

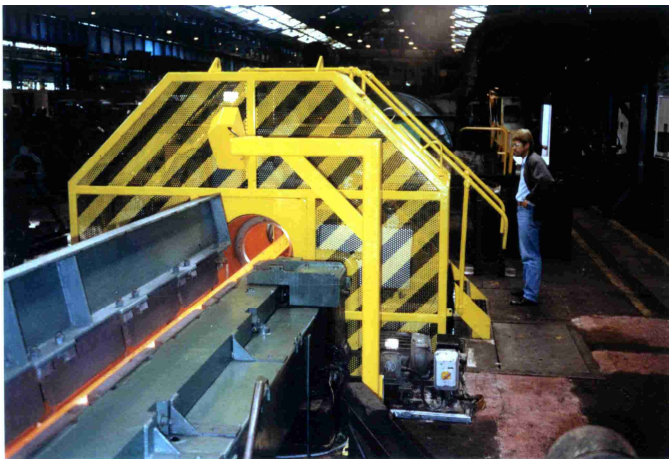
Rotating Laser Gauges



DO 150 RO-D (w.o. protection cover)
measurement field 150 mm
4 entire profil measurements/s



DO150 RO-D
in the line

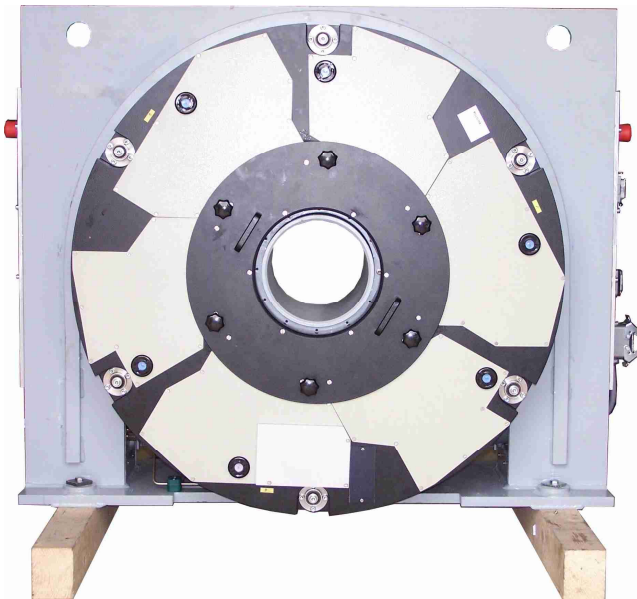


DO 450 RO in a tube mill
measurement field 400 mm

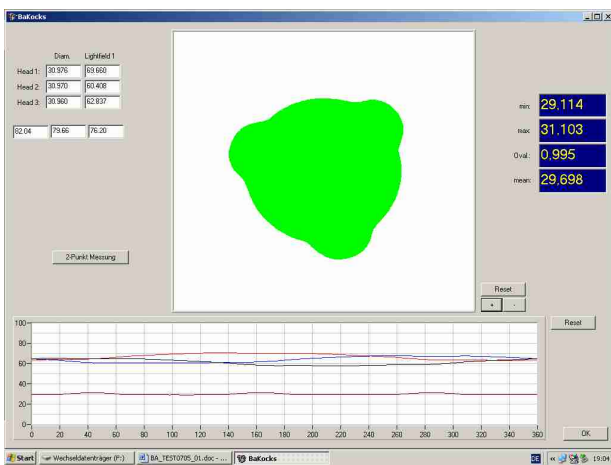


DO 75 RO-D in a bar mill
measurement field 75 mm
8 entire profil measurements/s

Rotating Gauge for Kocksblock



DO 150 RO-Tri (without protection cover)
measuring field 150 mm
6 entire Profil measurements/s

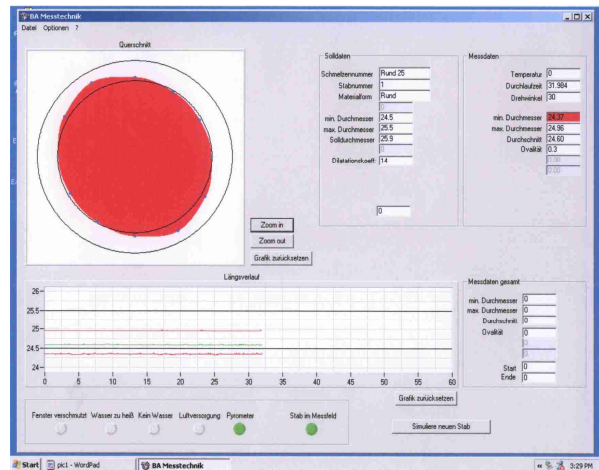


measured shape with "inner and outer circle"



DO 150 RO-Tri in the line

Fixed axis in line measurement gauges



6 axis gauge DO 200/6 in a hot mill
measurement field 200 mm

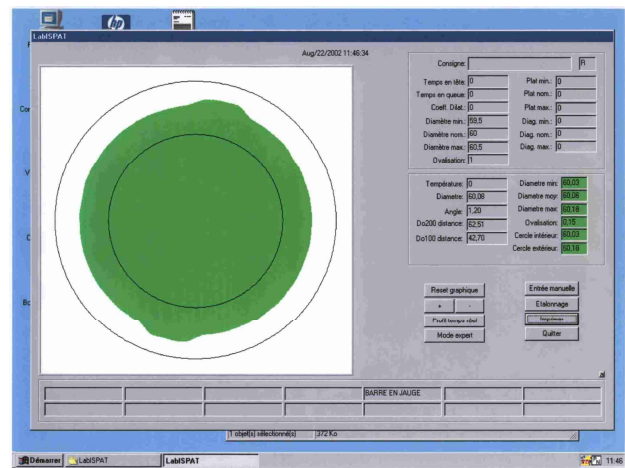
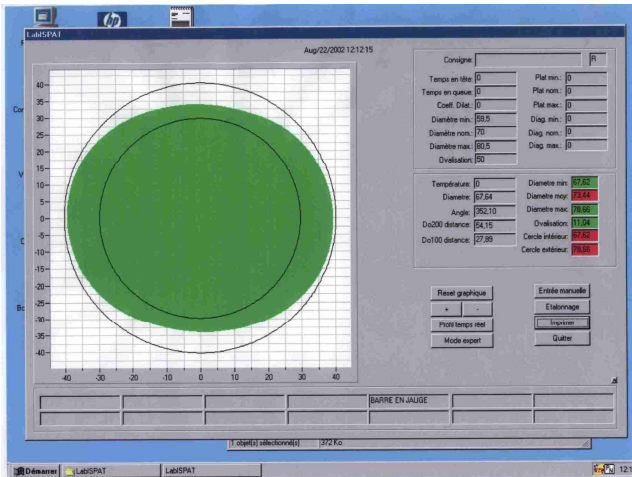


2 axis gauge DO 300/2
measurement field 300 mm



1 axis gauge for measurement of mandrels
measurement field 200 mm

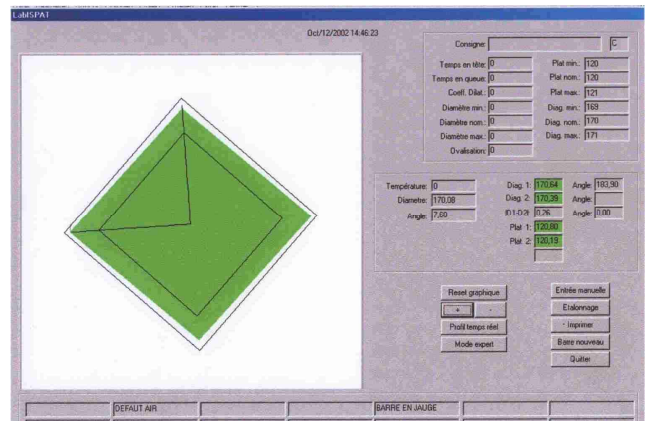
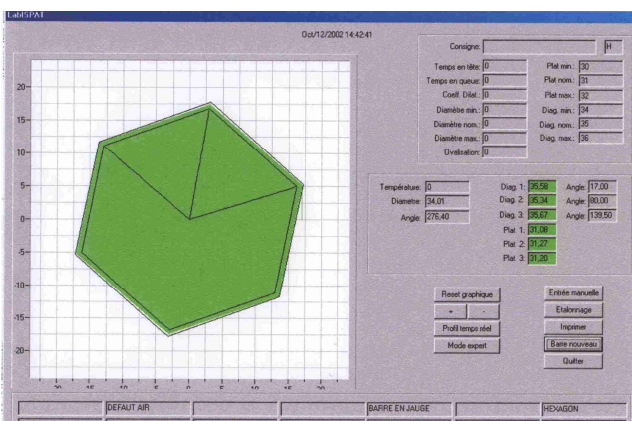
Customer specific measurement visualization



Shapes resp. deviations can be zoomed.

Out of tolerance values are indicated by change of colour.

Nominal / actual values are usually transferred from / to a Host computer



Customer list

Gauge Operation	Type	Customer	Start of
DO 150 W	Rotating	Thyssen, Krefeld, Germany	1992
DO 150 W	Rotating	Lechstuhl, Meitingen, Germany	1992
DO 200 K	Rotating	Thyssen, Witten, Germany	1992
DO 40 W	Oscillating	Thyssen, Duisburg, Germany	1993
DO 40 W	Oscillating	Arbed, Luxembourg	1993
DO 400 W	Rotating	Desford Tubes, UK	1993
DO 400 W	2axis (x,y)	Tianjin, China	1993
DO 40 W	Oscillating	Arbed, Luxembourg	1994
DO 40 W	Oscillating	Thyssen, Duisburg, Germany	1994
DO 100 K	Rotating	Krupp, Bochum, Germany	1994
DO 500 W	Oscillating	Thyssen, Witten, Germany	1994
DO 300 W	Rotating	Mannesmann, Ddf, Germany	1994
DO 300 K	Rotating	Gerdau-Piratini, Brazil	1995
DO 300 W	Rotating	SeAH Besteel, Korea	1995
DO 400 W	2axis (x,y)	Baotou, China	1995
DO 300 W	Rotating	Gerdau-Piratini, Brazil	1996
DO 400 W	Rotating	Jiangyin Xing Cheng, China	1996
DO 40 K	1 axis	Gerdau-Piratini, Brazil	1998
DO 100 K	1 axis	Gerdau-Piratini, Brazil	1998

Customer list

Gauge Operation	Type	Customer	Start of
DO 450 K	1 axis	Vallourec Mannesmann, Brazil	1999
DO 150 W	Rotating	OEMK, Oskol, Russia	1999
DO 150 W	Rotating	Jiangyin Xing Chen, China	2000
DO 35 RO-D W	Rotating	Jiangyin Xing Chen, China	2000
DO 75 RO-D W	Rotating	Shijiazhuang Iron and Steel, China	2000
DO 200 W	2axis (xy)	Ugine Savoie, France	2001
DO 200 W	4axis	Ugine Savoie, France	2001
DO 400 W	1 axis	Jiangyin Xing Chen, China	2001
DO 100 K	2axis (xy)	Ascometal, France	2001
DO 40 K	1 axis	Asco Villares, Brazil	2002
DO150 RO-D W	Rotating	Mittal Steel, France	2002
DO 300 W	Rotating	Mittal Steel, France	2003
DO150 RO-D W	Rotating	Mittal Steel, France	2003
DO 200 W	6axis	Severstal, Russia	2004
DO150 RO-D W	Rotating	SeAH Besteel, Korea	2004
DO 400 W	Rotating	Timken, Uk (upgrading with new digital electronic	2005
DO 150 K	1 axis	Saarstahl, Germany	2006
DO 100 K	1 axis	Thyssen Krupp, Germany	2006

Customer list

Gauge Operation	Type	Customer	Start of
DO 150 K	1axis	Saarstahl AG, Germany	2007
AMK 2800 W	Thickness- and width of plates	Alchevsk, Ukraine	2007
DO 100 K	2axis (xy)	Aceralia Transformados, Spain	2007
DO150 RO-Tri K	Rotating	JFE, Japan	2007

DO XXX	=	Measurement field	=	XXX mm
W	=	Hot application	=	800 – 1200 °C
K	=	Cold application		