



## Application examples



## Wireless Pressure Monitoring (WPM)

### Wireless Pressure Monitoring (WPM)

Wireless monitoring of gas springs

The core requirements on any pressing plant are: Automation and zero-defect production.

Prerequisite is also real-time process control.

The FIBRO Wireless Pressure Monitoring (WPM) system monitors gas springs in all areas in which cable or hose-reliant systems reach their technical limitations, or are simply uneconomical.

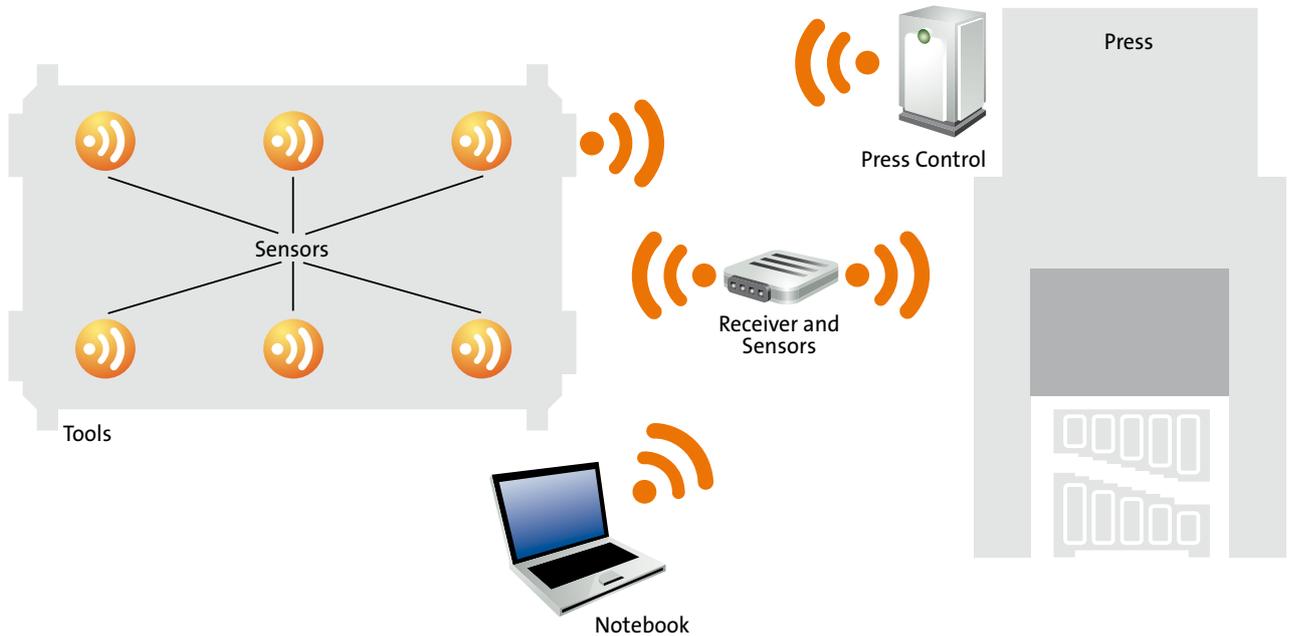
The WPM system monitors temperature and pressure in gas springs.

It consists of a coordinator and a sensor, which transmit wireless data to any designated Windows-based system. Custom software analyses the data and initialises the necessary process control and pre-emptive maintenance steps accordingly.

### Advantages:

- Around-the-clock monitoring and documentation
- Alert to defects avoiding production of faulty parts
- Pre-emptive wear detection and targeted troubleshooting
- Prevention of downtime and secondary failures
- Minimisation of leakage points
- Streamlined construction and assembly
- Optimised maintenance intervals and reduction of maintenance and repair costs

### Monitoring system - Method of operation



### The WPM system contains up to four components:

- Sensors in the pressing tool. These form a PAN (Personal Area Network).
- PC with receiver:  
A device for setting up the PAN and for initial parameterisation of the tool sensors.
- Press coordinator COO, which is permanently installed on the press, and which communicates with the tool sensors and the press controller. (Customer-specific)
- Press control connection. There are various connection options available. (Customer-specific)

# Wireless Pressure Monitoring (WPM) Receiver Software

2480.00.90.20.01

(in the scope of delivery)  
Receiver, PC - USB2.0  
incl. software CD for the PC



2480.00.90.20.01

Receiver, PC - USB2.0



2480.00.90.51.01.0

Software CD for PC

## Measuring example

Setting and display options for pressure and temperature variance



## Zero-defect production

Before and during the use of tools in the press, the WPM monitors the level of pressure of all gas springs. The system reports defects pre-emptively before a faulty part can be manufactured. Definable warning and alarm value limits.

## Gas spring location and status control via tool sensors



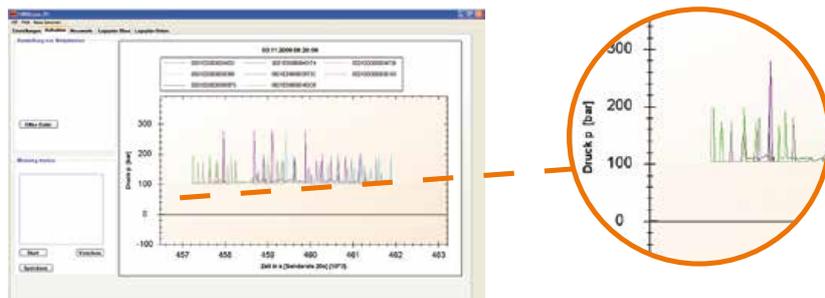
## Targeted maintenance

Temperature monitoring detects erosion before any drop of pressure occurs in the spring. System locates defective spring in case of malfunction. Downtime can be pre-emptively reduced or avoided. The WPM system enables wear-specific maintenance intervals that significantly reduce maintenance and repair compared to fixed intervals.

## Streamlined construction and assembly

Tool manufacturers need solely consider the position of sensors and springs. No need to install tube lines during assembly which means leakages are a thing of the past.

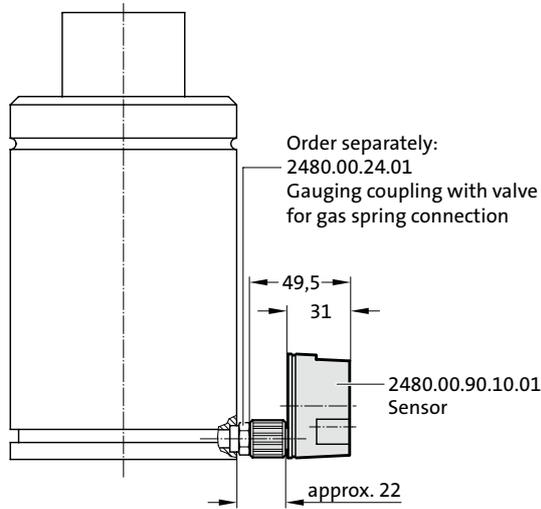
## Process control documentation (Pressure/Time diagram)



## Wireless Pressure Monitoring (WPM) Sensor Filling adapter, Battery

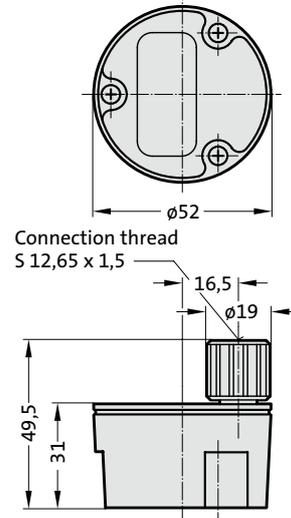
### Mounting Example:

Sensor - Gas spring connection



### 2480.00.90.10.01

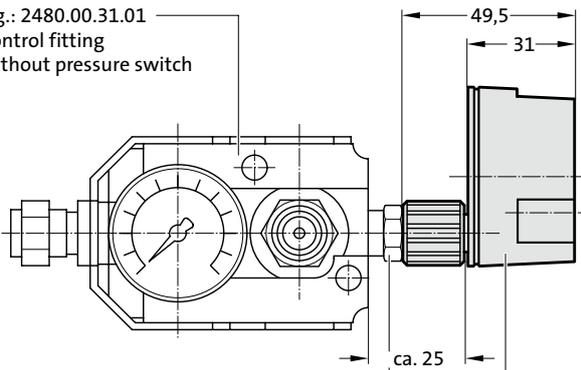
Sensor



### Mounting example:

Sensor - Control fitting connection

E.g.: 2480.00.31.01  
Control fitting  
without pressure switch



Order separately: 2480.00.24.02  
Gauging coupling with valve  
for connection to the control fitting

2480.00.90.10.01  
Sensor

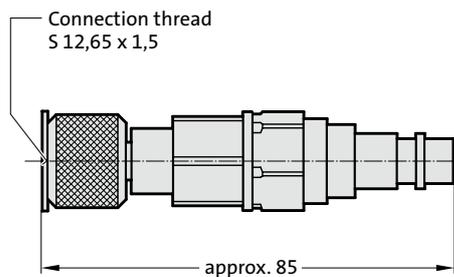
### 2480.00.90.10.01 Sensor Technical data:



Installation location:	any
Pressure medium:	Nitrogen - N <sub>2</sub>
Ambient and operating temperature range:	0° C to +80° C
Storage temperature range:	-25 to 80° C
Protection type:	IP 67
Pressure range:	0 - 500 bar
Per. overload:	Factor 1.5
Hysteresis:	+/- 0.5% v. EW
Linearity:	+/- 1% of max. Setup pressure
Repeatability:	+/- 0.5% v. EW
Bursting pressure:	Factor 2.5
Seals:	FKM (Viton)
Material:	Floor plate: VA steel, with welded in sensor
	Housing: Plastic ABS, Colour: black
Temperature drift:	< 0.2% / 10k (0° C to 80° C)
Temperature measuring range:	0 to 85° C
Mechanical connection:	Minimes connection S 12.65 x 1.5 for gauging coupling 2480.00.24.01/.03
Energy supply sensor unit:	3.6 V DC via Battery
Digital interface:	SPI /I2C
Sensor unit and wireless module:	

### 2480.00.90.00.10

Filling adapter for minimess connection



### 2480.00.90.10.00.1 Battery

Battery for reordering  
(Battery is included in the sensor's scope of delivery.)  
Battery capacity 3-4 years with "normal" tool use

# Filling and control fitting

## Filling hose

### Cylinder pressure regulator

#### Description:

The filling and control fitting 2480.00.32.21 is used to fill, vary the pressure setting (e.g. when testing tools) and measure the gas pressure.

The coupling enables the filling hose 2480.00.31.02 to be connected directly to the gas cylinder valve or the pressure regulator.

If the fitting is used solely for checking purposes, a simplified arrangement without the filling hose 2480.00.31.02 is also possible.

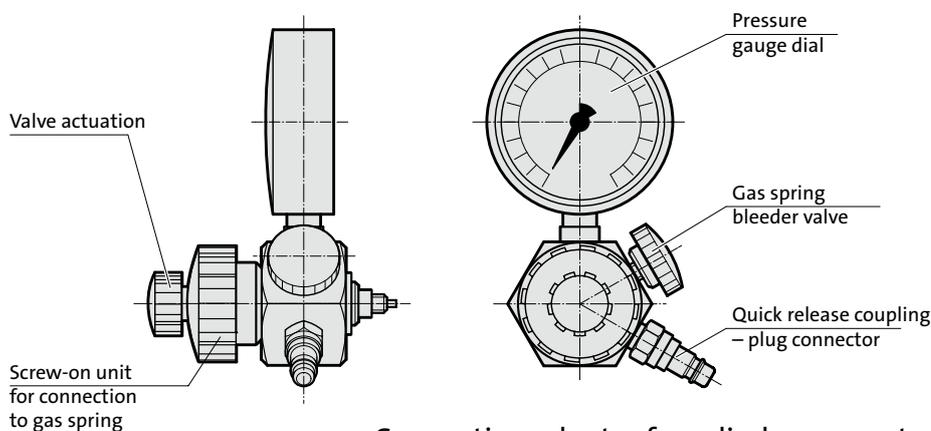
The fitting is equipped with an additional adapter 2480.00.32.11 for connecting to gas springs with G 1/8 valve connection as standard.

#### Note:

2 m long filling hose with quick release coupling, shut-off valve and gas bottle connector, order no. 2480.00.31.02 (order separately).

Other filling hose lengths to order.

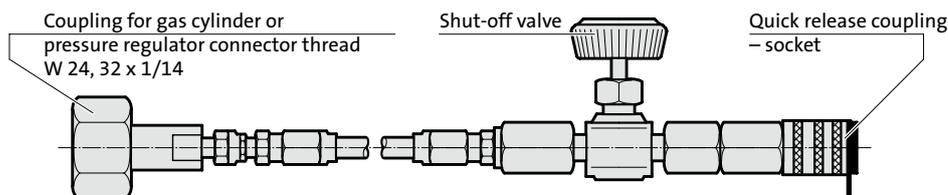
#### 2480.00.32.21 Filling and control fitting



#### Connecting adapter for cylinder connector

Order No.	Country	For cylinder connector
2480.00.31.02.00.10	France	AFNOR C, W21,8x1/14
2480.00.31.02.00.11	China	G 5/8-ISO228
2480.00.31.02.00.12	Great Britain	G 5/8

#### 2480.00.31.02 Filling hose



#### Description:

The pressure regulator 2480.00.32.07. is designed for 200 bar connections and for 300 bar gas cylinders.

The filling and control fitting 2480.00.32.21 is connected to the cylinder pressure regulator for filling gas springs using filling hose 2480.00.31.02 and connector adaptor 2480.00.32.07.04.

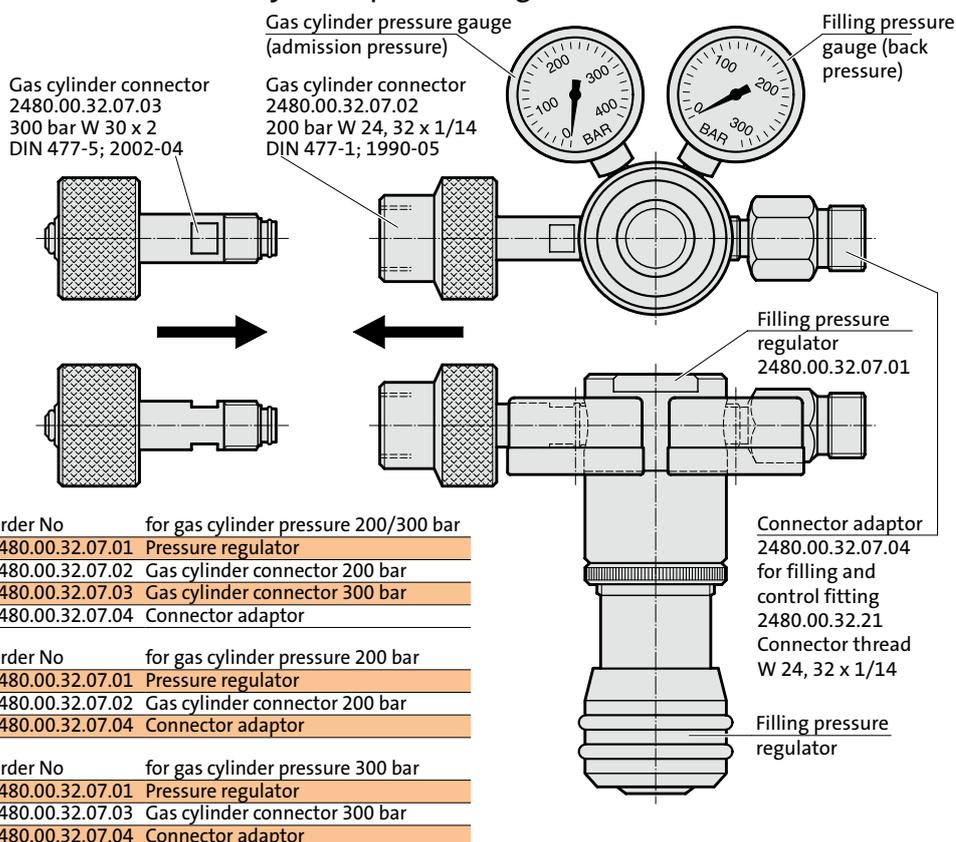
Depending on the type of gas cylinder, the gas cylinder connector used can either be the 2480.00.32.07.02 for 200 bar cylinders or the 2480.00.32.07.03 for 300 bar cylinders.

Max. admission pressure 300 bar  
Back pressure 10-200 bar

#### Other benefits:

- Hasty opening of the gate valve on the filling and control fitting 2480.00.32.21 cannot result in overfilling.
- It is not necessary to have the pressure display of the filling and control fitting 2480.00.32.21 in view.

#### 2480.00.32.07. Gas cylinder pressure regulator



Order No	for gas cylinder pressure 200/300 bar
2480.00.32.07.01	Pressure regulator
2480.00.32.07.02	Gas cylinder connector 200 bar
2480.00.32.07.03	Gas cylinder connector 300 bar
2480.00.32.07.04	Connector adaptor

Order No	for gas cylinder pressure 200 bar
2480.00.32.07.01	Pressure regulator
2480.00.32.07.02	Gas cylinder connector 200 bar
2480.00.32.07.04	Connector adaptor

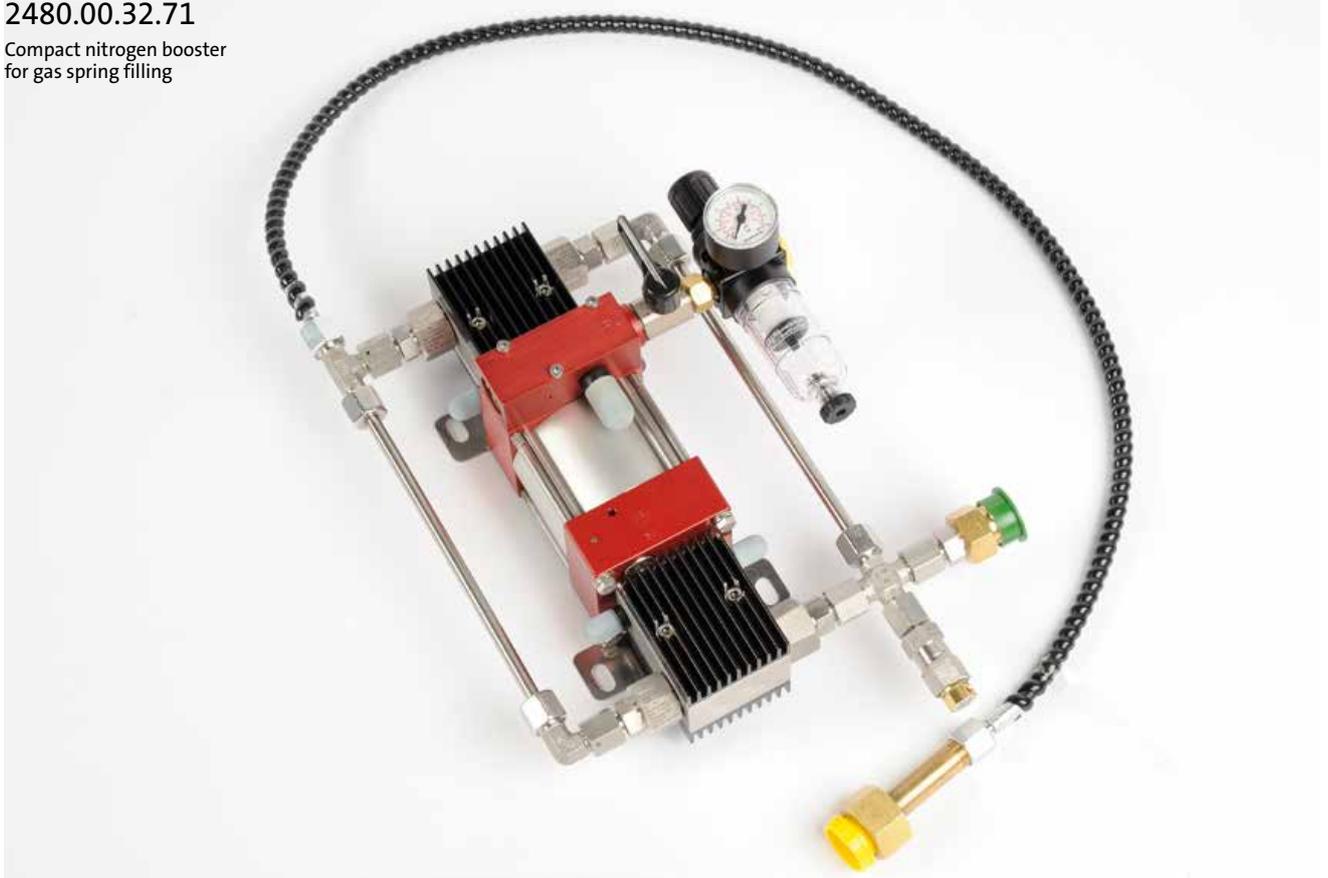
Order No	for gas cylinder pressure 300 bar
2480.00.32.07.01	Pressure regulator
2480.00.32.07.03	Gas cylinder connector 300 bar
2480.00.32.07.04	Connector adaptor



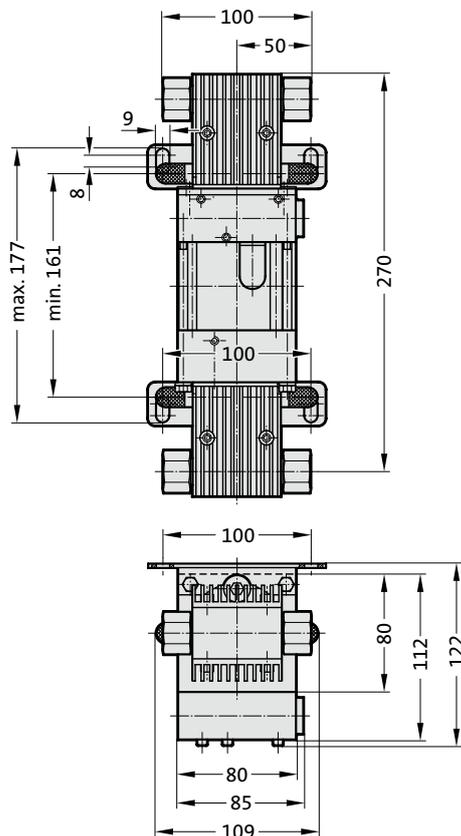
## Compact nitrogen booster for gas spring filling

2480.00.32.71

Compact nitrogen booster  
for gas spring filling



2480.00.32.71



### Description:

The FIBRO compact nitrogen booster 2480.00.32.71 was developed to compress nitrogen gas. It increases the output pressure of the nitrogen cylinders considerably.

For example, when filling gas springs, the N<sub>2</sub> cylinders can be used up to a residual pressure of 30 bar.

### Advantages:

- ▶ Increase in utilisation capacity
- ▶ Reduction in cylinder replacement time
- ▶ Minimisation of the number of cylinders
- ▶ Light weight (7.2 kg)
- ▶ Compact design
- ▶ Suitable for simple installation directly on all standard nitrogen cylinders (200 bar)

### Function:

The FIBRO compact nitrogen booster works according to the principle of a pressure relay valve. Low pressure is applied to a large surface, which in turns applies high pressure to a small surface. Continuous delivery is achieved by means of an internally actuated 4/2-way valve.

Compressed air is used as the drive mechanism.

A holding plate is included to secure the compact nitrogen booster to the nitrogen cylinder. The compact nitrogen booster is simply hung over the nitrogen cylinder connection.



# Compact nitrogen booster for gas spring filling Holding plate

## Connection diagram

Compact nitrogen booster



## 2480.00.32.71.02 Holding plate

for re-order



- ① 2480.00.32.71 Compact nitrogen booster
- ② Gas cylinder connection W24, 32 x 1/14 for 200 bar nitrogen cylinder
- ③ Nitrogen N<sub>2</sub> inlet
- ④ Compressed air inlet G1/4 max. 10 bar
- ⑤ Overpressure protection 400 bar
- ③ Nitrogen N<sub>2</sub> outlet
- ⑦ Connecting thread W24, 32 x 1/14

2480.00.32.71.02



### Technical data:

Drive compressed air: 1-10 bar

Calculated operating pressure at 10 bar air drive pressure:  
300 bar

Transmission ratio: 1:32

Displaced volume/double stroke: 11.6 cm<sup>3</sup>

### Connections:

Compressed air: G 1/4" thread

Nitrogen inlet:

Hose DN4, 1 m long with N<sub>2</sub> cylinder connection 200 bar

Nitrogen outlet:

N<sub>2</sub> cylinder connection 200 bar W24, 32 x 1/14

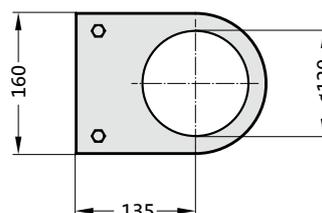
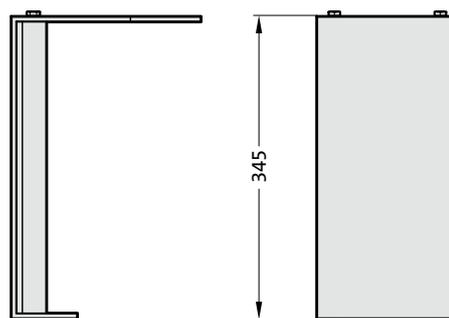
Max. operating temperature: 60°C

Weight: approx. 7.2 kg

Inlet pressure: 30-300 bar

Average supply rate\*: 280 NL/min

\* The delivery rate is dependent on the air drive and inlet pressure.



## Dynamometer for gas springs

2480.00.35.021

Analogue display



2480.00.35.032

Digital display



### Description:

The dynamometer with mechanical measuring device can be used to test the spring force of gas springs up to 8000 daN. The dynamometer with digital measuring device can be used to test the spring force of gas springs up to 10 000 daN.

The dynamometer 2480.00.35.021 with analogue display is supplied with three interchangeable pressure measuring nozzles different ranges of values:

	up to 300 daN
from 300	to 1750 daN
from 1750	to 8000 daN

The dynamometer 2480.00.35.032 with digital display has a pressure measuring nozzle for forces ranging from 0 to 10 000 daN.

Maximum spring installation height	analogous	= 700 mm
	digital	= 760 mm

## Dynamometer for gas springs

2480.00.35.04



### Description:

The dynamometer with digital measuring device can be used to test the spring force of gas springs up to 2000 daN.

Max. spring installation height: 488 mm.

Max. spring diameter: 150 mm.

## Toolkit for assembling gas springs



### 2480.00.50.11

Toolkit for all gas springs

The toolkit contains:

Pos.	Order No	Term	
1	2480.00.50.01.001	Assembly sleeve	Mini
2	2480.00.50.01.002	Assembly sleeve	00250
3	2480.00.50.01.003	Assembly sleeve	00500
3-1	2480.00.50.01.031	Assembly sleeve (2487.12.00500.)	X500
4	2480.00.50.01.004	Assembly sleeve	00750
5	2480.00.50.01.005	Assembly sleeve	01500
5-1	2480.00.50.01.051	Assembly sleeve (2487.12.01500.)	X1500
6	2480.00.50.01.006	Assembly sleeve	03000
7	2480.00.50.01.007	Assembly sleeve	05000
8	2480.00.50.01.008	Assembly sleeve	07500
9	2480.00.50.01.009	Assembly sleeve	10000
10-1	2480.00.50.01.101	Circlip tool	
13	2480.00.50.01.013	T-lever	M8
14-1	2480.00.50.01.141	T-lever	M16
15	2480.00.50.01.015	T-lever	G 1/8"
16-2	2480.00.50.01.162	T-lever, extension	M6
replaces 16-1			
17	2480.00.50.01.017	Valve pliers	
18	2480.00.50.01.018	Valve tool	M6
19	2480.00.50.01.019	Valve tool	G 1/8"
29	2480.00.50.01.029	Special valve spanner	
30	2480.00.50.01.030	Valve tool	VG 5
33	2480.00.50.01.033	Valve tool (2480.00.41.1)	M6
34	2480.00.50.01.034	Handle for disassembling	M3
39-1	2480.00.50.01.391	Tool case	

### Description:

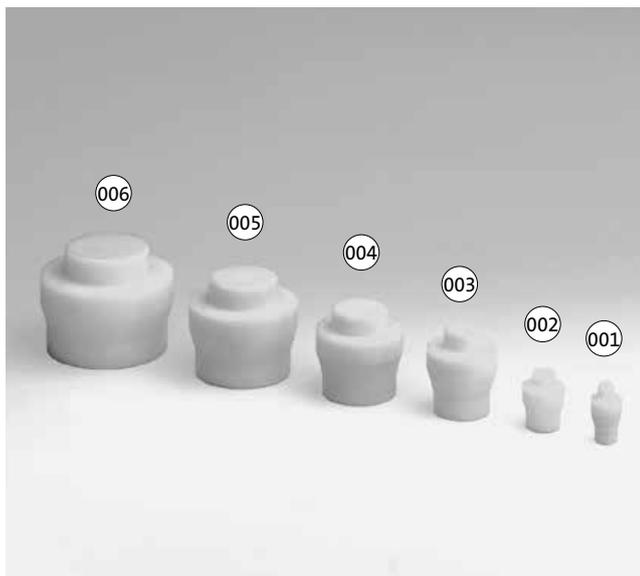
Toolkit for assembling and disassembling gas springs.

### Note:

Read instructions for use before working on it. Every tool can be ordered separately.



# Assembling cone



## 2480.00.50.04.

Assembling cone for gas springs with through bore passage 2496.12.

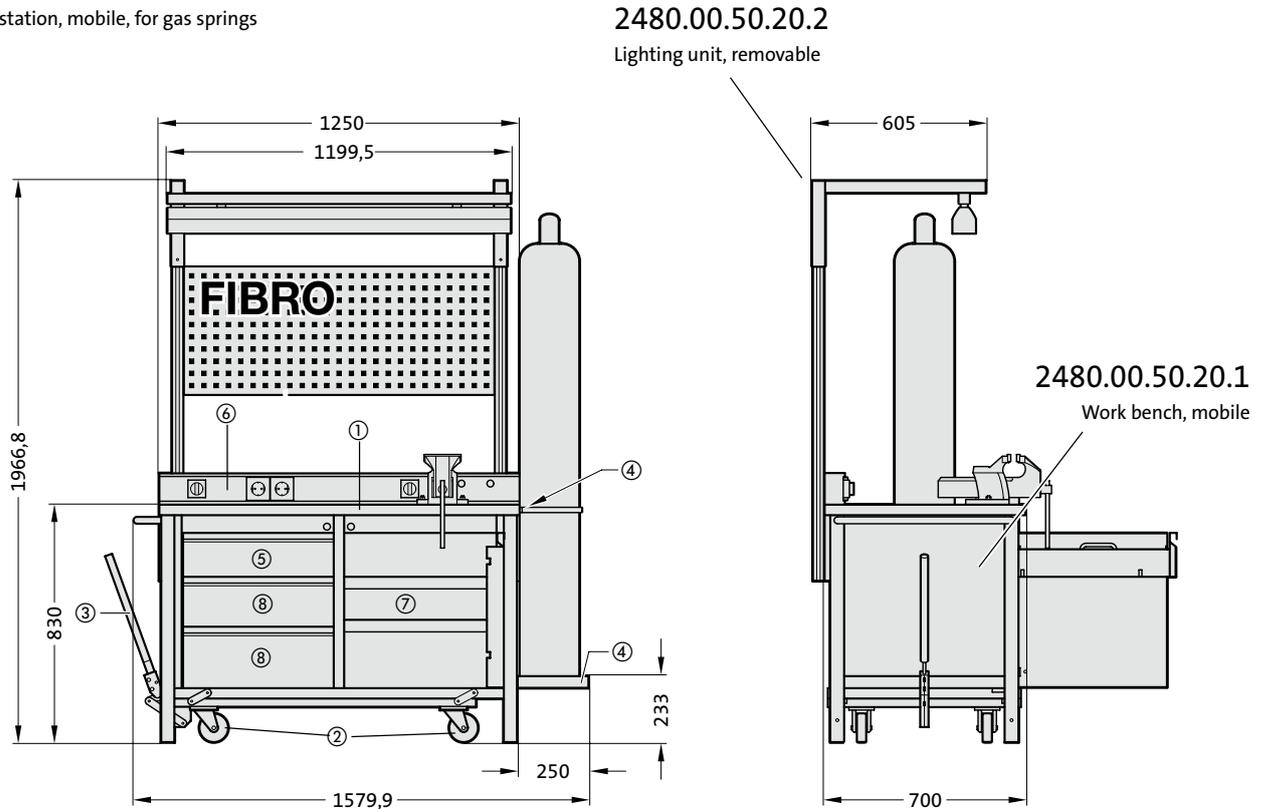
Pos.	Order No	Term
001	2480.00.50.04.001	Assembling cone 00270
002	2480.00.50.04.002	Assembling cone 00490
003	2480.00.50.04.003	Assembling cone 01060
004	2480.00.50.04.004	Assembling cone 01750
005	2480.00.50.04.005	Assembling cone 03300
006	2480.00.50.04.006	Assembling cone 04250



## Service station, mobile, for gas springs

2480.00.50.20.

Service station, mobile, for gas springs



### Description:

The mobile service station for gas springs is an optimised solution for the filling/maintenance of gas springs directly on the press or tool. The service station consists of a mobile work bench 2480.00.50.20.1 and a removable light unit 2480.00.50.20.2.

### Advantages:

- "All in One" solution
- High mobility coupled with secure stability
- Clean handling of the gas spring components
- High user comfort

The mobile work bench 2480.00.50.20.1 is equipped with a 40 mm thick Trovidur work surface ①. The surface is hard-wearing and very easy to keep clean.

The height adjustable chassis with 4 castors ② allows for high mobility and provides secure stability for the service station. The chassis is easily moved up and down by way of an excenter lever ③ located on the left of the unit.

At the right of the unit, a loading receptacle with a locking clip ④ is located for 200 bar bottles.

A removable oil sump with a grate in the upper drawer ⑤ will ensure clean handling of the internal gas spring components.

The energy panel ⑥ offers great user comfort because of its integrated operating elements, like the compressed air connection, light switch and 3 x 230 V electric outlet.

The removable lighting unit 2480.00.50.20.2 is height adjustable to cater to the individual requirements of the user.

### Technical data:

2480.00.50.20.1 Work bench, mobile:

Work surface, Trovidur (mm) 1250 x 700 x 40  
Work bench chassis made from profile steel tubing (mm) 45 x 45 x 2  
Parallel vices, jaw width = 100 mm

2480.00.50.20.2 Lighting unit, removable:

Elongated light (w = 1200 mm) with connection cable and plug  
2 x 45 W, strip louvre with reflector  
Electronic ballast  
Protection type IP20

### Connections

Input:

Central supply line on the right side of the cabinet (bottom rear) with electric supply line (protected energy supply plug)

1/4" internal thread for air infeed

Energy panel:

1 x 1/4" internal thread for air connection

1 x On/OFF switch for air supply, rotary switch for Nitrogen Compact Booster

3 x 230 V socket (with hinged lid)

1 x ON/OFF switch for power supply, rotary switch

### Accessory:

For optimised utilisation of the nitrogen bottle fill amount, a Compact Booster 2480.00.32.71 and a hose line DN4, 3 m 2480.00.32.71.05.03 can be integrated in specifically provided receiving braces in the cabinet ⑦. The two free drawers ⑧ offer additional space for specialist tool sets 2480.00.50.11 for the repair of gas springs.

## Hose press, pneumatic Hose shears

### 2480.00.54.10

Hose press, pneumatic  
for hose sizes DN2 and DN5

#### Description:

The FIBRO hose press, pneumatical 2480.00.54.10 is suited for pressing the following hose connection systems:

2480.00.23.	Minimess-system
2480.00.25.	24°-conus-system
2480.00.27.01.	Connector system, 24° conus micro

The pneumatic-hydraulic hose press drive enables simple and fast hose harnessing.

After connecting compressed air (max. 7 bar) on the G1/4" threaded fitting, the hose press is operated manually with the air-hydraulic pump (0.1 - 0.5 l/min. at 7 bar air pressure).

#### Technical data:

Crimp force	750 / 75 kN/t
max. Crimp range	52 mm
Opening	+10 mm
Opening without press clamps	52 mm
Press clamps (included in the delivery scope)	2480.00.54.10.02 (DN2) 2480.00.54.10.05 (DN5)
Drive	Pneumatic
Oil	1,4 liters
Length x width x height	230 x 180 x 160
Weight	16 kg

#### Lubricant-free

- Sheetmetal glide pads on the press tool:
- improved performance due to reduced friction
- no press tool wear and no contamination from lubricants, 20% reduction in friction loss



### 2480.00.54.03

Hose shears

The following press fixtures and hoses can be ordered:

#### for the Minimess-system

2480.00.23.00.	Hose 630 bar dimpled, DN2 *
2480.00.23.01.V	Threaded connection, straight, packed, DN2 - 1215
2480.00.23.02.V	Threaded connection, 90°, packed, DN2 - 1215

#### for the 24°-conus-system

2489.00.02.	High-pressure hose, dimpled, DN5 *
2480.00.25.01	Hose fitting, straight
2480.00.25.02	Hose fitting, 90°
2480.00.25.04	Hose fitting, 45°

#### for the connector system, 24° conus micro

2480.00.23.00.	Hose 630 bar dimpled, DN2 *
2480.00.27.01.V	Threaded connection, straight, packed

\* Hose lengths in 1 m steps, ordered,  
e.g. Ordering example hose DN2, 10 m lengths  
= 2480.00.23.00.0010

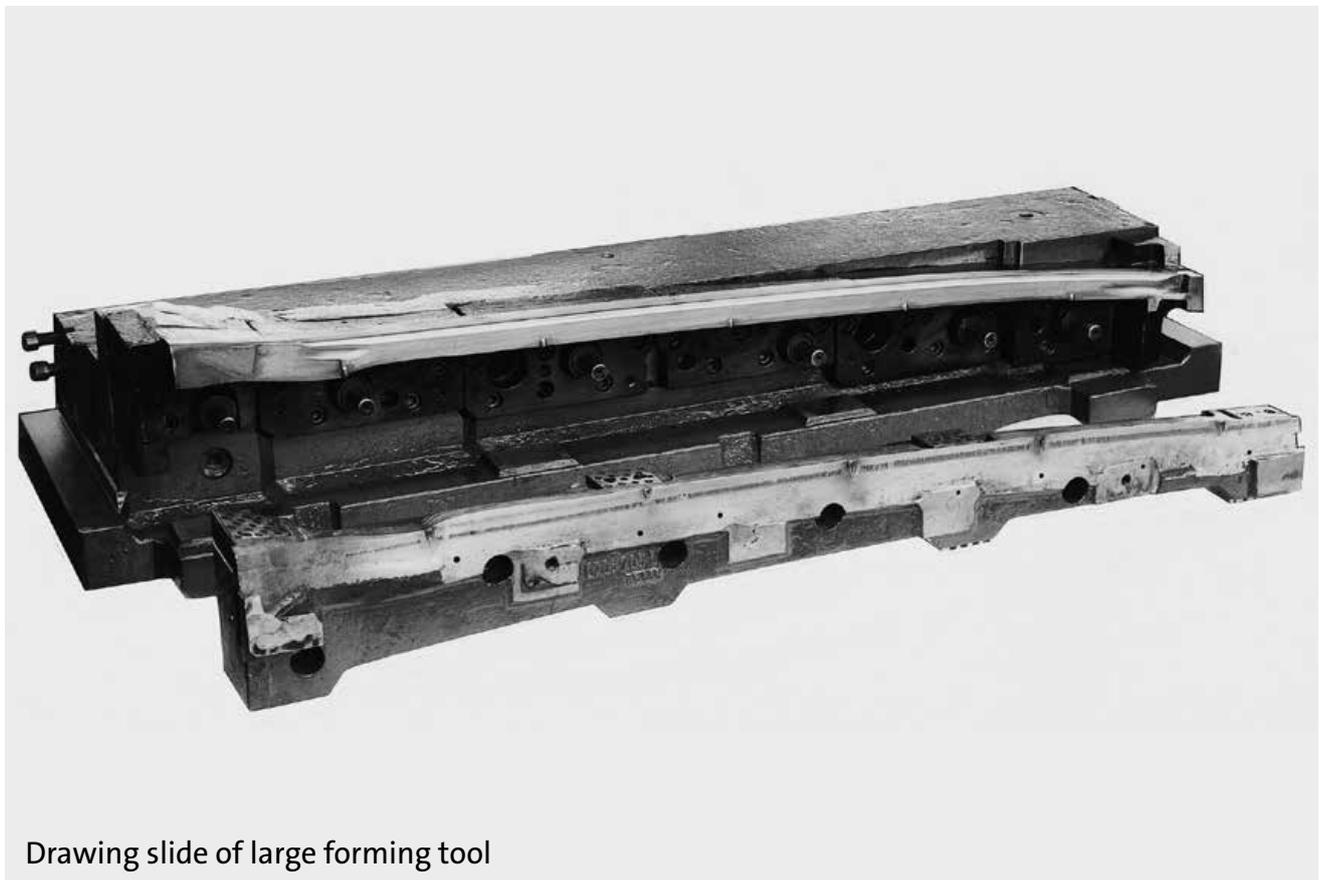




Application examples



Trimming tool with inclined, Cam-Operated slide

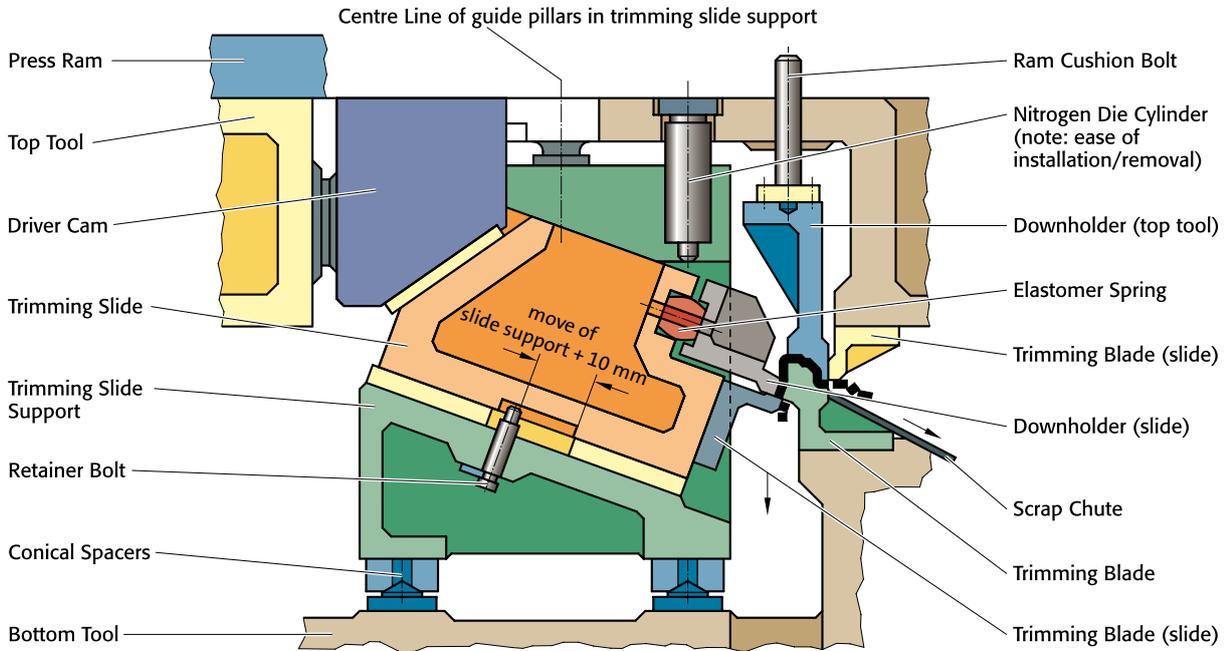


Drawing slide of large forming tool

# Application examples

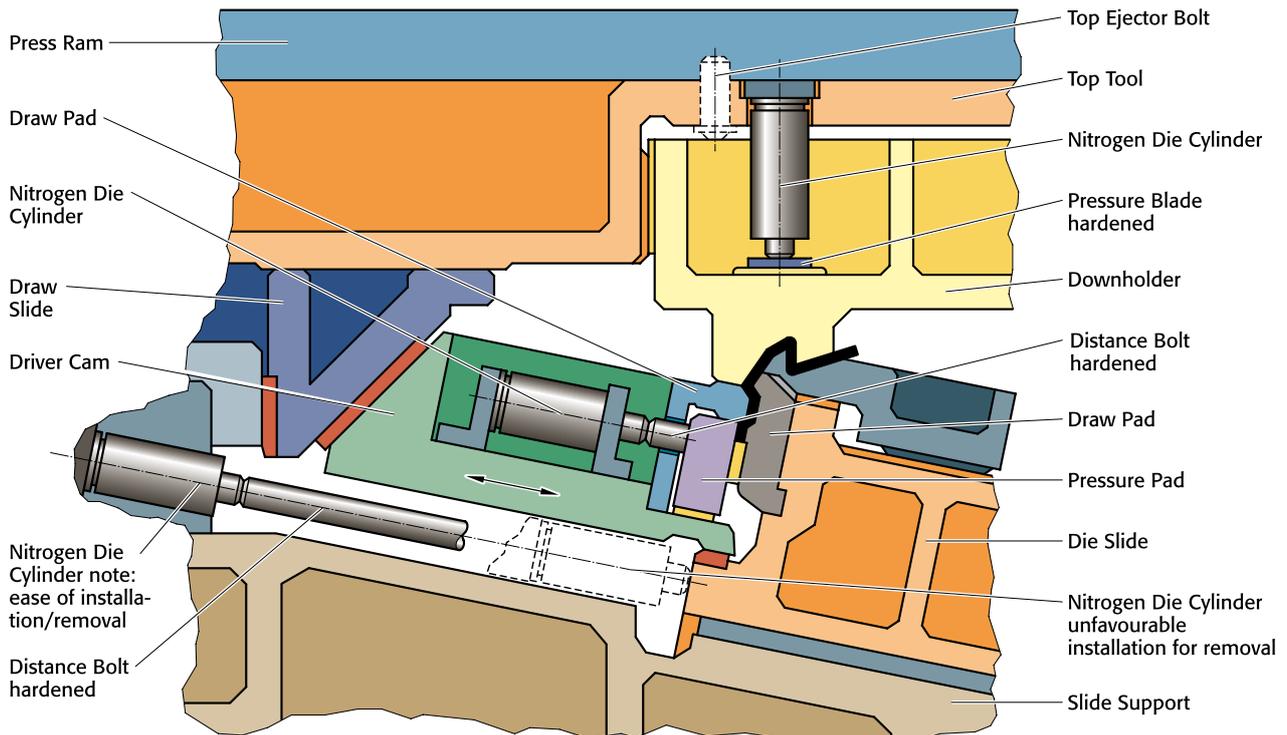
## Trimming tool with inclined cam slide

Nitrogen die cylinders in the top ensure the positive centering of the trimming slide on the centering cones in the bottom tool section.



## Drawing tool

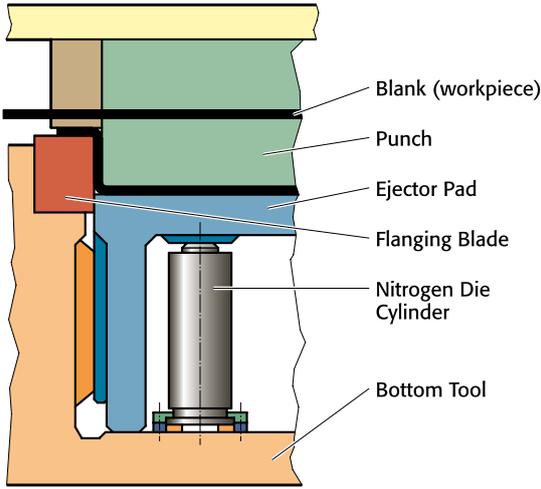
The nitrogen die cylinder for the drawing slide is easily placed into position; the safety lid secures it. Very high forces are required in this tool for the draw pad in the slide. The nitrogen die cylinders in the top tool serve as boosters for the insufficient ram cushion.



## Application examples

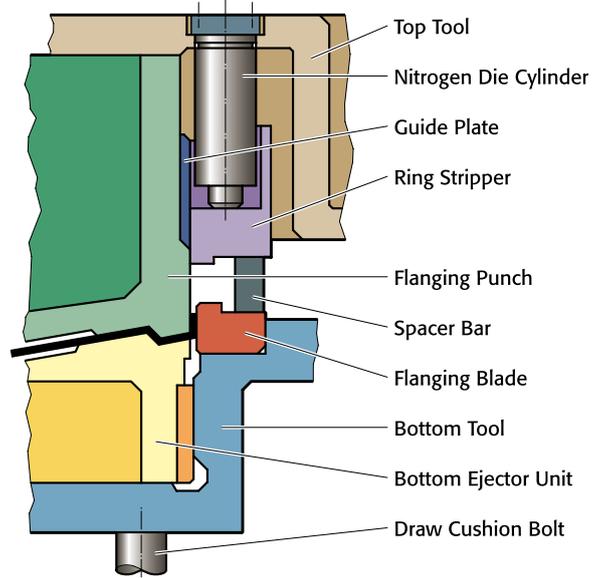
### Flanging tool with nitrogen die cylinders

Where bottom ejection facilities are lacking, FIBRO Nitrogen die cylinders will provide reliable actuation of piece part ejectors.



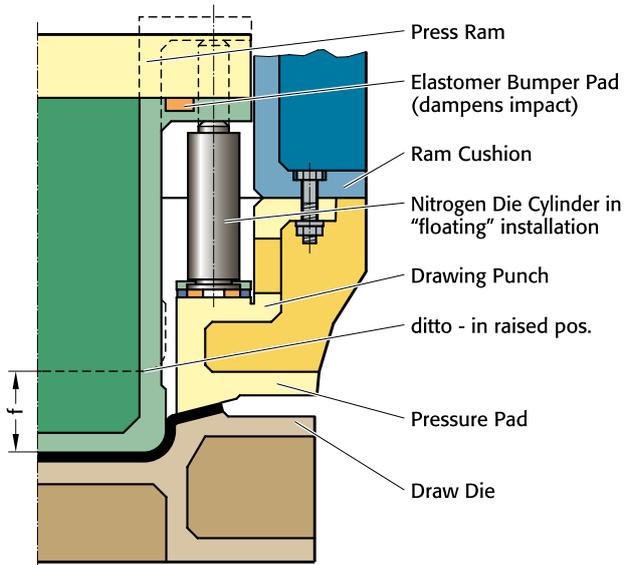
### Flanging tool with ring stripper

The ring stripper is actuated by nitrogen die cylinders.



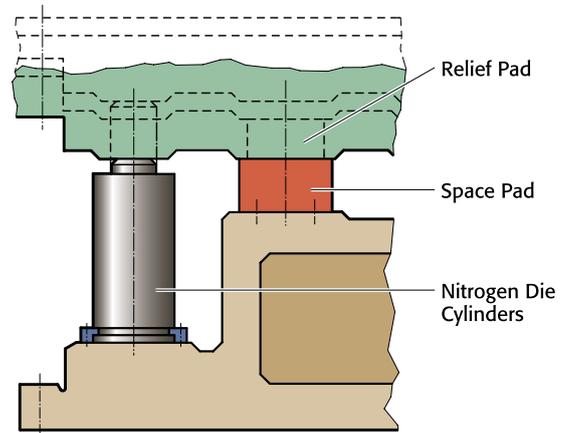
### Double-Acting drawing tool

In order to obtain shorter setting times, only the downholder is bolted to the ram cushion. The drawing punch is raised through  $f + 20$  mm by nitrogen die cylinders.



### Blanking and piercing tool

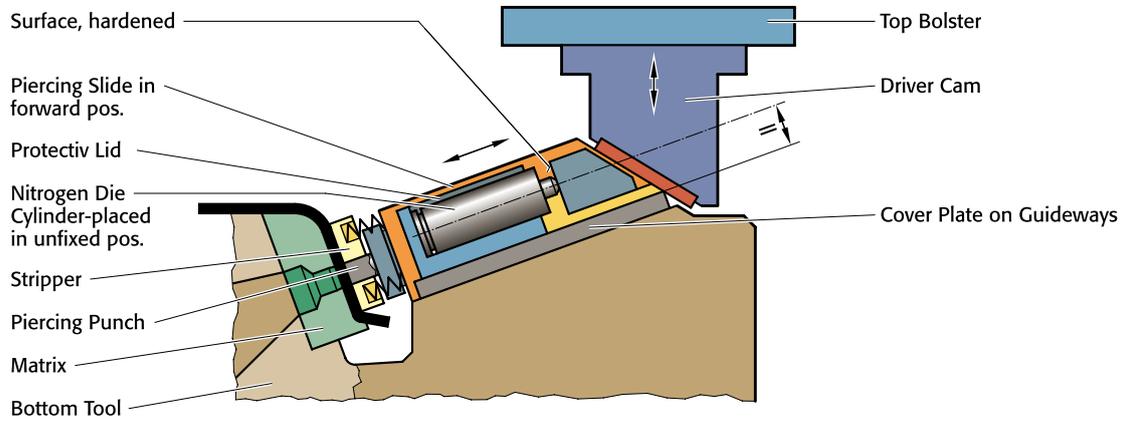
The application of nitrogen die cylinders instead of the usual elastomer bumpers results in a significant reduction of setting time. Moreover, injuries caused by "fly-out" elastomer bumpers are eliminated.



## Application examples

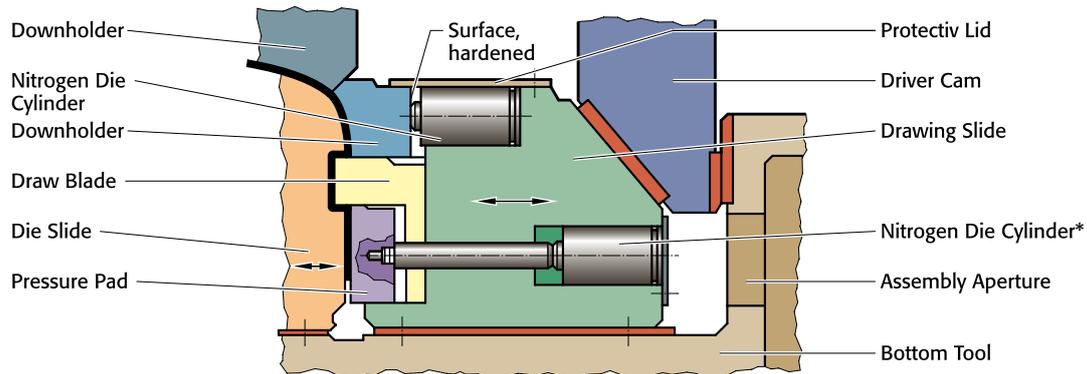
### Retraction of piercing slide by nitrogen die cylinder

Die cylinder is mounted to bottom tool. It retracts the slide after completion of the piercing operation. We recommend a "soft"-start on the cam shape in order to reduce impact and acceleration on the die cylinder.



### Drawing slide

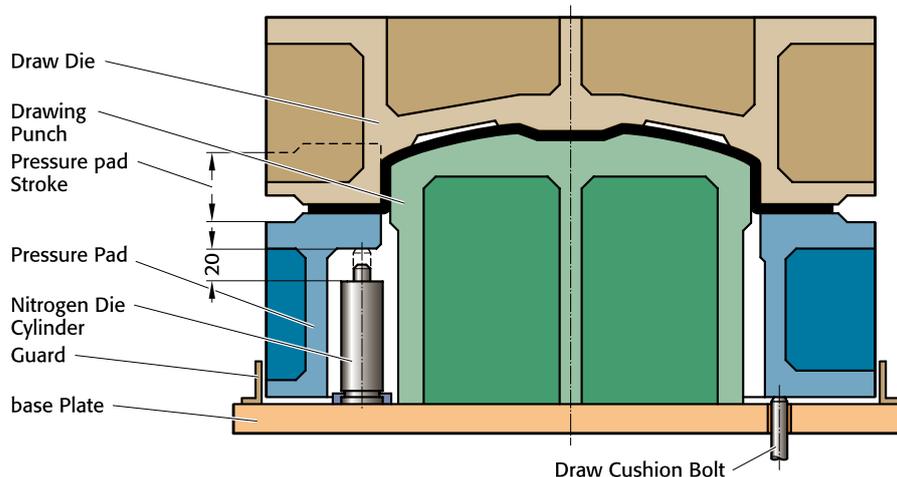
In order to prevent wrinkling, this tool requires high forces on the downholder and pressure pad. An elegant solution was achieved with nitrogen die cylinders. Ease of cylinder installation was ensured.



\*Must be secured with special flange.

### Drawing tool

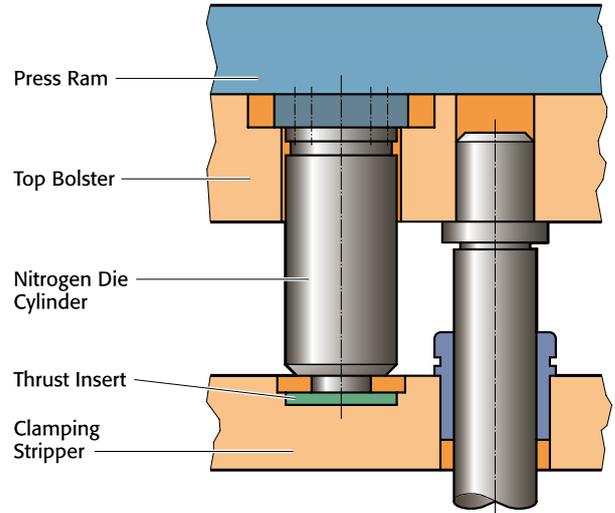
The pressure pad is actuated by nitrogen die cylinders during the final 20 mm of the draw.



## Application examples

### Detail of progression compound tool

The clamping stripper is actuated by two nitrogen die cylinders 2480.12.01500.025. The units provide an initial cylinder force of 15 kN each and a stroke capacity of 25 mm – of which 20 mm are utilized.

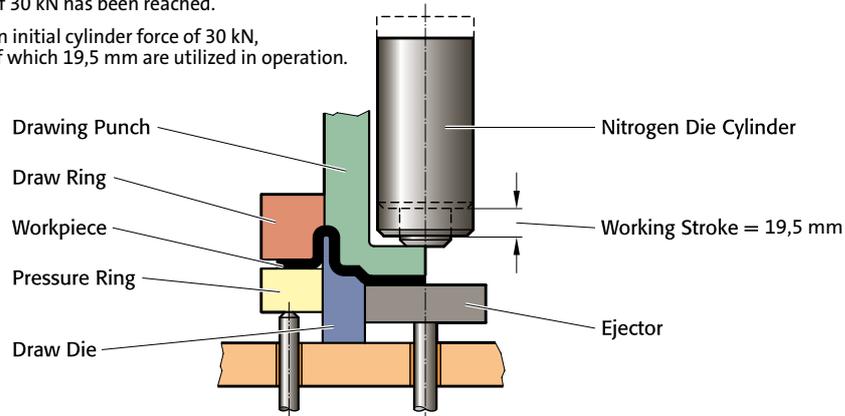


### Drawing tool

Intended for use in a 100 ton hydraulic press, with one nitrogen die cylinder 2480.12.03000.025 mounted in the drawing punch.

In this application the die cylinder serves to accomplish the initial pre-draw of the internal shape, as well as to finish the draw over the draw ring – after the bottoming pressure of 30 kN has been reached.

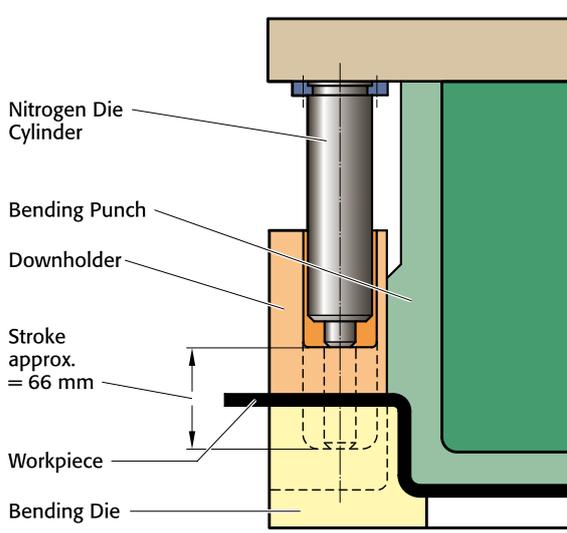
The nitrogen die cylinder has an initial cylinder force of 30 kN, a stroke capacity of 25 mm – of which 19,5 mm are utilized in operation. Stroking speed is 4 SPM.



### Bending tool for round bars

This tool employs two nitrogen die cylinders 2480.13.00750.080 for actuating the downholder. Press stroke is 92 mm. The stroke of the downholder is approx. 66 mm.

Because of manual loading, press strokes vary from 36 to 40 SPM. Part ejection is automatic. The nitrogen die cylinders provide an initial force of 7,5 kN each, and a stroke capacity of 80 mm.

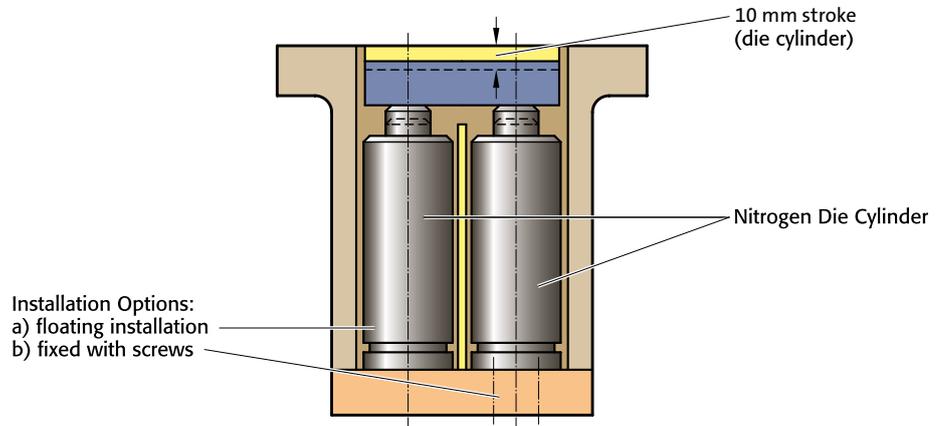


## Application examples

### Bottom ejector in progression compound tool

Two nitrogen die cylinders 2480.13.00750.025 are used, providing an initial force of 7,5 kN each, and a stroke capacity of 25 mm.

The actual working stroke is 10 mm. The tool is run at a speed of 150 SPM, with a ram stroke of 48 mm.

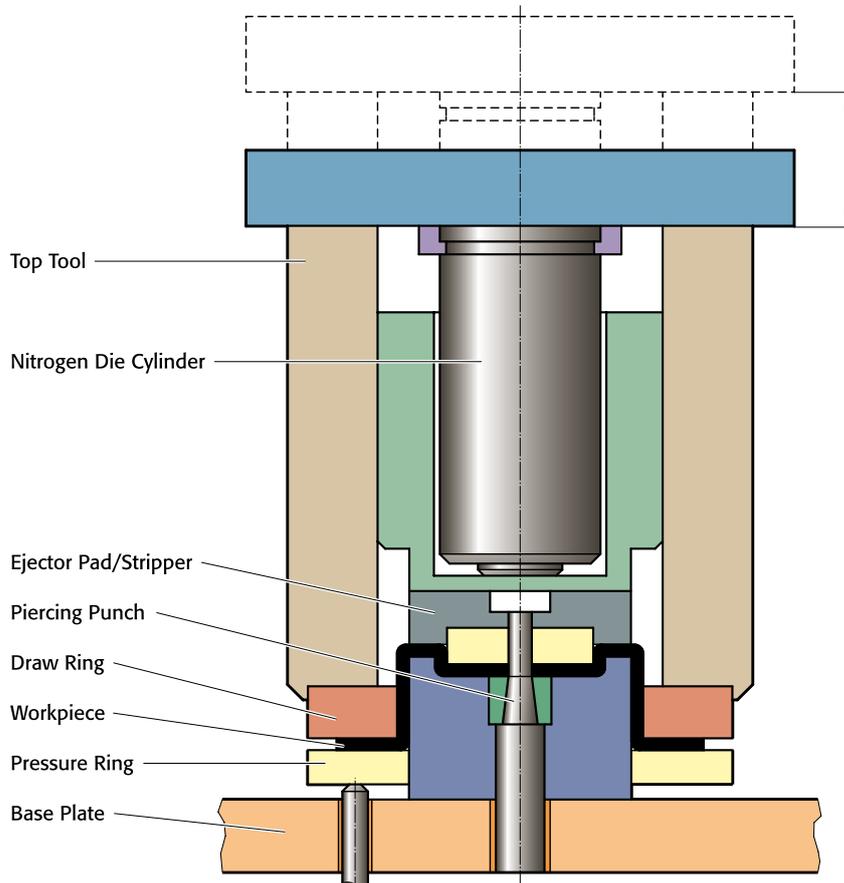


### Drawing- and piercing tool

This tool is used in a 100 ton hydraulic press.

The nitrogen die cylinder is a 2480.13.03000.080, with a charge pressure of 130 bar – giving an initial cylinder force of 26 kN.

Stroke capacity is 80 mm. The actual working stroke is 76 mm. The press is run at 14 SPM.



# Application example of gas springs

## Gas springs facilitate tools storage and tools preparation for production

Gas springs find increasing use in large press tools - in the sole role of aiding their storage and production preparation.

The springs are bolted to either the upper or lower bolsters. They are activated only when the tool is being taken out of the press.

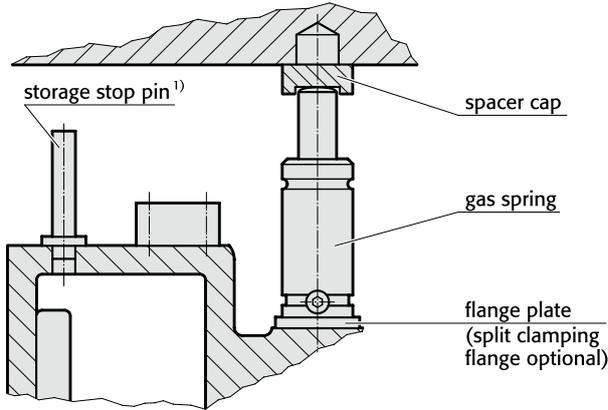
Application examples 1 and 2 show that special spacer caps are inserted prior to the tool being let down onto the gas springs – this being done whilst still in the press. During removal from the press and subsequent storage, the springs will keep the top tool elevated.

Storage stop pins are provided next to the springs; when tools are stacked one on top of the other, the increasing mass will force the springs to recede – and the tops will eventually abut against the storage pins – Once the stack is removed, the springs take over again and push the top tool up.

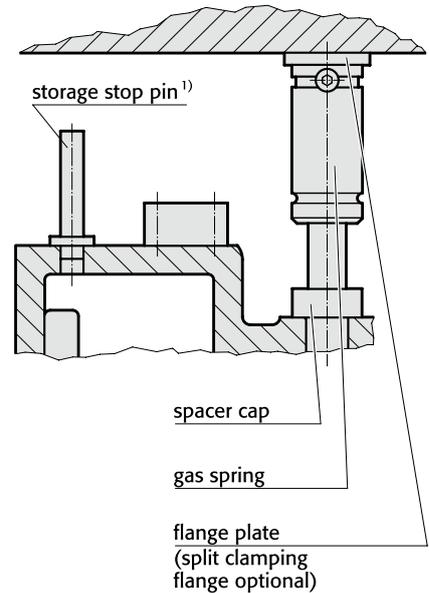
Upon being prepared for production, the springs facilitate access to the tool. Once back in the press, the spacer caps are removed and the storage springs remain inactive during the production run.

It is recommended to affix warning signs to the tools in a prominent position: the presence of gas springs in the tool often cannot be seen from the outside.

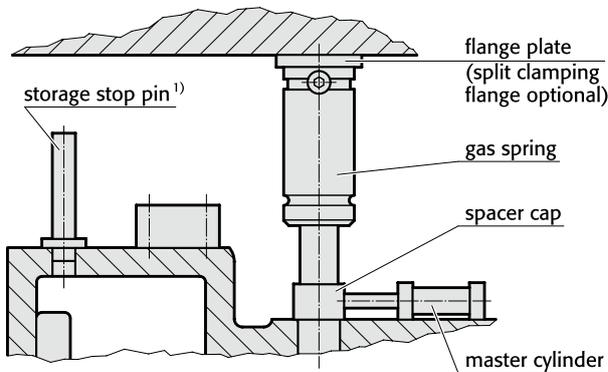
**Example 1: Gas Spring fixed to bottom bolster**



**Example 2: Gas Spring fixed to top tool**



**Example 3: Gas Spring fixed to bottom bolster**



1) storage stop pins are reversible - they are turned round and pushed down into their holes during getting the tool ready for production