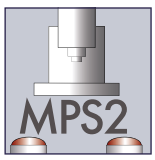
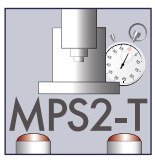
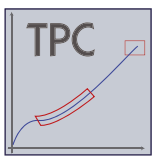
DAF Direct-acting press cylinders

The accessories

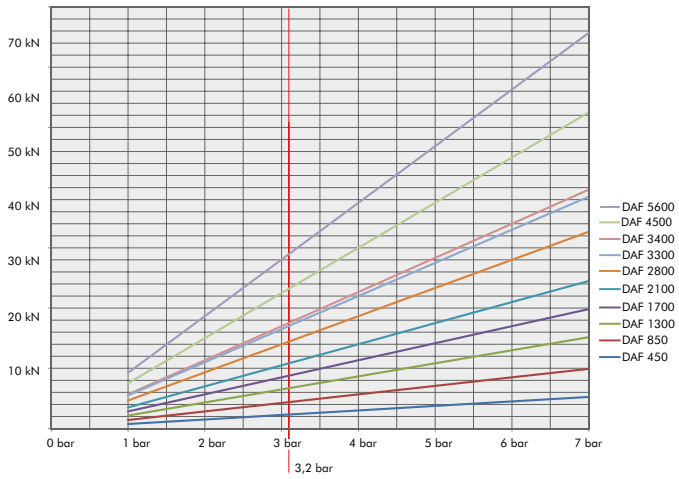




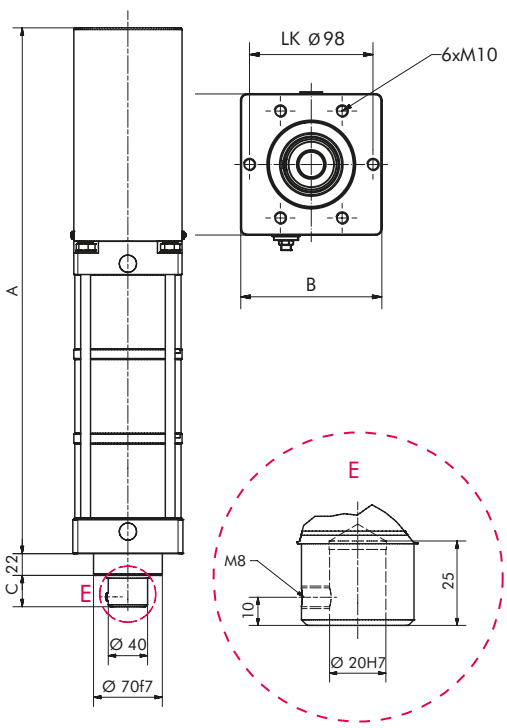


DAF direct-acting press cylinders with flange have been designed for flexible use in special machines. DAF press cylinders come with all the advantages of modern pneumatic presses as standard:

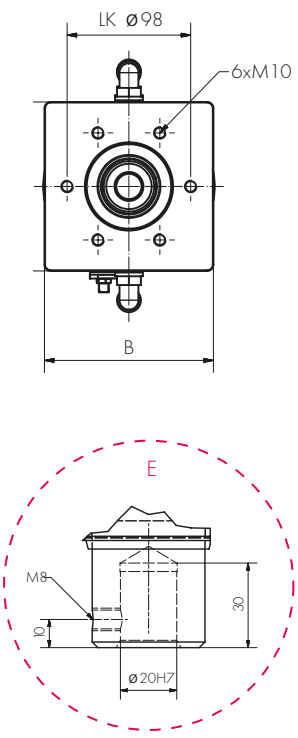
- Stepless adjustment of stroke length
- Adjustable end-position damping
- Tool mounting hole
- Easy to automate



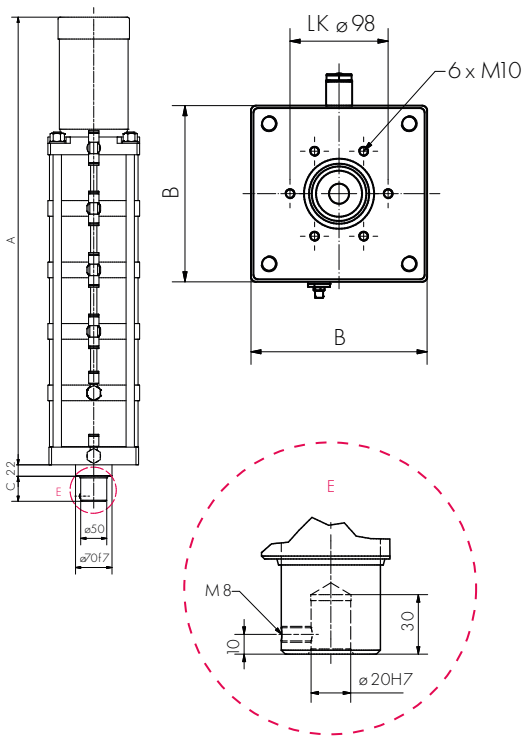
DAF 450
DAF 850
DAF 1300
DAF 1700



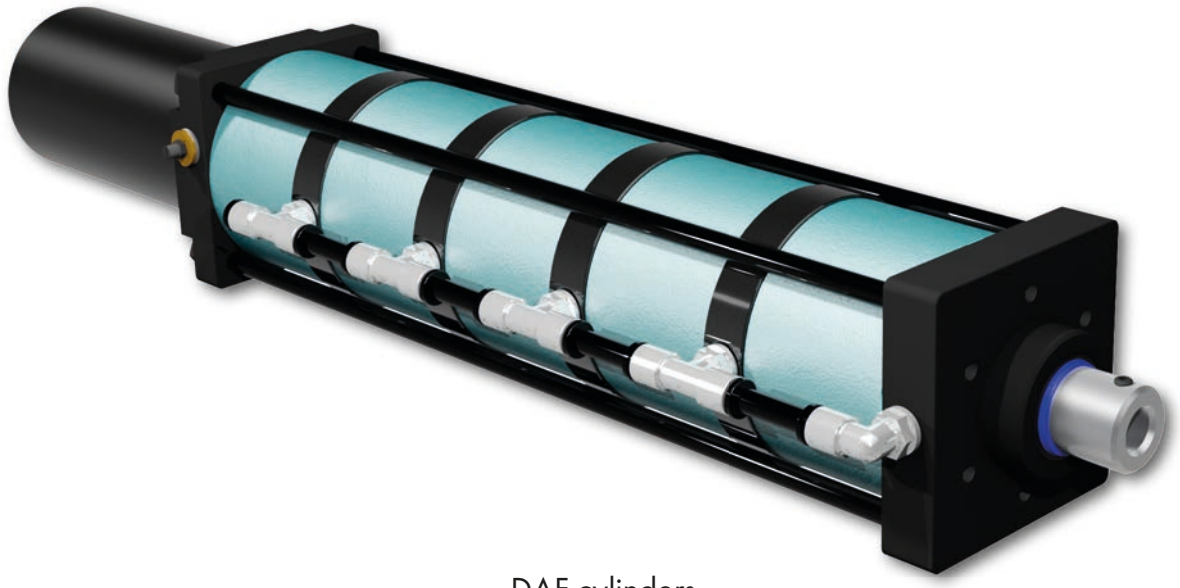
DAF 2100
DAF 2800
DAF 3400



DAF 1100
DAF 2200
DAF 3300
DAF 4500
DAF 5600



For details of fine stroke adjustment see page 37.



DAF cylinders

Type		DAF 450	DAF 850	DAF 1300	DAF 1700
Capacity at 6 bar	kN	4,5	8,5	13	17
Return force at 6 bar	kN	4	4	4	4
Stroke max.*	mm	40/60/80/100/120	40/60/80/100/120	40/60/80/100/120	40/60/80/100/120
A at 40 mm stroke	mm	363	449	535	621
Surcharge/20 mm more stroke	mm	20	40	60	80
B	mm	112	112	112	112
C	mm	32	32	32	32

Type		DAF 2100	DAF 2800	DAF 3400
Capacity at 6 bar	kN	21	28	34
Return force at 6 bar	kN	20	27	33
Stroke max.*	mm	40/60/80/100/120	40/60/80/100/120	40/60/80/100/120
A at 40 mm stroke	mm	581	689	797
Surcharge/20 mm more stroke	mm	60	80	100
B	mm	134	134	134
C	mm	38	38	38

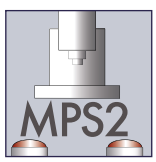
Type		DAF 1100	DAF 2200	DAF 3300	DAF 4500	DAF 5600
Capacity at 6 bar	kN	11	22	33	45	56
Return force at 6 bar	kN	10	10	10	10	10
Stroke max.*	mm	40/60/80/100/120	40/60/80/100/120	40/60/80/100/120	40/60/80/100/120	40/60/80/100/120
A at 40 mm stroke	mm	387	505	623	741	859
Surcharge/20 mm more stroke	mm	20	40	60	80	100
B	mm	172	172	172	172	172
C	mm	48	48	48	48	48

* Specify the stroke length when ordering.

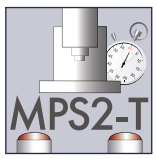
The controller model MPS-2 conforms to the safety requirements which must be applied according to the EC Machinery Directive 2006/42/EC and to the standards for the safety of pneumatic presses. MPS-2 two-hand controls fulfil all requirements of type IIIC according to DIN EN ISO 13851. mäder presses can therefore be used at workstations with manual loading and open tools. Safety is provided here by the controller, which is designed to be both electrically and pneumatically redundant.

MPS-2 controls include a press safety valve, maintenance unit, push button with protective collar, PLC with free interfaces, Ethernet interface and an integrated web server for remote maintenance, as well as an insert for standard micro SD cards and an electronic piece counter.

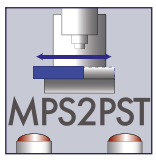
A key switch can be used to select between 2-hand operation or external control.



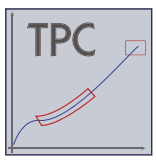
MPS-2
Basic version for two-hand operation.



MPS-2 T
MPS-2 controller with additional stop time function. When the press has reached its end position, a timer can be used to determine when the return stroke should take place.



MPS-2 PST
This type of MPS-2 controller is used to control a pneumatic slide table in addition to the press. The scope of supply also includes the stop time function (see MPS-2 T)



MPS-2 TPC
MPS-2 controller with an additional module TPC-MIDI for force/ displacement monitoring.

TPC-MIDI Process monitoring

Applications:

Joining and assembly processes using presses must today be carried out safely and if possible without retrospective checking. Specified parameters which define the press process must be maintained during production. Only in this way can the quality and safety of the manufactured product be guaranteed. For this reason, TPC-MIDI is used wherever consistent joining processes are required, the progress of which has to be checked and if applicable documented by means of software.

TPC-MIDI monitors the press operation, compares the actual progress with the requirements and subsequently evaluates it. In this way, reject parts can be reliably detected and separated out.

TPC-MIDI can be used both with hand-operated presses and with pneumatic presses. However, the TPC-MIDI is also available as a pure system component if a PLC environment already exists, e.g. in an automation system.

The advantages:

- TPC-MIDI can be programmed via the membrane keyboard or conveniently using the PC software.
- TPC-MIDI stores 16 different measuring programs
- Modern curve evaluation via freely parameterisable windows
- Evaluation options: Window, trapezoid window, block window, envelop curve, thresholds on the x or y axis.
- Interfaces: Ethernet and USB. Optional fieldbus integration with PROFIBUS, PROFINET or EtherNet/IP.
- Force measurement directly in the force characteristic with DMS sensor developed especially for presses.
- Software for programming and saving monitoring programmes, as well as for documentation of the individual press-fit processes

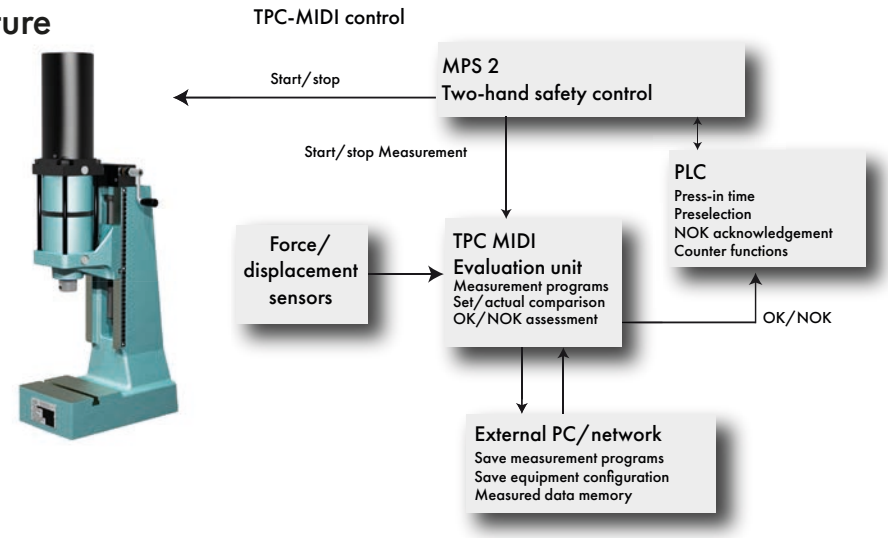
Clear OK / NOK message

With OK parts, the indicator light is green and the press is ready for the next working stroke.

NOK parts are reliably reported by the TPC-MIDI as an audible signal and by a red indicator light.
The next press stroke cannot be initiated until the error has been acknowledged.

DA 2800-40-130 with MPS-2 TPC

System structure



Load cell force sensors for TPC-MIDI

The load cell force sensor is fixed inside the ram bore. The tool holder can be fixed in the hole at the other end of the sensor. The force sensor is therefore always directly in the force flow between the press ram and the tool.

Measurement range	Measured value divergence	Tool holder
0 – 500 N	≤ ± 0.5% of EV	10H7 x 24 mm
0 – 1 kN	≤ ± 0.5% of EV	10H7 x 24 mm
0 – 2 kN	≤ ± 0.5% of EV	10H7 x 24 mm
0 – 5 kN	≤ ± 2.0% of EV	10H7 x 24 mm
0 – 10 kN	≤ ± 2.0% of EV	10H7 x 24 mm
0 – 20 kN	≤ ± 1.0% of EV	10H7 x 24 mm
0 – 50 kN	≤ ± 1.0% of EV	20H7 x 24 mm
0 – 100 kN	≤ ± 1.0% of EV	20H7 x 24 mm

Unless expressly required to the contrary, the load cell force sensor is selected to match the maximum capacity of the press used

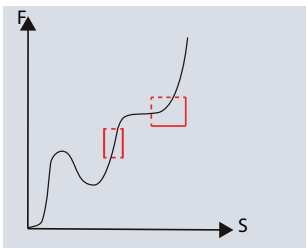
Potentiometric travel meter

Travel is measured potentiometrically. The service life of the sensors is 10^8 movements

Press stroke	Resolution	Linearity error
40 mm	0.025 mm	0.42%
60/80 mm	0.038 mm	0.41%
100 mm	0.050 mm	0.40%
120 mm	0.075 mm	0.40%

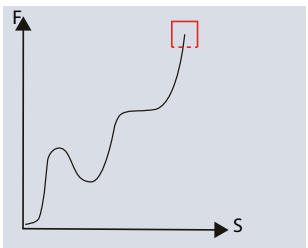
Monitoring windows

Pass-through window



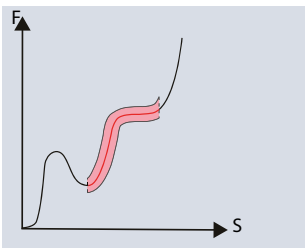
The force/displacement curve must pass through the window from the entry to the exit side as defined without one of the other window boundaries being infringed. The entry and exit sides can be freely selected.

Block window



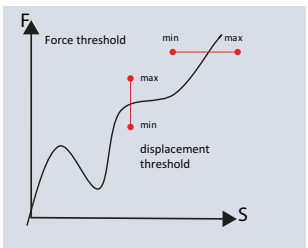
The block window monitors the final values of the press operation. With this type of window, the force/displacement curve must enter the specified entry side and must not leave the window again.

Envelope curve



The measuring curve must pass continuously through the envelope curve and must not infringe it. The envelope curve is taught by means of a teach-in process. Its X-axis parameters and the delta-Y, i.e. the force tolerance range, are then defined.

Monitoring window

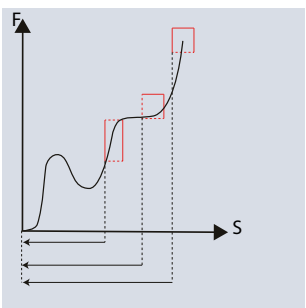


Thresholds define minimum values that must be reached within a certain range and may no longer be undershot. A force threshold (Y-axis) and alternatively a displacement threshold (X-axis) are available.

The reference points of the monitoring windows

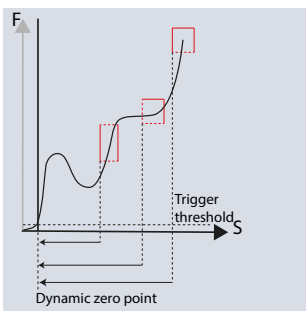
The reference points of the monitoring windows on the X-axis can be defined both rigidly and dynamically.

Absolute



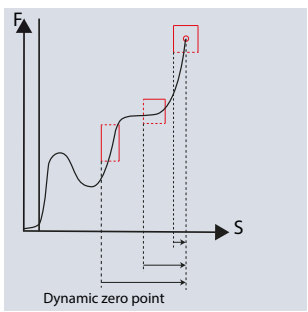
In the case of assembled parts with high repeat accuracy, the calibrated zero point of the displacement sensor on the X-axis is used as the reference point.

Trigger



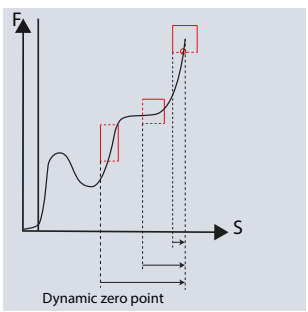
If the assembly sequence is identical as such, but the start of assembly has a major deviation on the X-axis, the beginning of the measurement can be defined by setting a trigger threshold on the Y-axis.

End force



If a measurement with an absolute or a trigger reference point is not useful, the position of the end force (Fmax) on the x-axis can be selected as the reference point. The position of the evaluation window on the X-axis then relates in reverse to this dynamic zero point.

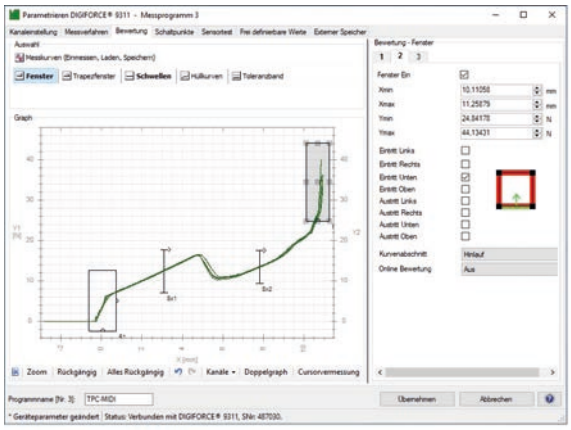
Block window

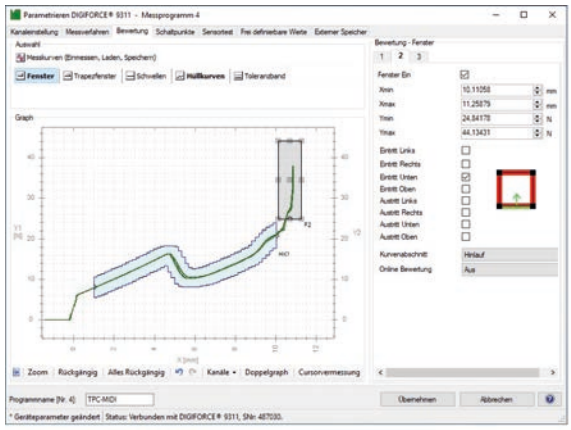


If the end force shows a wide spread, the reference point of the evaluation windows can also be defined using the entry of the curve into the block window. Any values after the block window has been reached are no longer taken into account. The position of the evaluation windows on the X-axis then relates in reverse to this dynamic zero point.

PC Software

TPC-MIDI is supplied as standard with the basic version of the software, with which the configuration of TPC-Midi and measurement programs can be set up and saved.





Equipment configuration

- Settings or teach-in of the force and displacement sensors (X/Y axes)
- Stipulation of measurement method and reference points
- Backup of complete unit configurations (up/download)

Measurement programs

- Creation and internal saving of 16 measuring programs. Further measurement programs can be created, saved and reloaded when required.
- Input of sets of curves
- Creation of monitoring windows and envelope curve
- Test runs with OK or NOK assessment

With the licensed full version, the production data per press-in operation can be recorded in addition.

- Production mode
- Measured data recording
- Clear-cut part reference
- Besides the programme's own format automatic print and export to ACII and Excel