

THE MEASUREMENT SOLUTION.

burster



Press fitting - the reliable way

100% QUALITY CONTROL FOR MANUALLY OPERATED PRESSES

100% quality with manually operated presses

QUALITY ASSURANCE ON MANUAL PRESSES IS NOT A LUXURY - IT'S ESSENTIAL.

Price and quality pressures are constantly rising, squeezing out any room for manufacturing defects. There is an ever-increasing need to monitor not only complex operations but also simple production and assembly processes.

Prevent costly product recalls! To obtain certainty for yourself and your customers, you need to be able to make reliable, quality-relevant statements about the components you manufacture. This particularly applies to monitoring press-fit operations on manual presses. There are many applications in this field in which margins are tight, and budgets and time are strictly limited.



HOW MUCH PRESS-FITTING CONTROL DO YOU NEED TO PRODUCE 100% FAULT-FREE?

Together let's choose the right tools for monitoring your manual presses and tailor them precisely to your needs!

We offer **3 different solutions** to cover all of your manual press applications.

Especially in areas you might not have considered yet, e.g. small production runs in mechanical engineering and component assembly, medical technology, electrical engineering, pharmaceuticals and household appliances.



Advantages of force and force-displacement monitoring on manual presses

- You reduce cost-intensive defects and enhance your production output.
- You monitor every process 100%.
- You prevent expensive product recalls that harm your image.
- You create the documented certainty that your customers demand.
- You will access new markets, applications and customers.

SUSTAINABLE FOR YOUR RESOURCES

Do you already use manual presses and carry out monitoring via visual checks or by feel? **Then it's time to act!**

Eliminate all uncertainties and equip the manual presses you are using with the press-fit monitoring system that's right for you. With our **3-solution concept** you render the processes on your manually operated or pneumatically/hydraulically assisted manual presses reliable and documentable in next to no time.

Monitor everything

- In production, laboratory or in test facilities
- On all standard manual presses
- Can be fitted to existing or new presses

Efficient and profitable

- Extremely attractive entry-level prices
- Continuous monitoring for less than 0.3 cents/part
- Built-in visual/acoustic signaling and part counter

Fast and reliable

- Plug & Work in 30 minutes
- Autoconfig mode instead of time-consuming adjustment work
- Tamper-proof and practical designs

burster COMPLETE – THE EASY WAY TO GET STARTED

You choose the right solution for your application as well as current and future requirements, from our 3-solution concept. Whether very simple or highly complex, for small or large quantities, with our 3 different solutions you will gain 100% certainty. Benefit also from our all-round service package that makes selection, setup and operation easy.



BASIC SOLUTION



COMFORT SOLUTION



HIGH-END SOLUTION

The 3-solution concept

MANY APPLICATIONS, ONE GOAL: 100% MANUAL PRESS MONITORING.

Whichever option fits the current requirements profile for your business or holds promising potential for the future – our monitoring concepts are the right way to go. You will also benefit from our all-round service offer that makes setup and initial operation easy.

From simple force indication to recording complex force-displacement processes, our systems solve all tasks in countless applications.

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BASIC SOLUTION

Low-cost for self-contained workstations

- ForceMaster 9110
- Load cells 8451/8552
- Only force or force-displacement monitoring
- Displacement transducer 8712/8713
- Accessories and service support

THE IDEAL STARTER PACKAGE FOR MANY BASIC APPLICATIONS



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COMFORT SOLUTION

Flexible with various evaluation capabilities and graphical of the process display

- DIGIFORCE® 9311
- Load cells 8451/8552
- Displacement transducers 8712/8713
- Accessories and service support



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HIGH-END SOLUTION

Innovative, high-precision solution with countless measurement and evaluation options

- DIGIFORCE® 9307
- Load cells 8451/8552
- Precision tension and compression load cells 8431/8432
- Displacement transducers 8712/8713
- Accessories and service support



Assembling gears



Press-fitting case lids



Press-fitting sealing plugs



Clearance checks for pumps



Fitting connecting plugs



Mounting shaft sealing rings



Powder compaction



Fitting watch hands



Press-insertion of ball bearings



Crimping sleeves/connectors



Inserting balls to seal holes



Electrical component assembly



Spring testing with hysteresis monitoring



Monitoring snap-fit processes



Basic – economical, for self-contained workstations

100% CONTROL, 100% LOW-COST.



The basic solution is a straightforward and simple yet effective way to control processes. We recommend this complete package when you want process control with very low overall costs.

COMPONENTS IN THE BASIC SOLUTION:

- **ForceMaster 9110**
Measuring instrument specially developed for manual presses, for press-insertion and joint monitoring
- **Load cells 8451/8552**
Robust, easy to fit, mechanical overload protection
- **Displacement transducers 8712/8713**
Durable, simple to mount, low-cost, precise



SIMPLE PROCESS CONTROL FOR MANY APPLICATIONS

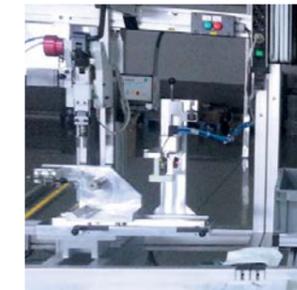
- Press-fitting case lids, sealing plugs etc.
- Assembling gears
- Powder compaction
- Clearance checks for pumps
- Fitting watch hands
- Mounting shaft sealing rings

Example applications:

AUTOMOTIVE SUPPLIERS
Pressing cast housings



ELECTRICAL ENGINEERING
Press-fitting IDC connectors



ENGINE PRODUCTION
Mounting shaft sealing rings



FEATURES OF THE BASIC SOLUTION WITH ForceMaster 9110:

Unbeatably low-cost

- Perfect control at entry-level price
- Plug & Work cuts downtimes

Simply fast

- Plug & Work in 30 minutes
- Autoconfig mode with automatic settings for evaluation tools
- Automatic sensor recognition
- Even inexperienced staff can set it up

Impressively easy

- Load cell is easy to attach to almost any standard manual press
- Visual and acoustic signaling

Practical, well-thought-out

- Onboard part counter
- Data logging on USB flash drive
- Fast part changes with smart-card system
- Optionally with force or force-displacement monitoring
- Tamper-proof

MEDICAL TECHNOLOGY

Fitting valves on infusion pumps



PLASTICS INDUSTRY

Joining plastic membranes in a metal housing



Please see our website for **more product details.**

Comfort – flexible process monitoring

100% CONTROL, 100% CONVENIENT.



The **comfort solution** is used wherever force-displacement curves need to be displayed. Enormous flexibility in measurement value acquisition, variable evaluation elements and a wide range of process dialogs render process control particularly convenient.

COMPONENTS OF THE COMFORT SOLUTION:

- **DIGIFORCE® 9311**
Process controller with wide performance scope
- **Load cells 8451/8552**
Robust, easy to fit, mechanical overload protection
- **Displacement transducers 8712/8713**
Durable, simple to mount, low-cost, precise



CONVENIENT PROCESS CONTROL WITH PRECISE EVALUATION

- Press-insertion of ball bearings
- Crimping sleeves and connectors
- Inserting balls to seal holes
- Assembly of electrical components

Example applications:

AUTOMOTIVE MANUFACTURERS

Riveting process on vehicle brake liners



ELECTRIC MOTOR MANUFACTURE

Fitting shafts to electric motors



DRIVE TECHNOLOGY

Random-sample testing in snap-disc production



FEATURES OF THE COMFORT SOLUTION WITH DIGIFORCE® 9311:

Impressively versatile

- Displays force-displacement curve
- 16 measurement programs
- Facility to combine window and envelope evaluation
- View and analyze the last 50 measurements
- Configurable function keys on touch display

Fast and powerful

- Live value display for force and displacement signals
- Convenient measurement data logging with **DigiControl** PC software or on a USB flash drive

Can be integrated anywhere

- Equipped with all relevant fieldbus interfaces
- Flexible start/stop conditions for the measurement phase

Please see our website for **more product details.**

High-end – for complex measurement processes

100% CONTROL, 100% UNIVERSAL.



The **high-end solution** is suitable for combining a large range and variance of components with control of complex processes. A huge range of individual measurement programs and diverse interfaces make the DIGIFORCE® 9307 a solution that meets the highest requirements for measurement and integration.

COMPONENTS IN THE HIGH-END SOLUTION:

- **DIGIFORCE® 9307**
Process controller with outstanding measurement accuracy
- **Load cells 8451/8552**
Robust, easy to fit, mechanical overload protection
- **Precision tension and compression load cells 8431/8432**
High-precision, immune to interference, convenient load application
- **Displacement transducers 8712/8713**
Durable, simple to mount, low-cost, precise



COMPLEX PROCESS CONTROL FOR DEMANDING APPLICATIONS

- Spring testing with hysteresis monitoring
- Snap-fit assemblies

Example application:

AEROSPACE ENGINEERING

Hysteresis testing on safety switches



FEATURES OF THE HIGH-END SOLUTION WITH DIGIFORCE® 9307:

Hugely versatile

- 128 measurement programs for a large variance of components
- Evaluations with graphical elements and mathematical functions

Universal

- For all standard sensor interfaces
- Control and configuration via fieldbus

Unsurpassed convenience

- Large 5.7" high-quality color display
- Numerical keypad

Perfect control

- Versatile, innovative evaluation and analysis elements
- Intelligent signal detection for complex force-displacement curves
- Comprehensive diagnostics and statistical analysis tools

Please see our website for **more product details.**

Global control: any press anywhere

MONITORING MATTERS JUST AS MUCH AS THE PRESS.

JUST EASY-PEASY: CONTROL ANY MANUAL PRESS WITH THE RIGHT SOLUTION

All sorts of businesses use manual presses. Countless manual workstations are fitted with widely different models and designs of manual presses. They are an indispensable tool in the small to moderate-scale simple production and assembly of components. They also provide a vital service in goods-inwards inspection and random sample testing of springs and moving assemblies.

There are numerous national and international press manufacturers producing general-purpose presses for these tasks. These presses can be retrofitted quickly and require practically no maintenance. They offer unrivalled efficiency for a range of production processes and batch sizes.

We have the right monitoring solution for whatever press you use. You can use our monitoring systems to guarantee 100% quality control and avoid costly and easily preventable mistakes. This boosts your productivity and provides documented peace-of-mind for you and your customers.

Compatible press models

- Rack-and-pinion presses
- Toggle presses
- Hydraulic presses
- Pneumatic presses
- Electric presses
- Eccentric presses

Highlights

- Hand-lever presses can be easily retrofitted with force and displacement sensors as well as evaluation electronics
- Range of forces 0 ... 2.5 N to 0 ... 100 kN
- Force measurement precision to 0.2 % F.S.
- Direct force measurement in the direction of the press ram axis
- Various mounting options for the displacement sensors to suit task in hand
- Automatic sensor recognition



The standard setup is to fit the load cell as an extension of the press ram, so that it measures the applied force directly inside the axis (directly at the tool). The displacement transducer (optional) moves co-jointly with the travel of the press ram, travelling in parallel with the ram axis at the side of the press head.

The mounting plate between press head and displacement transducer helps to align the axes exactly in parallel with each other. The clamp-on carrier, which is attached to the load cell, transfers the movement to the displacement sensor.

Our **how-to-do video** shows how to fit the load cell and displacement transducer to a manual press. It is available to download from:

<http://goo.gl/MBkWMN>



Practical – load cells and transducers

FOR FORCE AND DISPLACEMENT MEASUREMENT.

PRESS LOAD CELL 8552

Features

- Measuring ranges from 0 ... 100 N to 0 ... 25 kN
- Mechanical overload protection
- Different diameters of pin and hole can be selected
- Compact overall height
- Simple mounting on press ram

For the following applications

- Forces when joining parts
- Press-fittings
- Bending forces during deformation of materials
- Cutting forces
- Stamping forces
- Punching forces for blanks
- Breakaway forces in destructive testing



PRESS LOAD CELL 8451

Features

- Measuring ranges from 0 ... 0.5 kN to 0 ... 100 kN
- Measurement accuracy starting from 0.5 % F.S. for small measurement ranges
- Protection class IP67
- Rugged construction, works even under transverse forces
- Simple mounting on press ram

Options/Accessories

- Connecting cable in 3 m or 5 m length
- Linear bushing for particularly precise guidance

PRECISION MINIATURE LOAD CELLS 8431/8432

Features

- Measuring ranges from 0 ... 2.5 N to 0 ... 500 N
- High measurement accuracy from 0.2 % F.S.
- Minimal sensitivity to lateral forces thanks to support diaphragms



Typical application areas

- Switch and haptic testing
- Precision engineering
- Watch industry
- Medical technology
- Instrument manufacture

Options/Accessories

- Centring and mounting adapters for press ram
- Overload protection
- Hermetically sealed version

POTENTIOMETRIC DISPLACEMENT TRANSDUCERS 8712/8713

Features

- Measuring ranges from 0 ... 10 mm to 0 ... 150 mm
- Non-linearity from ± 0.05 % F.S.
- Service life 10^8 movements
- Available with spring inside or outside



Typical application areas

- Measuring pressing depth, deformation, sag and breaking stresses
- Operating travel of switches and buttons

Options/Accessories

- Attachment parts for mounting
- Sensing tips for various different requirements
- 5-pin connecting plug (8712)
- Mating connector and connecting cable (8712)
- Integral connecting cable in 1 m or 3 m length (8713)

Please see our website for **more product details**.

Press-fitting - the reliable way

THIS COMPARISON STANDS UP TO EVERY CHALLENGE.

	ForceMaster 9110	DIGIFORCE® 9311	DIGIFORCE® 9307
			
Applications	Basic solution for simple force or force-displacement monitoring, fast setup, easy to operate, rapid integration into existing systems.	Comfort solution with X/Y curve display, flexible integration into process environment with I/O control signals or popular fieldbus systems.	High-end solution with maximum precision for universal use with all sensor technologies, versatile evaluation and analysis elements.
Measurement accuracy	< ± 2 % F.S.	< 0.2 % F.S.	0.05 % F.S.
Measurement channels	2	2	6
Evaluation time	≥ 1 s	25 ms	15 ms
OK/NOK evaluation	■	■	■
Part counter	■	■	■
Range of components / measurement programs	Unlimited via smart cards	16	32/128
Display	Two-line numerical	3.5" TFT color LCD with touchscreen	5.7" TFT color LCD
Visual signaling	■	■	■
Acoustic signaling	■	Optional via external device	
Automatic sensor recognition	■ own format	■ burster TEDS	
Evaluation methods	Force thresholds, gateways and block windows	Window, trapezoid, threshold and envelope	Window, trapezoid, threshold, envelope, rotary switch and mathematical operations
Software	<ul style="list-style-type: none"> ■ FMControl ■ Easy configuration and reading out measurement data 	<ul style="list-style-type: none"> ■ DigiControl ■ Multi-channel evaluation and analysis software ■ Automatic curve archiving 	<ul style="list-style-type: none"> ■ DigiControl ■ Multi-channel evaluation and analysis software ■ Automatic curve archiving
Interfaces			
USB interface	■	■	■
RS232	■		■
Ethernet		■	■
Fieldbus interfaces		I/O interface, PROFIBUS, PROFINET, EtherNet/IP	I/O interface, PROFIBUS, PROFINET, EtherNet/IP, EtherCAT
Data recording	Curve data on USB flash drive	Results data via USB flash drive or DigiControl	Via DigiControl

Seamless monitoring for existing presses

RETROFIT PROCESS MONITORING.

We would be pleased to support you fitting reliable instrumentation to your existing manually operated presses. Our service offering ranges from analyzing your requirements and selecting the right products, to installation, training and calibration so that maximum availability is permanently maintained.

Benefit from our tailored service packages for our 3-solution concept

SERVICE PACKAGE 1:

Install sensors and connection of the controller on existing manual presses

SERVICE PACKAGE 2:

Startup of an equipped manual press and training on sensors and controllers

SERVICE PACKAGE 3:

Maintenance and calibration

Our do-it-yourself attachment kit for displacement transducers consists of a mounting plate with holes, screws, carrier for attachment to the 8552 load cell, self-adhesive cable ties for sensor connecting cable and a drawing for positioning the mounting plate.



Complete retrofitting

We can fit sensors and a process monitoring system to almost all standard manual presses. We offer you comprehensive support from connecting the instrumentation and initial operation to maintenance and calibration for your manual workstations.

Comprehensive advice

How large are the forces that actually occur? Can an existing press tool still be used? It is understandable that you have questions – we find the answers: Following a detailed consultation, send us test specimens on a no-obligation basis and we will calculate the forces that arise. Alternatively, after a detailed consultation, our service technicians can carry out test measurements on your premises.

Do you need test equipment for your existing manual press? Here too, we will be pleased to assist you. Just talk to us on a no-obligation basis.

Check online at www.burster.com to find your regional contact who will consult and support you individually.



Our **how-to-do video** shows how to fit the load cell and displacement transducer to a manual press. It is available to download from: <http://goo.gl/MBkWMN>



With certainty in good hands

ON-SITE CALIBRATION SERVICE CUTS PRODUCTION DOWNTIME.

Do you need to meet **ISO 9001** requirements for test equipment monitoring? With our **on-site calibration service**, you avoid production downtime and do not need to dismantle your machinery. After consultation the option of on-site calibration can be considered when applicable. We specialize in calibrating 1 N to 200 kN load cells.

Our modular concept meets all quality standards and application-specific requirements, whether you are using burster products or third-party equipment.

Test and calibration certificate

economical, fast and verifiable calibration on-site or in the lab.

Factory calibration

in our laboratory or on-site additionally provides verifiable statements concerning measurement uncertainty.



DAkkS calibration

satisfies the highest standards and requirements. We or our partners are accredited in accordance with DIN 17025.

Check online at www.burster.com to find your regional contact who will consult and support you individually.

TRANS CAL 7281 PRECISE CALIBRATION IN YOUR HAND

Our **unique mobile high-precision calibrator and testing device** is the smart, robust and traceable solution for your calibration requirements. With **TRANS CAL 7281**, you or our experts can perform mobile, on-site calibrations with high accuracy and without dismantling.

Performance profile

- Device test / strain gauge simulator
- Reference measurement chain
- Sensor test



**Device test/
strain gauge simulator**
Infinitely adjustable simulation values:
up to ± 50 mV/V, up to 10 VDC
Measurement: U_{supply} up to 10 VDC



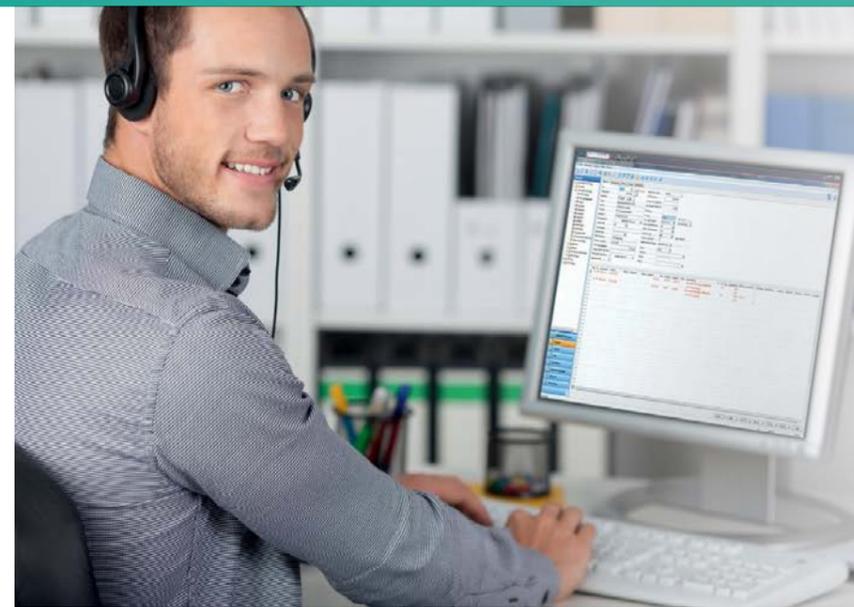
Reference measurement chain
in combination with a reference sensor



Sensor test
 R_i , R_a , Shunt, R_{ISO}

Service

KEEPING THE BIG PICTURE IN MIND.



With our **comprehensive service concept**, not only can you find a manual press monitoring solution that is exactly tailored to your needs, you can also depend on us at all times.

Modular components for planning, **implementing and operating your manual press monitoring system** cover all relevant aspects of your task – whether purchasing new equipment or retrofitting sensors to an existing press. From **measuring physical properties** to **calibrating** the finished system, from optimization to servicing and repairs.

→ KNOWLEDGEABLE APPLICATION SUPPORT

Our experts are happy to provide advice and help based on their experience gained over many years in production process monitoring and quality assurance.

→ OPTIMIZATION ADVICE

We make sure that you benefit from your measurement equipment while processes are running by continuously improving and optimizing your systems.

→ USER TRAINING

In structured and efficient training units designed for commissioning engineers, service staff and production personnel, your staff learn how to integrate and use our ForceMaster and DIGIFORCE® controllers and sensors smoothly and effectively. In these training sessions we look specifically at your application.

→ SYSTEM SETUP/COMMISSIONING

The clear operating structure of the ForceMaster and DIGIFORCE® controllers together with detailed fitting and mounting instructions and how-to-do videos enable you to independently install, setup and/or retrofit your measurement system. In more complex system environments and for custom-modified applications, we can provide a service technician to assist with on-site integration, fieldbus connection, configuration and evaluation. We offer worldwide support.

→ CALIBRATION SERVICES

Our accredited calibration centre offers you optimum reliability and traceability for initial calibration and recalibration of your ForceMaster and DIGIFORCE® controllers and accompanying sensors. We can quickly provide German-accredited DAkkS or factory calibration certificates by appointment. After consultation with us also on-site calibration can be considered where applicable to avoid production downtimes. Our experienced service engineers and service partners can provide support with detailed testing.

→ INTERNATIONAL ASSISTANCE & SUPPORT

ForceMaster and DIGIFORCE® systems run in applications worldwide. So you are right to expect also worldwide service. In cooperation with our international partner network we support you on-site exactly where our products work for you.

Check online at www.burster.com to find your regional contact who will consult and support you individually.

SYSTEM DESIGN



IMPLEMENTATION



OPERATION



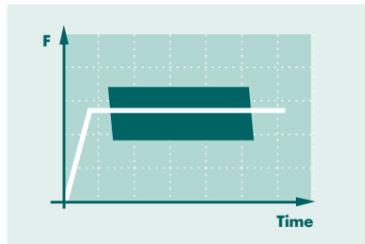
HELPFUL AND USEFUL TIPS.

Manual rack-and-pinion or toggle presses usually have a circular or square press ram. It is important to choose the correct sensor type for these manual presses whether purchasing the full assembly new or retrofitting sensors to an existing press. The following handy tips on mechanical requirements, installation conditions and technical measurement issues are intended to help you select the right load cell and displacement transducer and to fit them quickly and easily to your manual press.

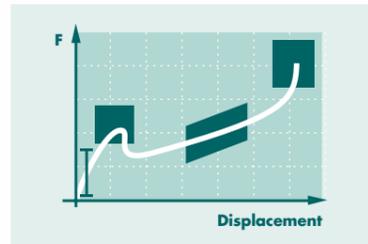
What are the most commonly used measurement procedures?

Simple force monitoring to determine whether the force has reached and/or not exceeded the defined limits during press-insertion under identical time conditions.

Detect and evaluate tolerance deviations and correct alignment or misalignment of parts during the joining process, using various analysis tools.



Force/time e.g. when gluing housing parts together



Force/displacement, e.g. when pressing a pin into a hole in the housing

LOAD CELL

What is the correct measurement range for the load cell?

The relevant figure here is the range needed to measure forces that occur during your joining process, **not the compression force range of the manual press!**



How to attach the load cell to the press ram?

Example: Manual press with an internal hole in the press ram



Ram with internal bore and grub screw



Load cell contact area, via which force is transmitted

When using **load cells 8451/8552** (different ram/bore diameters are available), these can usually be secured in the press ram using a grub screw. **→ This ensures that the load cell is fixed centrally with no possibility of movement or twisting.**

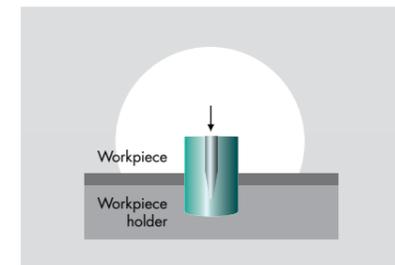
Please get in contact to discuss this or other fitting options. We can help you find a solution that makes both technical and economic sense.

What happens if the load cell is overloaded?

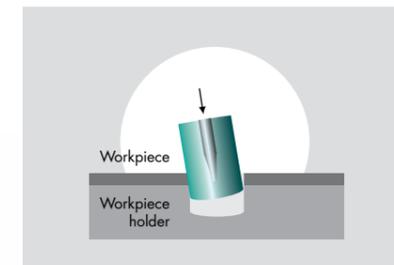
- The load cell may be destroyed and/or may have a much shorter service life
- The measurement properties will be impaired

Load cells 8451/8552 with built-in mechanical overload protection (up to 10 times the upper range value) **→ Protection against temporary static overloads.**

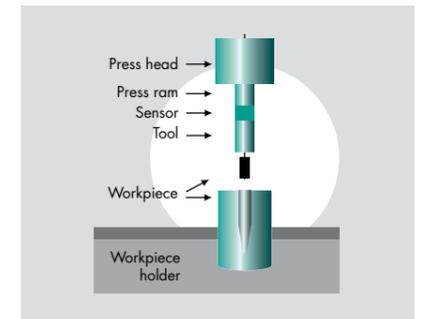
Preventing external forces!



RIGHT: exact positioning of the part → avoids lateral forces and measurement errors



WRONG: Lateral forces → measurement errors can occur



RIGHT: Press head, press ram, sensor, tool, workpiece and workpiece holder are precisely aligned with each other

DISPLACEMENT TRANSDUCER

Often it is not enough just to record the press-insertion force to obtain a meaningful assessment of a process. Factors such as special component geometries, a significant "feed-in length", different insertion speeds or the need to evaluate the required blocking dimension often require the use of a displacement transducer in addition to a force sensor.

What is the total travel of the manual press and what is the maximum pressing depth that needs to be detected and evaluated?

For designing the measurement range of the displacement transducer, a useful measure is a value between the total travel of the manual press and the maximum insertion depth/press-fit distance.



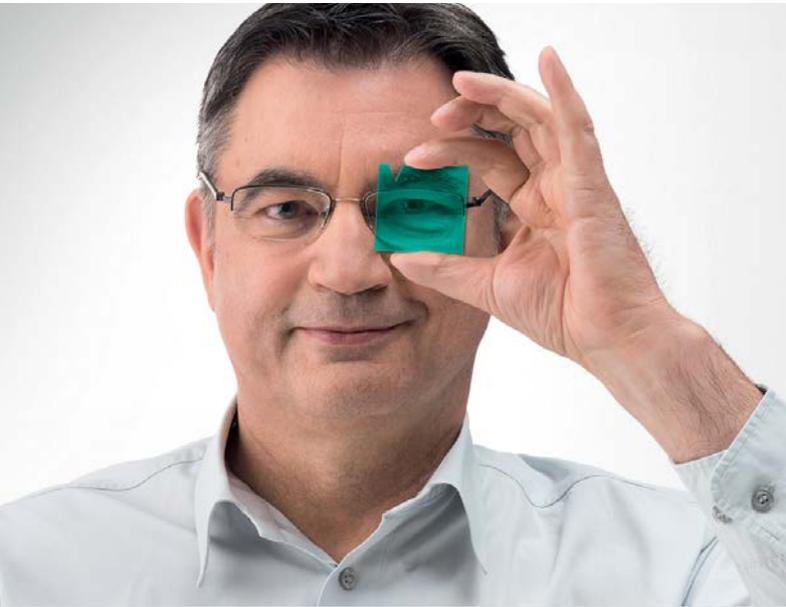
How to fit an additional displacement transducer to the manual press and what should be kept in mind?

The main point to consider is: Determine first of all whether the displacement transducer should be fitted centrally or on the left-hand or right-hand side of the manual press.

- A mounting surface of about 70 x 47 mm is required when using the attachment kit
- By means of two fixing holes, this set is very simple to attach to all kinds of different manual press models
- Specially designed ridges mean there is no need for additional modification of the mounting surface

THE MEASUREMENT SOLUTION.

burster



BECAUSE PROGRESS NEEDS VISION.

burster, the specialist for measuring equipment and sensors, delivers the ideal solution that meets your requirements to a T. We offer you forward-looking products, system solutions and a comprehensive suite of services to supplement our product range. With personal commitment and an uncompromising focus on quality.

Measuring technology with
perspective.

THE MEASUREMENT SOLUTION.

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