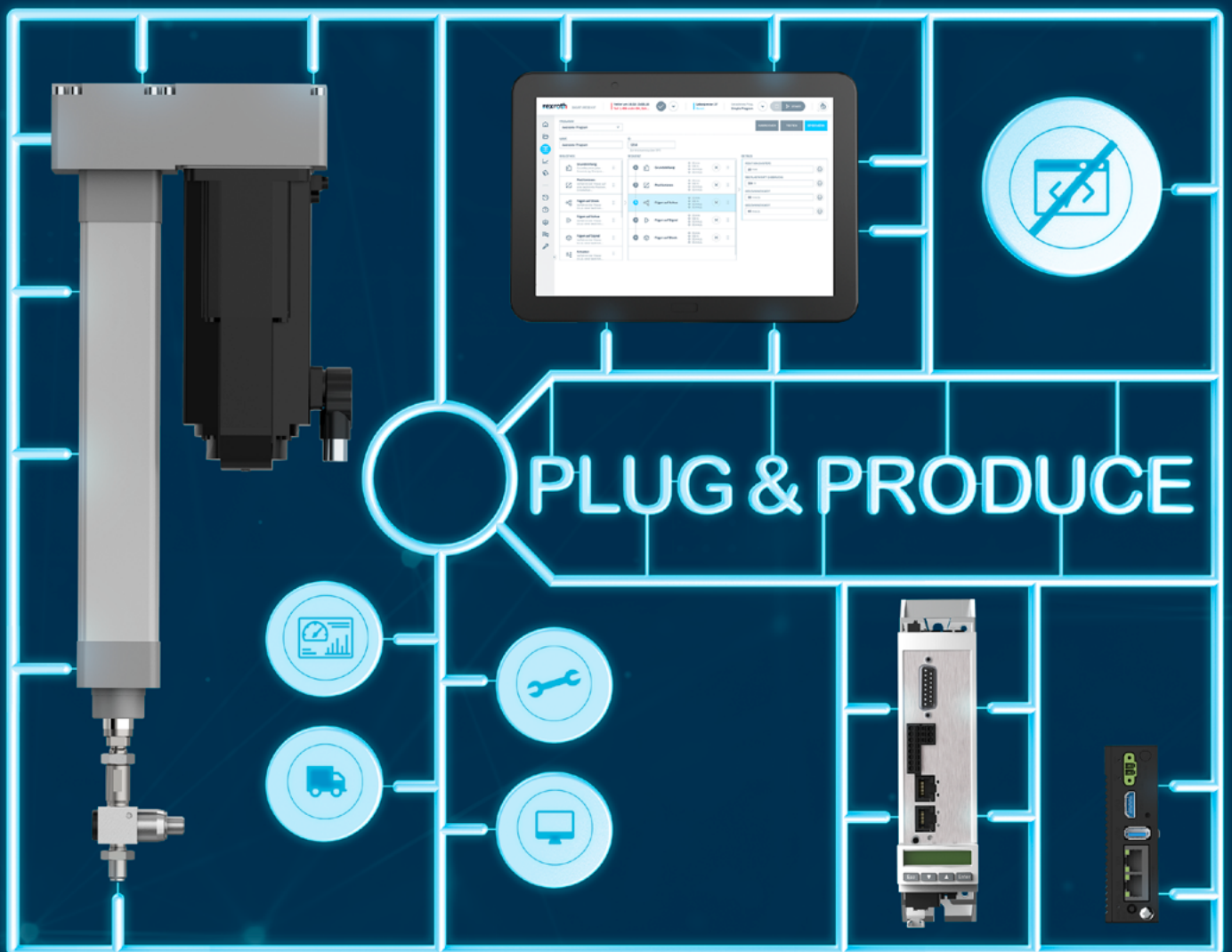rexroth
A Bosch Company

SMART FUNCTION KIT FOR PRESSING AND JOINING

PLUG & PRODUCE

FASTER, MORE PRODUCTIVE AND SMARTER. THE SMART FUNCTION KIT FOR PRESSING.

Times are changing, and so are industry requirements and processes. The trend is shifting away from individual products to complete system kits that make it possible to create easy and fast solutions with greater independence. The same applies to all pressing and joining processes in the Factory of the Future.

The Smart Function Kit from Bosch Rexroth accurately meets the industry requirements for machine and plant manufacturers. It is a fast, efficient and comprehensive solution for several applications with pressing and joining functions.

It functions according to the Plug & Produce principle and works with proven Rexroth components as well as state-of-the-art browser based user interface for all types of devices.

The time spent on engineering can be reduced by up to 95% thanks to simple product selection, as well as fast commissioning and process configuration.

SMART FACTS

The new software with an intuitive, modern design is I4.0 capable thanks to a connection via OPC-UA.

- All mechanical and electrical hardware from Rexroth

- Easy, fast commissioning with automatic configuration and parameterization of the servo drive. The integrated motion control minimizes the number of interfaces

- Support for error handling through plain text error messages in the software

DISCOVER ALL THE BENEFITS

Easy product selection

> Preselected mechanical, electrical and software components are combined in various kits for up to 70 kN

> All components from a single supplier – with proven Rexroth quality

Plug & Produce

> Delivered in a single package, including preinstalled operating software

> Automatic parameterization of the servo drive

> Function blocks for fast connection to higher-level controls

Zero programming

> No programming knowledge required

> Easy and logical configuration of the process and the evaluation elements

> Device independent browser based HMI

> Modern and intuitive design
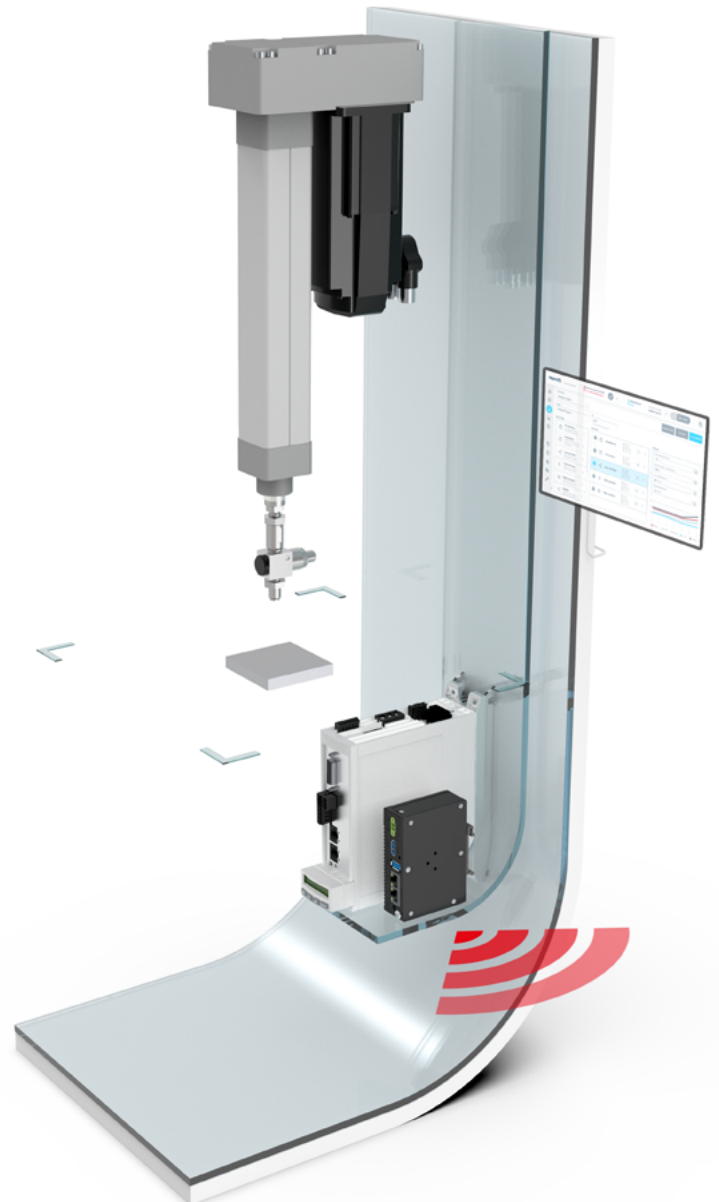
The modular Smart Function Kit consists of:

> Mechanics (electromechanical cylinder and force sensor)
> Electrical components (motor, servo drive
> and motion control)
  Software (commissioning, operation and process analysis)

The Smart Function Kit can be used for assembly, joining, forming and testing applications.

And all of this with a single point of contact, one selection tool as well as one single order and delivery.

FIVE STEPS TO THE FACTORY OF THE FUTURE WITH THE SMART FUNCTION KIT FOR PRESSING

Bosch Rexroth is a pioneer in the digitalization of Linear Motion Technology and in pressing and joining processes. Proven Rexroth technology as well as innovative products and solutions are delivered along the entire process chain. Initial solutions on the road to the Factory of the Future – such as the Smart Function Kit – are already available, and more are set to follow.

Servo motor

Electromechanical cylinder

Force sensor

Browser based HMI

5. SERVICE & MAINTENANCE

❯ All current system parameters at a glance: Status report and quality statistics

❯ Error handling with error messages displayed as plain text in the software

❯ Predictive maintenance functions and maintenance support are in the pipeline

4. OPERATION & DIAGNOSIS

❯ Visualization of process and status information

❯ Live display of force-displacement curves with subsequent analysis

❯ Visualization of process results (OK/NOK)

❯ Storing of all process data with quality evaluation in an internal database

❯ Data export of process results via web HMI

❯ IoT connection via OPC-UA
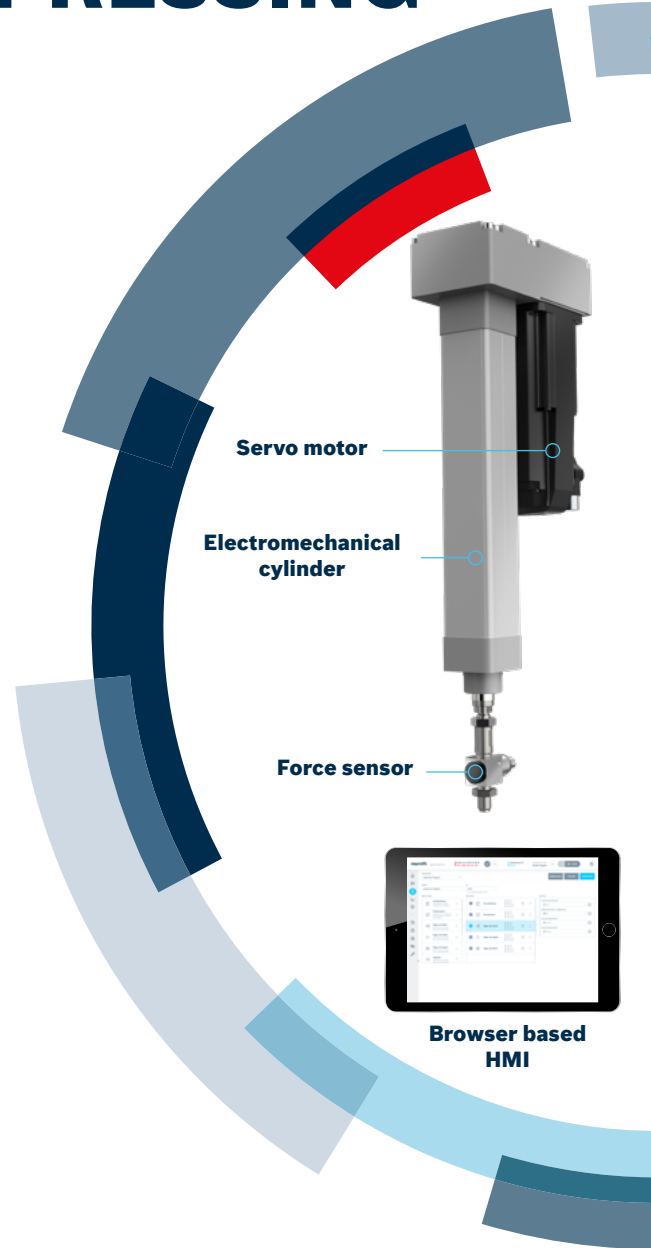
1. EASY PRODUCT SELECTION AND CONFIGURATION

- Preselected kits for forces from 2 to 70 kN
- Fast selection and sizing with LinSelect
- Just five clicks in the online configurator to the final product

Servo drive

Industrial PC

2. FAST ORDERING & DELIVERY

- Online ordering 24/7 in the Rexroth eShop
- All components from a single supplier
- Everything in a single package and a single delivery

3. INTUITIVE COMMISSIONING & PROCESS CONFIGURATION

- Preinstalled operating software with automatic parameterization of the servo drive
- Easy to connect to higher-level controls thanks to ready-made function blocks
- Guided commissioning via a set-up wizard
- No programming knowledge required
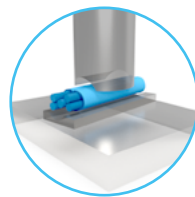
SMART FUNCTION KIT FOR PRESSING – THE APPLICATIONS

Whether it's for assembly and joining, or forming, or testing, the Smart Function Kit ensures easy commissioning, shorter time-to-market and maximum productivity in the production process.
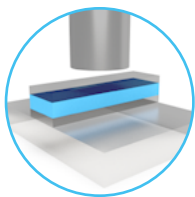
ASSEMBLY AND JOINING
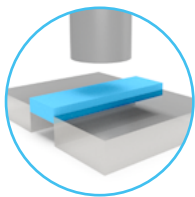
PRESS-FITTING
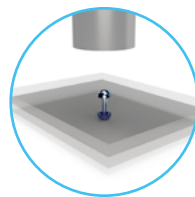Example: Stator packages for electric motors

CRIMPING
Examples: Hoses, cables and plastic parts in the automotive industry
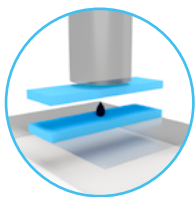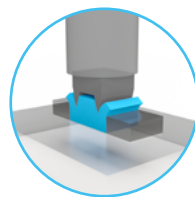
ASSEMBLING
Example: Bearing in to housing

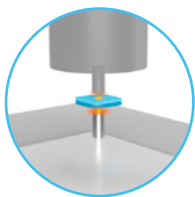**RIVETING**
Example: Economical joining of sheet metal parts

BONDING
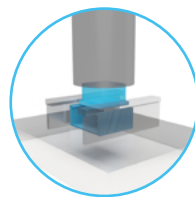Example: Bonding of plastic and composite materials

INSERTING
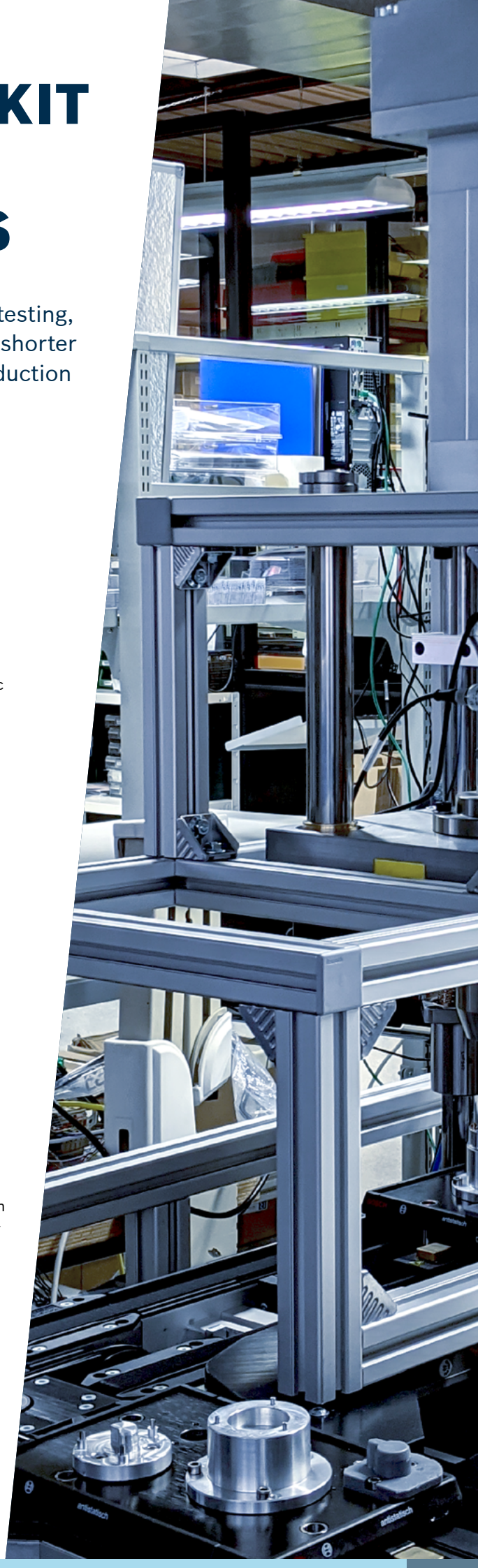Examples: Integration of magnets in lamination stacks in electric motor production

WELDING
Example: Hot plate welding

CLIPPING
Example: Connector contacts in connector housing

WIDE RANGE OF APPLICATIONS

The Smart Function Kit is suitable for a wide range of standardized pressing and joining applications. It is a flexible, compact and future-proof system solution.

> ❯ Efficient assembly and joining processes in many different industrial sectors

> ❯ Forming processes in the metal and plastics industries as well as packaging technology

> ❯ Testing tasks in development, quality assurance and test laboratories

FORMING
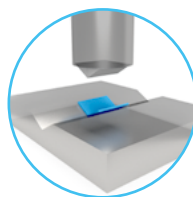
BENDING
Example: Sheet metal in the metal industry
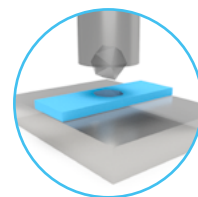
EMBOSSING
Example: Logos in plastic film in the plastics or packaging industries

DEEP DRAWING
Example: Forming of thin sheet materials

SHAPING
Example: Boxes in the packaging industry

TESTING
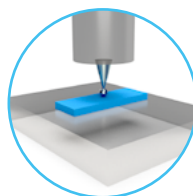
TESTING / MEASUREMENT
Example:
Material test stands
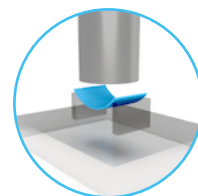
TESTING
Examples: Test setups, e.g. for dampers, springs, brake pedals

ALL SINGLE COMPONENTS AT A GLANCE

The Smart Function Kit combines proven Rexroth joining process components with a simple, web-based software solution.

The Smart Function Kit consists of perfectly matched hardware and software components, providing the perfect basis for system integrators and end users.

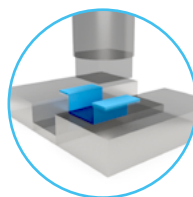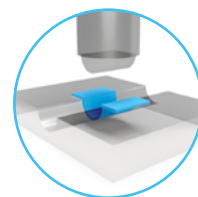It can be used either as a stand-alone solution or integrated into higher-level systems via Fieldbus.

HARDWARE

I4.0 READY
Connection via OPC-UA Data access via ReST programming interface

SERVO MOTOR MS2N
Latest generation of motors with absolute encoder and brake

ELECTRO-MECHANICAL CYLINDER EMC
with freely configurable stroke up to 400 mm. Parallel or axial motor attachment

INDUSTRIAL PC PR21
with integrated web server

FORCE SENSOR
DMS technology for cost-effective and robust force measurement

INDRADRIVE HCS01 SERVO DRIVE
with integrated PLC IndraMotion MLD and safety function STO or Safe Motion

FIELD BUS CONNECTION
to higher-level control

Power and encoder cable (5m or 10m) and cable for force sensor (15m) are included.

READY FOR
INDUSTRY 4.0

SOFTWARE

Tablet not included
in scope of delivery.

INTUITIVE SOFTWARE – NO PROGRAMMING KNOWLEDGE REQUIRED

Thanks to the modern, intuitive web HMI with modular drag and drop process configuration, the software is ready for immediate use with no previous knowledge required. The graphical creation of all required evaluation and analysis elements is virtually self-explanatory. It couldn't be any simpler or clearer.
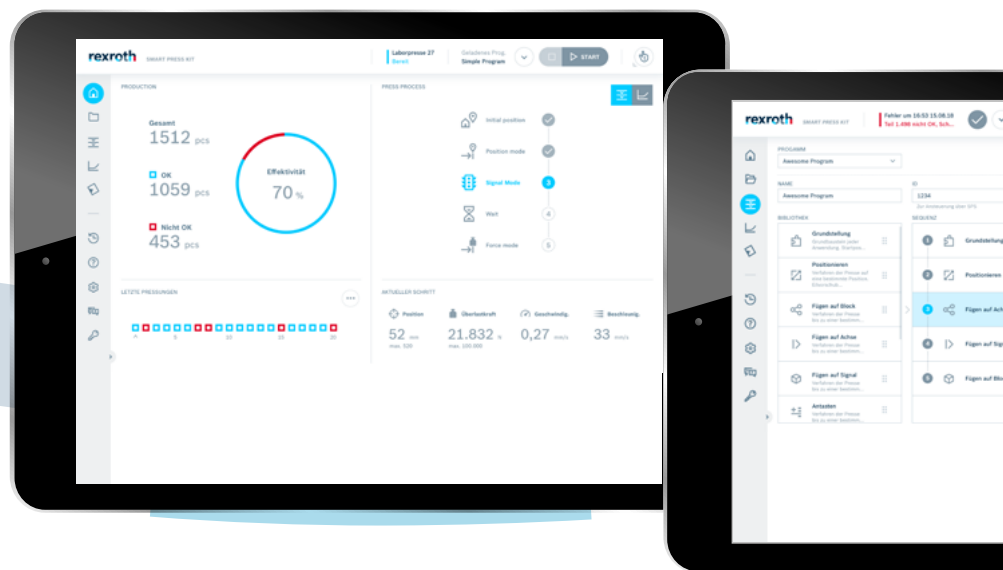
COMMISSIONING WITH AUTO CONFIGURATION (PLUG & PRODUCE)

- Preinstalled software
- Wizard for easy, fast commissioning
- Automatic loading of the hardware configuration
- Automatic parameterization of the servo drive
- Support for commissioning with homing and jog mode

Benefits:
- Time savings thanks to Plug & Produce
- Fewer errors and increased productivity
- Significantly reduced complexity

SIMPLE PROGRAMMING AND OPERATION

- Modular process configuration with drag and drop
- Logic check of input data
- Easy graphical creation of evaluation and analysis elements
- Visualization of process and status information in the dashboard

Benefits:
- High level of user friendliness – no programming knowledge required
- Error reduction and avoidance

ANALYSIS AND DIAGNOSIS VIA DASHBOARD

- Analysis of force-displacement curves
- Visualization of process results (OK/NOK)
- Process data storage for quality assurance in an internal database
- Process history with filter and export function
- Diagnostic functions: system parameters as well as status reports and statistics
- Log book with plain text error messages integrated in the software
- Data access via ReST programming interface

Benefits:
- Always up-to-date with current process data such as position, force and speed
- Short reaction times in case of deviations

SMART SELECTION – EASY CONFIGURATION

Combine mechanical and electrical components to create a customized Smart Function Kit in just six clicks. It couldn't be any faster or easier.

1. SIZE
Depending on nominal force

- 002 2 kN
- 004 4 kN
- 007 7 kN
- 012 12 kN
- 019 19 kN
- 030 30 kN
- 045 45 kN
- 070 70 kN

2. STROKE
Depending on size

- 002 35 – 400 mm
- 004 40 – 400 mm
- 007 65 – 400 mm
- 012 80 – 400 mm
- 019 70 – 400 mm
- 030 90 – 400 mm
- 045 110 – 400 mm
- 070 130 – 400 mm

3. MOTOR ATTACHMENT

- Axial
- Parallel

4. SAFETY TECHNOLOGY

- Safe Torque Off (STO)
- Safe Motion

5. FORCE SENSOR

- Without force sensor
- With force sensor

6. CABLE LENGTH

- 5 m
- 10 m

LinSelect and Online Configurator

For design and configuration, Rexroth uses engineering tools and configurators based on decades of application experience. These represent the first step on the road to the digitalization of Linear Motion Technology.

Selection of the right product with the LinSelect selection and sizing tool is followed by an easy, final configuration in the Online Configurator. Users can then download the CAD files and order the desired configuration in the Rexroth eShop. Thus, it is possible to create and order a customized Smart Function Kit from any location at any time.

LinSelect

Online Configurator

NOW. NEXT. BEYOND.
THE SMART FUNCTION KITS ARE ONLY THE FIRST STEP.

THE FUTURE STARTS HERE

The innovative Smart Function Kit from Bosch Rexroth represents another milestone on the road to the Factory of the Future. Comprehensive systems expertise, including software, is paving the way towards Industry 4.0 for pressing and joining applications. Many functions and services are already available along with proven Rexroth Linear Motion Technology components. Further offerings such as predictive maintenance solutions, for example, will be available in the near future. Bosch Rexroth is a competent, experienced partner for innovative digital Linear Motion Technology solutions. We are ready – now and in future.

THE SMART FUNCTION KIT FOR PRESSING IN FACTS & FIGURES

Technical information at a glance.

Size	002	004	007	012	019	030	045	070
Stroke [mm]	35...400	40...400	65...400	80...400	70...400	90...400	110 ... 400	130 ... 400
Nominal force [kN]	2	4	7	12	19	30	45	70
Maximum force [kN]	3	6	10	15	20	40	47	72
Max. velocity [m/s]	0.38	0.32	0.55	0.5	0.37	0.5	0.32	0.26
Force sensor/measurement								
Measurement technology	Strain gauge							
Measuring range [kN]	-0.3 ... +3	-0.6 ... +6	-1 ... +10	-1 ... +15	-1 ... +20	-1 ... +40	-1 ... +55	-1 ... +75
Sampling rate [Hz]	1000							
Resolution [bit]	14							
Accuracy (linearity) [% FS]	+/- 0.3							
Servo drive (with integrated motion control)								
Power supply [V]	1 x AC 110...230 3 x AC 110...230	1 x 3 AC 110...230 3 x AC 200...500	3 x AC 200...500	3 x AC 200...500	3 x AC 200...500	3 x AC 200...500	3 x AC 200...500	
Safety function acc. to EN 61800-5-2	Safe Torque Off (STO) or Safe Motion[1]							
Fieldbus interface	Profinet, Ethernet/IP, EtherCAT, Sercos III							
Software functions								
Max. number of programs	99							
Number of program steps per program	500							
Number of digital inputs/outputs	6 inputs + 1 output or 7 inputs							
Force measurement	Unlimited duration, without resolution reduction							
Evaluation elements	Windows, envelopes, thresholds							
Ambient conditions								
Ambient temperature (operation) [°C]	0–50°C (loss of performance at temperatures exceeding 40°C)							
IP protection class	Mechanics: Standard IP54 (up to IP65 possible) Control cabinet hardware: IP20							

[1] Up to Category 4, Performance Level e according to EN ISO 13849-1 and SIL 3 according to EN 62061
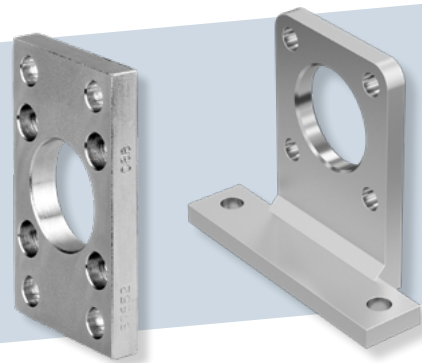
ACCESSORIES FOR THE SMART FUNCTION KIT FOR PRESSING

Everything you could possibly need.

Bosch Rexroth also provides matching accessories for the
Smart Function Kit – from fastening elements to electrical components.

MOUNTING ELEMENTS

Flange mount
Foot mount

ELECTRICAL ACCESSORIES

Uninterruptible power supply
VAU

Mains filter
NFE/NFD

Power supply unit
VAP01

Panel PC
WR21

Ethernet cable, 5 m
RKB

The information provided serves only to describe the product. Due to the continuous development of our products, a statement about a certain property or suitability for a specific purpose cannot be derived from this information. The information does not relieve users of their duty to carry out their own evaluations and tests. It should be noted that our products are subject to natural wear and aging.