

UFM Compact5

Our press range UFM Compact5 is our specialist press for joining applications in narrow mounting positions like the motor assembly.



For more efficiency.

PROMESS

ASSEMBLY + SENSOR TECHNOLOGY

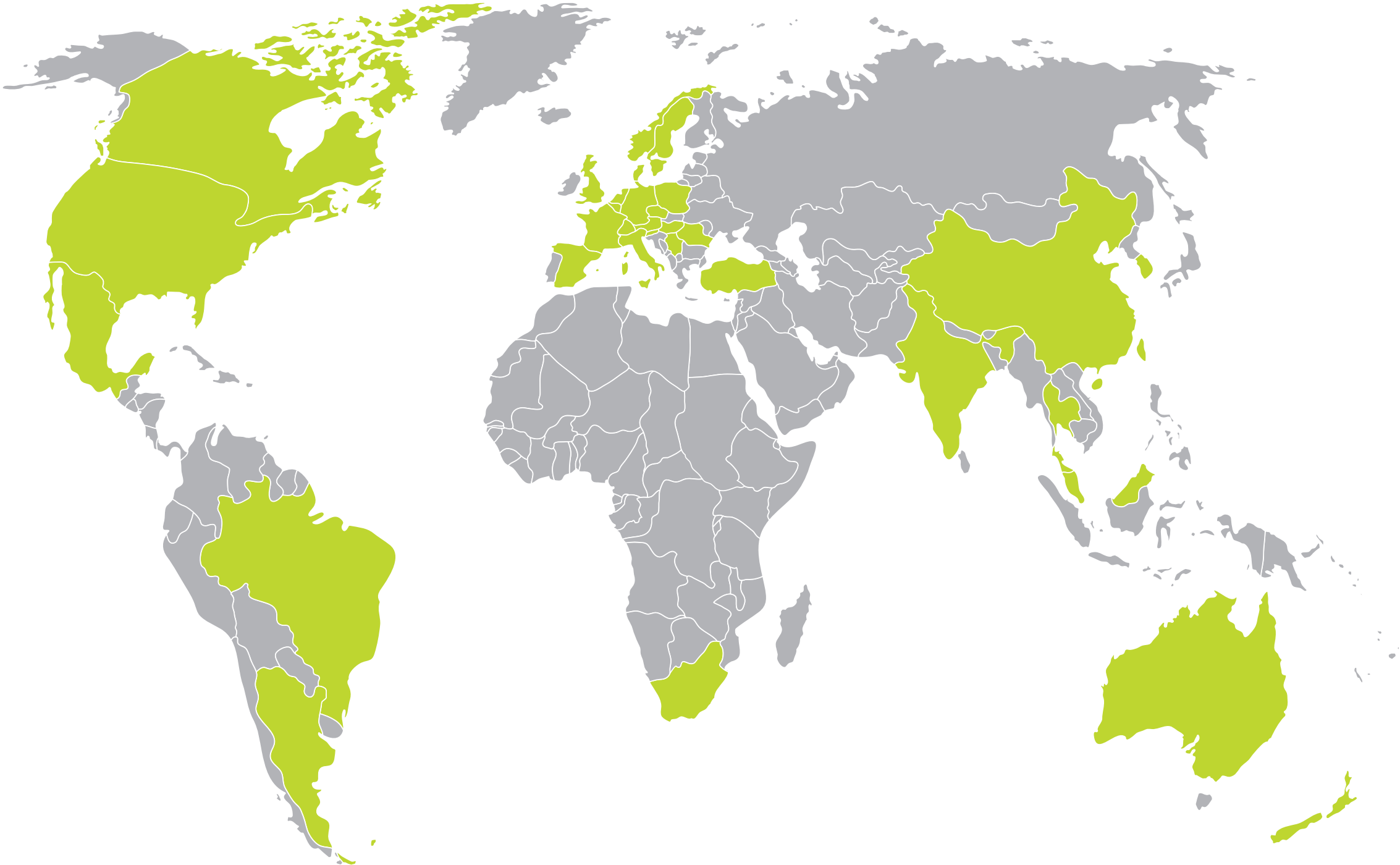
Your partner in the field of assembly and testing technology

Gerhard Lechler founded the company PROMESS in 1977 as an engineering office in the field of technical measurement in Berlin. Initially, the company distributed handmade patented measuring bearings for tool condition monitoring before the electro-mechanical assembly press (UFM) with integrated NC control was born at the end

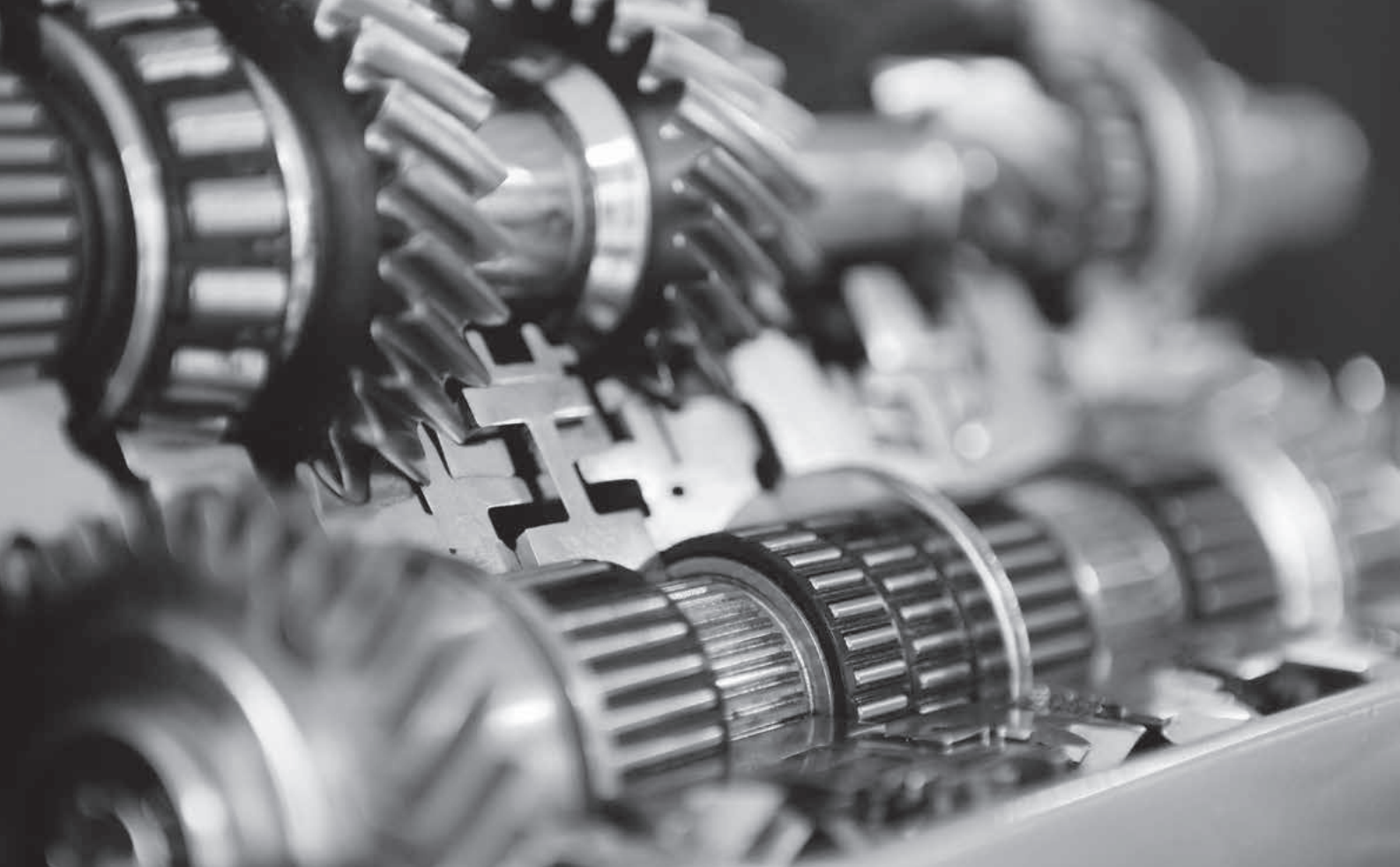
of the 1980s. Right from the beginning it was the strength and the passion of Gerhard Lechler to develop technical solutions for his customers. And this has not changed until today. This passion has continued so that the core competence of PROMESS is still the development of complete technological systems for solving the individual

and complex assembly and testing tasks and requirements of our customers. From process development to preliminary testing, from initial installation to daily production, PROMESS offers holistic expertise from a single source. Our specialist teams have comprehensive knowledge of our products and offer prompt and effective

advice worldwide. Today PROMESS is one of the global leaders in the manufacturing of electro-mechanical assembly presses with the widest range of presses in this field. Currently, more than 15,000 presses are operating in heavy industrial applications. In almost 30 countries all over the world our sales and service partners are looking forward to your enquiries and questions.

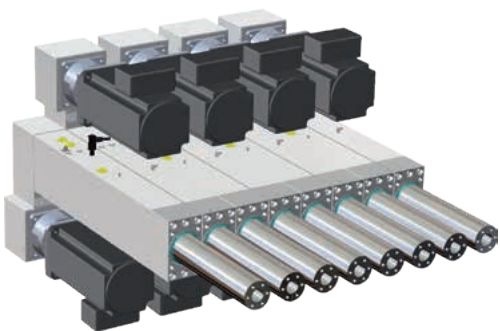


Australia	Malaysia
Austria	Mexico
Argentina	Netherlands
Belgium	Norway
Brazil	Poland
Canada	Romania
China	Serbia
Czech Republic	Singapore
Denmark	Slovakia
France	Slovenia
Germany	South Africa
Great Britain	Spain
Hungary	Sweden
India	Switzerland
Italy	Thailand
Korea	Turkey
New Zealand	USA



UFM Compact5

Our press range UFM Compact5 is our specialist press for joining applications in narrow mounting positions like in the motor assembly. It features a slim and weight reduced design. The servomotor is aligned parallel to the assembly press, this results in a low installation height. Because of this it is possible to join eight valve seat guides and rings into a motor block simultaneously. Also a connection to robots and the use in flexible assembly concepts is possible due to their reduced weight.



Press Types

The presses in our line UFM Compact5 feature an absolute encoder, a strain gauge force transducer and our digital preamplifier PDM-S by default. The PDM-S allows for a high accuracy in the force measurement. In addition, the following set-ups are available:

Type	Force	Stroke	Speed
1	25	350	250
2	50		150
3	50		240

Advantages

- Standard model includes absolute encoder that eliminates the need for referencing
- Digital force measurement with 24 bit resolution
- Multi range calibration for force input (optional)
- Small dimensions
- Weight reduced design
- Low installation height
- Sensor system can be easily extended using versatile PROMESS-BUS
- Utilization of window and envelope technologies
- No PLC knowledge required
- PLe for STO by default

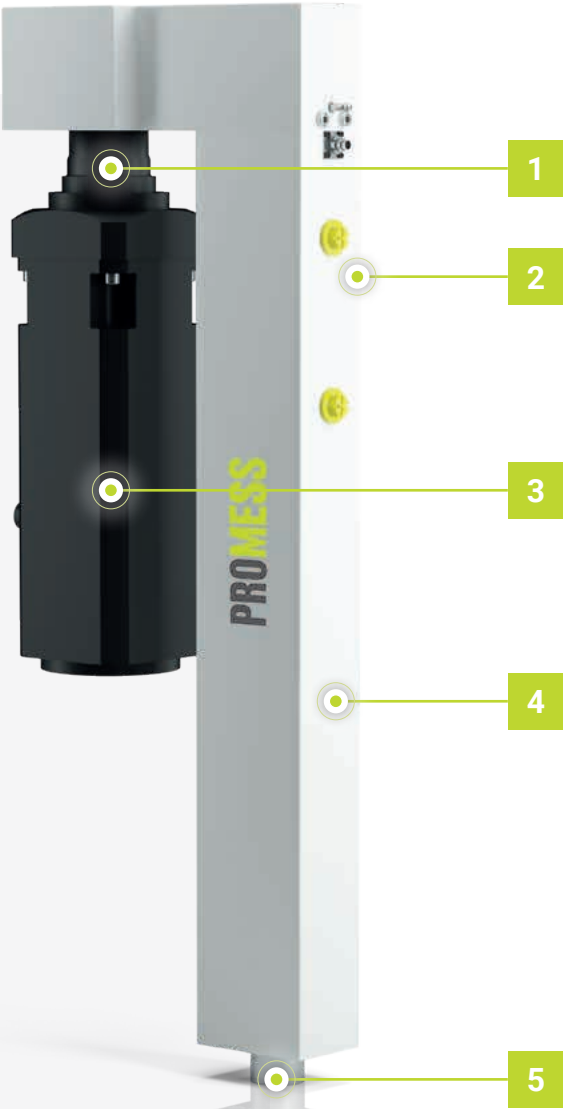


Mechanics

The assembly presses UFM Compact5 are robustly designed thus making it well suited for long periods of use. The durable and compact gear drive is ideal for high forces at small dimensions. In order to realize low installation heights and a compact design, the units feature the servomotor aligned parallel to the assembly press.

A synchronous belt connects the motor with the roller gear and provides a high positioning accuracy. The integrated absolute encoder eliminates the need for referencing at the start of the cycle.

- 1. Gear box
- 2. Integrated strain gauge force transducer
- 3. AC servomotor with absolute encoder
- 4. Steel housing
- 5. Anti-twist press ram

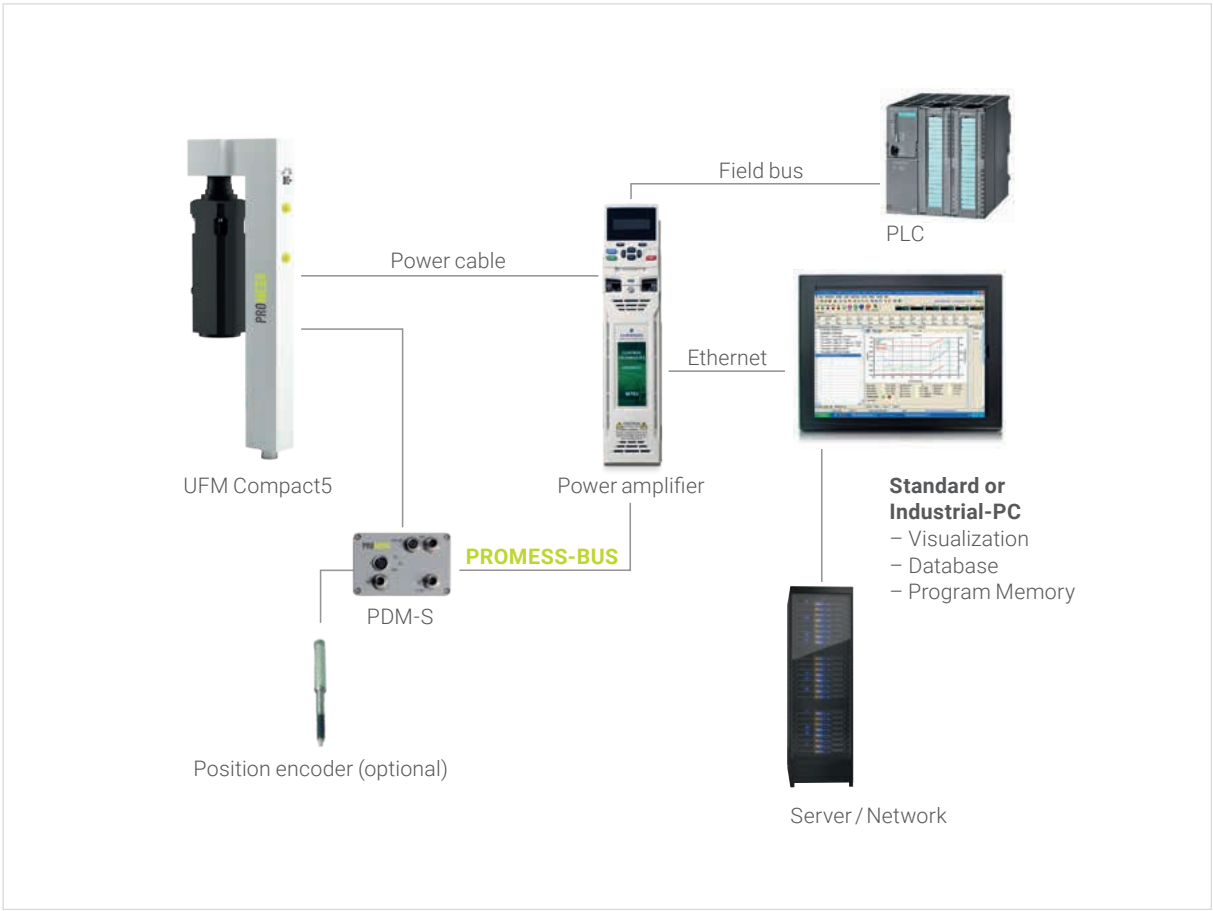


System design

The mechanical system is controlled by a power amplifier with an integrated NC module. The internal RISC processor coordinates the assembly press and can be easily programmed and operated using a conventional PC/display.

The controller coordinates the mechanical motion of the press as well as monitoring the force and distance. The force-distance characteristic can

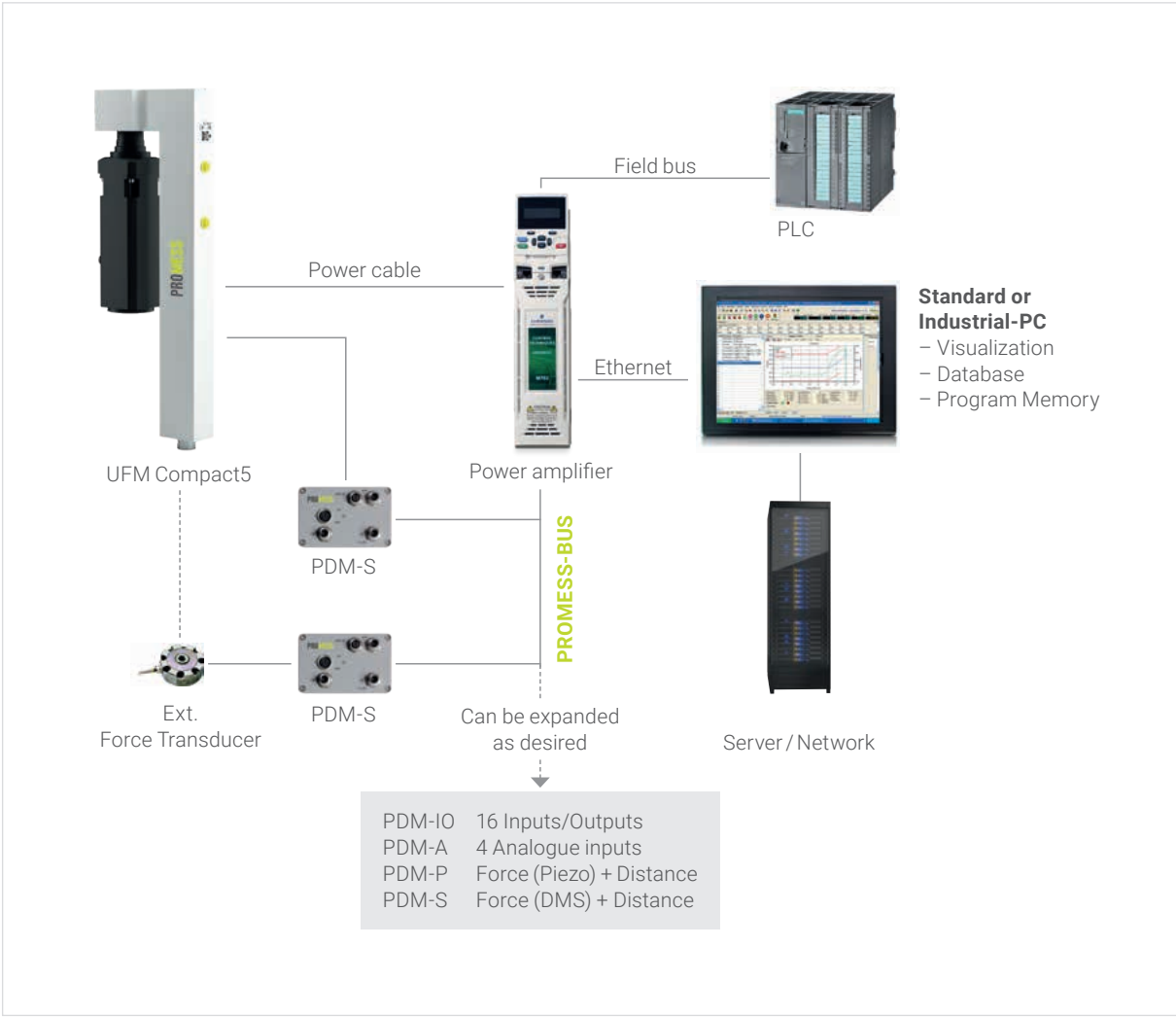
be monitored using envelopes and/or window methods. The data can be edited numerically and graphically so that each individual process can be easily monitored. The automatic learning function allows customers to eliminate the need for custom programming and simply learn the processing limits using a good part. Quality assurance data is stored using the database plugin and can be re-used at any time.



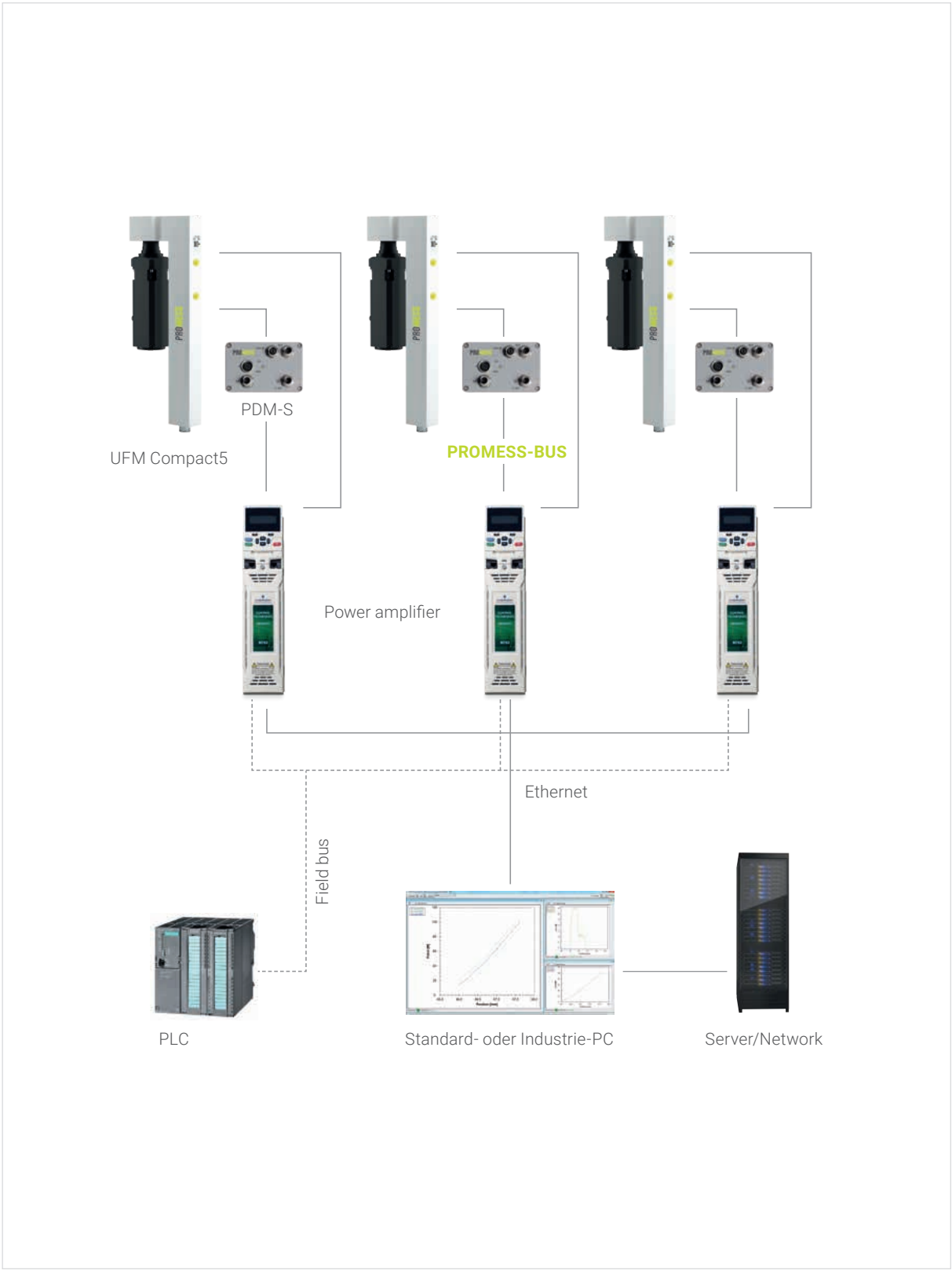
Basic version

The system utilizes a digital preamplifier. This transfers the force signal at a resolution of 24-bit. When the characteristics are calibrated, the assembly press achieves a system accuracy of 0.3 % from the final value. The characteristic

calibration process is comparable to a multispan calibration for 10 spans. The characteristic map is created automatically using the UFM Calibrate plugin. The results are stored in a calibration report and can be printed out.



Extension/Options



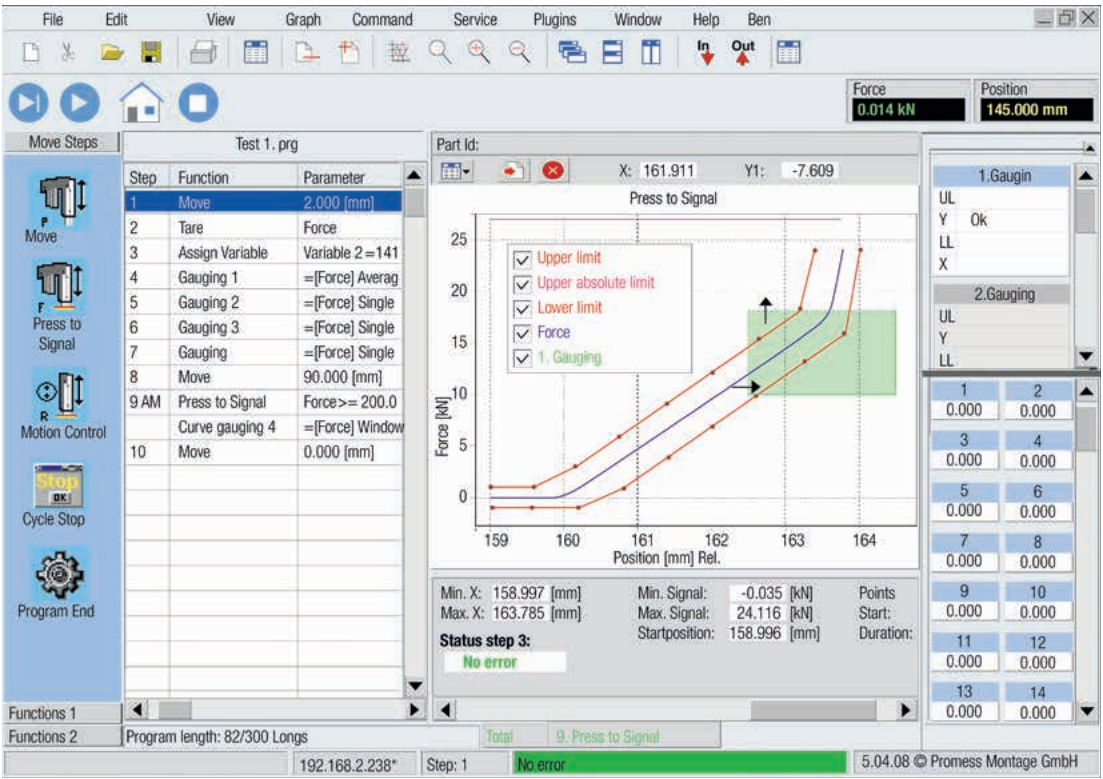
Line configuration

Software

As standard, the UFM Compact5 range of presses comes with the UFM V5.xx programming software. This software is intuitive to operate and does not require any PLC expertise. It can be used to create simple or advanced joining processes.

The integrated User Administration feature offers multiple permission levels and logging for process safety. The log documents who makes which changes to the program. Each user profile can be exported and then imported to another station. Thus it is possible to integrate a user administration system and also to connect the system to a higher-level permission system using the .Net interface or field bus (e.g., Euchner EKS system).

The transparent and concise program surface allows users to quickly create programs. The main window lists all programming steps together with their functions. The function screens can be opened successively to enter the process values. Thus the force, displacement, time, speed, acceleration and braking rate can be easily programmed for each step. Once the required input screens have been defined, the joining program is completed and the steps are processed automatically.



Main window

Highlights for demanding applications

- **Positioning on force slope:**
Joining components until a definite slope (increasing force) or relatively once a click point has been detected.
- **Controller module:**
This module allows you to easily solve processes by controlling the process variables and maintaining constant signals, e.g., spinning operations with constant force controlling.
- **Measurement data system:**
Measurement data can be captured relative to positions and force, but also relative to freely definable reference points (e.g., relative to achieving a specific threshold).
- **Bending compensation:**
Not only customizable for separate systems, also for specific processes and components.

ONLY
WITH
US

Triggertechnology by PROMESS

The triggers are “pulse points”. Up to seven trigger points can be defined in order to react to processing events during movement. These reactions can include:

- Smooth speeds
- Set the outputs in real time
- Change target parameters during movement
- Correct process tolerances during movement

Software Highlights

- Press to signal, press to force, press to an external signal (e.g., analogue or TTL signals)
- Force and speed can be programmed individually during the joining process
- Variables can be used to transmit setpoints, perform calculations using PLC and generate counters
- 100 % quality control using window and/or envelope methods
- 100 % process documentation using modern database structure
- 100 % process analysis using standardized interface to QS-STAT (optional), alternative to process data management software IPM (optional) – can be expanded using .net interface
- Trigger function for demanding applications
- High controller accuracy (minimization of overshoot in control processes)
- Display of two graphs in one diagram
- Quick printout of a graph report (screenshot)

Modern Database Structure

All process data including the curves can be stored in a database. All common database formats such as Oracle, MS SQL and Access are supported. A separate database is created for each station. Programs can be stored and reused at any time. Since the program changes can be traced, this provides 100 % traceability throughout the entire production.

The database can be analyzed using the DB Viewer with its extensive querying and filtering options. Graphs can be superimposed on each other for comparisons and analyses.

Envelopes can be edited and reloaded into the press. The data can also be exported in Excel format at any time. The standard models include the database software package and DB viewer.

Scope of Delivery for Components

- Scope of Delivery for Components
- Power amplifier incl. application module and UFM V5 firmware
- Brake resistance
- Digital preamplifier PDM-S
- Cable, field bus and more accessories on request



Accessories/Options

PROMESS has developed extensive accessories for the UFM Compact5 range of presses that provide them with additional functionality. Together with our many years of expertise, we provide you with complete technologies for solving your own complex assembly and testing tasks.

External Force Transducer

The external force transducers are designed to measure tension and compression forces both statically and dynamically. They feature a high measurement precision and a low installation height.

Sensors (Position encoder)

The PROMESS NC controller allows you to connect various additional sensors for measuring force, distance, temperature or other variables.

Technical Data				
Item no.	Sensor / Accessory	Cable	Stroke	Resolution
3647	Precision sensor ST 1278	axial	12 mm, neutral position extended	+/- 0,001 mm
3640	Precision sensor ST 1278	radial	12 mm, neutral position extended	
4103003080	Precision sensor ST 1277	axial	12 mm, pneumatic retracted	
4103003078	Precision sensor ST 3078	axial	30 mm, neutral position extended	

Connecting cables have to be ordered separately.

Frames

PROMESS provides different frames on request.

Safety Box PSB

As an option to our assembly presses UFM Compact5 we offer our PROMESS Safety Box PSB as an alternative to the integration in electrical cabinets. The device features all safety and power components for this purpose.

It can easily and quickly be connected by plug & play. All cables are pluggable. Due to the compact design, the PSB can be mounted next to the assembly press so that cable lengths can be reduced and wiring becomes unnecessary. By using the PSB your assembly press will be ready for production instantly.

Advantages

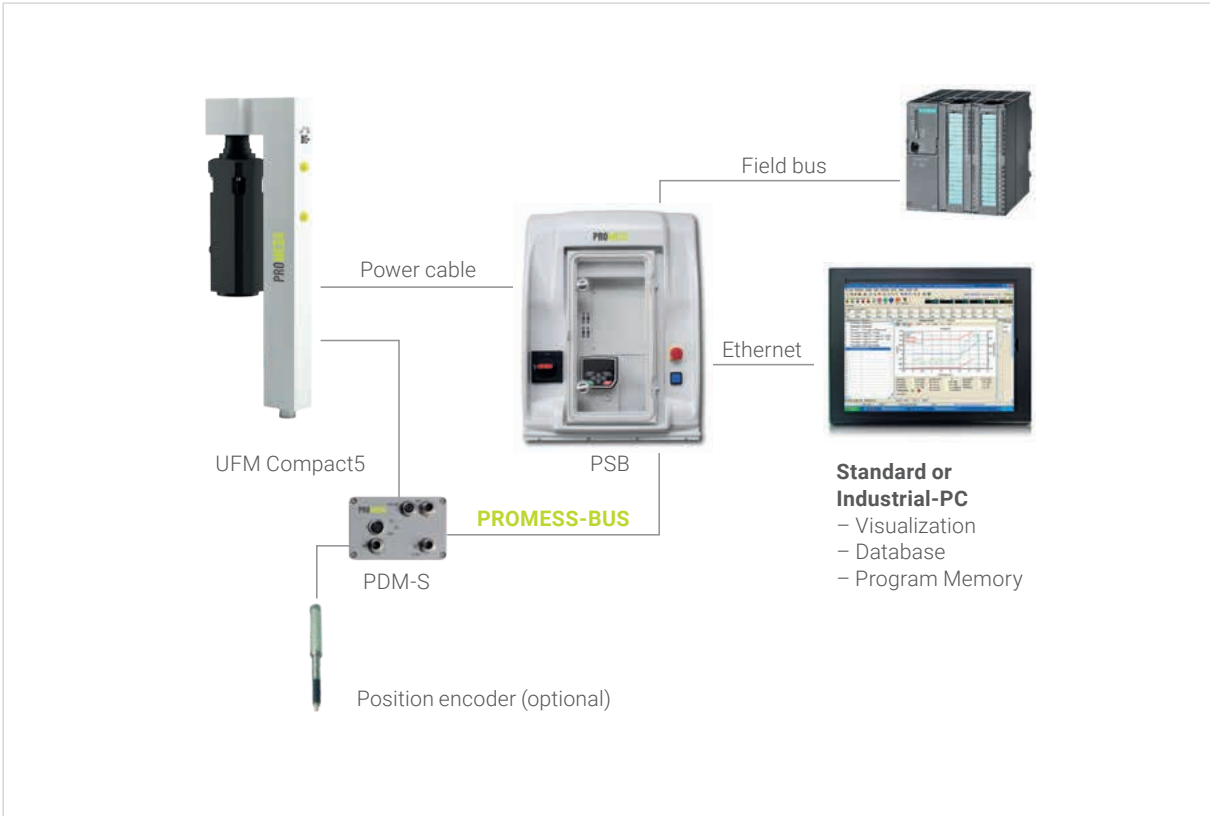
- No integration in electrical cabinets
- Reduction of cable lengths
- No wiring work
- No adaption of electrical diagrams
- Short connection time:
plug & play
- PLe for STO by default
- Extension on
SLS, SS1, SS2
possible
- IP Code 54
- Extremely
compact design

PSB010G2



Technical Data		
UFM Compact5	25 kN	50 kN
Item no.	PSB030G2	PSB060G2
Connection voltage	3 AC 380 ... 480 V, +/- 10 %, 48 ... 65 Hz	
Connected load at 400 V	10 kVA	18,5 kVA
Protection class	IP 54	
Weight	18 kg	26 kg
Recommended protection	IEC 20 A class gG	IEC 40 A class gG
Temperature range	0 ... +40 °C	
Power loss	493 W	654 W
PC interface	Ethernet	
Option PLC, fieldbus interface	Profibus, Profinet, EtherCAT (add. on request)	

System Design



System Design

Overview connections



Safety Module PSD

The PSD safety module is delivered tested and ready to install. It contains the power electronics and safety controller for the joining unit. It offers the following safety functionality: STO in PLe in accordance with DIN ISO 13849-1; optional: SSx and SLS in PLd in accordance with DIN ISO 13849-1.

The safety module eases and accelerates the installation procedure for the joining unit.

The PSD is suitable for our UFM Compact5 units with and without brakes. As a prerequisite, it must be controlled using field bus.

Advantages

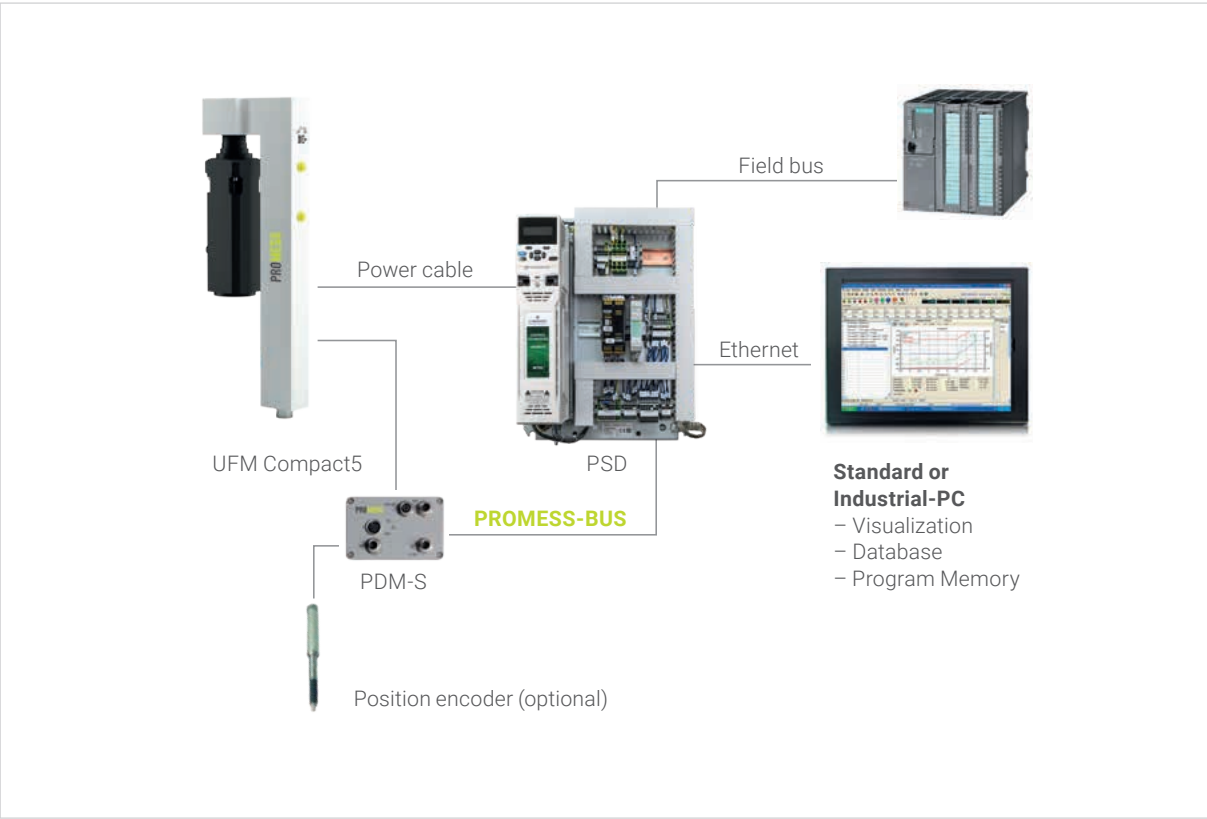
- Short installation times
- No wiring necessary
- Completely inspected and tested
- EMC tested



Mounted Components

- AC servo amp with NC module
- Brake resister
- EMC components, main power filter
- Safety controller: Safety functionality
- STO in PLe in accordance with DIN ISO 13849-1; optional: SSx and SLS in PLd in accordance with DIN ISO 13849-1
- Field bus interface (must be ordered separately)
- Set of cables (must be ordered separately)
- Required connectors (connected to pins):
 - Power supply
- 24-volt emergency stop circuit

System Design



System Design

Technical Data						
UFM Compact5	Item no.	WxHxD (mm)	Supply - voltage	Frequency	Operating temperature range	Control voltage
25 kN	2340100EG2	500 x 500 x 300	380 ... 480 VAC, +/- 10 %, 3ph	50 ... 60 Hz	5 ... 40 °C	24 VDC, +/- 10 %
50 kN	2440150EG2	500 x 500 x 350				
50 kN	2540270EG2					

PROMESS Digital Modules PDM

PROMESS offers four different multifunction amplifiers PDM. The modules are digitally connected to the UFM control via the PROMESS bus. They feature the following characteristics:



PDM-S
Item no. 14650

Digital preamplifier for strain gauge force transducer, multi range calibration optional

Input Force Transducer	
Accuracy class	0.1%
Sensitivity	0.1 ...5mV/V
Analogue bandwidth	10 kHz typ. (-3dB)
Resolution A/D converter	24 bit
Housing	Aluminium die-cast
Protection class EN 60529	IP 40
Dimensions WxHxD	125x80x57 mm (height without connectors)
Input Encoder	
Tracks	A+, B+, A-, B-
Level	Rectangle TTL 5V
Counter	16 bit



PDM-A
Item no. 14711

Four analogue inputs

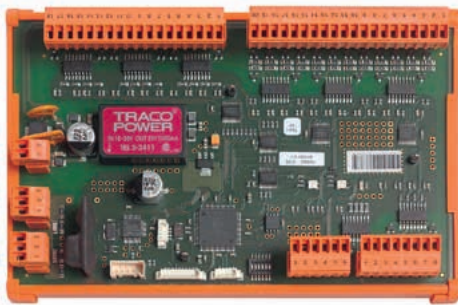
Analogue Inputs	
Precision class	0.25 %
Analogue bandwidth	10 kHz typ. (-3dB)
Resolution A/D converter	24 bit
Housing	Aluminium die-cast
Protection class EN 60529	IP 40
Dimensions WxHxD	125 x 80 x 57 mm (height without connectors)
Supply voltage	24 VDC
Input Encoder	
Tracks	A+, B+, A-, B-
Level	Rectangle TTL 5V
Counter	16 bit



PDM-P
Item no. 14655 / 56

Digital preamplifier for piezo force transducer, multi range calibration optional

Input Force Transducer	
Accuracy class	0.1%
Analogue bandwidth	10 kHz typ. (-3dB)
Resolution A/D converter	24 bit
Housing	Aluminium die-cast
Protection class EN 60529	IP 40
Dimensions WxHxD	125x80x57 mm (height without connectors)
Input Encoder	
Tracks	A+, B+, A-, B-
Level	Rectangle TTL 5V
Counter	16 bit



PDM-IO
Item no. 14700

16 digital in- and outputs

Digital in- and outputs	
Input protection	Electrically isolated
Output protection	Electrically isolated
Eingangsspannung	24 VDC
Ausgangsstrom	24 VDC
Case mounting	Cap rail
Protection class EN 60529	IP 40
Dimensions WxHxD	165x109x55 mm

Connector Sets

If a cable set is not ordered, a connector set will be required.

UFM Compact5	Item no.
25 kN	752500CP
50 kN	755000CP
50 kN	

Cable Sets

The cable sets are available in lengths of 5*, 10, 15, and 20 m.

UFM Compact5	Item no.
25 kN	752505CP*
50 kN	755005CP*
50 kN	

Field Busses

PROMESS provides various field busses for communicating between the PLC and NC controller of the press.

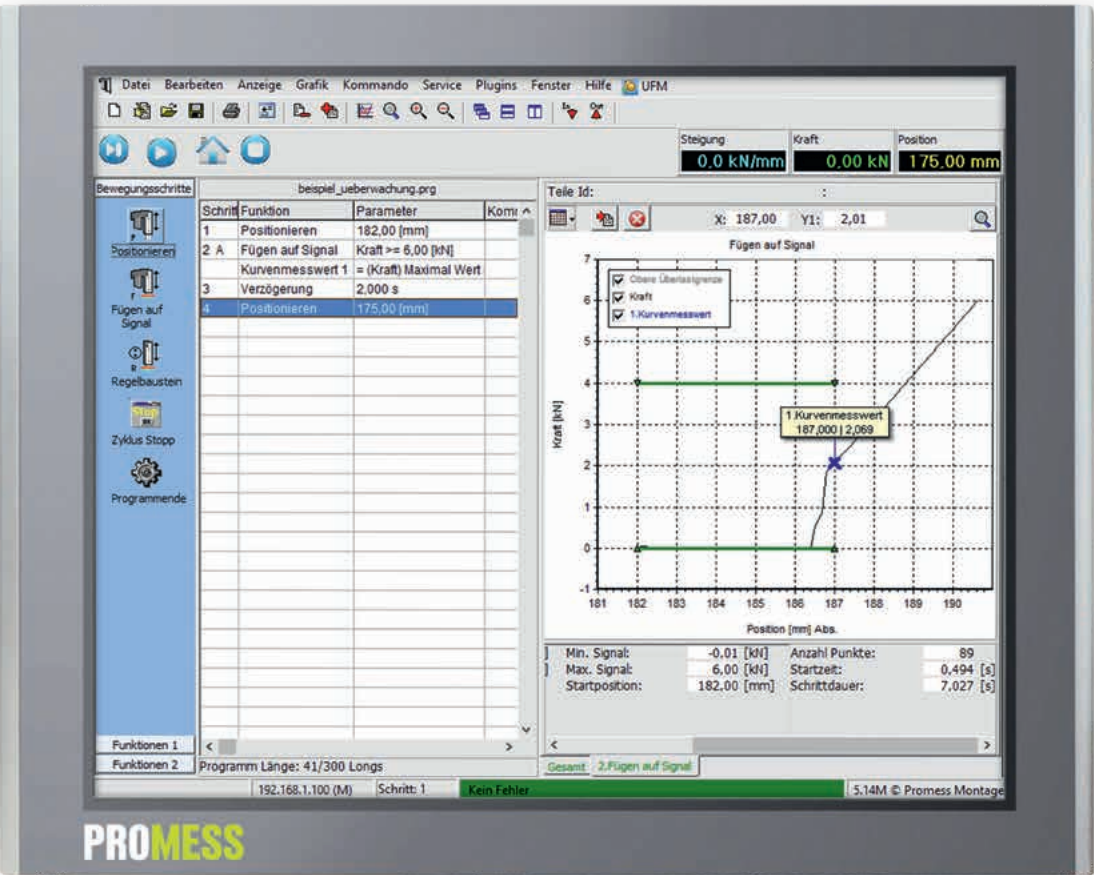
UFM Compact5	Item no.
Profibus	3302005550
Profinet	3302005585
EtherCAT	3302005595
Ethernet IP	3302005590

Additional field busses on request.



Display and PC

As a programming unit for editing NC programs and for visualizing signals, PROMESS offers industrial and panel PCs as well as different displays.



Panel-PC

- Display size 19"
- Resolution 1280 x 1024
- Fanless
- Touchscreen: resistiv

Display

PROMESS offers different displays on request.

Software Plugins

PROMESS offers a range of custom plugins for its powerful UFM V5.xx programming software. These can be connected to the software through the .net interface. This allows the software to be modified on a case-by-case basis and optimized

for specific applications without having to update or change the firmware. The expanded database is also linked to the plugin.

Excerpt from the plugin library:

■ UFMR Barcode

The UFMR Barcode plugin can be used to change the program within the UFM software using a barcode scanner. While the program runs, the barcode scanner can be used, for instance, to transfer a Part ID using the UFM dialog function.



■ UFMR MachineCapability

The plugin UFMR MachineCapability is used to determine the machine capability of force measurements in an electromechanical assembly press. The machine capability test is performed by repeatedly running of a UFM program running to a given force value while reading the position and force values of the joining unit as well as optionally the values of a reference transducer.



UFM Machine Capability

■ UFMR Calibrate

The plugin UFM Calibrate was developed for the calibration of the force transducer of our electro-mechanical assembly presses. It supports the 2-point calibration of the analog preamp as well as the characteristic calibration with the integrated range calibration of our digital preamp PDM-S.

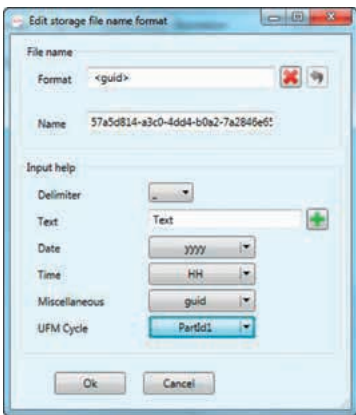


Calibration plugin

It is also possible to perform the calibration using other non-integrated references. In this case, the base point values of the reference transducer are entered manually.

■ URM XML-Writer

The XML Writer plugin is used to export data generated during the joining process, such as gaugings, curve data and variable values, to an XML file. The XML files can be used for any further processing and analysis.



URMR XML-Writer

■ UFMR QDE

The UFMR QDE plugin allows you to export quality data into the statistics software Qs-STAT from the Q-DAS company and thus helps you to control and optimize your production process. You can export measurement data as characteristic data, as well as supplementary data and description data for every joining program. Exports are supported for "dfq" as well as "dfd" and „dfx" file formats.



■ UFMR IPM

The plugin UFMR IPM also supports the control and optimization of your assembly process and helps you to detect production failures early. You can export process



Our services for you

From development to after-sales service, we offer the complete package from a single source. On request, we support you from process development through to the use of our assembly presses at your premises. Whether you are using our assembly presses for the first time or are already familiar with them is not important. We offer you the necessary service for a long and sustainable use of our products at every stage.

The service of our products includes the following services:

- Process development
- Preliminary tests
- Rental units
- Start-up operation
- Documentation
- Training courses
- Remote / maintenance
- Calibration service
- Emergency, repair and spare parts service
- Sale of used assembly presses
- Consignment warehouse
- Worldwide sales and service network



For more „green“ efficiency

By choosing a universal joining module from PROMESS, you are choosing a long-lasting, energy-efficient drive system. We design your joining module individually in advance, which avoids overdimensioning and increased energy consumption. This saves you energy costs and conserves resources. Where possible, we take back used assembly presses, rework them and bring them back into the product cycle. The refurbished modules are state-of-the-art and have short delivery times. In addition, you receive a 12-month warranty and contribute to climate protection.



Maintenance

Preventive maintenance is the easiest way to reduce costly downtimes, increase machine service life and boost productivity. A maintenance contract for regular preventive maintenance by our trained personnel ensures maximum use of your products.



Our maintenance contract includes one service assignment per year with the following services:

- Re-grease all lubrication points
- Change of transmission oil as required (if applicable)
- Visual and noise inspection of mechanical and safety-relevant components
- Replacement of worn parts as required and if spare parts are in stock
- Update of the software as required and requested by the customer
- Checking / setting the zero point as required
- Checking the force curve over the nominal stroke
- Preparation of a machine condition report and quotation for the rectification of any defects
- Calibration and adjustment of the force signal, issue of a calibration certificate
- Adjustments (e.g. belt tension) as required
- Travelling expenses included
- Warranty extension by 12 months after maintenance (maximum of 5 years after delivery)
- 10% discount on spare parts
- 10% discount on services and training

Calibration service

Our assembly presses are supplied with a factory calibration. After this, we recommend regular calibration to ensure the reliability of your measuring equipment and to prevent incorrect process parameters from occurring. On request, PROMESS can support you with the calibration and adjustment of your force measuring system with appropriate calibration services. Choose between a factory calibration or a calibration according to an accredited in-house procedure. Both services are carried out by our experienced service technicians on your premises.

Our calibration laboratory is accredited in accordance with DIN EN ISO/IEC 17025:2018 by the German Accreditation Body (DAkkS) and carries out calibrations in the accredited area.

Calibration services	
Factory calibration	Accredited calibration
- Factory calibration of the force measuring system - Factory calibration certificate - Traceable calibration - Conformity assessment	- Calibration of the force measuring system according to accredited in-house procedure - Internationally recognised calibration certificate (with ILAC and DAkkS logo) - Traceable calibration - Conformity assessment (optional) - Fulfilment of the requirements of the DIN EN ISO/IEC 17025 - Recognised measurement uncertainties for each measuring point - Determination of the reversal margin (hysteresis) (optional)
- Adjustment of the force measuring system - Checking the distance measuring system - Function check for noise and wear - Lubrication - Testing the machine capability (optional)	

What are the advantages of calibration according to an accredited procedure compared to factory calibration??

- Calibration in accordance with the accredited procedure fulfils the requirement 7.1.5.3.2 external laboratories from the IATF 16949 standard.
- You will receive an internationally recognised calibration certificate that meets the requirements of DIN EN ISO/IEC 17025 and bears the DAkkS logo.
- Measurement uncertainties are shown and assigned directly to each measuring point.
- Determination of the reversal span (hysteresis) on request.
- You have the verification of a traceable calibration.
- We can carry out a conformity assessment for you on request.

Calibration set

Alternatively, you can calibrate or test the machine capability of your assembly press yourself using our calibration set. The process can be automated using the optionally supplied software. Finally, a log is created that can be exported to Microsoft Excel.

The PROMESS calibration set contains

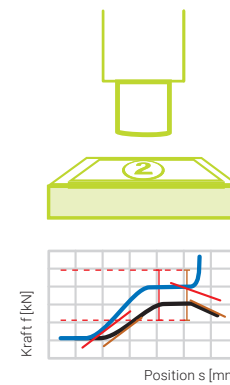
- Reference transducer
- Evaluation unit for the reference transducer with display and USB interface for connection to a PC
- Calibration certificate of the reference transducers as a factory calibration certificate or as a "DAkkS calibration certificate" possible
- PROMESS UFM Calibrate software (optional)
- Case



Calibration set	50 kN
Item no.	5103
Force transducer	KAM/50kN/0,2
Base plate	XKM 094
Diameter/height	Ø90 / 25
Plug	XKC 041
Display	KT-V5
Factory calibration	XKW 221

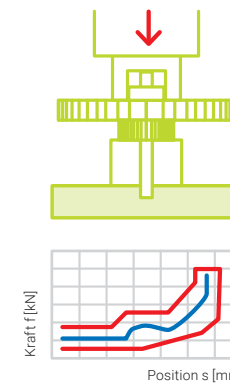


Application Examples



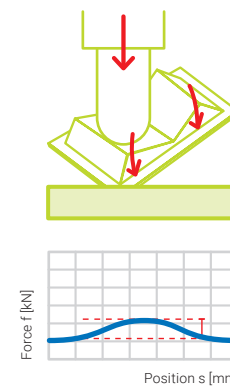
Stamping/Forming

- Stamping and forming with detection of part height and relative forming distance.



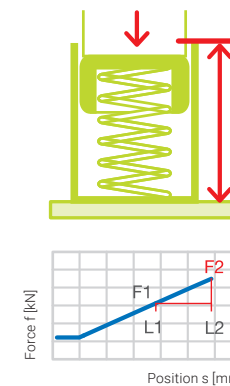
Join on Contact

- Joining on contact with precise shutdown once absolute shoulder position has been reached.



Surface Checks

- Logging of force-distance data for multiple switch points.



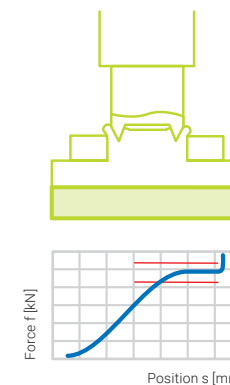
Testing/Measuring

- Logging of force-distance data for multiple positions.



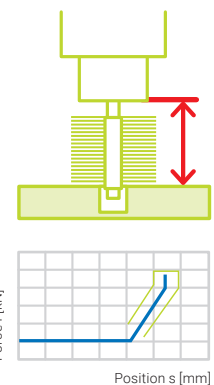
Bending

- Monitored bending of straps, brackets etc. on safety components.



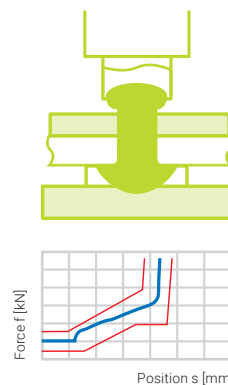
Press-fitting

- Press-fitting with controlled force for relative displacement.



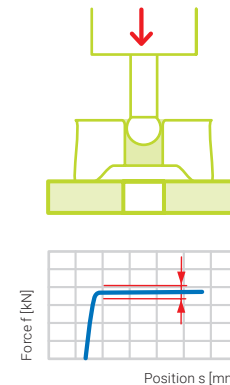
Precision Joining

- Precision joining < 0.002 mm, collision-free due to electronic bending compensation.



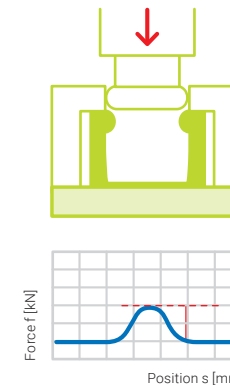
Riveting

- Rivet press with programmable press force and control of power press.



Calibrating

- Calibration with quality assurance through monitored force.



Clipping

- Joining of plastic and medtech parts with monitoring of snapping force.

PROMESS. For more efficiency.



PROMESS

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und Prüfsysteme mbH

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