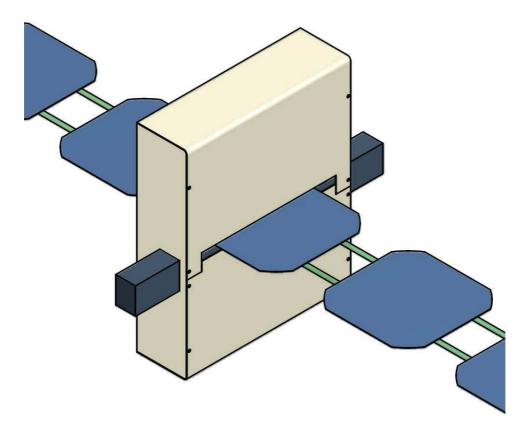
MX 152 Electronic Thickness and Resistivity Gauge



The system consists of the measuring head, an electronic rack linked by one standard cable with 25-pin D-connector and a PC.

To allow three thickness scans during belt transport at different wafer sizes, two measuring bars, one from top and one from bottom, hold 3 sensors each. The outer sensors pairs left and right are mounted on a linear sledge and can be moved simultaneously equidistant to the center by means of a manually moved lever.

Before and behind of each capacitive sensor are light barriers to validate the measurements of a sensor only if both are covered. This assures safe measurements even with different wafer forms or misalignments. To ensure safe start and finish of measurement the light barriers have to be uncovered between two incoming wafers. Therefore the wafers must be at least 30mm apart.

Optionally a one-scan resistivity measurement can be added within the same case, as well as a one-point P/N sensor.

The electronic rack is connected to a PC which itself is linked with the host PC by an Ethernet connection.

A simple TCP/IP based protocol is used to communicate measurement values and to arm/disarm measurements.

Technical Specifications

Wafer Sizes

125 + 156 mm Square, Pseudo-Square, Round

Thickness Accuracy Conditions:

Sensor Diameter Active Area Active Area

Distance from Edge

Resistivity Sheet Resistance Accuracy Sensor Diameter Active Area Distance from Edge PN type tester

Max .Belt speed Distance between Wafers: Only Thickness Head Thickness + Resistivity = max. Throughput

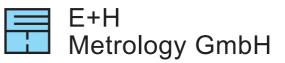
Power Voltage Consumption 100 – 300 μm +/- 1 μm max. height changing +/- 150 μm after calibration with a 200 μm reference wafer 10 mm 5.5 mm Ø (lateral sensors) 1.5 mmX8.7 mm (center sensor rectangular) 5.5 mm

0.2 – 30 Ohm*cm (thk.=240µm) 8 – 1200 Ohm/square +/- 5 % 18 mm ca. 12 mm Ø 11 mm Resistivity range 20mΩcm to 3000Ωcm

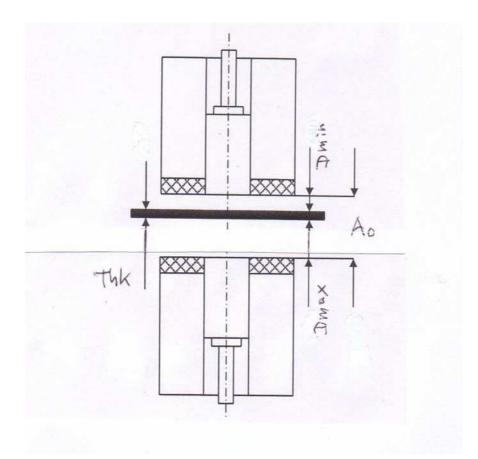
360 mm/s

> 20 mm > 30 mm 5000 Wafer/h

100 – 240 VAC 15 VA



Sensor gap and max. wafer position changing



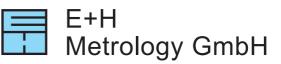
Sensor Gap:

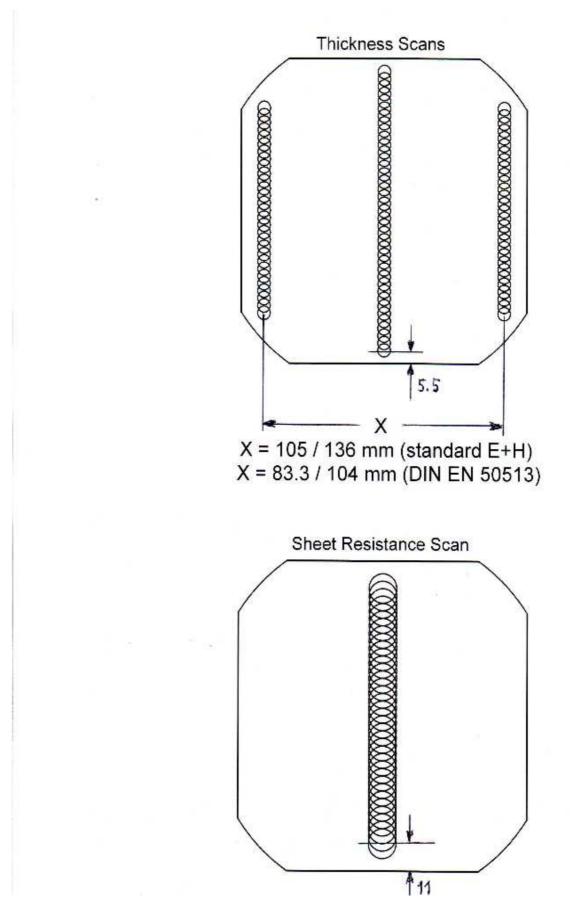
Ao = Dmin + Dmax + minThk = 1600	μm
----------------------------------	----

Dmin = 300 μm Dmax = 1200 μm

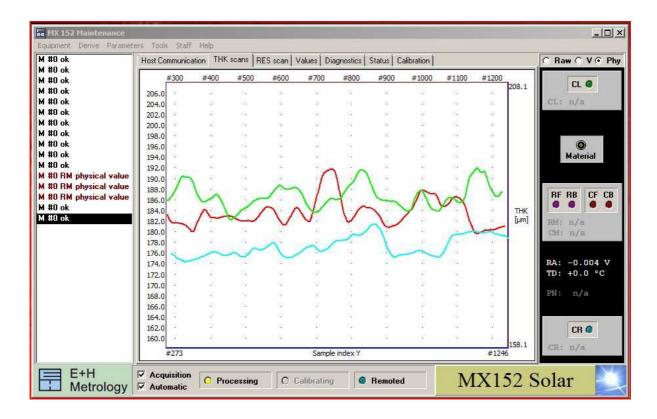
Within these limits,

the Thk changes will be additional to the accuracy	+/- 1 μm
utilising the whole gap, additional about	+/- 2 µm





Square Wafer 156 x 156 mm (polycrystalline)



Thickness	184.0	μm
TTV	18.0	μm

Square Wafer 156 x 156 mm (polycrystalline)

‡0 ok 🔺	Host Comm	iunication	THK scans	RES scan	Values	Diagnostics	Status I	Calibration				C Raw C V @
t0 ok t0 ok		#200	#300	#400	#500	#600	#700	#800	#900	#1000):	1 and 1
t0 ok	85.000		31	124	10	12	20	92	φ.		89.000	CL 🥥
‡0 ok	335555					100	~					CL: n/a
‡0 ok	80.000	106	12	33 :			-tarbatege		26	-		
0 ok	75.000	35	8 3	83	100	5 3	18	23	85		1	
0 ok	70.000		- 2	1.0		20	2.0	15	28	12		
0 ok		35		85 16	20 53					20- 36		O
0 ok 0 DM shusisal ush	65.000							•				Material
0 RM physical valu 0 RM physical valu	60.000	26	(i)	52	-56	88) 1	34	185 	80	26		
0 RM physical valu	55.000	0X	39	124	83	1 81	90	98	R	88		-
0 ok	50.000											RF RB CF
0 ok	2002-0100222	ix.	12	33	12	£5	201	65	3	0X	RES	
0 ok	45.000	8	83	89	100	1 33	18	23	85	8	[osq]	1988 - 10 F 10
O Scan buffer over	40.000	12	12	12	20.	50	50	75	25	12		RM: n/a CM: n/a
0 Scan buffer over	35,000	35	13	16	53	20	22	12	3	35		ser, nya
0 ok	356357											
0 ok	30.000	25	89 C	614	-56	1 97	97)	(4)	340	24		RA: -0.002
0 Scan buffer over	25.000	08	35	84	10	8	90	98	92	88		TD: +0.0 °C
O Scan buffer over	20.000	1.0	2	25	22	£8	**	30		20		148846421 (1487444)
0 RM physical valı 0 ok	4107020000											PN: n/a
0 ok	15.000	8	83 *	55°	-	5 3	18	20	85	8		
0 ok	10.000	32	62	82	28	50	20	15	25	32		(J
0 ok	5.000	8	83	82	- 58	43	48	53	62	8		CR 🥥
0 ok						200 - 411					0.000	CR: n/a
O ok 🔽	#	140			San	nple index Y				#1030	5	GR. I/a

Sheet Resistance Resistivity 80.8 Ohm/sq 1.84 Ohm*cm

Round Wafer 125 mm Diameter (monocrystalline)



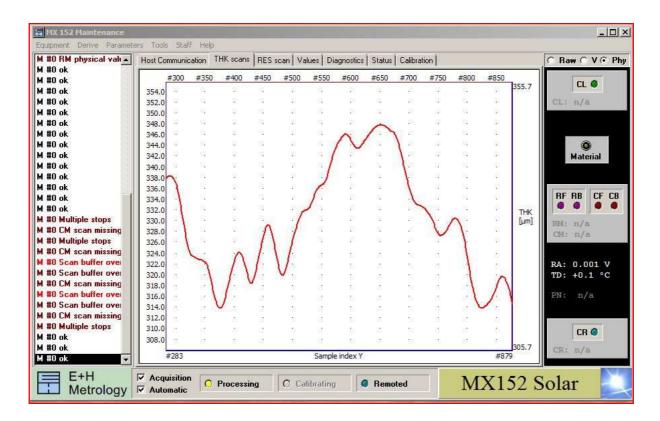
Thickness	184.0	μm
TTV	15.5	μm

Round Wafer 125 mm Diameter (monocrystalline)

M #0 ok	Host Commu	inication	THK sc	ans RI	ES scan	Value	s Diag	nostics	Status	Calibr	ation				C Raw C V @ P
M #0 ok		#200	#250	#300	#350	# 400	#450	#500	#550	#600	#650	#700	#750		
M #0 ok		#200	#250	#300	#350	#400	#450	#500	#550	#600	#050	#700	#750	54,000	CL Ø
1 #0 ok	52.000 .	85	83	88	35	\$3	35	83	88	33	\$3	33	83	5 1.000	
l #0 ok	50.000				1	1	12	63			-	12	1		CL: n/a
l#O ok	48.000	26	19	520	142	1	36	- 12	/	102	20	14	14 10		
l#Ook	46.000 ·	88	84	82	\$\$	\$3	~		1	33	\$ 3	32	87		
1 #0 ok	44.000	32	(i)	81	滴	19	524		6K	16	49	324	8 9		
#0 ok	42.000 +	12	195	R	98	18	24	195	92	X	- 63	24	19		0
#0 ok	40.000	99	緣	35	10	5 8	95	绿	35	18	1 33	951	28 C		Material
1 #0 ok	38,000 ·	33	83	88	32	53	10	83	85	23	5 3	35	83		material
#0 RM physical value	36.000	22	62	33	15	50	82	63	35	15	50	52	62		
THE REPORT OF A DECISION OF A DECISIONO OF A	34.000	85	63	227	42	20	<u>88</u>	12	32	12	20	?ä	13		-
#0 RM physical value	32.000 ·	88	19	82	53	2 3	22	19	62	SS	\$ 3	32	19		RF RB CF CE
#0 RM physical value	30.000 ·	324	8¥	36	16	29	34	19 4	30	38	49	324	89 C		
l #0 ok	28.000 +	12	15	32	98	13	125	15	3	98	33	124	13	RES	
1 #0 ok	26.000 +	39	10	36	36	<u>.</u>	32	10	36	35	10	32 C	13	[osq]	RM: n/a
#0 ok	24.000	99	83	90	182	53	29	(B	35	18	1 33	251	(3)		CM: n/a
#0 Scan buffer overflo	22.000 .	83	83	88	33	5 3	13	83	33	33	\$3	83	83		and a set of the
#0 Scan buffer overflo	20.000	137	62	25	15	50	1.2	62	25	15	5.5	1.2	12		
#0 ok	18.000	16	13	SS -	32	25	25	13	32	32	25	?ä	13		RA: -0.002 V
1 #0 ok	16.000 .	82	87	82	33	2 3	32	8	12	33	\$ 3	32	87		TD: +0.0 °C
#0 Scan buffer overflo	14.000	324	8¥	80	16	2 9	32	(i)	80	38	49	324	8 9		1D. TO.O C
#0 Scan buffer overflo	12.000 +	35	100	35	36	£31	53	107	36	36	£3.	59	.e.		PN: n/a
#0 RM physical value	10.000 ·	35	8 3	98	182	53	95	4 3	35	182	53	95	83 C		7.14 1 11/ 61
#0 nm physical value	8.000 ·	88	83	88	2	\$3	33	83	85	23	\$3	33	83		
HO OK	6.000	19	63	23	15	50	1.9	3	85	15	50	1.2	8		1
1	4.000	15	8	88	32	25	25	- 12	32	32	25	25	13		CR 🥥
	2.000 ·	88	87	62	53	2 3	32	87	628	53	\$ 3	32	82		1
I	#1	41				9	Sample i	ndav V					#80	0.000	CR: n/a
	#1						Jumpie	INCA 1					#00		

Sheet Resistance Resistivity 48.5 Ohm/sq 0.89 Ohm*cm

Square EFG – Wafer 100 x 100 mm (1 scan)



Thickness	331.0	μm
TTV	34.0	μm

Square EFG – Wafer 100 x 100 mm (1 scan)

M #0 RM physical value	Host Communic	ation TH	IK scans	RES sca	in Value	s Diagn	ostics St	atus Cal	ibration				C Raw C V @ P
M #0 ok	1	#200	#250	#300	#350	#400	#450	#500	#550	#600	#650		
M #0 ok		#200	#200	#300			# 100		+ 550	#000	#050	150.000	CL 🥥
1 #0 ok	145.000 140.000	90	+0	20 4	5.4 192	-0.4		947-	~	224	C+	Charles Constants	
1 #0 ok	135,000	200 200	**				20 20		1:1	1	2		CL: n/a
l #0 ok	130.000	2				12	8	2	/	\checkmark	V		
#0 ok	125.000		-	1	1	14	9	1	10		4		
#0 ok	120.000		53	83		Contrast.	382	1	18	25	(3 2		
#0 ok	115.000	3ž	20	16	13			1	20	16	13		0
#0 ok	110.000	30	<u>1</u> 31	8	19	08	98	98	¥8	23	195		Material
#0 ok	105.000	33	<u> </u>	22	12	2	33		<u>50</u>	10	83.		-ratorial
#0 ok	100.000	42.	2.7	ina -	12	24	42	42	2.7	10a	12		
#0 ok	95.000	90	48	50	19		90	943	¥8	50	89		
#0 ok	90.000	* 2	10 A	35	188 1	52	10	17.0	88	85	8.8		RF RB CF CE
#0 ok	85.000 - 80.000 -	2		1		6	8	2					0000
	75.000	**		204	æ	1.00	340	315	43	-	82	RES	
#0 Multiple stops	70,000	20	20	1.0					500 50	1.0		[osq]	RM: n/a
#O CM scan missing	65.000	2			1		1		1		2		CM: n/a
#0 Multiple stops	60.000	20	<u>1</u> 8	34	19	36	æ	30	£3,	39	12		
#O CM scan missing	55.000	20	50	32	62	32	15	25	50	12	62		
#0 Scan buffer over	50.000	46	£3	82	84	3¥	33	18	2 3	82	87		RA: 0.001 V
#0 Scan buffer over	45.000	x (18	35	100	1	10	20	£81	35	19		TD: +0.1 °C
#0 CM scan missing	40.000	33	1 33		S.	2	<u>8</u>	33	- 18 A		88 .		
#0 Scan buffer over	35.000	92	+3	224		38		3.2	+3	224	04 201		PN: n/a
#0 Scan buffer over	30.000		23	335	12		05	3 11	10	335	185		1070702 (7708072).
#0 CM scan missing	20.000		1			1	8	2					
#0 Multiple stops	15.000	333	28	324	34	100	98	30	23	324	34		
#0 Multiple stops #0 ok	10.000	10	±3	254	83	20	32	10	\$3	251	88		CR 🥥
11000000000000000000000000000000000000	5.000	32	25	12	14	16	10	2	25		12	0.000	
#0 ok	#145					Sample inc	lav V				#676	0.000	CR: n/a
#0 ok 🔽	#143					sample inc	IEX 1				#0/0	0	

Sheet Resistance Resistivity

126.0 Ohm/sq 4.17 Ohm*cm



