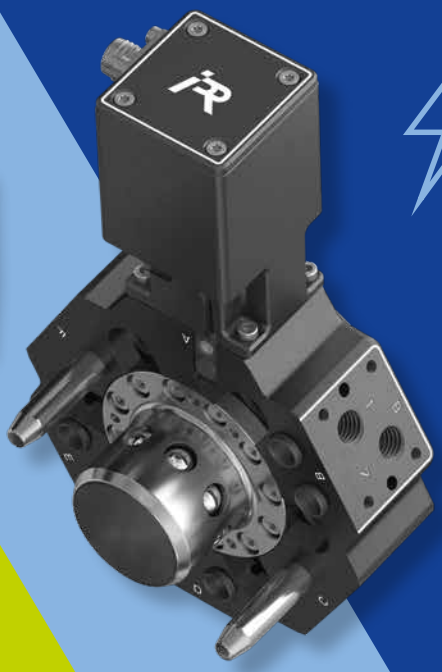
TOOL CHANGERS

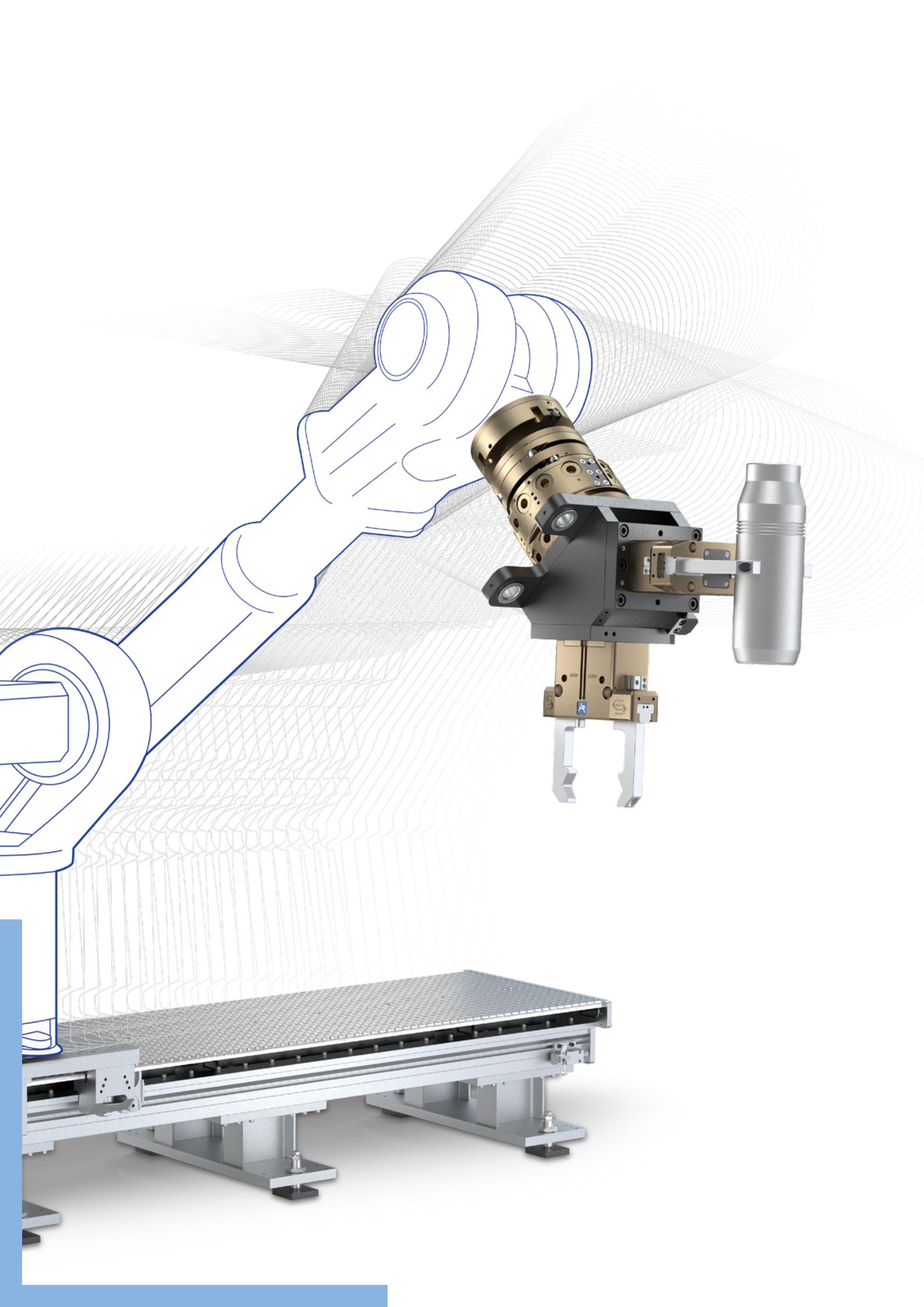
TKX SERIES

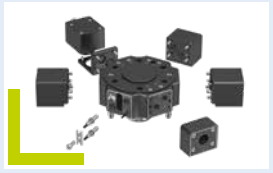


TKX
TOOLCHANGER3
PNEUMATIC · ELECTRIC · MANUAL

MODULARITY TAKEN TO THE LIMIT

INTELLIGENT PERIPHERALS FOR ROBOTS





Overview

IPR – Solutions at hand

Our components make your robot more intelligent, flexible and versatile

Innovation meets top quality

IPR – Intelligente Peripherien für Roboter GmbH is a leader in the development and manufacturing of products related to industrial robots and offers an extensive product range with innovative systems and components for assembly and handling technology. Our parallel and angular grippers, tool changers, joining and compensating systems as well as load limiters, 7th axes for robots and customer-specific solutions are used by customers in many countries around the world.

Companies from all industries trust our products. Quality, technical and industry knowledge are our most important success factors.
We offer you standard products ready for immediate use, but we also support you in special and large-scale projects. Here you benefit directly from the development and manufacturing technologies in our house.

Industry-specific solutions
for robot applications and automation solutions

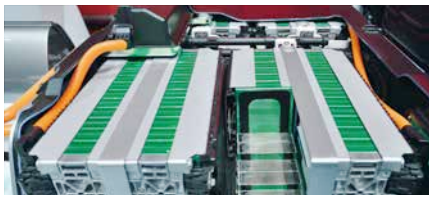
Assembly and handling technology

Machinery loading and unloading

Foundry and forge

Automotive

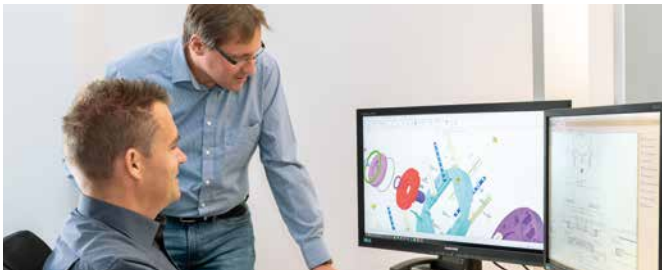
E-mobility



Medicine and pharmaceuticals

Increased value for your application

IPR components are used in a wide variety of industries. The high variance in the product series combined with the possibility of creating modified standard or specifically designed special products in a short time holds a lot of potential for meeting the requirements of our customers. Our success is the result of many years of experience in our company. Our employees are professionals in their field and have extensive knowledge around industries and production processes. This is how we continually develop innovative, high-quality and high-performance solutions for each individual project.



Individuality for your application
from standardized to customized

For individual solutions, we combine standardized components with custom-built modules to reduce design and delivery times as well as costs. Our company provides these services for a wide range of industries such as the automotive and supplier industry, machine tools and plant engineering, intralogistics, electrical industry, renewable energies, medical technology and the aerospace industry.

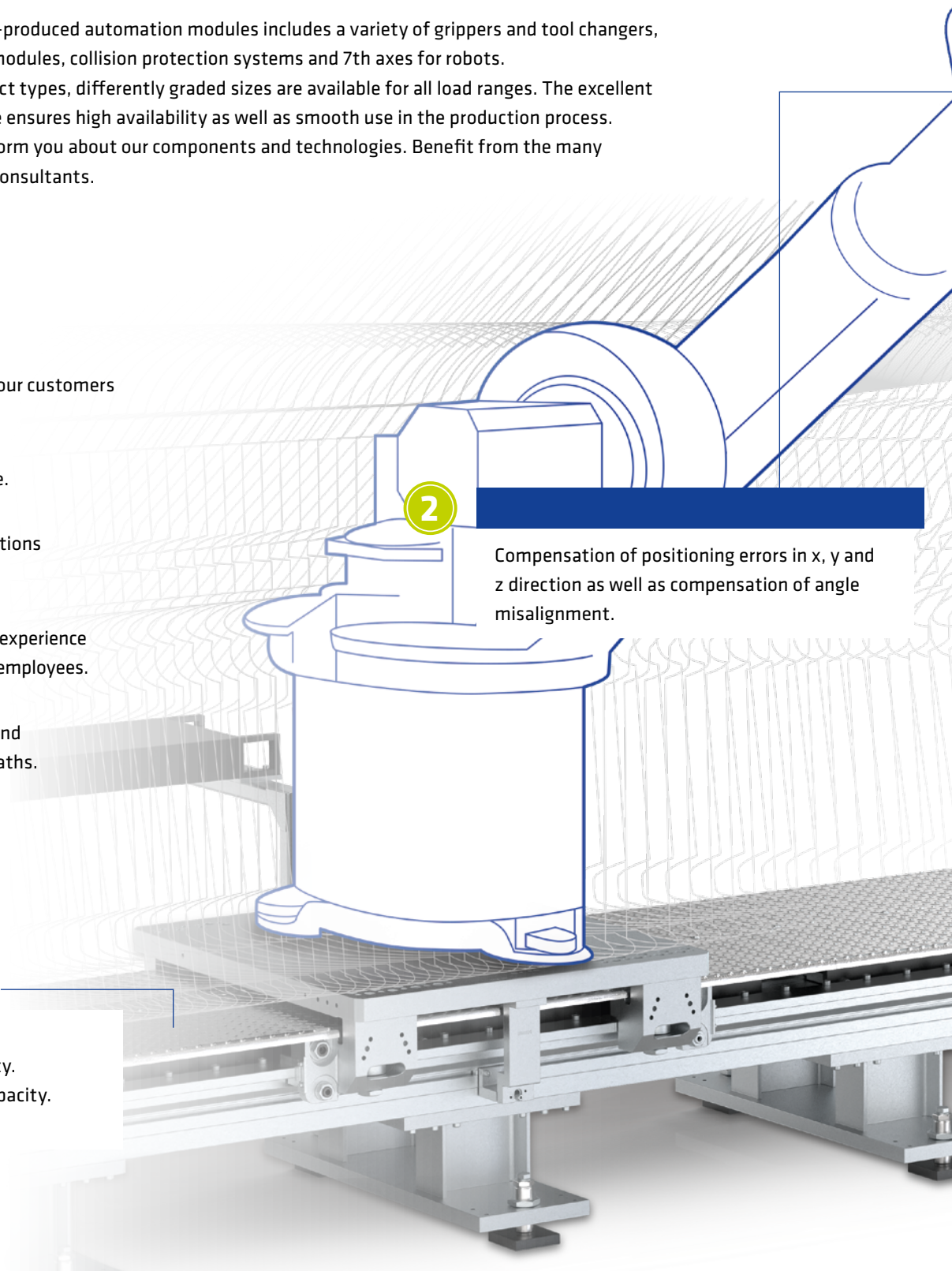
IPR offers everything that robots need to work

Discover our extensive portfolio of peripherals for robots

Our product range of series-produced automation modules includes a variety of grippers and tool changers, joining and compensation modules, collision protection systems and 7th axes for robots.
Within the individual product types, differently graded sizes are available for all load ranges. The excellent quality of our product range ensures high availability as well as smooth use in the production process.
We would be pleased to inform you about our components and technologies. Benefit from the many years of experience of IPR consultants.

IPR stands for:

- **Customer proximity**
  We are always there for our customers with advice and support.
- **Internationality**
  We are on site worldwide.
- **Innovation**
  We offer innovative solutions in top quality.
- **Competence**
  We utilize many years of experience and the know-how of all employees.
- **Quality and flexibility**
  We live lean structures and short decision-making paths.



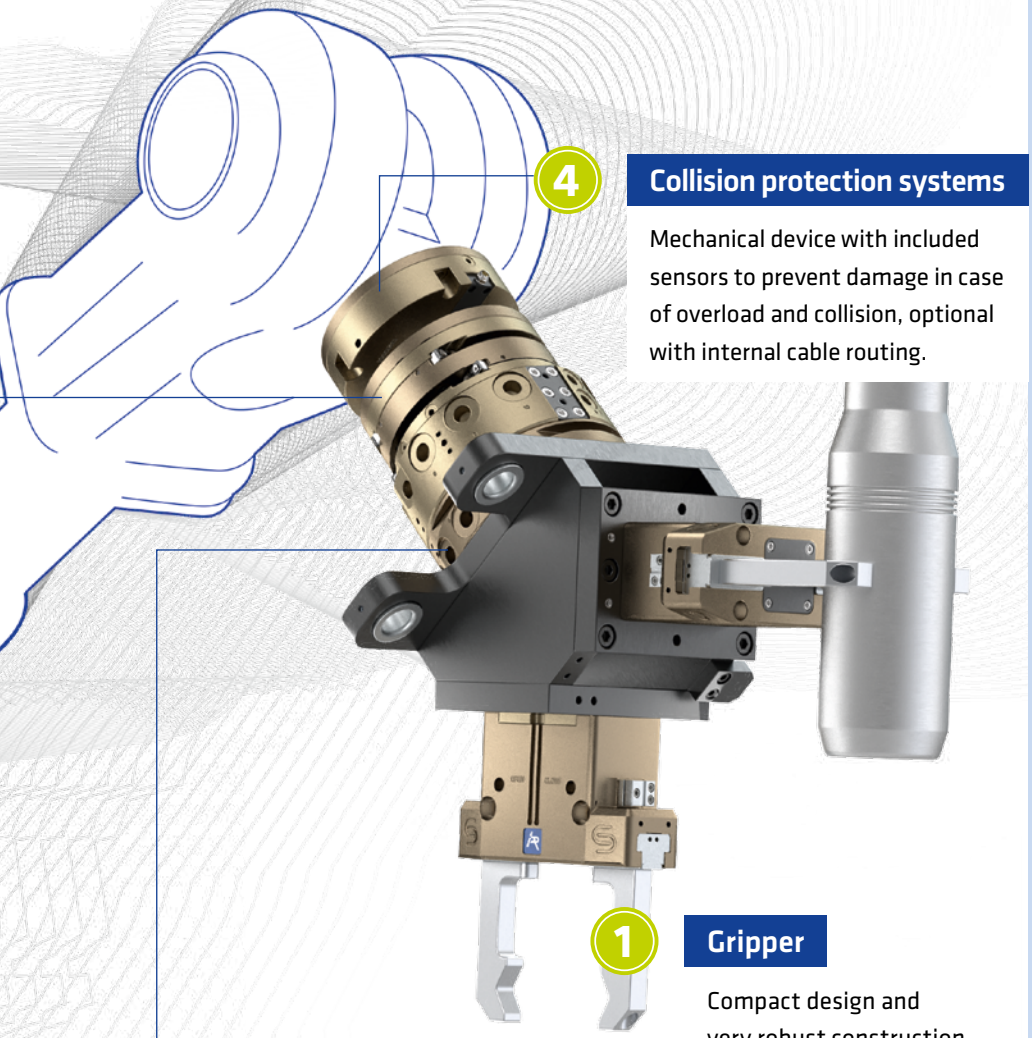
2

Compensation of positioning errors in x, y and z direction as well as compensation of angle misalignment.

5

7th axes

Modular system.
High repeatability.
Extreme load capacity.
Long life.



4 Collision protection systems

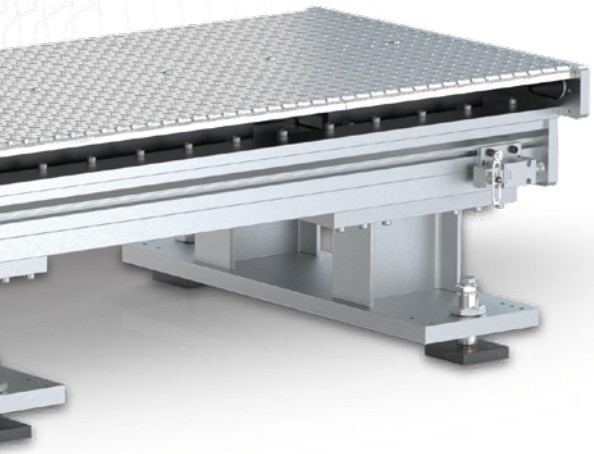
Mechanical device with included sensors to prevent damage in case of overload and collision, optional with internal cable routing.

1 Gripper

Compact design and very robust construction. Gripping force retention via spring (optional).

3 Tool changer

Quick change of tools and grippers on the robot or gantry. Simple assembly and high flexibility due to short changeover times.



1 Gripper

2

3

4 Collision protection systems

5 7th axes for robots

The revolutionary tool changer modular system from IPR

3 drives – compatible and interchangeable

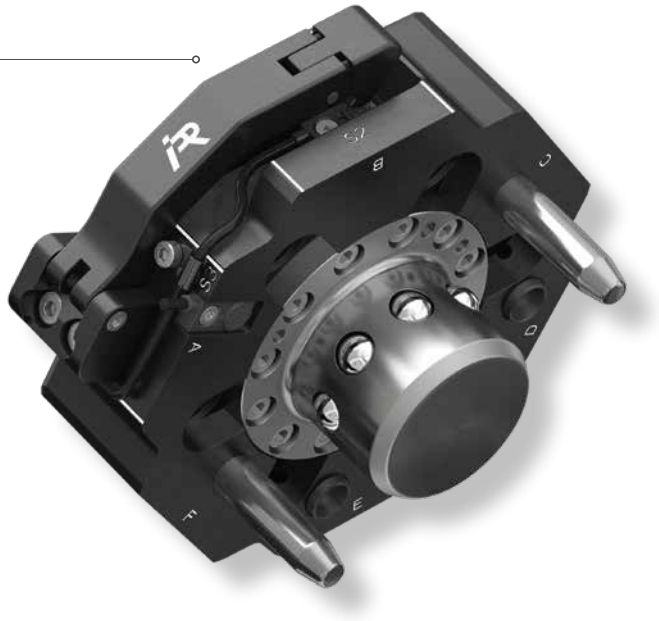
Everything from a single source

The new TKX family is revolutionizing the world of robotic automation: Three drive technologies with endless application possibilities. From classic industrial applications to use with lightweight robots and stationary applications, the new tool changers are convincing all along the line. From now on every robot in production can be equipped with a single system – interchangeable and fully flexible.

TKX TOOLCHANGER3
PNEUMATIC · ELECTRIC · MANUAL

TKM | MANUAL

Change in the blink of an eye – no power supply necessary, therefore especially suitable for applications with low replacement cycles.



The TKX Ecosystem

Optimal accessories for your tools

In addition to standardized transmission modules for signals, power, pneumatics and various fluids, the TKX ecosystem also includes a double interlock and an extensive modular system for storing the TKT tool sides. This ecosystem is continuously being expanded and optimized in order to provide the highest performance to our customers.

TKT

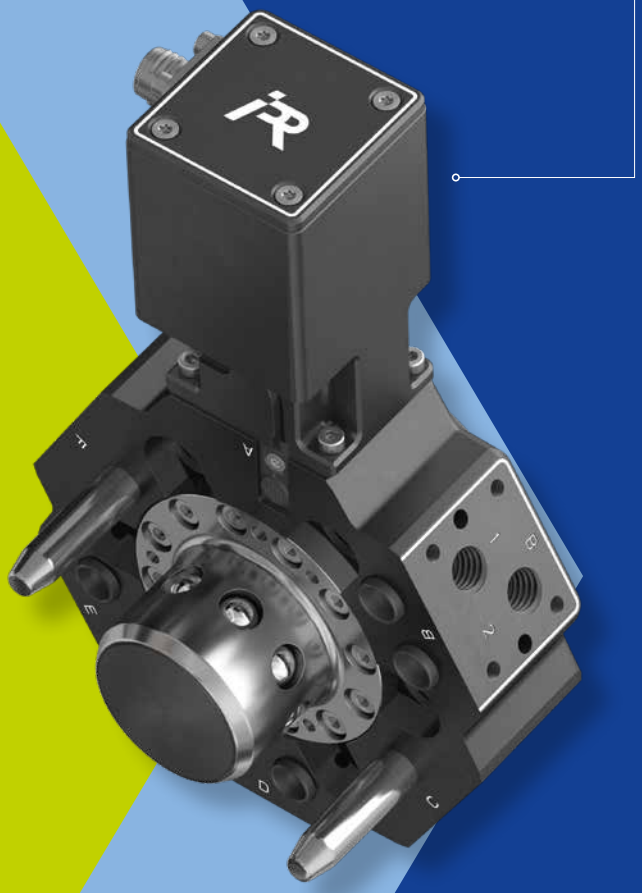
One for all – the same tool side can be used for each drive variant and interchanged between them as required.

TKP | PNEUMATIC

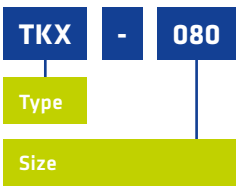
Proven functional principle – successful for 30 years and further improved with optimized kinematics for maximum locking force.

TKE | ELECTRIC

Changing with 24 V – no pneumatics necessary, therefore especially suitable for light-weight robots, cobots and environments without compressed air.



TKX Series Product Name



Advantages of the TKX series

- **Modular design** with countless combination options
- **New pneumatic seals** for efficient sealing and low coupling forces
- Designed for **highest loads**
- Easy teaching thanks to **extra long tapered pins**

TKP | PNEUMATIC

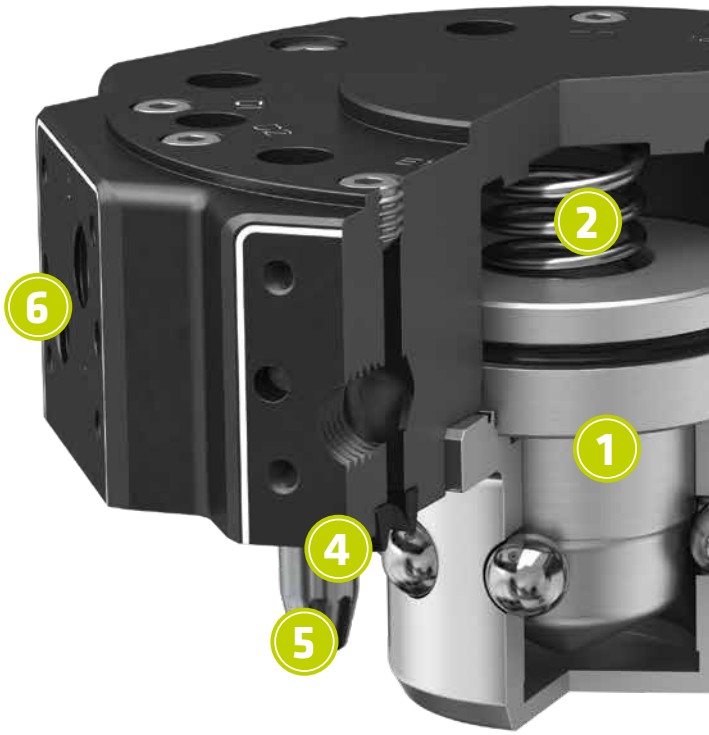
Proven functional principle

Fields of application

The TKP pneumatic tool changer is suitable for all robot and gantry applications with automated tool changing by the robot. In most cases, a compressed air supply is already provided on the robot, so that the locking and unlocking of the changer can be easily triggered via the robot controller.

Compatibility

Screw-on patterns according to DIN EN ISO 9409-1 allow for compatibility of TKP series with almost every robot from Fanuc, Kuka, ABB, Stäubli, Yaskawa and many more. They can be mounted directly to the hand flange of the robot and do not require any special mounting tool. If a special mounting pattern is required, we will be pleased to supply a robot-specific adapter plate.



PNEUMATIC

FAST

RELIABLE

Figure shows TKP-080 with optional sensors

Product advantages & benefits at a glance

- Modular system with different drives and interchangeable mold side
- Multiple mounting surfaces for optional modules allow specific configuration of the system for each application
- Up to 5x higher tensile load possible compared to similar tool changers
- Improved integrated air feedthroughs with high reliability, high temperature resistance and low abrasion
- Modern design with high quality appearance and increased functionality
- Hard chrome plated functional parts for high corrosion resistance, surface hardness and low friction
- Easy robot teaching due to extra long centering pins and increased maximum distance when locking

1 Pneumatic piston
The proven and widely used technology of locking via compressed air also contributes to fast change cycles and reliable function in the TKP.

2 Stainless steel spring for force retention
Even in the event of a loss of compressed air, the standard integrated compression spring briefly prevents unintentional release of the mold side.

3 Preparation for standard sensors
For integrated process control, sensor kits can be ordered at the same time or retrofitted, both for sensing the interlock and the coupling with the mold.

4 Specially sealed pneumatic feedthroughs
The pneumatic seals specially developed for the TKX series are particularly robust, ensure a constant feedthrough of pneumatics or vacuum and can be replaced without tools.

5 Extra long taper pins
In order to make teaching the robot as easy as possible without external and safe as possible without external aids, extra long tapered pins support centering and coupling of the tool side. of the tool side.

6 Multiple module surfaces
For maximum modularity, each robot side of the TKX series has several screw-on surfaces for modules of various types.

7 Uniform tool side
Regardless of the drive of the robot side – whether pneumatic, electric or manual – a single tool side can be used universally and interchanged between the different versions as required.

TKE | ELECTRIC

Change with 24 V

Fields of application

The TKE electric tool changer is particularly particularly suitable for applications that do not require pneumatics at all. In addition to lightweight robots and cobots, these also include applications in the food, medical medical and pharmaceutical industries with high demands on cleanliness and protection against external influences.

Compatibility

Screw-on patterns according to DIN EN ISO 9409-1 allow for compatibility of TKE series with almost every robot from Fanuc, Kuka, ABB, Stäubli, Yaskawa and many more. They can be mounted directly to the hand flange of the robot and do not require any special mounting tool. If a special mounting pattern is required, we will be pleased to supply a robot-specific adapter plate.

ELECTRICAL

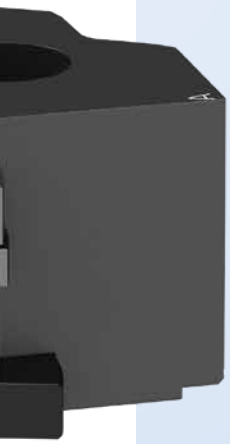
CLEAN

SAFE

Figure shows TKE-080 with optional sensors

Product advantages & benefits at a glance

- Modular system with different drives and interchangeable mold side
- Multiple mounting surfaces for optional modules allow specific configuration of the system for each application
- Up to 5x higher tensile load possible compared to similar tool changers
- Improved integrated air feedthroughs with high reliability, high temperature resistance and low abrasion
- Modern design with high quality appearance and increased functionality
- Hard chrome plated functional parts for high corrosion resistance, surface hardness and low friction
- Easy robot teaching due to extra long centering pins and increased maximum distance when locking



1 **Powerful electric motor**
The electric drive of the locking device makes it possible to completely dispense with a pneumatic supply and use it in environments without compressed air.

2 **Self-locking via thread pitch**
The mechanical properties of the sliding block on the threaded rod result in self-locking and thus force retention in the de-energized state.

3 **Preparation for standard sensors**
For integrated process control, sensor kits can be ordered at the same time or retrofitted, both for sensing the interlock and the coupling with the mold.

4 to **7** See page 13

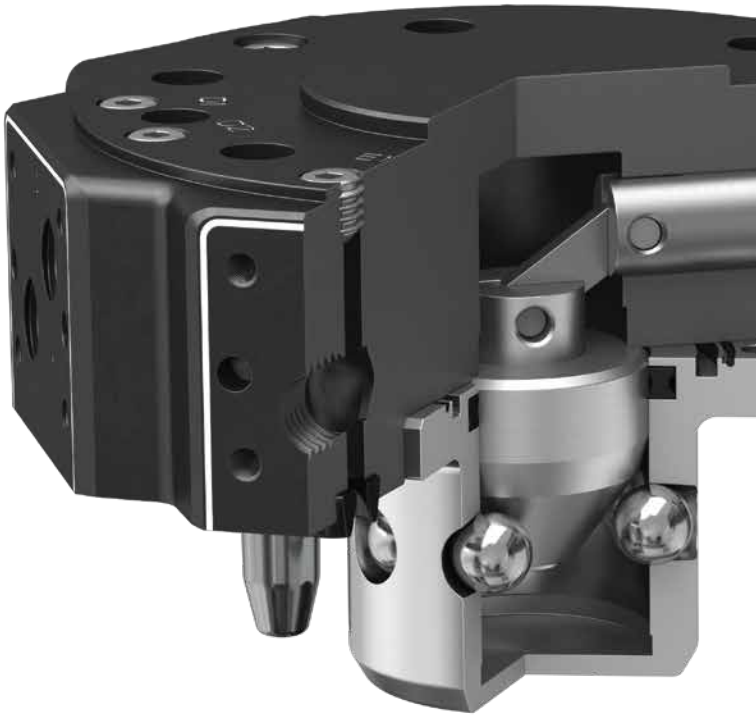
TKM | MANUAL

Fields of application

The TKM manual tool changer is particularly suitable for applications with low change cycles for which the implementation of an automated control system is not worthwhile. With the ergonomically shaped push lever, the mounted tool can be changed quickly and easily without extensive training.

Compatibility

Screw-on patterns according to DIN EN ISO 9409-1 allow for compatibility of TKM series with almost every robot from Fanuc, Kuka, ABB, Stäubli, Yaskawa and many more. They can be mounted directly to the hand flange of the robot and do not require any special mounting tool. If a special mounting pattern is required, we will be pleased to supply a robot-specific adapter plate.



MANUAL

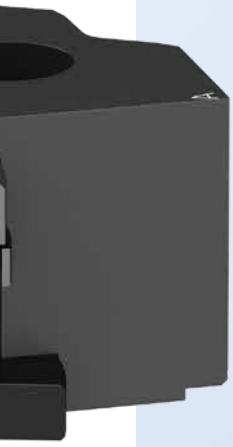
SIMPLE

AFFORDABLE

Figure shows TKM-080 with optional sensors

Product advantages & benefits at a glance

- Modular system with different drives and interchangeable mold side
- Multiple mounting surfaces for optional modules allow specific configuration of the system for each application
- Up to 5x higher tensile load possible compared to similar tool changers
- Improved integrated air feedthroughs with high reliability, high temperature resistance and low abrasion
- Modern design with high quality appearance and increased functionality
- Hard chrome plated functional parts for high corrosion resistance, surface hardness and low friction
- Easy robot teaching due to extra long centering pins and increased maximum distance when locking



1 **Ergonomic push lever**
With complete elimination of external drive power, the TKM can be locked and unlocked quickly and easily by hand.

2 **Protection against accidental unlocking**
Mechanical engagement of the thrust lever in the locked position prevents unintentional release of the locking mechanism. Optionally, it can be equipped with a sensor.

3 **Preparation for standard sensors**
For integrated process control, sensor kits can be ordered at the same time or retrofitted, both for sensing the interlock and the coupling with the mold.

4 to **7** See page 13

Tool changer TKX series

Visualized principle of function

decoupled

TKP | PNEUMATIC

The proven functional principle of a pneumatic tool changer has been further optimized and improved in the new TKP. The piston is pressed upwards (towards the screw-on surface, unlocked) or downwards (towards the coupling surface, locked) by compressed air supply. An angled contour on the piston presses the balls outward against the locking bushing on the tool side. The pressure spring in the piston chamber also briefly prevents the tool side from releasing in the event of a drop in compressed air. The optional integrated sensors monitor the piston position as well as the presence of the mold side.

TKE | ELECTRIC

The electric motor, in conjunction with specially developed deflection kinematics, enables the same locking system to be used as in the pneumatic changer. The threaded spindle is rotated by the motor and moves a spindle nut, which sits in an oblique contour in the locking piston and moves it up or down. The balls are pushed outward and locked to the tool side. Standard integrated sensors for piston sensing enable process control and assist with motor control. Overloading of the motor is avoided and the service life of all components is increased.

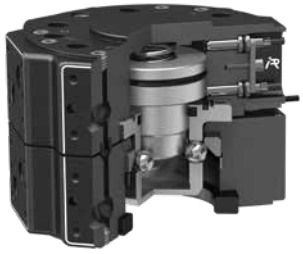
TKM | MANUAL

The uniform locking system of the TKX series allows the same mold side to be used without restrictions in the manually lockable variant. The thrust lever can be opened with little effort after releasing the lock, which causes a stroke movement of the piston by means of special toggle lever kinematics. Here, too, the presence of the tool side as well as the locking that has taken place can be sensed via optional sensors. Extra-long taper pins prevent excessive tilting of the tool side during the coupling process, thus avoiding damage to the locking bush.

coupled

locked

Figure shows TKP-080
with optional sensors



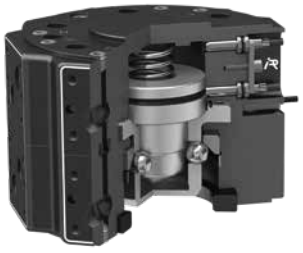


Figure shows TKE-080
with optional sensors

Figure shows TKM-080
with optional sensors

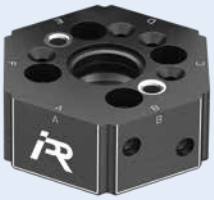
Basic modules

TKX-003

TKP-003

TKE-003

TKM-003



TKT-003

Technical data

TKP PNEUMATIC | TKE ELECTRIC | TKM MANUAL

	TKP-003	TKE-003	TKM-003	TKT-003
Item no.	150301100	COMING SOON	150301264	150301101
Attachment	robot side		robot side	tool side
Type of actuation	pneumatic		manual	-
Recommended payload	3 kg			
Max. tensile/compressive force	1,000 N			
Max. moment Mx, My	35 Nm			
Max. moment Mz	140 Nm			
Repeatability	0.02 mm			
Number of mounting surfaces	5	5	4	5
Number of pneumatic/ vacuum feedthroughs	4	4	4	4
Connection type internal bushings	M3			
Weight	0.14 kg	-	0.2 kg	0.1 kg
Locking/unlocking time	coming soon	-	application-dependent	-
Energy required for locking/unlocking	4 to 8 bar	-	application-dependent	-
Self-hold	Stainless steel pressure spring	-	Kinematics	-
Optional sensors	Status query (locked/ unlocked/ presence mold side by means of attachment module)			-
Connection flange	ISO 9409-1-31,5-4-M5			
Outer diameter (base body)	55 mm			
Height (base body)	22 mm			
Protection class	IP 54			
Max. axis deviation in X/Y direction	coming soon			
Max. angular offset from Z axis	coming soon			
Max. offset while locking	0.8 mm			
Coupling way	17 mm			
Air consumption per cycle	0.022 l			
Ambient temperature	+5 to +80 °C	+5 to +50 °C	+5 to +80 °C	+5 to +80 °C

Sensors

Interrogation of locking and mold side

Sensor kits by version and type of query

Suitable for	Interrogation of the interlock Item no.	Query tool side Item no.
TKP-003	150301340	via add-on module See page 38
TKE-003	integrated*	via add-on module See page 38
TKM-003	-	via add-on module See page 38

*The TKE electric tool changer contains sensors for interlock sensing as standard, as these are required to control the motor.

Transmission modules

Transmission of signals/power/field buses

ME-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
ME-8-8M12X	150301210	150301209	See page 31
ME-4-4M12D	150301146	150301145	See page 31
ME-3-3M8A	150301128	150301127	See page 31
ME-4-4M8A	150301124	150301126	See page 31
ME-4-4M12A	150301129	150301125	See page 31
ME-5-5M12A	150301123	150301122	See page 31

More information and 3D data available on request

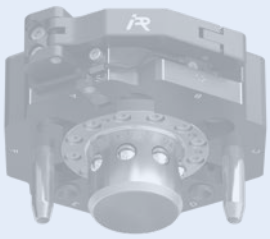
Basic modules

TKX-050

TKP-050

TKE-050

TKM-050



TKT-050

Technical data

TKP PNEUMATIC | TKE ELECTRIC | TKM MANUAL

	TKP-050	TKE-050	TKM-050	TKT-050
Item no.	150301218	COMING SOON	COMING SOON	150301221
Attachment	robot side			tool side
Type of actuation	pneumatic			-
Recommended payload	50 kg			
Max. tensile/compressive force	24,000 N			
Max. moment Mx, My	350 Nm			
Max. moment Mz	1,000 Nm			
Repeatability	0.02 mm			
Number of mounting surfaces	5	5	4	5
Number of pneumatic/ vacuum feedthroughs	6	6	4	6
Connection type internal bushings	G1/8" (NW6)			
Weight	0,95 kg	-	-	0,58 kg
Locking/unlocking time	coming soon	-	-	-
Energy required for locking/unlocking	4 to 8 bar	-	-	-
Self-hold	Stainless steel pressure spring	-	-	-
Optional sensors	Status query (locked/unlocked/presence tool side)			-
Connection flange	ISO 9409-1-63-4-M6			
Outer diameter (base body)	99 mm			
Height (base body)	38 mm			
Protection class	IP 54			
Max. axis deviation in X/Y direction	+/- 1.4 mm			
Max. angular offset from Z axis	+/- 0.5°, higher values on request			
Max. offset while locking	1.4 mm			
Coupling way	35 mm			
Air consumption per cycle	0.111 l			
Ambient temperature	+5 to +80 °C	+5 to +50 °C	+5 to +80 °C	+5 to +80 °C

Sensors

Interrogation of locking and mold side

Sensor kits by version and type of query

Suitable for	Interrogation of the interlock Item no.	Query tool side Item no.
TKP-050	150301261	150301235
TKE-050	integriert*	150301235
TKM-050	150301235	150301235

*The TKE electric tool changer contains sensors for interlock sensing as standard, as these are required to control the motor.

Transmission modules

Transmission of signals/power/field buses

ME-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
ME-8-8M12X	150301210	150301209	See page 31
ME-4-4M12D	150301146	150301145	See page 31
ME-3-3M8A	150301128	150301127	See page 31
ME-4-4M8A	150301124	150301126	See page 31
ME-4-4M12A	150301129	150301125	See page 32
ME-5-5M12A	150301123	150301122	See page 32
ME-5-5M12L	150301197	150301199	See page 32
ME-12-MIL12	150301133	150301134	See page 33
ME-19-MIL19	150301136	150301135	See page 33
ME-15-DA15	150301143	150301144	See page 33
ME-26-DA26-R	150301148	150301149	See page 34

Pneumatic/vacuum transmission

MP-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
MP-4-M5NW4	150301162	150301160	See page 35
MP-2-G1/8NW6	150301163	150301161	See page 35
MP-1-G1/4NW11	150301164	150301158	See page 35
MP-1-G3/8NW11-R	150301157	150301159	See page 35

Earth/mass transmission

MG-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
MG-1-1M4-R	150301152	150301151	See page 34

Further modules of the TKX ecosystem starting on page 38

ⓘ More information and 3D data available on request

Basic modules

TKX-080

TKP-080

TKE-080

TKM-080

TKT-080

Technical data

TKP PNEUMATIC | TKE ELECTRIC | TKM MANUAL

	TKP-080	TKE-080	TKM-080	TKT-080
Item no.	150301055	150301117	150301177	150301056
Attachment	robot side	robot side	robot side	tool side
Type of actuation	pneumatic	electric	manual	-
Recommended payload	80 kg			
Max. tensile/compressive force	53,000 N			
Max. moment Mx, My	2,030 Nm			
Max. moment Mz	1,700 Nm			
Repeatability	0.02 mm			
Number of mounting surfaces	5	5	4	5
Number of pneumatic/ vacuum feedthroughs	6	6	4	6
Connection type internal bushings	G1/8" (NW6)			
Weight	1.4 kg	1.77 kg	1.41 kg	0.79 kg
Locking/unlocking time	0.2 s	1.7 s	application-dependent	-
Energy required for locking/unlocking	4 to 8 bar	24 V / 1.2 A	application-dependent	-
Self-hold	Stainless steel pressure spring	Self-locking	Kinematics	-
Optional sensors	Status query (locked/unlocked/presence tool side)			-
Connection flange	ISO 9409-1-80-6-M8			
Outer diameter (base body)	120 mm			
Height (base body)	38 mm			
Protection class	IP 54			
Max. axis deviation in X/Y direction	+/- 1.75 mm			
Max. angular offset from Z axis	+/- 1.3°			
Max. offset while locking	1.6 mm			
Coupling way	35 mm			
Air consumption per cycle	0.179 l			
Ambient temperature	+5 to +80 °C	+5 to +50 °C	+5 to +80 °C	+5 to +80 °C

Sensors

Interrogation of locking and mold side

Sensor kits by version and type of query

Suitable for	Interrogation of the interlock Item no.	Query tool side Item no.
TKP-080	150301261	150301235
TKE-080	integriert*	150301235
TKM-080	150301235	150301235

*The TKE electric tool changer contains sensors for interlock sensing as standard, as these are required to control the motor.

Transmission modules

Transmission of signals/power/field buses

ME-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
ME-8-8M12X	150301210	150301209	See page 31
ME-4-4M12D	150301146	150301145	See page 31
ME-3-3M8A	150301128	150301127	See page 31
ME-4-4M8A	150301124	150301126	See page 31
ME-4-4M12A	150301129	150301125	See page 32
ME-5-5M12A	150301123	150301122	See page 32
ME-5-5M12L	150301197	150301199	See page 32
ME-12-MIL12	150301133	150301134	See page 33
ME-19-MIL19	150301136	150301135	See page 33
ME-15-DA15	150301143	150301144	See page 33
ME-26-DA26-R	150301148	150301149	See page 34

Pneumatic/vacuum transmission

MP-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
MP-4-M5NW4	150301162	150301160	See page 35
MP-2-G1/8NW6	150301163	150301161	See page 35
MP-1-G1/4NW11	150301164	150301158	See page 35
MP-1-G3/8NW11-R	150301157	150301159	See page 35

Earth/mass transmission

MG-Series

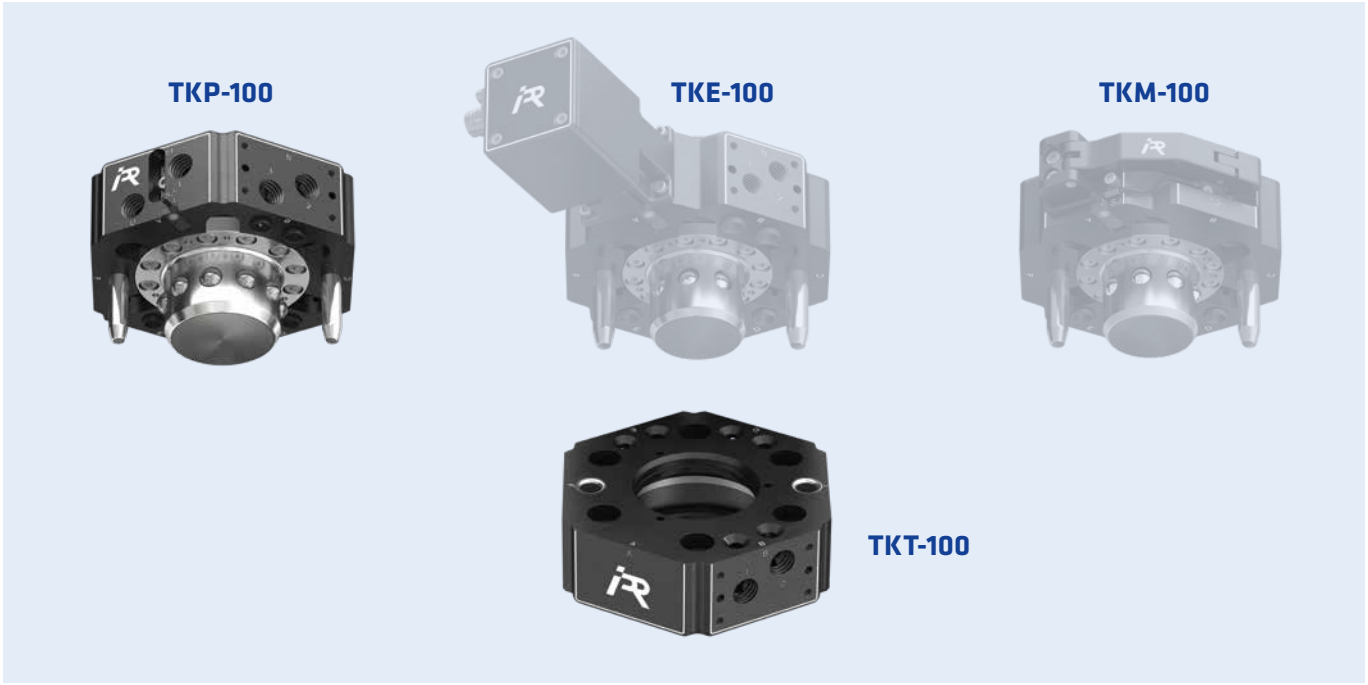
Type	Item no. Robot side	Item no. Tool side	Technical data
MG-1-1M4-R	150301152	150301151	See page 34

Further modules of the TKX ecosystem starting on page 38

More information and 3D data available on request

Basic modules

TKX-100



Technical data

TKP PNEUMATIC | TKE ELECTRIC | TKM MANUAL

	TKP-100	TKE-100	TKM-100	TKT-100
Item no.	150301098	COMING SOON	COMING SOON	150301095
Attachment	robot side			tool side
Type of actuation	pneumatic			-
Recommended payload	100 kg			
Max. tensile/compressive force	75,000 N			
Max. moment Mx, My	3,500 Nm			
Max. moment Mz	1,700 Nm			
Repeatability	0.02 mm			
Number of mounting surfaces	5	-	-	5
Number of pneumatic/ vacuum feedthroughs	6	-	-	6
Connection type internal bushings	G1/4"			
Weight	1.92 kg	-	-	1.11 kg
Locking/unlocking time	coming soon	-	-	-
Energy required for locking/unlocking	4 to 8 bar	-	-	-
Self-hold	Stainless steel pressure spring	-	-	-
Optional sensors	Status query (locked/unlocked/presence tool side)			-
Connection flange	ISO 9409-1-100-6-M8			
Outer diameter (base body)	140 mm			
Height (base body)	42 mm			
Protection class	IP 54			
Max. axis deviation in X/Y direction	+/- 1.8 mm			
Max. angular offset from Z axis	+/- 0.5°			
Max. offset while locking	1.6 mm			
Coupling way	35 mm			
Air consumption per cycle	0.295 l			
Ambient temperature	+5 to +80 °C	+5 to +50 °C	+5 to +80 °C	+5 to +80 °C

Sensors

Interrogation of locking and mold side

Sensor kits by version and type of query

Suitable for	Interrogation of the interlock Item no.	Query tool side Item no.
TKP-100	150301279	150301235
TKE-100	integriert*	150301235
TKM-100	150301235	150301235

*The TKE electric tool changer contains sensors for interlock sensing as standard, as these are required to control the motor.

Transmission modules

Transmission of signals/power/field buses

ME-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
ME-8-8M12X	150301210	150301209	See page 31
ME-4-4M12D	150301146	150301145	See page 31
ME-3-3M8A	150301128	150301127	See page 31
ME-4-4M8A	150301124	150301126	See page 31
ME-4-4M12A	150301129	150301125	See page 32
ME-5-5M12A	150301123	150301122	See page 32
ME-5-5M12L	150301197	150301199	See page 32
ME-12-MIL12	150301133	150301134	See page 33
ME-19-MIL19	150301136	150301135	See page 33
ME-15-DA15	150301143	150301144	See page 33
ME-26-DA26-R	150301148	150301149	See page 34

Pneumatic/vacuum transmission

MP-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
MP-4-M5NW4	150301162	150301160	See page 35
MP-2-G1/8NW6	150301163	150301161	See page 35
MP-1-G1/4NW11	150301164	150301158	See page 35
MP-1-G3/8NW11-R	150301157	150301159	See page 35

Earth/mass transmission

MG-Series

Type	Item no. Robot side	Item no. Tool side	Technical data
MG-1-1M4-R	150301152	150301151	See page 34

Further modules of the TKX ecosystem starting on page 38

ⓘ More information and 3D data available on request

TKX Ecosystem

Configurable for your application

All from a single source

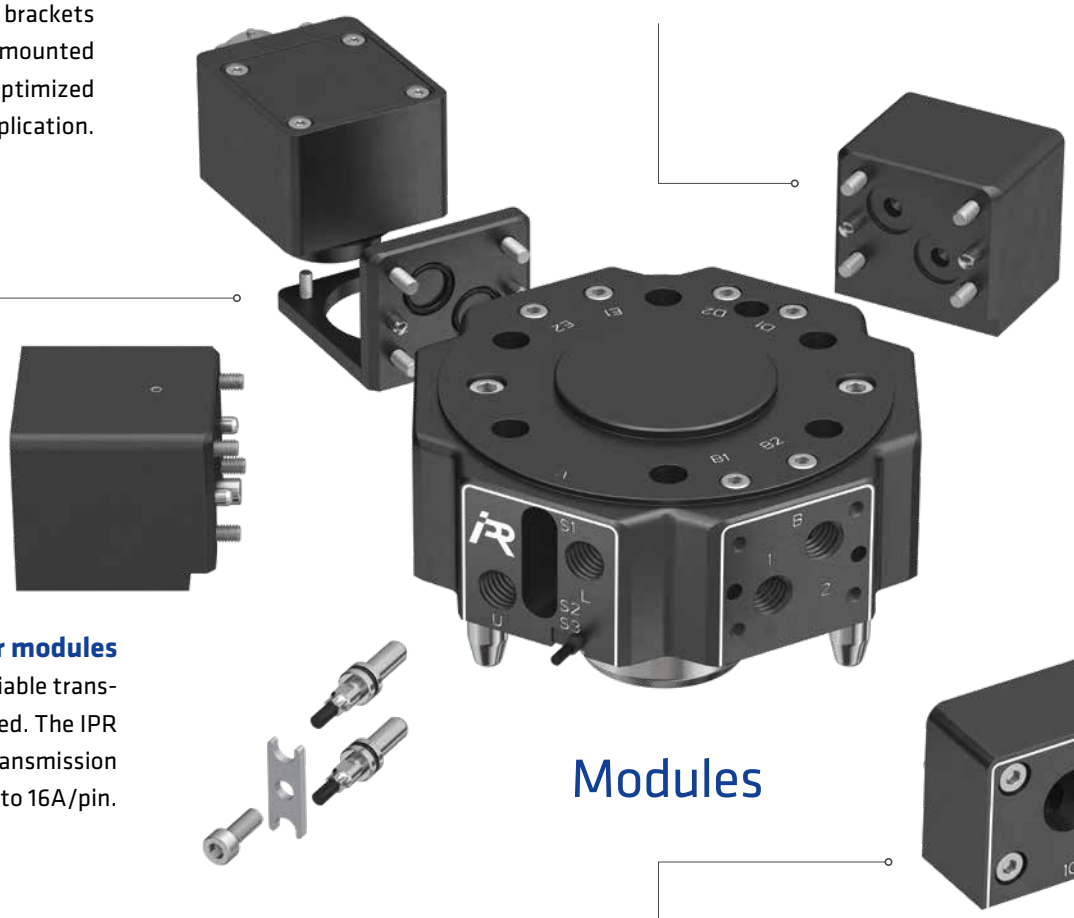
The TKX family offers an extensive module catalog. In addition to additional air, vacuum, signal, industrial Ethernet, fluidics modules, the mounting surfaces can be used for the II tray (stud tray). The variety of combinations here is almost infinite and is continuously being expanded.

Pneumatic modules

If additional air feed-throughs are required for the application or if the air transfers included in the TKX tool changer cannot be used, the pneumatic modules make it possible to transfer compressed air and vacuum.

Module angle

Specially developed mounting brackets allow the TKX modules to be mounted rotated by ±90°. This enabled optimized cable routing in the application.



Power modules

In electronics, not only a reliable transmission of signals is required. The IPR power modules enable the transmission of currents with up to 16A/pin.

Modules

Fluidics modules

Various liquid media can be transferred via the TKX fluidic modules. In three sizes, they allow a flow rate of up to 25 L/min.

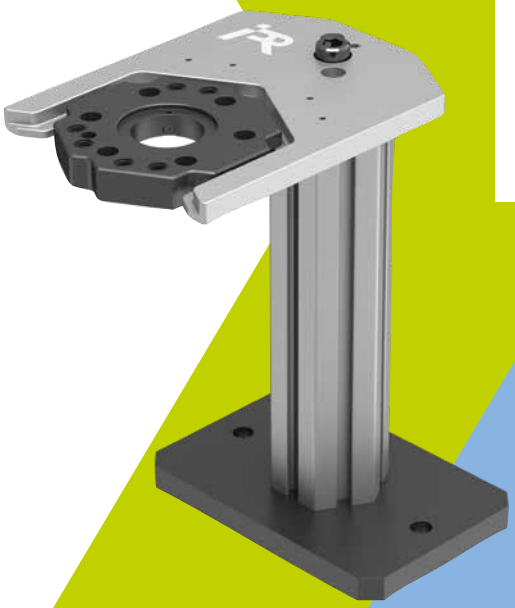
Advantages

- **22 modules** for unlimited combinations
- Different connections and designs – **suitable for every application**
- Constantly growing modular system

Trays

II-Tray Pin Tool Rack

One mounting surface is all that is needed to use the space-saving II-Tray depositing system. It supports horizontal or vertical depositing as well as torque support as needed.



U-Tray Tool Rack

If all attachment areas are required for modules, the U-Tray storage system offers the offers the solution. By means of an add-on adapter, the tray is placed on an additional level with minimal structure. It can be used horizontally and vertically.

Signal modules

A variety of electrical transmission modules enables the process-safe transmission of signals up to 1 GBit/s. In addition, the TKX mounting brackets allow these modules to be installed in up to 3 orientations.

Standard is not enough for us

- II-Tray, the **simple and fast solution** for filing requirements
- U-Tray, our **extended storage solution**
- Vertical and horizontal storage possible
- **Sensors optionally** expandable

Transmission modules

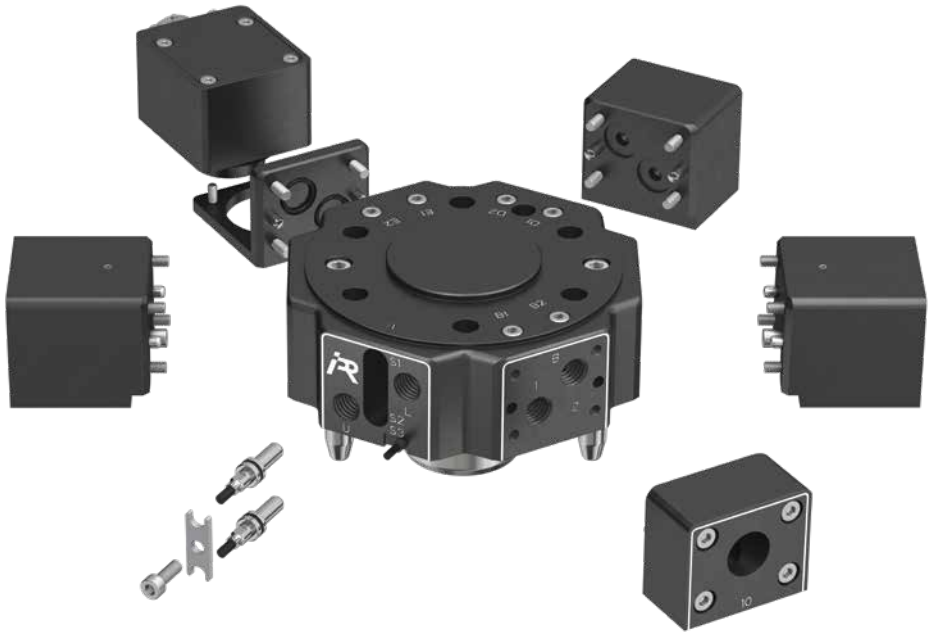
Implementation of any type of media

Overview

The new transmission modules for IPR's TKX series allow electrical signals, field buses as well as pneumatics and fluids of any kind to be transmitted. The standardized screw-on pattern allows the direct attachment to one of the various module surfaces of the tool changer. The highlight of the new accessory portfolio are the **Ethernet modules for 100 Mbit and 1 Gbit transmission speed** – the solution for Industrial Ethernet and Industry 4.0!

Compatibility

The transmission modules have been specially developed for the TKX series, ensuring compatibility across all sizes and versions. Our experts will be happy to provide support in the event of queries regarding optimum configuration and design.



Advantages

- Coordinated product design. **Modules** for TKP, TKE, and TKM are **identical**
- Reliable coupling of all suitable media
- **Easy retrofitting** of new modules **or replacement** when requirements change.

Pneumatic / Fluid Modules at a glance

Technical data	from	to
Number of feedthroughs	1	4
Max. pressure	8 bar	120 bar
Connection thread	M5	G3/8“
Weight	0,10 kg	0,12 kg
Material	Aluminium	
Customs tariff number	84799070	

Electrical modules at a glance

Technical data	from	to
Number of contact pins	3	26
Max. voltage per pin	5 V	400 V
Max. current per pin	0,5 A	16 A
Weight	0,03 kg	0,1 kg
Material	POM / Aluminium	
Customs tariff number	85369095	

Transmission of signals/power/field buses

ME-8-8M12X

Data

ME-8-8M12X-R

ME-8-8M12X-T

Type	ME-8-8M12X-R	ME-8-8M12X-T
Item no.	150301210	150301209
Attachment	robot side	tool side
Number of contact pins	8	
Max. voltage per pin	5 V	
Max. current per pin	0.5 A	
Connection type	M12 (male), 8-pin, X-coded	M12 (female), 8-pin, X-coded
Weight	0.031 kg	0.031 kg
Contact pin type	fixed	spring-loaded

ME-4-4M12D

Data

ME-4-4M12D-R

ME-4-4M12D-T

Type	ME-4-4M12D-R	ME-4-4M12D-T
Item no.	150301146	150301145
Attachment	robot side	tool side
Number of contact pins	4	
Max. voltage per pin	5 V	
Max. current per pin	0.5 A	
Connection type	M12 (male), 4-pin, D-coded	M12 (female), 4-pin, D-coded
Weight	0.031 kg	0.031 kg
Contact pin type	fixed	spring-loaded

ME-3-3M8A

Signals

ME-3-3M8A-R

ME-3-3M8A-T

Type	ME-3-3M8A-R	ME-3-3M8A-T
Item no.	150301128	150301127
Attachment	robot side	tool side
Number of contact pins	3	
Max. voltage per pin	60 V	
Max. current per pin	3 A	
Connection type	M8 (male), 3-pin, A-coded	M8 (female), 3-pin, A-coded
Weight	0.030 kg	0.028 kg
Contact pin type	fixed	spring-loaded

ME-4-4M8A

Signals

ME-4-4M8A-R

ME-4-4M8A-T

Type	ME-4-4M8A-R	ME-4-4M8A-T
Item no.	150301124	150301126
Attachment	robot side	tool side
Number of contact pins	4	
Max. voltage per pin	60 V	
Max. current per pin	3 A	
Connection type	M8 (male), 4-pin, A-coded	M8 (female), 4-pin, A-coded
Weight	0.030 kg	0.028 kg
Contact pin type	gefedert	spring-loaded

Transmission of signals/power/data

ME-4-4M12A

Signals

ME-4-4M12A-R

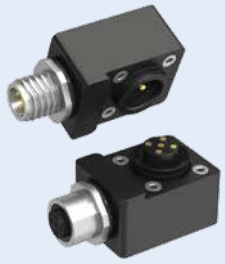
ME-4-4M12A-T

Type	ME-4-4M12A-R	ME-4-4M12A-T
Item no.	150301129	150301125
Attachment	robot side	tool side
Number of contact pins	4	
Max. voltage per pin	60 V	
Max. current per pin	3 A	
Connection type	M12 (male), 4-pin, A-coded	M12 (female), 4-pin, A-coded
Weight	0.032 kg	0.031 kg
Contact pin type	spring-loaded	fixed

ME-5-5M12A

Signals

ME-5-5M12A-R



ME-5-5M12A-T

Type	ME-5-5M12A-R	ME-5-5M12A-T
Item no.	150301123	150301122
Attachment	robot side	tool side
Number of contact pins	5	
Max. voltage per pin	60 V	
Max. current per pin	3 A	
Connection type	M12 (male), 5-pin, A-coded	M12 (female), 5-pin, A-coded
Weight	0.033 kg	0.031 kg
Contact pin type	spring-loaded	fixed

ME-5-5M12L

Power

ME-5-5M12L-R

ME-5-5M12L-T

Type	ME-5-5M12L-R	ME-5-5M12L-T
Item no.	150301197	150301199
Attachment	robot side	tool side
Number of contact pins	5	
Max. voltage per pin	63 V	
Max. current per pin	16 A	
Connection type	M12 (male), 5-pin, L-coded	M12 (female), 5-pin, L-coded
Weight	0.104 kg	0.100 kg
Contact pin type	fixed	spring-loaded

ME-8-MIL8

Power

ME-8-MIL8-R

ME-8-MIL8-T

Type	ME-8-MIL8-R	ME-8-MIL8-T
Item no.	150301300	150301301
Attachment	robot side	tool side
Number of contact pins	8	
Max. voltage per pin	400 V	
Max. current per pin	13 A	
Connection type	MIL (male), 8-pin	MIL (female), 8-pin
Weight	0.103 kg	0.103 kg
Contact pin type	fixed	spring-loaded

ME-12-MIL12

Signals/Power

ME-12-MIL12-R

ME-12-MIL12-T

Type	ME-12-MIL12-R	ME-12-MIL12-T
Item no.	150301133	150301134
Attachment	robot side	tool side
Number of contact pins	12	
Max. voltage per pin	320 V	
Max. current per pin	5 A	
Connection type	MIL (male), 12-pin	MIL (female), 12-pin
Weight	0.116 kg	0.103 kg
Contact pin type	fixed	spring-loaded

ME-19-MIL19

Signals/Power

ME-19-MIL19-R

ME-19-MIL19-T

Type	ME-19-MIL19-R	ME-19-MIL19-T
Item no.	150301136	150301135
Attachment	robot side	tool side
Number of contact pins	19	
Max. voltage per pin	250 V	
Max. current per pin	5 A	
Connection type	MIL (male), 19-pin	MIL (female), 19-pin
Weight	0.112 kg	0.135 kg
Contact pin type	fixed	spring-loaded

ME-24-MIL24

Signals/Power

ME-12-MIL12-R

ME-12-MIL12-T

Type	ME-24-MIL24-R	ME-24-MIL24-T
Item no.	150301302	150301303
Attachment	robot side	tool side
Number of contact pins	24	
Max. voltage per pin	250 V	
Max. current per pin	5 A	
Connection type	MIL (male), 24-pin	MIL (female), 24-pin
Weight	0.103 kg	0.103 kg
Contact pin type	fixed	spring-loaded

ME-15-DA15

Signals

ME-15-DA15-R

ME-15-DA15-T

Type	ME-15-DA15-R	ME-15-DA15-T
Item no.	150301143	150301144
Attachment	robot side	tool side
Number of contact pins	15	
Max. voltage per pin	60 V	
Max. current per pin	3 A	
Connection type	D-SUB DA (male), 15-pin	D-SUB DA (female), 15-pin
Weight	0.032 kg	0.032 kg
Contact pin type	gefedert	spring-loaded

Transmission of ground

ME-26-DA26

Signals

ME-26-DA26-R

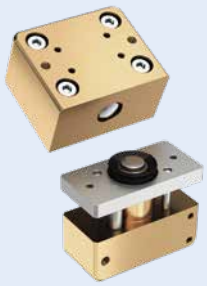
ME-26-DA26-T

Type	ME-26-DA26-R	ME-26-DA26-T
Item no.	150301148	150301149
Attachment	robot side	tool side
Number of contact pins	26	
Max. voltage per pin	60 V	
Max. current per pin	3 A	
Connection type	D-SUB DA (male), 26-pin	D-SUB DA (female), 26-pin
Weight	0.032 kg	0.032 kg
Contact pin type	spring-loaded	fixed

MG-1-1M4

Ground

MG-1-1M4-R



MG-1-1M4-T

Type	MG-1-1M4-R	MG-1-1M4-T
Item no.	150301152	150301151
Attachment	robot side	tool side
Number of contact pins	1	
Max. voltage per pin	-	
Max. current per pin	35 A	
Connection type	Kabelschuh M4	Kabelschuh M4
Weight	0.173 kg	0.307 kg
Contact pin type	spring-loaded	fixed

Pneumatic/vacuum transmission

MP-4-M5NW4

Pneumatic module

MP-4-M5NW4-R

MP-4-M5NW4-T

Type	MP-4-M5NW4-R	MP-4-M5NW4-T
Item no.	150301162	150301160
Attachment	robot side	tool side
Number of feed-throughs	4	
Connection thread	M5	
Max. pressure	8 bar	
Weight	0.114 kg	0.114 kg

MP-2-G1/8NW6

Pneumatic module

MP-2-G1/8NW6-R

MP-2-G1/8NW6-T

Type	MP-2-G1/8NW6-R	MP-2-G1/8NW6-T
Item no.	150301163	150301161
Attachment	robot side	tool side
Number of feed-throughs	2	
Connection thread	G1/8"	
Max. pressure	8 bar	
Weight	0.111 kg	0.111 kg

MP-1-G1/4NW11

Pneumatic module

MP-1-G1/4NW11-R

MP-1-G1/4NW11-T

Type	MP-1-G1/4NW11	MP-1-G1/4NW11
Item no.	150301164	150301158
Attachment	robot side	tool side
Number of feed-throughs	1	
Connection thread	G1/4"	
Max. pressure	8 bar	
Weight	0.109 kg	0.110 kg

MP-1-G3/8NW11

Pneumatic module

MP-1-G3/8NW11-R

MP-1-G3/8NW11-T

Type	MP-1-G3/8NW11-R	MP-1-G3/8NW11-T
Item no.	150301157	150301159
Attachment	robot side	tool side
Number of feed-throughs	1	
Connection thread	G3/8"	
Max. pressure	8 bar	
Weight	0.107 kg	0.107 kg

Transmission of fluids

MP-1-G1/2NW12

Pneumatic module

MP-1-G1/2NW12-R

MP-1-G1/2NW12-T

Type	MP-1-G1/2NW12-R	MP-1-G1/2NW12-T
Item no.	150301333	150301334
Attachment	robot side	tool side
Number of feed-throughs	1	
Connection thread	G1/2"	
Max. pressure	8 bar	
Weight	0.113 kg	0.115 kg

MF-1-G1/8NW3

Fluid module

MF-1-G1/8NW3-R

MF-1-G1/8NW3-T

Type	MF-1-G1/8NW3-R	MF-1-G1/8NW3-T
Item no.	150301305	150301306
Attachment	robot side	tool side
Number of feed-throughs	1	
Connection thread	G1/8"	
Max. flow rate	8 L/min	
Max. pressure	120 bar	
Coupling mode	pressure-free	
Weight	0.2 kg	0.16 kg

MF-1-G1/4NW5

Fluid module

MF-1-G1/4NW5-R

MF-1-G1/4NW5-T

Type	MF-1-G1/8NW3-R	MF-1-G1/8NW3-T
Item no.	150301305	150301306
Attachment	robot side	tool side
Number of feed-throughs	1	
Connection thread	G1/4"	
Max. flow rate	12 L/min	
Max. pressure	80 bar	
Coupling mode	pressure-free	
Weight	0.31 kg	0.28 kg

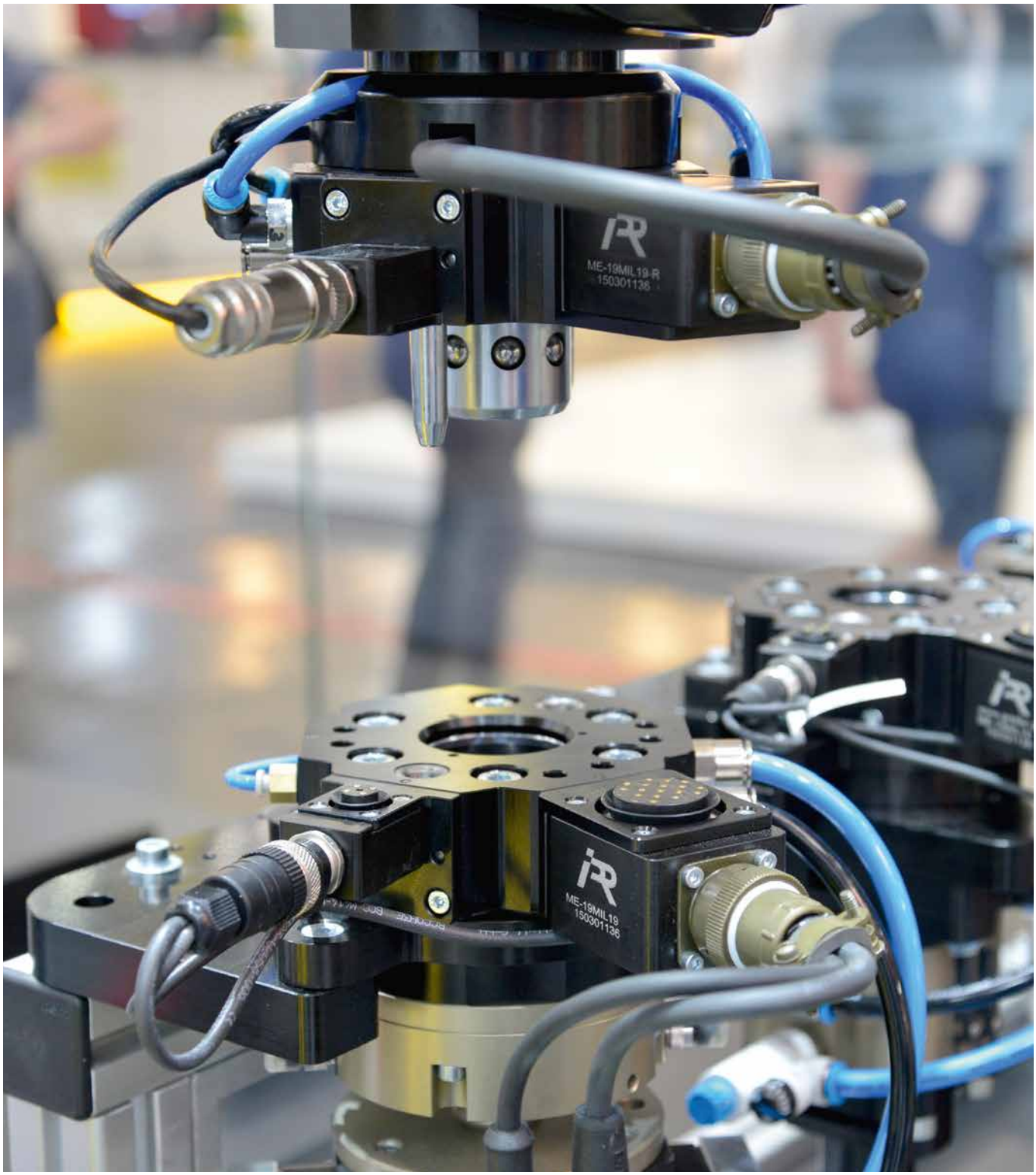
MF-1-G3/8NW8

Fluid module

MF-1-G3/8NW8-R

MF-1-G3/8NW8-T

Type	MF-1-G1/8NW3-R	MF-1-G1/8NW3-T
Item no.	150301305	150301306
Attachment	robot side	tool side
Number of feed-throughs	1	
Connection thread	G3/8"	
Max. flow rate	25 L/min	
Max. pressure	40 bar	
Coupling mode	pressure-free	
Weight	0.86 kg	0.72 kg


ME-19MIL19-R
150301136
ME-19MIL19
150301136

TKX Ecosystem Overview

The right answer to application requirements

The foundation of the TKX ecosystem is the versatile mounting surfaces of the TKX tool changer. Perfect module combinations for the application can be individually selected and mounted from a wide range of transfer modules. Other modules such as the II-Tray storage system can be easily connected to the TKX via a mounting surface. The TKX ecosystem offers the flexibility to equip applications in the best possible way.

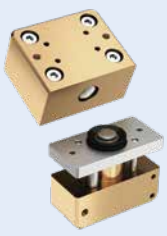
Module		Adapter kit			
Type	**Item no.**	**TKX-003**	**TKX-050**	**TKX-080**	**TKX-100**
ME-3-3M8A-R	150301128	153200189	153200190	153200190	153200223 + 153200190
ME-3-3M8A-T	150301127	153200189	153200190	153200190	153200223 + 153200190
ME-4-4M8A-R	150301124	153200189	153200190	153200190	153200223 + 153200190
ME-4-4M8A-T	150301126	153200189	153200190	153200190	153200223 + 153200190
ME-4-4M12A-R	150301129	153200189	153200190	153200190	153200223 + 153200190
ME-4-4M12A-T	150301125	153200189	153200190	153200190	153200223 + 153200190
ME-4-4M12D-R	150301146	153200189	153200190	153200190	153200223 + 153200190
ME-4-4M12D-T	150301145	153200189	153200190	153200190	153200223 + 153200190
ME-5-5M12A-R	150301123	153200189	153200190	153200190	153200223 + 153200190
ME-5-5M12A-T	150301122	153200189	153200190	153200190	153200223 + 153200190
ME-5-5M12L-T	150301199	-	153200192	153200192	153200223 + 153200192
ME-5-5M12L-R	150301197	-	153200192	153200192	153200223 + 153200192
ME-8-8M12X-R	150301210	153200189	153200190	153200190	153200223 + 153200190
ME-8-8M12X-T	150301209	153200189	153200190	153200190	153200223 + 153200190
ME-8-MIL8-R	150301300	-	-	-	153200226
ME-8-MIL8-T	150301301	-	-	-	153200226
ME-12-MIL12-R	150301133	-	153200192	153200192	153200223 + 153200192
ME-12-MIL12-T	150301134	-	153200192	153200192	153200223 + 153200192
ME-15-DA15-R	150301143	-	153200193	153200193	153200222
ME-15-DA15-T	150301144	-	153200193	153200193	153200222
ME-19-MIL19-R	150301136	-	153200192	153200192	153200223 + 153200192
ME-19-MIL19-T	150301135	-	153200192	153200192	153200223 + 153200192
ME-24-MIL24-R	150301302	-	-	-	153200226
ME-24-MIL24-T	150301303	-	-	-	153200226
ME-26-DA26-R	150301148	-	153200194	153200194	153200225
ME-26-DA26-T	150301149	-	153200194	153200194	153200225
MG-1-1M4-R	150301152	-	153200196	153200196	153200223 + 153200196
MG-1-1M4-T	150301151	-	153200197	153200197	153200223 + 153200197

ⓘ Module and adapter kit are always required for use.

Electric module

ME
Transmission of
Signals/power/field buses

Grounding module



MG
Transmission of ground

Module		Adapter kit			
Type	**Item no.**	**TKX-003**	**TKX-050**	**TKX-080**	**TKX-100**
MP-4-M5NW4-R	150301162	-	BFS in MP included	BFS in MP included	153200223
MP-4-M5NW4-T	150301160	-			153200223
MP-2-G1/8NW6-R	150301163	-	BFS in MP included	BFS in MP included	153200223
MP-2-G1/8NW6-T	150301161	-			153200223
MP-1-G1/4NW11-R	150301164	-	BFS in MP included	BFS in MP included	153200223
MP-1-G1/4NW11-T	150301158	-			153200223
MP-1-G3/8NW11-R	150301157	-	BFS in MP included	BFS in MP included	153200223
MP-1-G3/8NW11-T	150301159	-			153200223
MP-1-G1/2NW12-R	150301333	-	BFS in MP included	BFS in MP included	153200223
MP-1-G1/2NW12-T	150301334	-			153200223

ⓘ Module and adapter kit are always required for use.

Module		Adapter kit			
Type	**Item no.**	**TKX-003**	**TKX-050**	**TKX-080**	**TKX-100**
MF-1-G1/8NW3-R	150301305	-	BFS in MF included	BFS in MF included	153200223
MF-1-G1/8NW3-T	150301306	-			153200223
MF-1-G1/4NW5-R	150301307	-	-	-	153200223
MF-1-G1/4NW5-T	150301308	-	-	-	153200223
MF-1-G3/8NW8-R	150301309	-	-	-	-
MF-1-G3/8NW8-T	150301310	-	-	-	-

ⓘ Module and adapter kit are always required for use.

Pneumatic module

MP
Pneumatic/vacuum transmission

Fluid module

MF
Transmission of fluids

Storage systems for TKX series

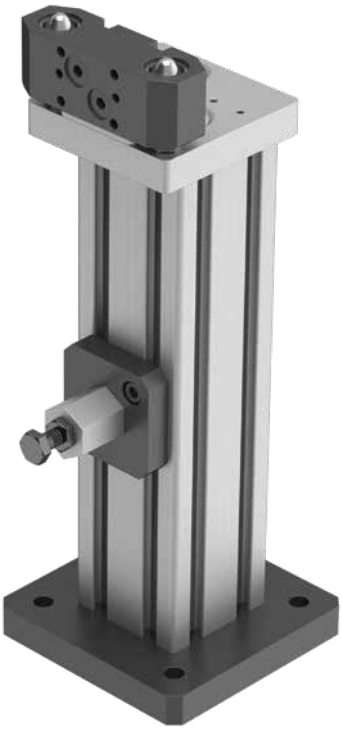
Quick and easy change

Overview

A central element of the comprehensive TKX tool changer modular system are the trays, II-Tray and U-Tray. They complement the TKX ecosystem with the right features for highly flexible, secure and optionally expandable storage solutions. Like all storage stations from IPR, the TKX trays enable the automatic change of tools on the robot in an uncomplicated and process-safe manner.

Application areas

Do you want to store your tools in a process-safe and defined way without spending a lot of time on manual changing processes? Then IPR's storage systems are ideal for your application. Whether assembly, removal or testing application – the automated exchange of tools increases productivity and reduces downtimes of your plant.



II-Tray
Pin Tool Rack

U-Tray
Tool Rack

Advantages

- Extensive **tray construction kit**
- **Two** principles with two variants each
- **Horizontal or vertical** deposit
- Optional **sensor scanning** in the tray

TKX storage solutions

Tailored to your project

II-Tray Pin Tool Rack

Type	Designation	003	050	080	100
Tool rack plate	MAP	150301369	150301291		150301355
Torque support	MDS	150301370	150301292		150301357
Storage module horizontal	MIH	150301371	150301290		150301356
Storage module vertical	MIV	150301372	150301321		150301360

Advantages: ■ Modular solution ■ Easy to install ■ Highly space saving

U-Tray Tool Rack

Type	Designation	003	050	080	100
Tool rack plate horizontal	MUH	-	150301373		150301375
Tool rack plate vertical	MUV	-	150301374		150301376
Tool rack flange plate low	MFF	-	150301387	150301385	150301389
Tool rack flange plate high with air connections	MHF	-	150301388	150301386	150301390

Advantages: ■ Proven tool rack ■ All module surfaces are furthermore available for other modules

MFF
Tool rack flange plate low

MFH
Tool rack flange plate high
with air connections

Universal

Type	Designation	003	050	080	100
Sensor query tray (Without sensor)	MSK		160100133		

Standard is not enough for us

Solution competence made to measure

Our standard components can easily be adapted to customer-specific requirements. Various attachments and accessories are available for this purpose.

For more complex applications, where the modification of standard components no longer offers a sensible solution, we design special components that are precisely tailored to your applications. Many years of experience help us to find a technically and economically fit solution for you – quickly and effectively.

Special nozzle changer for seam sealing applications

Personal consulting

We are happy to provide advice on our components and technologies. Benefit from the long standing experience of the IPR advisors.

01

CONSULTING

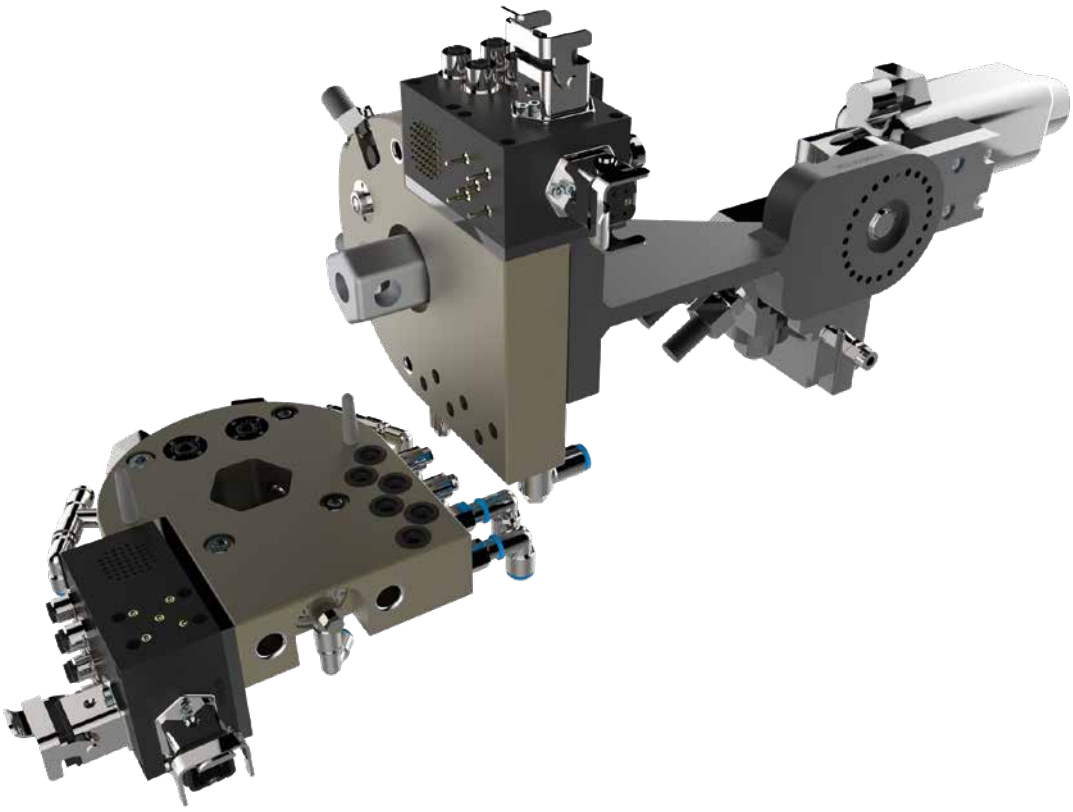
Our expert employees specifically address your wishes and requirements and offer you competent advice on your application. With over 30 years of experience in the production of high-quality components and systems, IPR supports and supplies its customers worldwide, thereby creating valuable customer proximity.

02

QUOTING & PROJECT PLANNING

In the next step, we develop a solution proposal for you and create a project plan in this context. This is followed by a cost-benefit optimization and a feasibility analysis. These include the technical designs as well as constructive tests by our engineering team.

Complex tool changer for PVC applications



03

ENGINEERING AND DESIGN

Our engineers and designers are professionals in their field and have in-depth knowledge of all industries and processes. Our specialists implement individual projects professionally and on schedule look forward to first-class conception and implementation.

04

MANUFACTURING

A machine park equipped with the latest technologies and processes, great know-how in manufacturing as well as highly trained employees ensure that every single product is manufactured with the highest precision, quality and passion to your satisfaction.

05

ON SITE SERVICE

We offer you a unique support in every phase – even after commissioning: from maintenance and repair service to spare parts service and customer training on site or at IPR.
Our professional services show that customer proximity is very important to us.

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