EICHLER
Elektronik-Service-Center
Ein Unternehmen der WISAG

Customer Information

Your Direct Line to EICHLER

24/7 service on spare parts and equipment excess stock in case of emergency

+49 8196 9000-247

Our telephone service is available 24 hours a day, 365 days a year, including Sundays and public holidays. We supply fully tested spare parts from stock. Please contact us for further details. In case of machine breakdown, you can contact our technical support team directly.

Questions about sales, maintenance and repair

+49 8196 9000-0

Due to the high quality standards we set ourselves, you will receive all repaired, replacement or exchange devices cleaned, refurbished and function-tested, with at least a 24-month guarantee and warranty. Ask at any time about maintenance orders on-site or for a detailed cost estimate.
If you have any basic questions, please arrange a personal consultation appointment with your EICHLER sales representative.

Life Cycle Management

+49 8196 9000-350

When it comes to ensuring system availability, Configuration Management with an on-site inventory or the right supply strategy – then you've come to the right place. We will be happy to answer your questions or arrange an appointment for a detailed consultation.

Training schemes – EICHLERakademiE

+49 8196 9000-366

Do you have any questions about contents, hotel bookings, how to reach us? Are you in need of specific technical consultations or do you wish to join our training schemes? We will be happy to help you!

Sell excess stock

+49 8196 9000-550

We are constantly on the lookout for devices and units from the fields of HMI, PLC assemblies, drive technology and robotics. Across all manufacturers, we offer you an uncomplicated and fast way to reduce your automation technology stocks.

K-Info 13-en

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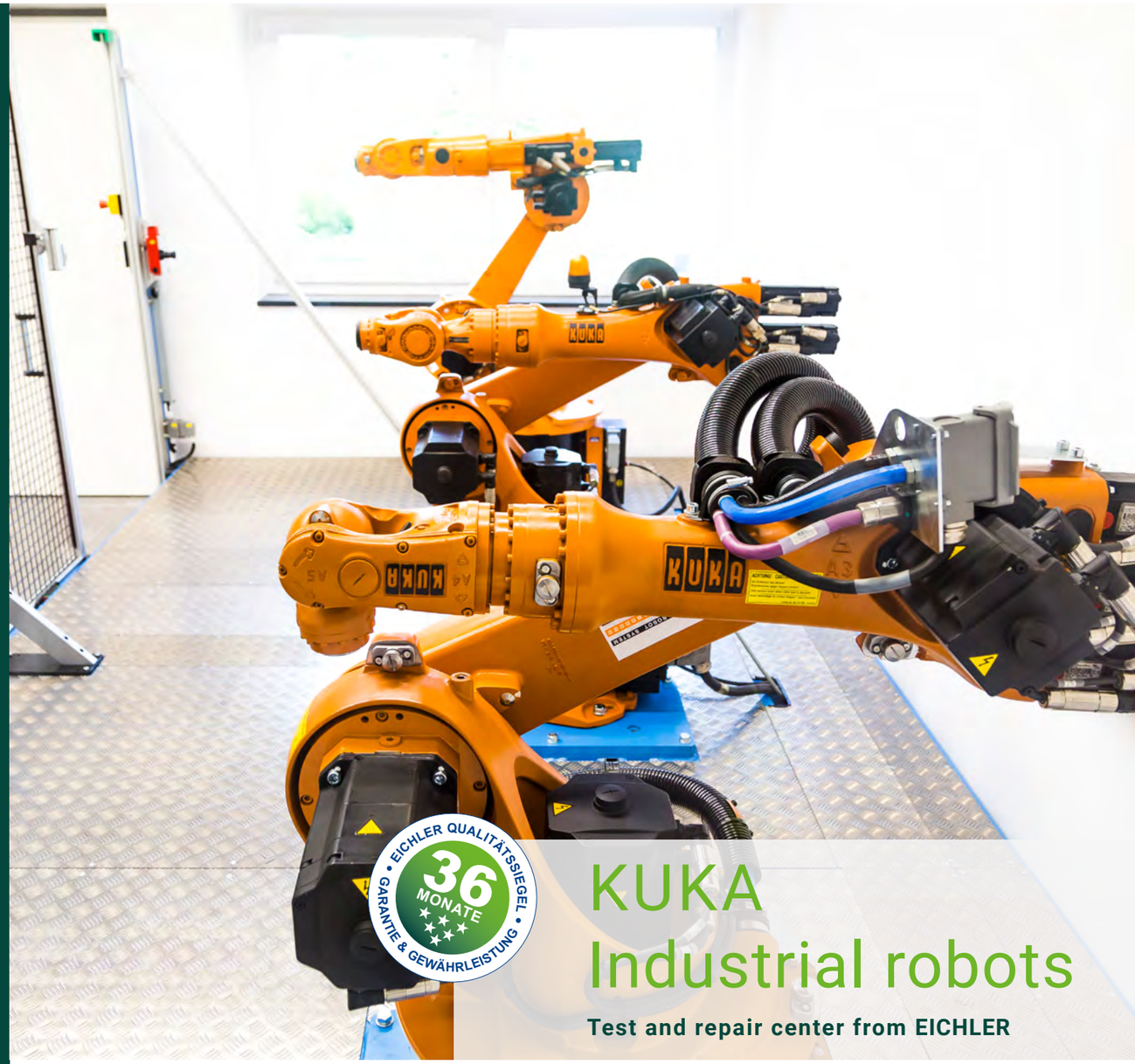
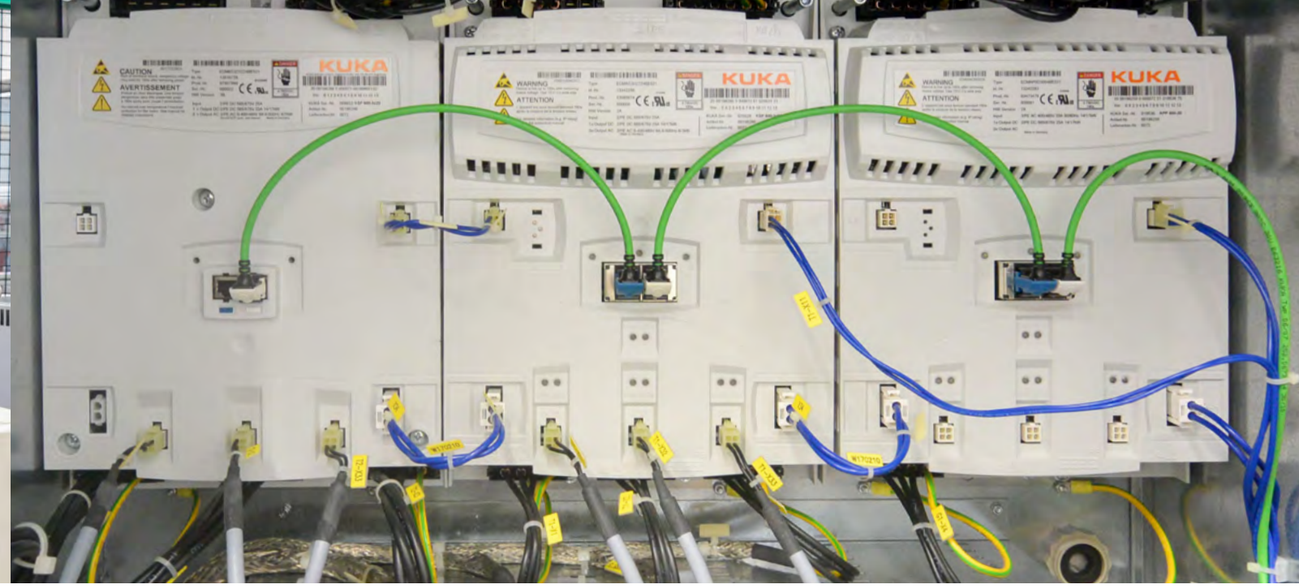


KUKA
Industrial robots

Test and repair center from EICHLER

www.eichler-service.com



Know-how

In repair and testing

Since 2017, **EICHLER** experts have been testing KUKA robotic devices. In a dedicated repair and testing area, they diagnose and test electronic assemblies from the KRC1, KRC2, and KRC4 series – with the clear objective to maintain the robots' functionality well beyond obsolescence.

The use of robots is growing – not only in Asia, but also in Europe. Especially in industries such as automotive, electronics industries or mechanical engineering, robotics is enabling efficient manufacturing processes. The range of possible applications expands with a new generation of roots. At the same time, maintaining existing systems is becoming increasingly demanding, as the service life of industrial robots often exceeds the lifespan of their electronic components. In addition, manufacturers' discontinuations make access to spare parts and services more difficult.

EICHLER meets these challenges with decades of experience in repair of industrial automation technology. For KUKA modules of the series KRC1, KRC2 and KRC4 EICHLER offers a comprehensive range of services: repairs down on component level, control cabinet refresh, and professional testing procedures in our in-house test centre. This ensures reliable continued operation well beyond obsolescence.

Comprehensive functional check as part of the incoming inspection

Once the faulty parts arrive at the EICHLER Service Centre, a precise fault diagnosis begins. The assembly is fully commissioned within the relevant robot system, enabling even complex faults, such as those in safety circuits or interfaces to be clearly identified. Targeted diagnostics shorten the repair time and form the basis for a detailed cost estimate. This gives full cost control, as only the actual faults are charged. After the approval, the repair is carried out by trained technicians down on component level. The service is completed with technical cleaning, preventive maintenance measures, and a minimum warranty of 24 months.

Final function test ensures repair success

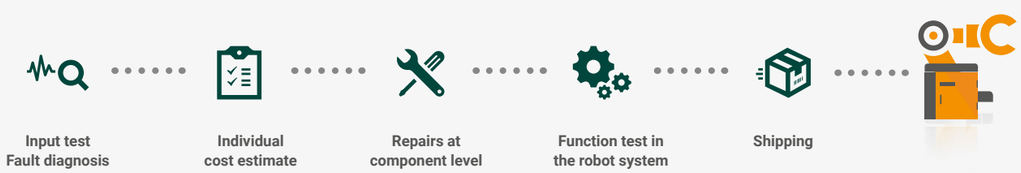
Before a repaired assembly leaves the EICHLER Service Centre, it undergoes a comprehensive functional test. Whether it's a KCP control unit or a KSD servo module – all assemblies are fully commissioned. At the test centre, robots undergo endurance runs lasting several hours under realistic operating conditions. During these tests, all functions, interfaces and safety devices are checked in accordance with a defined testing procedure. For KUKA KSD assemblies, an automated parameter check including a test report can be carried out on request. This allows the warranty to be extended to up to 36 months*. The test duration can be individually adjusted if required.

Test centre developed in-house by **EICHLER**

At the heart of the facility are four industrial robots in unmistakable KUKA orange, representing the KRC1, KRC2 KRC2 ed05 and KRC4 control generations.

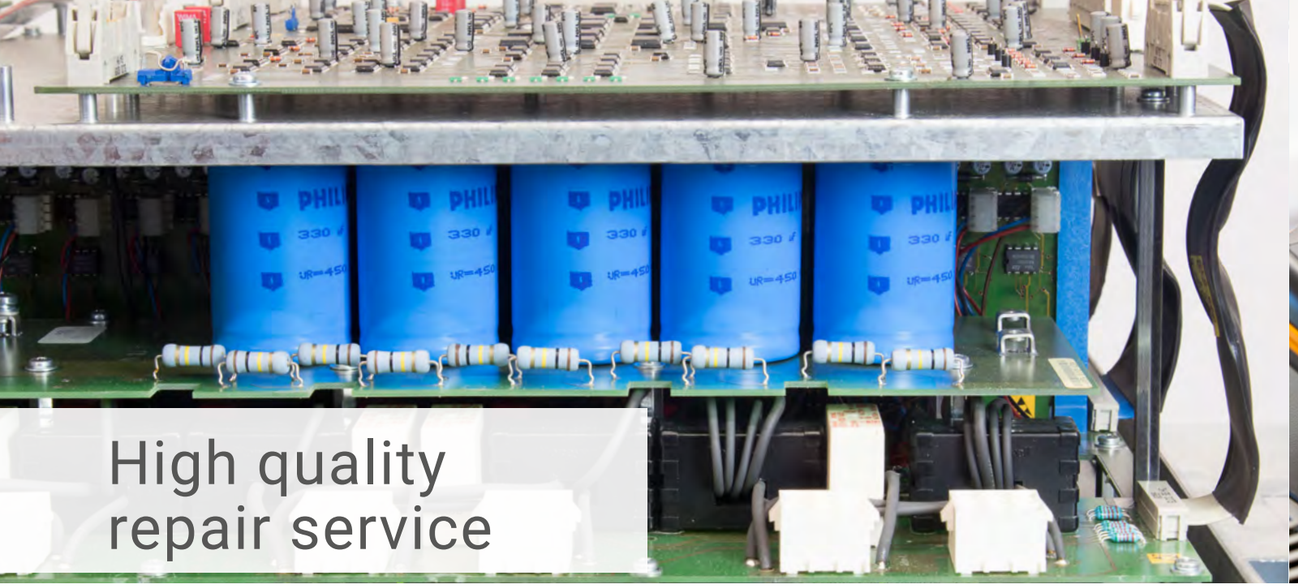
Our robots operate within a secure safety cage and are mounted on a flexible structure. Thanks to modular adapter plates, different robot series can be integrated quickly and according to specific requirements. Outside the secured area, electronic units from the HMI, control and drive sectors are seamlessly integrated into the robot peripherals – ensuring the highest repair quality.

Repair process



- ✔ **Certified processes according to**
  ISO 9001:2015; ISO 14001:2015; ISO 45001:2018; KTA1401
- ✔ **Use of components**
  Installation of original component types if available, otherwise components with identical functions and specifications
- ✔ **Operating license remains intact**
  No significant changes to the device, no conflicts for the operator with the Product Safety Act or the Machinery Ordinance
- ✔ **Help with active and discontinued series**
  Repair, maintenance and testing of industrial robots from the KRC1 generation to KRC4 series units
- ✔ **Final examination in real robot system**
  Test of the devices under realistic conditions, commissioning in the system with the appropriate KRC controller and the compatible industrial robot
- ✔ **Guarantee and warranty**
  Minimum warranty of 24 months on each KUKA unit, with optional* extension of the warranty for KSD modules to 36 months

*with optional, chargeable extended inspection



High quality repair service

Both for the power electronics of the KUKA KRC series from KRC1 to KRC4 ...

KUKA KPC1 – Control PCs

These PCs are often sent to EICHLER for repair due to faults caused by flat bios batteries, age-related internal signal processing errors as well as power supply issues, damaged hard disks and defective power supply units. The functions of all standard interfaces, including the hard disk, mouse and keyboard, are checked in advance. The range of repairs includes the PC and its individual parts. After the repair, the industrial PC is put into operation in a complete robot system for testing.

KUKA KRC1 – PM 6 Power components

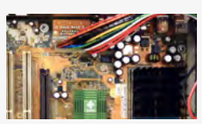
Service and spare parts services for KRC1 power modules PM6 have already been discontinued by the manufacturer. Many robots with these power modules are still in use today. Age-related defects in components often lead to sudden failures. To prevent this, a regular refresh is recommended. After the initial inspection, components subject to wear are replaced and the complete robot system undergoes thorough technical cleaning and final tests.

KUKA KRC1 – Safety board

With the KUKA KRC1 safety circuit board, defective components such as relays often cause faults. If the contacts of the installed relays and safety relays with forcibly guided contacts are heavily soiled or damaged, this can quickly lead to a system standstill. At EICHLER, the defective components are replaced. Following the repair, the circuit board is tested in a complete robot system.

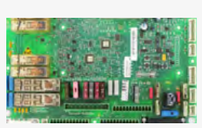
KUKA KRC2 – MFC Cards

Many components subject to wear are installed on the MFC card. These components, such as optocouplers, should be checked or replaced regularly so that the card can continue to function fully and safety is guaranteed. During preventive maintenance measures, the assemblies are subjected to professional technical cleaning and all components subject to wear are replaced.



KUKA KPC2 – Control PCs

EICHLER offers two repair options for older control PCs from the KRC2 series: The complete PC, with the internal power supply being particularly susceptible to faults, or the repair of specific individual components such as DSE cards, MFC2 cards and graphics cards (KVGA 1.0, 2.0) can be specifically repaired. Each control unit, from the complete package or as an individual part, is then put into operation in a real system or complete robot system and tested for full functionality. In general, control units, whether from the complete package or as individual components, are finally commissioned in a real system or a complete robot system and tested for full functionality.



KUKA KRC2 „edition 05“

Industrial robots in this series are based on the KRC2 controller type. They are designed for cooperation between man and machine in confined spaces. „edition 05“ robots have extended functio-nalities, an additional safety circuit and a modified software version. EICHLER has the know-how to repair their electronic units such as control panels, control PCs or power supplies professionally and to test them under realistic conditions for completion.

KUKA KRC4 – Power packs and servo packs

KUKA Power Packs are responsible for the power supply and, depending on the version, also for axis control. The Servo Packs, on the other hand, are only responsible for controlling up to three axes. Repairs to KPP and KSP modules from the KRC4 series can be carried out in the Service Center down to component level. This is followed by a technical cleaning with a final comprehensive test scenario in the complete robot system.

... as well as for safety boards and handheld control devices.

ESC safety cards

The KUKA ESC card (Electronic Safety Circuit) ensures the safe operation of robot systems via a dual-channel safety circuit. Communication within this closed ESC circuit is continuously monitored. In the event of a fault, the ESC card immediately triggers a safe shutdown of all robot axes. EICHLER has developed a dedicated process for servicing safety technology in accordance with current regulations. Safety boards from the KRC1, KRC2, KRC2ed. 05 and KRC4 systems are repaired with the utmost precision using original components. Every repair is fully documented – transparent and traceable. Preventive maintenance measures, detailed inspection of all solder joints, and a final function test within the original robot system are key elements of our quality assurance – carried out according to the four-eyes principle and including a multi-hour endurance run to detect even sporadic or temperature-dependent faults. All repairs come with a 24-month warranty and guarantee.

smartPADs

KUKA smartPADs are used with industrial robots of the KRC4 control generation. At first glance, they differ significantly from the HMI devices of the KCP1 and KCP2 series. Thanks to the innovative 8,4“ touch display and the 6D mouse, even complex operating tasks can be performed with ease.

However, even the latest generation of mobile control devices is not immune to faults or failures. EICHLER carries out smartPAD repairs for a wide range of specific issues involving the following components:

- Touchscreen / display
- Data cable
- Emergency stop
- Motherboard
- Keypad
- Enabling switch
- Key switch
- Space mouse
- Housing

After repair, each smartPAD is tested under real conditions with a KRC4 controller and robot at EICHLER test centre – including a multi-hour testing cycle. In addition to a detailed repair report, you will receive a minimum 24-month warranty in the repair performed at the EICHLER Service Centre.

Control Panel KCP1 and KCP2

Despite being discontinued by KUKA, KCP1 and KCP2 handheld control units are still widely used – particularly in the automotive industry. They provide all necessary control and display functions for the operation and programming of robot systems. During maintenance, EICHLER technicians carry out repairs down on component level, including:

- Keyboard
- Display
- Emergency stop
- Space mouse
- Data line
- Key switch
- Enabling switch
- Housing damage
- Mainboard repairs

Following extensive final testing under real conditions with test controller and robot, you will receive a 24-month warranty and guarantee on the repair.

Control cabinet refresh

Refurbishment at the Service Centre

Tip: Schedule refreshes during non- production periods.

EICHLER offers expert refurbishment of your robot electronics at its in-house testing and repair centre.

Regular refreshes extend the service life of robot electronics and forms the basis for sustainable re-use concepts. At the EICHLER Service Centre in Pürgen, both complete control cabinets and individual assemblies are thoroughly cleaned, expertly overhauled, and function-tested using proprietary testing technology.

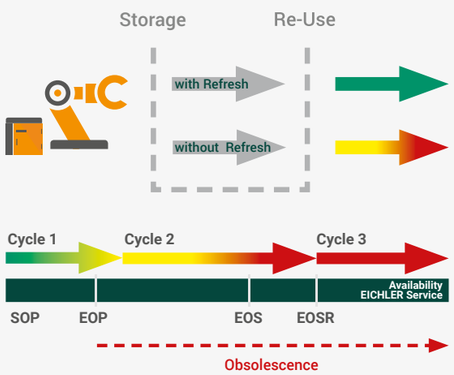
Preventive maintenance is especially valuable in environments with heavy contamination, such as rubber particles, dust, or liquids, helping to avoid costly system breakdown.

What does the refresh include?

The experts at the EICHLER Robotics Centre carry out preventive refresh procedures for KUKA control cabinets of the KRC1 and KRC2 series. This process includes complete disassembly, the measurement and replacement of electronic and mechanical wear parts, as well as professional technical cleaning. Preventive maintenance is performed on integrated modules such as power supplies, ESC boards, and more. The control cabinet is checked for worn components such as fans, batteries, terminal connections, and the cable harness. They get replaced as required. The technical cleaning process involves both dry and wet methods, applied manually or by machine. Specially formulated chemical cleaners, microorganisms, and dry ice are used. After wet cleaning, devices are cleared of residual moisture using compressed air and then dried in special heating cabinets.

Once the refresh is complete, the cabinet system is reassembled. Final commissioning within a complete robot system verifies full functionality over several hours or even several days. The refurbishment control cabinet system comes with a 24-month warranty and guarantee.

Re-use concepts benefit from refresh



The operating life of industrial robots is closely linked to production cycles in many industries. On average, the duration of a cycle is around 7 years. From the second cycle onwards, manufacturer-imposed limitations on service and spare part availability can already complicate maintenance.

Especially when older KUKA KRC2 systems are carried out into a third generation, regular refresh procedures are essential to avoid unplanned failures. For modern re-use concepts that involve storing complete robot systems for future deployment, such maintenance is indispensable.

Interview

„We want to protect our customers as much as possible from unwanted long downtimes and high costs and thus also do our bit for the environment.“

Marius Felkner has been working at Eichler GmbH for over ten years now. He completed his training as an electronics technician here, attended technical school for two years and then returned to the company as a state-certified electrical engineer. Marius took over as Robotics Team Leader in 2019. In this interview, you can find out what connects him to robotics and what he still wants to achieve.

How did you get into robotics and what do you like about it?

Marius Felkner: During my time here at Eichler, I worked in all of our technical departments, which was very informative for me. In addition to working in drive technology, the topic of robotics became more and more of a focus for me. The qualifications I acquired in the technical school predestined me to take over the team management of this specialist area.

The special thing about robotics at Eichler is that we work on a real system with the robots, which I personally enjoy very much every day. This has the advantage that we can test the devices under real conditions, which makes fault localization more effective. This saves a lot of time, which ultimately also benefits the customer. They receive their cost estimate and, as a result, their repaired appliance much faster.

What are the current challenges?

MF: Both troubleshooting and rectification are becoming increasingly difficult. Some time ago, sporadic errors were rather rare, whereas recently they have been occurring more and more frequently. This always raises the following questions: When exactly does the fault occur at the customer's premises? In what environment is the device located? For example, is it exposed to extreme heat, cold or vibrations? All these aspects must be considered. If the customer provides us with a detailed picture of the fault, this is very helpful for us technicians to locate the fault more quickly.

The procurement of spare parts also plays a major role. Especially for obsolete series, there are hardly any possibilities to obtain special components. Eichler currently has an extensive stock of spare parts, but as team leader I am also responsible for developing a strategy for the future. Opening up new procurement sources or collecting technical data for redesigns, to name just a few points.

What do you expect from robotics in terms of obsolescence?

MF: In robotics, but also in industry in general, we have seen over the last 10 years that devices are becoming defective after an ever shorter service life and are being discontinued earlier by the manufacturer. I would like to see manufacturers producing in a more sustainable and therefore more environmentally conscious way again and guaranteeing longer spare parts procurement instead of always focusing on selling more new appliances.

It is difficult to say whether and when manufacturers will change their mindset. However, we want to protect our customers as much as possible from unwanted long downtimes and high costs and thus also do our bit for the environment. That's why, in addition to repairs, Eichler also offers equipment refreshes, including complete systems for the KUKA KRC1 and KRC2 cabinets.

What are your plans for the future?

MF: It all started with KUKA in robotics, which is where we are currently strongest. However, we want to expand our repair portfolio to include other well-known manufacturers in the future

Thank you very much for the interview!

EICHLER repairs the following series:

■ KRC1 ■ KRC2 ■ KRC2 ed.05 ■ KRC4

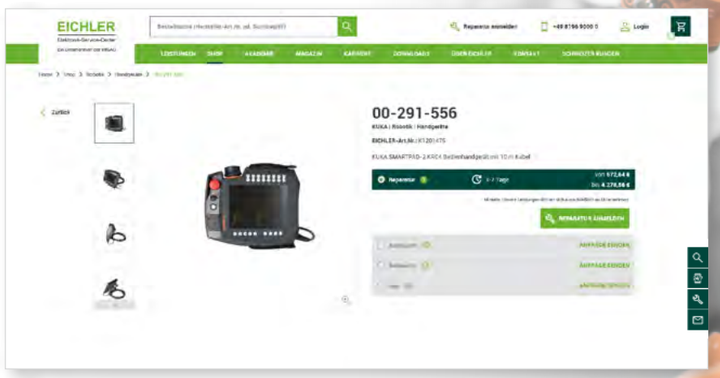
Description	KRC1	KRC2 / edition05	KRC4	Guarantee
Digital Servo Electronics DSE	✓	✓		24 months
KUKA Control Panel KCP1+2	✓	✓		24 months
KUKA Mainboard SY-7VBA133		✓		24 months
KUKA Steuerungs-PC	✓	✓	✓	24 months
KUKA VGA KVGA Card	✓	✓		24 months
Multi Funktion Card MFC	✓	✓		24 months
KUKA smartPAD			✓	24 months
KUKA smartPAD 2			✓	24 months
KUKA Control Panel KCP2-SP		✓		24 months
KUKA Power Supply Unit PSU	✓	✓	✓	24 months
Cabinet Control Unit CCU			✓	24 months
Cabinet Interface Board CIB			✓	24 months
ESC-CI Safety Cards		✓		24 months
FE 201 Typ 1	✓			24 months
FE 201 Version A	✓			24 months
FE 201 Version B	✓			24 months
PCI Interbus Card	✓	✓		24 months
PCI Profibus Card	✓	✓		24 months
Power Management Board PMB			✓	24 months
Proxy for PROFINET			✓	24 months

Description	KRC1	KRC2 / edition05	KRC4	Guarantee
Resolver Digital Converter RDC			✓	24 months
Resolver Digital Wandler RDW	✓	✓		24 months
Safe RDW		✓		24 months
Safe RDW I/O Print board		✓		24 months
KUKA Servo Drive KSD1-8		✓		36 months*
KUKA Servo Drive KSD1-16		✓		36 months*
KUKA Servo Drive KSD1-32		✓		36 months*
KUKA Servo Drive KSD1-48		✓		36 months*
KUKA Servo Drive KSD1-64		✓		36 months*
KUKA Power Supply KPS-600/20-ESC		✓		24 months
KUKA Power Pack KPP 600-20			✓	24 months
KUKA Power Pack KPP 600-20 UL			✓	24 months
KUKA Servo Pack KSP 600-3x20			✓	24 months
KUKA Servo Pack KSP 600-3x20 UL			✓	24 months
KUKA Servo Pack KSP 600-3x40			✓	24 months
KUKA Servo Pack KSP 600-3x40 UL			✓	24 months
KUKA Servo Pack KSP 600-3x64			✓	24 months
KUKA Servo Pack KSP 600-3x64 UL			✓	24 months
Power Modul PM6-600	✓			24 months

* with optional, chargeable extended inspection

www.eichler-service.com

Discover KUKA robotic equipment from generation KRC1 to KRC4 available for purchase or repair – from KCP control units and KRC controller PCs to power supplies



Exclusively at **EICHLER** – up to 36 months warranty and guarantee

For almost 50 years, EICHLER has stood for outstanding service quality in the repair and sale of both modern and legacy automation technology. Your system availability is our top priority. Every repaired assembly and every sold device undergoes advanced testing procedures and strict quality controls. Once flawless functionality is confirmed, you receive the EICHLER quality seal – with 24 months warranty and guarantee, or even up to 36 months* in some cases.

* with optional, chargeable extended inspection

EICHLER on YouTube:

Get a comprehensive insight insight into our range of services.

Use the QR code to visit the video „Robotics - Repair and maintenance“

(This video is in German only, with English subtitles available.)