

# GAS SPRINGS \*LCF, DAMPED



\* LCF Force Manager is a warning sign of Associated Spring



## **GAS SPRINGS \*LCF, DAMPED**

### **Description:**

The LCF series represents a whole new generation of nitrogen-filled gas springs developed to meet the needs of the machine tool and press-making industries.

Negative factors such as

- high impact stresses
- excessive noise
- extreme bounce off the pad

are all minimised by LCF springs.

Characteristics such as

- dimensions
- fixing methods
- filling with gas and purging
- working in interconnected systems

are identical to those for standard ISO or type 2480.13. gas springs.

The springs from the LCF series reduce impact stresses by 50% compared to conventional gas springs.

The force builds up gradually and acceleration is uniform, reducing wear on both tool and press. As a result, less maintenance is required.

LCF springs are at least 20% quieter than standard gas springs.

The reduced noise level is due to the lower impact force, making these springs a cost-effective alternative to soundproofing panels.

They are thus more economical and environmentally-friendly.

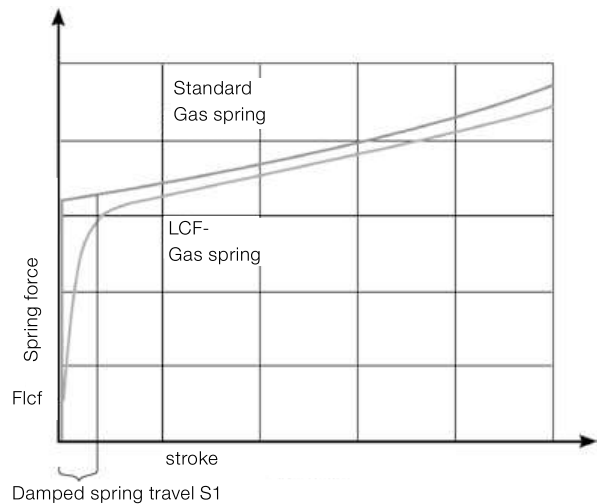
The LCF springs reduce the extreme bounce off the pad during the return stroke, thus lessening vibration on the workpiece and allowing the workpiece to be transported more effectively.

Since the spring travel is damped, the pad motion is more uniform, so in many cases the press stroke rate and thus productivity can be increased.

\* LCF Force Manager is a warning sign of Associated Spring

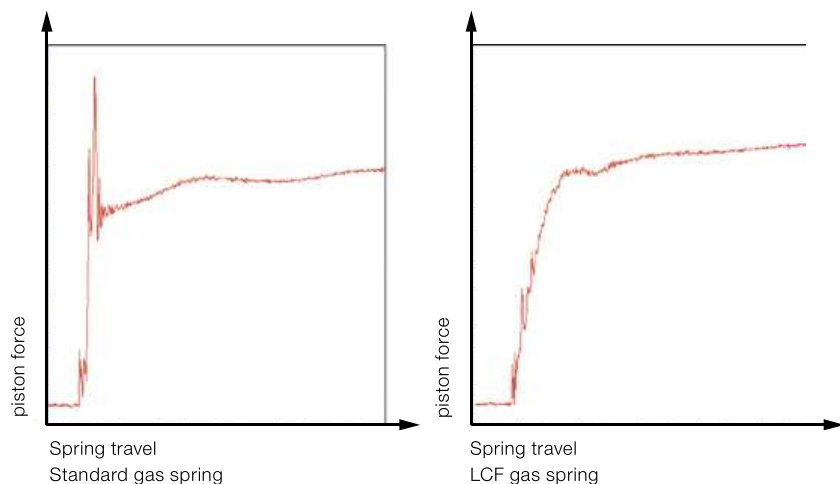
# GAS SPRINGS \*LCF, DAMPED

## 2484.13. Force diagram for gas springs LCF

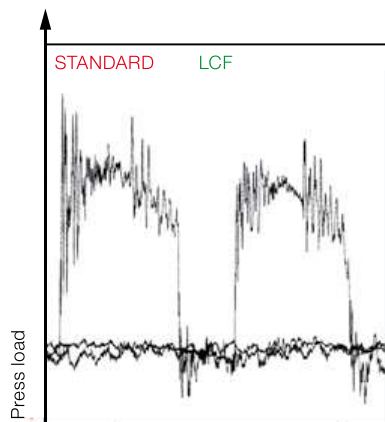


With the springs from the LCF series, the force builds up gradually and acceleration is uniform.

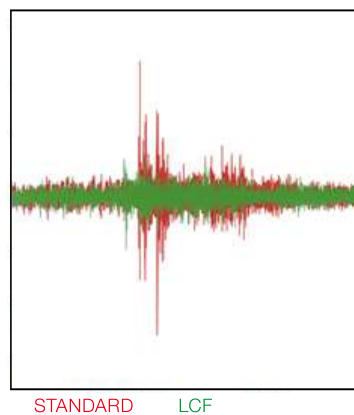
### Measured dynamic piston force, Measured values for the 5000 series



### Comparative press load diagram



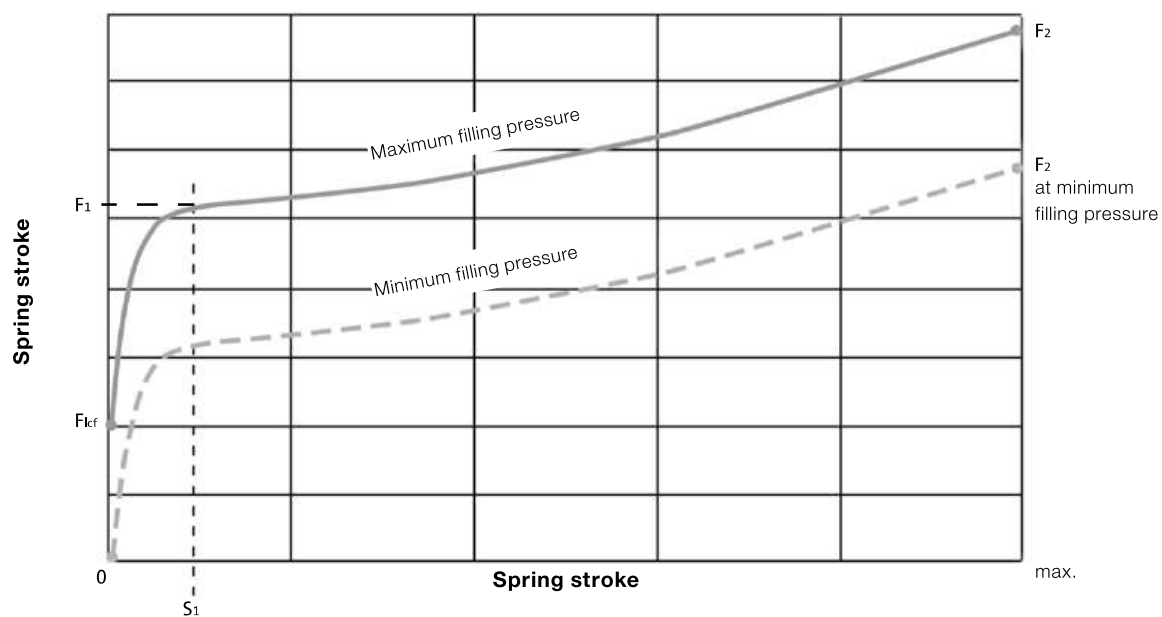
### Noise reduction



The springs from the LCF series are quieter due to the reduced impact force.

## GAS SPRINGS \*LCF, DAMPED

### 2484.13. Force diagram for gas springs LCF



**Note:** Maximum pressure for LCF gas springs: 150 bar.  
Observe the minimum filling pressure!

#### Guidelines for the use of LCF gas springs

1. After the damped spring travel ( $S_1$ ) the LCF gas spring achieves the same initial spring force ( $F_1$ ) and pressure build up as the standard gas spring (to ISO).
2. The spring force ( $F_{icf}$ ) should exceed the weight (e.g. the pad) by at least 15% so that it is held in the correct position (this does not apply in the case of minimum filling pressure).

Spring size	$F_{icf}$ at 150 bar [daN]	Damped spring travel $S_1$	Minimum filling pressure [bar]
2484.13.00750.	470	3,1	70
2484.12.01500.	700	4,6	105
2484.13.03000.	1600	3,8	69
2484.13.05000.	2500	7,7	76
2484.13.07500.	3000	10,4	90





# LCF GAS SPRING, DAMPED

**Note:**

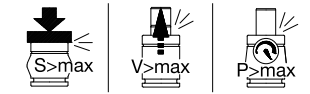
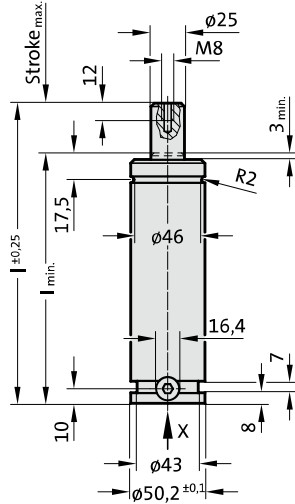
Initial spring force  $F_{ict}$  at 150 bar = 470 daN  
 Full spring force after 3.1 mm damped spring travel

Order No for spare parts kit: 2484.13.00750

Gas spring without valve  
 Order No (example): 2484.13.00750. .P

Pressure medium: Nitrogen  $N_2$   
 Max. filling pressure: 150 bar  
 Min. filling pressure: 70 bar  
 Working temperature: 0°C to +80°C  
 Temperature related force increase:  $\pm 0.3\%/^{\circ}C$   
 Max. recommended extensions per minute: approx. 15 to 40 (at 20°C)  
 Max. piston speed: 1.6 m/s

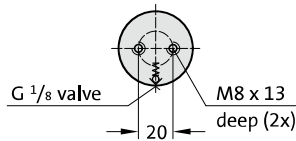
2484.13.00750.



2484.13.00750.

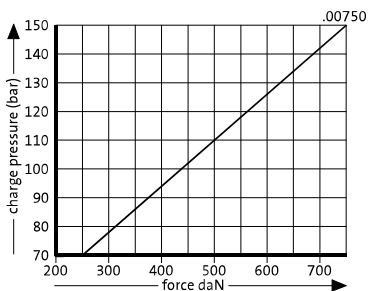
**LCF Gas Spring, damped**

View X - Gas spring

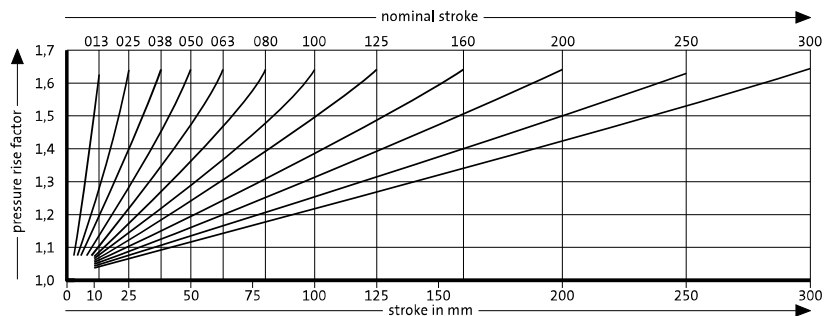


Order No	Stroke <sub>max</sub> (s)	l <sub>min</sub>	l
2484.13.00750.013	12.7	107.7	120.4
2484.13.00750.025	25	120	145
2484.13.00750.038	38.1	133.1	171.2
2484.13.00750.050	50	145	195
2484.13.00750.063	63.5	158.5	222
2484.13.00750.080	80	175	255
2484.13.00750.100	100	195	295
2484.13.00750.125	125	220	345
2484.13.00750.160	160	255	415
2484.13.00750.200	200	295	495
2484.13.00750.250	250	345	595
2484.13.00750.300	300	395	695

Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!

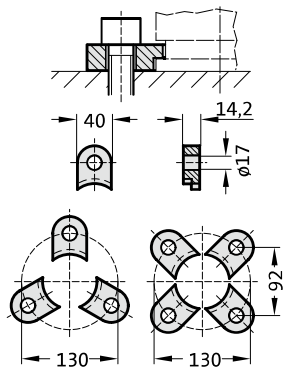




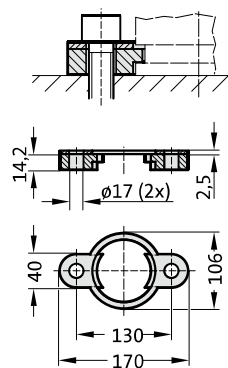


# LCF GAS SPRING, DAMPED MOUNTING VARIATIONS

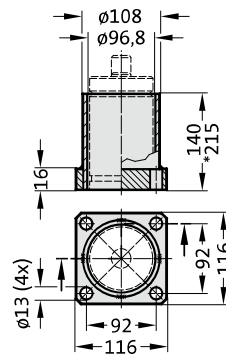
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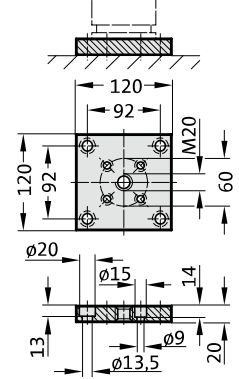
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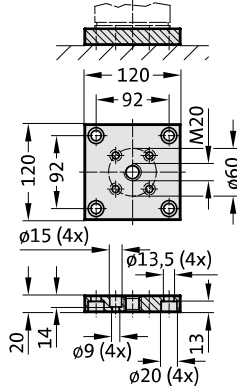
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2480.010.03000.215\*<sup>3)</sup>



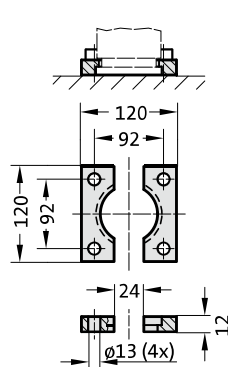
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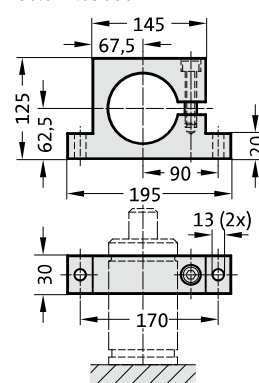
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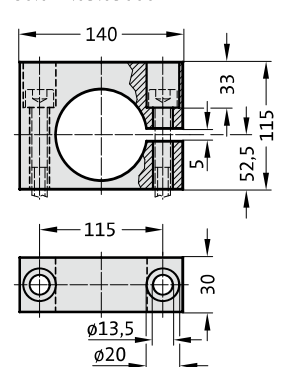
2480.022.03000



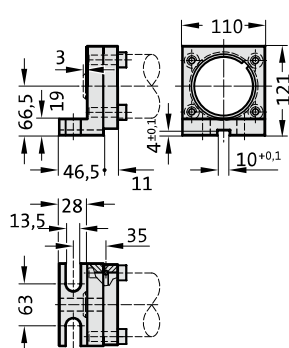
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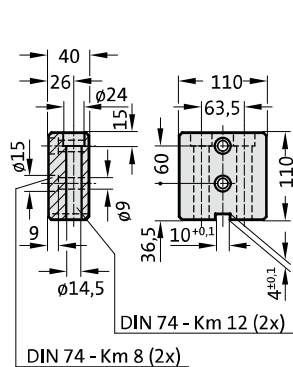
2480.044.03.03000<sup>2)</sup>



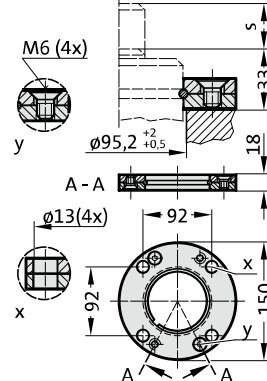
2480.045.03000<sup>2)</sup>



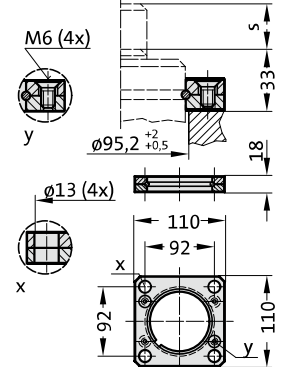
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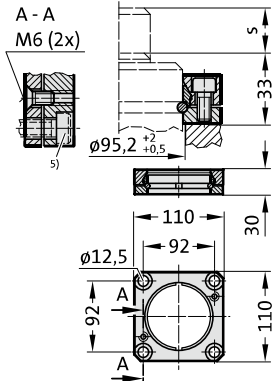
2480.055.03000



2480.057.03000



2480.064.03000<sup>4)</sup>



## Note:

- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop Surface!
- <sup>3)</sup> Not for use with composite connection.
- <sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.
- <sup>5)</sup> Machine screws with hexagonal socket (compact head recommended)

# LCF GAS SPRING, DAMPED

**Note:**

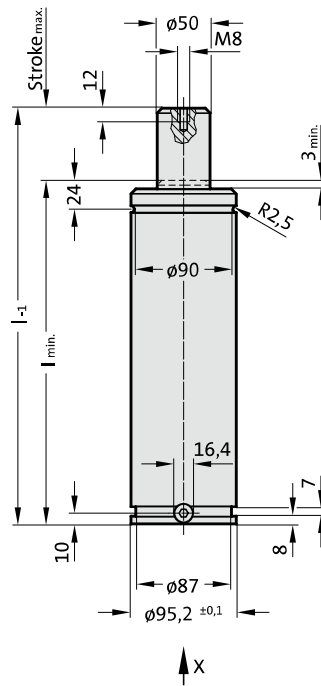
Initial spring force  $F_{ict}$  at 150 bar = 1600 daN  
 Full spring force after 3.8 mm damped spring travel

Order No for spare parts kit: 2484.13.03000

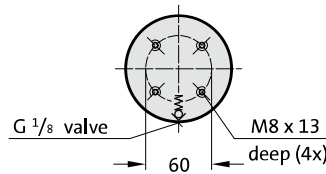
Gas spring without valve  
 Order No (example): 2484.13.03000. .P

Pressure medium: Nitrogen  $N_2$   
 Max. filling pressure: 150 bar  
 Min. filling pressure: 68 bar  
 Working temperature: 0°C to +80°C  
 Temperature related force increase:  $\pm 0.3\%/^{\circ}C$   
 Max. recommended extensions per minute: approx. 15 to 40 (at 20°C)  
 Max. piston speed: 1.6 m/s

2484.13.03000.



View X - Gas spring

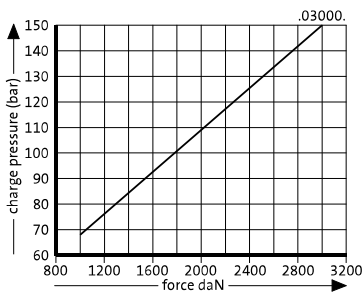


2484.13.03000.

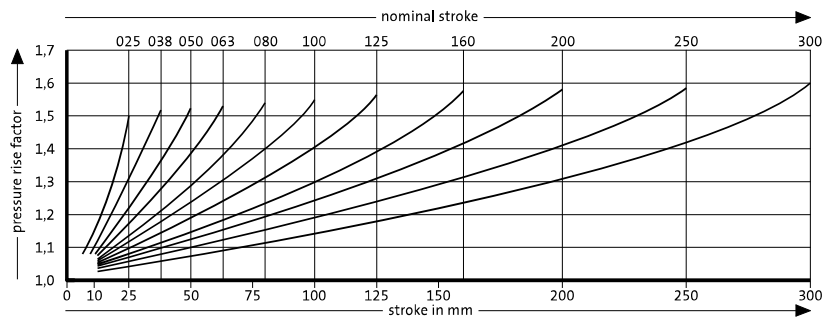
LCF Gas Spring, damped

Order No	Stroke <sub>max</sub> (s)	l <sub>min</sub>	l
2484.13.03000.025	25	145	170
2484.13.03000.038	38.1	158.1	196.2
2484.13.03000.050	50	170	220
2484.13.03000.063	63.5	183.5	247
2484.13.03000.080	80	200	280
2484.13.03000.100	100	220	320
2484.13.03000.125	125	245	370
2484.13.03000.160	160	280	440
2484.13.03000.200	200	320	520
2484.13.03000.250	250	370	620
2484.13.03000.300	300	420	720

Initial spring force versus charge pressure





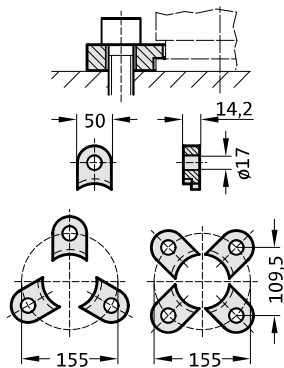
Spring force Diagram displacement versus stroke rise





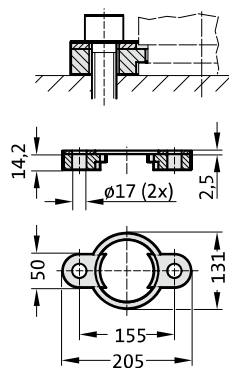
Pressure rise factor accounts for displacement but not external influences!



# LCF GAS SPRING, DAMPED MOUNTING VARIATIONS

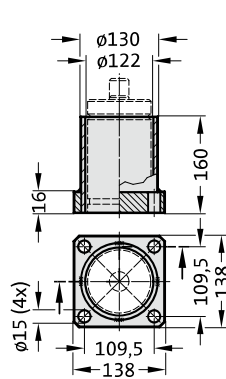
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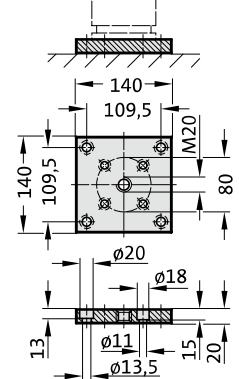
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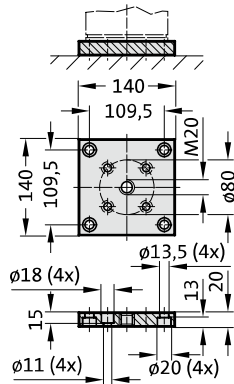
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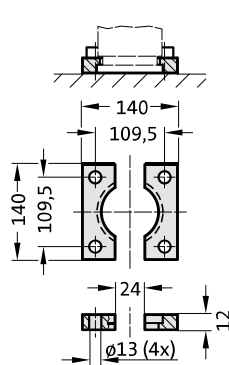
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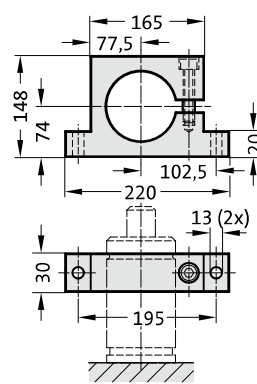
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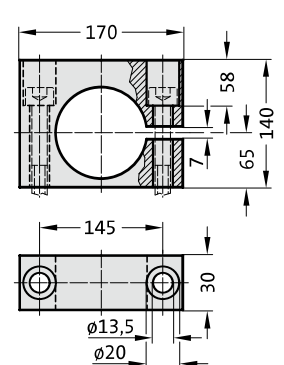
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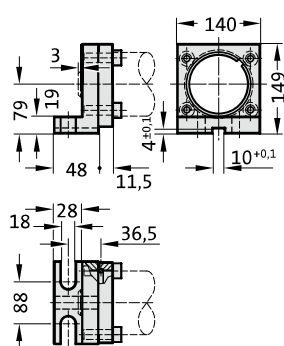
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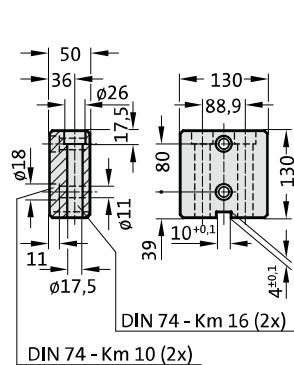
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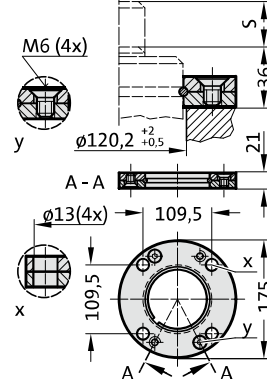
2480.045.05000<sup>2)</sup>  





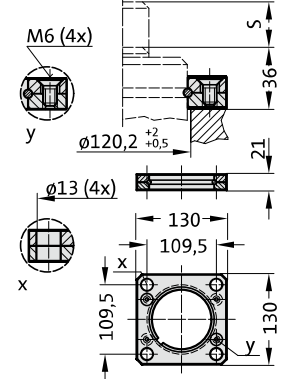
2480.047.05000<sup>2)</sup>  





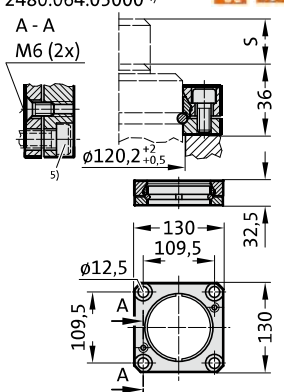
2480.055.05000  



2480.057.05000  



2480.064.05000<sup>4)</sup>  



## Note:

- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop Surface!
- <sup>3)</sup> Not for use with composite connection.
- <sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.
- <sup>5)</sup> Machine screws with hexagonal socket (compact head recommended)

# LCF GAS SPRING, DAMPED

**Note:**

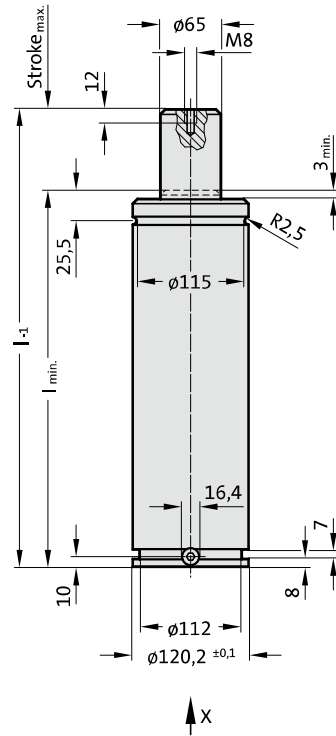
Initial spring force  $F_{ict}$  at 150 bar = 2500 daN  
 Full spring force after 7.7 mm damped spring travel

Order No for spare parts kit: 2484.13.05000

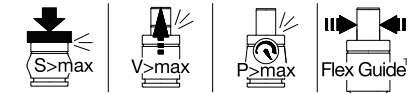
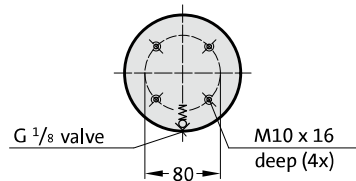
Gas spring without valve  
 Order No (example): 2484.13.05000 .P

Pressure medium: Nitrogen  $N_2$   
 Max. filling pressure: 150 bar  
 Min. filling pressure: 75 bar  
 Working temperature: 0°C to +80°C  
 Temperature related force increase:  $\pm 0.3\%/^{\circ}C$   
 Max. recommended extensions per minute:  
 approx. 15 to 40 (at 20°C)  
 Max. piston speed: 1.6 m/s

2484.13.05000.



View X - Gas spring

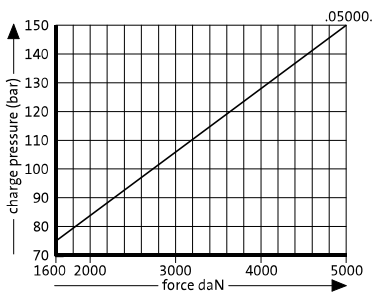


2484.13.05000.

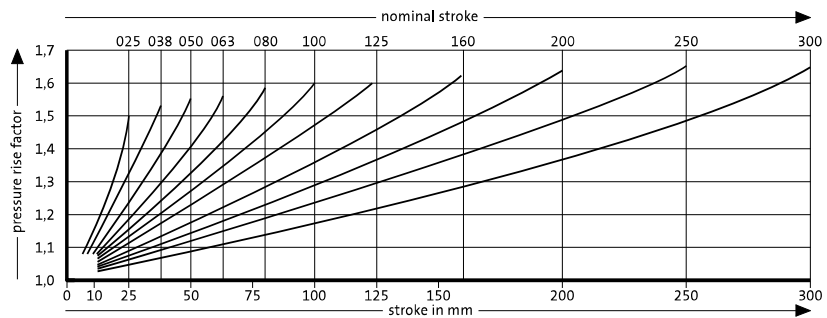
**LCF Gas Spring, damped**

Order No	Stroke <sub>max</sub> (s)	l <sub>min</sub>	l
2484.13.05000.025	25	165	190
2484.13.05000.038	38.1	178.1	216.2
2484.13.05000.050	50	190	240
2484.13.05000.063	63.5	203.5	267
2484.13.05000.080	80	220	300
2484.13.05000.100	100	240	340
2484.13.05000.125	125	265	390
2484.13.05000.160	160	300	460
2484.13.05000.200	200	340	540
2484.13.05000.250	250	390	640
2484.13.05000.300	300	440	740

Initial spring force versus charge pressure




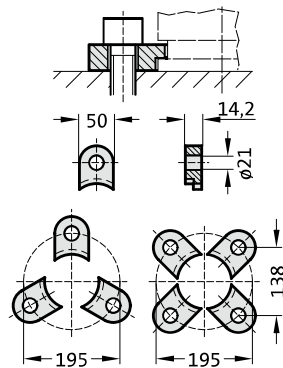
Spring force Diagram displacement versus stroke rise





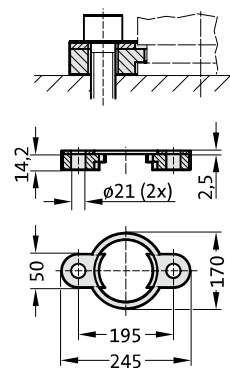
Pressure rise factor accounts for displacement but not external influences!

# LCF GAS SPRING, DAMPED MOUNTING VARIATIONS

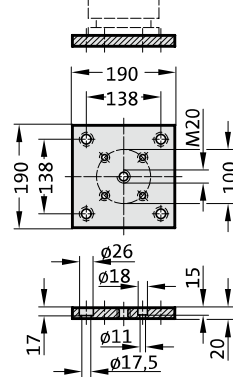
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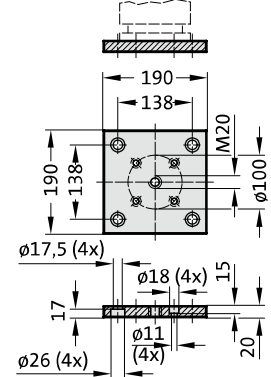
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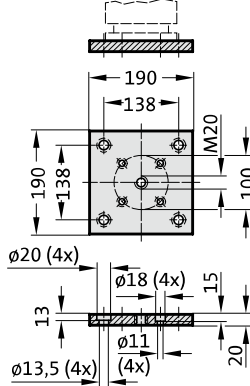
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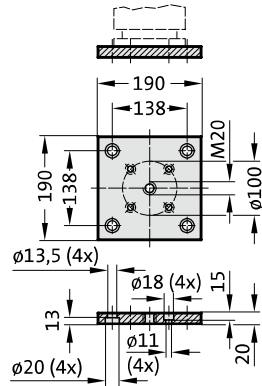
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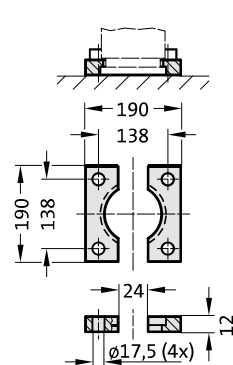
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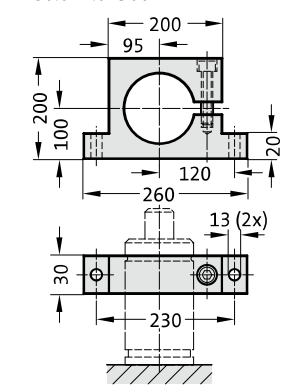
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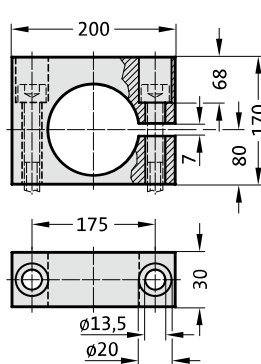
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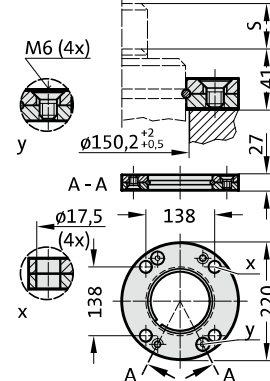
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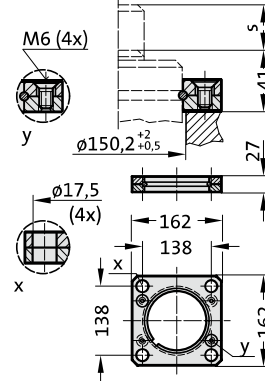
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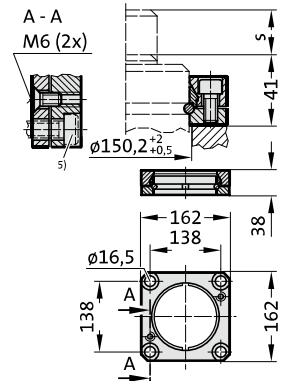
2480.055.07500  



2480.057.07500  



2480.064.07500<sup>4)</sup>  



## Note:

- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop Surface!
- <sup>3)</sup> Not for use with composite connection.
- <sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.
- <sup>5)</sup> Machine screws with hexagonal socket (compact head recommended)