

# YASKAWA



## ARC WELDING

## YRC1000 CONTROLLER



## ROBOTICS DIVISION EUROPE - OVERVIEW

# globales Produktportfolio

In der Automatisierungstechnik ist YASKAWA einer der **global führenden Technologielieferanten**



**Industrie-  
roboter**

48.000



**Frequenz-  
umrichter**

2,2 Mio.



**Servo-  
antriebe**

2,1 Mio.

Produktionsleistung 2018

430.000

27 Mio.

18 Mio.

Installierte Einheiten Stand 2018

# INNOVATIVE LÖSUNGSPHILOSOPHIE

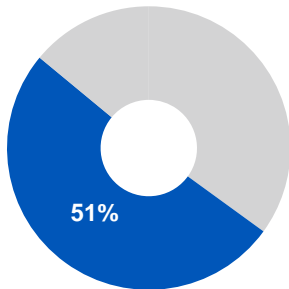
Erfinder des Begriffs

# Mechatronik

Einführung der ganzheitlichen  
Problemlösungsphilosophie in die  
Ingenieurwissenschaften  
(1969)



# ROBOTICS DIVISION EUROPA



Konstruktion und  
Einrichtung  
**schlüsselfertiger  
Komplettanlagen**



Red Dot Award

## Hauptmärkte:

- Automobil Tier 1
- Automobil OEMs
- Maschinenbauer,  
Systemintegratoren



**1000**  
Mitarbeiter

Roboter mit Kunden-  
und Applikations-  
spezifischen  
Anpassungen für  
**Systemintegratoren**

## Kernbranchen



Schweißen  
(Automotive)



Abgas-  
anlagen



Maschinen be-  
und entladen



Verpackung/  
Handling



Lackieren/  
Beschichten



# ROBOTICS EUROPE – PORTFOLIO OVERVIEW

## INDUSTRIAL ROBOTS & POSITIONERS



### ROBOTS



## STANDARD SYSTEMS



### SYSTEMS



## CUSTOMIZED SYSTEMS



## TCS – REPAIR, REFURBISHMENT, SAFETY CONSULTING, SPARE PARTS –



### SERVICE ACADEMY



# ROBOTICS – EUROPEAN OPERATIONS



HQ, Large Systems

Allershausen,  
Germany



Systems

Nantes,  
France



Positioners, Systems

Risto,  
Slovenia

Torsås,  
Sweden



Controllers, Systems, Positioners



Manipulators



Kočevje,  
Slovenia

# ROBOTICS – EUROPEAN PRODUCTION PLANTS



Engineering / Turnkey Systems in Allershausen, Germany



Controller & Cabinet Assembly in Torsas, Sweden



Engineering / Turnkey Systems / Positioner Manufacturing in Risto, Slovenia



Engineering / Turnkey Systems / Positioner / Track / Gantry Production in Torsas, Sweden

# YASKAWA

## ARC WELDING PRODUCTS



# ARC/LASER WELDING/CUTTING ROBOTS



## ARC & LASER WELDING ROBOTS



**AR-Series**  
7 - 25 kg Payload  
700 ... 3120mm Reach  
Arc welding



**GP Series**  
7 – 600 kg Payload  
700 ... 3500mm Reach  
Handling



**GA50 (Q2/2020)**  
50 kg payload  
High Precision Laser Applications



## ARC WELDING EQUIPMENT



Supported Power Sources, Weld Torches & Dress Packs

a.m.m.

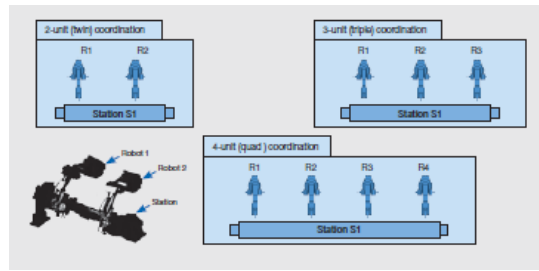
# SOFTWARE AND SENSORS

## PC SOFTWARE TOOLS



Standard and special welding software  
 MotoVRC, RobCAD, MotoAdmin, MotoCalvEG, FTP,  
 MotoOPCServer, MotoModbus, JobExchanger, FDDWin a.m.m.

## ROBOT SOFTWARE FUNCTIONS



Coordinated Motion, Twin/Triple/Quad configurations,  
 Weaving, External Reference Point, Teaching Point  
 Adjustment, Error Recovery, Safety Torque Off, a.m.m.

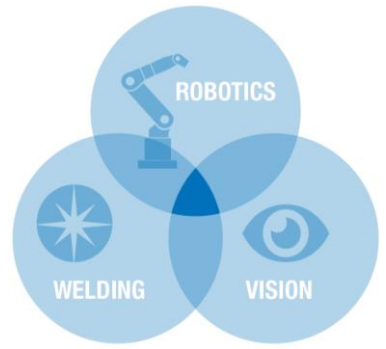
## SEAM FINDING / FOLLOWING / INSPECTION SENSORS



Scansonic      Meta Vision      Servo robot      MotoSense

The right sensor for every task.

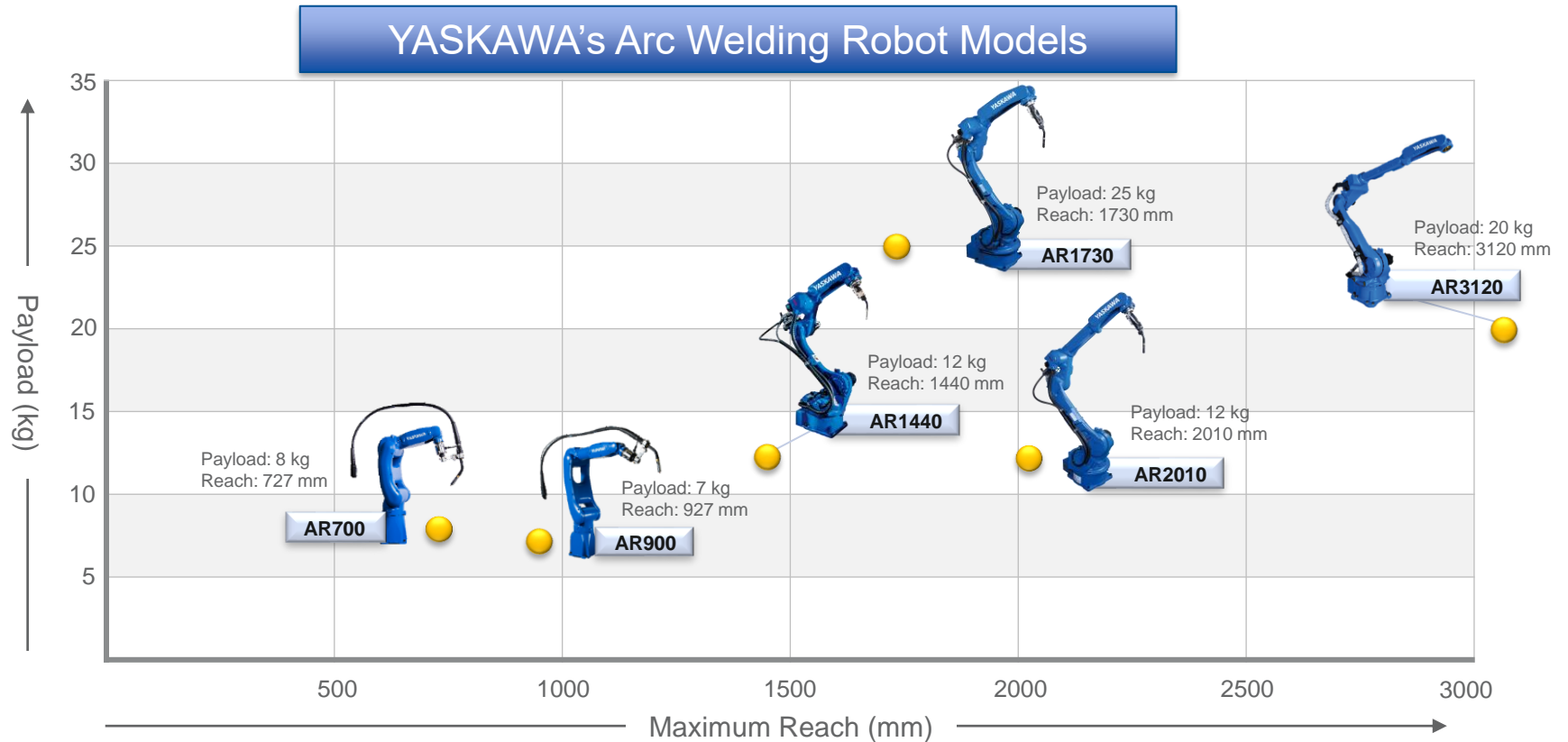
COMARC arc sensor, multilayer,  
 tactile sensors,  
 AccuFast, TCP, MotoSight2D  
 interface, MOTOEyeLT,  
 MOTOSense a.m.m.



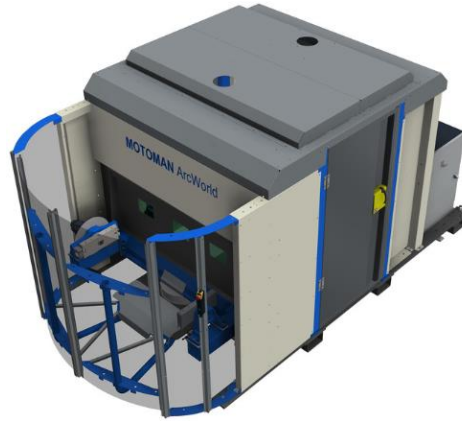
## YRC1000 - ARC WELDING ROBOT PORTFOLIO

# ARC WELDING ROBOT LINE-UP

- Compatible with YRC1000 controller



# YASKAWA



## STANDARD ARC WELDING CELLS

# ArcWorld

LESS SPACE | MORE OUTPUT

# ARCWORLD HS MICRO

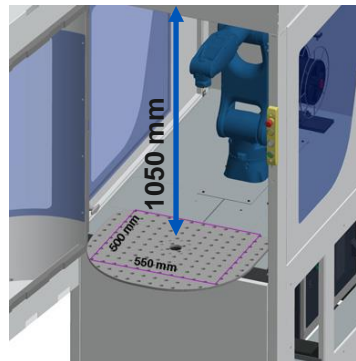
Compact Arc Welding Station for Beginners

- EASY to install and operate
- EASY to relocate
- EASY to place – small footprint
- EASY to transport
  
- Platform and casing with blue polycarbonate glare shield protection
- Includes MOTOMAN-AR900 robot and YRC1000 controller
- Max payload on the fixed table = 100 kg
- Max. Fixture Dimensions: 550x500x1050 mm
- Complete welding packages
- Welding Wizard for creating robot jobs
- Start/stop button panel
- Hood prepared for fume extraction
- CE-marking

1.3 m<sup>2</sup>



Robot, YRC1000 controller and welding power source – all inside!



<https://www.yaskawa.de/en/products/system-engineering/arc-welding-systems/standard-systems/>

# ARCWORLD RS MINI

Compact Arc Welding Station with manually operated turntable

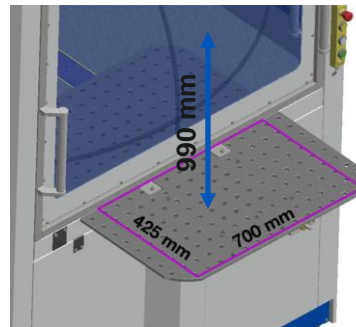
- EASY to install and operate
- EASY to relocate
- EASY to place – small footprint
- EASY to transport
  
- Platform and casing with blue polycarbonate glare shield protection
- Included MOTOMAN-AR900 robot and YRC1000 controller
- Manually operated rotating turntable, max. 100 kg on each side
- Max. Fixture Dimensions: 425x700x990 mm \*)
- Complete welding packages
- Welding Wizard for creating robot jobs
- Start/stop button panel
- Hood prepared for fume extraction
- CE-marking

\*) with consideration to station indexing

2.25 m<sup>2</sup>



Robot, YRC1000 controller and welding power source – all inside!



<https://www.yaskawa.de/en/products/system-engineering/arc-welding-systems/standard-systems/>

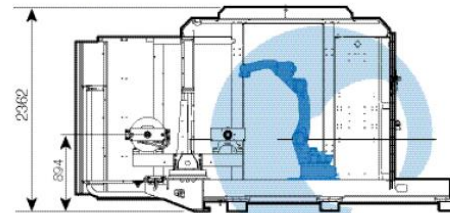
# ARCWORLD CS

Compact 2 Station Standard Arc Welding Cells

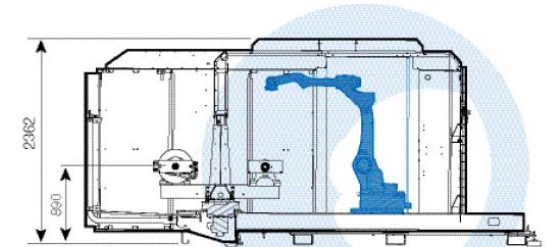
- EASY to install and operate
- EASY to relocate
- EASY to place – small footprint
- EASY to transport
  
- Material can be loaded with an overhead crane
- Single and Twin Robot Options (AR1440 or AR2010)
- Versions with Fixed 7 Horizontal / Vertical Rotary Positioner,
- Max. Payload: 500kg per station
- Max. Fixture dimensions: 2 Versions 1300 or 2050 mm
- Ready to weld with optional welding packages
- Full Offline Programming Support



**L = 1300 mm (pin to pin)**  
Workpiece maximum width 1200 mm



**L = 2050 mm (pin to pin)**  
Workpiece maximum width 1950 mm

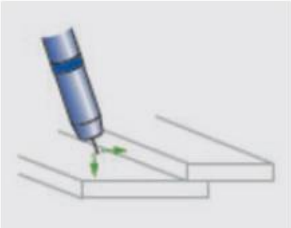




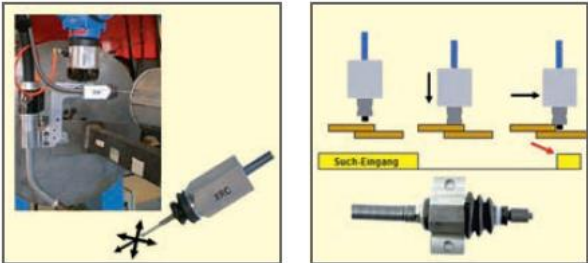
## FUNCTIONS

# ARC WELDING SENSORS

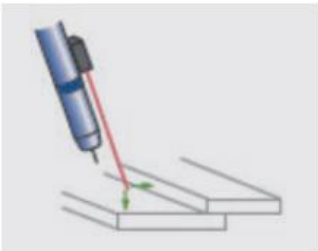
## Taktile Sensoren



Einfachste, aber günstige und bewährte Methode der statischen Bauteilvermessung, wie z.B. der Startpunktsuche: Mittels Suchfahrten bis Bauteilkontakt können Differenzen zwischen Original- und aktuellem Bauteil detektiert und Programmpunkte entsprechend verschoben werden. Schaltkontakt erfolgt durch elektrischen Kurzschluss (Suchspannung auf Draht oder Gasdüse) oder mechanischen Taster.



## AccuFast

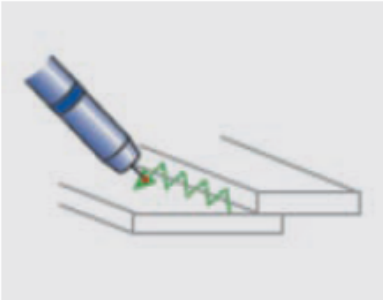


YASKAWA-Produkt: Eindimensionaler Laser, Reflexionstaster, Suchroutinen wie oben beschrieben, aber berührungslos. Kantensprung am Bauteil wird durch den Intensitätssprung des reflektierten Laserstrahles detektiert.

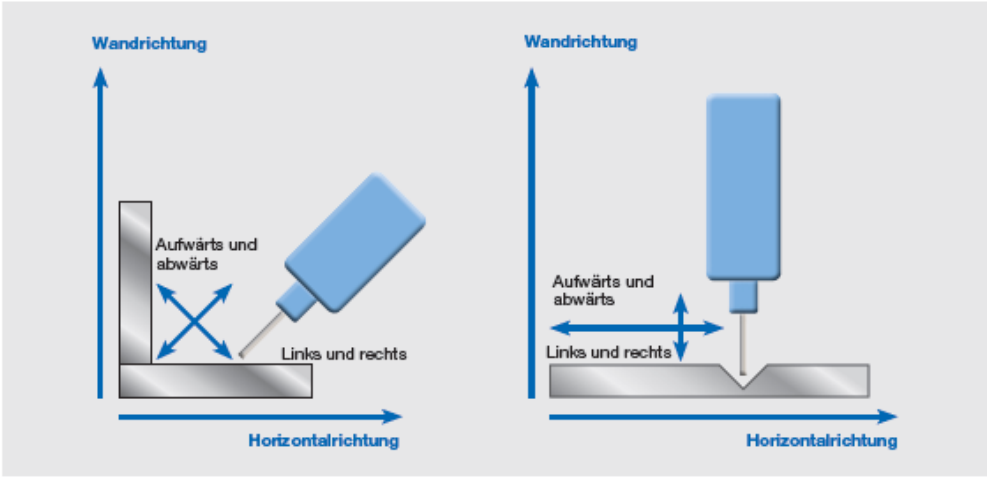


# ARC WELDING SENSORS

## Lichtbogensensor COMARC

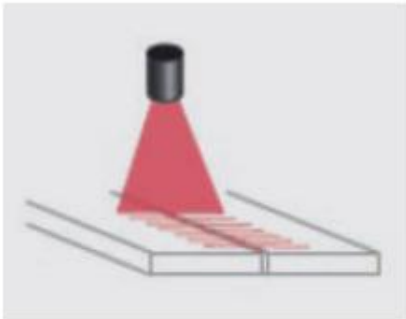


Der Lichtbogensensor COMARC ist ein Nahtverfolgungssystem, welches die Stromstärkeänderungen im Lichtbogen bei sich ändernder freien Drahtlänge während dem Pendeln über einen Shunt erfasst. Die sich ergebenden Differenzen zu den an dieser Naht eingelearnerten Werten sind die Grundlage für eine Korrektur der Schweißbahn. Im Gegensatz zu einer „statischen“ Vermessung, kann hier auch auf Abweichungen reagiert werden, die während des Prozesses durch Schrumpfung und Verzug entstehen.



# ARC WELDING SENSORS

## Optisches Nahtverfolgungssystem



Echtzeit-Nahtverfolgung mit Tracking-Kameras verschiedener Sensorhersteller. Kommunikation mit dem Roboter erfolgt via Analogspannungen mit der General Sensor Function oder via Ethernet mit der MOTOEyeLT Software. Die dem Brenner vorauslaufende Laser-Triangulations-Kamera übermittelt in Echtzeit Positions- und Geometriedaten der Schweißnaht. Anhand dieser Daten können „online“ Korrekturen der Roboterbahn und/oder Anpassungen der Prozessparameter (z.B. Geschwindigkeit, Pendel- und Schweißparameter) vorgenommen werden.

Kamerahersteller:



Scansonic



Meta Vision Systems

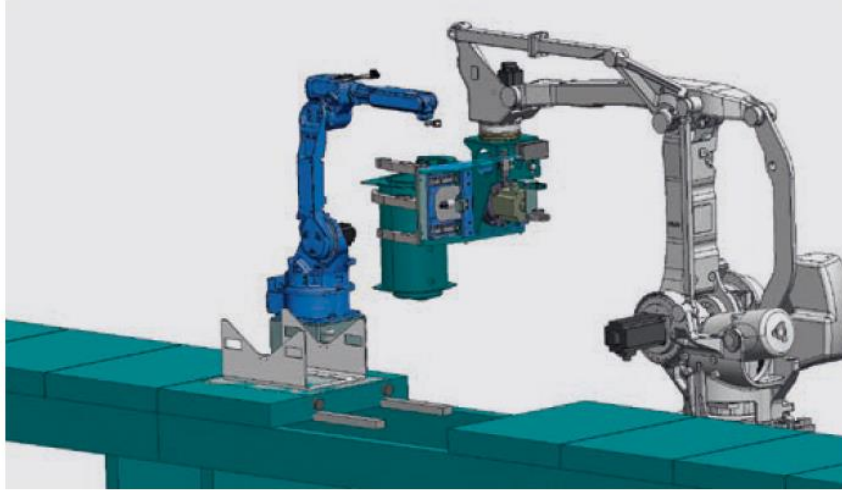


Servo Robot



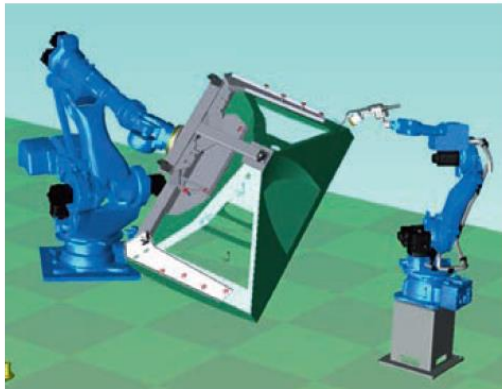
YASKAWA MotoSense

# ARC WELDING JIGLESS WELDING



*Mannloses MaG-Schweißen  
an Groß-Heizkesseln  
MPL800 mit HP20  
Sensorik: taktiler Sensor und  
Lichtbogensensor*

*Mag-Schweißen an Schüttgut-Behältern  
MH400 mit MH50-30  
Sensorik: Vision-System, MOTOSense SeamFinder  
und taktiler Sensor*



*MaG-Schweißen an diversen Gehäuseteilen und Unterbaugruppen  
ES165 mit MA1800  
Sensorik: taktiler Sensor und Lichtbogensensor*



# YASKAWA

## POSITIONERS

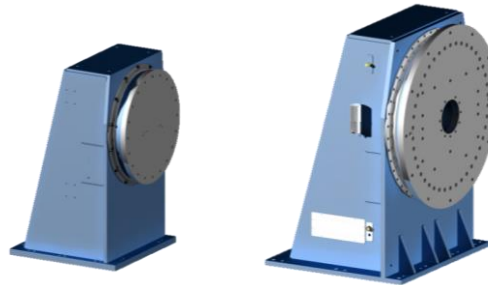


WD-250/1000



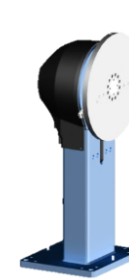
WD-1000/1500

## DirectDrive & GearDrive



W-5000 to W-20000

## GearDrive



WH-250/500



WH-750...3000

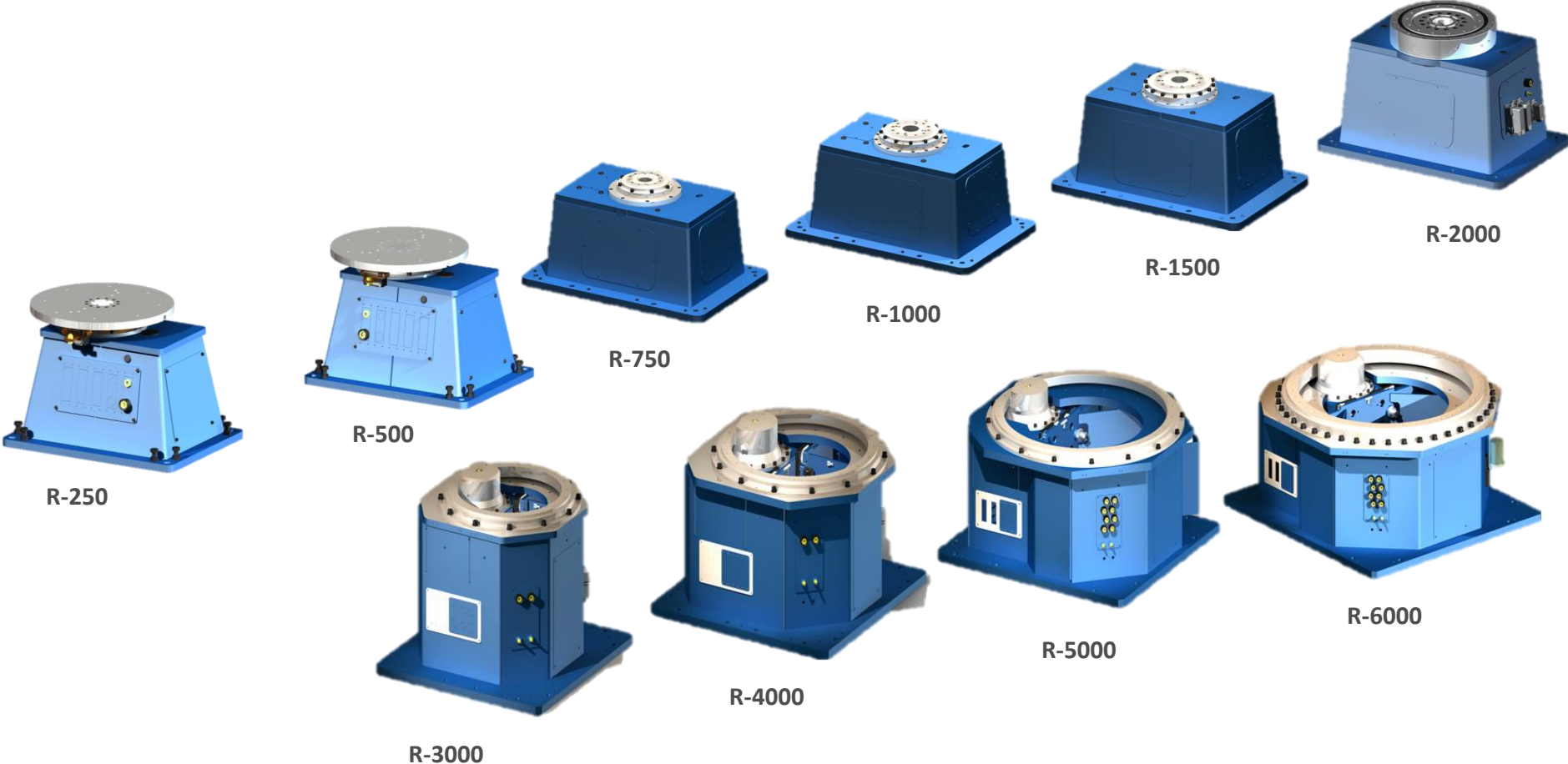
## HollowShaftDrive

### Options:

- Media Supply Kits (I/O, Fieldbus, Safety Signals, Pneumatic/hydraulic Supply)
- Disks, Fixture Holders
- Grounding

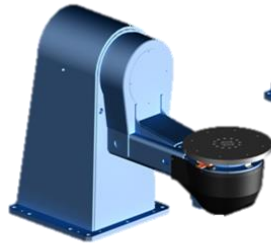
# TURNTABLES R-250 TO R-6000

YEU

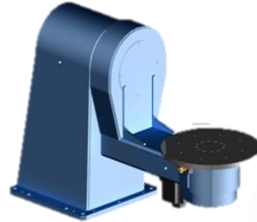




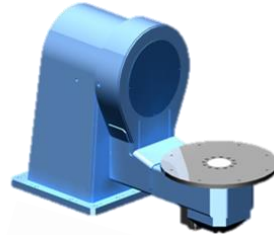
# L-TYPE POSITIONERS



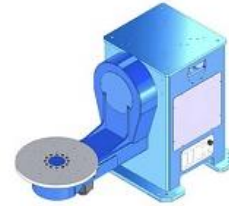
WL-250



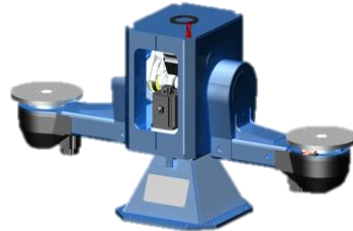
WL-500



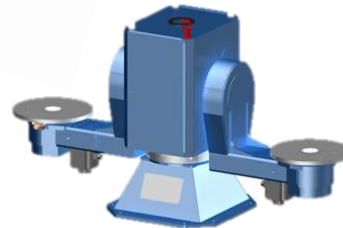
WL-1000



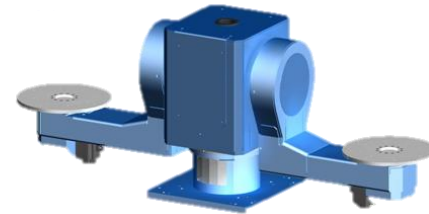
B1L-250/500



R2L-250



R2L-500



R2L-1000

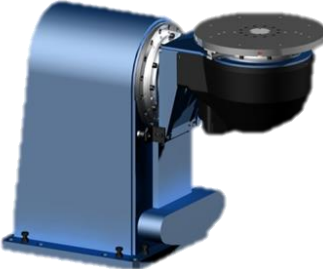
Length 200mm to 400mm  
Ø 1200mm – 1600mm  
Payload 250kg – 1000kg

# TURN-TILT-ROTATE POSITIONERS

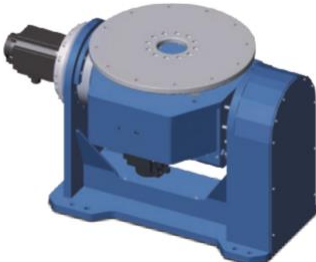
YEU



DK-250



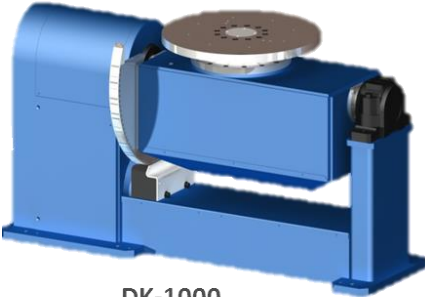
DK-500



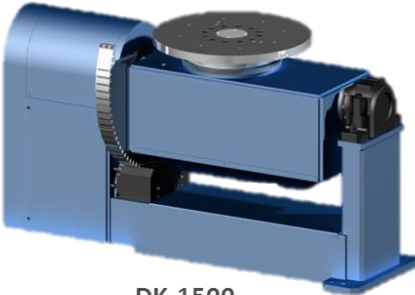
DK-500 Compact



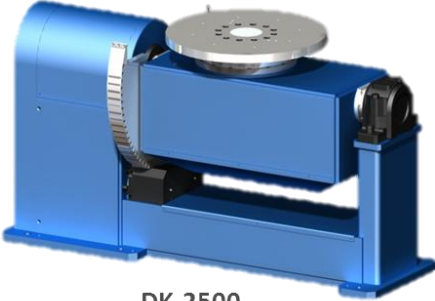
TR-1000



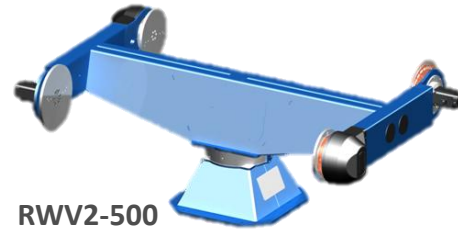
DK-1000



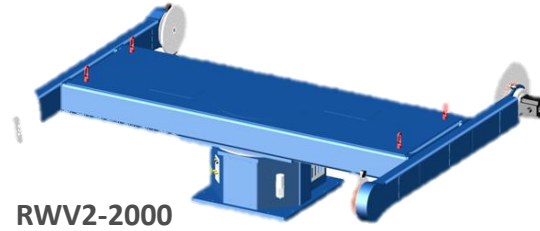
DK-1500



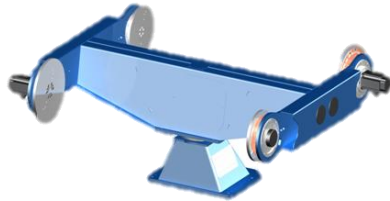
DK-2500



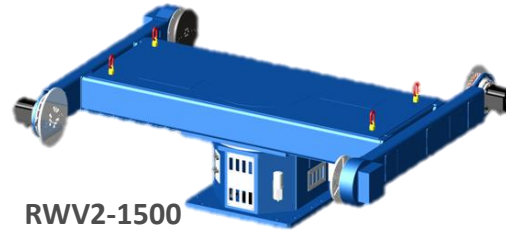
RWV2-500



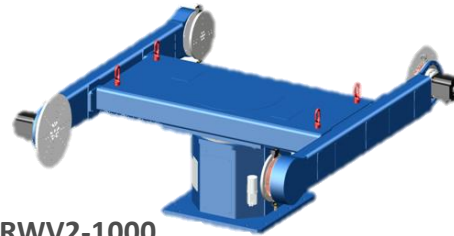
RWV2-2000



RWV2-250



RWV2-1500



RWV2-1000

Length 1600mm - 4000mm  
Ø 1000mm – 1800mm

# HORIZONTAL TURNTABLES

## Three Axis Turntables



V2-500D3

Length 1650mm - 2550mm  
Ø 1300mm – 1600mm



H2-500 to H2-1000

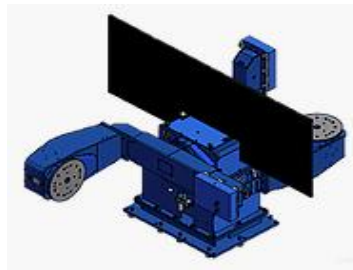
Length 1650mm - 4050mm  
Ø 1200mm



VMH-500 to VMH-1000

Length 1600mm - 2636mm  
Ø 1300mm

VMF-500 to VMF-750  
(L-Arm)  
Ø 1500mm – 2000mm



RM2-250 to RM2-1000  
Length 1600mm - 6500mm  
Ø 1200mm – 1300mm



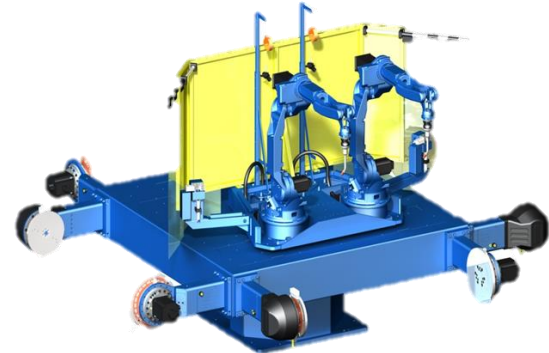
# POSITIONERS WITH ROBOT ON TOP



B2W-250/1500



B2C-250/500



RWV4-M2



B2L-250/500



RWV2-M1



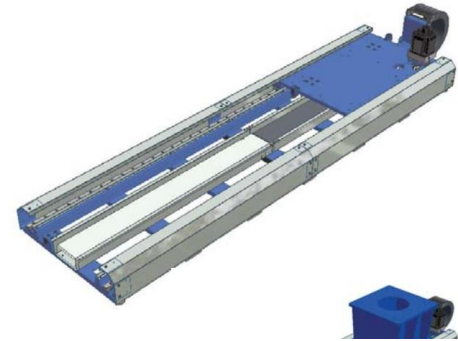
RWV2-M2



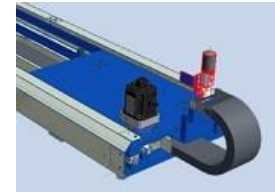
TS-100D  
2...4m



TSL-600SD / 1000SD  
2...24m



TSL-2000SD/4000SD  
6...24m



**Options:** Ceiling Mount/Gantry/Pillars, Additional Carriage, Protection Covers, Fixtures for travelling Wire Barrel, Robot Stands, Automatic Lubrication Units...

TSG-Y



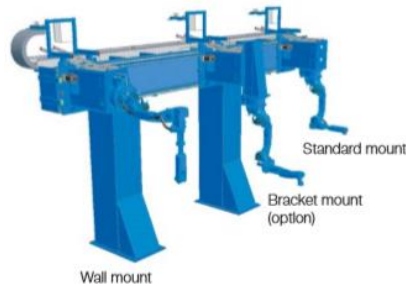
TSG-YZ



TSG-YX



TSG-XYZ



Standard Length: 4m – 24m  
Standard Payload: 500kg – 2000kg  
Customized Options

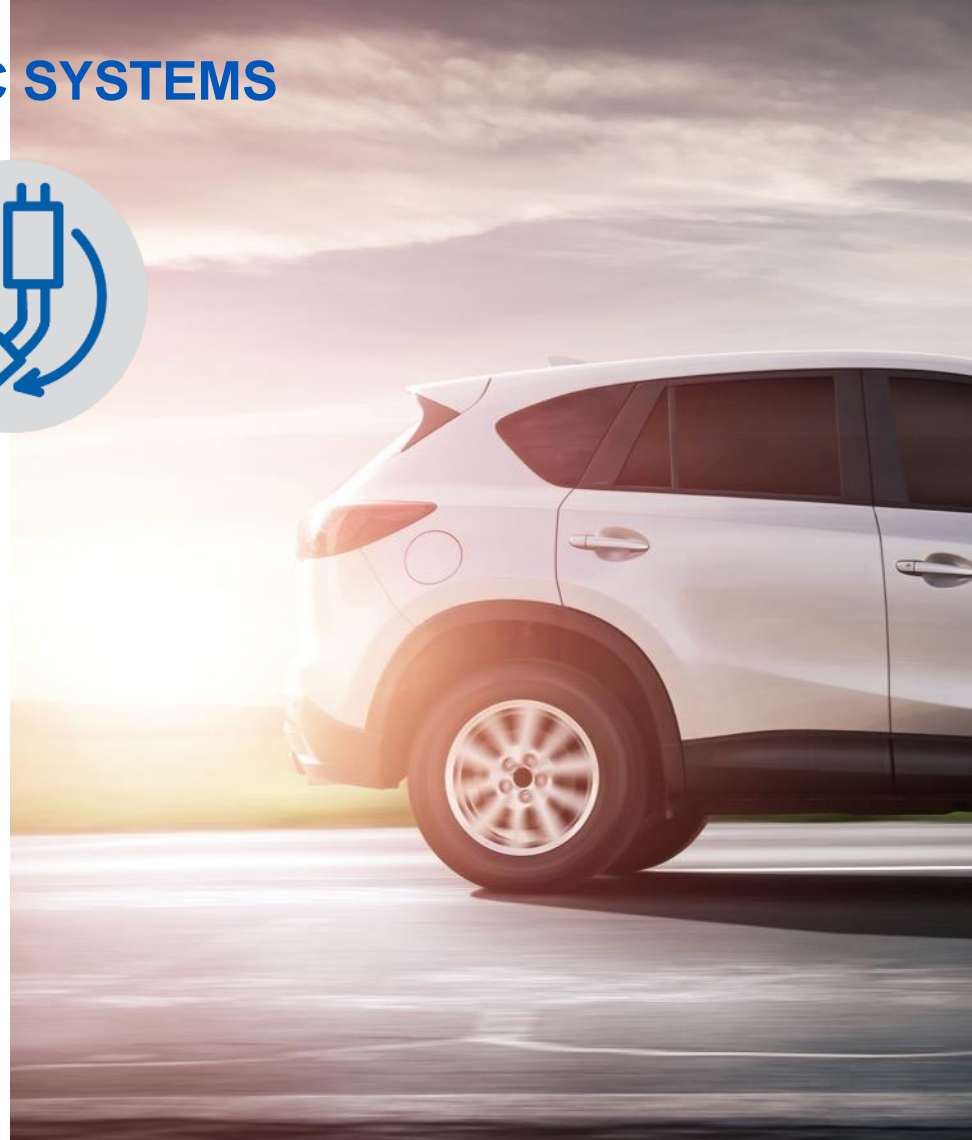
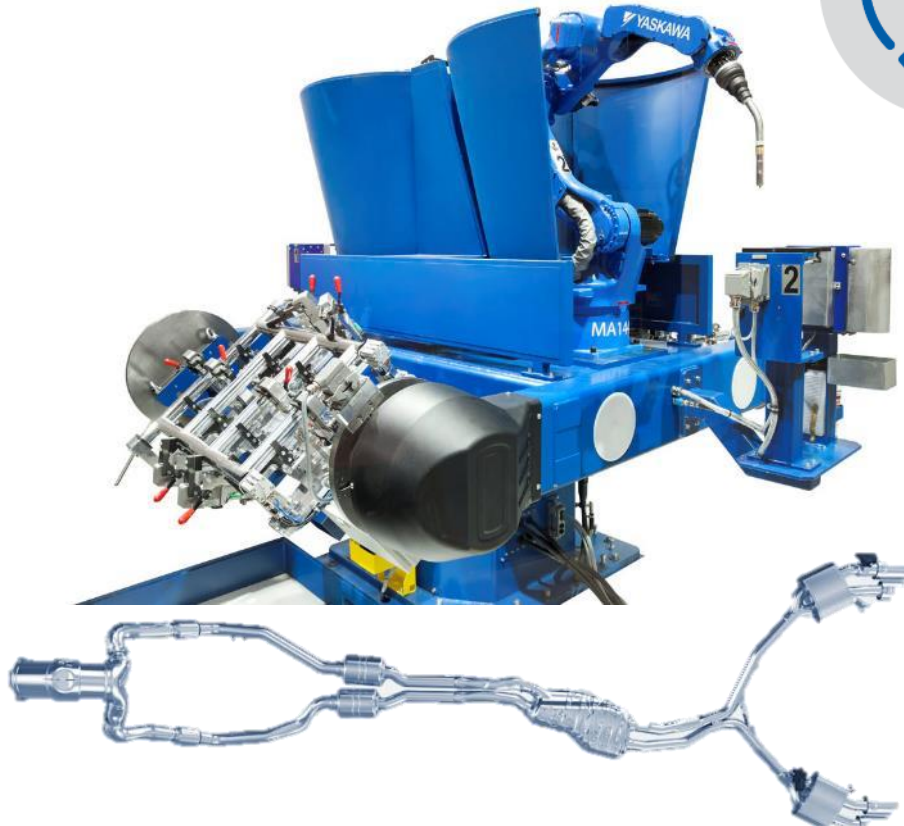
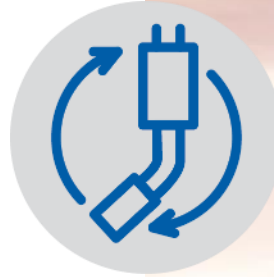
Mounting Options for Multi-Robot-Applications

## ARC WELDING – CUSTOMIZED TURNKEY SYSTEMS



# CUSTOMIZED TURNKEY ROBOTIC SYSTEMS

## CAR EXHAUST WELDING



# CUSTOMIZED TURNKEY ROBOTIC SYSTEMS

## TRUCK EXHAUST WELDING

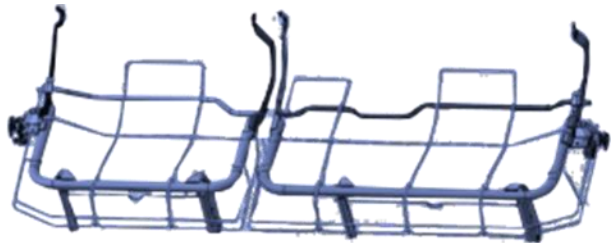
Final exhaust assembly  
17 possible variants



# CUSTOMIZED TURNKEY ROBOTIC SYSTEMS

## CAR SEAT STRUCTURE WELDING

ARC & SPOT welding Rear Cushion,  
universal fixtures (40 + 60%)



# CUSTOMIZED TURNKEY ROBOTIC SYSTEMS

## GENERAL INDUSTRY WELDING



Fully automated welding of crane booms



MAG robot welding system for tractor cabins

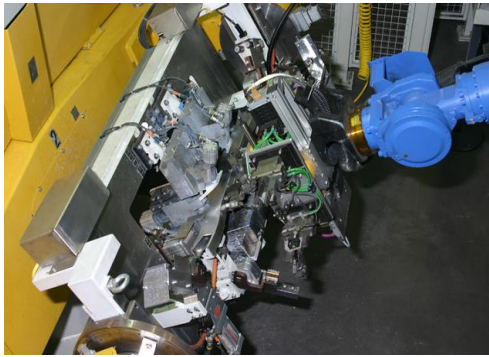
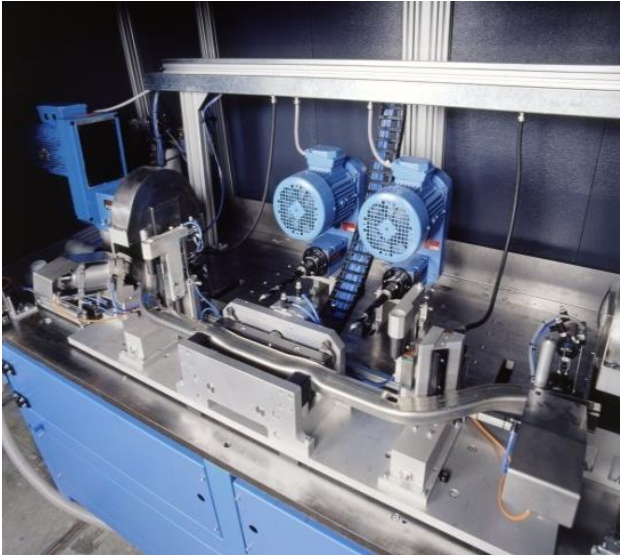


Innovative robot welding system for chassis prototypes

# ARC WELDING TURNKEY SYSTEMS (3)



# ARC WELDING TURNKEY SYSTEMS (5)



## REFERENCES

# ARC WELDING TURNKEY SYSTEMS REFERENCES

BENTELER



BOZ GROUP

Westfalia



Johnson Controls

DAIMLER

KTM

faurecia



Eberspächer



Hoval



PSA PEUGEOT CITROËN

BOYSEN  
INNOVATIONEN ABGASTECHNOLOGIE



bosal

CLAAS



SYMACON



JUNGHEINRICH

TENNECO



GEBERIT

PÖTTINGER



PWO



wanzi

Gestamp



TOWER  
INTERNATIONAL

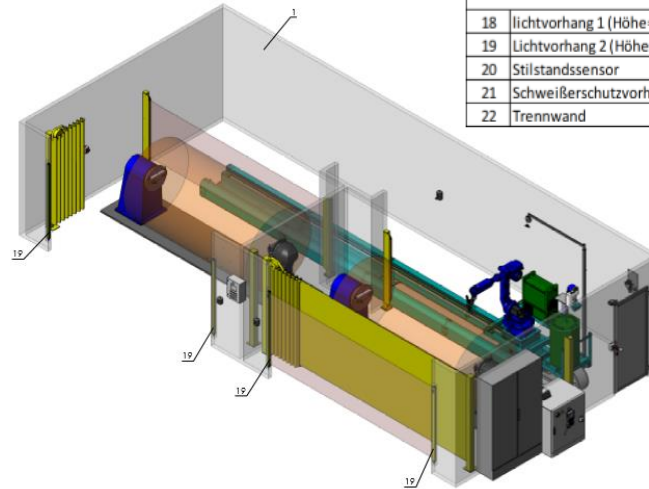
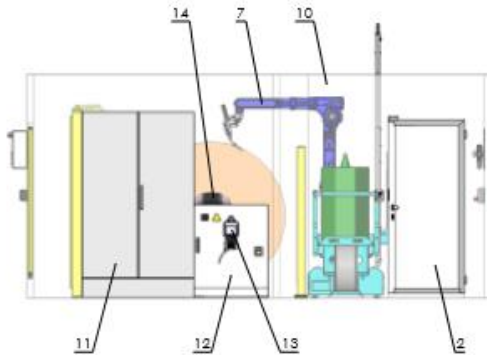
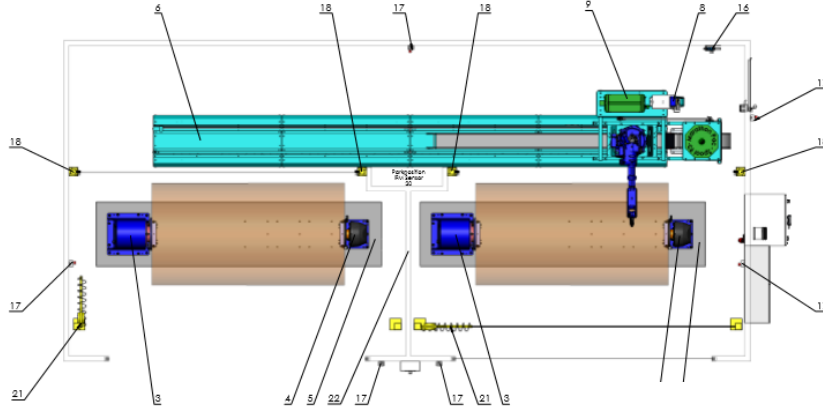


LIEBHERR

VIESSMANN



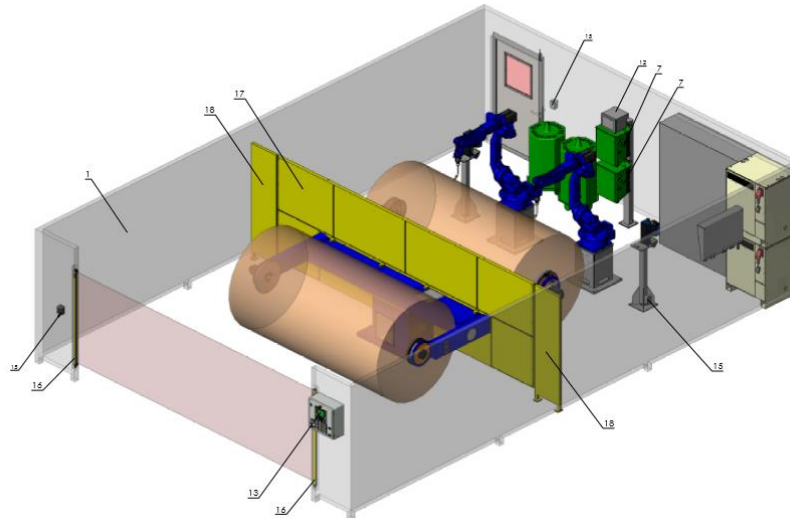
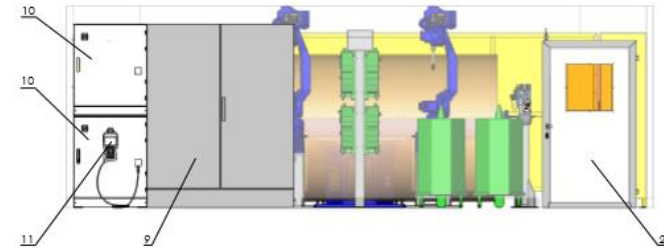
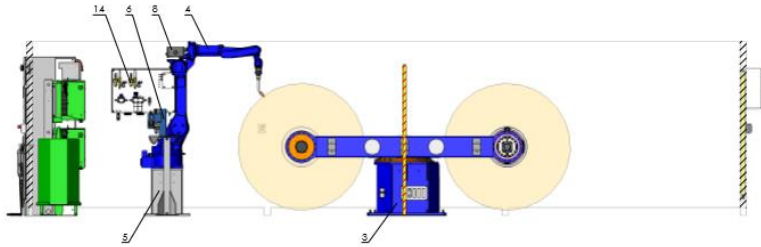
# KONZEPTE WENDER GEGENLAGER , FÜR LANGE TEILE



## Komponentenliste

1	Kabine	1
2	Serviceüre	1
3	WD-1000	2
4	G-1000	2
5	Bodenplatte (WD-G)	2
6	Bodenfahrbahn TSL-1000	1
7	Roboter HP20D-6	1
8	Brennerreinigungsgerät	1
9	Stromquelle	1
10	Drahtvorschubkoffer	1
11	Anlagensteuerung	1
12	Robotersteuerung	1
13	Teachbox	1
14	Schweißprozesssteuerung	1
15	Bedienpult	1
16	Medienanschlussplatte	1
17	Quittiertaster	6
<b>Sicherheit</b>		
18	lichtvorhang 1 (Höhe=1500mm)	2
19	Lichtvorhang 2 (Höhe=1200mm)	2
20	Stillstandssensor	1
21	Schweißerschutzvorhang manuel	2
22	Trennwand	1

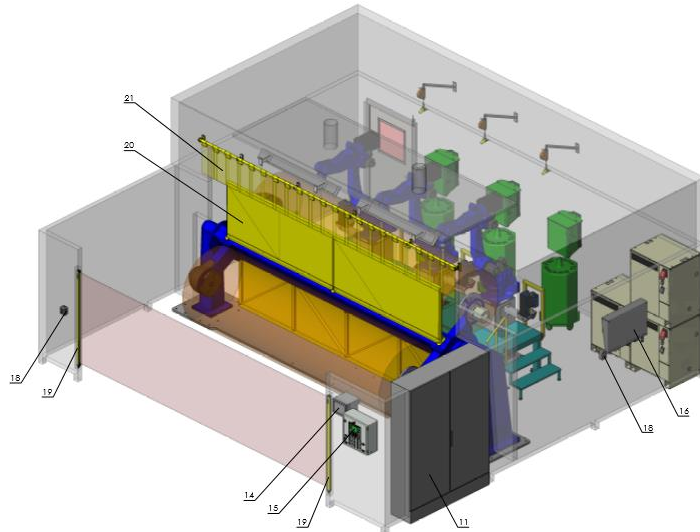
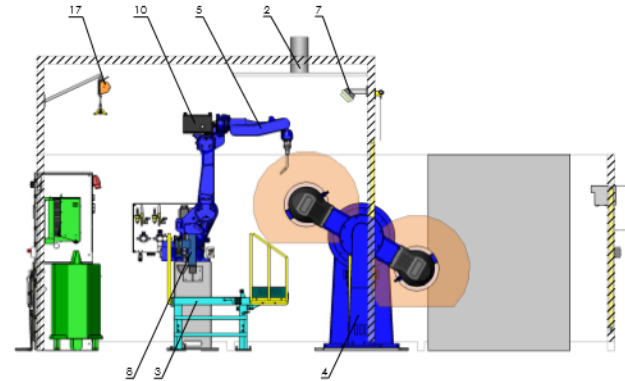
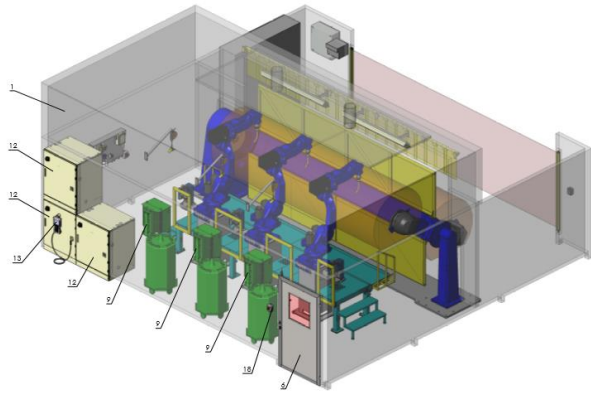
# KONZEPTE RWV-2 (H-TISCH), FÜR KOMPAKTE TEILE



## Komponentenliste

1	Kabine	1
2	Servicetüre	1
3	RWV2	1
4	Roboter	2
5	Robotersockel	2
6	Brennerreinigungsgerät	2
7	Stromquelle	2
8	Drahtvorschubkoffer	2
9	Anlagensteuerung	1
10	Robotersteuerung	2
11	Teachbox	1
12	Schweißprozesssteuerung	1
13	Bedienpult	1
14	Medienanschlussplatte	1
15	Quittiertaster	3
<b>Sicherheit</b>		
16	Lichtvorhang	1
17	Schweißerschutz mitdrehend	1
18	Trennwand	2

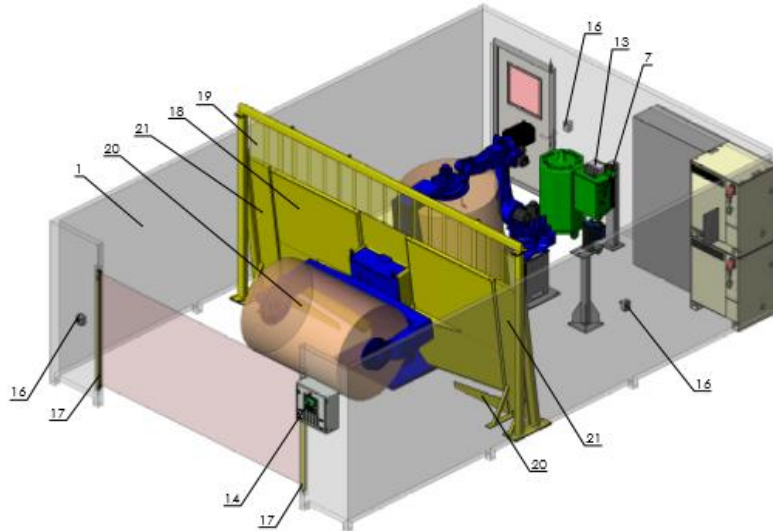
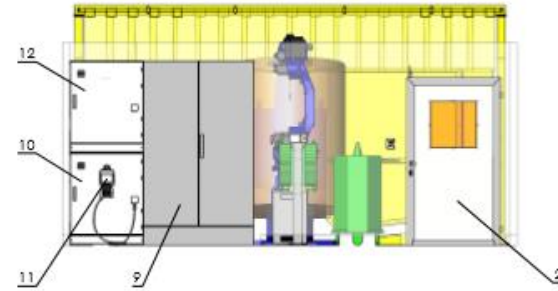
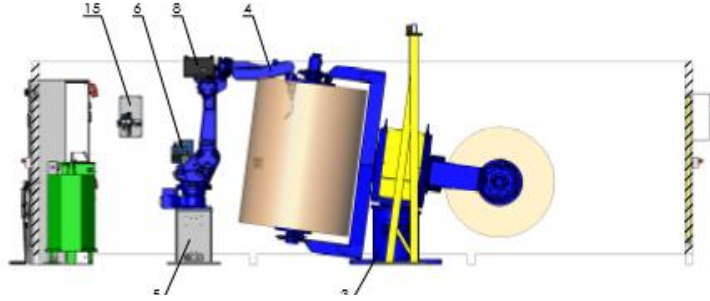
# KONZEPTE WGH-2



## Komponentenliste

1	Kabine	1
2	Absaugsystem	1
3	Programmierbühne	1
4	WGH2	1
5	Roboter	3
6	Servicetür	1
7	Beleuchtung	2
8	Brennerreinigungsgert	3
9	Stomquelle	3
10	Drahtvorschubkoffer	3
11	Anlagensteuerung	1
12	Robotersteuerung	3
13	Teachbox	1
14	Schweißprozesssteuerung	1
15	Bedienpult	1
16	Medienanschlussplatte	1
17	Balancer	3
18	Quittiertaster	3
<b>Sicherheit</b>		
19	Lichtvorhang	1
20	Schweißerschutz mitdrehend	1
21	Schweißerschutzvorhang	1

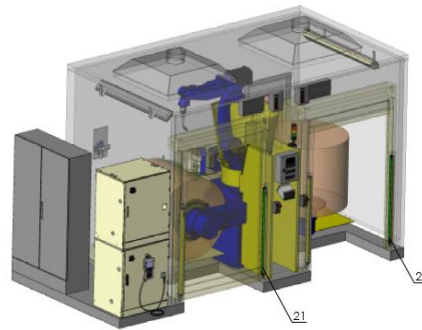
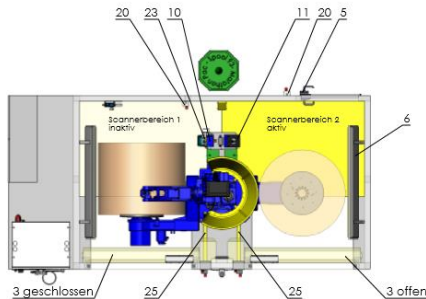
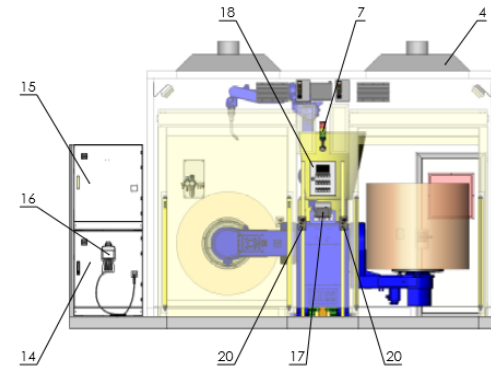
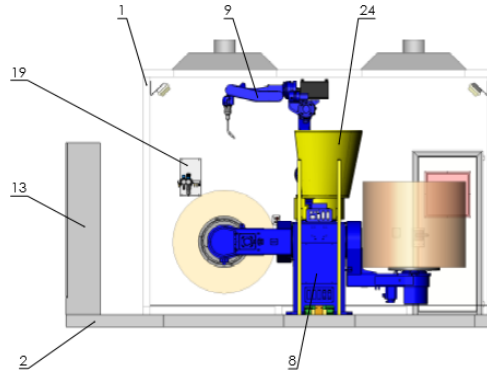
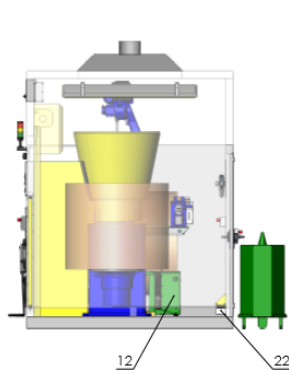
# KONZEPTE R2C, KLEINTEILE, AUFWENDIGE STRUKTUREN



## Komponentenliste

1	Kabine	1
2	Serviceüre	1
3	R2C-250 (Sockel 7,5")	1
4	Roboter	1
5	Robotersockel	1
6	Brennerreinigungsg�r�t	1
7	Stomquelle	1
8	Drahtvorschubkoffer	1
9	Anlagensteuerung	1
10	Robotersteuerung	1
11	Teachbox	1
12	Zusatzschrank f�r externe Achsen	1
13	Schwei�prozesssteuerung	1
14	Bedienpult	1
15	Medienanschlussplatte	1
16	Quittiertaster	3
<b>Sicherheit</b>		
17	Lichtvorhang	1
18	Schwei�erschutz mitdrehend	1
19	Schwei�erschutzvorhang	1
20	Barriere	2
21	Trennwand	2

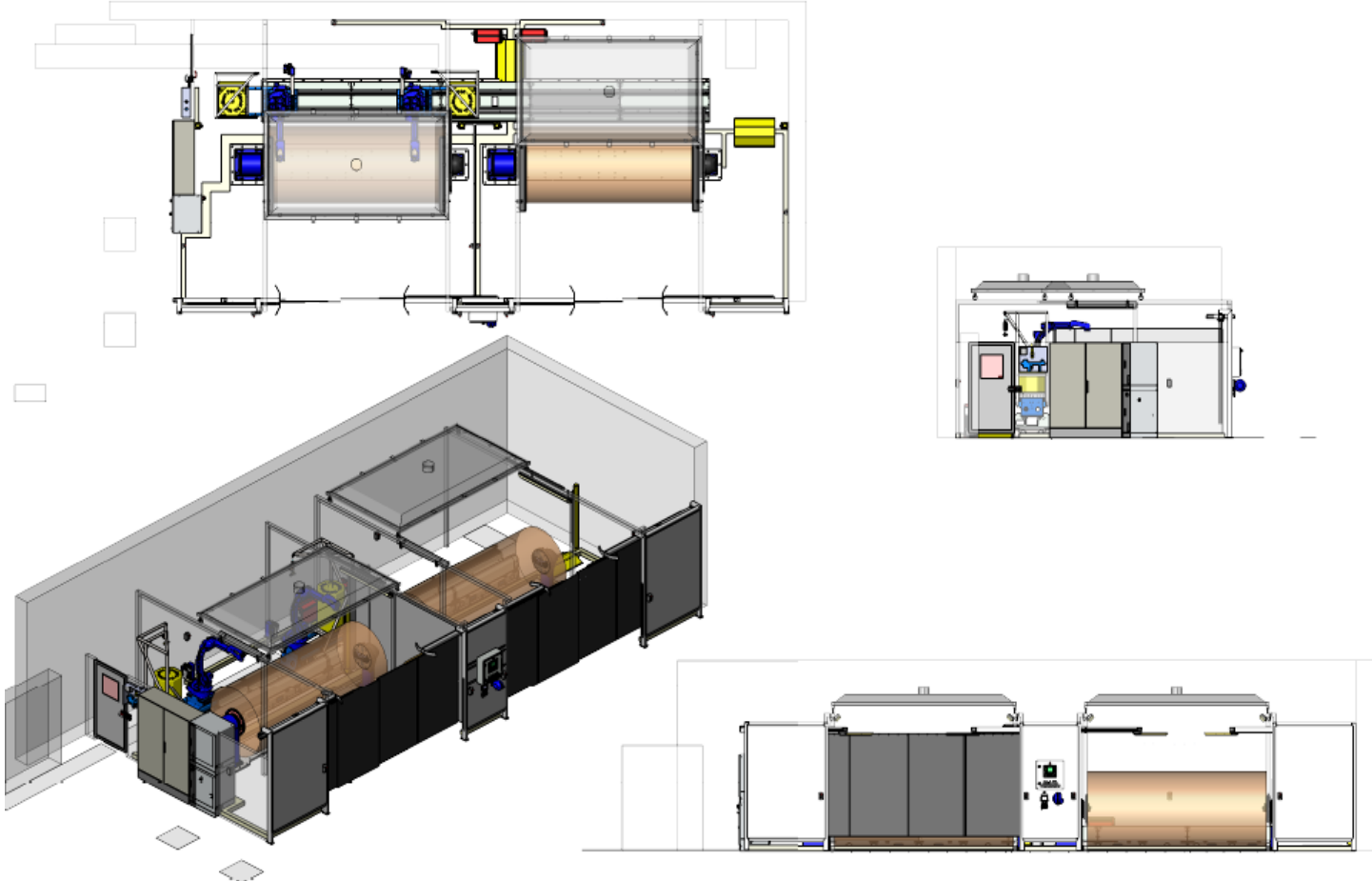
# KONZEPTE KOMPAKTANLAGE B2L, KLEINTEILE



## Komponentenliste

1	Kabine	1
2	Bodenrahmen	1
3	Rolltor mit Steuerung	2
4	Absaugesse	2
5	Serviceüre	1
6	Beleuchtung	2
7	Signalampel	1
8	Positionierer B2L	1
9	Roboter MA1800	1
10	Brennerreinigungsgerät	1
11	Brennervermessung	1
12	Stromquelle	1
13	Anlagensteuerung	1
14	Robotersteuerung	1
15	Zusatzschrank für externe Achsen	1
16	Teachbox	1
17	Schweißprozesssteuerung	1
18	Bedienpult	1
19	Medienanschlussplatte	1
20	Quittiertaster	4
<b>Sicherheit</b>		
21	Lichtvorhang	2
22	Laserscanner	1
23	Stillstandssensor	1
24	Schweißerschutz mitdrehend	1
25	Trennwand	2

# BEISPIEL: WENDER MIT 2 ROBOTERN UND VERSCHIEBBARE ABSAUGESSE



**YASKAWA**