



PIONEERS IN BIW WELDING &
AUTOMATION SINCE 1970



KAY VYBIN CORPORATION

PRODUCT PORTFOLIO

Comprehensive solutions for robotic automation, cable management, and resistance welding equipment



KVC DRESSPACK RETENTION SYSTEM

Spring-Based Retract

Kinking Protection









Durable Mechanism



Why KVC Dresspack?

Meticulously engineered to protect cables while eliminating interference and kinking during robot operation. Our system addresses critical pressure points on each axis to provide a flexible yet durable solution for cable management.

Key Benefits

-  Increased Longevity
-  No Kinking
-  Flexibility in Applications
-  Easy Installation
-  Wider Range of Motion
-  Cost Effective Durability
-  Higher Resistance & Safety
-  Make in India Initiative

36-70mm

Diameter Range

100%

Robot Compatibility

24/7

Support Available

KEY FEATURES

Flexible & Durable

Material comp curated to be resistant to sharp movements and harsh environments, yet flexible for all applications

Smooth Operation

Frictionless movement reduced kinking, breakages, and cable damage

Versatile Compatibility

Works with ABB, Fanuc, KUKA, Yaskawa and all major brands

Enhanced Precision

High-quality linear guides for precise, repeatable movements

Compact Design

Easy installation into existing setups without major modifications

Reliable Retract Stroke

Consistent 400mm retract stroke at affordable cost

Made in India Product

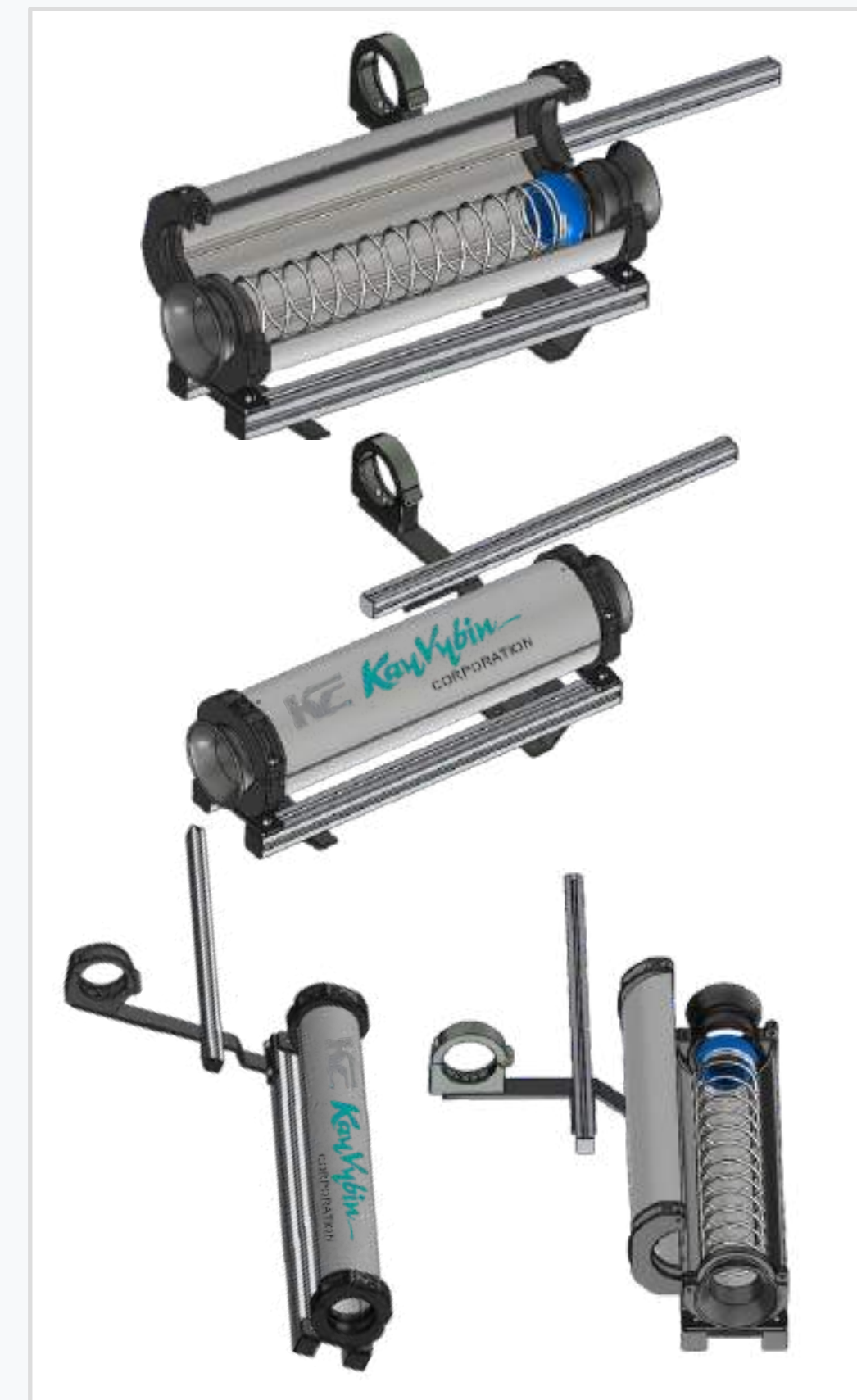
In-house design and assembly using advanced global raw materials ensures low cost yet highest quality

Speedy Service

Localised in-house parts guarantee short lead times for service and spares

High Payload Capacity

Suited for heavy-duty applications



TECHNICAL SPECIFICATIONS

SIZE	DIMENSIONS (mm)	WEIGHT
NW 70	175 x 200 x 650	14.9 kg
NW 52	145 x 150 x 650	8.65 kg
NW 36	105 x 140 x 650	6.2 kg

MATERIALS

Aluminum Alloy
Stainless Steel, PVC
Black Anodized Finish

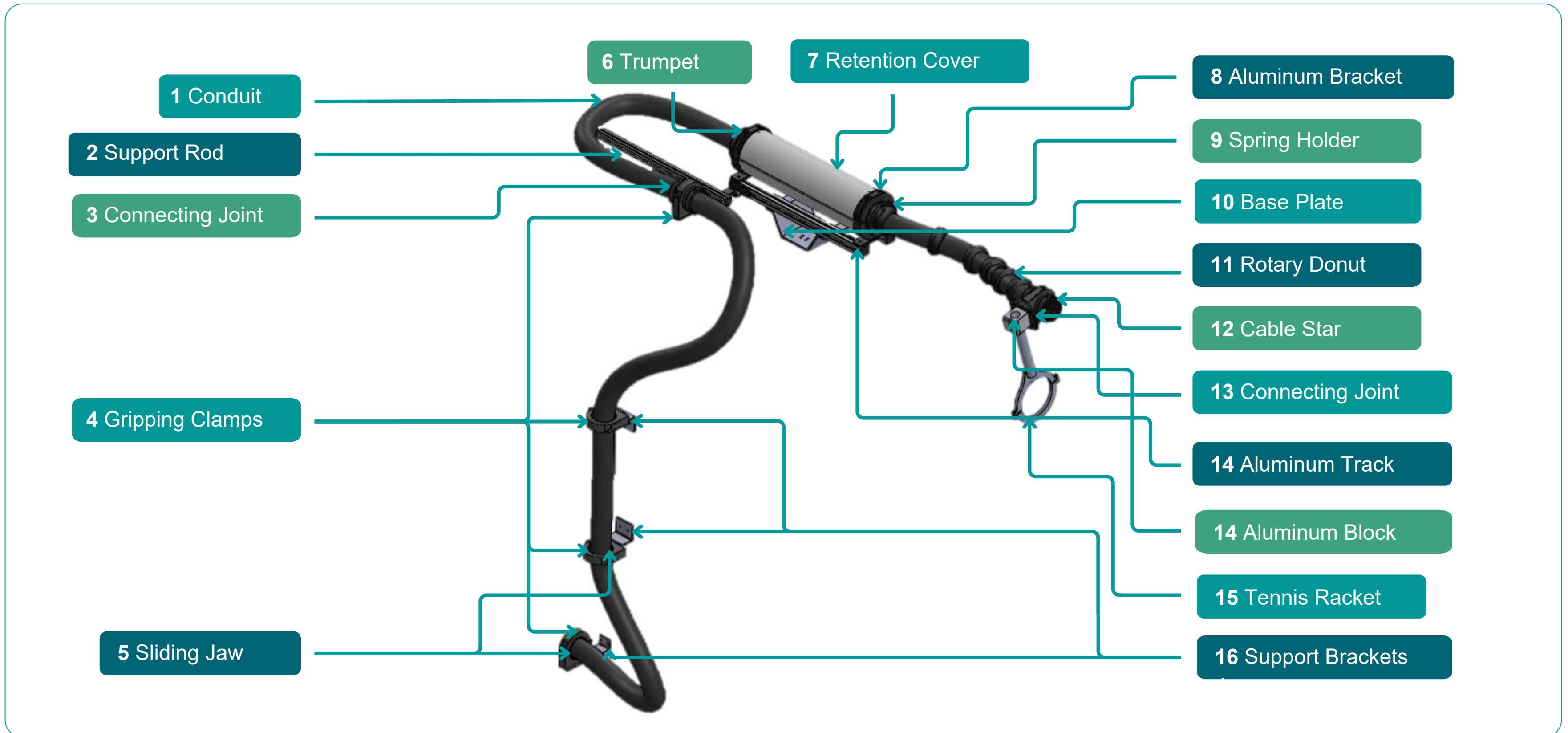
RETRACT STROKE

400 mm stroke
Long & efficient
movement

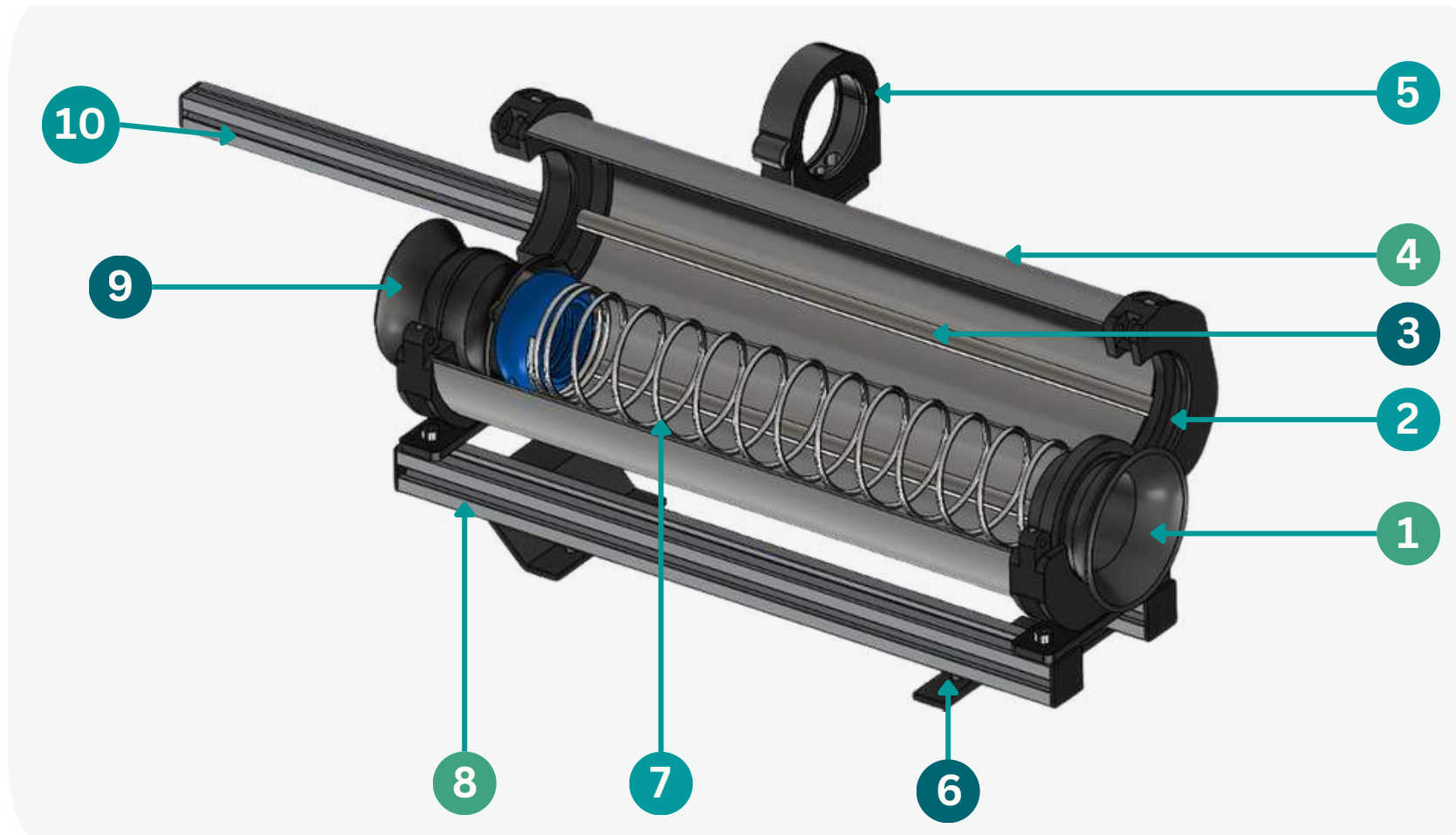
COMPATIBLE ROBOTS

ABB, Fanuc, KUKA
Yaskawa & all major
robot brands

DESIGN DETAILS

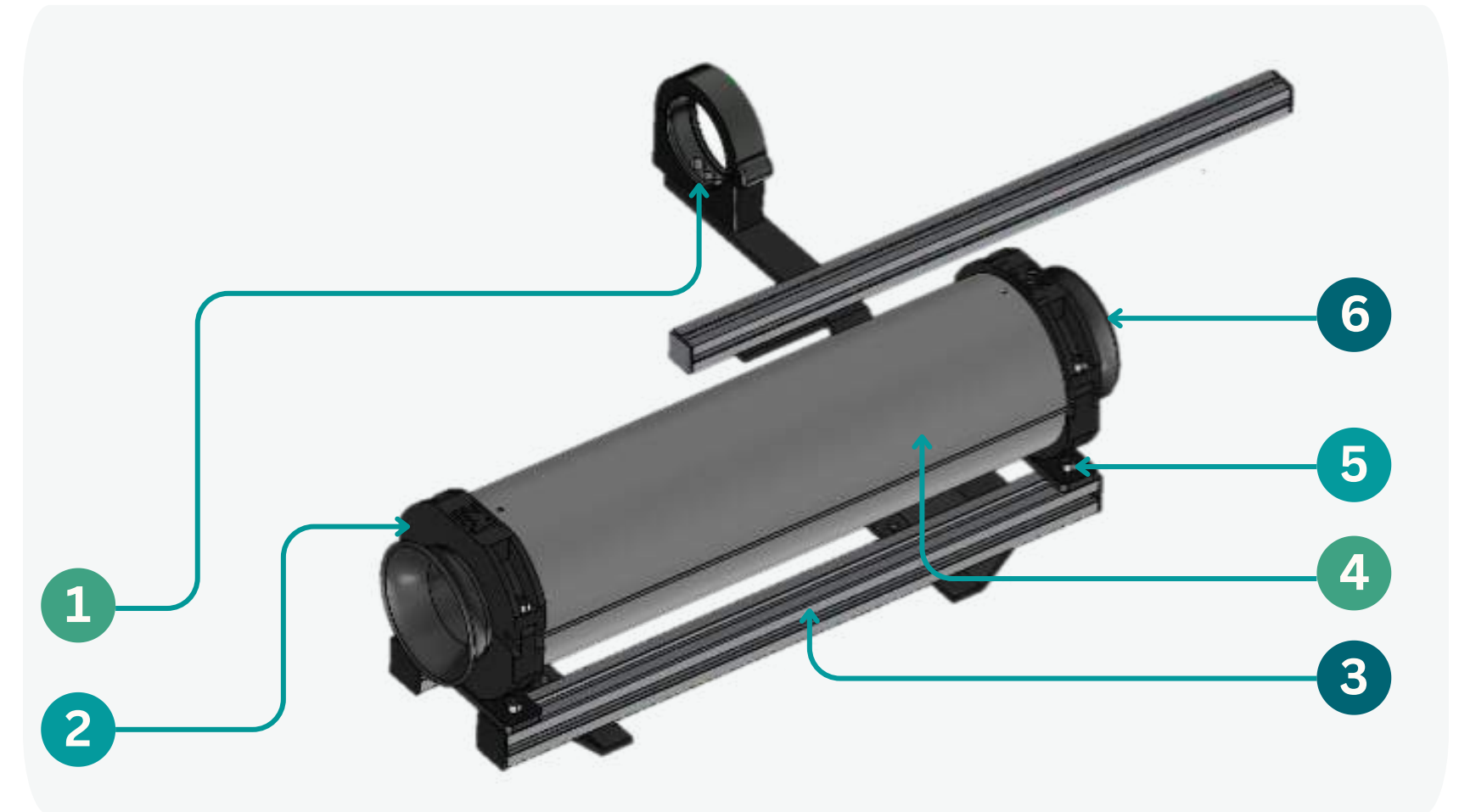


DESIGN DETAILS



- | | |
|--------------------------|---------------|
| 1. SPRING HOLDER | 6. BASE PLATE |
| 2. ALUMINIUM BRACKET | 7. SPRING |
| 3. STAINLESS STEEL GUIDE | 8. BASE TRACK |
| 4. PROTECTIVE COVER | 9. TRUMPET |
| 5. HOLDING BRACKET | 10. SUPPORT |

[Retention Assembly - Inner Detail]



- | | |
|----------------------|---------------------|
| 1. SUPPORT BRACKET | 4. RETENTION COVER |
| 2. ALUMINIUM BRACKET | 5. TRACK BASE |
| 3. ALUMINUM TRACK | 6. ALUMINUM BRACKET |

[Retention Assembly - Outer Detail]

DESIGN DRAWINGS



Watch Now: <https://youtu.be/PytXmyc3JB0>



Complete Dresspack Retention System

Engineered for seamless cabling—install in minutes, let your robot run for years.

Dresspack In Detail

Watch Now: https://youtu.be/_mjWud9WXqA?si=TmTXjRH-IAYQ1IAb



KVC Dresspack Retention System

Durable | Flexible | Cost-Effective | Made in India

BUSINESS BENEFITS

Make In India Strategy with Kay Vybin Dresspack

Shorter Leadtime

Reduced lead time for spares, integration service, and maintenance due to a 24/7 available team. Production lines run smoothly without interruptions, even during installations and service.

In-House Spare Parts

Durable and flexible German-engineered components locally stocked are offered at the lowest costs without transportation shipping charges. Localized assembly also allows for easy and quick supply.

Cost Effective Solution

The system is made using high-tech German components and assembled in-house. It benefits from Make in India scheme and is significantly more affordable without compromising on the highest quality.

Customized Flexibility

Dresspacks made to match customers' specific robotic application needs, ensuring necessary cables move flexibly without any interference or breakages.

LUVATA

LUVATA · USA

LUVATA SPOT WELDING ELECTRODES



Oxygen Free Copper

Durability Tested

Superior Welding Performance

THE LUVATA ADVANTAGE



Importance of Precise Welding in Global Automotive Production

Luvata's Promise

90M+

Vehicles Produced Globally (2025)

5,000

Avg Spot Welds Per Vehicle

450B+

Total Welds Globally



97%

On-Time In-Full Delivery (OTIF)

2-10

Days Lead Time (Stock Items)

50+

Years of Industry Experience

Streamlined Lean Supply Chain Set up Globally

- 6 manufacturing plants across 4 continents
- Own copper & chromium raw material supply
- 70+ years of electrode cap expertise
- Widest product range in the industry

Fully Cold-Formed Electrodes

- Malleable, excelling in electrical and thermal conductivity oxygen-free copper
- Superior grain structure vs machined caps
- Higher hardness & longer tip life
- Consistent performance weld after weld
- Reduced tip dressing frequency

Trusted by All Major Global Automotive OEM

- Trusted by all major global OEMs
- Direct supply to Tier 1 & Tier 2 suppliers
- Approved vendor across multiple platforms
- Proven in high-volume production lines
- Supporting EV & traditional programs

OFE-OK®

Certified High-Purity C101 Copper

Oxygen-Free Copper Tech

- 101.5% IACS electrical conductivity — the purest commercial grade
- Impurity content below 40 ppm (0.0040%) for maximum purity
- Immune to hydrogen embrittlement
- Exceptional thermal conductivity, formability & impact strength
- Ideal for precision industrial applications

Zero

Weld Spatter

Spatter-Free Weld Quality

- Electrode material selection eliminates costly weld spatter
- Better weld quality with less rework and reduced component testing
- Lower maintenance costs and dressing cycles from cleaner welding
- Reduced PPE damage & health risks
- Increased production uptime and reduced power consumption

ISO 9001

Certified Quality Management

Quality Assurance

- ISO 9001:2015 certified across all manufacturing facilities
- Complete material traceability from raw material to finished cap
- Metallurgical lab testing at every plant
- Industry-leading consistency standards

WHY LUVATA?

Own Raw Materials
Copper & Chromium Supply

OFE-OK® Certified Purity
101.5% IACS Conductivity

Spatter-Free Solutions
Proven at Major OEMs

Z-Trode®

The ideal cap electrode for resistance welding of light-to-medium gauge coated and uncoated steels and aluminum alloys

CDA Alloy C15000 Zirconium Copper



85% IACS

1080°C MP

367 W/m.K

Prevents Sticking

Zirconium discourages zinc alloying on the weld face — no special dressings or increased power needed for coated materials.

Resists Mushrooming

Superior conductivity allows lower current settings and less heat, greatly improving resistance to mushrooming vs CuCrZr alloys.

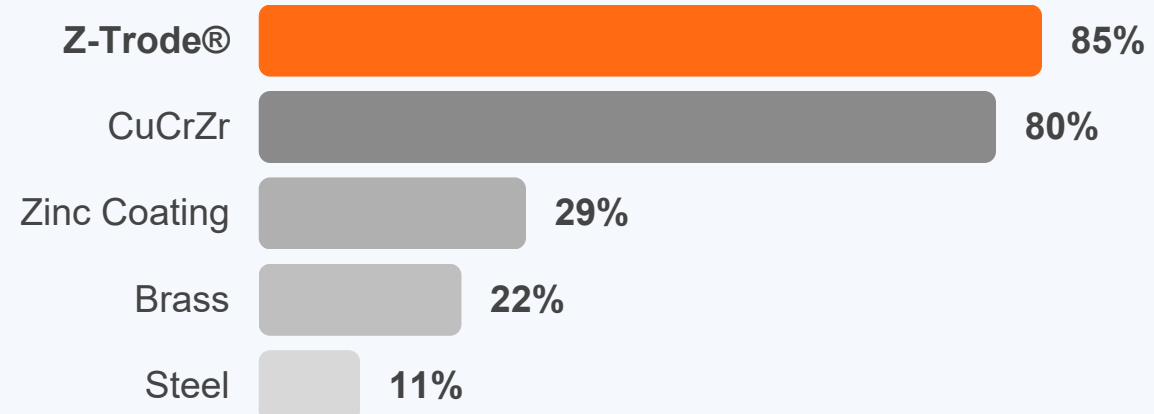
Requires Less Energy

Up to 20% weld current reduction compared to conventional CuCrZr and CuCr settings — with no loss in weld integrity.

Reduces Downtime

No warm-ups or preparation after electrode changes. Extended life expectancy with significantly lower maintenance requirements.

Conductivity Comparison (IACS @ 20°C)



Key Specifications

Alloy	C15000 CuZr
Composition	Zr 0.15%, Cu bal.
Conductivity	Min. 85% IACS
Hardness	Min. 65 HRB
Tensile Strength	≥ 420 N/mm ²
Thermal Cond.	367 W/m.K
Melting Point	~1080°C
Standards	ISO 5821

A-Trode®

The universal cap electrode for resistance welding of light-to-medium gauge-coated and uncoated steels

CDA Alloy C18150 CuCrZr | RWMA Class II



80% IACS

500°C Soft.

320 W/m.K

Proprietary Billet Casting

Oxygen-free casting process enables optimal chrome and zirconium alloying, producing a superior fine grain structure vs conventional CuCrZr

Superior Grain Structure

Luvata's fine grain CuCrZr delivers higher hardness retention at elevated temperatures — extending electrode life under demanding weld cycles.

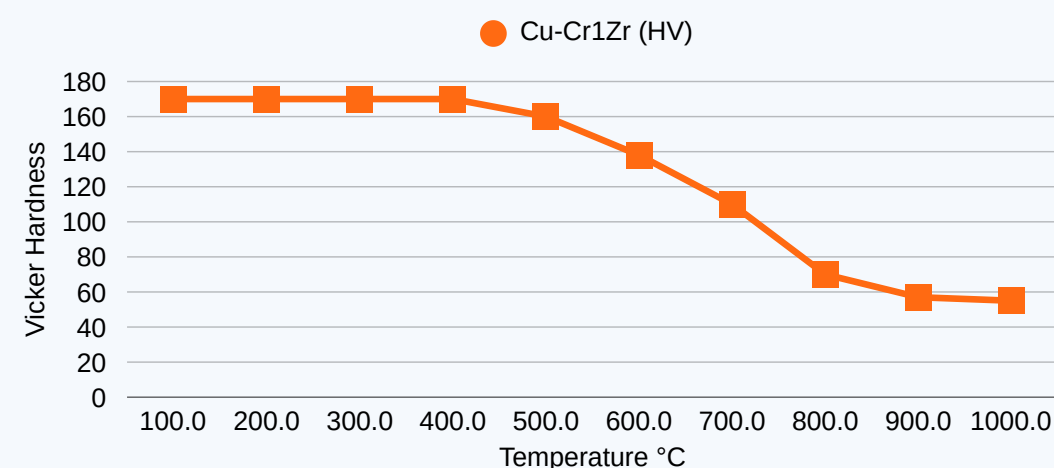
Versatile Applications

Ideal for coated and uncoated steels. Suited for male/female electrodes, backing dies, seam welding wheels, and projection welding.

Cold-Formed & Machined

Electrodes are cold headed or machined to suit any required shape. Custom electrodes manufactured to customer drawing with ISO 5821 compliance.

Vicker Hardness vs Temperature



Softening temperature: min. 500°C — retains hardness far longer than standard alloys

Key Specifications

Alloy	C18150 CuCrZr
Standard	EN ISO 5182 A2/2
Conductivity	Min. 80% IACS
Hardness	Min. 75 HRB
Tensile Strength	≥ 490 N/mm ²
Yield Strength	≥ 430 N/mm ²
Elongation	≥ 15%
Thermal Cond.	320 W/m.K

H-Trode™

The ideal cap electrode for resistance welding of 5000, 6000 and 7000 grade aluminium components

5000 | 6000 | 7000 Grade Aluminium



92% IACS

Cold-Formed

Non-Stick

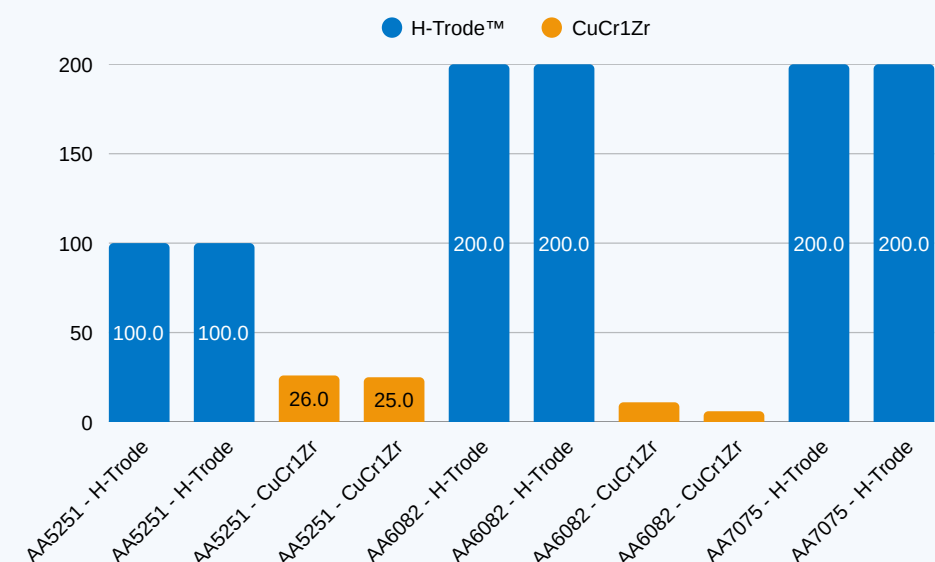
Compatible Equipment

Works with conventional spot welding equipment — no expensive alternative solutions needed. Enables stable aluminium welding on existing lines.

Increased Productivity

Significantly higher output vs alternative joining methods. Standard dressing equipment maintains optimal weld quality throughout production.

Number of Welds Produced without Sticking



Non-Stick Performance

92% IACS conductivity ensures maximum resistance stays between aluminium sheets, reducing heat at the electrode face and eliminating sticking.

Most Cost-Effective for Aluminium

Extended life expectancy, lower maintenance, and consistent quality welds deliver the highest ROI for aluminium welding applications.

H-Trode Welding Process

5000 Series Al

100

spot welds before dressing

6,000

spot welds: electrode life

6000/7000 Series Al

200

spot welds before dressing

12,000

spot welds: electrode life

Nitrode®

Unmatched captip for cost-effective, high-quality performance in resistance-welding applications

C15760 CuAl₂O₃ | RWMA Class 20



78% IACS

1083°C Soft.

160 HV

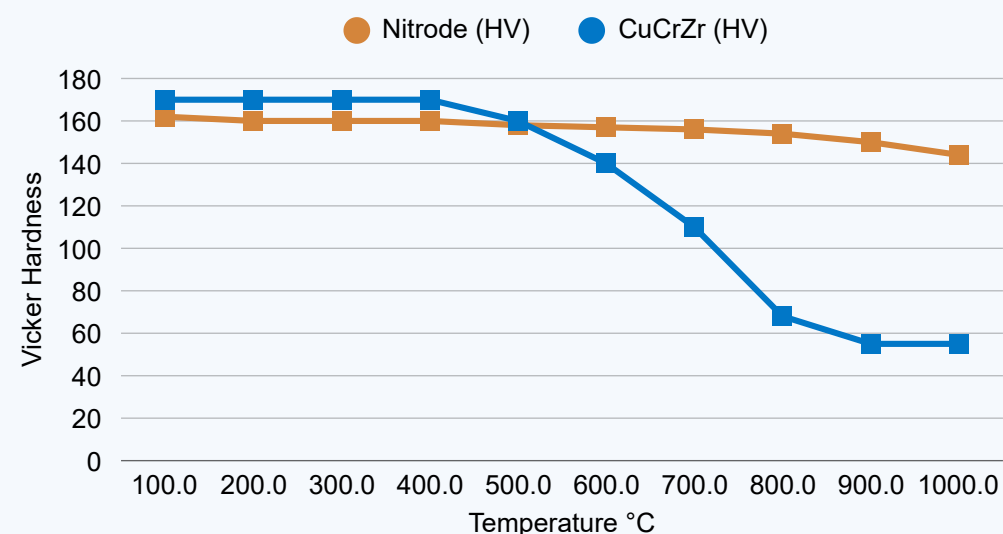
Longer Weld Life

Resists annealing at temperatures up to 900°C. Resists mushrooming on the contact surface, allowing far more welds before tip dressing or tip change.

Reduces Energy by 10%

Up to 10% current reduction with no loss of weld quality. Smoother startups with no warm-ups, meaning fewer electrode changes and less downtime.

Hardness at High Temperatures



Non-Stick Properties

Al₂O₃ refractory qualities reduce infusion of liquid and gaseous zinc into the copper matrix — reducing sticking on galvanized and coated metals.

Works on All Steels

Superior performance on HSS, HSLA, micro-alloyed, nitrogenized, low-carbon, electrolytically zinc-coated, galvanized, and other steel grades.

Key Specifications

Alloy	C15760 CuAl ₂ O ₃
Standard	EN ISO 5182 C20/1
Conductivity	78% IACS
Hardness	83 HRB / 160 HV
Tensile Strength	489–537 MPa
Yield Strength	393–441 MPa
Elongation	18–23%
Softening Temp.	1083°C

Luvaweld®

MIG and Braze Welding Wire

Wire Characteristics

- ✓ Seamless construction
- ✓ Tangle-free feeding
- ✓ Consistent roundness & diameter
- ✓ Homogeneous composition
- ✓ Contaminate-free quality



3 Alloys

0.8–3.2mm

AWS

Technical Support

Experienced technical support with on-site assistance. Kay Vybin are Luvata experts ready to help optimize wire selection and welding parameters for your application.

Global Supply Chain

Single integrated global supply chain ensures consistent availability. Customer-specific wire manufactured to meet exact specifications.

High Quality Complete Solution

One-stop shopping for MIG brazing wire, brazing tips, and resistance welding electrodes. Fully integrated production from raw material to finished product.

Customer Specific Wirte

Luvata works directly with your engineering team to tailor alloy composition, precise diameter tolerances, and custom packaging configurations for an optimal solution

Wire Specifications — 3 Alloy Options

	CuSi3Mn	CuAl8	CuAl10Fe
CDA	C65600	C61000	C61800
AWS A 5.7	ER CuSi-A	ER CuAl-A1	ER CuAl-A2
Tensile (MPa)	330–370	390–450	390–500
Hardness (HB)	80–90	100	140
Density (kg/dm ³)	8.5	7.7	7.5
Solidus (°C)	910	1030	1030
Liquidus (°C)	1025	1040	1090

Wire Diameters

0.8mm	0.9mm	1.0mm
1.2mm	1.6mm	2.0mm
2.4mm	3.2mm	

Wire Diameters

Spools: 4.5–15 kg | Drums: 100–227 kg

WHY SPLATTER MATTERS?

The Cost of Spatter

Molten metal particles expelled during spot welding damage equipment, reduce weld quality, and create costly downtime.

✗ PPE Damage & Replacement

✗ Equipment Repair & Maintenance

✗ Production Down-Time

✗ Poor Weld Quality

✗ Higher Power Consumption

✗ Health & Safety Risks

The Luvata Solution

With Luvata's expertise in electrode material selection and welding parameter optimization, spatter can be eliminated — delivering measurable savings.

✓ Better Weld Quality & Less Rework

✓ Lower Maintenance & Equipment Costs

✓ Increased Production Uptime

✓ Reduced Power Consumption

✓ Safer & Cleaner Environment

✓ Less Component Testing Required



<https://www.youtube.com/watch?v=RstpOxetyKw>



Nissan's Journey Towards Spatter-Free Welding

UK's largest car producer for 15 consecutive years | Biggest exporter for 13 years

£3.5B

Investment

6,000

Staff

2,000

Cars/Day

The Plant

NMUK produces the Qashqai, Note, Juke, and the 100% electric Nissan Leaf. The Body Shop is a highly-automated section with over 800 robots where pressed panels are welded together to create complete body shells.

4,000

Spot Welds Per Vehicle

800+

Robots in Body Shop

The Challenge

NMUK spent significant resources on problems directly caused by spatter — damage to sensors, cables, jigs, clamps, and mechanical drives. Manual removal of spatter added further costs and production delays.

"We switched to Luvata electrodes, but mainly focused on cost benefits, not the long-term costs of spatter. Luvata was persistent in explaining we needed to consider those costs as well."

— Weld Team Supervisor, NMUK

The Result

Working with Luvata, NMUK selected the correct electrode material and fine-tuned welding parameters to achieve spatter-reduced welds — across multiple alloys and steel grades used in production.

"Based on our production requirements and working closely with Luvata, we were able to pick the right electrode for us. It resulted in a spatter-reduced weld."

— Weld Team Supervisor, NMUK

1 Correct Electrode Material Selection

2 Optimized Welding Parameters

3 Spatter-Free Welds Across All Models



REIKU · GERMANY

REIKU CABLE MANAGEMENT SYSTEMS



Seamless System Integration

German Engineering Precision

Maximum Cable Service Life

COMPANY PROFILE



German-Engineered Cable Protection Systems Since 1969

Who We Are

REIKU develops, produces, and markets cable protection systems for mechanical, chemical, and thermal protection of electrical leads and cables. Founded in 1969 in Germany, REIKU has evolved from a niche zip-on-plastic hose manufacturer into one of the world's leading specialists in complete cable protection systems.

50+

Years of Systems Experience

4,000+

Articles in Central Warehouse

30+

Countries Distributed

Certifications & Standards

ISO 9001

TÜV Certified

CSA

UL

CE

RoHS

REACH

DNV

In-House Manufacturing

Own development, processing, and production facility in Wiehl, Germany — 40km east of Cologne. Full control from raw material formulation to finished cable protection systems.

Robotics Expertise

30+ years working with robotics manufacturers to develop application-specific solutions. Specially formulated materials and unique product geometry for long-lasting performance.

Global Distribution

Central warehouse with 4,000+ articles for fast worldwide delivery. Independent distribution partners across 30+ countries — no waiting time, no production loss.

Chemical & Thermal Resistance

Specially modified high-quality materials resistant to solvents, bore oil, lubrication oil, ASTM oils, fuels, and grease. Optimal component protection in the harshest environments.

REIKU — Cable Protection | System Sheathings | Heat Protection | Fine Braiding

PRODUCT RANGE



Complete Cable Protection Solutions for Every Application



Automation & Robotics

Purpose-built cable protection for robotic arms and automated production lines. Specially formulated materials for continuous motion and high-cycle applications.



Cable Protection Systems

Complete conduit systems with quick-fit connectors and stackable supports. Robust yet flexible corrugated tubing for mechanical, chemical, and thermal protection.



System Sheathings

Zip-on plastic sheathings for bundling and protecting cable harnesses. Quick installation and easy access for maintenance — REIKU's original innovation since 1969.



GL-Heat Protection

Specialized thermal protection systems for high-temperature environments. Shields cables and leads from extreme heat in welding, foundry, and heavy industrial applications.



Fine Braided Tubings

Precision braided protective tubing for delicate cables and sensitive electronics. Excellent flexibility with superior abrasion resistance for demanding environments.

The REIKU System Advantage

Robust yet flexible corrugated conduits + easy-to-assemble quick-fit connectors + stackable system supports = a complete, well-protected cable management system built for speed & adaptability.

Quick Assembly

Snap-fit connectors for rapid installation and easy cable access during maintenance

Easy Adaptation

Special lock technology makes reconfiguration and equipment changeovers effortless

Modular Design

Stackable, joinable system supports for flexible routing and clean cable management

Global Availability

4,000+ articles in stock, fast delivery worldwide with zero production downtime

Purpose-Built Cable Protection for Industrial Robots & Cobots

30+ Years of Robotics Experience

REIKU works closely with robotics manufacturers to develop customer-oriented solutions. All robotics materials have been specially formulated to offer optimum performance in continuous motion, high-cycle applications.



High-Cycle

Multi-Axis

Robot Cable Protection

Complete conduit systems designed for the unique motion profiles of 6-axis industrial robots. Specially formulated materials withstand continuous flexing and torsion across millions of cycles.

Cobot Cable Protection

Lightweight, compact cable management for collaborative robots. Designed for safe human-robot interaction zones with smooth surfaces and flexible routing in tight spaces.

Fasteners & Accessories

Robot-specific mounting brackets, clamps, and fasteners for clean cable routing along robot arms. Quick-change capability for minimal downtime during maintenance.

Retraction Springs

Spring-loaded cable retraction systems that keep conduits tensioned and organized during robot movement. Prevents cable snagging and extends cable life significantly.

Kink Protection & Jointed Tubing

Connectors with integrated spring kink protection for high-flex zones. Jointed tubing sections allow controlled articulation at robot joints and axis points.

Unique Geometry Advantage

REIKU's proprietary conduit geometry combined with specially formulated robotics materials guarantees long-lasting protection — even in the most demanding automated environments.

CABLE PROTECTION SYSTEM



High-Tech Polyamide Cable Protection — Conduits, Holders & Fittings



Corrugated Conduits

- Standard cable protection tubings
- Two-part divisible conduits
- Nominal widths 4.5 to 90mm
- Polyamide 6 — self-extinguishing
- Halogen-free flame protection
- Small bending radius, no cross-section change
- Torsion-free assembly with parallel grooves



Reliable Holders & Connectors

- Gripping Clamps
- Tube Clamps
- Straight connectors, 90° and 45° elbow connectors
- Female thread. Full metal connectors
- EMC shielded connectors
- Distributors & multi-feed (UNI®)
- Push-in & strain relief connectors



System Supports & Accessories

- Stackable & joinable system supports
- Tube clamps for secure routing
- Reducers and enlargers
- Hexagonal lock nuts & plug screws
- Self-secured lock connectors
- Cable glands & seals
- Corrugated tube trimmer tool

Protection Ratings

IP65 — IP x8

With complete sealing (5 bar)

IP54

Without sealing

Vibration-resistant connections

Torsion-free mounting

Metal-free system available

Polyamide 6 Material

- ✓ Self-extinguishing — naturally flame resistant
- ✓ Halogen-free flame protection additive
- ✓ Cadmium-free colouring — no toxic gases
- ✓ Resistant to solvents, oils & fuels
- ✓ Bore oil, lubrication oil, ASTM oil resistant
- ✓ Resistant to power fuels & grease

Industries Served

Aerospace

Railway

Commercial Vehicles

Shipbuilding

Mechanical Engineering

Robotics

Electronic Installation

General Industry

GL HEAT PROTECTION



Reliable heat protection for cables and components exposed to radiated heat exceeding 1000°C. Three material ranges from +350°C to +800°C — available as fabric, strips, tubes, or custom-shaped form pieces. Sewn with REIKU stainless steel special yarn.

GLASO

+350°C

Aluminium-laminated glass fabric

Tough but elastic glass fabric with aluminium coating that reflects up to 90% of radiated heat. Interior is sealed against water absorption. Resistant to oils and fuels.

- Density: 2.55 g/cm³
- Tensile: 4,000 N/50mm
- Melting: ~850°C
- Non-flammable

Fabric (2 thicknesses), strips (6 widths), tubes up to Ø300mm
Closure: Velcro & press studs (D-closure)

GLASIL

+650°C

Aluminium-laminated silicium fabric (SiO₂)

Elastic silicium fabric with one-side aluminium lamination. No asbestos. Resistant to oils, acids, and virtually unlimited industrial applications.

- Tensile: 700 N/50mm
- Melting: ~1,600°C
- Non-flammable
- Asbestos-free

Fabric (2 thicknesses), strips (6 widths), tubes up to Ø280mm
Closure: Velcro closure

KEVLAR®

+800°C

Para-Aramid/KEVLAR® with aluminium transfer foil

DuPont KEVLAR® weave with embossed aluminium foil reflecting up to 95% of radiated heat. High cut resistance, UV resistant on coated side.

- Density: 1.44–1.45 g/cm³
- Tensile: 2,500 N/50mm
- Decomp.: >400°C contact
- Hardly combustible (PU coat)

Fabric, strips (6 widths), tubes up to Ø280mm
Closure: Velcro & press studs

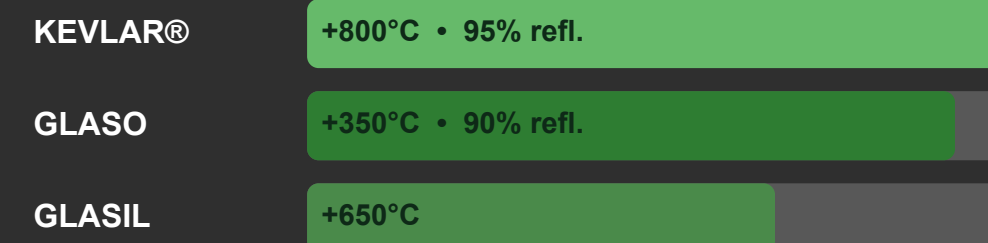
Retrofittable Installation

G-Closure (polyamide velcro with overlap) allows GL heat protection to be fitted at any time to existing installations. Non-flammable closure should face away from heat source. D-Closure (stainless steel press studs) available for GLASO range.

Supply Forms

- ✓ Fabric rolls (multiple thicknesses)
- ✓ Strips in 6 standard widths
- ✓ Tubes in 21 diameters up to Ø300mm
- ✓ Custom form pieces in any geometry
- ✓ Cut with scissors (KEVLAR®: special)
- ✓ Stainless steel REIKU special yarn seams

Heat Reflection & Range



Source heat can exceed 1000°C | All ranges asbestos-free, oil & fuel resistant

FINE BRAIDED TUBINGS



Available in nominal widths 4–60mm | Delivered as running-meter rolls | 85%+ surface coverage | Monofilament Ø 0.27mm

Protect. Bundle. Stay Flexible.

Braided tubings that protect & bundle electrical cables while retaining full flexibility. Expandable to 2× diameter for easy installation on long cable runs. Over 85% surface coverage.

Key Properties

- ✓ Very good abrasion resistance
- ✓ Wide temperature range (–75°C to +450°C)
- ✓ Halogen-free & self-extinguishing
- ✓ PCP, asbestos, cadmium & formaldehyde free
- ✓ HF shielding available (CU FG — 60 dB)
- ✓ Expandable to 2× diameter for easy install
- ✓ Colour-coded for safety-relevant markings



5 Material Types at a Glance

Type	Material	Temp Range	Melting Pt	Application	Flame
PA FG	Polyamide PA 6.6	–40 to +160°C	+245°C	Aviation, Vehicles	Self-ext. Halogen-free
EC FG	E-CTFE (Halar)	–75 to +150°C	+245°C	Aviation, Chemical	UL94 V-0 Halogen-free
PP FG	Polypropylene PP	–30 to +105°C	+160°C	General Industrial	Self-ext. Halogen-free
CU FG	Tinned Copper	–75 to +450°C	+1083°C	HF Shielding 60 dB	Not inflammable
RPET FG	PET (EN 45545)	–40 to +150°C	+255°C	Railways, Transport	Self-ext. EN 45545

Chemical Resistance (PA & EC)

- Crude & hydraulic oils
- Turbine & vehicle fuels
- Aircraft lubrication oils
- Defrosting liquids
- Fire extinguishing agents
- Detergents & general solvents
- Trichloroethane & MEK

FG EA Support System

Stackable and joinable mounting system for braided tubings.

- ✓ Tool-free terminal release from supports
- ✓ Stackable & joinable for flexible routing
- ✓ Pre-assembly ready for switch cabinets
- ✓ Prevents fraying during maintenance
- ✓ Available NW 6–45mm in black & grey

SYSTEM SHEATHINGS



Retrofittable zip-on cable protection — fitted to existing installations in seconds. 3 closure types × 6 sheathing ranges. NATO, German Army & Deutsche Telekom approved. Screened or unshielded, 9–120mm, supplied on 50m reels.

Z-Closure

Standard

Fast and efficient with lightweight hand plier. PVC construction — can be permanently welded with RSQ adhesive for tamper-proof installations.

M-Closure

Heavy-Duty

Designed for large wire bundles or floor-mounted cables. Heavy-duty press closure sealed with M-glide tool or simple finger pressure.

G-Closure

Velcro

Polyamide velcro tape — ideal for confined spaces, frequent access, and special applications. Easy to open and re-close repeatedly.

6 Sheathing Ranges

BEKUM

SKB / SKG

High-quality soft PVC
Mechanical protection
Wall: 0.5mm | Self-extinguishing
Temp: -30 to +80°C

BENYL

ZNB

Vinyl-coated polyester fabric
Mechanical protection
Wall: 0.6mm | Hardly combustible
Temp: -20 to +75°C

B2X-BEKUM

2KB / 2KG

2-ply Cu mesh + PVC
HF screening
Wall: 2.0mm | Self-extinguishing
Temp: -30 to +80°C

B4X-BEKUM

4KB / 4KG

4-ply Cu mesh + PVC
HF screening (heavy)
Wall: 3.5mm | Self-extinguishing
Temp: -30 to +80°C

B2X-BENYL

2NB

2-ply Cu mesh + polyester
HF screening
Wall: 2.0mm | Hardly combustible
Temp: -20 to +75°C

B4X-BENYL

4NB

4-ply Cu mesh + polyester
HF screening (heavy)
Wall: 3.5mm | Hardly combustible
Temp: -20 to +75°C

Key Features

Retrofittable to existing installations

Internal overlap protects closure

Custom cut, slit & perforated

RSQ adhesive for permanent welding

Screened versions: 360° shield with Cu earth wire

Self-extinguishing acid & oil resistant

LH-TC END-OF-ARM TOOLING



Precision End-of-Arm Tooling

Application-Tested Design

Universal Robot Compatibility

COMPANY PROFILE

KEY HIGHLIGHTS

2015

Year Established

¥24.63M

Registered Capital

70+

Patents & 5 Software Copyrights

Listed

China Stock Exchange · Code: 200649

ISO 9001 · CE Certified · SIL Safety Certified



Production Plant (Zhengzhou)

Zhengzhou Linghang Robot Co., Ltd. (LH-TC) was established in 2015, specializing in independent R&D, design, and manufacture of robot End-Of-Arm Tooling (EOAT). Recognized as a National High-Tech Enterprise, Linghang serves as an industry leader in robot EOAT offering advanced high tech solutions at an affordable cost.

CUSTOMERS SERVED

BYD	TOYOTA	NISSAN	FORD
HUAWEI	CHERY	VOLVO	GEELY
XPENG MOTORS	BIW WELDING	HONGQI	GWM

Global presence: Zhengzhou HQ · Shanghai · Germany (Cologne) · Thailand (Rayong) · Poland (Warsaw)

Complete End-Of-Arm Tooling Solutions for Industrial Robotics

Multi Application



Robot Tool Changers

Inclined safety locking structure with special materials. Redundancy signal transmission for stable data transfer. Leak-free fluid connection across millions of operations.



Force Control



Floating Deburring Tools

360° radial floating for universal deburring. 1,000–60,000 RPM electric spindle with auto cutter change. Axial floating compensates work force within $\pm 0.5N$.



Clamping



Pneumatic Grippers

Multi-tooth guide rail + ladder structure for high torque capacity. Unique coating maintains precision through thousands of grinding cycles. Self-lubricating design.



Positioning



Floating Position Compensate Devices

X/Y, Z, X/Y/Z direction compensation. Locks center point and stores position for precise assembly. ISO 9409 interface for simplified integration.



Energy Docking



Energy Coupling Boards

Multi-module interfaces for power, data, I/O, pneumatic and liquid transfer. Ultra-high plug life with super current carrying capacity. Vibration-resistant design.



Connectivity



Utility Couplers

Modular multi-module interfaces for flexible combination. X/Y/Z floating eliminates docking errors. Optional LED indicators for locked/unlocked status confirmation.



ROBOT TOOL CHANGER SERIES



5–3,000kg

Payload Range

3M+

Locking Cycles

100%

Robot Brand Compat.

LH-TC ATCs enable fast, automated switching of end-of-arm tools. The robot side mounts on the robot arm; the tool side attaches to end-effectors. One robot side supports multiple tool sides — enabling transmission of electricity, gas, and liquid while boosting line flexibility and robot utilization.

ADAPTATION MODULES

I/O Signal

Liquid

Electrical Power

High Current

Industrial Bus

High Frequency

Pneumatic

Servo

1

High-Strength Alloy Steel Locking

3M+ cycle durability · Rockwell HRC58 hardness · High-chromium steel balls, magnesium-aluminum shell, Grade 12.9 high-strength bolts

2

Mechanical Safety Self-Lock

Spring holds cam in locked position on pressure loss · Safety reverse-tilt surface neutralizes gravity · Tool plate cannot fall off

3

Low Friction Spring Probes

Max <0.1N friction per probe · Multi-point contact ensures stable signals · Z-axis $\pm 1.5\text{mm}$, XY 0.1mm, 0.5° angle compensation

4

Built-in Arc Extinguishing Module

High-stability chip with locking/unlocking sensor control · Non-energized probe contact and separation · Protects contact points under hot-swap

5

Active + Static Redundant Signal Design

Dual-channel redundancy ensures operation even if one channel fails · Optimized for complex factory environments and multi-axis robots

6

Self-Sealing Fluid Connector (Patented)

Auto-seals water/air on disconnect · Scale self-cleaning via circumferential seal slide · 25L/min flow rate · Seal replacement in seconds

TOOL CHANGER: HIGHLIGHTS & SETUP

DIRECT ROBOT INTERFACE CONNECTION



FANUC

Robot Adapting Module

Industrial bus, DeviceNet, arc-proofing, heat-resistant insertion, fast connection & tool ID



YASKAWA

Robot Adapting Module

Industrial bus, tool ID — interface matches perfectly with YASKAWA robot connectors



ABB

Robot Adapting Module

Profibus, DeviceNet, ProfiNet, servo power, encoder signal, tool ID — seamless compatibility



KUKA

Robot Adapting Module

Servo power, encoder signal, voltage & temperature feedback — matches KUKA servo interface

Also compatible with: ESTUN · NACHI · INOVANCE + all other robot brands | 100% of robot electrical interfaces on the market — standardized or customized

HOW TO SELECT A TOOL CHANGER

Robot Payload

Tool changer payload must be greater than or equal to the robot's payload rating.

Torque Check

Calculate the static torque from tool center of gravity distance to the tool side surface. Use this to confirm the correct model

Optional Modules

Select modules based on media required by end tool: electrical, bus, servo, high-frequency, water/air modules available.

Locking Non-contact

Non-contact locking activates at 2.5mm distance. ISO 9409 standard flange for convenient installation.

ADDITIONAL HIGHLIGHTS

Anti-Stuck Positioning

Anti-jamming positioning pin structure — locking and separation are smoother and easier to debug.

LED Status Visibility

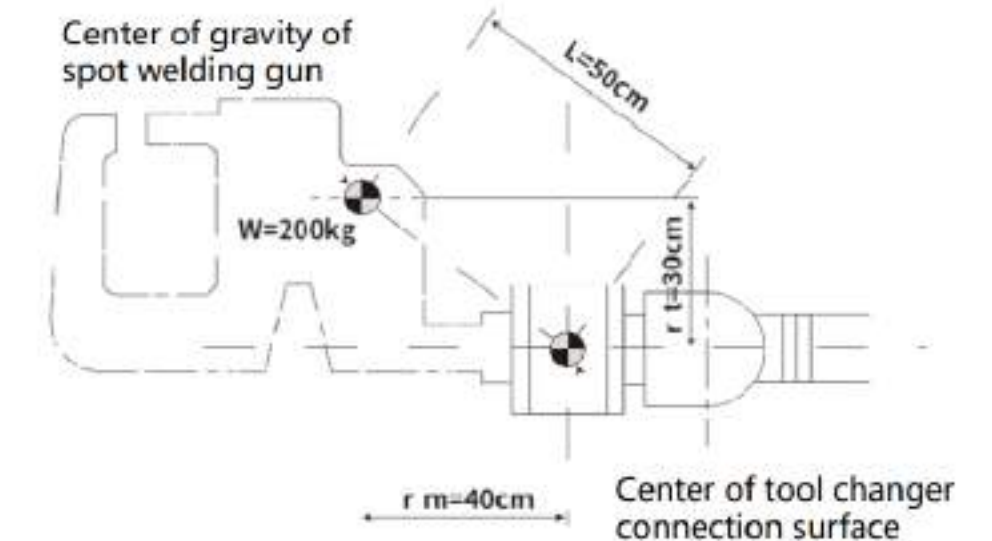
LED status display facilitates debugging. External M8 connection for easy maintenance or replacement.

Zero Volt Pins

Zero-volt pin contacts first and separates last — protects electrical components from surge or short.

Tool ID Recognition

Automatically identifies the tool plate ID and executes the corresponding robot process — no manual switching.



















Workpiece weight: W=200KG
Eccentric distance: $L = \sqrt{r_m^2 + r^2} = 50\text{cm}$
Moment of force (static): $M = L \times W \times Gr = 50 \times 200 \times 1.5 = 15000\text{kgfcm}$
Torque (static): $M = r \times W \times Gr = 30 \times 200 \times 1.5 = 9000\text{kgfcm}$

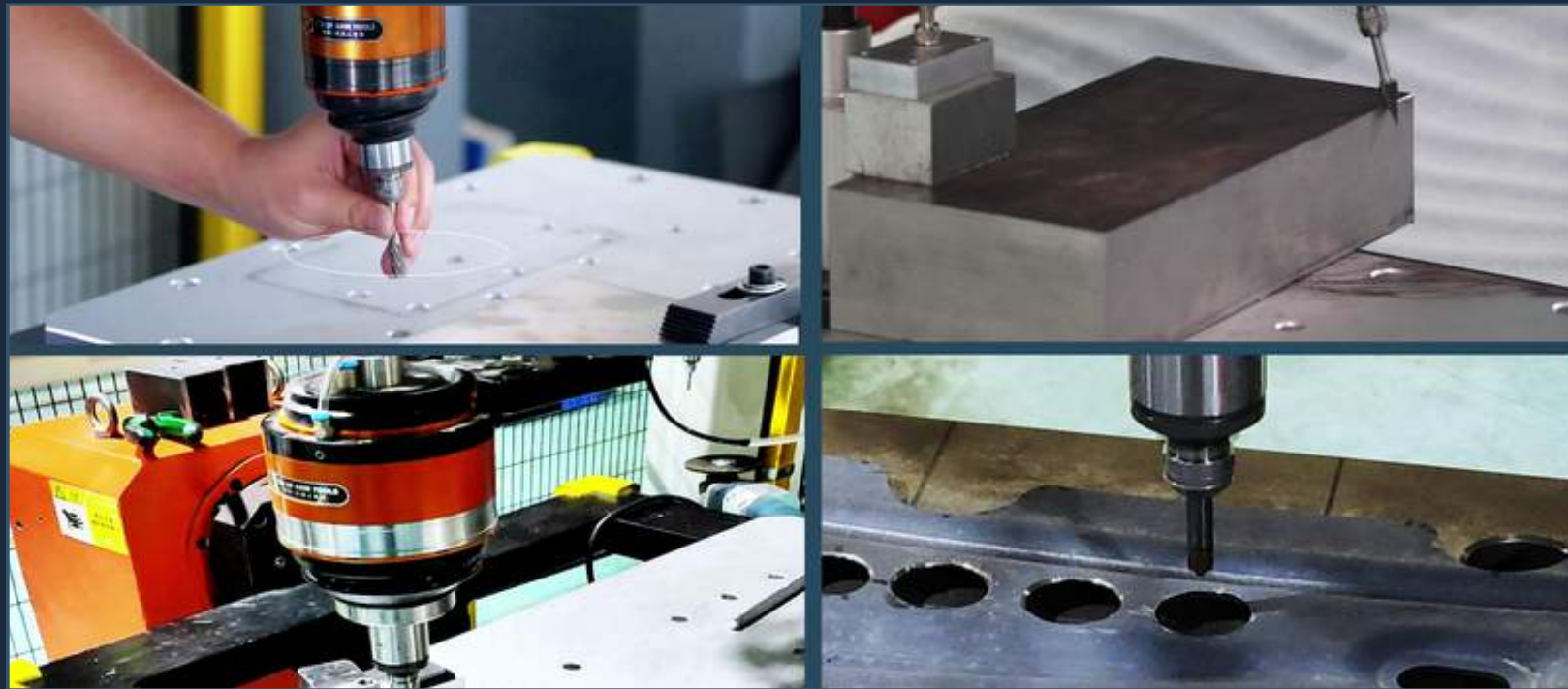
PRODUCT RANGE

- 18 models from LTC-0005 to LTC-3000
- Supports all end tool configurations: welding, gripping, assembly, stamping
- Customized solutions available

TOOL CHANGER: APPLICATION CASES

<p>BYD Automobile Welding Workshop</p> <p>9 bases, Xi'an factory. Rapid switching between welding guns and grippers. 4,500+ sets supplied.</p> 	Automotive	<p>Changan Automobile Welding Workshop</p> <p>C589E project, Hefei. Switching between welding guns and grippers. Zero signal loss or water leakage.</p> 	Automotive	<p>SGMW (Wuling) Welding Workshop</p> <p>Liuzhou Factory. Gun-to-gun and gun-to-gripper switching. Stable with zero leakage reported.</p> 	Automotive	<p>FAW-Volkswagen Stamping Workshop</p> <p>Domestic replacement for IPR. Significant improvements in signal stability and production efficiency.</p> 	Automotive
<p>XPeng Motors Luggage Welding</p> <p>Welding gun and gripper switching. Stable operation — zero signal loss or water leakage. Integrator: ABB.</p> 	EV	<p>FAW Hongqi Servo Module Upgrade</p> <p>Replaced Stäubli servo modules. Stable signal transmission with significantly reduced maintenance costs.</p> 	Automotive	<p>GAC Honda Stamping Workshop</p> <p>Zengcheng Factory Line A. Gripper-to-gripper. Resolved severe locking wear from high shear force.</p> 	Automotive	<p>FAW Mould Tengfei Workstation Renovation</p> <p>Same robot dresspack used to switch between old and new welding guns. Integrator: Changchun Dazheng.</p> 	Automotive
<p>Changan Ford Welding Line — Floor</p> <p>Chongqing. Harsh environment. 250,000+ vehicles and 500,000+ fault-free open/close cycles.</p> 	Automotive	<p>Geely Supplier Loading & Unloading</p> <p>High-pressure water washing of motor housings. Switches 3 fixtures. Self-sealing air module used.</p> 	Auto Parts	<p>BYD Changsha Assembly Application</p> <p>Laser coding hybrid engines — handling, flipping and assembly of heavy workpieces. Integrator: Guangzhou Baosheng.</p> 	EV	<p>Wuxi Langxian Thermoforming Stamping</p> <p>Harsh environment up to 1000°C. Resolved air leakage and tool plate fall-off from competitor brand.</p> 	Stamping
<p>Chongqing Linghuan Ultrasonic Welding</p> <p>2 ultrasonic welding units switched per workpiece for plastic welding. High-frequency module used.</p> 	Plastics	<p>3C Industry (Mobile) Visual Recognition Line</p> <p>Mobile phone labeling & collection. Precision camera recognition for accurate positioning. 8-pin signal module.</p> 	Technology	<p>Agile Robots Semiconductor Line</p> <p>Automated tool switching for semiconductor manufacturing. Servo module improves robot utilization and rhythm.</p> 	Semiconductor	<p>Piaoma Robot / SGIS Substation Humanoid</p> <p>Shanghai 110kV Qiantan Substation. Humanoid duty robot for inspection, monitoring & emergency response.</p> 	Humanoid

RADIAL FLOATING DEBURRING TOOLS



72-in-1 Integrated Die-Cast Rear Floor — Proven Results with LT-6000

840

Welding points eliminated

2dB

In-cabin noise reduced

17%

Vehicle weight reduced

2M km+

Verified durability

WORKSTATION CONFIGURATIONS & DEBURRING POSITIONS

A — Robot Carries Tool

Fixed workpiece
Robot path follows part

B — Robot Carries Part

Fixed grinding station
Robot gets workpiece

Parting Line

Primary die-cast flash removal position

Riser / Machined Surface

Secondary finishing and edge cleanup

WHY RADIAL FLOATING DEBURRING?

01

360° Radial Floating — Follows Any Surface

Patented high-sensitivity floating mechanism adapts to any surface angle ($r \leq 5^\circ$). It self-adjusts in real time, eliminating need for precise robot path programming around complex geometries.

02

Constant Force = Consistent Material Removal

Floating force is controlled via compressed air pressure. When pressure stays constant, so does the grinding force — ensuring uniform cutting volume, consistent finish, and 0 over-grinding.

03

Ultra-High Precision — <0.001mm Repeatability

Position repeatability below 0.001mm. Eliminates variability between batches and shifts — what one robot does at 8am is replicated exactly at 8pm, no manual rework required.

04

Up to 60,000 RPM — Handles Any Material

High-speed spindle tackles aluminum castings, steel castings, injection molded plastics, titanium, carbon fiber and ceramics. Max output torque 6 N·m — power for the toughest burrs.

DEBURRING TOOL: HIGHLIGHTS



FEATURE 1

Flexible Contact

0–35mm axial floating travel gives the tool fully compliant, elastic contact with the workpiece. Surface variation is absorbed naturally — no rigid force spikes, no damage to the part.



FEATURE 2

Constant Force + Posture Compensation

The actuator automatically detects the robot's posture and adjusts the output force to compensate for gravity — the same grinding force regardless of robot's working position.



FEATURE 3

Adaptive — Concave Surface

When the tool encounters a dip or concave point, the constant force system automatically extends to maintain contact and grinding pressure. No missed spots & re-teaching.



FEATURE 4

Adaptive — Convex / Bump

When the tool hits a raised surface or bump, the system retracts and rebalances instantly — protecting the part surface and maintaining consistent material removal.

SMART CONNECTIVITY & CONTROL

IO & TCP Communication

IO & TCP Communication Seamless integration with any robot controller or PLC — FANUC, ABB, KUKA, YASKAWA etc

Real-Time Force Monitoring

Live monitoring of grinding force and equipment status — instant process adjustments without stopping the line.

Segmented Process Routes

Per-zone control of force, speed and dwell — one program handles parting lines, holes, edges and machined surfaces.

Open Vision Interface

Open interface connects to cameras and sensors — enables vision-guided deburring for parts with variable positioning or casting variation.

WHY THESE OVER RIGID TOOLS?

Zero overgrind

Constant force prevents excess material removal — part dimensions stay within tolerance every cycle

No path re-teach

Surface compliance relaxes robot path tolerances. Caves programming time & handles casting variation

Any robot posture

Posture compensation ensures identical grinding force regardless of the robot's working position

Handles bumps & dips

Adaptive control for both concave and convex surface variation — no missed spots, no damage

IP65 rated

Sealed against coolant, oil mist and swarf — runs in wet grinding environments without risk

DEBURRING TOOLS: APPLICATION CASES

60,000 RPM Max spindle speed

0.001mm Position repeatability

360° Radial floating range

±0.5N Force control accuracy (AF100B)



Automotive

Volvo — Integrated Die-Cast Rear Floor Deburring

Aluminum die-casting · LT-6000

Spindle: 25,000rpm · Robot: 400mm/s · Air: 0.02–0.09MPa. Flexible segmented feed & spindle speed adjustment. Customer reported efficient production with simultaneous quality improvement and cost reduction.



EV / Automotive

US EV OEM — Integrated Die-Cast Rear Floor Deburring

Aluminum die-casting · LT-6000

Segmented floating force control and interactive data system for rapid completion of parting line, mold line, ejector boss and extrusion pin grinding. Shortened production cycle, significantly reduced costs.



Plastic

Plastic Injection Molded Parts — Mold Line Grinding

Plastic (Hard) · LT-FR020A-20-S6000

Removed burrs from the edges of plastic injection molding tool boxes. Irregular corners and shapes required floating function. Spindle: 6,000–12,000rpm · Air: 0.1–0.15MPa · Feed: 50–150mm/s.



Automotive

Steering Gear Housing — Edge Chamfering

Cast iron · LT-FR030B-3060J

This project is to chamfer the edge of the steering gear housing. Complex structure, difficult to process. The floating grinding tool rapidly removed burrs and improved production. Workpiece material is cast iron.



Automotive

Gearbox Housing — Multi-Point Grinding

Aluminum alloy · LT-FR040B-S4040

This project involves the grinding of the gearbox housing. Good grinding effect, fast deburring. Spindle: 8,000rpm · Air: 0.15MPa · Feed: 100mm/s · Tool: spherical alloy rotary file.



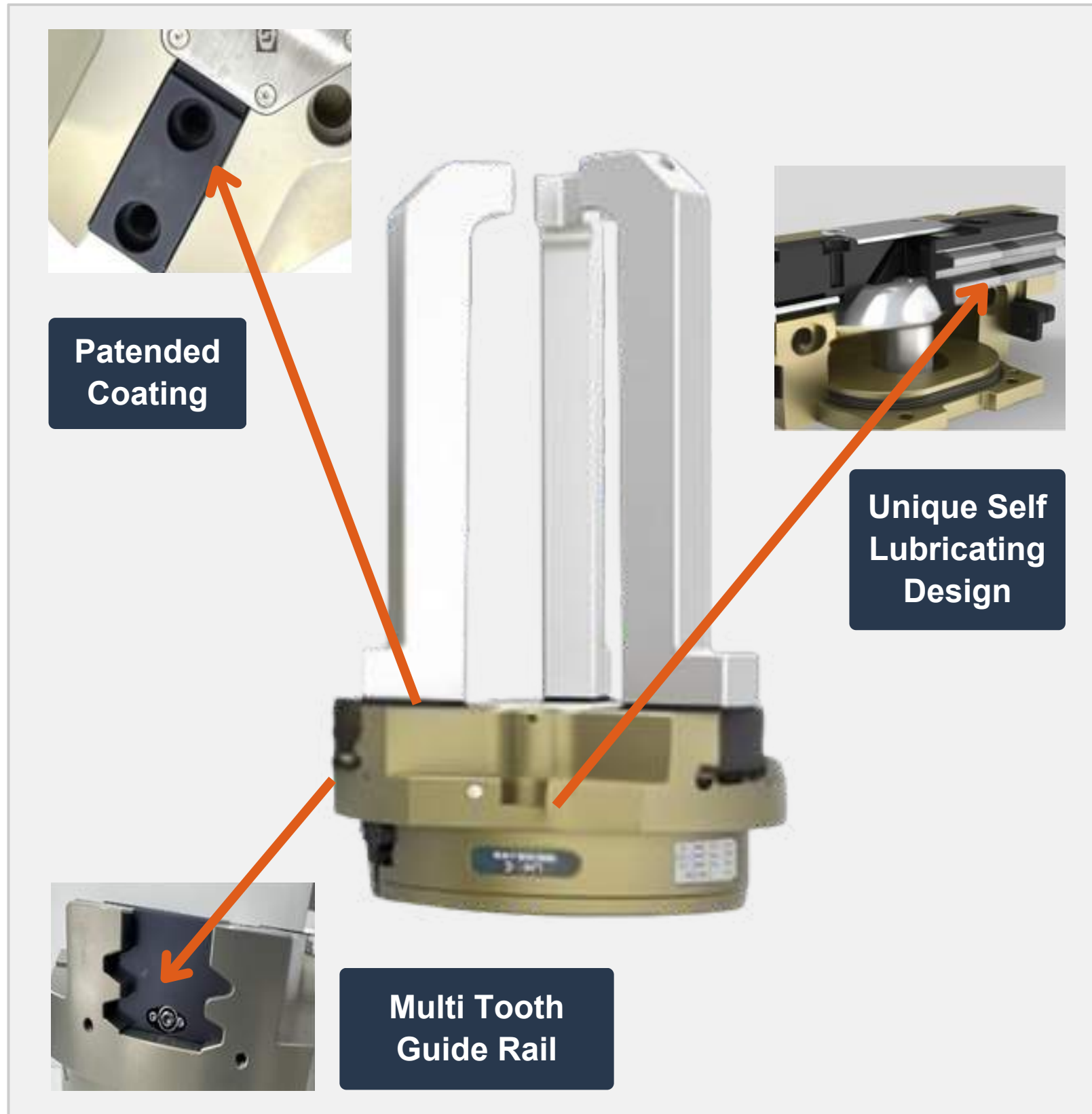
Automotive

Automobile Glass Sunroof — Residual Glue Removal

Glass / rubber · Radial floating tool

Removed residual rubber from glass sunroof in one pass without damaging glass. Rigid grinding could not meet requirement. Spindle: 5,000rpm · Feed: 50mm/s · Tool: 6mm handle, 50 linen wheel · 0.4MPa.

PNEUMATIC GRIPPER SERIES



ADVANTAGES & FEATURES

LH-TC pneumatic grippers combine precision engineering with patented materials science — delivering stable, accurate, and maintenance-free performance across demanding industrial environments.

More Stable

01

Multi-Tooth Guide Rail & Trapezoidal Structure

The multi-tooth guide rail is perfectly combined with the trapezoidal structure to meet the requirements of bearing greater torque and bending moment.

More Precise

02

Patented PVD Coating Process

The patented coating process ensures that the slider remains nearly lossless after tens of millions of displacements.

Longer Service Life

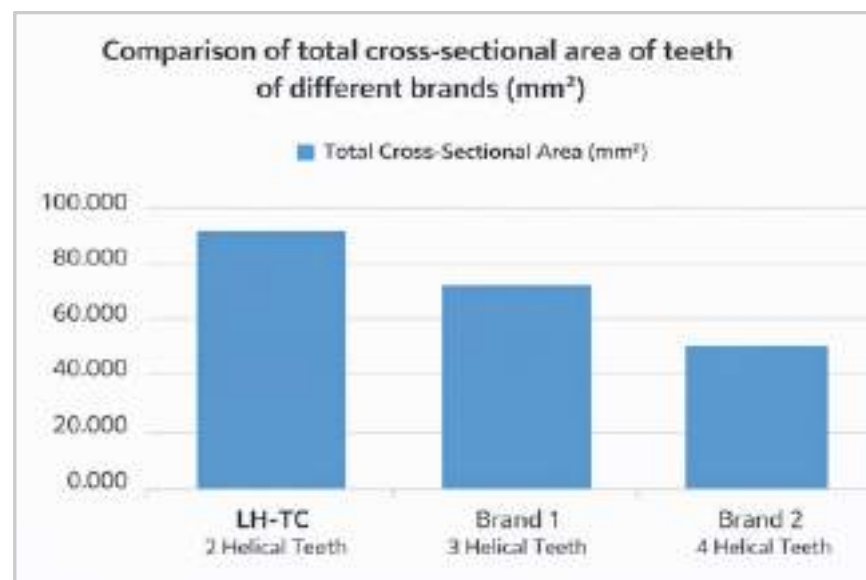
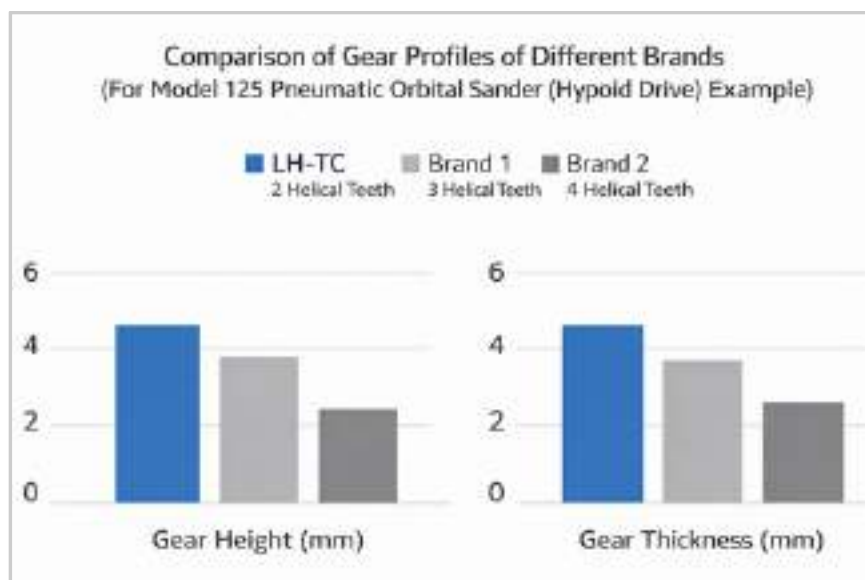
03

Unique Self-Lubricating Design

Groove-technology slider with sealed dustproof lubrication oil storage tank. Lubrication support on every open/close cycle — longer maintenance-free service life.

PNEUMATIC GRIPPER: ADVANTAGES

ADVANTAGE 1 — MORE STABLE: Multi-Tooth Guide Rail



**Compared with SC*K brand:
Total tooth cross-section area = +20%**

The 2-tooth helical guide rail is perfectly combined with the trapezoidal wedge-drive structure. This bears greater torque and bending moment than conventional guide rail designs. The trapezoidal structure distributes load across a moderate force-bearing cross-section, balancing pressure and friction while resisting bending forces.

ADVANTAGE 2 — MORE PRECISE: Patented PVD Coating Process

Surface Hardness
HV 2700–3000

Coating Thickness
2–4 μm

Temp. Resistance
≥ 500°C

The slider surface is strengthened by a Physical Vapor Deposition (PVD) coating process — an ultra-hard, thin protective layer bonded directly to the metal surface. This greatly improves wear resistance: the slider remains nearly lossless after millions of displacements, ensuring consistent accuracy over the product lifetime with no surface replacement required.

ADVANTAGE 3 — LONGER SERVICE LIFE: Unique Self-Lubricating Design

Per-Cycle Lubrication Support
Groove-technology slider delivers lubrication on every open/close action, reducing friction, wear, and lowering the failure rate.

Reduced Cost & Manpower
Eliminates manual lubrication — lowering labor input and total cost of ownership.

Extended Maintenance-Free Period
Self-lubricating design prolongs maintenance-free intervals. Sealed dustproof lubrication oil storage tank requires no manual refilling.

High-Load Long-Term Reliability
Maintains excellent performance under continuous, high-load industrial production.

PNEUMATIC GRIPPER: APPLICATION CASES

NEW ENERGY VEHICLE (NEV) BATTERY APPLICATIONS

1 Battery Cell Assembly & Testing

Stable gripping force and precise positioning ensure accurate assembly and high-quality production of battery cells.

2 Battery Module Assembly, Welding & Packaging

Steadily grasps and holds battery modules to ensure assembly accuracy, welding quality, and packaging consistency.

3 PACK Manufacturing — Large Component Handling

Powerful gripping force and stability ensures safe, efficient handling of large battery pack components during PACK assembly.

REAL-WORLD DEPLOYMENT CASES



Grasping an Electric Box

CLIENT

Shanghai Xuantian → Xuchang Xuji Electric Application

SOLUTION

Multi-tooth guide rail + trapezoidal structure carries greater torque and bending moment within a compact form factor.

OUTCOME

Customer reported efficient and reliable gripping performance in production.



Holding Castings for Polishing

CLIENT

Dalian Jiahong Intelligent

SOLUTION

Compact structure with best-in-class force-to-size ratio. CFM option ensures grip is maintained even on pressure loss.

OUTCOME

Precise clamping and smooth operation confirmed. Stable production quality at high throughput.



Battery Grasping — Overseas

CLIENT

Russian Industrial Customer

SOLUTION

3-finger design (PG3) provides stable wrap-around grip. Quick pneumatic response enables efficient pick-and-place in tight spaces.

OUTCOME

Significantly improved work efficiency and safety. Customer satisfaction high.

FLOATING POSITION COMPENSATION DEVICES

Precise error correction for deformation-sensitive workpieces and assembly processes



PRODUCT OVERVIEW

Floating compensation devices improve machining accuracy and process reliability — especially for deformation-sensitive workpieces. They respond flexibly to position deviations, maintain stable clamping force, and extend equipment maintenance cycles while reducing overall costs.

Powerful Function

Precisely compensates position errors during assembly and loading.

Compensation in Multi-Direction

Supports X&Y, Z, and full X&Y&Z direction compensation.

Precise Control

Locks center point with position storing function for exact, repeatable operation.

Easy for Mounting

ISO9409 standard interface simplifies the assembly process.

Stable & Durable

Firm material construction improves service life of the equipment.

Highly Integrated

Supports seamless integration with robot control systems.

UTILITY COUPLER SERIES

Provides energy connection between master and slave stations — transmitting power, air, fluid, communication signals, and more. Equipped with all-round floating in X, Y, and Z directions, eliminating docking errors. Primary applications in automotive manufacturing for quick docking of trolleys, equipment, and molds.

Multi-Media Energy

Carries power, data, I/O, air, and liquid in a single connection.



LT-F31

Standard Utility Coupler

MEDIA

Power, signal, bus, servo, air

COMPENSATION

X&Y: $\pm 4\text{mm}$ · Z: 2mm · Angle: $\pm 3^\circ$ · Coupling Force: $\geq 1526\text{N}$

Floating Error Correction

X/Y/Z floating eliminates docking misalignment errors.



LT-F31C

Coupler with Liquid Channels

MEDIA

Power, signal, bus, servo, air, liquid

COMPENSATION

X&Y: $\pm 1\text{mm}$ · Z: 2mm · Angle: $\pm 3^\circ$ · Coupling Force: $\geq 1526\text{N}$

Modular Design

Flexible medium configuration — combinations tailored per application.



LT-F41

Compact Signal & Power Coupler

MEDIA

Power, signal, bus, servo

COMPENSATION

X&Y: $\pm 4\text{mm}$ · Z: 2mm · Angle: $\pm 3^\circ$ · Coupling Force: $\geq 1526\text{N}$

Servo or Cylinder Driven

Optional drive method for flexible integration.



LT-F31G-EP01-SE

Wireless Utility Coupler

MEDIA

Power, signal, bus, servo, air

COMPENSATION

X&Y: $\pm 4\text{mm}$ · Z: 2mm · Angle: $\pm 3^\circ$ · Coupling Force: $\geq 1526\text{N}$

UTILITY COUPLER SERIES



PRODUCT OVERVIEW

The Energy Coupling Device integrates multiple connection types — power, signal, data, fiber, liquid, and pneumatic — on a single configurable frame or housing. Designed for applications requiring frequent plug cycles, it meets multi-function needs in automotive manufacturing, new energy, and industrial automation.

X, Y Direction Tolerance

± 4 mm

Floating Angle

$\pm 1.5^\circ$

Position Repeatability

± 0.1 mm

High Stability & Reliability

Robust construction handles multi-function and frequent plug requirements across all media types.

Ultra-High Plug Life

Designed for continuous industrial operations with thousands of connection cycles.

Strong Current Carrying Capacity

Handles high-current power modules — from signal-level to high-power electrical connections.

Vibration & Impact Resistant

Maintains connection integrity under vibration and mechanical shock in active production environments.



IVOSTUD · GERMANY

IVOSTUD WELDING SYSTEMS



Modular System Design

60 Welds Per Minute

Stop-Pin-Free Technology

COMPANY PROFILE



Best-in-class multi-purpose, modular stud welding systems for flexible adaptation of production requirements.

KEY HIGHLIGHTS

60+

Years of Experience

200

Employees Worldwide

6

Own Global Entities

10+

International Distributors

MODULAR SYSTEM COMPONENTS

Power Sources N4s — AC or DC capability

Different Sorter / Feeder Systems (FSE 1000s)

Wide Variety of Welding Heads (KSE series)

Hand-held Welding Guns

Robot Enhancements & Speed Port

Various Accessories

TRUSTED BY LEADING OEMs

Audi

Volkswagen

BMW

Mercedes-Benz

Toyota

Ford

General Motors

Renault

KUKA

ThyssenKrupp

Gestamp

faurecia

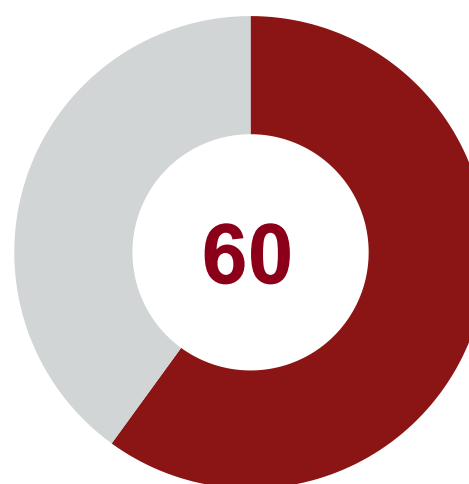
BENTELER

KIRCHHOFF

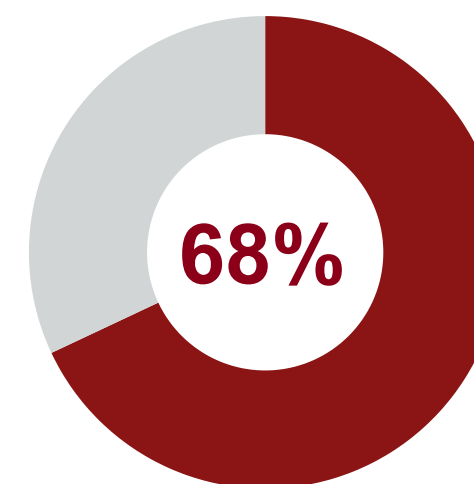
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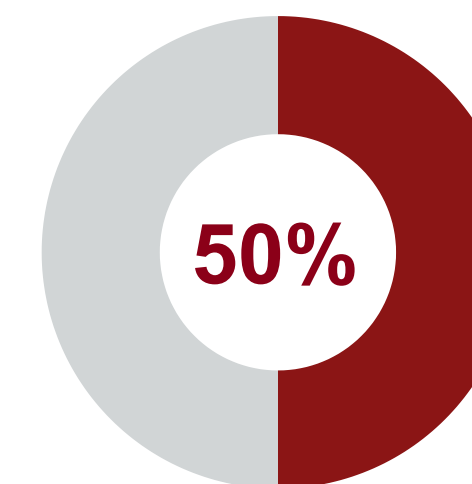
KEY FACTS



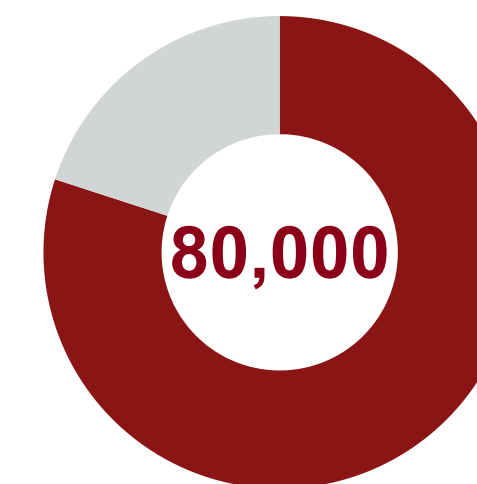
Up to 60 welds per minute



Reduction of compressed air consumption by up to 68%



50% faster bolt feeding



Up to 80,000 welds per bolt holder

N4s WELDING SYSTEMS



N4s

Inverter Power Source



Output Power
1800A

at 55V

Max Feeders / Tools
Up to 5

per source

Idle Consumption
<10VA

Power-Safe-Mode

3-in-1 Universal Power Source

Stud · TARC · TARC Nut

A single N4s unit handles stud welding, TARC welding, and TARC nut welding. Supports up to 5 feeders simultaneously — with optional feeder monitoring of up to 6 positions per feeder, each individually configurable.

High Output with Long Cable Support

1800A / 55V

Delivers 1800A at 55V, enabling long welding cables across the production floor. Built-in supply monitoring and maximum duty cycle rating make it ideal for demanding multi-shift automotive operations.

Power-Safe-Mode — Energy Efficient

<10VA Idle

Robot-triggered energy saving mode cuts idle draw to under 10VA. Only the CO-CPU and external robot interface remain active, with the system fully ready for operation again within 5 seconds of deactivation.

Weld Impedance Control

Auto Safety Monitor

Issues an automatic warning when maximum welding circuit impedance is exceeded — catching connection issues before they result in defective welds. Redundant system monitoring meets Performance Level 'd'.

N4s-AC — Aluminum Welding Ready

AC Module Add-On

Simply expand the standard N4s with the AC-Module-1000s for aluminum welding capability, smoke reduction, and sheet metal cleaning. The different materials in modern car body construction demand this flexibility.

WELDING HEADS



Servo-electrical path monitoring eliminates the need for a support foot — enabling access to beads, radii, concave and convex surfaces.

Compact anodized aluminum housing. No protective cover required. All media hoses integrated into the head connection.

Any Geometry



No Support Foot Required

Servo-electrical path monitoring replaces the mechanical stop pin entirely — allowing welding on any surface profile including beads, radii, concave and convex sheet metal without flat embossing.

Fast Changeover & Service-Friendly

The modular and robust design enables fast cycle times. Head connections sit within interference edges for rapid changeovers. Compact anodized aluminum housing eliminates the need for an external protective cover.

Intelligent Stud Feeding & Monitoring

Integrated intelligent feeding with hose monitoring. Multiple head variants can be built on a single base body — minimizing spare parts inventory. All connections and media hoses compactly integrated into the head.

HEAD VARIANTS

KSE 1000s

Standard servo-driven, aluminum body

KSE 1055s

Angled exit for tight geometries

KSE 1055LSPs

Up to 4 stud types, one head

KSE 2000s

Smallest welding head worldwide

P NS 40 SL

Hand-held welding gun

PSE 1000s

Robot-compatible stud welding head

STUD FEEDERS & SPEED PORT



Stud Feeders

FSE 1000s & FSE 5000s

62%

Compressed air reduction vs. standard feeders (validated by automotive OEM)



50%

Faster feeding time

Quiet

Low noise & low wear operation

6

Positions per feeder — all monitorable

FSE 5000s — High-Volume Feeder

Thanks to modular design, customized configurations for single or multi-station systems are possible. Each feeder can be converted to a different bolt type simply by replacing the feeding unit.

Speed Port

Pre-position next stud during welding — up to 50% cycle time reduction



<100ms

Stud load time into welding head

50%

Conveying time reduction

Parallel

Welding & pre-positioning simultaneously

HOW IT WORKS

After each weld, the next stud loads from the Speedport buffer into the welding head in under 100ms. Simultaneously, the Speedport is reloaded during the active welding process — true parallel operation that eliminates idle wait time entirely and maximises robot utilisation.

FSE 1000s modules: IFM (Feeder Module) · IBM (Bunker Module) · ISM (Servo Module)

Various accessory components make your IVOSTUD stud welding system unique — whether reducing wear, maximizing throughput, or enabling aluminium welding.

Wear Reduction

Feed Hose Separation Point

Reduces wear in robot-guided systems by isolating hose movement at the critical separation point — extending the service life of feed hoses and reducing unplanned downtime.

Flexibility

Bolt Diverter

Weld similar bolts with one welding head connected to two feeders. The bolt diverter switches between feed lines — enabling multi-bolt flexibility without changing the welding head.

Aluminum Welding

AC Module 1000s

Add-on module that upgrades the standard N4s power source for AC welding — enabling aluminium stud welding, smoke reduction and sheet metal cleaning in a single expansion.

Installation

Robot Hose Package Solution

Various solutions for routing hose packages on robots, depending on robot type and cell layout. Compact, clean integration that protects hose assemblies throughout the robot's full range of motion.

Quality Assurance

Test & Calibration System

Dedicated test & calibration equipment ensures consistent weld quality and traceability. Essential for environments where process documentation and periodic verification are mandatory.

Cycle Time

Speedport

Pre-positions the next bolt in front of the welding head during the active welding process. Reduces conveying times by up to 50%, directly increasing robot throughput without any change in weld quality.

Mechanical

Safe Feed Tube Connection



The new feed tube connection is a purely mechanical solution — securing hose connections without any electronic monitoring components. Eliminates a common source of failure in high-cycle welding environments, improving uptime and reducing maintenance complexity.

Connectivity

Windows Touch User Panel



A Windows-based touch panel with Ethernet connection provides an intuitive interface for monitoring and adjusting weld parameters. Full process data visualisation, weld history, and parameter management — all from a single screen.

Integration

Universal Industrial Bus Interface



New communication interface supports all major industrial fieldbus protocols via Ethernet/RMII — ProfiNet, Profibus, EthernetIP, and more. Seamlessly integrates into any existing automation architecture or robot cell without additional hardware.

SPOTRON WELDING MEASUREMENT INSTRUMENTS

Consistent Weld Quality

Real-Time Weld Monitoring

Industry-Grade Reliability



SPOTRON — RESISTANCE WELDING INSTRUMENTS

COMPANY OVERVIEW

Spotron, manufactured by Mekano Corporation (Japan), is a specialist in design, development, production and sales of measuring instruments for resistance welding — including force gauges, welding current meters, condition monitors, and secondary cable checkers. Every Spotron instrument is engineered for the demands of automotive and industrial spot welding quality assurance.

Made in Japan

Precision manufacturing
and quality control

Spot Welding Specialist

Dedicated measurement
instruments

Full Product Range

Current · Force ·
Monitor · Cable



PRODUCT RANGE

Welding Monitor

AMS-115 / AMS-116

High-accuracy welding condition monitor for current and weld time. AC/DC, up to 600Hz.

Secondary Cable Checker

AMS-1070E

Micro-ohm meter for detecting cable degradation and contact resistance faults.

Welding Current Meter

SP-3288 / SP-3290

Handy current meter for all resistance welding types. USB data output (SP-3290).

Current & Volt Meter

SP-3510

Combined current/voltage measurement with touch panel LCD and waveform display.

Digital Force Gauge (Advanced)

SP-270 Series

Advanced electrode force gauge with graphical waveform display and data recording.

Digital Force Gauge

SP-255 Series

Handy digital weld force gauge with Hold & Peak Memory. Battery powered.

Hydraulic Force Gauge

SP-231N Series

Compact analogue hydraulic weld force gauge. No batteries needed. 7 range variants.

SP-255 — DIGITAL WELD FORCE GAUGE



PRODUCT OVERVIEW

The SP-255 is a compact, handy digital weld force gauge designed for easy measurement of electrode force in spot welding — one of the three critical welding conditions. Using a high-accuracy sensor with digital LCD display, it provides successive real-time readings with Hold and Peak Memory functions. Dry battery powered for maximum portability.

THREE SENSOR TYPES

Fixed Type

10kN, 20kN

Integrated hydraulic sensor, insulated. Compact fixed-body design.

FU Type

FU10kN, FU20kN

Hydraulic insulated sensor with flexible long neck for awkward positions.

F Type

F200N–F50kN

Direct load cell sensor, flexible long neck. 5 range options (200N–50kN).

KEY FEATURES

Wide Range Coverage — 200N to 50kN

9 models covering forces from 200N up to 50kN across 3 sensor types. Suitable for light bench-top welders up to heavy-duty robotic welding guns.

Battery Powered — 8+ Hours Operation

Powered by 2 x UM-3 dry batteries with 8+ hours runtime on alkaline. Battery status alert in display. No power cable required for field measurements.

Auto-Zero Reset for Easy Operation

Auto-Zero function eliminates manual zero adjustment. Combined with Auto-Power Off, the gauge is fast to set up and use.

Successive Digital Display with Hold & Peak Memory

Force values displayed continuously at 64 samples/sec, averaged per 0.5 seconds. Freezes any reading, retains the maximum force reached.

Accuracy: $\pm 1\%$ Full Scale · Limit Force: 120% of Rated · Battery: 2xUM-3 · Battery Life: 8+ hrs · Analog Output Option: 2.0V at rated force

SP-231N — HYDRAULIC WELD FORCE GAUGE



PRODUCT OVERVIEW

The SP-231N is a simple, reliable analogue hydraulic weld force gauge for measuring electrode force in spot welding. Requiring no batteries or external power, it is the most portable and robust solution for routine force checks on the shop floor. The sealed hydraulic sensor includes an insulation plate to prevent damage from accidental weld current passage.

7 MODEL VARIANTS

SP-233SN 0.3–3kN	SP-236N 0.3–3kN	SP-231N 0.3–3kN	SP-232N 0.3–3kN	SP-233-3T 0.3–3kN	SP-233-4T 0.3–3kN	SP-241N 0.3–3kN
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KEY FEATURES

No Power Required — Fully Self-Contained

Closed hydraulic system requires no batteries or power source. Ideal for field use, shop floor rounds, or locations without power access.

Insulated Sensor for Weld Current Protection

Hydraulic sensor incorporates an insulation plate — protecting the gauge from damage even if weld current is accidentally applied during measurement.

Maximum Value Pointer for Easy Reading

Peak-hold pointer retains the maximum force reading after the weld cycle, allowing operators to read the value without digital interfaces.

SP-241N Flexible Neck Variant

Features a flexible neck bendable to U-form — ideal for awkward gun geometries or tight robot gun access points in automated welding cells.

Accuracy: $\pm 3\%$ Full Scale · Limit Force: 120% of Rated · Ranges: 3kN to 40kN · Weight: 400–680g (unit) · Carrying Case Included

SP-270 — DIGITAL WELDING FORCE GAUGE



PRODUCT OVERVIEW

The SP-270 is Spotron's advanced model for measuring and analyzing electrode force in spot welding. It packs multi-function capabilities into a compact, portable unit — including a 4-inch TFT color LCD with graphical waveform display, 1000 samples/second real-time measurement, and direct USB data output to PC. Available in 5 force ranges from 200N to 50kN.

AVAILABLE RANGES

F200N 20–200N	F1000N 100–1000N	F10kN 1–10kN	F30kN 3–30kN	F50kN 5–50kN
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KEY FEATURES

1000 Samples/Second Real-Time Measurement

High-speed continuous sampling for precise capture of dynamic electrode force profiles — critical for detecting irregularities in automated welding cells

Touch Panel LCD with Waveform Display

4-inch TFT color display with 3 modes: Basic (numeric), Graph (waveform with adjustable time axis), & Bar Indication for upper/lower limit judgement.

USB Data Output to PC — 1ms Resolution

Outputs electrode force data at 1ms intervals to PC via USB. Free software included. Stores 300 measured values and 8 graph waveforms internally.

Up to 6 Exchangeable Sensors

Supports up to 6 sensor channels for exchanging different range sensors. Common power from dry cell or USB bus — no separate charger needed

Accuracy: $\pm 1\%$ Full Scale · Limit Force: 120% of Rated · Power: Dry Cell / USB Bus · Size: 85×140×35mm · Analog Output: DC ± 2 V F.S.

AMS-115 / AMS-116 — WELDING MONITOR



PRODUCT OVERVIEW

The AMS-115/116 are high-performance, high-accuracy welding monitors developed as next-generation successors to Spotron's established line. They measure welding current and time across all common current types — with optional super-low (50A) and super-high (999kA) ranges and frequency support up to 600Hz. The AMS-116 adds seam welding capability with measurement time up to 9000 cycles (180 seconds).

AMS-115 — Spot Welding
Max weld time: 2 sec / 1200 CY (600Hz)

AMS-116 — Seam Welding Specialist
Max weld time: 180 sec / 9000 CY (50Hz)

KEY FEATURES

Universal Current Type Coverage

Measures AC, DC, capacitor discharge, and inverter currents. Standard range 0.5kA–99.9kA; optional 50A–999kA for ultra-low / high current applications.

High Frequency Support up to 600Hz

Covers mid-frequency and high-frequency inverter welding. Weld time measurement in both CYCLE and millisecond modes.

Multi-Pulse & Intermittent Pulse Measurement

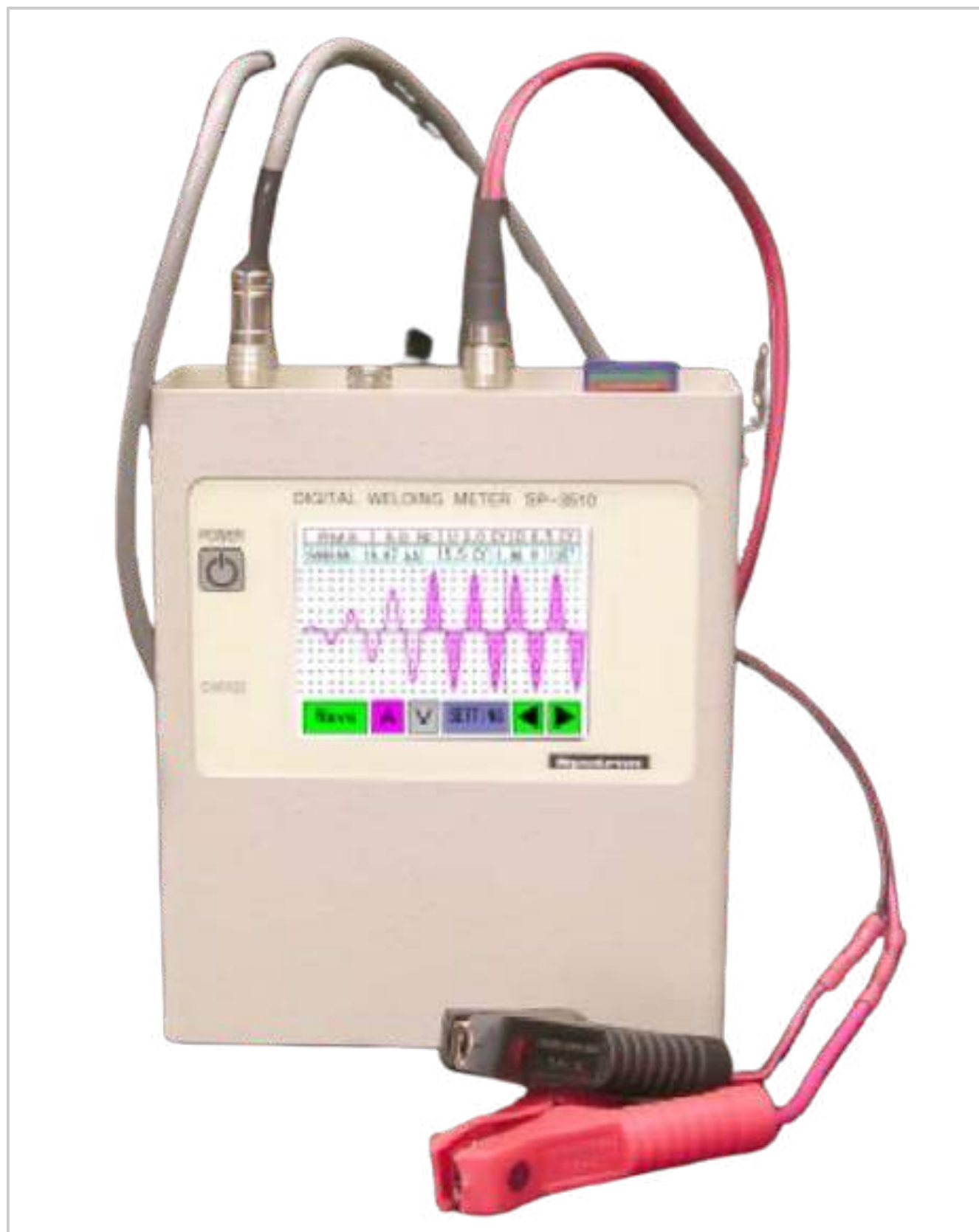
Measures all pulses averaged or designated individual pulses (1–9999). Supports complex multi-pulse weld schedules in modern welding controllers.

32 Condition Memory + RS232C PC Interface

Store up to 32 monitoring conditions. RS232C standard for PC data management. Rich I/O signals and optional expansion modules available.

Current Accuracy: RMS $\pm(2\%rdg+3dgt)$ / PEAK $\pm(2\%rdg+9dgt)$ · Time Accuracy: $\pm 0.5CY$ / $\pm 1ms$ · Power: AC100–240V · Weight: 2.7kg

SP-3510 — WELDING CURRENT / VOLT METER



PRODUCT OVERVIEW

The SP-3510 is a comprehensive welding current and voltage meter for all resistance welding types. Its 3.5-inch touch panel LCD displays current, voltage, weld time, and live waveforms — giving engineers a complete view of each weld. Data is saved automatically to internal memory and can be exported via SD card or USB for analysis and traceability.

4 DISPLAY MODES

Standard

Per-weld summary: Current, heat time, voltage, phase angle

Division

Per-cycle breakdown of the standard data

Waveform

Current waveform for each heat application

Graph

Graphical trend of measured data over time

KEY FEATURES

Simultaneous Current & Voltage Measurement

Measures welding current (1–499kA, 3 ranges) and secondary voltage (0.30–59.9V) simultaneously. Both RMS average and Peak values displayed.

Touch Panel LCD with Waveform Display

3.5-inch color touch panel for easy operation and configuration. Current waveform is displayed live, enabling visual verification of weld quality.

Long-Time Seam Welding Support

Covers weld time up to 9999 cycles or 180,000ms — suitable for continuous seam welding operations up to 3 minutes.

SD Card & USB Data Management

All measurement data and waveforms saved to SD card. USB connection enables PC data transfer. External thermal printer for on-site reporting.

Current: 1–499kA ($\pm 2\%$ F.S.) · Voltage: 0.30–59.9V ($\pm 1\%$ F.S.) · Time: 0.5–9999CY / 1–180,000ms · Size: 145×183×65mm · Weight: 1.9kg

SP-3288 / SP-3290 — WELDING METER



PRODUCT OVERVIEW

The SP-3288/SP-3290 are compact, handy welding current meters for measuring secondary current and weld time across all types of resistance welding. Using Mekano's patented toroidal coil sensor, they display RMS or Peak current together with weld time and conduction angle. SP-3290 adds USB data output to PC for complete measurement record management.

SP-3288 — Standard
Weld time up to 999.5CY / 2000ms

SP-3290 — with USB Data Output
Extended time to 9999ms + PC data transfer

KEY FEATURES

Universal Application — All Welding Types

Covers single/3-phase AC, rectified, AC/DC inverter, capacitor discharge, and intermittent seam welding. Three current ranges: 0.5–9.99kA / 2.5–25.0kA / 10–99.9kA.

Compact & Lightweight with 100-Count Memory

Body weighs just 0.45kg. Stores up to 100 measurement records in built-in memory. Touch key operation for easy field use.

Designated Time Scope & Multi-Pulse Support

Measures designated time windows for any current type, and specific pulse numbers in multi-pulse welding schedules — flexible enough for modern weld controllers.

USB Data Output with Free PC Software (SP-3290)

Transfers date/time, count, current, weld time, conduction angle, and per-cycle divisional data to PC. Free software available at Spotron website.

Current Accuracy: $\pm 2\%$ F.S. · Time Accuracy: $\pm 0.5\text{CY} / \pm 1\text{ms}$ · Power: NiMH Battery + AC Adaptor · Size: 87×151×30mm · Weight: 0.45kg

AMS-1070E — SECONDARY CABLE CHECKER



PRODUCT OVERVIEW

The AMS-1070E is a low-resistance measuring device (micro-ohm meter) designed specifically for resistance welding maintenance. It detects degradation in secondary cables, kickless cables, and identifies faults caused by insufficient bolting or oxidized contact surfaces — catching problems before they affect weld quality.

KEY FEATURES

4-Terminal Measurement System

Employs the 4-terminal (Kelvin) method with special micro-ohm circuits for high-accuracy low-resistance measurements, eliminating lead resistance from readings.

100-Condition Memory

Store up to 100 upper limit resistance values (OK/NG judgement thresholds) for different cables and connections — instant pass/fail indication on 4-digit LED display.

Data Recording via SD Card & USB

Measurement records with date/time can be exported to PC via SD card or USB for trending, maintenance logs, and quality documentation.

Rechargeable Battery with AC Adaptor

Built-in rechargeable lead-acid battery for portable field use. AC100–240V adaptor included for bench use or charging. Operating temperature: 5°C–40°C.

Measurement Range: 0.003mΩ – 19.99mΩ · Accuracy: ±0.3% F.S. or ±1% R_{dg} ±3dgt · Dimensions: 158×190×65mm · Weight: 1.9kg

DOOSAN

DOOSAN · KOREA

DOOSAN COLLABORATIVE ROBOTS

Collaborative by Design

Sensor-Rich Force Control

5 Series. Every Application



DOOSAN COBOT LINEUP

DOOSAN

ABOUT DOOSAN

Doosan Robotics (Korea) is a world-leading collaborative robot manufacturer — the world's first motion platform company. Doosan cobots are certified to NRTL (US), CE (Europe) and KCs (Korea) safety standards, and are used across automotive, manufacturing, food & beverage, and service industries worldwide.

Super SAFE

5 workspace zones · 6-axis torque sensors · NRTL / CE / KCs certified

Super EASY

Software-Defined Robot Platform · Direct teach cockpit · Smart Setup

Super FLEXIBLE

Doosan Mate ecosystem · Gateway-free connectivity · 14+ model variants

PRODUCT SERIES

Prime P-SERIES	P3020 30kg · 2030mm · 5-DoF · Palletizing specialist
High-Power H-SERIES	H2515 · H2017 Up to 25kg · 1700mm · Gravity compensator · Half power
Masterpiece M-SERIES	M1509 · M1013 · M0617 · M0609 6 torque sensors · 0.2N sensitivity · 12-min Smart Setup
Agile A-SERIES	A0912 · A0509 (3 variants each) 2× joint speed · 3 options · 10% faster · Quick ROI
Edge — Food & Beverage E-SERIES	E0509 NSF certified · IP66 · 2/3 smaller packaging · 14-month ROI



Prime

P-SERIES

Payload

30

kg

Reach

2030

mm

Degrees of Freedom

5

DoF



The P-SERIES leads innovation in palletizing automation. With an unparalleled payload of 30kg and working radius of 2,030mm, it surpasses existing cobot limits — handling heavy loads over longer distances than any comparable cobot.

KEY FEATURES

Prime+ Innovation Unparalleled payload and reach

30kg · 2030mm

Handles heavy loads over longest distances, enabling automation scenarios impossible for standard cobots.

Prime+ Productivity 5-axis palletizing structure

No Singularities

The 5-axis structure eliminates singularities during palletizing movements, reducing cycle time.

Prime+ Economic Efficiency ~25% less power vs. competitors

~25% Less Power

Minimize initial investment costs with industry-leading energy efficiency. Lower running costs from day one.

MAIN APPLICATIONS

Palletizing

Managing Heavy Objects

Packaging & Logistics

H-SERIES — HIGH-POWER

DOOSAN

The H-SERIES is the most powerful collaborative robot on the market. Its extraordinary payload of 25kg and 6-axis torque sensor enable sophisticated, safe work — with a built-in Gravity Compensator delivering half the power consumption of comparable 6-axis articulated robots.

High+ Payload

25 kg

Highest payload among existing collaborative robots, allowing for efficient and organized work through the simultaneous hand

High+ Reach

1700 mm

With a wide working radius and superior efficiency for multiple work processes and remote palletizing, it is perfect for many applications

High+ Energy Efficiency

1/2 Power

Built-in Gravity Compensator enables cost-effective operation for a wide range of applications with half the power consumption

H2515

Payload 25kg · Reach 1500mm



H2017

Payload 20kg · Reach 1700mm



MAIN APPLICATIONS

Palletizing

Machine Tending

Managing Heavy
Objects

Assembling Heavy
Parts

Assembling Automotive
Bodies

Welding

Inspection

Film Production

M-SERIES — MASTERPIECE

DOOSAN

Prime

M-SERIES

Torque Sensors

6 sensors

Collision Sensitivity

0.2 N

Smart Setup Time

12 mins



M-SERIES is the highest quality premium cobot. Six high-tech torque sensors deliver the highest dexterity for highly sophisticated tasks — with the industry's best collision sensitivity at 0.2N. Smart Setup automatically measures inclination angles, tool position, and weight, getting the robot up and running in 12 minutes straight from the box.

KEY FEATURES

Master+ Safety Superior Collision Detection

30kg · 2030mm

Six high-tech torque sensors detect subtle force changes across all axes — the highest sensitivity in the cobot class.

Master+ Force Control 5-axis palletizing structure

No Singularities

Delivers the highest level of force and compliance control for safe and precise work that demands consistent force.

Master+ Smart Set Up ~25% less power vs. competitors

~25% Less Power

Minimize initial investment costs with industry-leading energy efficiency. Lower running costs from day one.

MAIN APPLICATIONS

Machine Tending

Welding

Assembling Power Tools

Polishing & Deburring

Gluing & Bonding

Plastic Injection Support

Palletizing

Press Forming

A-SERIES — HIGH-POWER

DOOSAN

A-SERIES can go anywhere. Designed for those hesitant to adopt cobots, it delivers superior speed and competitive pricing for quicker ROI. Three configurations — Universal, Force Sensor, and F&B Dedicated — let customers match precision or hygiene requirements. Available in 5kg (900mm) and 9kg (1200mm) variants.

A+ Speed

2× Joint Speed Enhancement

2× enhanced joint speed delivers measurable improvements in productivity, efficiency, and cycle time. Average work speed is 10% faster than comparable cobots in the same class — directly translating to higher throughput and faster return on investment.

A+ Customization

3 Configuration Options

Universal model for general cost-effective automation. Force Sensor model (S suffix) for precision contact operations. F&B Dedicated model (F suffix) with NSF Food Zone certification for food and beverage applications.

A+ ROI

Quick Return on Investment

10% faster work speed combined with competitive pricing delivers faster return on investment than any comparable cobot — the ideal choice for first-time cobot adopters looking for simple, proven automation.

Universal

A0509 · A0912

Force Sensor

A0509S · A0912S

F&B Dedicated

A0509F · A0912F

MAIN APPLICATIONS

Assembly

Machine Tending

Polishing &
Deburring

Inspection

Pick & Place

Gluing & Bonding

Air Blowing

Service (F&B)

E-SERIES — EDGE

DOOSAN

Edge

E0509

Payload 5kg · Reach 900mm



NSF
Food Zone

IP66
Rated

The most optimal cobot for Food & Beverage industry. NSF food zone certification and IP66 accreditation ensure maximum hygiene and sanitation — while compact all-in-one packaging (2/3 smaller than existing cobots) makes E-SERIES easy to transport and install in any F&B space. ROI achievable in as few as 14 months.

KEY FEATURES

Edge+ Sanitation

NSF + IP66

NSF Food Zone certification and IP66 accreditation ensure the highest hygiene standards for food operations.

Edge+ Portability

2/3 Smaller

All-in-one packaging is 2/3rds smaller than existing cobots. Easy to transport, install, and redeploy between stations.

Edge+ ROI

14 Months ROI

Most cost-effective automation solution in F&B. Achieves rapid ROI in 14 months for coffee applications.

MAIN APPLICATIONS

Coffee

3 espresso cups in 15 seconds — pours like a barista

Ice Cream

Scoops and delivers ice cream right to customers

Deep Frying

Fries food in 170°C / 224°F oil safely and consistently

Noodles

Boils rice noodles, udon and more with consistent quality

THANK YOU

Please contact sanil.patil@kayvybin.com, raju.haridoss@kayvybin.com, kritvi.kulkarni@kayvybin.com for any questions

Kay Vybin Corporation
www.kayvybin.com · sales@kayvybin.com