isel ROBOTIK

successful with wafer handling components

Wafer Handling Components

FOR SEMICONDUCTOR INDUSTRY

EFFICIENT & ECONOMICAL WAFER HANDLERS

Your added value in the semiconductor industry

- customer specific
- high production depth made in Germany
- ISO 1 Clean room certification for wafer handlers
- free training for new customers
- throughput analysis

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IWH - 2-link heavy duty arm series 1 8
IWH - 3-link heavy duty arm series 1 10
IWH - 2-link heavy duty arm series 3 12
IWH - super heavy duty dual arm SHD 14
Controller - Advanced 16
End Effectors - IEE Series 18
Accessories 20
Linear Track - ILD Series 22
Logosol Prealigner - LPA Series 24

This catalogue contains a variety of robotic products offered by isel robotik. Our products are specifically designed and engineered to address the unique needs and requirements of the semiconductor, flat panel display, nanotechnology and related industries.

If you have special applications or product requirements please contact us. With several thousand systems in field and many years of experience, we look forward to receiving your inquiries.

aalberts advanced mechatronics

isel Germany is part of the stocklisted company Aalberts since february 2022. Since the inception in 1975, Aalberts is where technology matters and real progress can be made - humanly, financially and environmentally.

Greatness is made of shared knowledge

Just like isel Germany, all Aalberts companies stand their ground in the engineering and technology world. As the world is changing rapidly and innovation cycles are reduced dramatically, the open and pragmatic internal culture at Aalberts helps us to exchange fresh thinking and to embrace new technologies.

isel ROBOTIK

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INNOVATIVE TECHNOLOGY

The ADVANCED controller has a defined path speed, so that speed and acceleration focus on the tool centre point (TCP) and not on individual axes.

Robotic Industries Association

Bauart geprüft
Sicherheit
Regelmäßige Produktions-überwachung

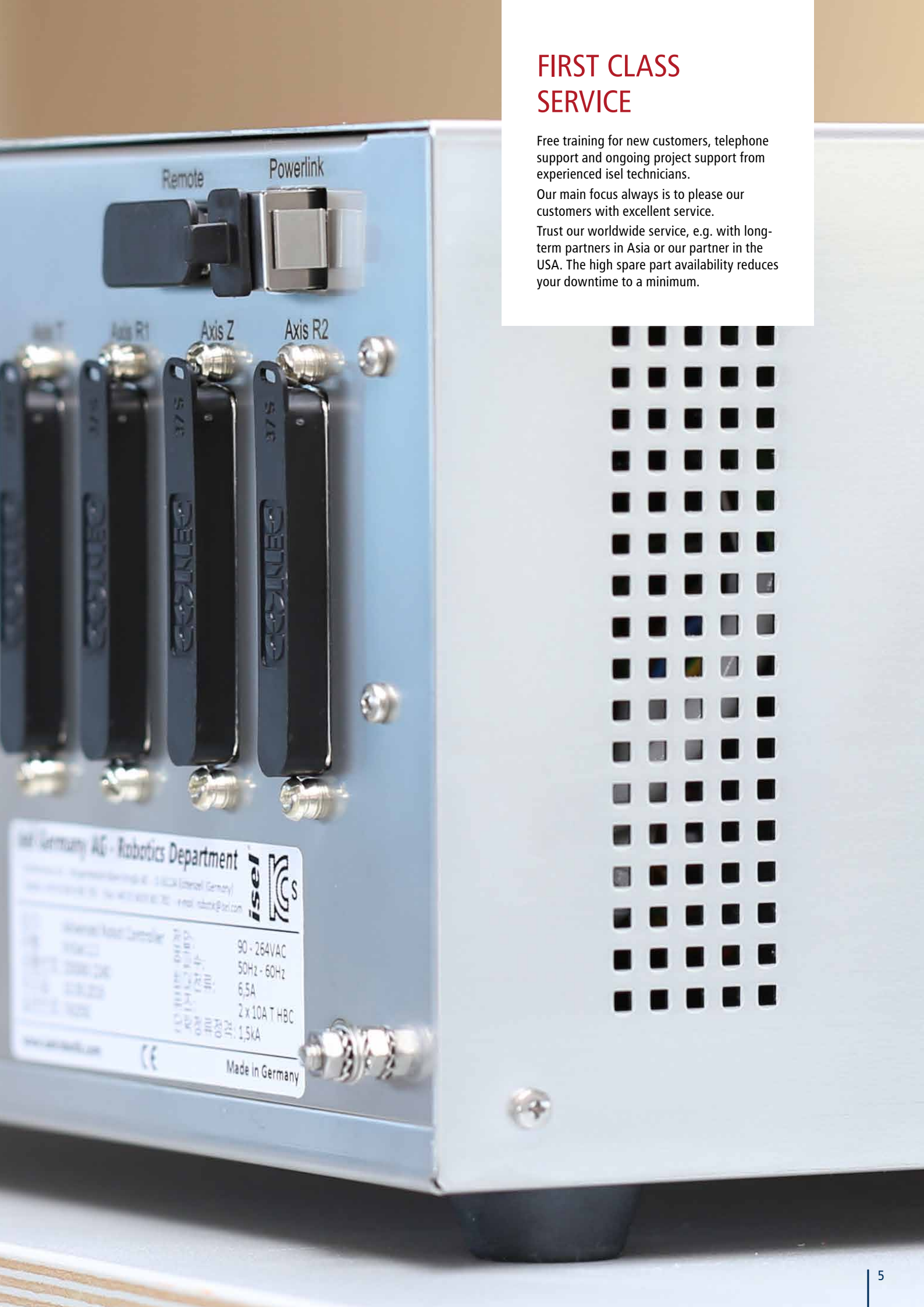
www.tuv.com
ID 1111216703

FIRST CLASS SERVICE

Free training for new customers, telephone support and ongoing project support from experienced isel technicians.

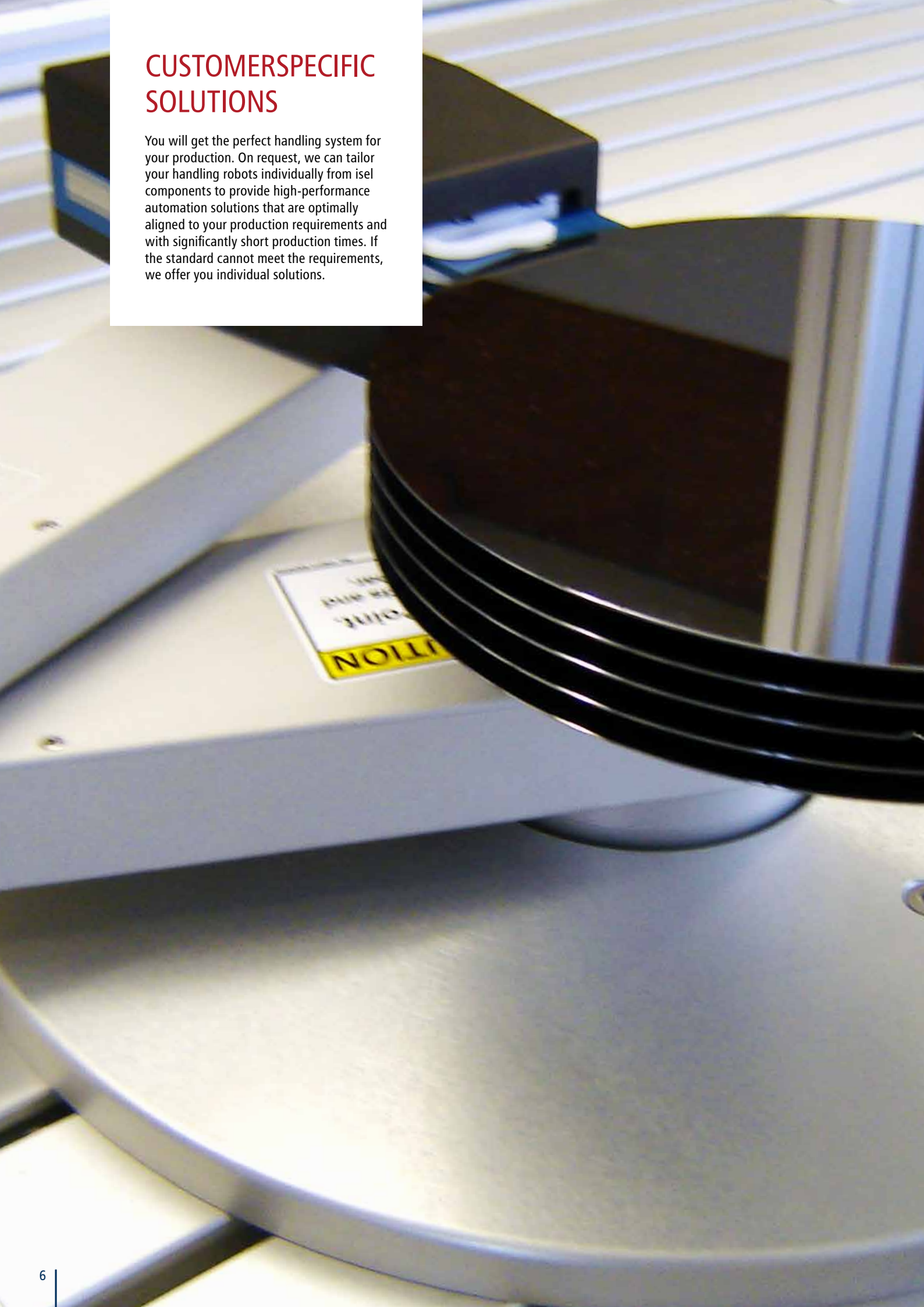
Our main focus always is to please our customers with excellent service.

Trust our worldwide service, e.g. with long-term partners in Asia or our partner in the USA. The high spare part availability reduces your downtime to a minimum.



CUSTOMERSPECIFIC SOLUTIONS

You will get the perfect handling system for your production. On request, we can tailor your handling robots individually from isel components to provide high-performance automation solutions that are optimally aligned to your production requirements and with significantly short production times. If the standard cannot meet the requirements, we offer you individual solutions.



isel ROBOTIK

Innovative robot technology for Wafer Handling

Robust and longlasting all-in-one solutions, customer specific manufacturing, comprehensive project support. isel Germany AG is your perfect partner for wafer handling components for semiconductor industry.

WAFER HANDLING ROBOT | IWH

WITH 2-LINK HEAVY DUTY ARM AND BODY SERIES 1

Characteristics

- excellent structural rigidity and precision
- maximum reliability
- top mounted (TA) or bottom mounted (BA) versions available
- customized solutions
- absolute or incremental encoder
- seamless integration with Prealigner, linear track and other peripheral components
- ISO 1 clean-room environment compatible
- MTBF: >70,000 operating hours

MADE IN GERMANY

Fraunhofer IPA TESTED® DEVICE isel Germany AG IWH-BA13S14HDF-1 Report No. IS 1103-547

IWH TA10S10HD

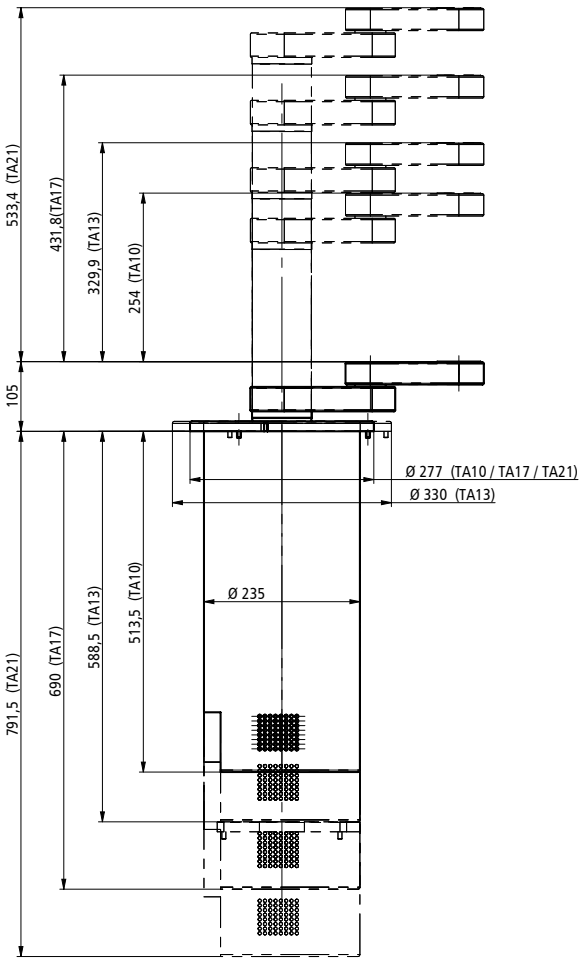
Specifications

Repeatability	T	±0.02°
	R	±0.02 mm
	Z	±0.02 mm
Working range	Z	10", 13", 17", 21"
	radial	10", 12", 14", 16", 20"
	theta	500°
Payload		up to 3 kg*
Maximum speed	T	360°/s
	R	1,000 mm/s
	Z	450 mm/s
Power supply		115 – 230 VAC 50 – 60 Hz 550 VA (ADVANCED)
Main interface		RS-232 [DB9], Ethernet [RJ-45]
Weight		approx. 25 – 32 kg

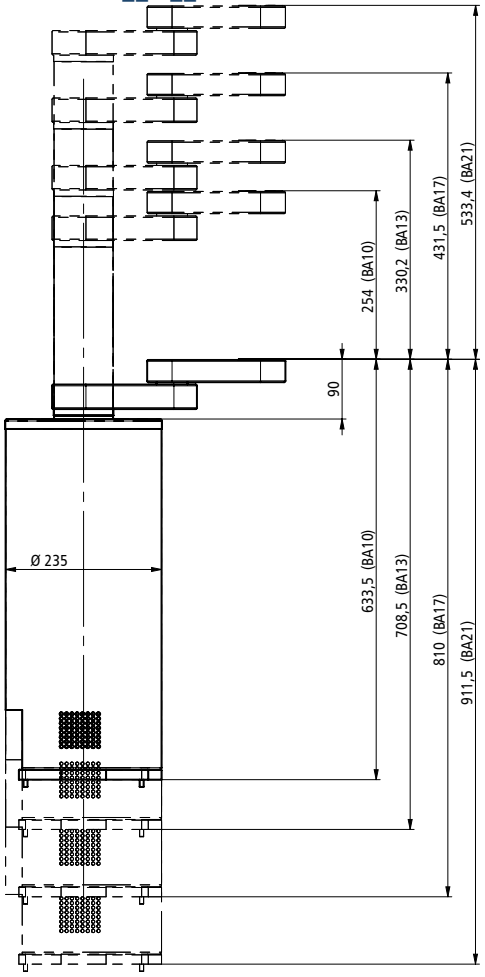
* depending on arm configuration

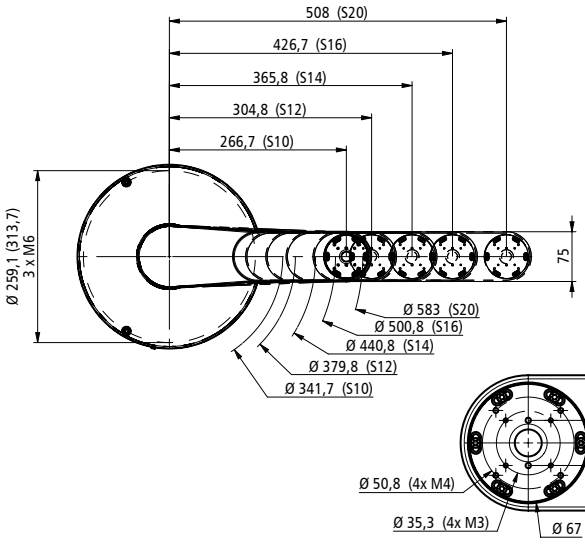
Dimensions

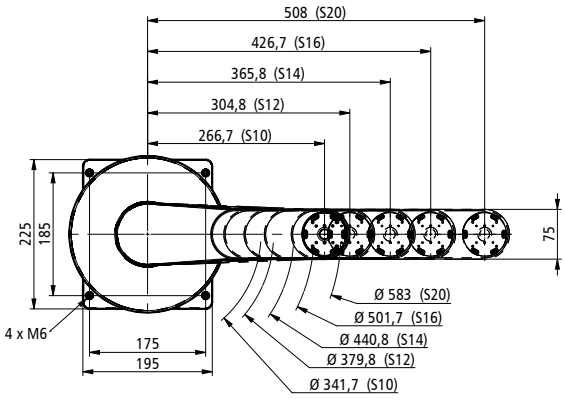
IWH TA __ S __ HD F-1



IWH BA__ S __ HD F-1







WAFER HANDLING ROBOT | IWH

WITH 3-LINK HEAVY DUTY ARM AND BODY SERIES 1

Characteristics

- excellent structural rigidity and precision
- maximum reliability
- top mounted (TA) or bottom mounted (BA) versions available
- customized solutions
- absolute or incremental encoder
- seamless integration with Prealigner, linear track and other peripheral components
- ISO 1 clean-room environment compatible
- MTBF: >70,000 operating hours

MADE IN GERMANY

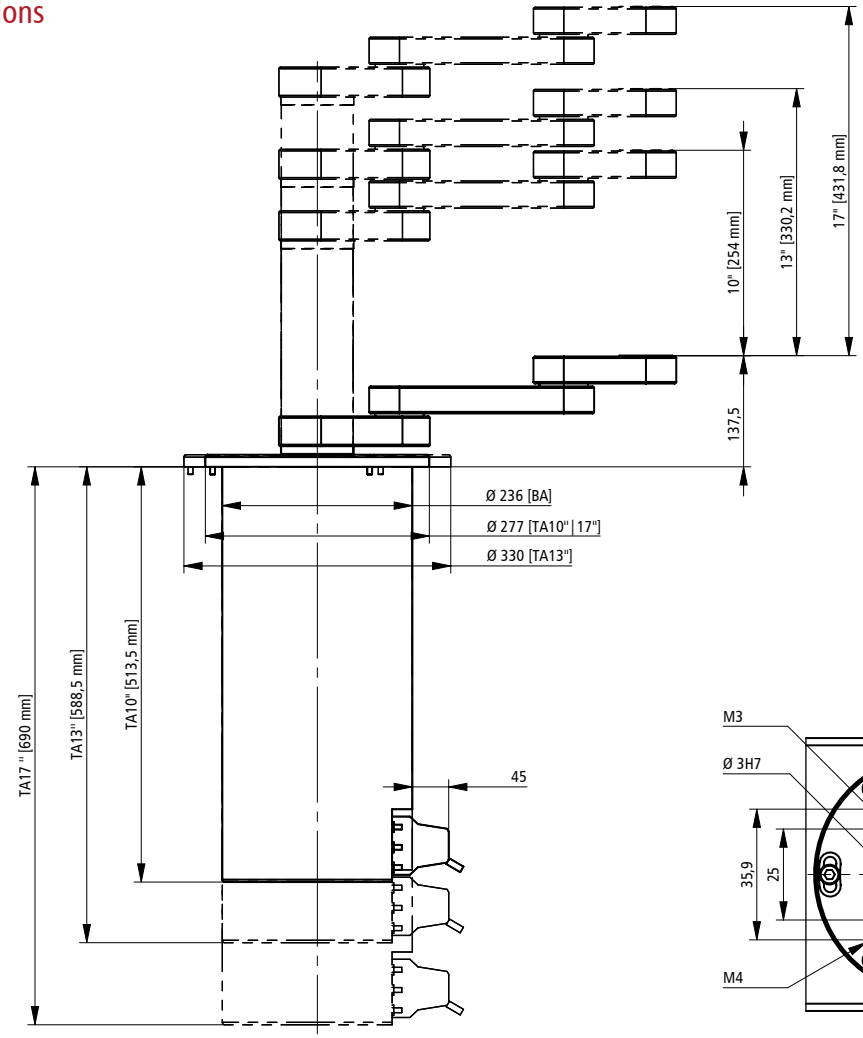
IWH TA10S16

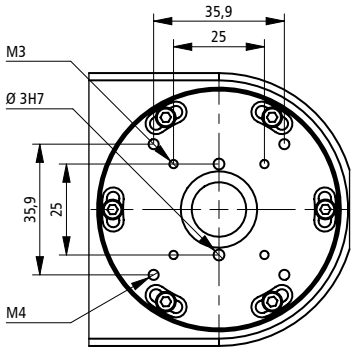
Specifications

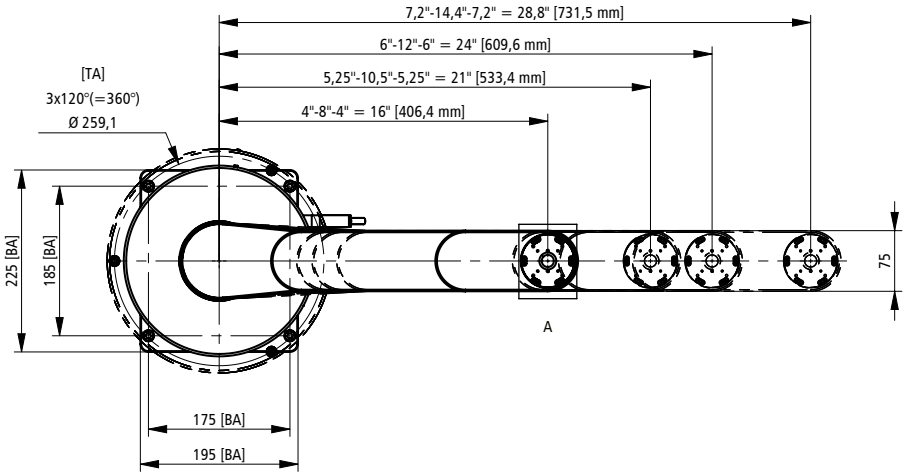
Repeatability	T	±0.02°
	R	±0.02 mm
	Z	±0.02 mm
Working range	Z	10", 13", 17"
	radial	16", 21", 24", 28"
	theta	500°
Payload		up to 3 kg*
Maximum speed	T	360°/s
	R	1,000 mm/s
	Z	450 mm/s
Power supply		115 – 230 VAC 50 – 60 Hz 550 VA (ADVANCED)
Main interface		RS-232 [DB9], Ethernet [RJ-45]
Weight		approx. 25 – 32 kg

* depending on arm configuration

Dimensions


17" [431,8 mm]
13" [330,2 mm]
10" [254 mm]
137,5
Ø 236 [BA]
Ø 277 [TA10"|17"]
Ø 330 [TA13"]
TA17" [690 mm]
TA13" [588,5 mm]
TA10" [513,5 mm]
45


35,9
25
M3
Ø 3H7
35,9
25
M4


7,2"-14,4"-7,2" = 28,8" [731,5 mm]
6"-12"-6" = 24" [609,6 mm]
5,25"-10,5"-5,25" = 21" [533,4 mm]
4"-8"-4" = 16" [406,4 mm]
[TA]
3x120°(=360°)
Ø 259,1
225 [BA]
185 [BA]
75
A
175 [BA]
195 [BA]

WAFER HANDLING ROBOT | IWH

WITH 2-LINK DUAL ARM AND BODY SERIES 3

Characteristics

- excellent structural rigidity
- wafer handling up to 300mm
- maximum reliability and precision
- seamless integration with Prealigner, linear track and other peripheral components
- very smooth running
- backlash free Harmonic Drive® gears
- absolute or incremental encoder
- exact vacuum value can be displayed via controller software
- fully integrated software adjustable vacuum sensors
- ISO 1 clean-room environment compatible
- MTBF: >70,000 operating hours

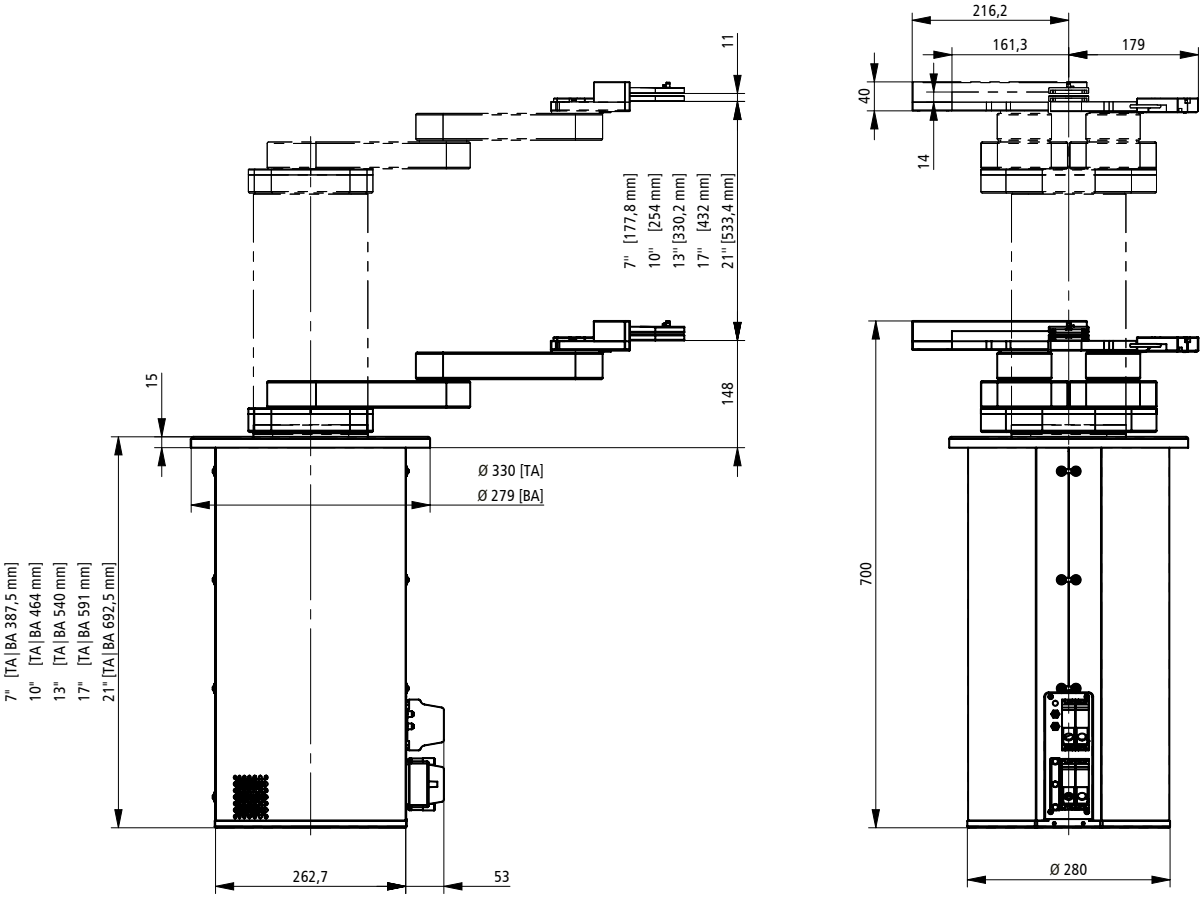
Optional: 2 flip modules iFM-300-3
available with high performance motors

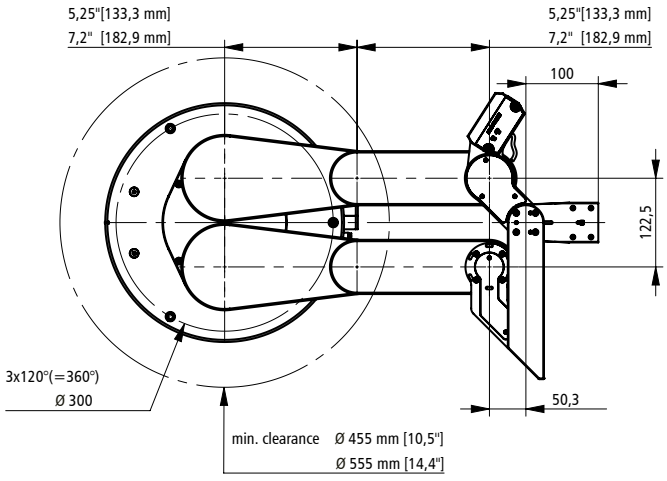
Specifications

Repeatability	T	±0.02°
	R	±0.02 mm
	Z	±0.02 mm
Working range	Z	7", 10", 13", 15", 17", 21"
	radial	10", 14"
	theta	500°
Payload		up to 1.25 kg (per arm)*
Maximum speed	T	360°/s
	R	1,100 mm/s
	Z	425 mm/s
Power supply		115 – 230 VAC 50 – 60 Hz 550 VA (ADVANCED)
Main interface		RS-232 [DB9], Ethernet [RJ-45]
Weight		approx. 25 – 40 kg

*depending on arm configuration

Dimensions


11
7" [177,8 mm]
10" [254 mm]
13" [330,2 mm]
17" [432 mm]
21" [533,4 mm]
148
15
Ø 330 [TA]
Ø 279 [BA]
7" [TA | BA 387,5 mm]
10" [TA | BA 464 mm]
13" [TA | BA 540 mm]
17" [TA | BA 591 mm]
21" [TA | BA 692,5 mm]
262,7
53
216,2
161,3
179
40
14
700
Ø 280


5,25"[133,3 mm]
7,2" [182,9 mm]
5,25"[133,3 mm]
7,2" [182,9 mm]
100
122,5
3x120°(=360°)
Ø 300
50,3
min. clearance Ø 455 mm [10,5"]
Ø 555 mm [14,4"]

WAFER HANDLING ROBOT | IWH

WITH SHD SUPER HEAVY DUTY DUAL ARM AND SHD BODY

Characteristics

- excellent structural rigidity
- proven for panel handling
- maximum reliability and precision
- seamless integration with Prealigner, linear track and other peripheral components
- very smooth running
- backlash free Harmonic Drive® gears
- absolute or incremental encoder
- fully integrated software adjustable vacuum sensors (ADVANCED controller)
- ISO 1 clean-room environment compatible
- MTBF: >70,000 operating hours

MADE IN GERMANY

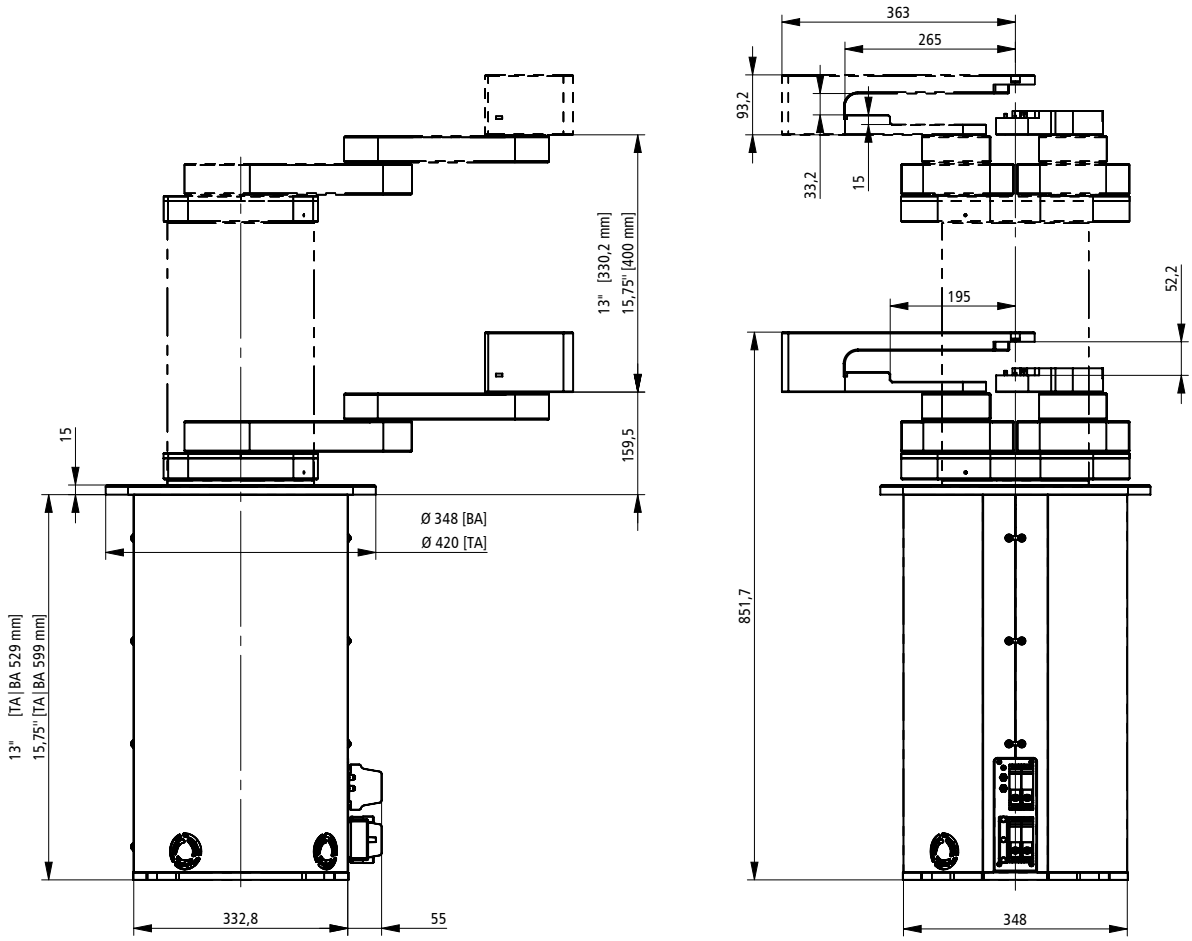
IWH SHD dual arm robot

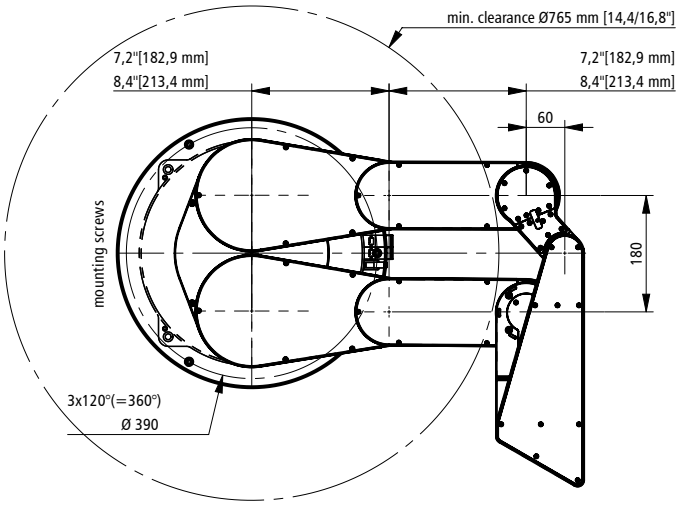
Specifications

Repeatability	T	±0.02°
	R	±0.02 mm
	Z	±0.02 mm
Working range	Z	13", 15"
	radial	14", 16"
	theta	500°
Payload		up to 5 kg (per arm)*
Maximum speed	T	180°/s
	R	800 mm/s
	Z	300 mm/s
Power supply		115 – 230 VAC 50 – 60 Hz 800 VA
Main interface		RS-232 [DB9], Ethernet [RJ-45]
Weight		approx. 60 kg

*depending on arm configuration

Dimensions


363
265
93,2
33,2
15
52,2
195
851,7
348
13" [330,2 mm]
15,75" [400 mm]
159,5
15
Ø 348 [BA]
Ø 420 [TA]
13" [TA | BA 529 mm]
15,75" [TA | BA 599 mm]
332,8
55


min. clearance Ø765 mm [14,4/16,8"]
7,2"[182,9 mm]
8,4"[213,4 mm]
7,2"[182,9 mm]
8,4"[213,4 mm]
60
180
mounting screws
3x120°(=360°)
Ø 390

CONTROLLER | „ADVANCED“

The ADVANCED controller is based on a continuous path control with integrated safety PLC which incorporates state-of-the-art technology. The innovative path control guarantees a constant and maximum speed on the TCP which ensures additional safety during substrate handling. The controller runs on Powerlink real time bus system which improves performance even further.

The supported high voltage technology enables very dynamic behavior when using an additional linear motor axis.
isel ADVANCED controllers complies with current international standards for industrial robots. The operating interface integrated into the controller can be visualized on any PC with VNC viewer. It provides an innovative and intuitive GUI for setting up and managing the ADVANCED robot system. The ADVANCED robot controller is made by isel.

MADE IN GERMANY

ria Robotic Industries Association

ADVANCED controller front

ADVANCED controller back

Characteristics

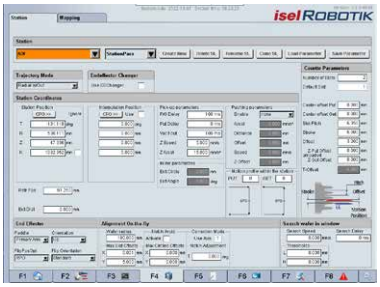
- innovative graphical user interface
- powerful control electronics „State of the Art“
- integrated safety control according to DIN EN ISO 10218-1
- Resolver or EnDat-2.2 encoder
- 19" rack 4HU/RU or desk version
- interface: Ethernet, RS232
- dimensions: 392 x 169 x 415 mm
- weight: 10 kg
- optional: teach pendant
- third party certified by TÜV for
  - ISO 10218-1 (Robot safety)
  - USA compliance
  - Korea compliance

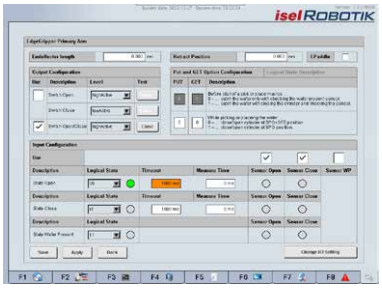
TÜVRheinland® ZERTIFIZIERT

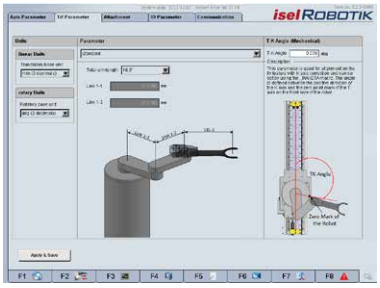
Bauart geprüft
Sicherheit
Regelmäßige Produktions-überwachung

www.tuv.com
ID 1111216703

Graphical User Interface (GUI)







Teach pendant for ADVANCED controller

- optimal support when setting up an isel wafer handler with ADVANCED controller
- GUI on a 6,5" VGA colour display
- ergonomic multi-grip for fatigue-free work
- hand wheel for jogging operation
- enable switch and stop button for safe manual operation (complies with EN ISO 13850)

END EFFECTORS | IEE SERIES

ISEL END EFFECTORS

... are optionally available with many different contact materials such as PTFE (SafeCoat), PEEK, VITON, KALREZ. Additionally, we offer many special designs for your individual wafers and substrates. We will create the solution to your customized endeffector requirements.

MADE IN GERMANY

Paddle 4-8" EE

Horse-Shoe 8-12" EE

Extended 4-8"

Extended Horse-Shoe

Ceramic EE

Double EE

Friction EE

Exclusion Zone EE

Characteristics

- for all wafer sizes
- high rigidity
- good cost/performance ratio
- PTFE SafeCoat (Standard) for each of our robots
- High-resistance dissipative coating available

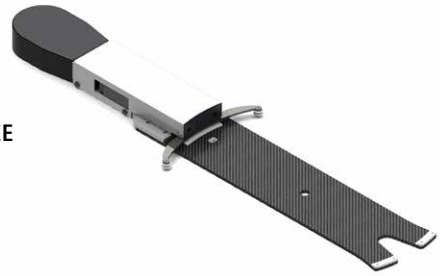
Options

- different wafer mapping sensors
- several surface coatings
- special designs: pocket - friction wafer - edge grip - exclusion zone vacuum

Warp / Bow Wafer

Through Beam EE

Edge Grip EE



Frame EE

Customized 4"

Customized EE

Panel EE

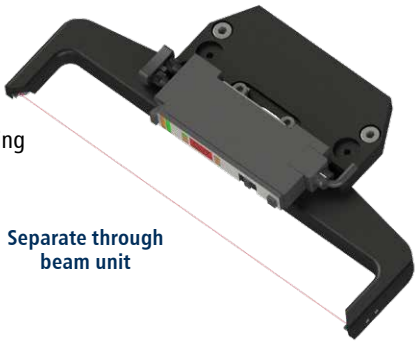
Panel EE

ACCESSORIES

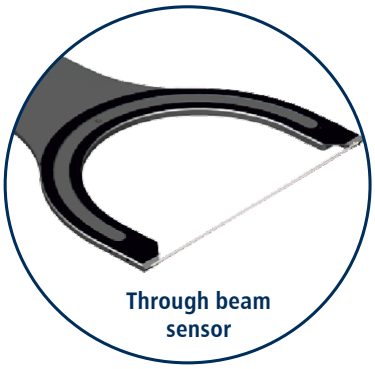
WAFER MAPPING SENSORS

Through Beam Sensor

- optional to reflective Sensor
- integrated in endeffector
- or as separate unit
- more suitable for thin wafer mapping



Separate through beam unit



Through beam sensor

PD45

- laser (class 2) light source
- measuring distance 200 mm or 300 mm
- small laser dot and housing

PD 45

Cyberoptics

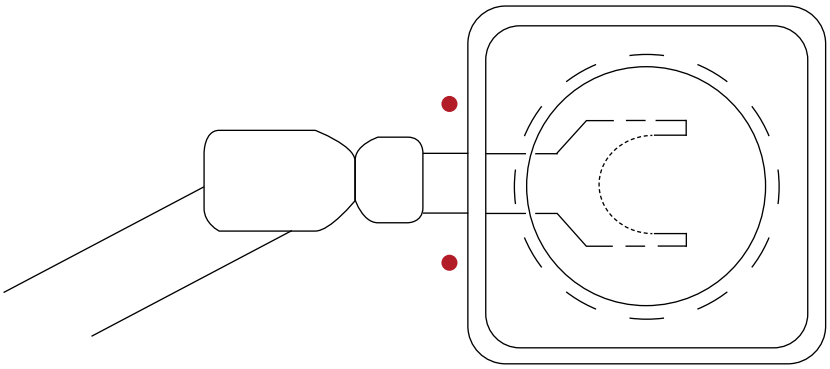
- light source: 2 x 850 mm diode lasers
- optimum detecting range: 38 mm (1.5")
- Maximum detecting range: 40 mm (1.6")
- Laser class 1
- PNP

Flip Module IFM-300-3

- precise wafer flipping by adjustable mechanical stops
- universal endeffector adapter
- adjustable hard stop damping
- adjustable flip speed
- option: lateral mapping sensor
- TAP to EE 100 mm

ALIGNMENT on the fly

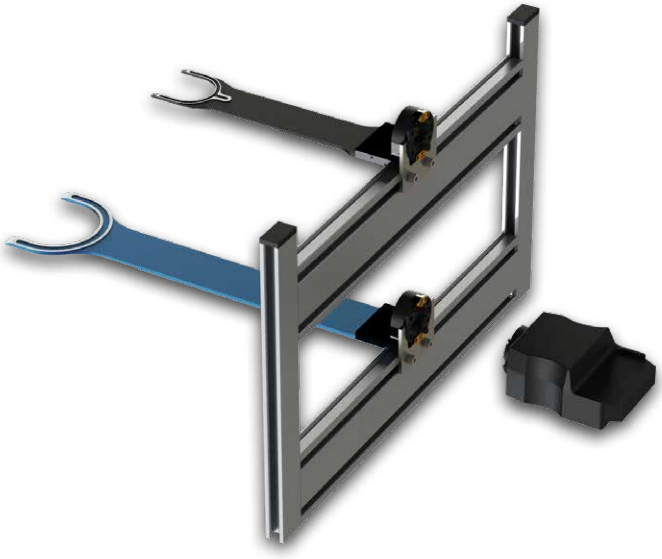
- wafer centering without Prealigner
- offset centering during PUT movement
- no alignment station necessary
- time efficient wafer centering



● = laser sensors

END EFFECTOR CHANGER (ADVANCED controller only)

- full automatic endeffector changing system
- software endeffector management
- for all endeffector types



LINEAR TRACK | ILD SERIES

In order to increase the robot's radius of action, the handling system can simply be expanded by adding a further axis that is fully integrated into the system. Depending on the application, it can be mounted below the wafer handler or with the wafer handler mounted on the side. Due to the use of linear motors, the linear axes are very dynamic, low-maintenance and smooth-running. They achieve high acceleration values and speeds, approach positions very precisely and work practically wear-free due to the omission of mechanical connecting links.
Due to the segment design, lengths of up to 32 meters with absolute encoders can be realized.

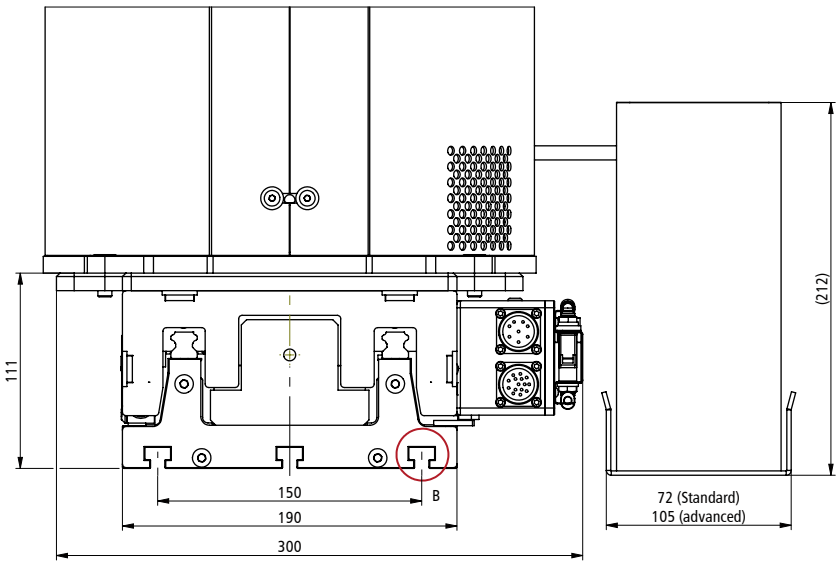
Characteristics

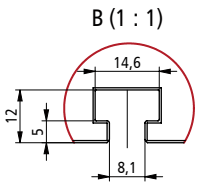
- speed up to 4,5m/s
- acceleration up to 10 m/s²
- total length up to 32 m
- repeatability +/- 0.01 mm
- option: top or side mounting
- fully integrated into the robot system
- direct drive motor
- low-maintenance
- MTBF: >70,000 operating hours

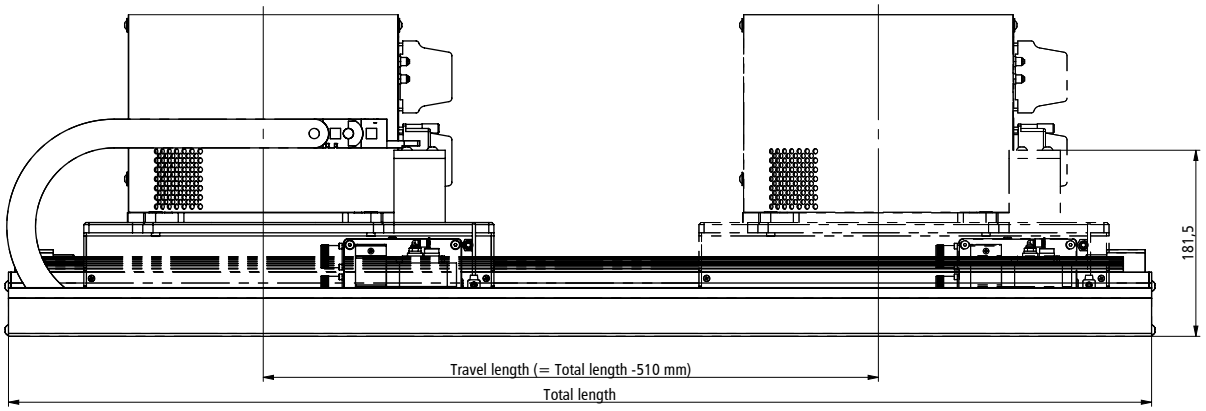
Specifications

Repeatability	±0.01 mm
Motor	direct drive
Maximum speed	4.5 m/s
Maximum length	32 m
Maximum acceleration	10 m/s²

Dimensions



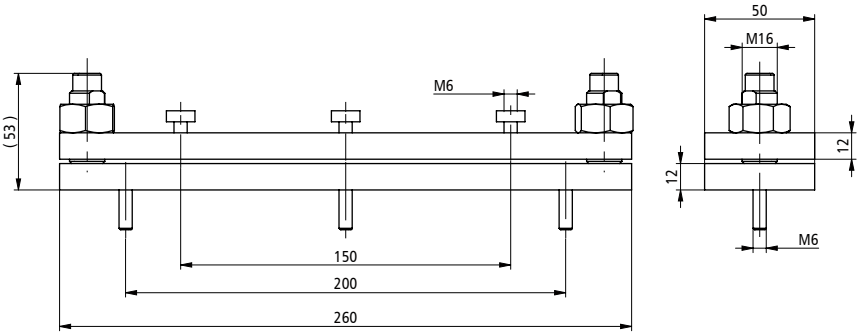




ASSEMBLE SET

for aligning the axes

(consisting of two adapter plates, four nuts, two leveling bolts and mounting material)



PREALIGNERS | LPA SERIES

The LPA series Prealigners from Logosol are an innovative, high-precision, class 1 clean room solution with integrated scan electronics. These Logosol Prealigners make it possible to align objects from 45 mm to 480 mm, regardless of their degree of transparency. They centre wafers, masks and other substrates, detect notches, flats or other marks and align the object exactly and independently.

The Logosol Prealigners are proprietary products of Logosol Inc. USA www.logosolinc.com.

Three-axis Logosol Prealigners

- innovative all-in-one design
- alignment times < 3.5 seconds
- repeatability: linear 0.025 mm, circular 0.02°
- contactless measurement using LED and CCD sensor
- integrated scanning electronics
- standalone capability
- chuck or pin load and change to another wafer size without rebuild
- transparent, semi-transparent, holed and opaque wafers can be aligned
- SEMI, flat and notch wafer specifications
- for wafer sizes from 2" to 18"
- connection fields available from the side and from below
- option: external (notch sensor)
- option: dual layer for bonded wafer

Single axis Logosol Prealigners

- alignment times < 2.5 seconds
- contactless measurement using LED and CCD sensor
- integrated scanning electronics
- chuck load
- change to another wafer size without rebuild
- transparent, semi-transparent, holed and opaque wafers can be aligned
- All, flat and notch wafer specifications
- for wafer sizes from 3" to 12"
- connection panel available at the side and from below

Three-axis Logosol Prealigner LPA series with lateral connectors and PEEK-pin/chuck

Three-axis edge handling Logosol Prealigner with lateral connectors

Single-axis Logosol Prealigner LPA series with bottom connectors configuration

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Characteristics LOGOSOL

Specifications		PREALIGNER MODEL												
		Standalone						Embedded						Edge Handling
		26-3	38-3	58-3	312-3	812-3	1218-3	25-1E	38-1E	58-1E	312-1E	812-1E	1218-1E	Type
Wafer Diameter	2"	✓						✓						
	3"	✓	✓		✓			✓	✓		✓			
	100mm	✓	✓		✓			✓	✓		✓			4EH, 45EH
	125mm	✓	✓	✓	✓			✓	✓	✓	✓			5EH, 45EH, 56EH
	150mm	✓	✓	✓	✓				✓	✓	✓			6EH, 56EH
	200mm		✓	✓	✓	✓			✓	✓	✓	✓		8EH, 8ET
	300mm				✓	✓	✓				✓	✓	✓	12ET
	450mm						✓						✓	
Square Substrates		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
Angular Accuracy (3 Sigma)	10000 CPR Encoder	0.04°					N/A	0.06°					N/A	0.04°
	24000 CPR Encoder	0.02°						0.04°						0.02°
Centering Accuracy (3 Sigma)		25um						50um						25um
Max Initial Offset		10mm	12mm					9mm	10mm					1.7mm to 2.0mm
Body Dimensions	W	173mm						95mm						173mm
	L	267mm			317mm		404mm	266mm					328mm	267mm or 317mm
	H	190mm						191mm						190mm to 206mm
Weight		5.0kg to 5.7kg						3.4kg to 3.8kg						5.3kg to 6.0kg
Servo Axes		Three						One						Three
Handling		Vacuum Chuck and Pins						Vacuum Chuck						Edge Handling
Facilities Required		100-240VAC, 50/60Hz; 48VA or 24 DC/2A, Vacuum 12" Hg for vacuum retention												
Host Interface		RS 232, Ethernet												
Flat/Notch Compatibility		Semi Standards Compliant												
Wafer Opacity		Transparent, Semi-Transparent												
Cleanliness		Class 1												
MTBF		More than 70000 hours												

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Quality assurance

The quality assurance system for our products includes all areas which contribute to the attainment of quality objectives. It is based on statutory requirements, customer requirements and the internal quality requirements of isel Germany AG.

The quality assurance system ensures the production processes are controllable and that only products that meet the respective specifications are forwarded to the next working stage. We hold DIN ISO 9001:2015 certification.

References

Subsequently you'll find a selection of companies that participated in a successful co-operation with us and that successfully use our products:

AP&S
centrotherm
CYBER TECHNOLOGIES
E+H Metrology
FormFactor™
Integrated Dynamics Engineering
INNOLAS SEMICONDUCTOR
LIEB ENGINEERING SONDERMASCHINEN LOHNFERTIGUNG
mechatronic systemtechnik gmbh
NexGen Wafer Systems
PRO micron Micro Measuring Imaging
PVA TePla
SEMILAB
SEMSYSCO
SÜSS MicroTec
Vistec Electron Beam

isel ROBOTIK

successful with
wafer handling components

Plant in Eiterfeld
36132 Eiterfeld, Hesse
Total area: approx. 52,000 m²

Plant in Eichenzell
36124 Eichenzell, Hesse
Total area: approx. 30,000 m²

isel ROBOTIK

successful with wafer handling components

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ria Robotic Industries Association

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