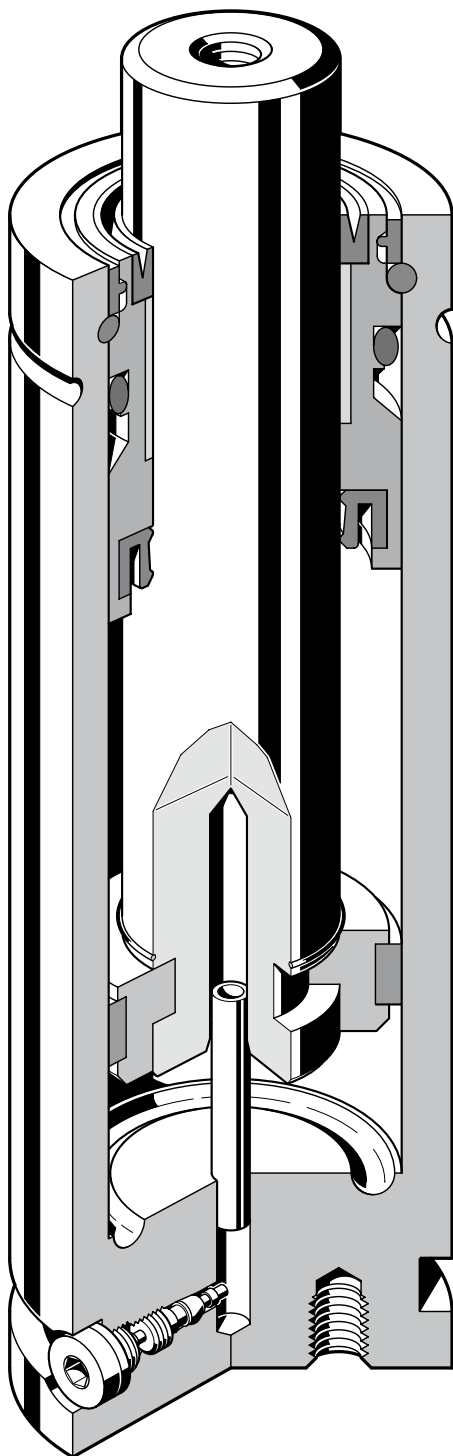


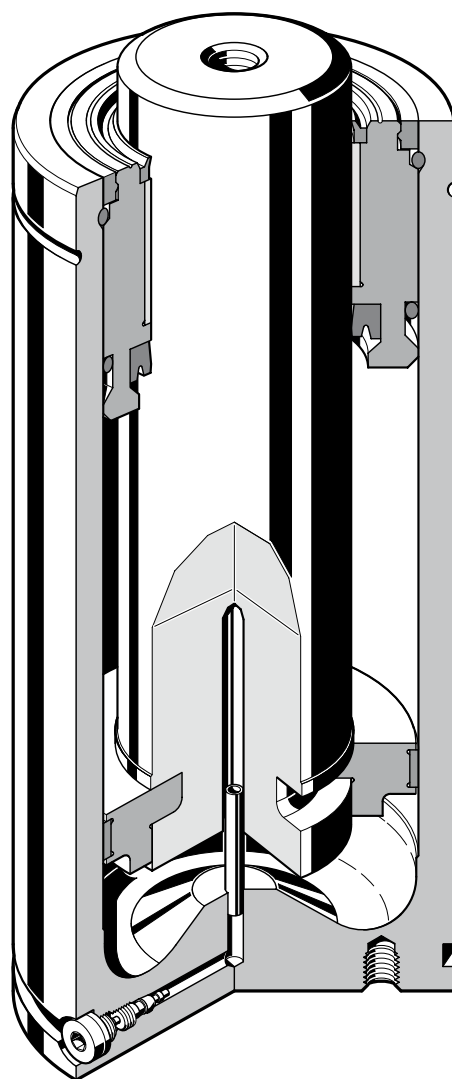


# Nitrogen Gas springs





2480.12.



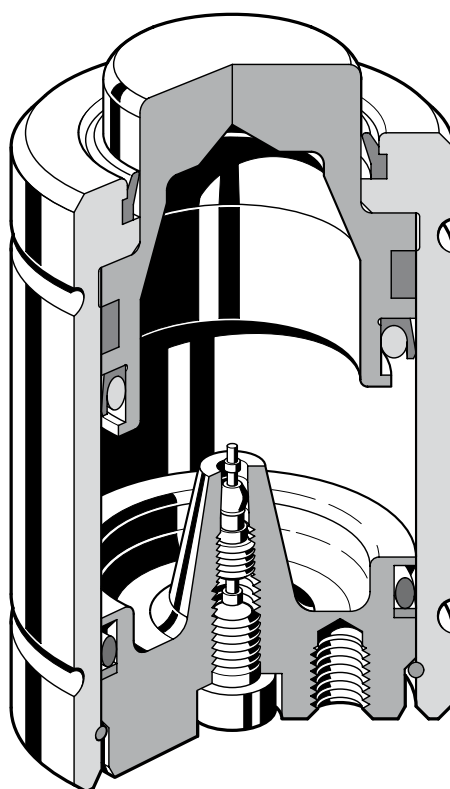
2480.13.

# Compact-Gas spring Single-Chamber system



**FIBRO**

2490.



## Gas springs

### FIBRO Gas springs

The extensive range of FIBRO Gas springs constitutes an ideal supplement to and expansion of the traditional programmes of spring elements such as helical springs, disc springs and elastomer units. With their minimal space requirement, Gas springs close a gap where ever the accent is on accomodation of the utmot force component within a minimum of space – or where exceedingly large travel is demanded: FIBRO Gas springs take care of both demands, even in combination.

Their self-contained nitrogen charge makes FIBRO Gas springs completely autonomous devices. Feeder pipes or storage vessel are not required.

Monitoring of charge pressure, however, is necessary in certain special cases. Suitable equipment for in-situ pressure control can be found in the Accessories Section.

As long as all mounting detail is laid out with due circumspection, removal and installation of the units presents no problems whatsoever.

Instructions are included with every delivery of Gas springs.

Application examples see at the end of chapter F.

### Functioning

The pressure medium is a commercially available, environment-friendly nitrogen. FIBRO Gas springs have a standard charge pressure of max. 150 bar (180 bar). Depending on spring size and type, this pressure offers initial force ratings of 2 daN to 20,000 daN.

### Pressure Build-Up

In operation the piston rod enters the spring space whose volume is progressively reduced. The resulting pressure rise can be plotted on the Gas Spring Diagram as a multiplication factor. The spring force is the product of initial force times that pressure-rise factor and can therefore be calculated easily.

### Working temperature

The spring temperature should not exceed +80°C.

### Charge pressure

Modification of charge pressure allows variation of the force rating and can be predetermined from the spring Diagram.

### Installation

FIBRO Gas springs can be used in any installation position. Whether or not external forces act on them when at rest is of no consequence.



**All FIBRO Gas springs meet the requirements of the Pressure Equipment Directive 97/23/EC.**

The Pressure Equipment Directive (97/23/EC) has been ratified by the European Parliament and the Council of Europe. The requirements of the Pressure Equipment Directive came into force throughout the EC on 29 May 2002.

The directive defines pressure equipment as vessels, pipework, safety devices and pressure accessories. In terms of the Directive a vessel is a casing which is designed and manufactured to contain fluids under pressure.

It follows from this definition that nitrogen Gas springs of all sizes are deemed to be pressure vessels and must in this respect comply with the Pressure Equipment Directive (97/23/EC) from 29 May 2002.



## Gas springs

### Maintenance

FIBRO Gas springs were designed for maintenancefree continual operation. It is recommended to oil the piston rod lightly from time to time.

Guide- and sealing elements can be exchanged easily and expeditiously. They are available as a kit. Each kit comes with detailed instructions for maintenance of FIBRO Gas springs.

### Attention

When safety functions are triggered (overstroke, return stroke, or overpressure protection), the gas pressure springs can no longer be repaired!

### Warning

FIBRO Gas springs may be charged only with commercial Grade 5.0 nitrogen gas.

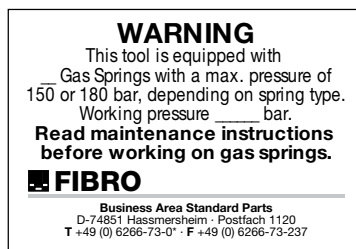
### Accessories

The accessories range for Gas springs comprises fastening devices, charge- and control units, screw connections for these, and connecting lines for compound installations.

FIBRO is not liable if fittings that are not original FIBRO fittings or fastening, accessory, and attachment parts that are not released by FIBRO are used.

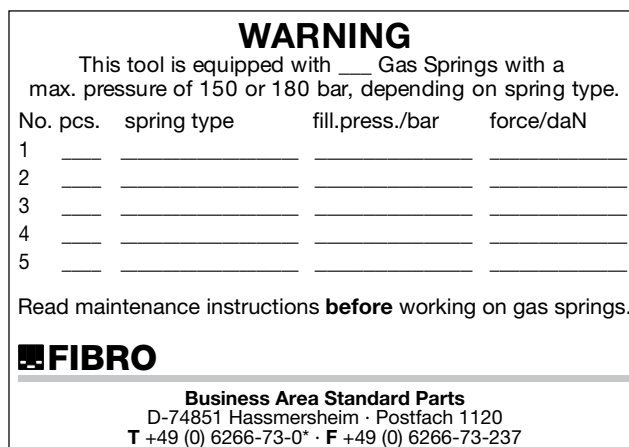
### Warning signs

These are available on request. The signs should be affixed near the springs in as prominent a position as possible.



#### Size 35x50 mm

Language	Order No
german	2480.00.035.050.1
english	2480.00.035.050.2
french	2480.00.035.050.3
italian	2480.00.035.050.4
spanish	2480.00.035.050.5
polish	2480.00.035.050.PL
czech	2480.00.035.050.CZ
turkish	2480.00.035.050.TR
chinese	2480.00.035.050.CN



#### Size 75x105 mm

Language	Order No
german	2480.00.075.105.1
english	2480.00.075.105.2
french	2480.00.075.105.3
italian	2480.00.075.105.4
spanish	2480.00.075.105.5
polish	2480.00.075.105.PL
czech	2480.00.075.105.CZ
turkish	2480.00.075.105.TR
chinese	2480.00.075.105.CN

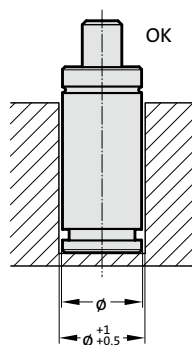
#### Size 110x150 mm

Language	Order No
german	2480.00.110.150.1
english	2480.00.110.150.2
french	2480.00.110.150.3
italian	2480.00.110.150.4
spanish	2480.00.110.150.5
polish	2480.00.110.150.PL
czech	2480.00.110.150.CZ
turkish	2480.00.110.150.TR
chinese	2480.00.110.150.CN

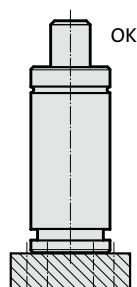
## Mounting directions for gas springs

### Mounting examples

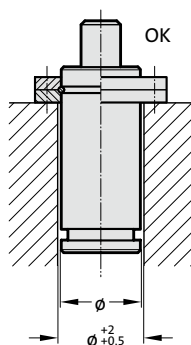
Below are the various gas spring mounting possibilities, which differ from model to model.



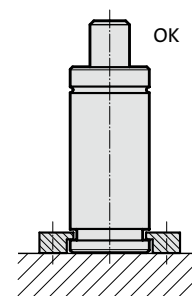
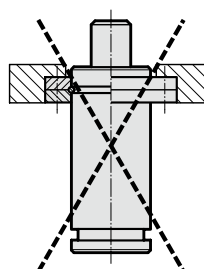
Installed loos in the bore.



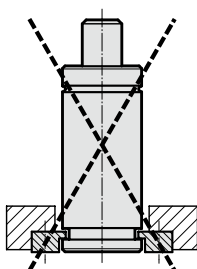
Screw mounted at the base with 2480.011.



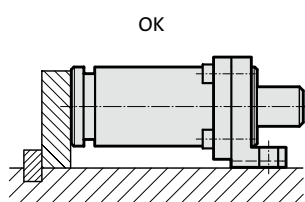
Fixed with 2480.055./057./058./064.



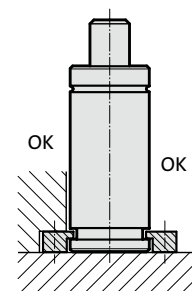
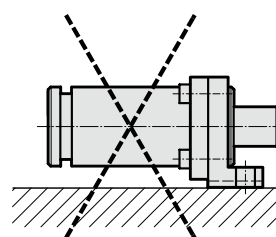
Fixed with 2480.007./008.



Fixed with 2480.007./008.



Fixed with 2480.044./045./047.

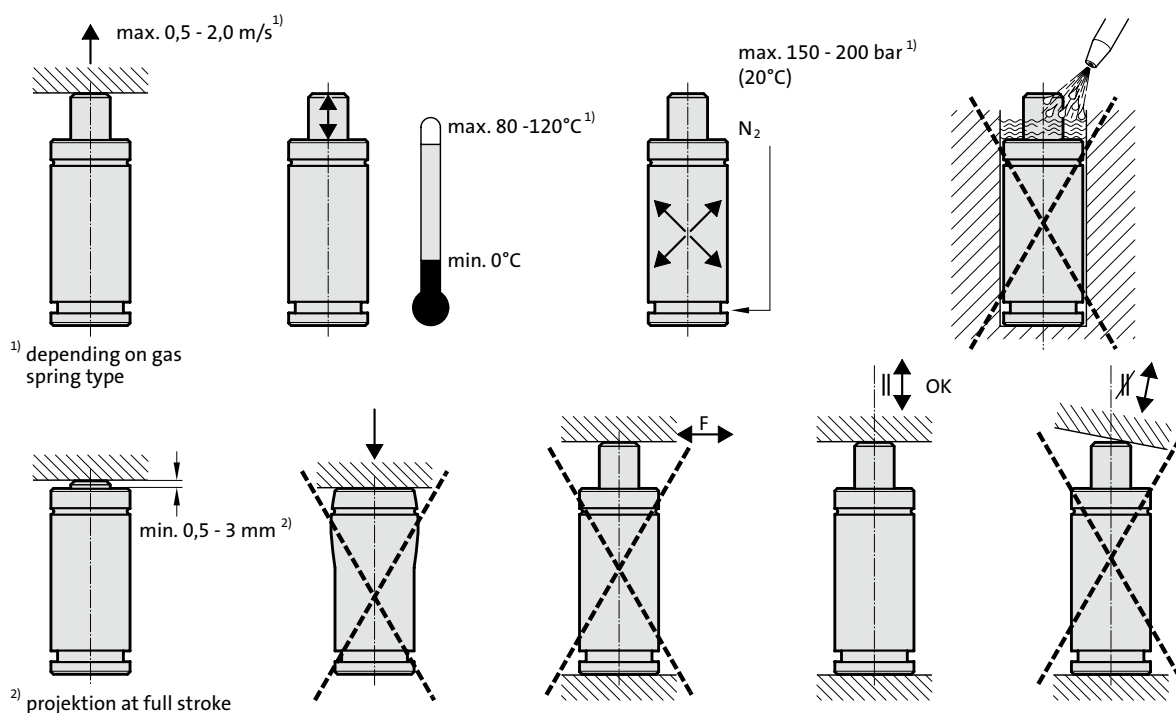


Fixed with 2480.022.

## Mounting directions for gas springs

To achieve the best possible service-life and safety from the gas spring, the directions below must be followed.

### Mounting instructions



- ▶ Secure the gas spring to the tool/machine whenever possible, using the threaded hole(s) in the base of the gas spring or a suitable flange. Never exceed the maximum torque values for the threads in the base of the gas spring: (M6 = 10 Nm; M8 = 24 Nm; M10 = 45 Nm; M12 = 80 Nm)
- ▶ The threaded hole in the piston rod top should not be used for mounting purposes. It is only to be used when carrying and servicing the gas spring.
- ▶ Do not use the gas spring in such a way that the piston rod is realised freely from its compressed position, as this could cause internal damage to the gas spring.
- ▶ Make sure the gas spring is mounted parallel to the direction of the compression stroke.
- ▶ Ensure the contact surface of the piston rod top is perpendicular to the direction of the compression stroke and is sufficiently hardened.
- ▶ The gas spring should not be subjected to the side loads.
- ▶ Protect the piston rod against mechanical damage and contact with fluids.
- ▶ We do not recommend the last 5 mm or 10% of the nominal stroke be utilised.
- ▶ The maximum charging pressure (at 20°C) must not be exceeded as it may effect the safety of the product.
- ▶ Exceeding the gas spring's recommended operating temperature will shorten the service-life of the gas spring.
- ▶ The entire contact surface of the piston rod / piston should be used.
- ▶ Do not remove bottom 2480./2497.00.20. from spring until all gas pressure has been discharged.

# FIBRO-Gas Springs – The Safer Choice

## Optimum safety for tools and operators



At FIBRO, safety and reliability are paramount. Particularly when it comes to our gas springs. With their unique range of safety features, FIBRO gas springs are the safest on the market.

### FIBRO safety features <sup>1)</sup>



**The benefit for you:**

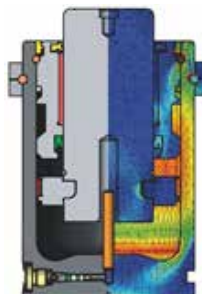
#### PED approval for 2 million strokes

FIBRO gas springs are developed, manufactured and tested for a minimum of 2 million\* full strokes in accordance with DGRL97/23/EG. The springs deliver this full performance at the maximum permissible limits in terms of filling pressure and operating temperature - even when combined with any of the various mounting types available.

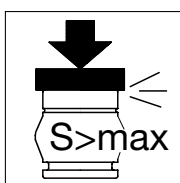
\* Calculation value for durability

#### ► Guaranteed safety and reliability for the entire service life of the spring

Repair kits and qualified training sessions available through FIBRO Service offer increased effectiveness and process reliability.



<b>FIBRO GmbH · Normalien · Standard Parts</b> DE-74855 Hassmersheim · Tel. +49(0)6266-73-0 · Fax *237	
Bestell-Nr.:	<b>2480.13.05000.050</b>
Order-Nr.:	
Fülldruck:	Federkraft:
Filling pressure:	Spring Force:
150 bar	5000 daN
PED-zugelassen für 2.000.000 Hübe bei voller Hubauslastung. PED-approved for 2,000,000 strokes at full stroke load.	
<b>Gasdruckfeder – Warnung!</b> Nicht öffnen - hoher Druck; Fülldruck max. 150 bar. Bitte Bedienungsanleitung beachten!	
<b>Gas Spring – Warning!</b> Do not open - high pressure; filling pressure max. 150 bar. Please follow instructions for use!	
<b>Ressort à gaz – Attention!</b> Ne pas ouvrir - haute pression; pression de remplissage max. 15 MPa. Veuillez observer les instructions d'emploi!	
<b>Molle a gas – Attenzione!</b> Non aprire - pressione alta massima; pressione di riempimento max. 150 bar. Si prega di osservare le istruzioni per l'uso!	
<b>Muelle de gas – Atención!</b> No abrir - alta presión; cargado a max. 150 bar. Por favor observar las instrucciones!	



**The benefit for you:**

**Possible causes of triggering:**

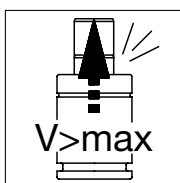
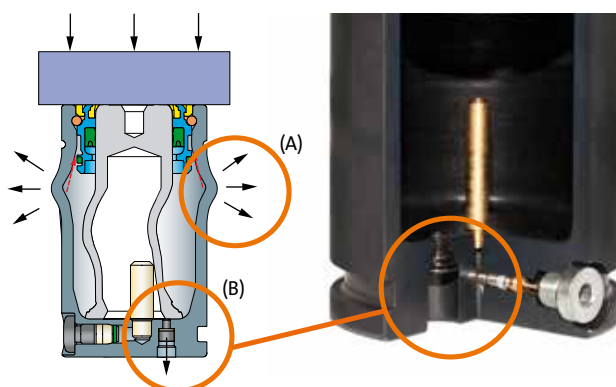
#### Overstroke protection

Conventional gas springs can burst in the event of an over-extended stroke. If this happens, parts flying around can become dangerous projectiles.

**FIBRO gas springs are different:** in the event of an overstroke and depending on the spring type the patented protection system will ensure that either the cylinder wall of the gas spring is deformed in a predefined manner (A) or the piston rod destroys a rupture bolt in the floor of the cylinder (B), thereby allowing the gas to escape into the atmosphere.

#### ► No risk of parts flying around in the event of an overstroke

Lack of stroke limitations in the tool/machine and placing the piston rods under a load (e.g. sheet-metal holder, slide reset, etc.), double sheet, incorrect installation position, etc.



**The benefit for you:**

**Possible causes of triggering:**

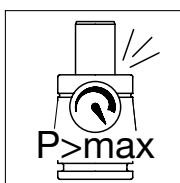
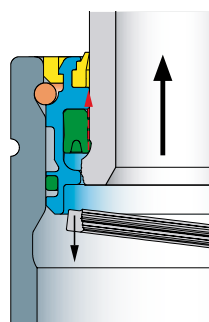
#### Return stroke protection

A particularly dangerous situation can arise with conventional gas springs if tool components become jammed and the pressure on the compressed piston rod is then abruptly released: in this case, the piston rod is then fired out of the cylinder like a missile.

**FIBRO gas springs are different:** special guides and a patented safety stop in the piston rods ensure your safety. If the speed is too high during the return stroke, the collar on the piston rod will automatically break. The integrated safety stop then destroys the seal, which allows the gas to escape into the atmosphere and the gas spring to become depressurised.

#### ► No risk of a piston rod firing out if the return stroke is too fast

Sudden loosening of jammed components, such as sheet-metal holder, slide, ejector, scraper function, etc.



**The benefit for you:**

**Possible causes of triggering:**

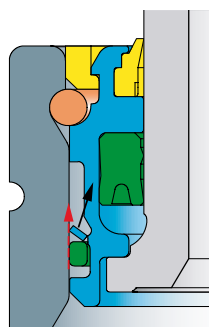
#### Overpressure protection

Conventional gas springs can burst if the internal pressure rises above a maximum permitted value. If this happens, parts flying around can become dangerous projectiles.

**FIBRO gas springs are different:** if the pressure rises above the maximum permitted value, the safety collar on the sealing set is automatically destroyed. The gas then escapes into the atmosphere and the gas spring is depressurised.

#### ► No risk of bursting parts in the event of overpressure

Incorrect filling (max. filling pressure 150 or 180 bar, nitrogen), infeed of liquid operating material, etc.



**After a protection function is triggered, the spring cannot be repaired and can no longer be used. It must be replaced completely.**

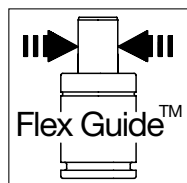
<sup>1)</sup> The safety features mentioned here have been implemented – with few exceptions – on all FIBRO gas springs.

Please refer to the relevant data sheets to check the current safety equipment which is provided with the gas spring you are interested in, or contact FIBRO GmbH directly for more information.



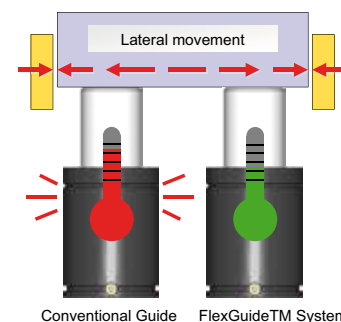
## Gas springs – The Safer Choice

### FIBRO reliability features



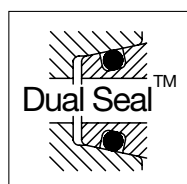
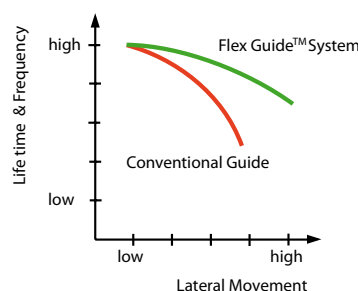
#### Flexible guides: The Flex Guide™ System

The Flex Guide™ System is a flexible guide in the gas spring which absorbs lateral movements of the piston rod. It minimises friction and lowers the operating temperature.



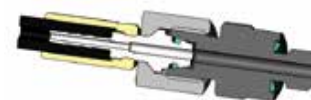
The benefits for you:

- ▶ Extended service life
- ▶ Increased stroke frequency, i.e. more strokes per minute



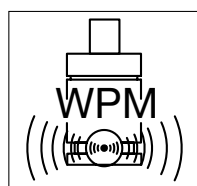
#### Safe hose connections: The Dual Seal™ System

The FIBRO Dual Seal™ System combines a metal seal with a soft elastomer seal. On hose connection systems, the system provides two leak-tight connections and prevents rotation.



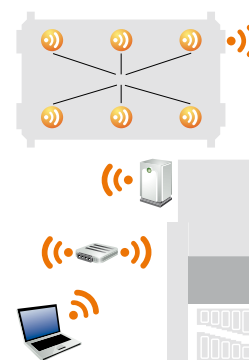
The benefits for you:

- ▶ Leak-tight connection, even under vibrations
- ▶ High process reliability
- ▶ Minimised tool down time
- ▶ Simple installation thanks to anti-rotation function



#### Wireless monitoring: The Wireless Pressure Monitoring (WPM) System

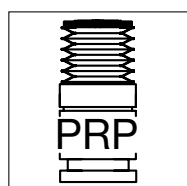
The optional Wireless Pressure Monitoring System (WPM) (patent pending) wirelessly monitors the pressure and temperature of FIBRO gas springs. Before a defective part is produced, the press operator receives a message from the WPM and can take appropriate action.



The benefits for you:

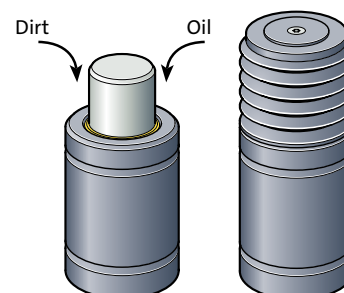
- ▶ Preventative quality assurance
- ▶ High process reliability
- ▶ Minimised tool down time
- ▶ Reduced maintenance and costs

Potential faults are individually displayed. As a result, service intervals can be extended. Maintenance and repair costs are reduced.



#### Protected piston rods: FIBRO Concertina Shrouds

The FIBRO Piston Rod Protection (patented) reliably protects the piston rods in gas springs against dirt, oil and emulsion. In this way, the system prevents damage to the piston rod surface and leaks at internal seals.



The benefits for you:

- ▶ Significantly longer service life for gas springs under harsh operating conditions

## Gas springs Synopsis

Nominal force in daN	Outside-Ø in mm	Stroke in mm	Built-in lenght in mm	Standard	Note	Order No
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### Gas springs, Ejector pin units

5	M16x1,5	10 - 125	65 - 295	VDI		2479.030.00005.
10	M16x1,5	10 - 125	65 - 295	VDI		2479.030.00010.
20	M16x1,5	10 - 125	65 - 295	VDI		2479.030.00020.
40	M16x1,5	10 - 125	65 - 295	VDI		2479.030.00040.
4	M16x2	10 - 125	65 - 295	VDI		2479.031.00004.
5	M16x2	10 - 125	65 - 295	VDI		2479.031.00005.
10	M16x2	10 - 125	65 - 295	VDI		2479.031.00010.
20	M16x2	10 - 125	65 - 295	VDI		2479.031.00020.
40	M16x2	10 - 125	65 - 295	VDI		2479.031.00040.
20	M24x1,5	10 - 125	65 - 295	VDI		2479.032.00020.
40	M24x1,5	10 - 125	65 - 295	VDI		2479.032.00040.
80	M24x1,5	10 - 125	65 - 295	VDI		2479.032.00080.
170	M24x1,5	10 - 125	65 - 295	VDI		2479.032.00170.
20	M24x1,5	10 - 125	65 - 295	WDX		2479.034.00020.
40	M24x1,5	10 - 125	65 - 295	WDX		2479.034.00040.
80	M24x1,5	10 - 125	65 - 295	WDX		2479.034.00080.
170	M24x1,5	10 - 125	65 - 295	WDX		2479.034.00170.

### Gas springs, small dimensions

13	12	7 - 125	56 - 295			2482.72.00013.
25	12	7 - 125	56 - 295			2482.72.00025.
38	12	7 - 125	56 - 295			2482.72.00038.
50	12	7 - 125	56 - 295			2482.72.00050.
18	15	7 - 125	56 - 295			2482.73.00018.
35	15	7 - 125	56 - 295			2482.73.00035.
50	15	7 - 125	56 - 295			2482.73.00050.
70	15	7 - 125	56 - 295			2482.73.00070.
30	19	7 - 125	56 - 295	VDI, ISO		2482.74.00030.
50	19	7 - 125	56 - 295	VDI, ISO		2482.74.00050.
70	19	7 - 125	56 - 295	VDI, ISO		2482.74.00070.
90	19	7 - 125	56 - 295	VDI, ISO		2482.74.00090.
50	24,9	10 - 125	62 - 295	VDI, ISO		2480.21.00050.
100	24,9	10 - 125	62 - 295	VDI, ISO		2480.21.00100.
150	24,9	10 - 125	62 - 295	VDI, ISO		2480.21.00150.
200	24,9	10 - 125	62 - 295	VDI, ISO		2480.21.00200.
50	32	10 - 125	70 - 300	VDI, ISO		2480.22.00050.
100	32	10 - 125	70 - 300	VDI, ISO		2480.22.00100.
150	32	10 - 125	70 - 300	VDI, ISO		2480.22.00150.
200	32	10 - 125	70 - 300	VDI, ISO		2480.22.00200.
	24,9	10 - 125	62 - 295			2480.23.

### Standard-Gas springs

250	38	10 - 125	70 - 300	VDI, ISO		2480.12.00250.
500	45,2	10 - 160	105 - 405	VDI, ISO		2480.12.00500.
750	50,2	13 - 300	120,4 - 695	VDI, ISO		2480.13.00750.
1500	75,2	13 - 300	135 - 710	VDI, ISO		2480.12.01500.
3000	95,2	13 - 300	145 - 720	VDI, ISO		2480.13.03000.
5000	120,2	25 - 300	190 - 740	VDI, ISO		2480.13.05000.
7500	150,2	25 - 300	205 - 755	VDI, ISO		2480.13.07500.
10000	195	25 - 300	210 - 760	VDI, ISO		2480.12.10000.

### Standard-Gas springs – HEAVY DUTY

1000	50,2	13 - 300	121 - 695	VDI, ISO		2488.13.01000.
2400	75,2	25 - 300	160 - 710	VDI, ISO		2488.13.02400.
4200	95,2	25 - 300	170 - 720	VDI, ISO		2488.13.04200.
6600	120,2	25 - 300	190 - 740	VDI, ISO		2488.13.06600.
9500	150,2	25 - 300	205 - 755	VDI, ISO		2488.13.09500.

### Gas springs with through bore passage

270	38	16 - 80	108 - 236			2496.12.00270.
490	50,2	16 - 80	112 - 240			2496.12.00490.
1060	75,2	16 - 100	122 - 290			2496.12.01060.

## Gas springs Synopsis

Nominal force in daN	Outside-Ø in mm	Stroke in mm	Built-in length in mm	Standard	Note	Order No
-------------------------	--------------------	-----------------	--------------------------	----------	------	----------

### Gas springs with increased spring force – POWER LINE

170	19	7 - 125	44 - 285	VDI, ISO		2487.12.00170.
320	24,9	7 - 125	44 - 285	ISO		2487.12.00320.
350	32	10 - 125	50 - 280	VDI, ISO		2487.12.00350.
500	38	10 - 125	50 - 280	VDI, ISO		2487.12.00500.
750	45,2	10 - 125	52 - 282	VDI, ISO		2487.12.00750.
1000	50,2	13 - 125	64 - 288	VDI, ISO		2487.12.01000.
1500	63,2	13 - 125	70 - 294	VDI, ISO		2487.12.01500.
2400	75,2	16 - 125	77 - 295	VDI, ISO		2487.12.02400.
4200	95,2	16 - 125	90 - 308	VDI, ISO		2487.12.04200.
6600	120,2	16 - 125	100 - 318	VDI, ISO		2487.12.06600.
9500	150,2	19 - 125	116 - 328	VDI, ISO		2487.12.09500.
20000	195	19 - 125	148 - 360			2487.12.20000.

### Compact-Gas springs

420	24,9	6 - 50	56 - 195			2490.14.00420.
750	32	6 - 50	63 - 195			2490.14.00750.
1000	38	6 - 50	61 - 230			2490.14.01000.
1800	50,2	6 - 65	66 - 271			2490.14.01800.
3000	63,2	10 - 65	85 - 256			2490.14.03000.
4700	75,2	10 - 65	80 - 273			2490.14.04700.
7500	95,2	10 - 65	90 - 279			2490.14.07500.
11800	120,2	10 - 65	100 - 320			2490.14.11800.
18300	150,2	10 - 65	110 - 323			2490.14.18300.

### Gas springs low build height

500	45,2	6 - 125	62 - 300			2485.12.00500.
750	50,2	6 - 125	62 - 300			2485.12.00750.
1500	75,2	25 - 100	110 - 260			2485.12.01500.

### »Speed Control™«, Gas springs, SPC, cushioned

750	75,2	125 - 300	360 - 710			2486.12.00750.
1500	95,2	125 - 300	370 - 720			2486.12.01500.
3000	120,2	125 - 300	390 - 740			2486.12.03000.
5000	150,2	125 - 300	405 - 755			2486.12.05000.

### Gas springs, DS, for Die Separation

3000	95,2	80 - 300	280 - 720			2486.22.03000.
5000	120,2	80 - 300	300 - 740			2486.22.05000.
7500	150,2	80 - 300	315 - 755			2486.22.07500.

### Gas springs to WDX standard/Request your catalogue

#### Gas springs, threaded

50 - 200	M28×1,5	10 - 125	62 - 292	external thread		2480.32.00050.-00200.
250	M38×1,5	13 - 100	75,4 - 250	external thread		2480.32.00250.
250	38	13 - 100	75,4 - 250	with male fixing thread		2480.82.00250.
1000	50,2	13 - 125	64 - 288	with male fixing thread		2487.82.01000.
15	M28×1,5	125	292	with hexagonal flange		2480.33.00015.125
50	M28×1,5	125	292	with hexagonal flange		2480.33.00050.125
100	M28×1,5	125	292	with hexagonal flange		2480.33.00100.125
150	M28×1,5	125	292	with hexagonal flange		2480.33.00150.125
200	M28×1,5	125	292	with hexagonal flange		2480.33.00200.125

### Gas springs for working temperatures up to 120°C

#### LCF Gas springs, damped

750	50,2	13 - 300	120,4 - 695			2484.13.00750.
1500	75,2	25 - 300	160 - 710			2484.12.01500.
3000	95,2	25 - 300	170 - 720			2484.13.03000.
5000	120,2	25 - 300	190 - 740			2484.13.05000.
7500	150,2	25 - 300	205 - 755			2484.13.07500.

#### Controllable Gas springs/Request your catalogue

2489.

#### Air Springs, to VW standard/Request your catalogue

2491.

#### Manifold system/Request your catalogue

2495.







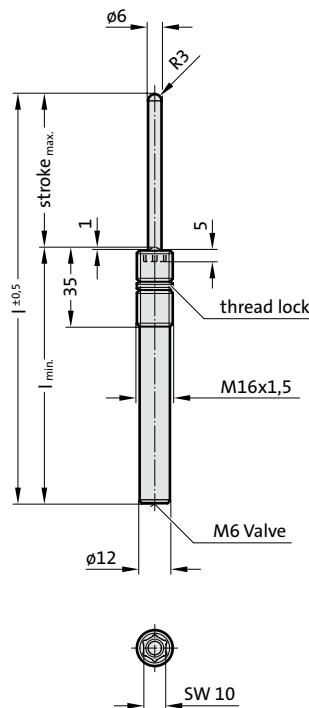
## Gas springs (Spring plungers)



## Gas spring (Spring plunger), with hexagon socket, VDI 3004



2479.030.



### Description:

Spring plungers are used as ejectors, damper pins, fixing and retaining pins in many sectors of the tool-, jig- and fixture-making industries. Assembly requires the use of special FIBRO insertion tool (2470.12.010.017).

### Note:

Worn gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen - N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 6 bar

Working temperature: 0°C to +80°C

Temperature related force increase: ± 0,3%/°C

Max. recommended extensions per minute:

approx. 100 (at 20°C)

Max. piston speed: 1,6 m/s

Upon customers request, also available unfilled, Order No 2479.030.00000...., Colour: black

2) Hexagon nut order supplementary: 2480.004.00040.1 (M16 x 1,5)

## 2479.030. Gas spring (Spring plunger), with hexagon socket, VDI 3004

Spring type:

Order No\*

	Stroke <sub>max.</sub>	I	I <sub>min.</sub>	.00005.	.00010.	.00020.	.00040.
				F <sub>initial</sub>	F <sub>final</sub>	F <sub>initial</sub>	F <sub>final</sub>
2479.030.□□□□□.010	10	65	55	6	10.3	11	19
2479.030.□□□□□.020	20	85	65	6	9.4	11	17.2
2479.030.□□□□□.030	30	105	75	6	9.1	11	16.7
2479.030.□□□□□.040	40	125	85	6	9	11	16.5
2479.030.□□□□□.050	50	145	95	6	9.6	11	17.6
2479.030.□□□□□.060	60	165	105	6	9.4	11	17.3
2479.030.□□□□□.070	70	185	115	6	9.3	11	17
2479.030.□□□□□.080	80	205	125	6	9.2	11	16.8
2479.030.□□□□□.100	100	245	145	6	9.1	11	16
2479.030.□□□□□.125	125	295	170	6	9	11	16.5

\*complete with spring type

**Spring force marking:**

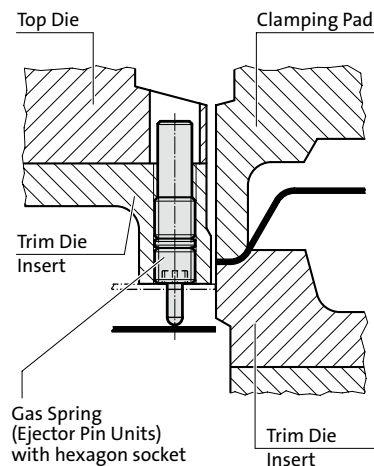
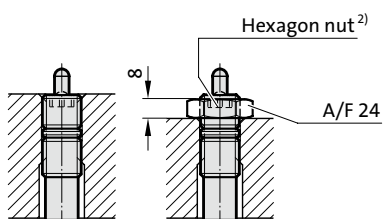
Spring type - Pressure [bar] - Colour:

.00005. - 20 - green

.00010. - 40 - blue

.00020. - 75 - red

.00040. - 150 - yellow

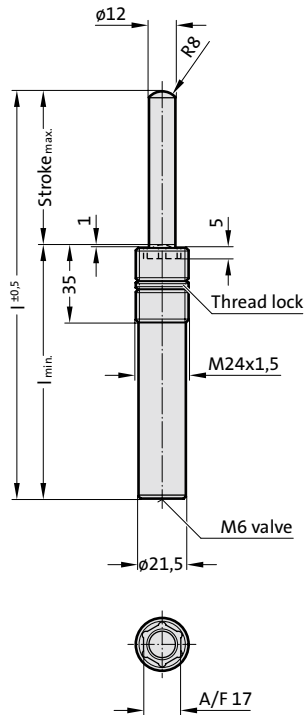




## Gas spring (Spring plunger), with hexagon socket, VDI 3004



2479.032.



### Description:

Spring plungers are used as ejectors, damper pins, fixing and retaining pins in many sectors of the tool-, jig- and fixture-making industries. Assembly requires the use of special FIBRO insertion tool (2470.12.010.017)

### Note:

Worn Gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen - N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 20 bar

Working temperature: 0°C to +80°C

Temperature related force increase: ± 0,3%/°C

Max. recommended extensions per minute: approx. 100 (at 20°C)

Max. piston speed: 1,6 m/s

Upon customers request, also available unfilled, Order No 2479.032.00000...., Colour: black

2) Hexagon nut order supplementary: 2480.004.00170

## 2479.032. Gas spring (Spring plunger), with hexagon socket, VDI 3004

Spring type:				.00020.		.00040.		.00080.		.00170.	
Order No*	Stroke <sub>max.</sub>	l	l <sub>min.</sub>	F <sub>initial</sub>	F <sub>final</sub>	F <sub>initial</sub>	F <sub>final</sub>	F <sub>initial</sub>	F <sub>final</sub>	F <sub>initial</sub>	F <sub>final</sub>
2479.032.□□□□□.010	10	65	55	23	33.1	45	64.8	85	122.4	170	244.8
2479.032.□□□□□.020	20	85	65	23	36.3	45	71.1	85	134.3	170	258.6
2479.032.□□□□□.030	30	105	75	23	38.2	45	74.7	85	141.1	170	282.2
2479.032.□□□□□.040	40	125	85	23	39.3	45	76.9	85	145.4	170	290.7
2479.032.□□□□□.050	50	145	95	23	42.5	45	83.2	85	157.3	170	314.5
2479.032.□□□□□.060	60	165	105	23	42.5	45	83.2	85	157.3	170	314.5
2479.032.□□□□□.070	70	185	115	23	42.8	45	83.7	85	158.1	170	316.2
2479.032.□□□□□.080	80	205	125	23	42.8	45	83.7	85	158.1	170	316.2
2479.032.□□□□□.100	100	245	145	23	43	45	84.1	85	159	170	318
2479.032.□□□□□.125	125	295	170	23	43	45	84.1	85	159	170	318

\*complete with spring type

### Spring force marking:

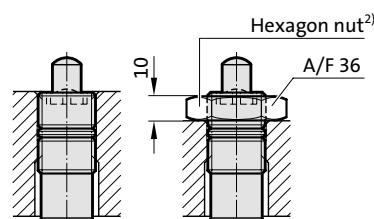
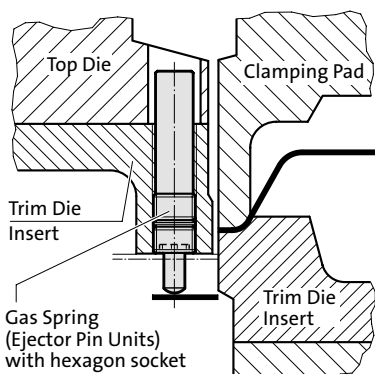
Spring type - Pressure [bar] - Colour:

.00020. - 20 - green

.00040. - 40 - blue

.00080. - 75 - red

.00170. - 150 - yellow





## Gas spring (Spring plunger), to WDX

### Description:

Spring plungers are used as ejectors, damper pins, fixing and retaining pins in many sectors of the tool-, jig- and fixture-making industries. Assembly requires the use of special FIBRO insertion tool (2470.12.010.017)

### Note:

Worn Gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen - N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 20 bar

Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0,3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 30 to 80 (at 20°C)

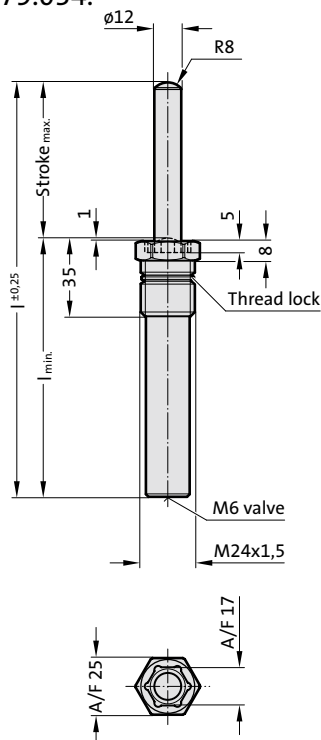
Max. piston speed: 1,6 m/s

### Attention!

Different colour coding for spring force used in WDX standard

Upon customers request, also available unfilled, Order No 2479.034.00000...., Colour: black

2479.034.



## 2479.034. Gas spring (Spring plunger), to WDX

Spring type:

Order No\*

	Stroke <sub>max.</sub>	l	l <sub>min.</sub>	.00020.		.00040.		.00080.		.00170.	
				F <sub>initial</sub>	F <sub>final</sub>	F <sub>initial</sub>	F <sub>final</sub>	F <sub>initial</sub>	F <sub>final</sub>	F <sub>initial</sub>	F <sub>final</sub>
2479.034.□□□□□.010	10	65	55	23	32.5	45	65	85	122	170	243.5
2479.034.□□□□□.016	16	77	61	23	36.6	45	73.3	85	137.4	170	274.8
2479.034.□□□□□.020	20	85	65	23	36	45	72	85	134.5	170	268
2479.034.□□□□□.025	25	95	70	23	38.9	45	77.8	85	145.9	170	291.8
2479.034.□□□□□.030	30	105	75	23	37.5	45	75	85	141	170	281.5
2479.034.□□□□□.038	38	121	83	23	40.7	45	81.4	85	152.7	170	305.4
2479.034.□□□□□.040	40	125	85	23	38.5	45	77	85	144.5	170	289
2479.034.□□□□□.050	50	145	95	23	42	45	83.5	85	156.5	170	313
2479.034.□□□□□.060	60	165	105	23	42	45	84	85	157	170	314
2479.034.□□□□□.070	70	185	115	23	42	45	84	85	157.5	170	315
2479.034.□□□□□.080	80	205	125	23	42	45	84	85	159	170	315.5
2479.034.□□□□□.100	100	245	145	23	42	45	84.5	85	158	170	316.5
2479.034.□□□□□.125	125	295	170	23	42	45	84.5	85	158.5	170	317

\*complete with spring type

Spring force marking:

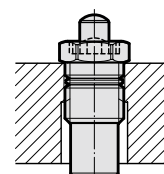
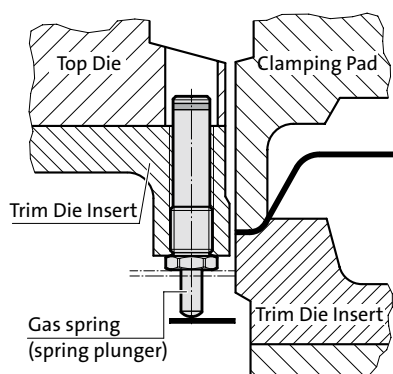
Spring type - Pressure [bar] - Colour:

.00020. - 20 - green

.00040. - 40 - blue

.00080. - 75 - red

.00170. - 150 - yellow







**Gas spring,  
small dimension,  
low force**



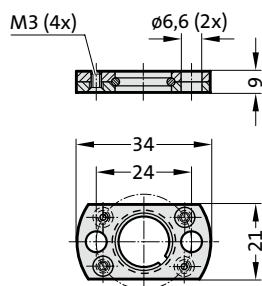
## Gas spring, small dimension, low force Mounting variations

2480.051.00013

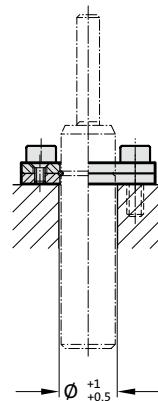
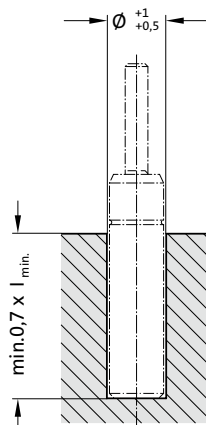
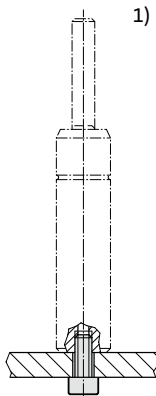


### Note:

<sup>1)</sup> Fixing at bottom thread only recommended for stroke length up to 25 mm.



### Mounting examples:







# Gas spring, small dimension and low force

## Description:

The Gas springs are colour-coded according to the spring force rating ranges 13-25-38-50 daN.

All springs, regardless of their spring force ratings, are of the same design. The differing force ratings result exclusively from the differing charge pressures. Gas can be added or reduced from below.

## Note:

Worn Gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen  $N_2$

Max. filling pressure: 180 bar

Min. filling pressure: 20 bar

Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}C$

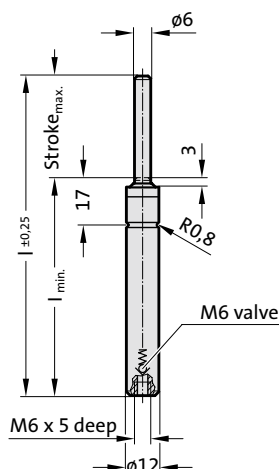
Max. recommended extensions per minute: approx. 40 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

Spring forces as per spring diagram.

Upon customers request, also available unfilled, Order No 2482.72.00000...., Colour: black

2482.72.



## 2482.72. Gas spring, small dimension and low force

Order No*	Stroke <sub>max</sub>	l	l <sub>min</sub>
2482.72.00000.007	7	56	49
2482.72.00000.010	10	62	52
2482.72.00000.013	12.7	67.4	54.7
2482.72.00000.015	15	72	57
2482.72.00000.019	19	80	61
2482.72.00000.025	25	92	67
2482.72.00000.038	38	118	80
2482.72.00000.050	50	142	92
2482.72.00000.063	63.5	172	108.5
2482.72.00000.075	75	195	120
2482.72.00000.080	80	205	125
2482.72.00000.100	100	245	145
2482.72.00000.125	125	295	170

\*complete with initial spring force

**Spring force marking:** Initial spring force [daN] - Pressure [bar] - Colour:

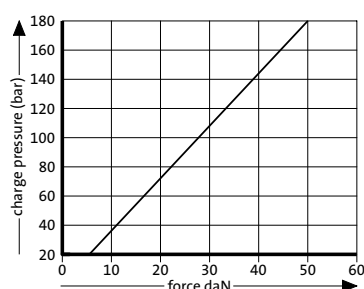
.00013. - 45 - green

.00025. - 90 - blue

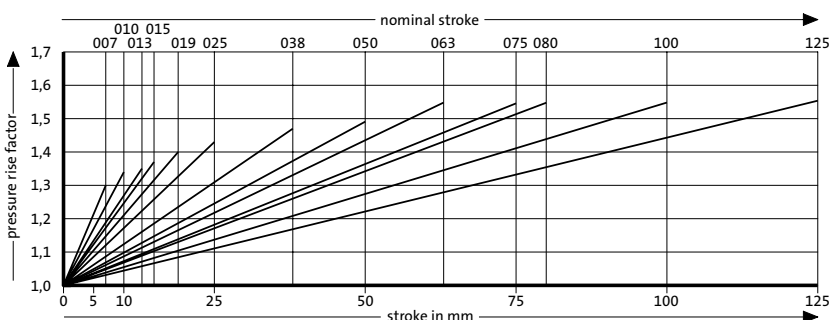
.00038. - 135 - red

.00050. - 180 - yellow

Initial spring force  
versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!

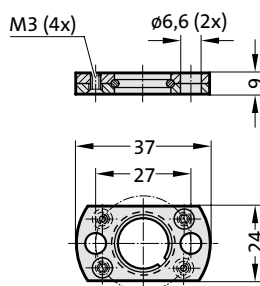
## Gas Spring, small dimension, low force Mounting variations

2480.051.00018

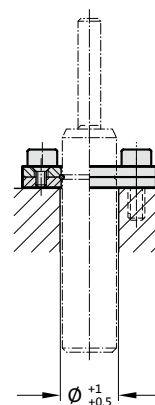
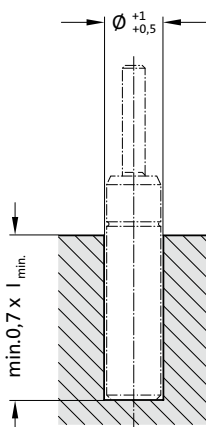
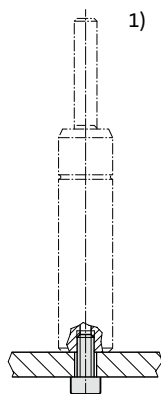


### Note:

<sup>1)</sup> Fixing at bottom thread only recommended for stroke length up to 25 mm.



### Mounting examples:





## Gas spring, small dimension and low force

### Description:

The Gas springs are colour-coded according to the spring force rating ranges  
18-35-50-70 daN.

All springs, regardless of their spring force ratings, are of the same design. The differing force ratings result exclusively from the differing charge pressures.  
Gas can be added or reduced from below.

### Note:

Worn Gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen  $N_2$

Max. filling pressure: 180 bar

Min. filling pressure: 20 bar

Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}C$

Max. recommended extensions per minute:

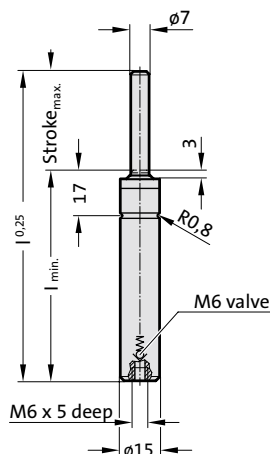
approx. 40 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

Spring forces as per spring diagram.

Upon customers request, also available unfilled, Order No 2482.73.00000. ....1,  
Colour: black

2482.73. .1



## 2482.73. .1 Gas spring, small dimension and low force

Order No*	Stroke <sub>max.</sub>	I	I <sub>min.</sub>
2482.73.00000.007.1	7	56	49
2482.73.00000.010.1	10	62	52
2482.73.00000.013.1	12.7	67.4	54.7
2482.73.00000.015.1	15	72	57
2482.73.00000.019.1	19	80	61
2482.73.00000.025.1	25	92	67
2482.73.00000.038.1	38	118	80
2482.73.00000.050.1	50	142	92
2482.73.00000.063.1	63.5	172	108.5
2482.73.00000.075.1	75	195	120
2482.73.00000.080.1	80	205	125
2482.73.00000.100.1	100	245	145
2482.73.00000.125.1	125	295	170

\*complete with initial spring force

**Spring force marking:** Initial spring force [daN] - Pressure [bar] - Colour:

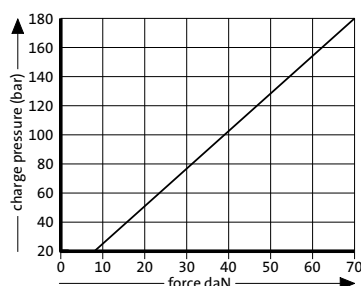
.00018. - 45 - green

.00035. - 90 - blue

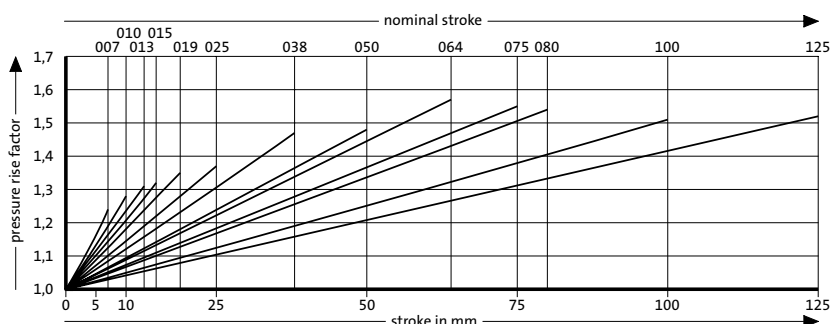
.00050. - 135 - red

.00070. - 180 - yellow

Initial spring force  
versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!

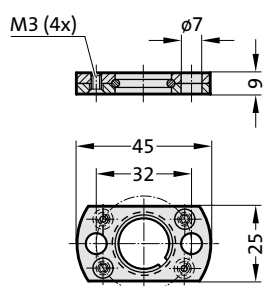
## Gas spring, small dimension, low force

### Mounting variations

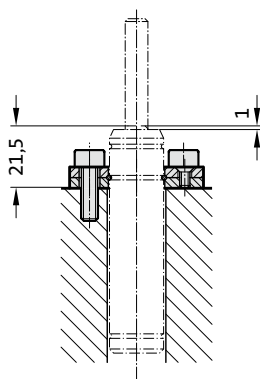
#### Note:

<sup>1)</sup> Fixing at bottom thread only recommended for stroke length up to 25 mm.

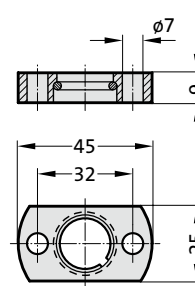
2480.051.03.00030



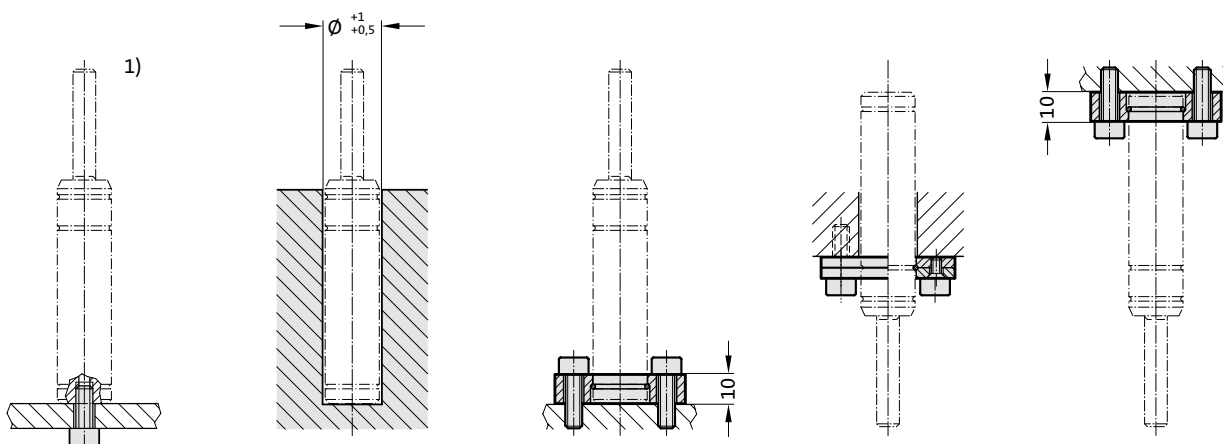
2480.051.03.00030



2480.052.00030



#### Mounting examples:



### Gas spring, small dimension and low force

Description:

The gas springs are colour-coded according to the spring force rating ranges 30-50-70-90 daN.

All springs, regardless of their spring force ratings, are of the same design. The differing force ratings result exclusively from the differing charge pressures.

Gas can be added or reduced from below.

Note:

Worn gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 180 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 100 to 150 (at 20°C)

Max. piston speed: 1.6 m/s

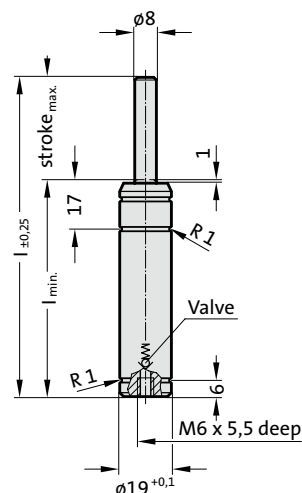
Spring forces as per spring diagram.

Upon customers request, also available

unfilled, Order No 2482.74.00000. ... .2,

Colour: black

2482.74..2



2482.74. .2 Gas spring, small dimension and low force

Order No*	Stroke <sub>max.</sub>	l	l <sub>min.</sub>
2482.74.□□□□□.007.2	7	56	49
2482.74.□□□□□.010.2	10	62	52
2482.74.□□□□□.015.2	15	72	57
2482.74.□□□□□.025.2	25	92	67
2482.74.□□□□□.038.2	38.1	118.2	80.1
2482.74.□□□□□.050.2	50	142	92
2482.74.□□□□□.063.2	63.5	172	108.5
2482.74.□□□□□.080.2	80	205	125
2482.74.□□□□□.100.2	100	245	145
2482.74.□□□□□.125.2	125	295	170
2482.74.□□□□□.150.2	150	345	195

\*complete with initial spring force

Spring force marking:

Initial spring force [daN] - Pressure [bar] - Colour:

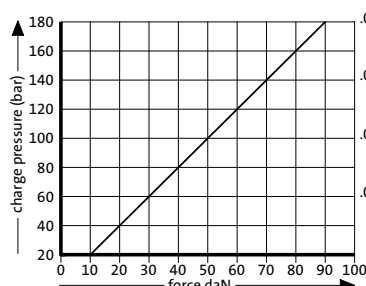
.00030. - 60 - green

.00050. - 100 - blue

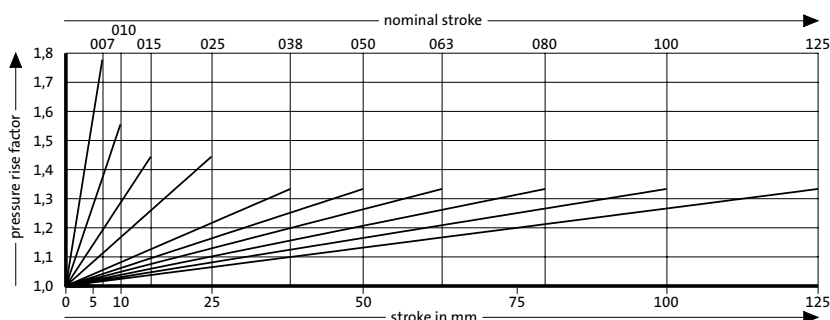
.00070. - 140 - red

.00090. - 180 - yellow

Initial spring force  
versus charge pressure



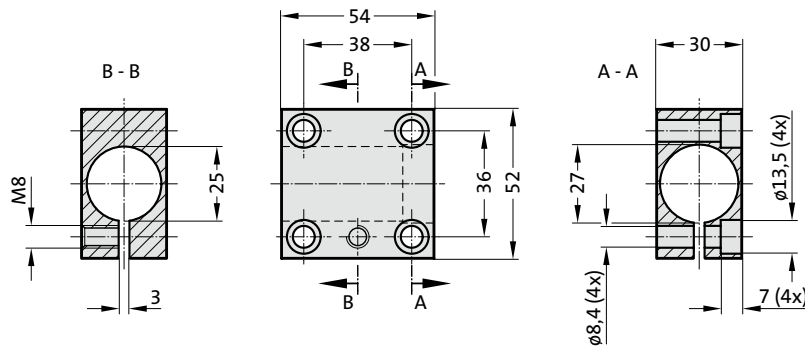
### Spring force Diagram displacement versus stroke rise



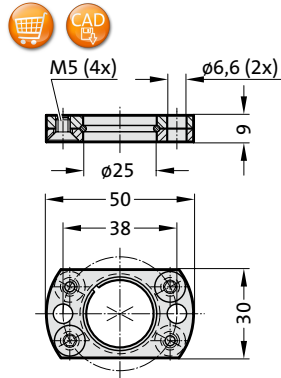
Pressure rise factor accounts for displacement but not external influences!

## Gas spring, small dimension, low force Mounting variations

2480.053.00150



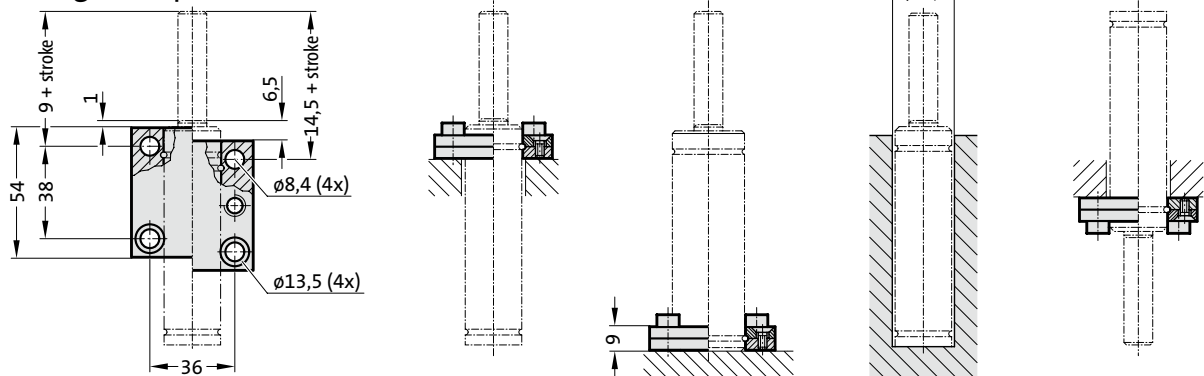
2480.051.00150



### Note:

<sup>2)</sup> Attention:  
The spring force must be  
absorbed by the stop surface.

### Mounting example:





# Gas spring, small dimension and low force

## Description:

The Gas springs are colour-coded according to the spring force rating ranges 50–100–150–200 daN.

All springs, regardless of their spring force ratings, are of the same design. The differing force ratings result exclusively from the differing charge pressures. Do take into consideration the colour-coded pressure rating during repair work and recharging.

## Note:

Order No for spare parts kit: 2480.21.00150

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 180 bar

Min. filling pressure: 25 bar

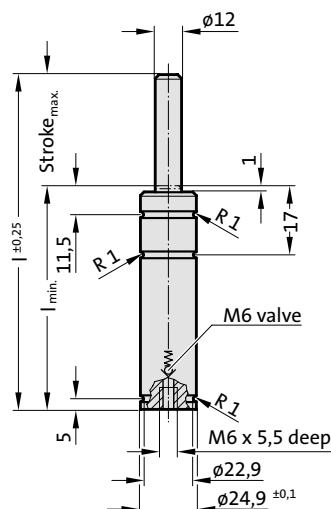
Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute: approx. 80 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2480.21.



Spring forces as per spring diagram.

Upon customers request, also available unfilled, Order No 2482.21.00000..., Colour: black

## 2480.21. Gas spring, small dimension and low force

Order No*	Stroke <sub>max.</sub>	l	l <sub>min.</sub>
2480.21.□□□□□.010	10	62	52
2480.21.□□□□□.013	12.7	67.4	54.7
2480.21.□□□□□.015	15	72	57
2480.21.□□□□□.016	16	74	58
2480.21.□□□□□.025	25	92	67
2480.21.□□□□□.038	38.1	118.2	80.1
2480.21.□□□□□.050	50	142	92
2480.21.□□□□□.063	63.5	172	108.5
2480.21.□□□□□.080	80	205	125
2480.21.□□□□□.100	100	245	145
2480.21.□□□□□.125	125	295	170

\*complete with initial spring force

### Spring force marking:

Initial spring force [daN] - Pressure [bar] - Colour:

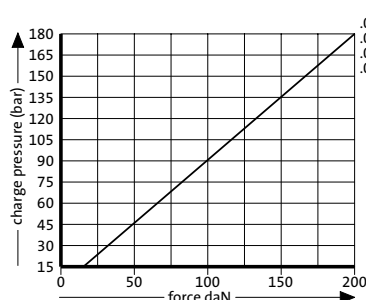
.00050. - 45 - green

.00100. - 90 - blue

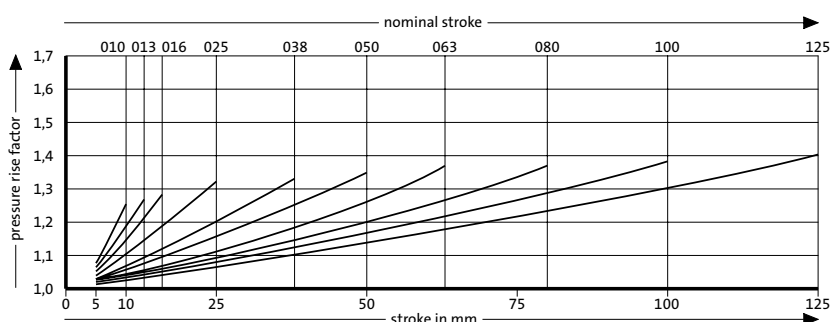
.00150. - 135 - red

.00200. - 180 - yellow

Initial spring force versus charge pressure



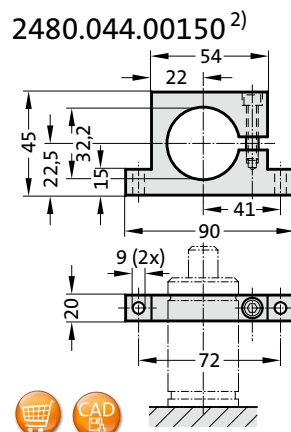
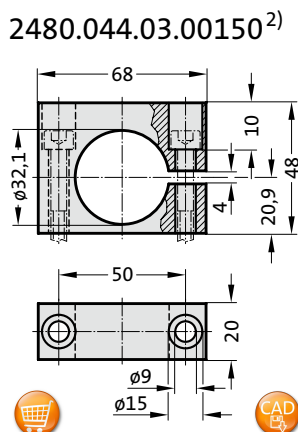
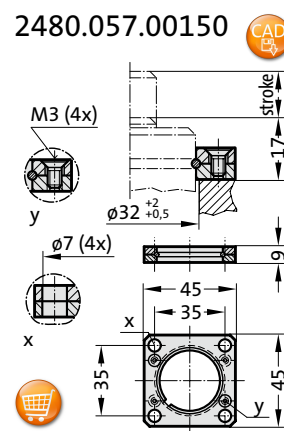
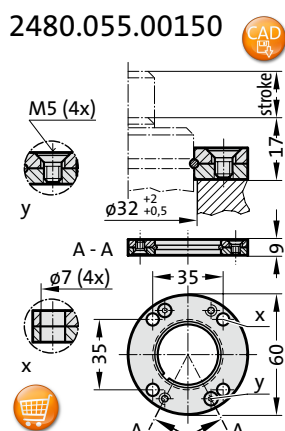
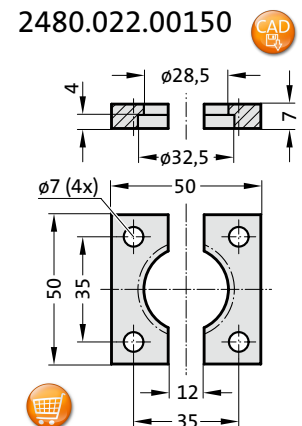
Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!

## Gas spring, small dimension and low force

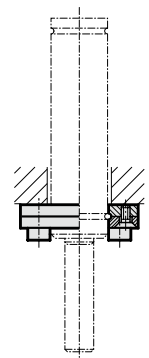
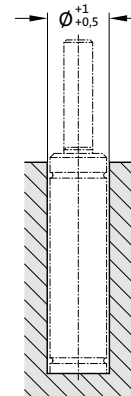
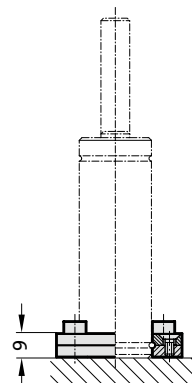
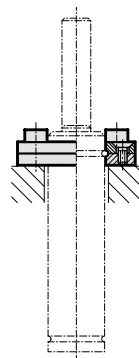
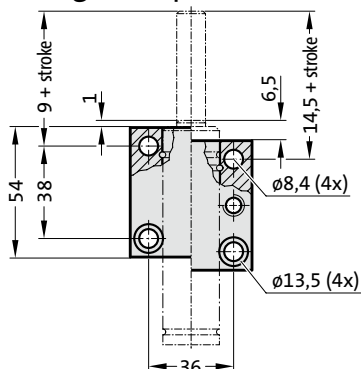
### Mounting variations



Note:

2) Attention:  
The spring force must be absorbed by the stop surface.

Mounting examples:





### Gas spring, small dimension and low force

Description:

The Gas springs are colour-coded according to the spring force rating ranges  
50–100–150–200 daN.

All springs, regardless of their spring force ratings, are of the same design. The differing force ratings result exclusively from the differing charge pressures. Do take into consideration the colour-coded pressure rating during repair work and recharging.

Note:

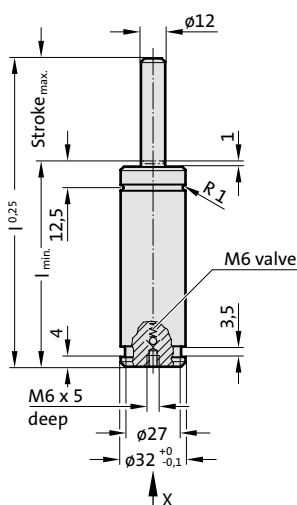
Order No for spare parts kit: 2480.21.00150

Pressure medium: Nitrogen N<sub>2</sub>  
Max. filling pressure: 180 bar  
Min. filling pressure: 25 bar  
Working temperature: 0°C to +80°C  
Temperature related force increase: ± 0.3%/°C  
Max. recommended extensions per minute:  
approx. 80 to 100 (at 20°C)  
Max. piston speed: 1.6 m/s

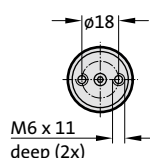
Spring forces as per spring diagram.

Upon customers request, also available unfilled, Order No 2482.22.00000..., Colour: black

2480.22..1



View X - Gas spring



2480.22. .1 Gas spring, small dimension and low force

Order No*	Stroke <sub>max.</sub>	l	l <sub>min.</sub>
2480.22.□□□□□.010.1	10	70	60
2480.22.□□□□□.013.1	12.7	75.4	62.7
2480.22.□□□□□.016.1	16	82	66
2480.22.□□□□□.025.1	25	100	75
2480.22.□□□□□.038.1	38.1	126.2	88.1
2480.22.□□□□□.050.1	50	150	100
2480.22.□□□□□.063.1	63.5	177	113.5
2480.22.□□□□□.080.1	80	210	130
2480.22.□□□□□.100.1	100	250	150
2480.22.□□□□□.125.1	125	300	175

\*complete with initial spring force

**Spring force marking:**

Initial spring force [daN] - Pressure [bar] - Colour:

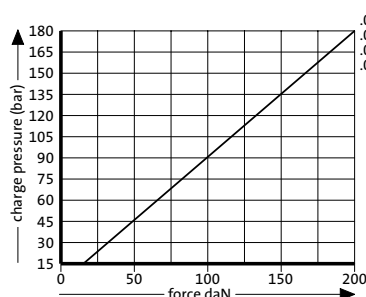
.00050. - 45 - green

.00100. - 90 - blue

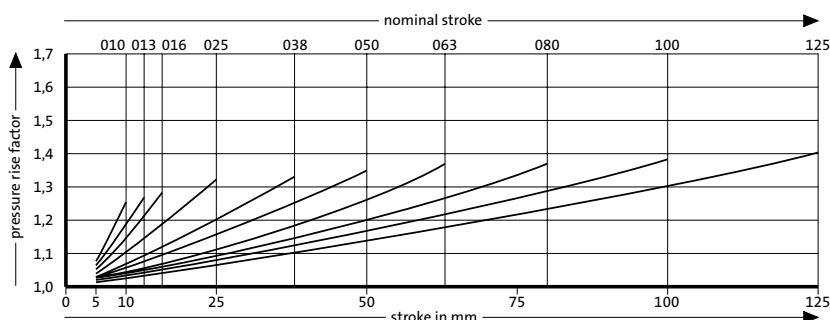
.00150. - 135 - red

.00200. - 180 - yellow

Initial spring force  
versus charge pressure



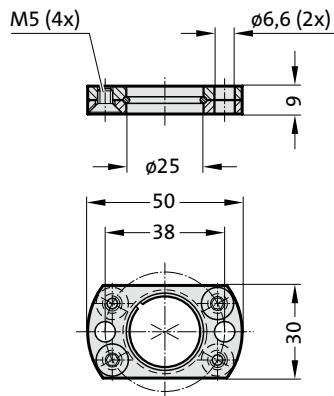
### Spring force Diagram displacement versus stroke rise



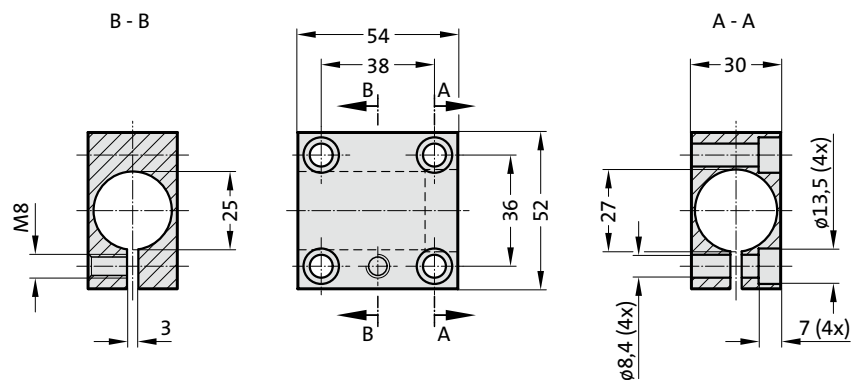
Pressure rise factor accounts for displacement but not external influences!

## Gas spring, small dimension, low force Mounting variations

2480.051.00150



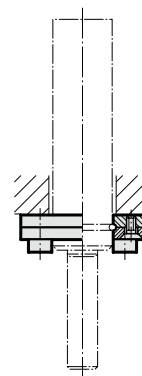
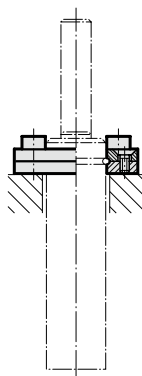
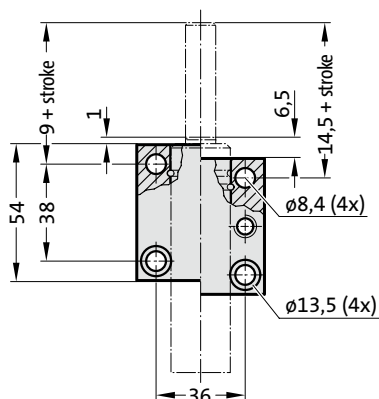
2480.053.00150



### Note:

Only gas spring with a stroke of 25 mm or greater can be attached using the upper groove.  
Only gas spring with a stroke of 38,1 mm or greater can be attached using the lower groove.

### Mounting examples:





## Gas spring, small dimension and low force

### Description:

Gas spring will be delivered unfilled and can only be used in a permanent connection (valveless).

### Note:

Initial spring force at 180 bar = 200 daN

Order No for spare parts kit: 2480.21.00150

Pressure medium: Nitrogen - N<sub>2</sub>

Max. filling pressure: 180 bar

Min. filling pressure: 25 bar

Working temperature: 0°C bis +80°C

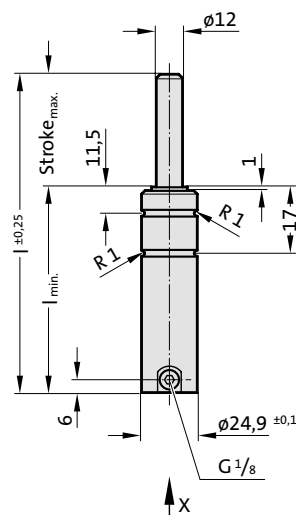
Temperature related force increase:  $\pm 0,3\%/^{\circ}\text{C}$

Max. recommended extensions per minute: ca. 80 to 100 (at 20°C)

Max. piston speed: 1,6 m/s

Spring forces as per spring diagram.

2480.23.



View X

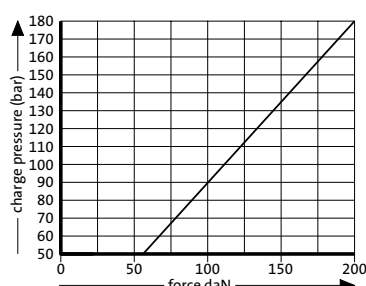


2480.23.

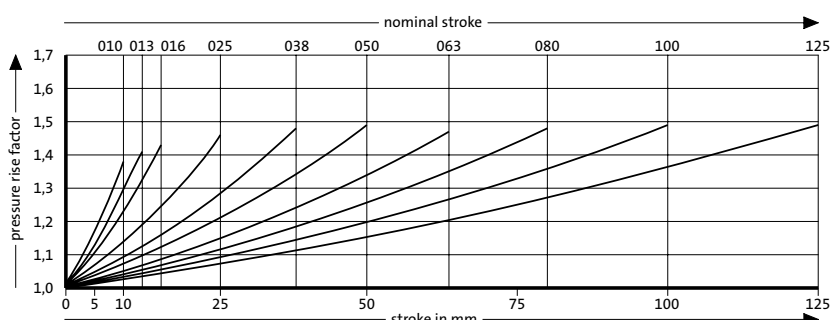
Gas spring, small dimension and low force

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2480.23.00000.010	10	52	62
2480.23.00000.013	12.7	54.7	67.4
2480.23.00000.016	16	58	74
2480.23.00000.025	25	67	92
2480.23.00000.038	38.1	80.1	118.2
2480.23.00000.050	50	92	142
2480.23.00000.063	63.5	108.5	172
2480.23.00000.080	80	125	205
2480.23.00000.100	100	145	245
2480.23.00000.125	125	170	295

Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!



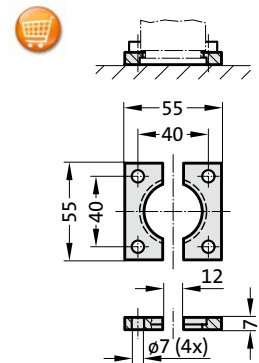


## Gas springs Standard

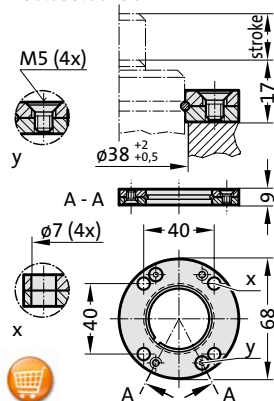


## Gas Spring, Standard Mounting variations

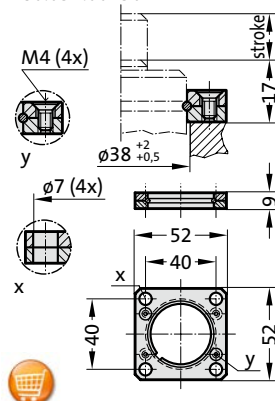
2480.022.00250



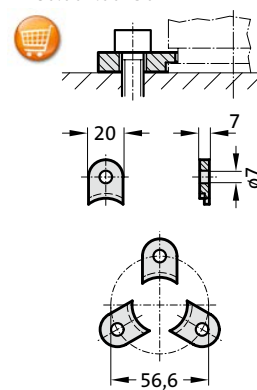
2480.055.00250



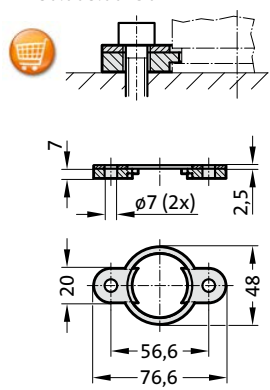
2480.057.00250



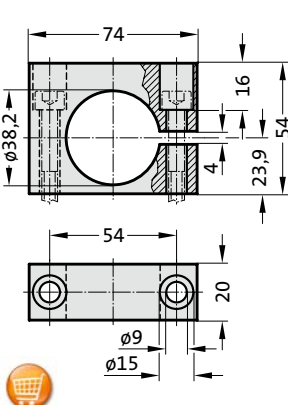
2480.007.00250



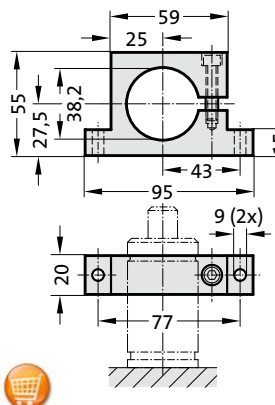
2480.008.00250<sup>3)</sup>



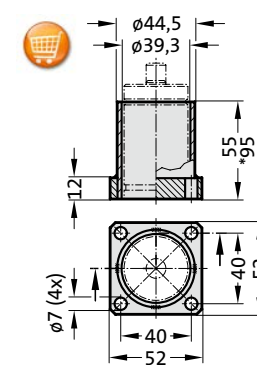
2480.044.03.00250<sup>2)</sup>



2480.044.00250<sup>2)</sup>



2480.010.00250.055<sup>3)</sup>  
2480.010.00250.095<sup>3)</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.



## Gas spring, Standard

### Note:

Initial spring force at 150 bar = 250 daN

Order No for spare parts kit: 2480.13.00250

Pressure medium: Nitrogen  $N_2$

Max. filling pressure: 150 bar

Min. filling pressure: 50 bar

Working temperature: 0°C to +80°C

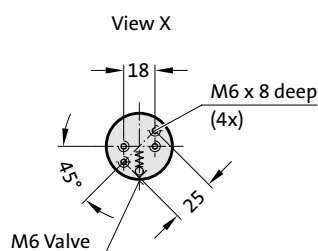
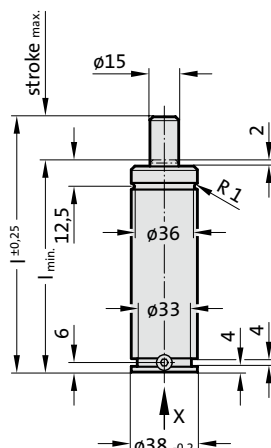
Temperature related force increase:  $\pm 0.3\%/^{\circ}C$

Max. recommended extensions per minute:

approx. 80 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2480.13.00250.

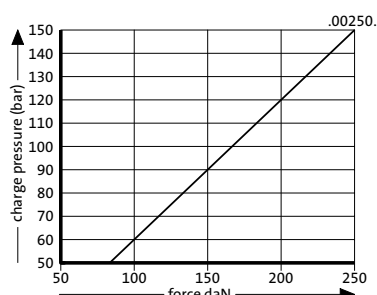


2480.13.00250.

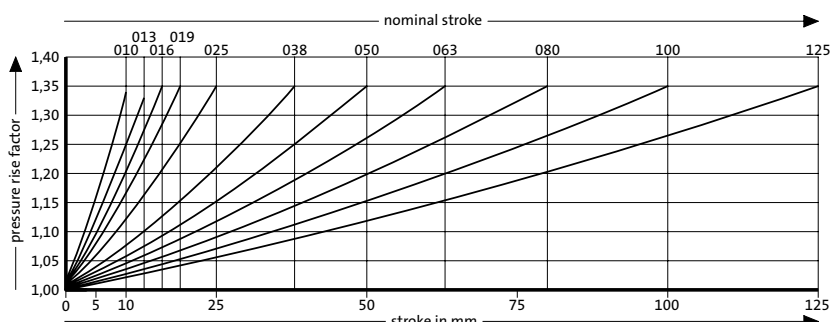
Gas spring, Standard

Order No	Hub <sub>max.</sub>	l <sub>min.</sub>	l
2480.13.00250.010	10	60	70
2480.13.00250.013	12.7	62.7	75.4
2480.13.00250.016	16	66	82
2480.13.00250.019	19	69	88
2480.13.00250.025	25	75	100
2480.13.00250.038	38.1	88.1	126.2
2480.13.00250.050	50	100	150
2480.13.00250.063	63.5	113.5	177
2480.13.00250.080	80	130	210
2480.13.00250.100	100	150	250
2480.13.00250.125	125	175	300

Initial spring force  
versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!





## Gas spring, Standard

Note:

Initial spring force at 150 bar = 470 daN

Order No for spare parts kit: 2480.13.00500

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 50 bar

Working temperature: 0°C to +80°C

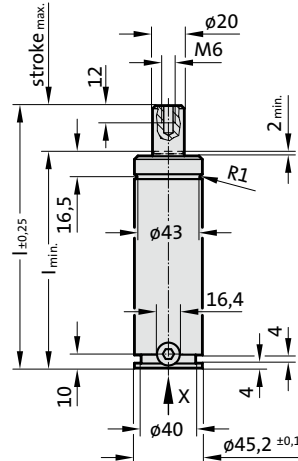
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 40 to 80 (at 20°C)

Max. piston speed: 1.6 m/s

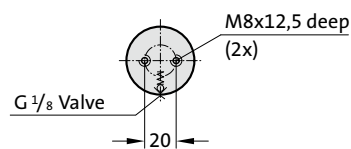
2480.13.00500.



2480.13.00500.

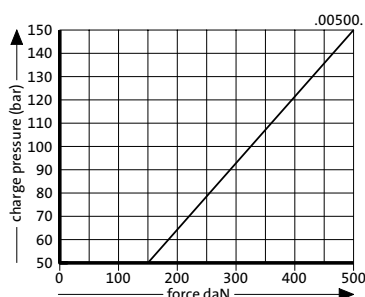
Gas spring, Standard

View X

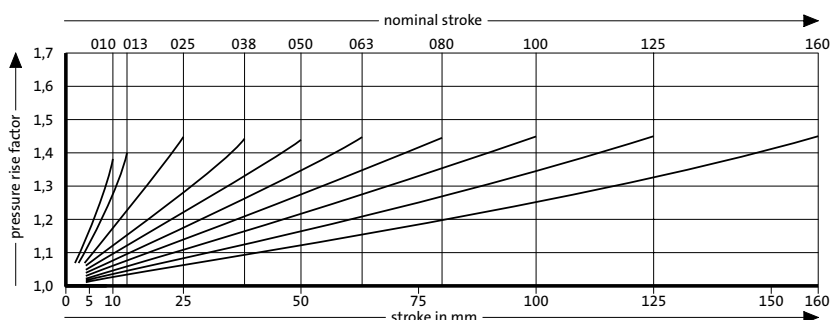


Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2480.13.00500.010	10	95	105
2480.13.00500.013	12.7	97.7	110.4
2480.13.00500.025	25	110	135
2480.13.00500.038	38.1	123.1	161.2
2480.13.00500.050	50	135	185
2480.13.00500.063	63.5	148.5	212
2480.13.00500.080	80	165	245
2480.13.00500.100	100	185	285
2480.13.00500.125	125	210	335
2480.13.00500.160	160	245	405

### Initial spring force versus charge pressure



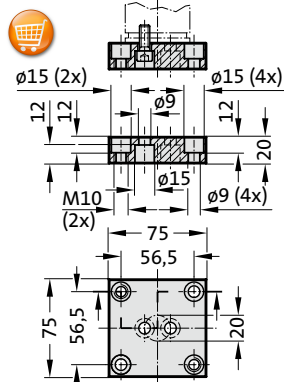
Spring force Diagram displacement versus stroke rise



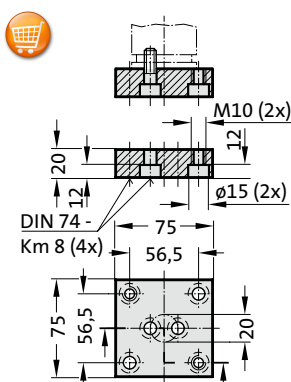
Pressure rise factor accounts for displacement but not external influences!

## Gas Spring, Standard Mounting variations

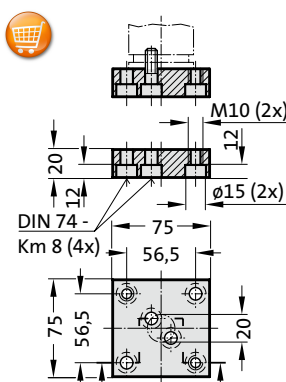
2480.011.00750.3



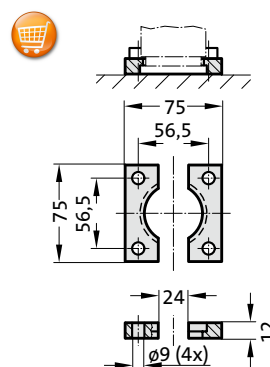
2480.011.00750



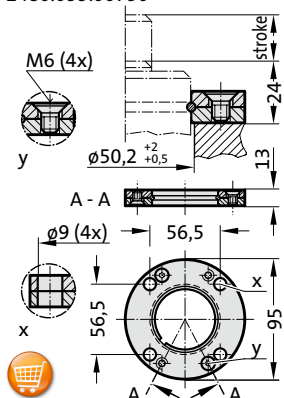
2480.011.00750.1



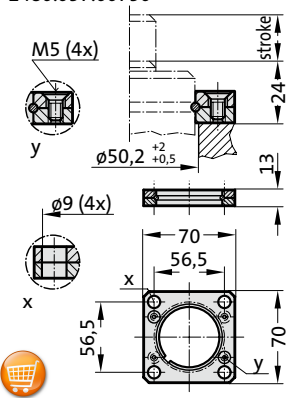
2480.022.00750



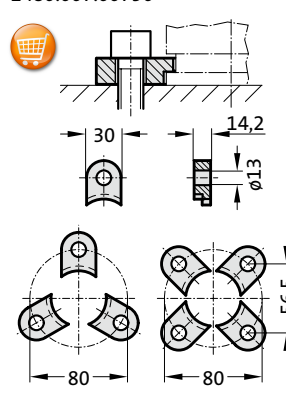
2480.055.00750



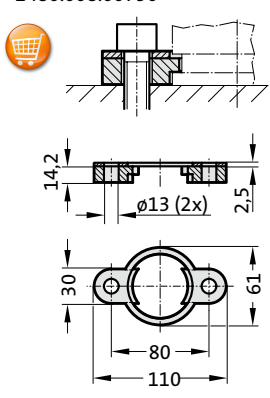
2480.057.00750



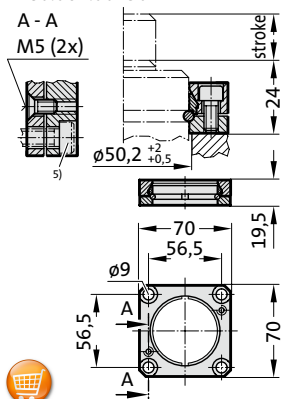
2480.007.00750



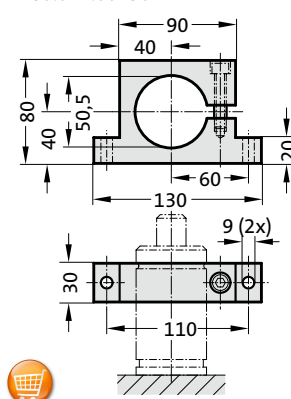
2480.008.00750<sup>3)</sup>



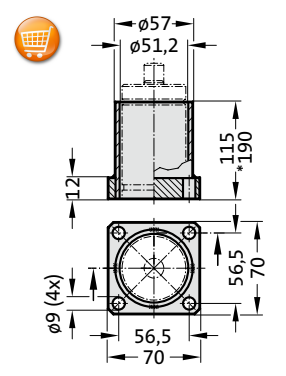
2480.064.00750<sup>4)</sup>



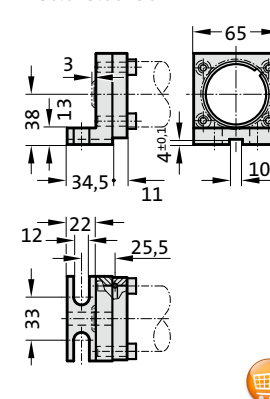
2480.044.00750<sup>2)</sup>



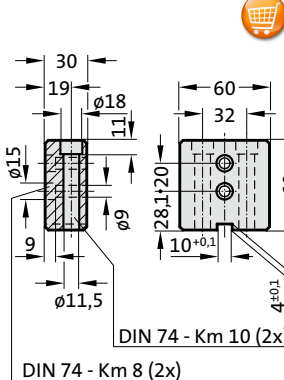
2480.010.00750.115<sup>3)</sup>  
2480.010.00750.190<sup>3)</sup>



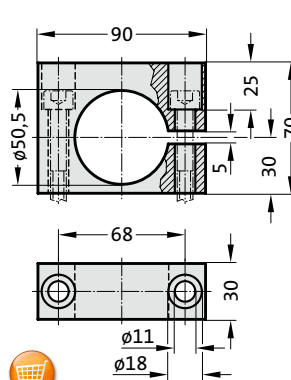
2480.045.00750<sup>2)</sup>



2480.047.00750<sup>2)</sup>



2480.044.03.00750<sup>2)</sup>



### Note:

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

## Gas spring, Standard

Note:

Initial spring force at 150 bar = 750 daN

Order No for spare parts kit: 2480.13.00750

Order No for spare parts kit: to Renault standard EM24.54.700 2480.13.00750.R

Gas spring to Renault standard EM24.54.700

Order No (example): 2480.13.00750. .R

### 1) Special stroke lengths

Not for gas springs to Renault Standard  
EM24.54.700.

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

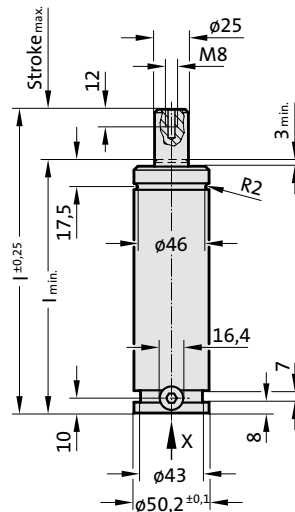
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 15 to 40 (at 20°C)

Max. piston speed: 1.6  
for 2480. ... R: 2.0 m/s

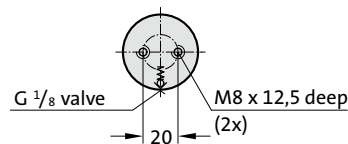
2480.13.00750.



2480.13.00750.

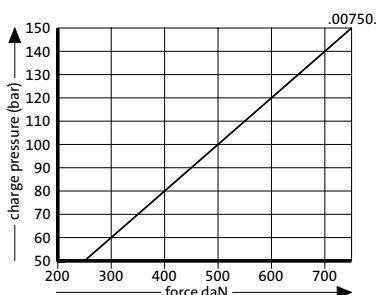
### Gas spring, Standard

View X - Gas spring

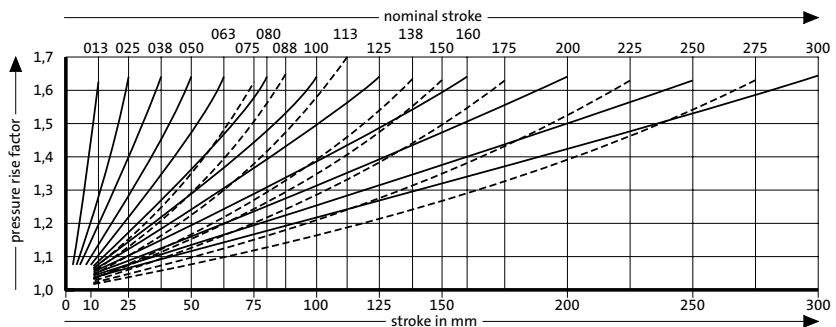


Order No	Stroke <sub>max</sub>	$l_{min}$	$l$
2480.13.00750.013	12.7	107.7	120.4
2480.13.00750.025	25	120	145
2480.13.00750.038	38.1	133.1	171.2
2480.13.00750.050	50	145	195
2480.13.00750.063	63.5	158.5	222
2480.13.00750.075 1)	75	170	245
2480.13.00750.080	80	175	255
2480.13.00750.088 1)	87.5	182.5	270
2480.13.00750.100	100	195	295
2480.13.00750.113 1)	112.5	207.5	320
2480.13.00750.125	125	220	345
2480.13.00750.138 1)	137.5	232.5	370
2480.13.00750.150 1)	150	245	395
2480.13.00750.160	160	255	415
2480.13.00750.175 1)	175	270	445
2480.13.00750.200	200	295	495
2480.13.00750.225 1)	225	320	545
2480.13.00750.250	250	345	595
2480.13.00750.275	275	370	645
2480.13.00750.300	300	395	695

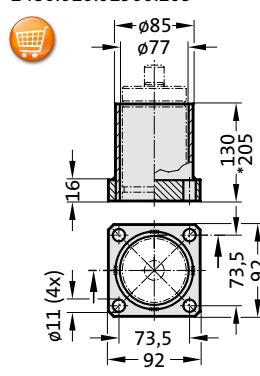
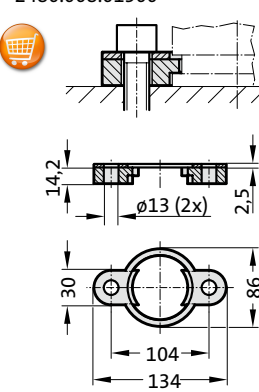
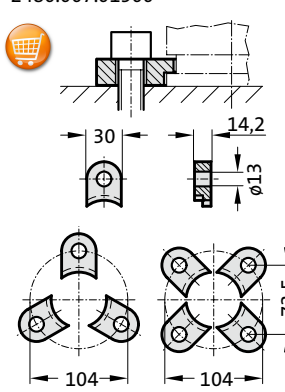
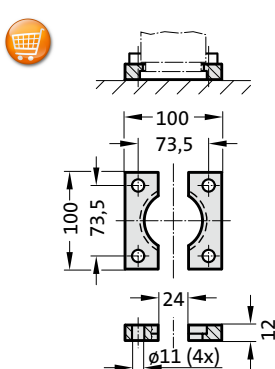
### Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!



**Note:**

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

## Gas spring, Standard

Note:

Initial spring force at 150 bar = 1500 daN

Order No for spare parts kit: 2480.12.01500

Order No for spare parts kit: to Renault standard EM24.54.700 2480.12.01500.R

Gas spring to Renault standard EM24.54.700

Order No (example): 2480.12.01500..R

### 1) Special stroke lengths

Not for gas springs to Renault Standard  
EM24.54.700.

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

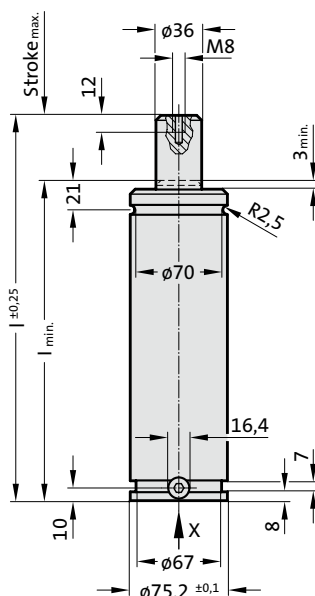
Max. recommended extensions per minute:

approx. 15 to 40 (at 20°C)

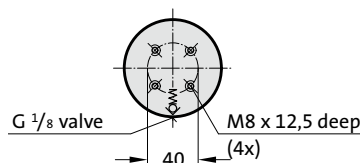
Max. piston speed: 1.6 m/s

for 2480. ... .R: 2.0 m/s

2480.12.01500.



View X - Gas spring

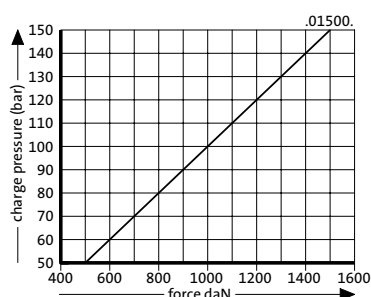


2480.12.01500.

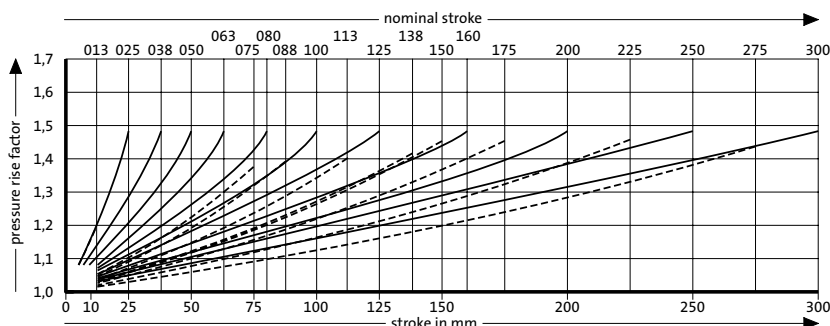
### Gas spring, Standard

Order No		Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2480.12.01500.013	1)	12.7	122.3	135
2480.12.01500.025		25	135	160
2480.12.01500.038		38.1	148.1	186.2
2480.12.01500.050		50	160	210
2480.12.01500.063		63.5	173.5	237
2480.12.01500.075	1)	75	185	260
2480.12.01500.080		80	190	270
2480.12.01500.088	1)	87.5	197.5	285
2480.12.01500.100		100	210	310
2480.12.01500.113	1)	112.5	222.5	335
2480.12.01500.125		125	235	360
2480.12.01500.138	1)	137.5	247.5	385
2480.12.01500.150	1)	150	260	410
2480.12.01500.160		160	270	430
2480.12.01500.175	1)	175	285	460
2480.12.01500.200		200	310	510
2480.12.01500.225	1)	225	335	560
2480.12.01500.250		250	360	610
2480.12.01500.275		275	385	660
2480.12.01500.300		300	410	710

### Initial spring force versus charge pressure



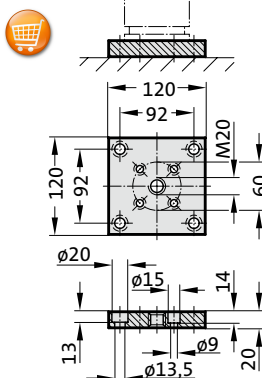
### Spring force Diagram displacement versus stroke rise



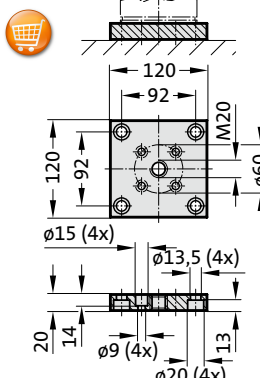
Pressure rise factor accounts for displacement but not external influences!

## Gas spring, Standard Mounting variations

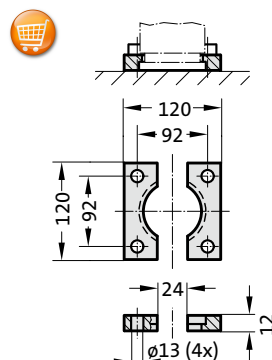
2480.011.03000



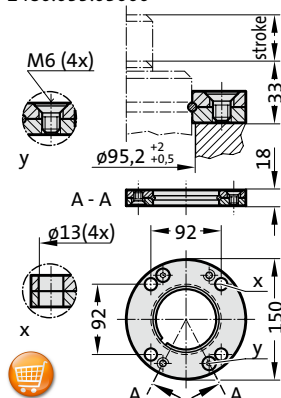
2480.011.03000.2



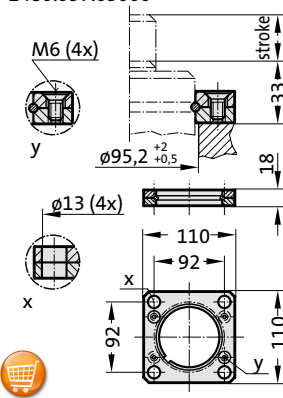
2480.022.03000



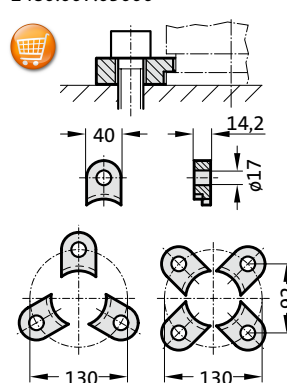
2480.055.03000



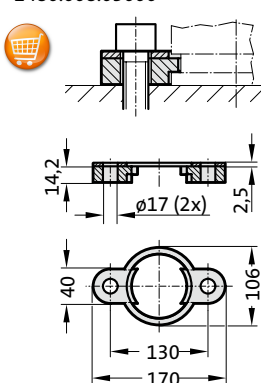
2480.057.03000



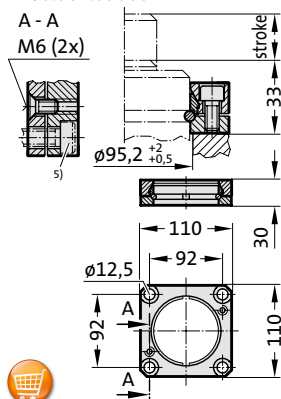
2480.007.03000



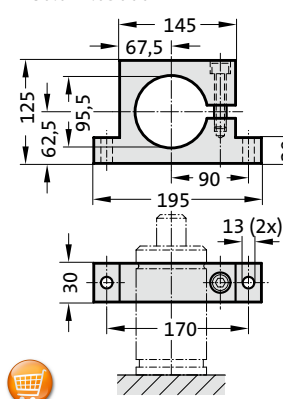
2480.008.03000<sup>3)</sup>



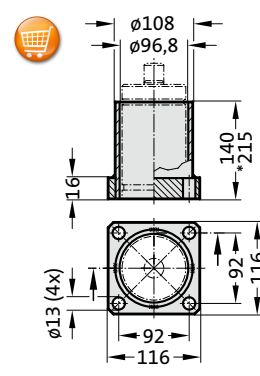
2480.064.03000<sup>4)</sup>



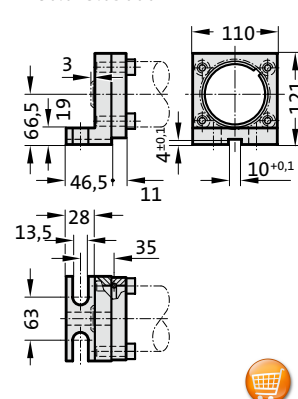
2480.044.03000<sup>2)</sup>



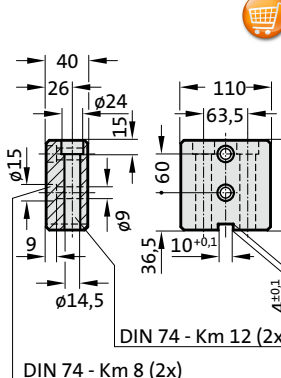
2480.010.03000.140<sup>3)</sup>  
2480.010.03000.215<sup>3)</sup>



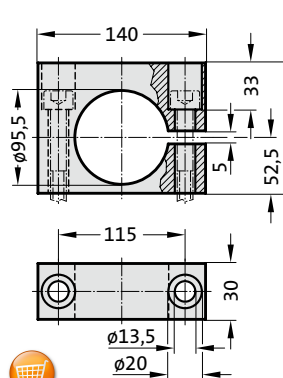
2480.045.03000<sup>2)</sup>



2480.047.03000<sup>2)</sup>



2480.044.03.03000<sup>2)</sup>



### Note:

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

Note:

Initial spring force at 150 bar = 3000 daN

Order No for spare parts kit: 2480.13.03000

Order No for spare parts kit: to Renault standard EM24.54.700 2480.13.03000.R

Gas spring to Renault standard EM24.54.700

Order No (example): 2480.13.03000. .R

### 1) Special stroke lengths

Not for gas springs to Renault Standard  
EM24.54.700.

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

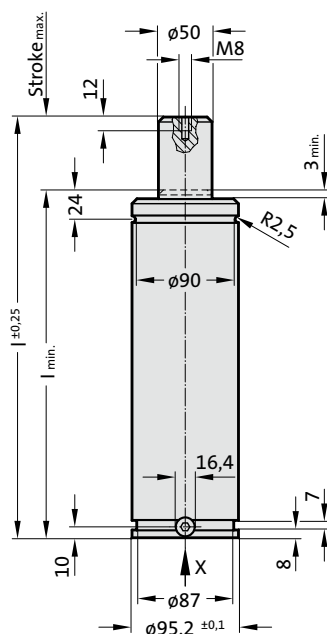
Max. recommended extensions per minute:

approx. 15 to 40 (at 20°C)

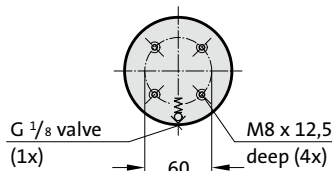
Max. piston speed: 1.6 m/s

for 2480. ... R: 2.0 m/s

2480.13.03000.



View X - Gas spring

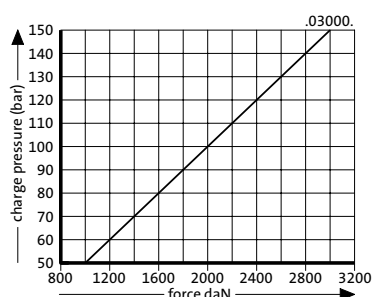


2480.13.03000.

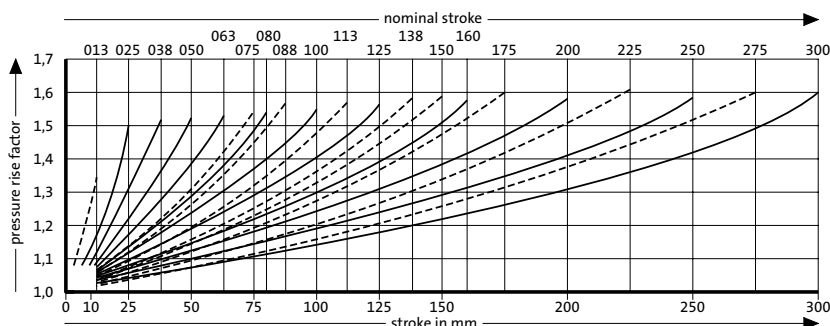
Gas spring, Standard

Order No		Stroke <sub>max.</sub>	I <sub>min.</sub>	I
2480.13.03000.013	1)	12.7	132.3	145
2480.13.03000.025		25	145	170
2480.13.03000.038		38.1	158.1	196.2
2480.13.03000.050		50	170	220
2480.13.03000.063		63.5	183.5	247
2480.13.03000.075	1)	75	195	270
2480.13.03000.080		80	200	280
2480.13.03000.088.1	1)	87.5	207.5	295
2480.13.03000.100		100	220	320
2480.13.03000.113	1)	112.5	232.5	345
2480.13.03000.125		125	245	370
2480.13.03000.138	1)	137.5	257.5	395
2480.13.03000.150	1)	150	270	420
2480.13.03000.160		160	280	440
2480.13.03000.175	1)	175	295	470
2480.13.03000.200		200	320	520
2480.13.03000.225	1)	225	345	570
2480.13.03000.250		250	370	620
2480.13.03000.275	1)	275	395	670
2480.13.03000.300		300	420	720

Initial spring force  
versus charge pressure



### Spring force Diagram displacement versus stroke rise

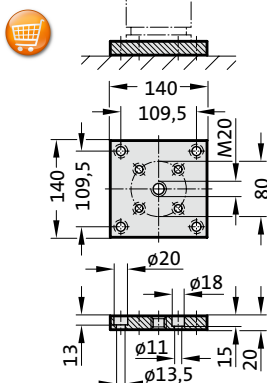


Pressure rise factor accounts for displacement but not external influences!

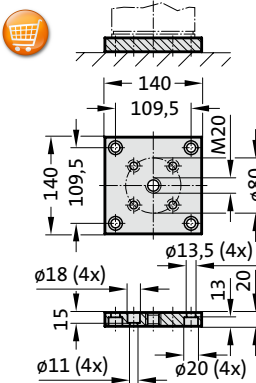


## Gas spring, Standard Mounting variations

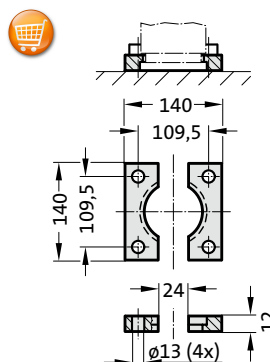
2480.011.05000



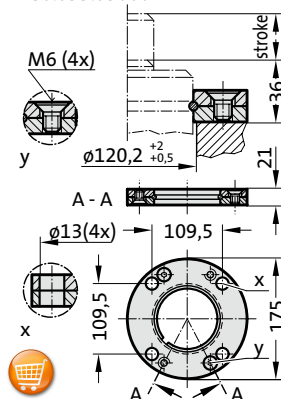
2480.011.05000.2



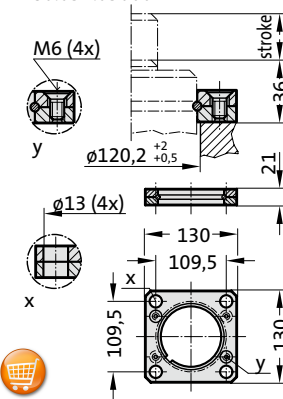
2480.022.05000



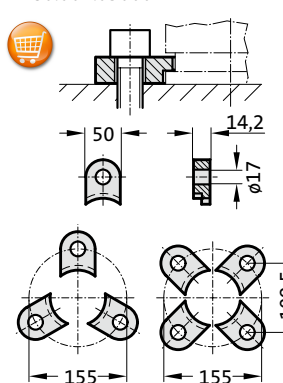
2480.055.05000



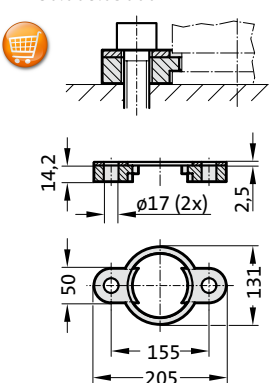
2480.057.05000



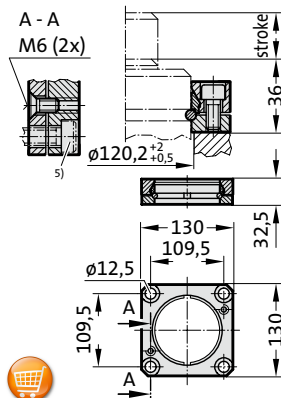
2480.007.05000



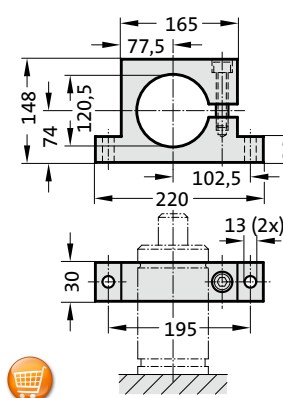
2480.008.05000<sup>3)</sup>



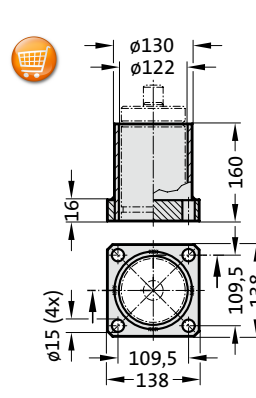
2480.064.05000<sup>4)</sup>



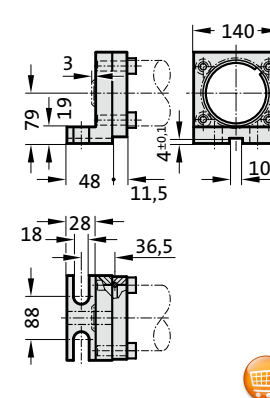
2480.044.05000<sup>2)</sup>



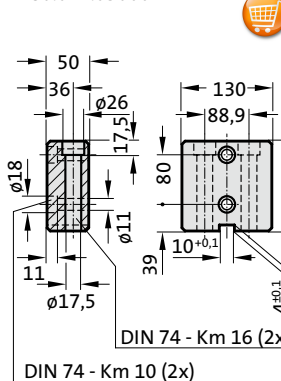
2480.010.05000.160<sup>3)</sup>



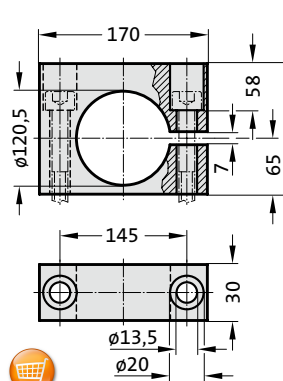
2480.045.05000<sup>2)</sup>



2480.047.05000<sup>2)</sup>



2480.044.03.05000<sup>2)</sup>



### Note:

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



## Gas spring, Standard

Note:

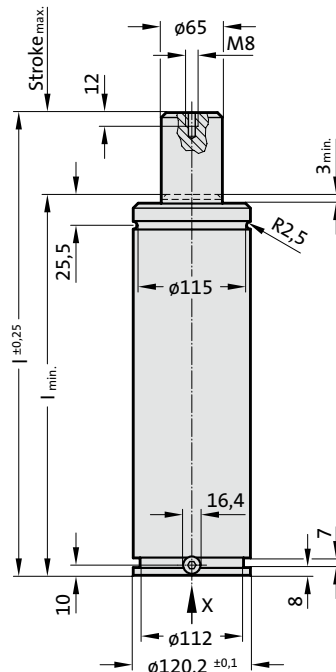
Initial spring force at 150 bar = 5000 daN

Order No for spare parts kit: 2480.13.05000  
Order No for spare parts kit: to Renault standard EM24.54.700 2480.13.05000.R  
Gas spring to Renault standard EM24.54.700  
Order No (example): 2480.13.05000. .R

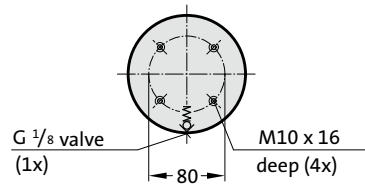
1) Special stroke lengths  
Not for gas springs to Renault Standard  
EM24.54.700.

Pressure medium: Nitrogen N<sub>2</sub>  
 Max. filling pressure: 150 bar  
 Min. filling pressure: 25 bar  
 Working temperature: 0°C to +80°C  
 Temperature related force increase: ± 0.3%/°C  
 Max. recommended extensions per minute:  
 approx. 15 to 40 (at 20°C)  
 Max. piston speed: 1.6 m/s  
 for 2480 ... R: 2.0 m/s

2480.13.05000.



View X - Gas spring

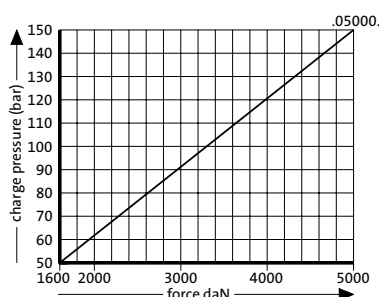


2480.13.05000.

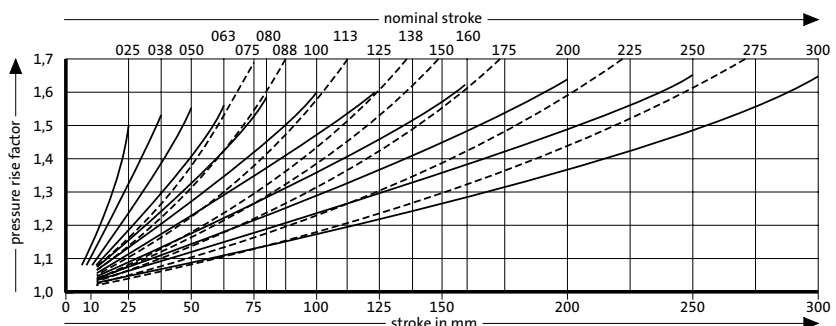
Gas spring, Standard

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2480.13.05000.025	25	165	190
2480.13.05000.038	38.1	178.1	216.2
2480.13.05000.050	50	190	240
2480.13.05000.063	63.5	203.5	267
2480.13.05000.075 1)	75	215	290
2480.13.05000.080	80	220	300
2480.13.05000.088 1)	87.5	227.5	315
2480.13.05000.100	100	240	340
2480.13.05000.113 1)	112.5	252.5	365
2480.13.05000.125	125	265	390
2480.13.05000.138 1)	137.5	277.5	415
2480.13.05000.150 1)	150	290	440
2480.13.05000.160	160	300	460
2480.13.05000.175 1)	175	315	490
2480.13.05000.200	200	340	540
2480.13.05000.225 1)	225	365	590
2480.13.05000.250	250	390	640
2480.13.05000.275 1)	275	415	690
2480.13.05000.300	300	440	740

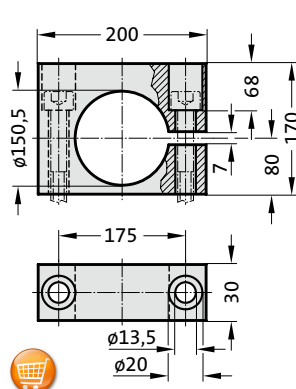
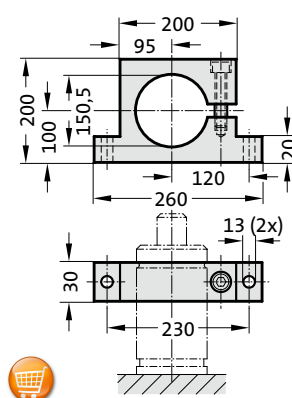
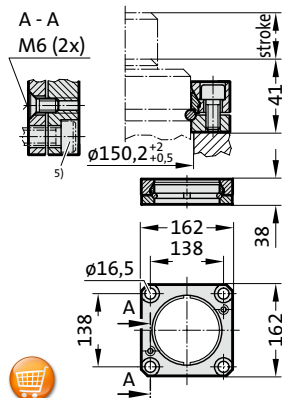
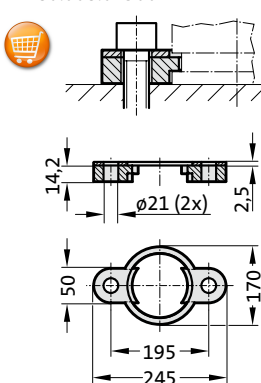
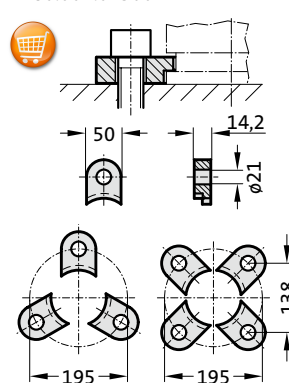
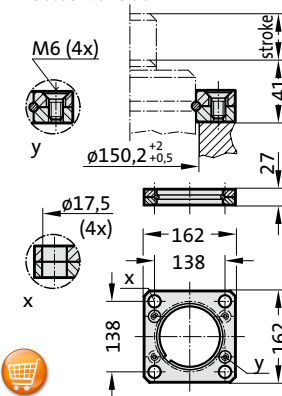
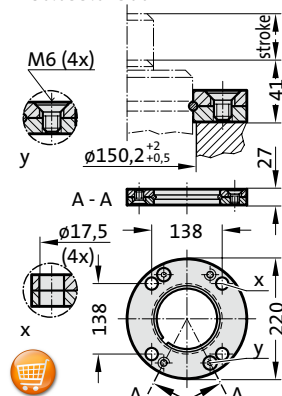
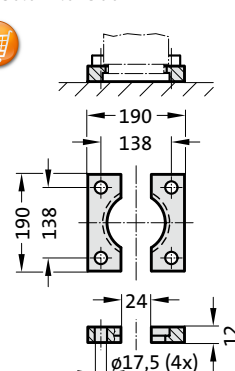
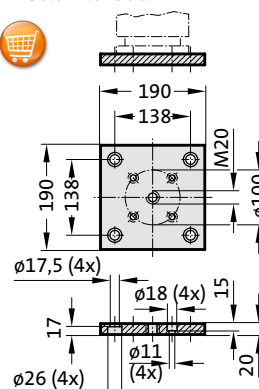
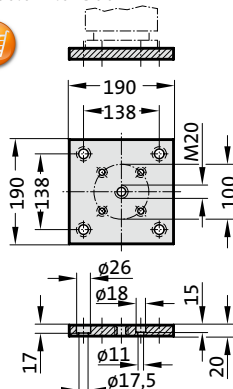
### Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!



Note:

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

Note:

Initial spring force at 150 bar = 7500 daN

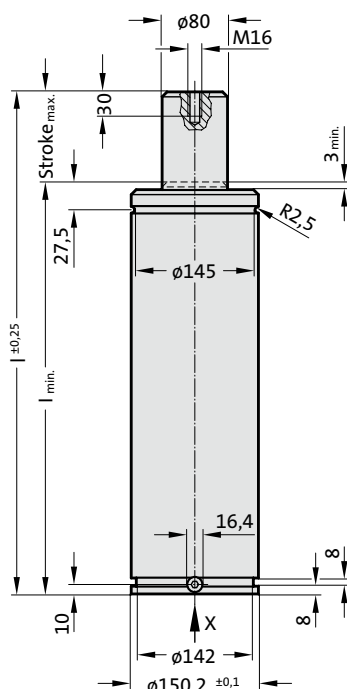
Order No for spare parts kit: 2480.13.07500  
Order No for spare parts kit: to Renault standard EM24.54.700 2480.13.07500.R  
Gas spring to Renault standard EM24.54.700  
Order No (example): 2480.13.07500. .R

### 1) Special stroke lengths

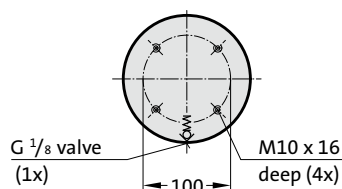
Not for gas springs to Renault Standard  
EM24.54.700.

Pressure medium: Nitrogen N<sub>2</sub>  
 Max. filling pressure: 150 bar  
 Min. filling pressure: 25 bar  
 Working temperature: 0°C to +80°C  
 Temperature related force increase: ± 0.3%/°C  
 Max. recommended extensions per minute:  
 approx. 15 to 40 (at 20°C)  
 Max. piston speed: 1.6 m/s  
 for 2480 ... R: 2.0 m/s

2480.13.07500.



View X - Gas spring

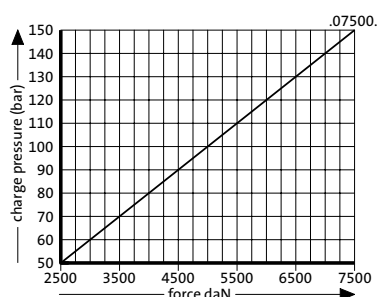


2480.13.07500.

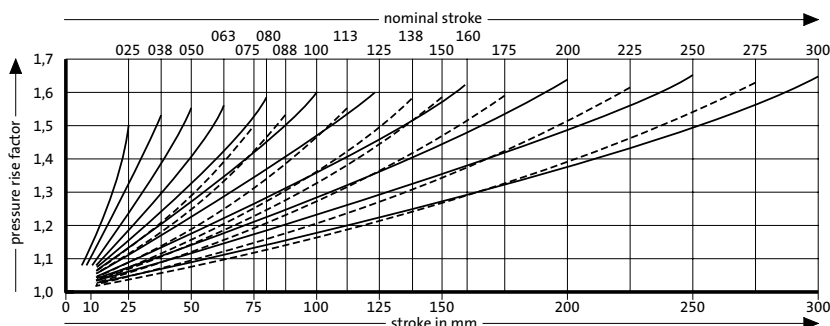
Gas spring, Standard

Order No		Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2480.13.07500.025		25	180	205
2480.13.07500.038		38.1	193.1	231.2
2480.13.07500.050		50	205	255
2480.13.07500.063		63.5	218.5	282
2480.13.07500.075	1)	75	230	305
2480.13.07500.080		80	235	315
2480.13.07500.088	1)	87.5	242.5	330
2480.13.07500.100		100	255	355
2480.13.07500.113	1)	112.5	267.5	380
2480.13.07500.125		125	280	405
2480.13.07500.138	1)	137.5	292.5	430
2480.13.07500.150	1)	150	305	455
2480.13.07500.160		160	315	475
2480.13.07500.175	1)	175	330	505
2480.13.07500.200		200	355	555
2480.13.07500.225	1)	225	380	605
2480.13.07500.250		250	405	655
2480.13.07500.275	1)	275	430	705
2480.13.07500.300		300	455	755

### Initial spring force versus charge pressure



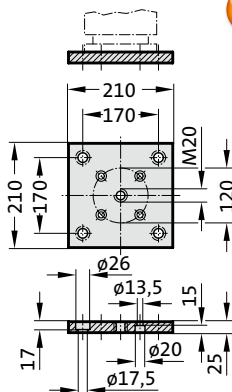
### Spring force Diagram displacement versus stroke rise



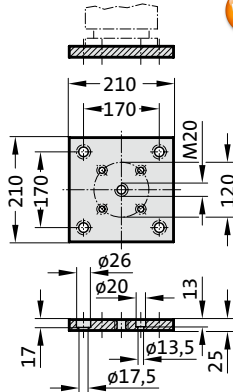
Pressure rise factor accounts for displacement but not external influences!

## Gas spring, Standard Mounting variations

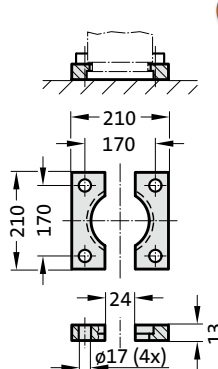
2480.011.10000.2



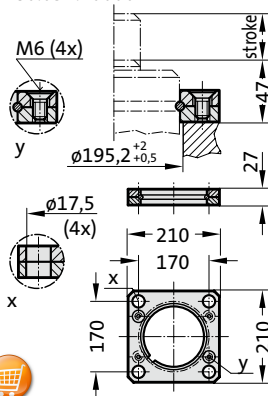
2480.011.10000



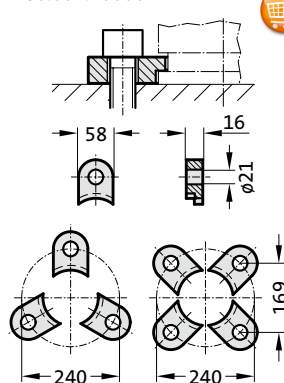
2480.022.10000



2480.057.10000



2480.007.10000



Note:

Initial spring force at 150 bar = 10000 daN

Order No for spare parts kit: 2480.12.10000

Gas spring to Renault standard EM24.54.700

Order No (example): 2480.12.10000..R

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

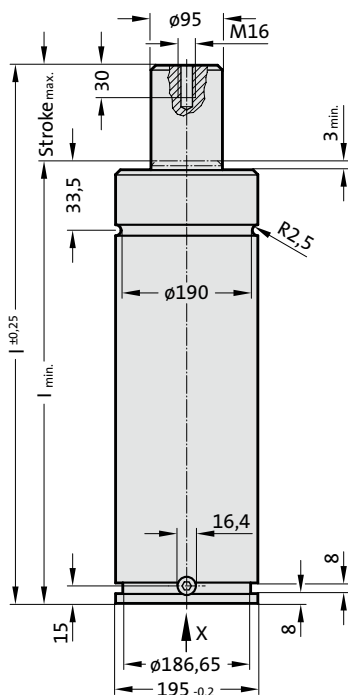
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

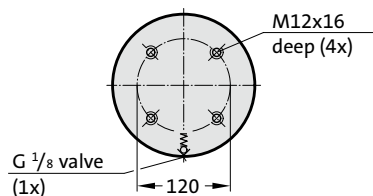
approx. 15 to 40 (at 20°C)

Max. piston speed: 1.6 m/s

2480.12.10000.



View X - Gas spring

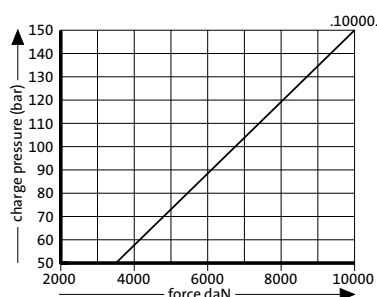


2480.12.10000.

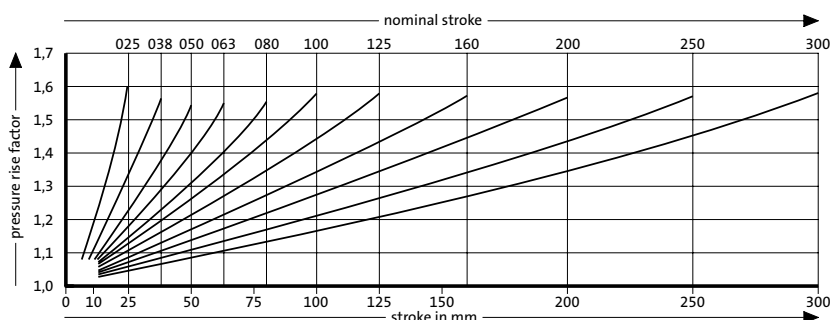
Gas spring, Standard

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2480.12.10000.025	25	185	210
2480.12.10000.038	38.1	198.1	236.2
2480.12.10000.050	50	210	260
2480.12.10000.063	63.5	223.5	287
2480.12.10000.080	80	240	320
2480.12.10000.100	100	260	360
2480.12.10000.125	125	285	410
2480.12.10000.160	160	320	480
2480.12.10000.200	200	360	560
2480.12.10000.250	250	410	660
2480.12.10000.300	300	460	760

### Initial spring force versus charge pressure



### Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!



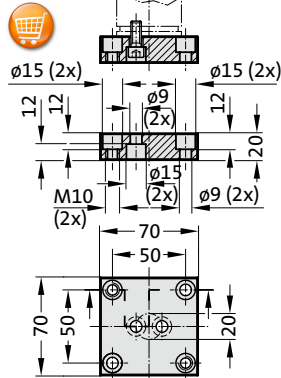


# Gas springs HEAVY DUTY

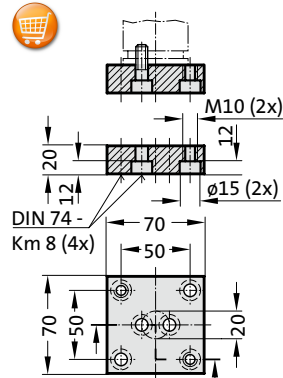


## Gas Spring, HEAVY DUTY Mounting variations

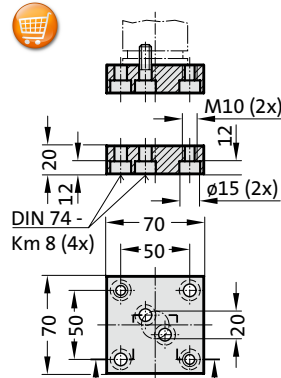
2480.011.00500.2



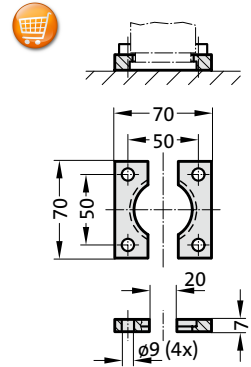
2480.011.00500



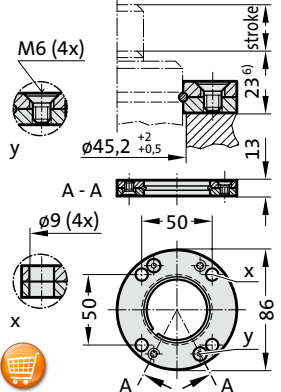
2480.011.00500.1



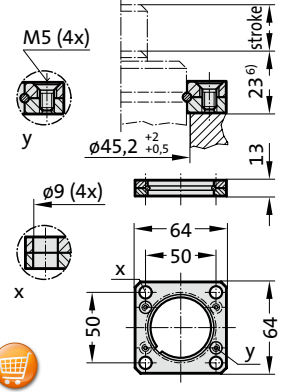
2480.022.00500



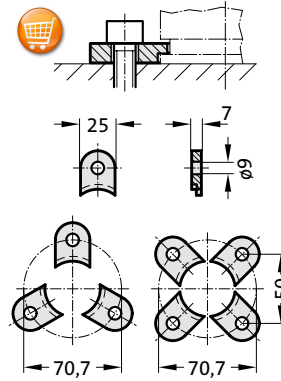
2480.055.00500



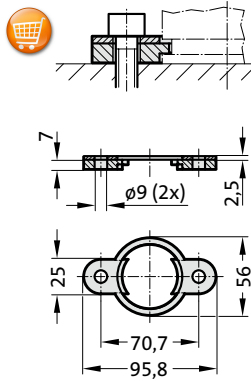
2480.057.00500



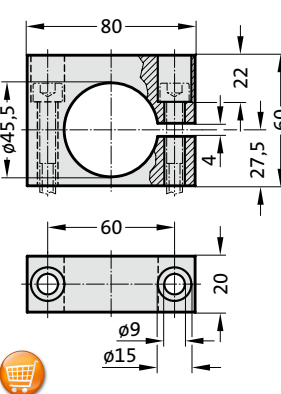
2480.007.00500



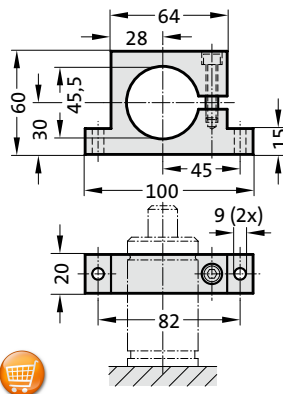
2480.008.00500<sup>3)</sup>



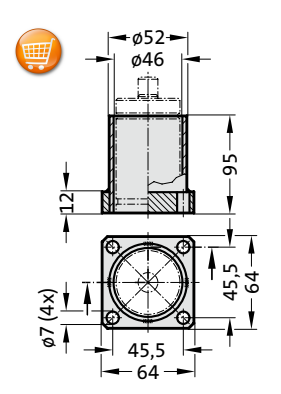
2480.044.03.00500<sup>2)</sup>



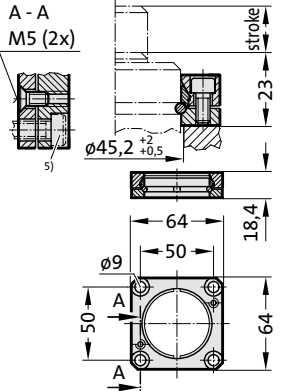
2480.044.00500<sup>2)</sup>



2480.010.00500.095<sup>3)</sup>



2480.064.00500<sup>4)</sup>



### Note:

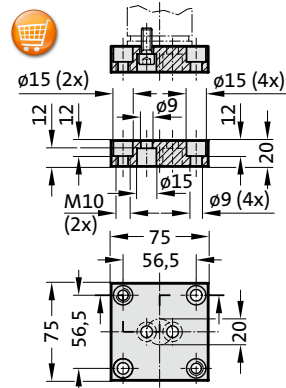
- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop surface!
- <sup>3)</sup> Not for use with composite connection.
- <sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.
- <sup>5)</sup> Machine screws with hexagonal socket (compact head recommended)
- <sup>6)</sup> Installation height increased from 22 mm to 23 mm according to VDI 3003.



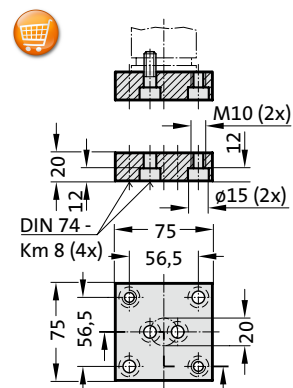


## Gas spring HEAVY DUTY Mounting variations

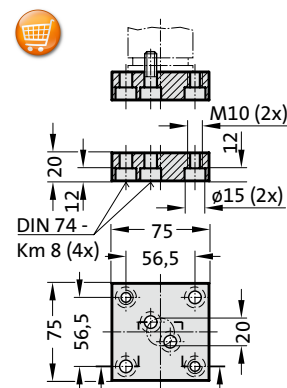
2480.011.00750.3



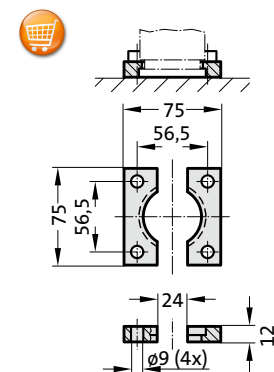
2480.011.00750



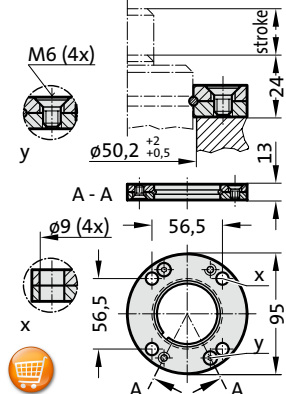
2480.011.00750.1



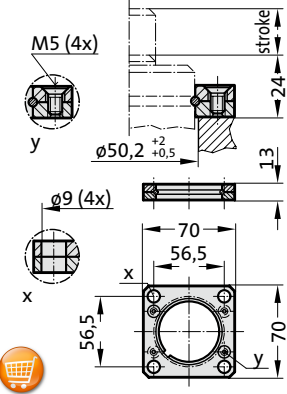
2480.022.00750



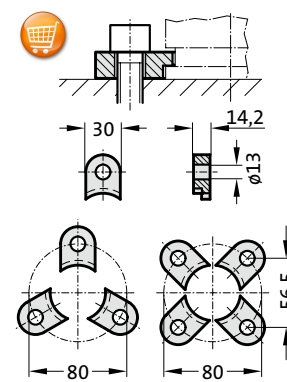
2480.055.00750



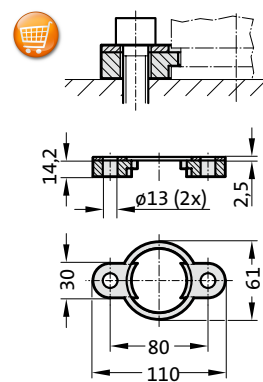
2480.057.00750



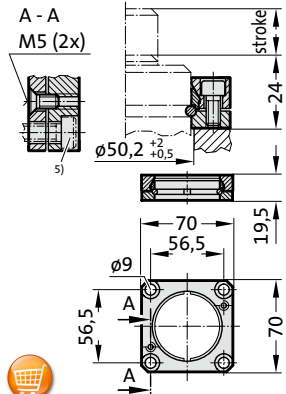
2480.007.00750



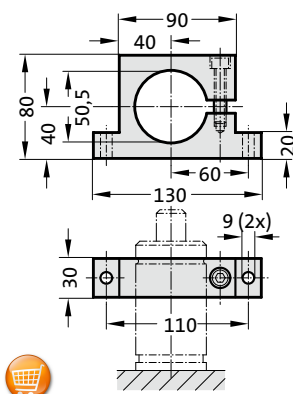
2480.008.00750<sup>3)</sup>



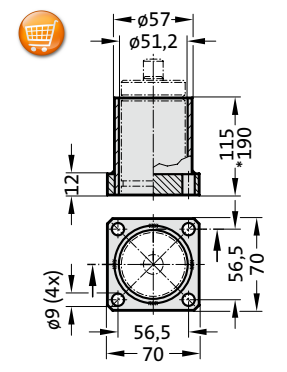
2480.064.00750<sup>4)</sup>



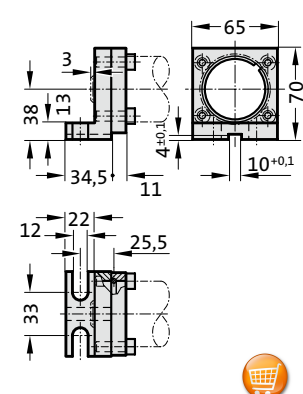
2480.044.00750<sup>2)</sup>



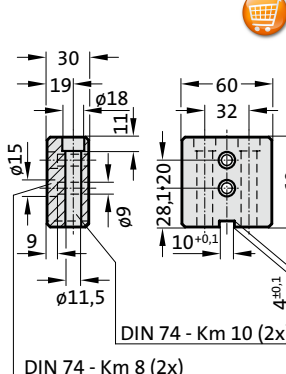
2480.010.00750.115<sup>3)</sup>  
2480.010.00750.190<sup>3)</sup>



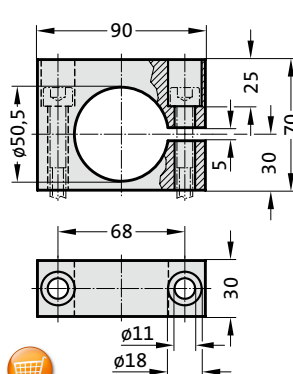
2480.045.00750<sup>2)</sup>



2480.047.00750<sup>2)</sup>



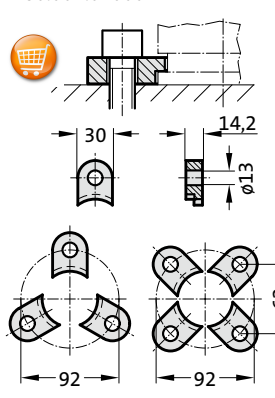
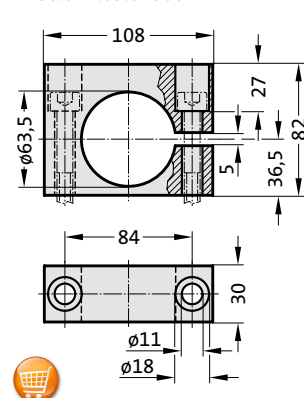
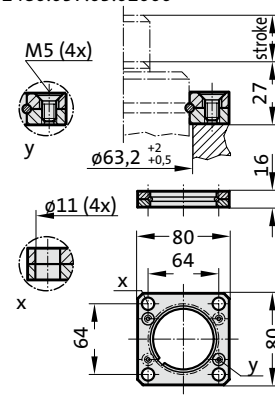
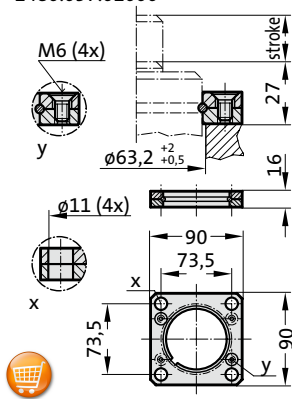
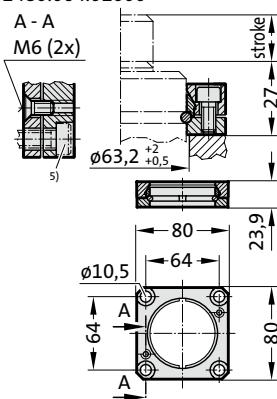
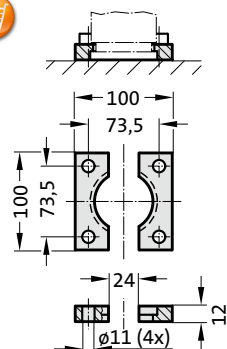
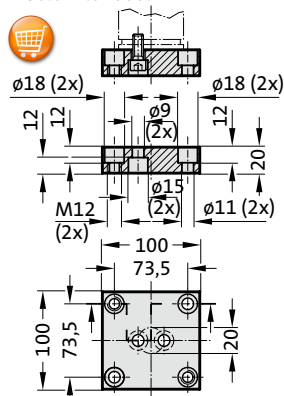
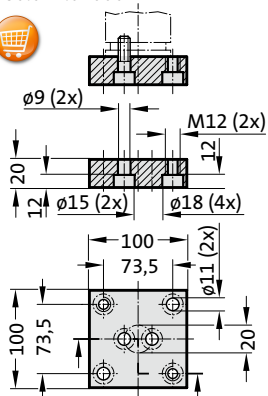
2480.044.03.00750<sup>2)</sup>



### Note:

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

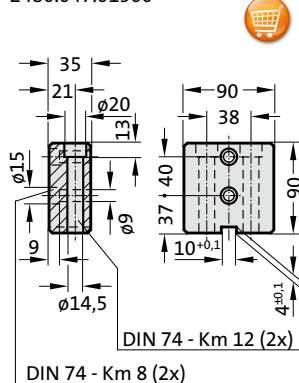
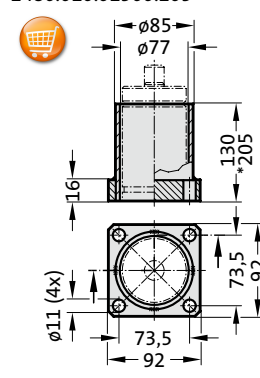
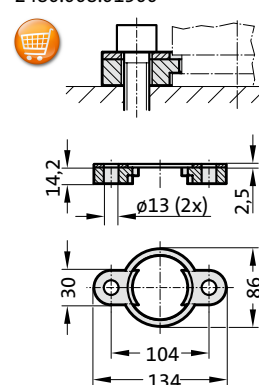
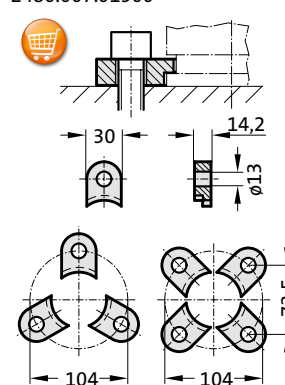
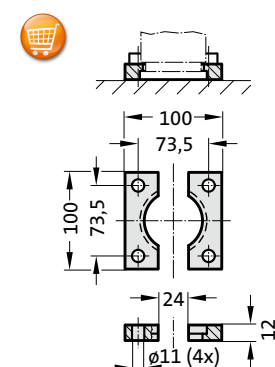




**Note:**

- 2) **Attention:**  
The spring force must be absorbed by the stop surface!
- 4) Square collar flange, non-rotating, fixing for composite connection.
- 5) Machine screws with hexagonal socket (compact head recommended)





**Note:**

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



Note:

Initial spring force at 150 bar = 2400 daN

Order No for spare parts kit: 2488.13.02400

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

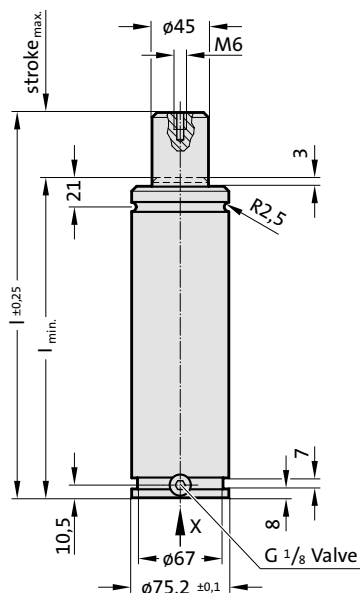
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

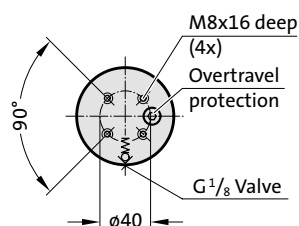
approx. 15 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2488.13.02400.



View X

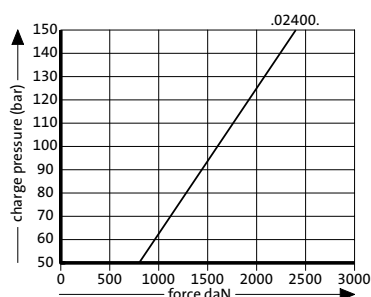


2488.13.02400.

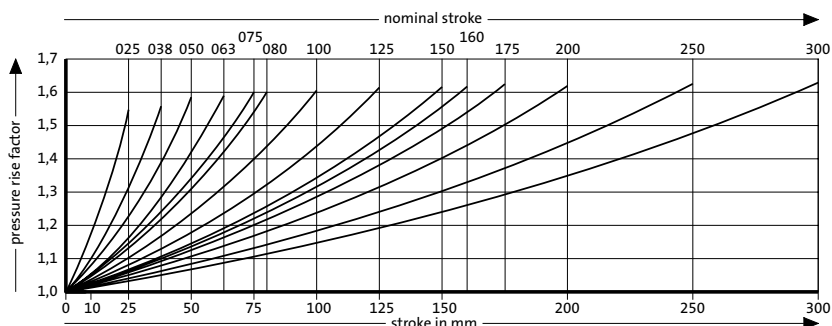
## Gas spring HEAVY DUTY

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2488.13.02400.025	25	135	160
2488.13.02400.038	38	148	186
2488.13.02400.050	50	160	210
2488.13.02400.063	63	173	236
2488.13.02400.075	75	185	260
2488.13.02400.080	80	190	270
2488.13.02400.100	100	210	310
2488.13.02400.125	125	235	360
2488.13.02400.150	150	260	410
2488.13.02400.160	160	270	430
2488.13.02400.175	175	285	460
2488.13.02400.200	200	310	510
2488.13.02400.250	250	360	610
2488.13.02400.300	300	410	710

### Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise

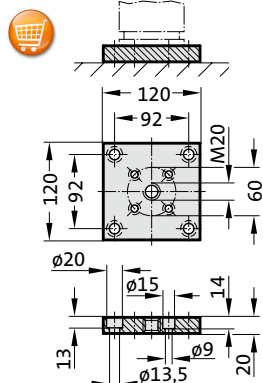


Pressure rise factor accounts for displacement but not external influences!

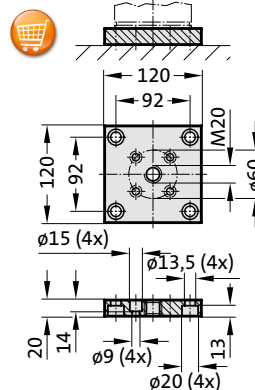


## Gas spring HEAVY DUTY Mounting variations

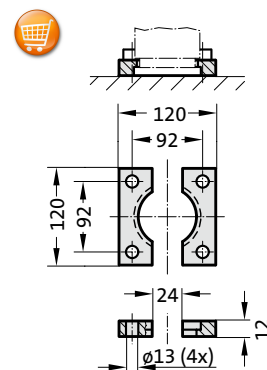
2480.011.03000



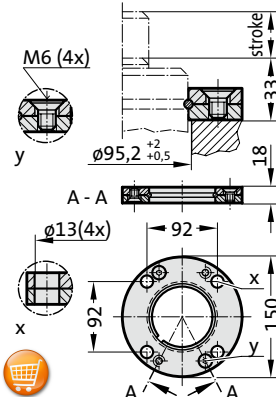
2480.011.03000.2



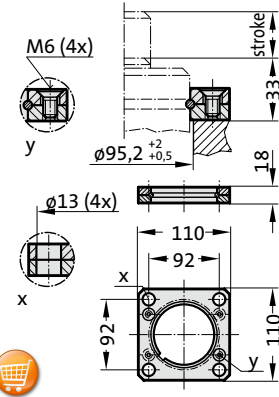
2480.022.03000



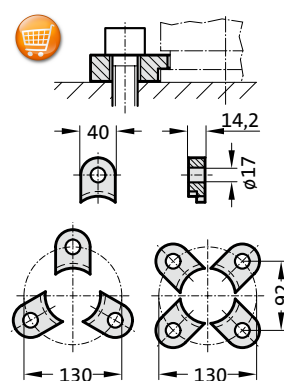
2480.055.03000



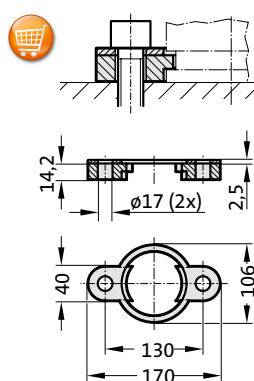
2480.057.03000



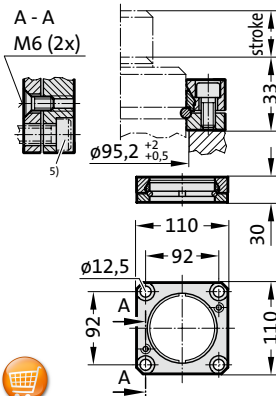
2480.007.03000



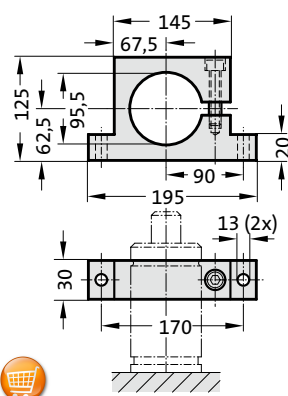
2480.008.03000<sup>3)</sup>



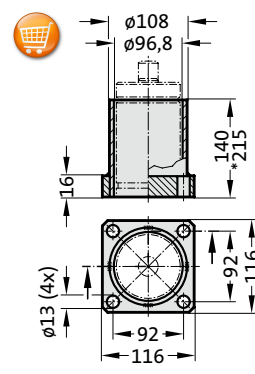
2480.064.03000<sup>4)</sup>



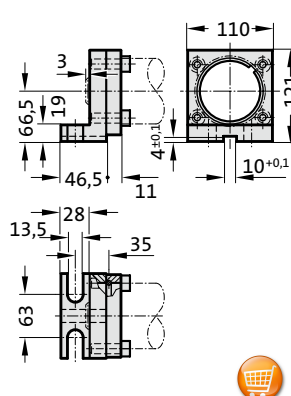
2480.044.03000<sup>2)</sup>



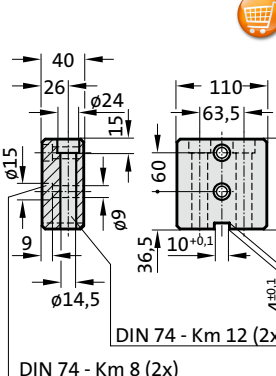
2480.010.03000.140<sup>3)</sup>  
2480.010.03000.215\*<sup>3)</sup>



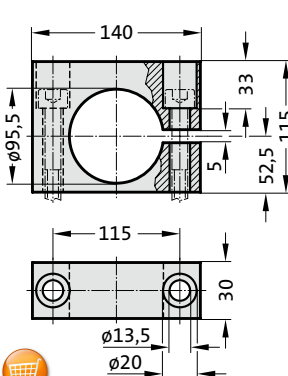
2480.045.03000<sup>2)</sup>



2480.047.03000<sup>2)</sup>



2480.044.03.03000<sup>2)</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)





## Gas spring HEAVY DUTY

### Note:

Initial spring force at 150 bar = 4200 daN

Order No for spare parts kit: 2488.13.04200

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

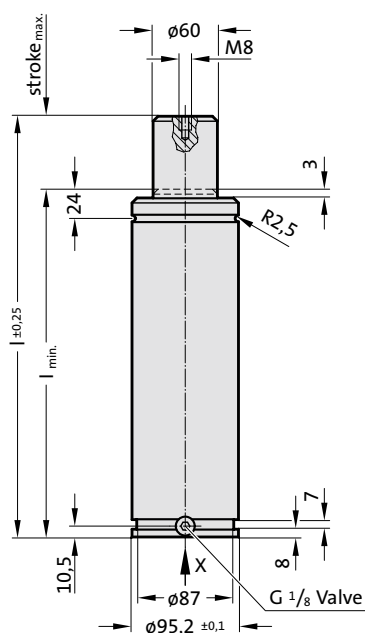
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

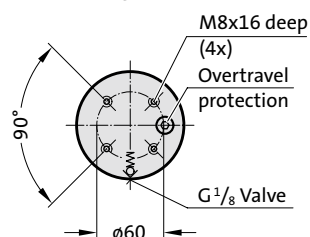
approx. 15 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2488.13.04200.



View X

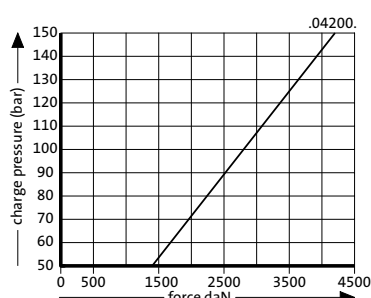


2488.13.04200.

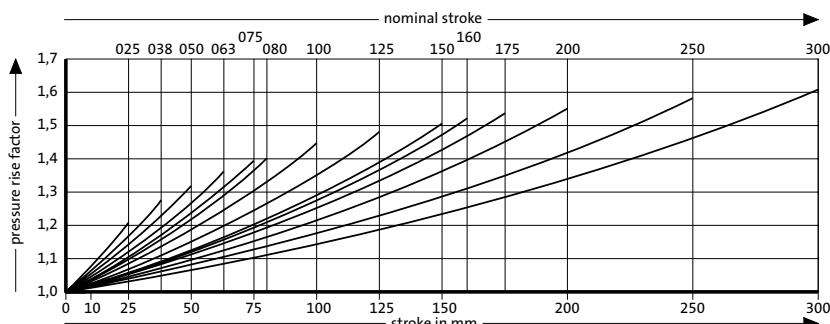
### Gas spring HEAVY DUTY

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2488.13.04200.025	25	145	170
2488.13.04200.038	38	158	196
2488.13.04200.050	50	170	220
2488.13.04200.063	63	183	246
2488.13.04200.075	75	195	270
2488.13.04200.080	80	200	280
2488.13.04200.100	100	220	320
2488.13.04200.125	125	245	370
2488.13.04200.150	150	270	420
2488.13.04200.160	160	280	440
2488.13.04200.175	175	295	470
2488.13.04200.200	200	320	520
2488.13.04200.250	250	370	620
2488.13.04200.300	300	420	720

Initial spring force  
versus charge pressure



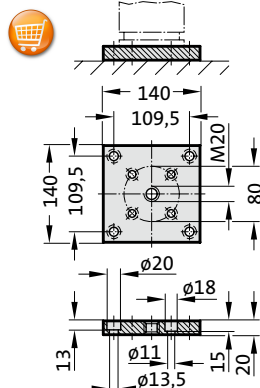
Spring force Diagram displacement versus stroke rise



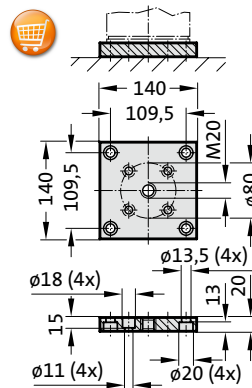
Pressure rise factor accounts for displacement but not external influences!

## Gas spring HEAVY DUTY Mounting variations

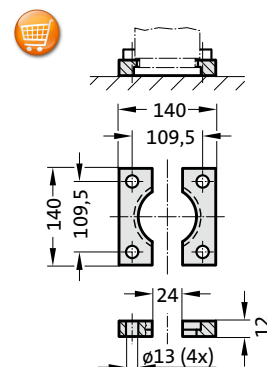
2480.011.05000



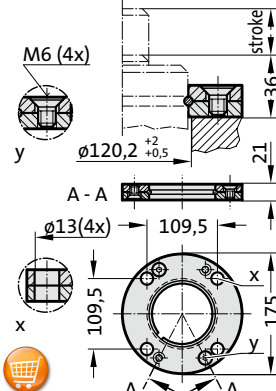
2480.011.05000.2



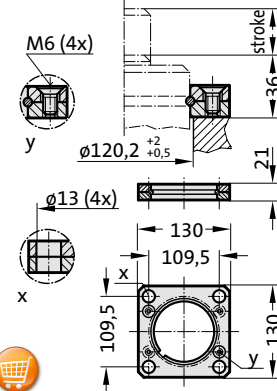
2480.022.05000



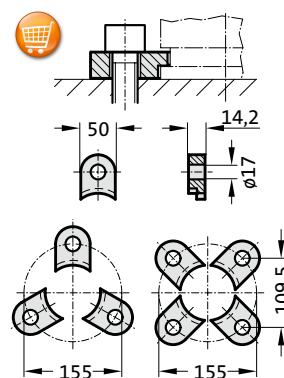
2480.055.05000



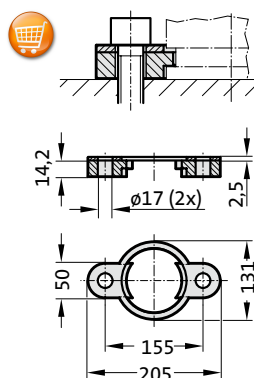
2480.057.05000



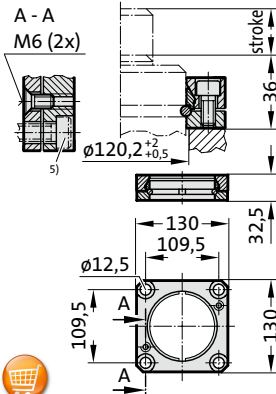
2480.007.05000



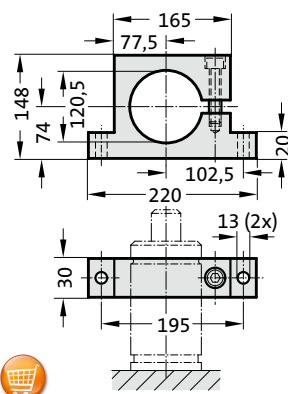
2480.008.05000<sup>3)</sup>



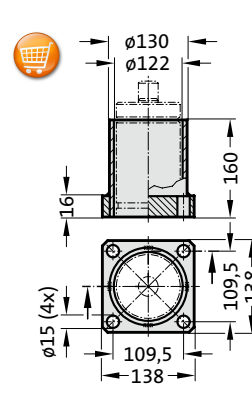
2480.064.05000<sup>4)</sup>



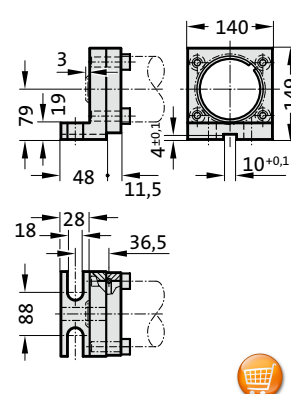
2480.044.05000<sup>2)</sup>



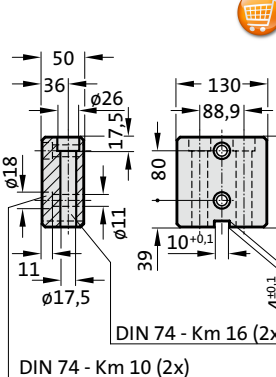
2480.010.05000.160<sup>3)</sup>



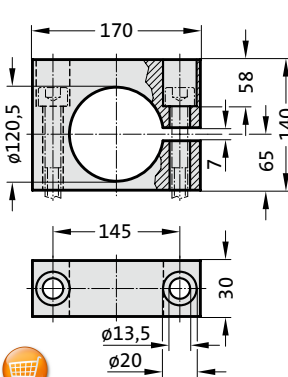
2480.045.05000<sup>2)</sup>



2480.047.05000<sup>2)</sup>



2480.044.03.05000<sup>2)</sup>



### Note:

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



## Gas spring HEAVY DUTY

### Note:

Initial spring force at 150 bar = 6600 daN

Order No for spare parts kit: 2488.13.06600

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

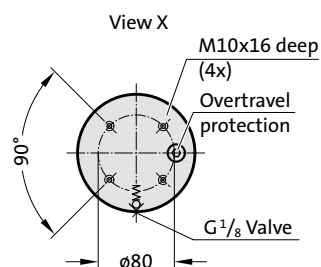
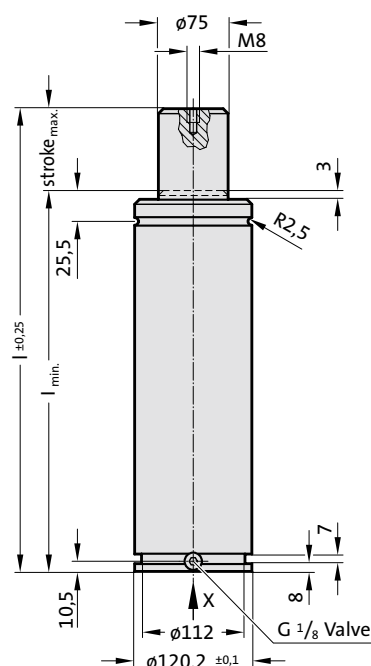
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 15 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2488.13.06600.

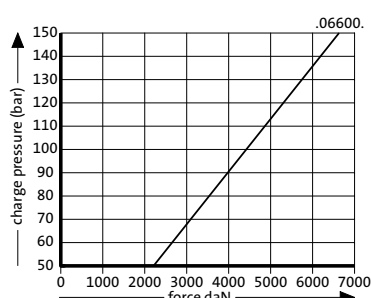


2488.13.06600.

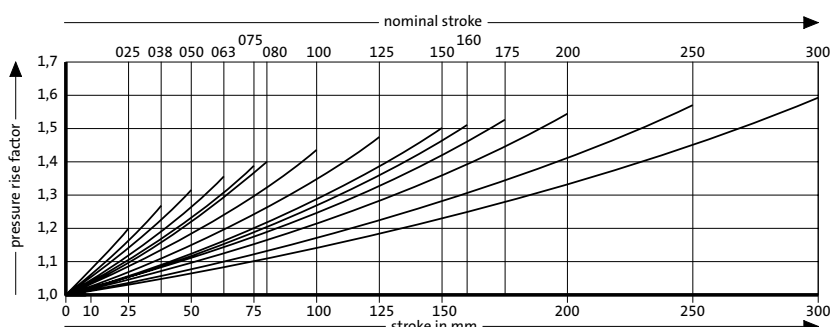
### Gas spring HEAVY DUTY

Order No	Stroke <sub>max.</sub>	I <sub>min.</sub>	I
2488.13.06600.025	25	165	190
2488.13.06600.038	38	178	216
2488.13.06600.050	50	190	240
2488.13.06600.063	63	203	266
2488.13.06600.075	75	215	290
2488.13.06600.080	80	220	300
2488.13.06600.100	100	240	340
2488.13.06600.125	125	265	390
2488.13.06600.150	150	290	440
2488.13.06600.160	160	300	460
2488.13.06600.175	175	315	490
2488.13.06600.200	200	340	540
2488.13.06600.250	250	390	640
2488.13.06600.300	300	440	740

Initial spring force  
versus charge pressure



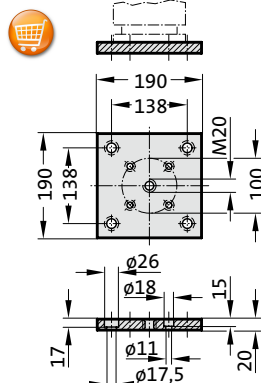
Spring force Diagram displacement versus stroke rise



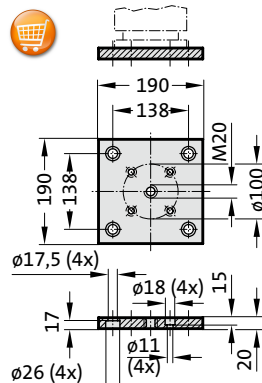
Pressure rise factor accounts for displacement but not external influences!

## Gas spring HEAVY DUTY Mounting variations

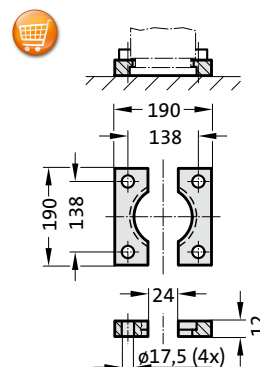
2480.011.07500



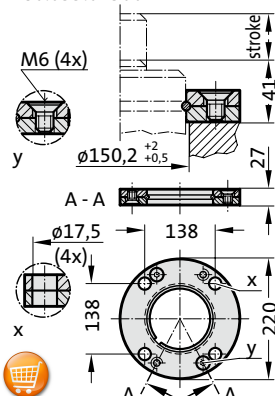
2480.011.07500.2



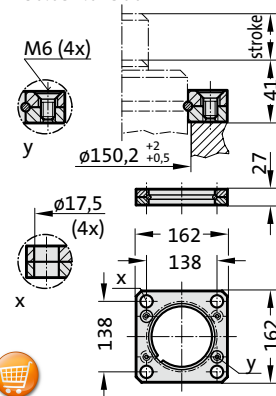
2480.022.07500



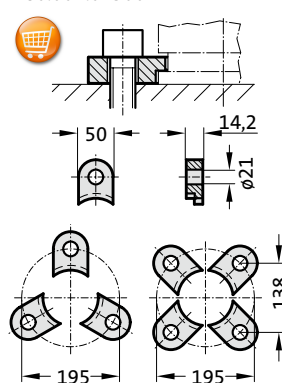
2480.055.07500



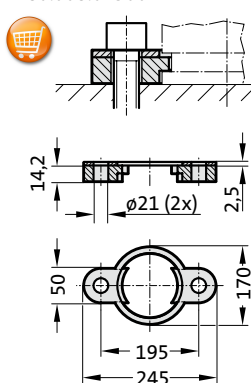
2480.057.07500



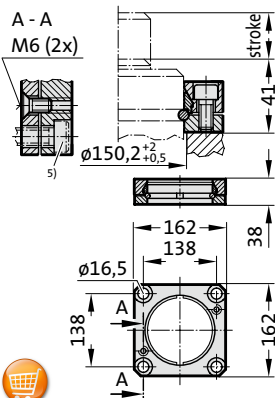
2480.007.07500



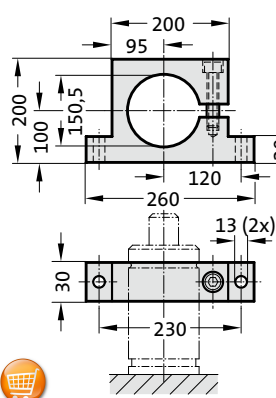
2480.008.07500<sup>3)</sup>



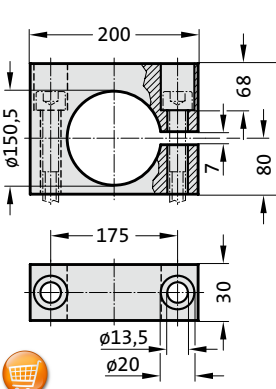
2480.064.07500<sup>4)</sup>



2480.044.07500<sup>2)</sup>



2480.044.03.07500<sup>2)</sup>



### Note:

- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop surface.
- <sup>3)</sup> Note:  
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).



Note:

Initial spring force at 150 bar = 9500 daN

Order No for spare parts kit: 2488.13.09500

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

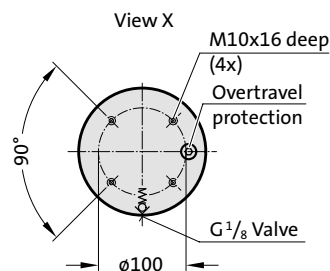
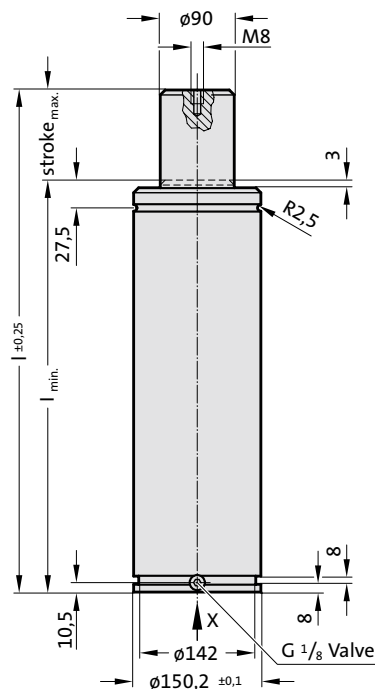
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 15 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2488.13.09500.

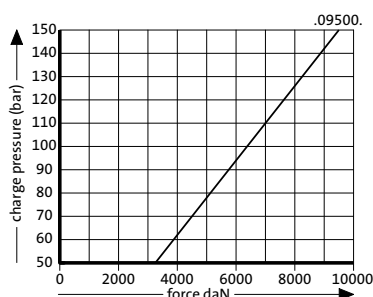


2488.13.09500.

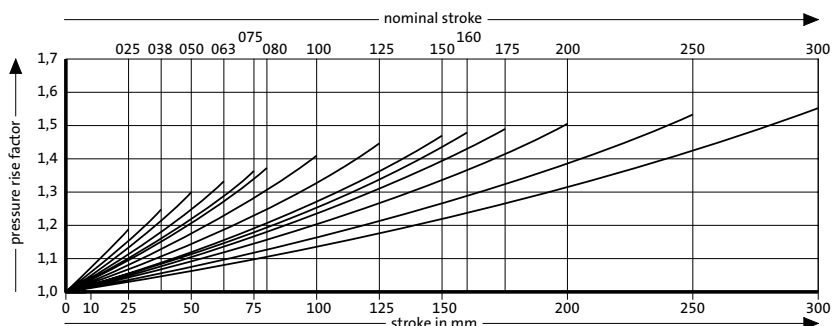
## Gas spring HEAVY DUTY

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2488.13.09500.025	25	180	205
2488.13.09500.038	38	193	231
2488.13.09500.050	50	205	255
2488.13.09500.063	63	218	281
2488.13.09500.075	75	230	305
2488.13.09500.080	80	235	315
2488.13.09500.100	100	255	355
2488.13.09500.125	125	280	405
2488.13.09500.150	150	305	455
2488.13.09500.160	160	315	475
2488.13.09500.175	175	330	505
2488.13.09500.200	200	355	555
2488.13.09500.250	250	405	655
2488.13.09500.300	300	455	755

### Initial spring force versus charge pressure



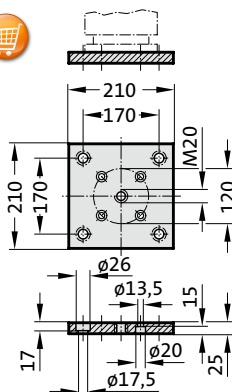
Spring force Diagram displacement versus stroke rise



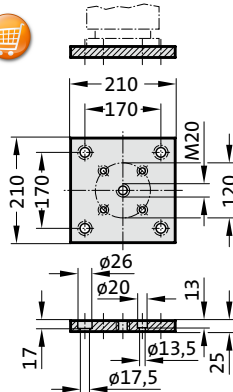
Pressure rise factor accounts for displacement but not external influences!

## Gas spring HEAVY DUTY Mounting variations

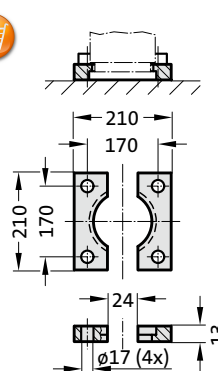
2480.011.10000.2



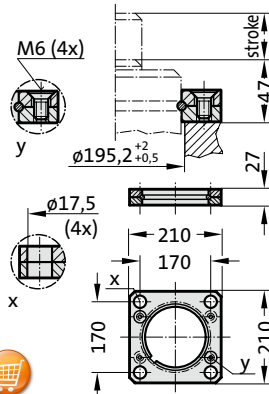
2480.011.10000



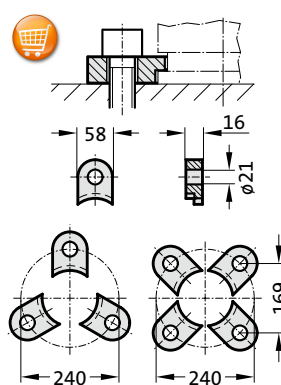
2480.022.10000



2480.057.10000



2480.007.10000





# Gas spring HEAVY DUTY

## Note:

Initial spring force at 150 bar = 20000 daN

Order No for spare parts kit: 2488.13.20000

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

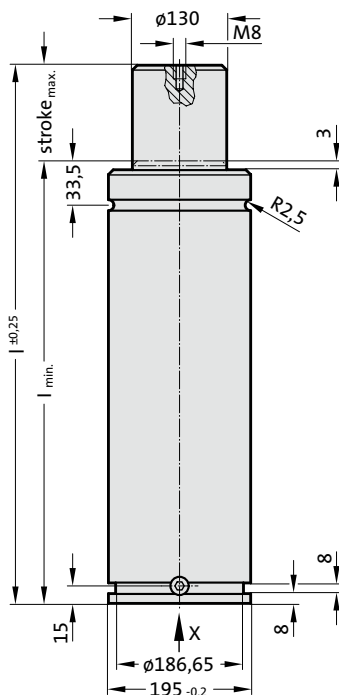
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

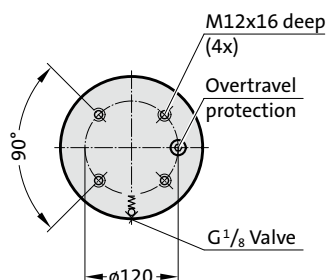
approx. 15 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2488.13.20000.



View X

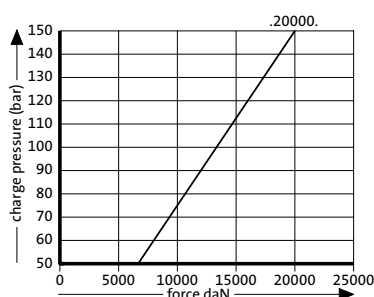


2488.13.20000.

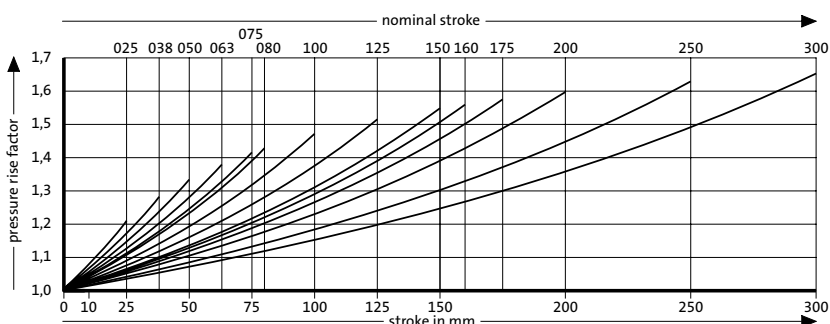
## Gas spring HEAVY DUTY

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2488.13.20000.025	25	185	210
2488.13.20000.038	38	198	236
2488.13.20000.050	50	210	260
2488.13.20000.063	63	223	286
2488.13.20000.075	75	235	310
2488.13.20000.080	80	240	320
2488.13.20000.100	100	260	360
2488.13.20000.125	125	285	410
2488.13.20000.150	150	310	460
2488.13.20000.160	160	320	480
2488.13.20000.175	175	335	510
2488.13.20000.200	200	360	560
2488.13.20000.250	250	410	660
2488.13.20000.300	300	460	760

Initial spring force  
versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!





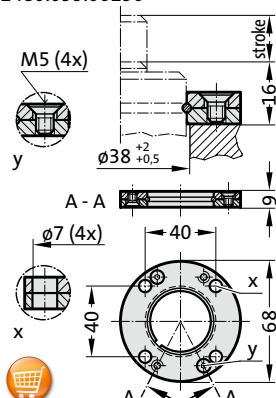


**Gas springs  
with through  
bore passage**

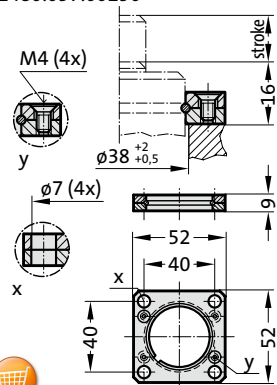


## Gas spring with through bore passage Mounting variations

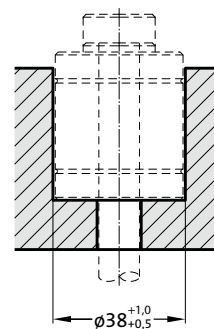
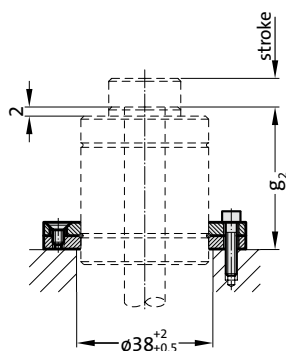
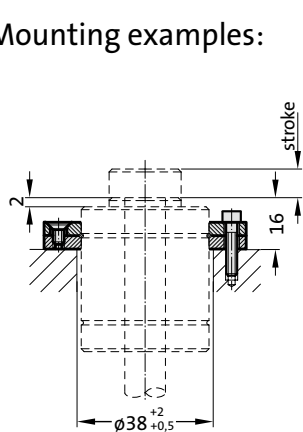
2480.055.00250



2480.057.00250



### Mounting examples:



## Gas spring with through bore passage

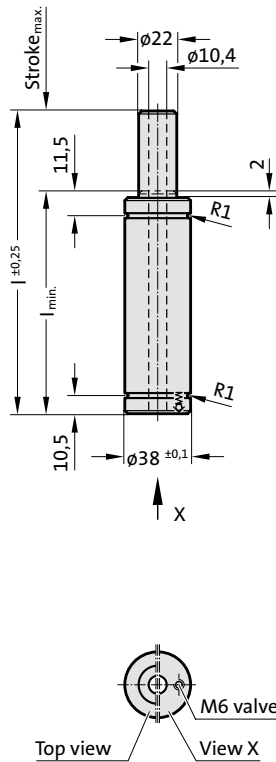
Note:

Initial spring force at 150 bar = 270 daN

Order No for spare parts kit: 2496.12.00270

Pressure medium: Nitrogen N<sub>2</sub>  
 Max. filling pressure: 150 bar  
 Min. filling pressure: 50 bar  
 Working temperature: 20°C to +80°C  
 Temperature related force increase: ± 0.3%/°C  
 Max. recommended extensions per minute:  
 approx. 15 to 40 (at 20°C)  
 Max. piston speed: 0.5 m/s

2496.12.00270.



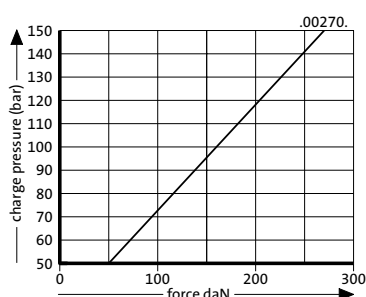
2496.12.00270.

### Gas spring with through bore passage

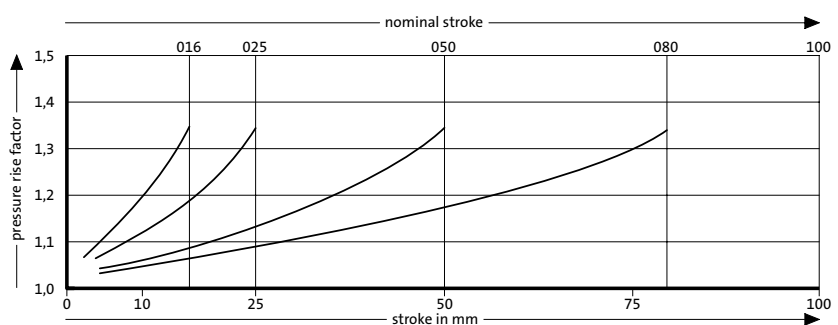
Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l	g <sub>2</sub> <sup>*</sup>
2496.12.00270.016	16	92	108	86
2496.12.00270.025	25	101	126	95
2496.12.00270.050	50	126	176	120
2496.12.00270.080	80	156	236	150

\*see mounting example

### Initial spring force versus charge pressure



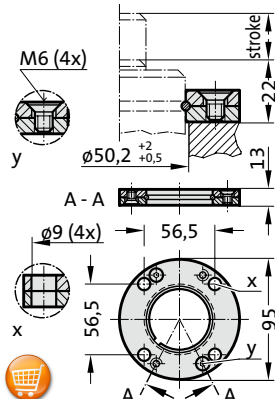
Spring force Diagram displacement versus stroke rise



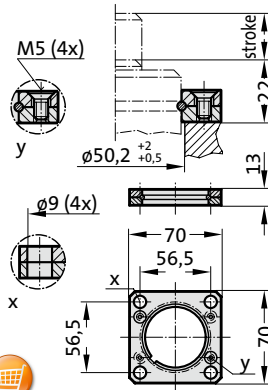
Pressure rise factor accounts for displacement but not external influences!

## Gas spring with through bore passage Mounting variations

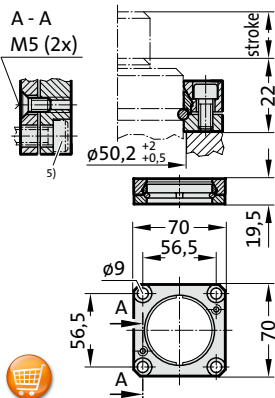
2480.055.00750



2480.057.00750



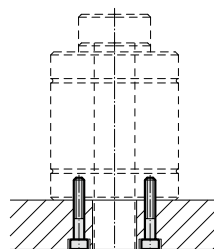
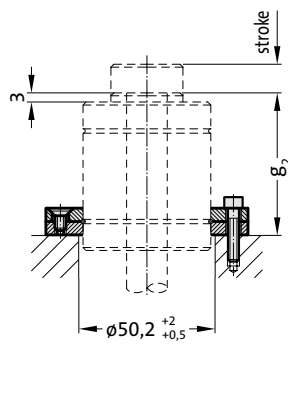
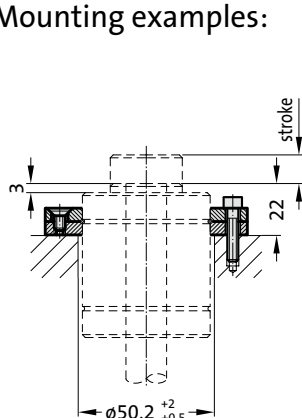
2480.064.00750<sup>4)</sup>



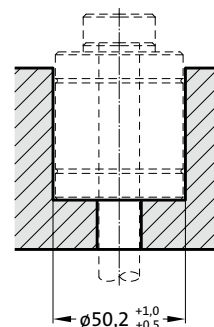
### Note:

- 4) Square collar flange, non-rotating, fixing for composite connection.
- 5) Machine screws with hexagonal socket (compact head recommended)

### Mounting examples:



see Note!





# Gas spring with through bore passage

## Note:

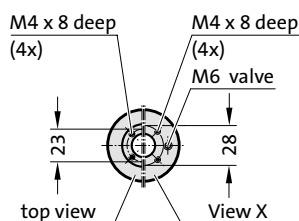
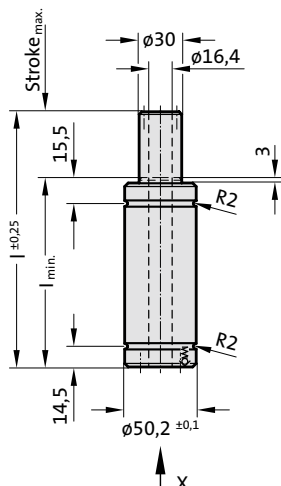
Initial spring force at 150 bar = 490 daN

When mounting to floor, contact over the entire floor of the cylinder tube must be ensured!

Order No for spare parts kit: 2496.12.00490

Pressure medium: Nitrogen N<sub>2</sub>  
 Max. filling pressure: 150 bar  
 Min. filling pressure: 50 bar  
 Working temperature: 20°C to +80°C  
 Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$   
 Max. recommended extensions per minute: approx. 15 to 40 (at 20°C)  
 Max. piston speed: 0.5 m/s

2496.12.00490.



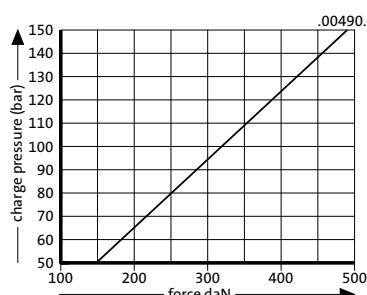
2496.12.00490.

Gas spring with through bore passage

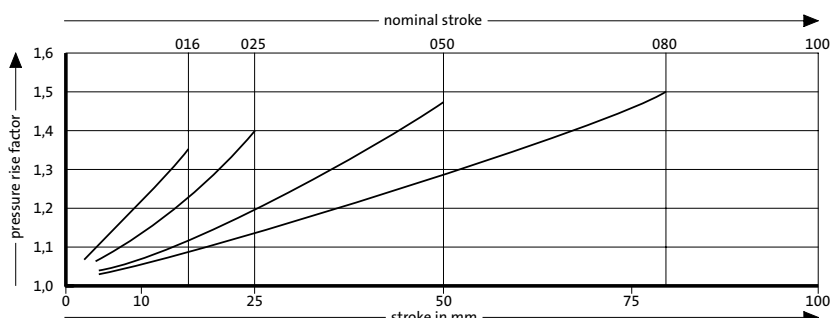
Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l	g <sub>2</sub> *
2496.12.00490.016	16	96	112	88
2496.12.00490.025	25	105	130	97
2496.12.00490.050	50	130	180	122
2496.12.00490.080	80	160	240	152

\*see mounting example

Initial spring force versus charge pressure



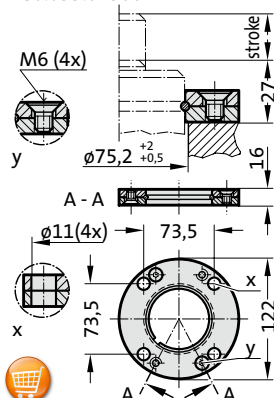
Spring force Diagram displacement versus stroke rise



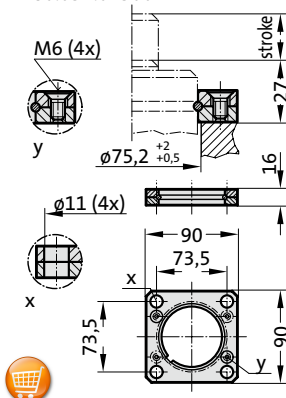
Pressure rise factor accounts for displacement but not external influences!

## Gas spring with through bore passage Mounting variations

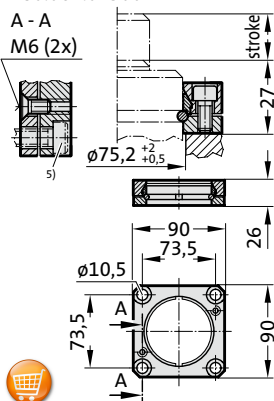
2480.055.01500



2480.057.01500



2480.064.01500<sup>4)</sup>

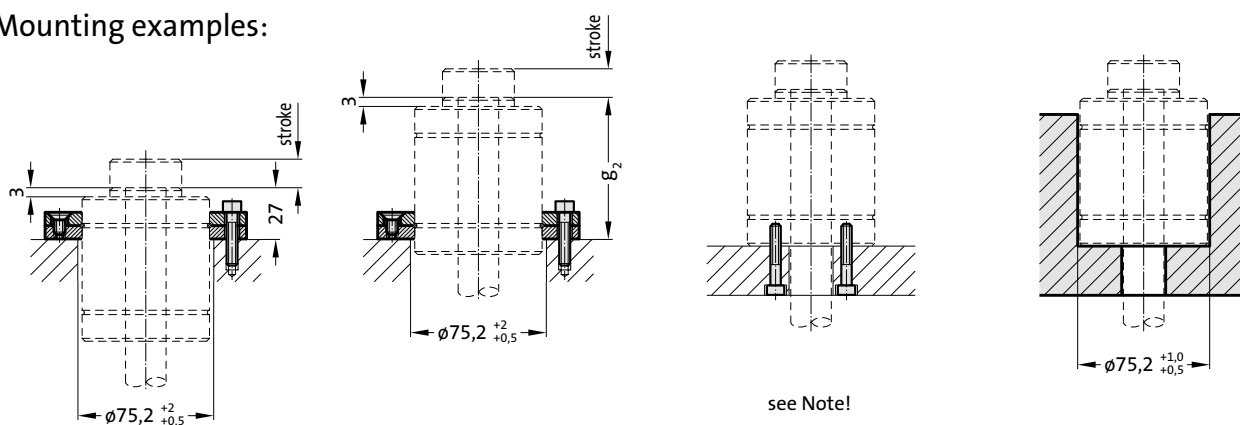


### Note:

<sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.

<sup>5)</sup> Machine screws with hexagonal socket (compact head recommended).

### Mounting examples:



see Note!



## Gas spring with through bore passage

### Note:

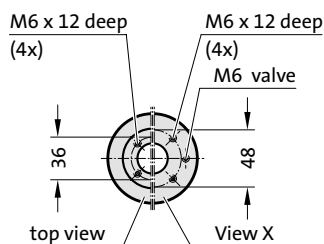
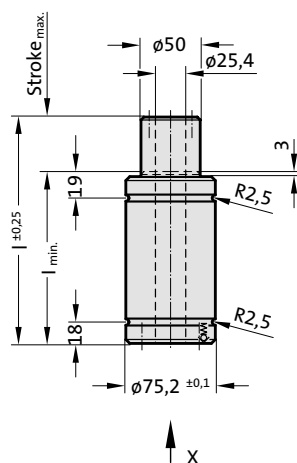
Initial spring force at 150 bar = 1060 daN

When mounting to floor, contact over the entire floor of the cylinder tube must be ensured!

Order No for spare parts kit: 2496.12.01060

Pressure medium: Nitrogen  $N_2$   
 Max. filling pressure: 150 bar  
 Min. filling pressure: 50 bar  
 Working temperature: 20°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: 0.5 m/s

2496.12.01060.



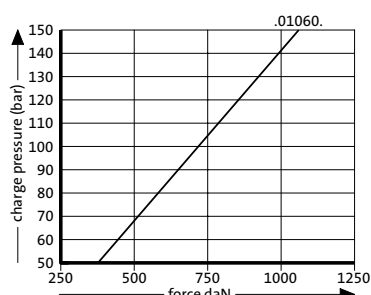
2496.12.01060.

Gas spring with through bore passage

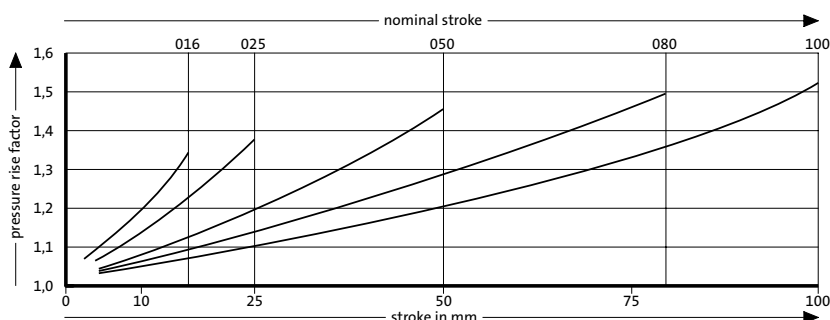
Order No	Stroke <sub>max.</sub>	$l_{min.}$	$l$	$g_2^*$
2496.12.01060.016	16	106	122	96
2496.12.01060.025	25	115	140	105
2496.12.01060.050	50	140	190	130
2496.12.01060.080	80	170	250	160
2496.12.01060.100	100	190	290	180

\*see mounting example

Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!





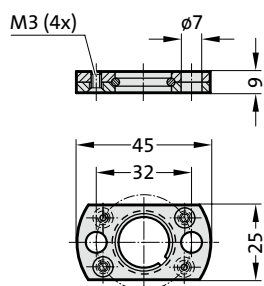


## Gas springs with increased spring force POWER LINE

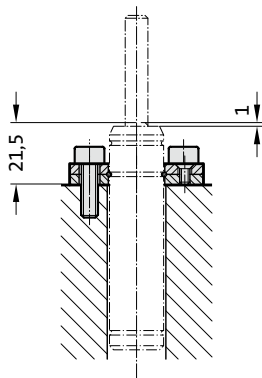


## Gas Spring POWERLINE Mounting variations

2480.051.03.00030

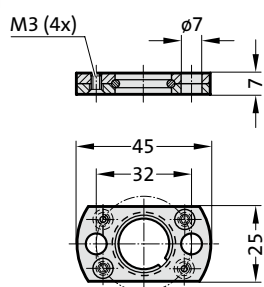


2480.051.03.00030



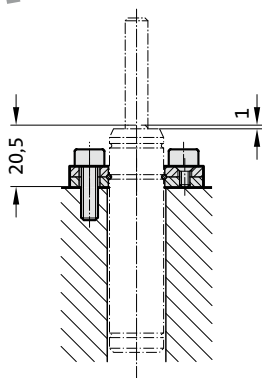
2480.051.00030

phasing out

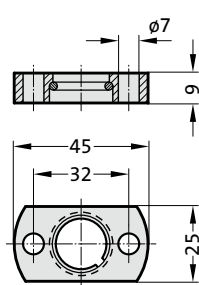


2480.051.00030

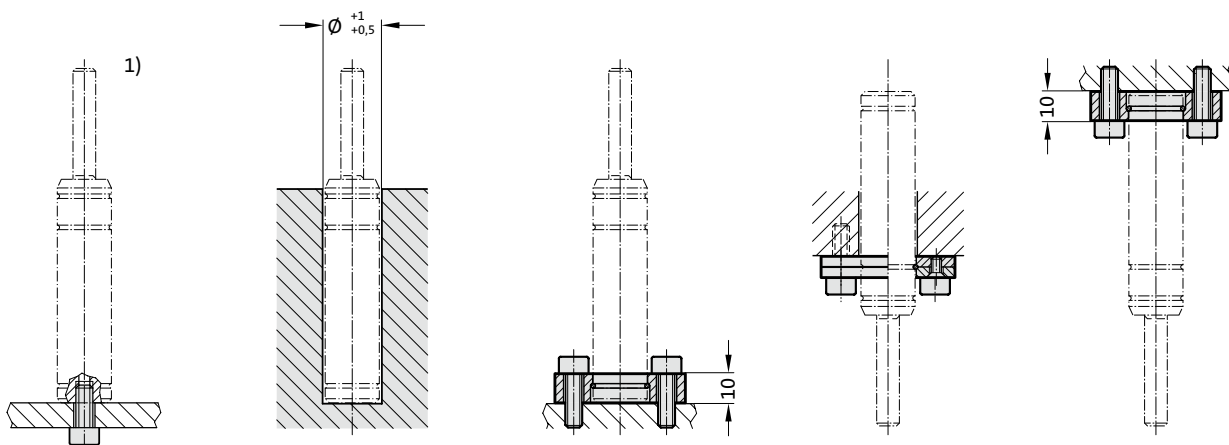
phasing out



2480.052.00030



### Mounting examples:



Note:

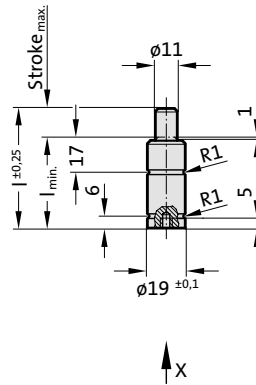
Initial spring force at 180 bar = 170 daN

Worn gas springs cannot be repaired, they have to be replaced completely.

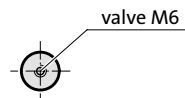
1) Fixing at bottom thread only  
recommended for stroke length up to 50 mm.

Pressure medium: Nitrogen N<sub>2</sub>  
 Max. filling pressure: 180 bar  
 Min. filling pressure: 25 bar  
 Working temperature: 0°C to +80°C  
 Temperature related force increase: ± 0.3%/°C  
 Max. recommended extensions per minute:  
 approx. 400 to 100 (at 20°C)  
 Max. piston speed: 1.6 m/s

2487.12.00170.



View X

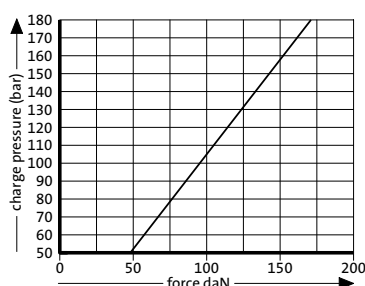


2487.12.00170.

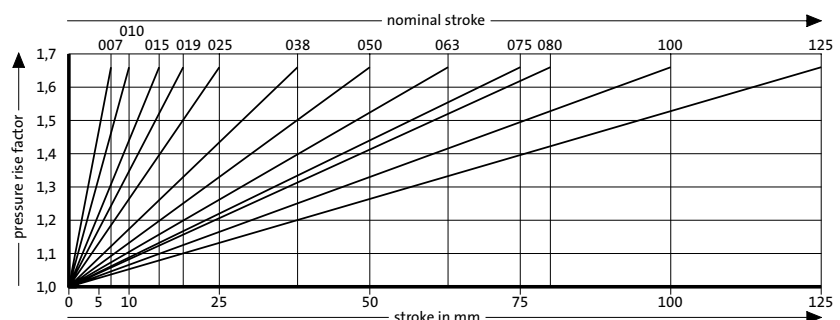
## Gas spring POWERLINE

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2487.12.00170.007	7	37	44
2487.12.00170.010	10	40	50
2487.12.00170.015	15	45	60
2487.12.00170.019	19	49	68
2487.12.00170.025	25	55	80
2487.12.00170.038	38	68	106
2487.12.00170.050	50	80	130
2487.12.00170.063	63	93	156
2487.12.00170.075	75	110	185
2487.12.00170.080	80	115	195
2487.12.00170.100	100	135	235
2487.12.00170.125	125	160	285

### Initial spring force versus charge pressure

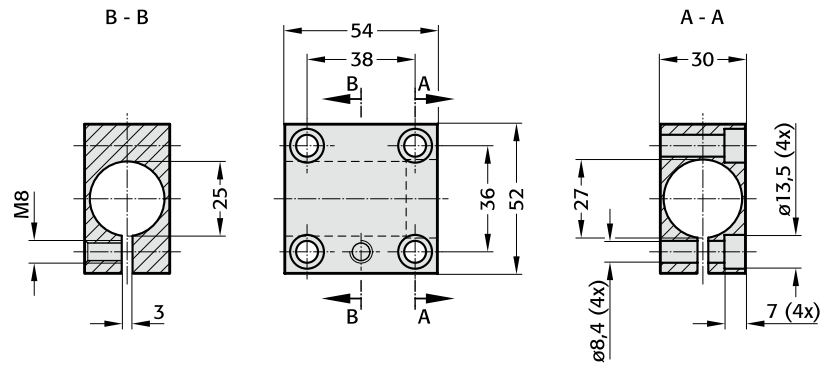
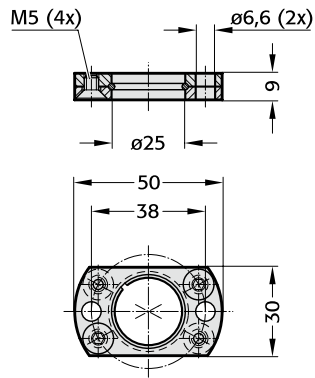


Spring force Diagram displacement versus stroke rise

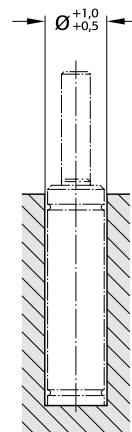
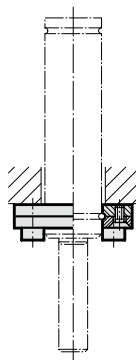
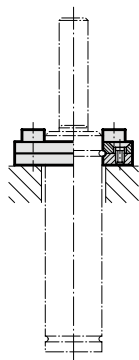
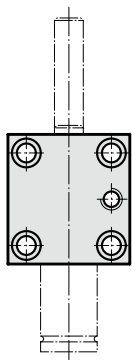


Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations



### Mounting examples:



Note:

Initial spring force at 180 bar = 320 daN

Worn gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 180 bar

Min. filling pressure: 25 bar

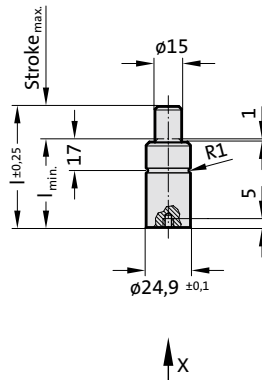
Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

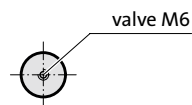
Max. recommended extensions per minute:

approx. 400 to 100 (at 20°C)

Max. piston speed: 1.6 m/s



View X

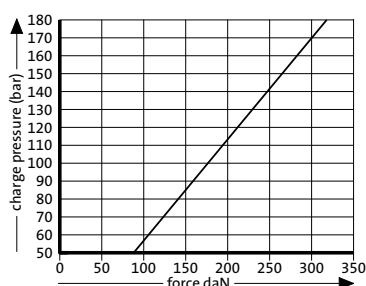


2487.12.00320.

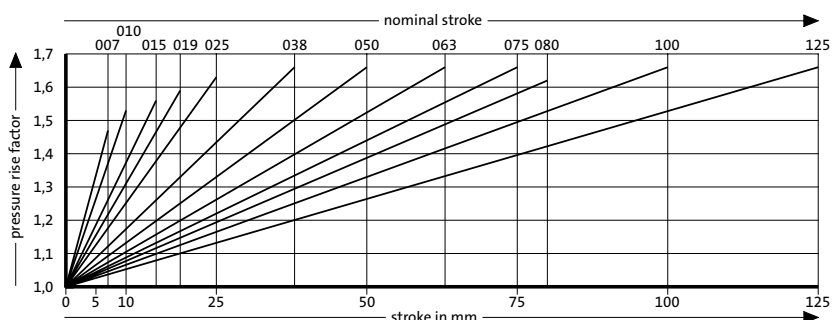
## Gas spring POWERLINE

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2487.12.00320.007	7	37	44
2487.12.00320.010	10	40	50
2487.12.00320.015	15	45	60
2487.12.00320.019	19	49	68
2487.12.00320.025	25	55	80
2487.12.00320.038	38	68	106
2487.12.00320.050	50	80	130
2487.12.00320.063	63	93	156
2487.12.00320.075	75	110	185
2487.12.00320.080	80	115	195
2487.12.00320.100	100	135	235
2487.12.00320.125	125	160	285

### Initial spring force versus charge pressure



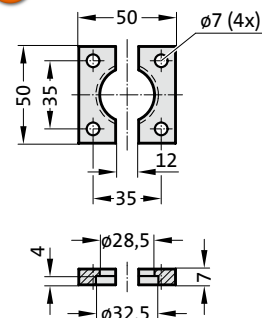
Spring force Diagram displacement versus stroke rise



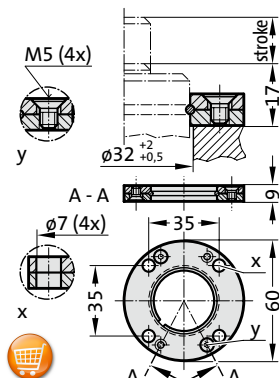
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

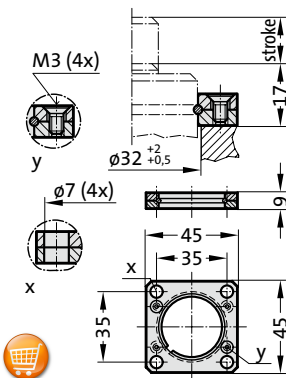
2480.022.00150



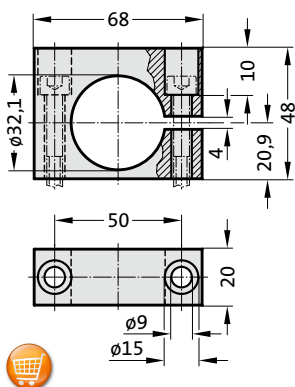
2480.055.00150



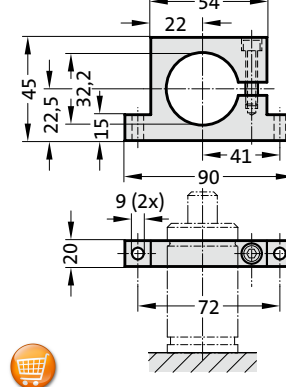
2480.057.00150



2480.044.03.00150<sup>2)</sup>



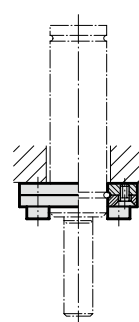
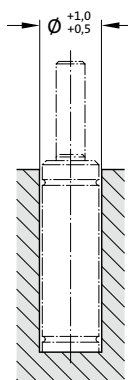
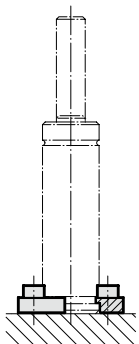
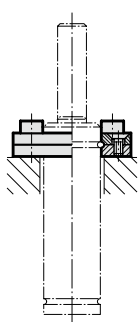
2480.044.00150<sup>2)</sup>



### Note:

<sup>2)</sup> Attention:  
The spring force must be  
absorbed by the stop surface.

### Mounting examples:



Note:

Initial spring force at 180 bar = 350 daN

Order No for spare parts kit: 2487.12.00350

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 180 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

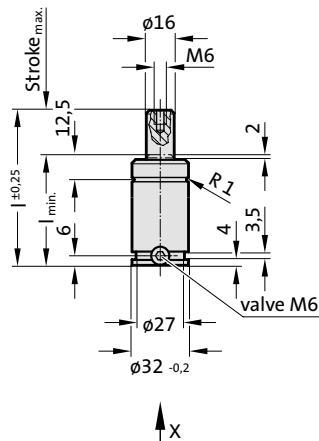
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

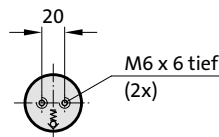
approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.00350.



View X

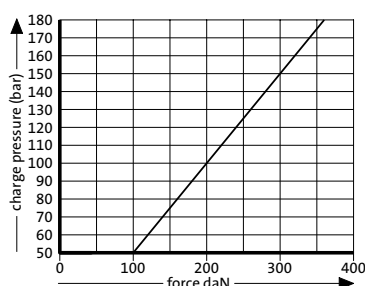


2487.12.00350.

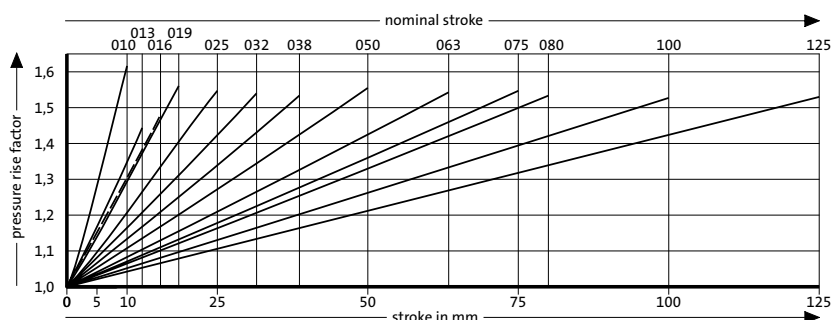
## Gas spring POWERLINE

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2487.12.00350.010	10	40	50
2487.12.00350.013	13	43	56
2487.12.00350.016	16	46	62
2487.12.00350.019	19	49	68
2487.12.00350.025	25	55	80
2487.12.00350.032	32	62	94
2487.12.00350.038	38	68	106
2487.12.00350.050	50	80	130
2487.12.00350.063	63	93	156
2487.12.00350.075	75	105	180
2487.12.00350.080	80	110	190
2487.12.00350.100	100	130	230
2487.12.00350.125	125	155	280

### Initial spring force versus charge pressure



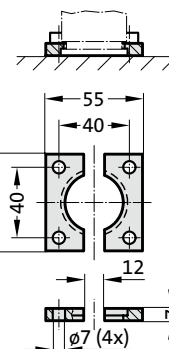
Spring force Diagram displacement versus stroke rise



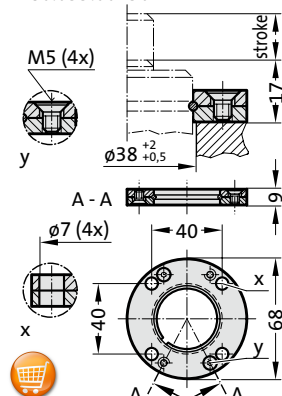
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

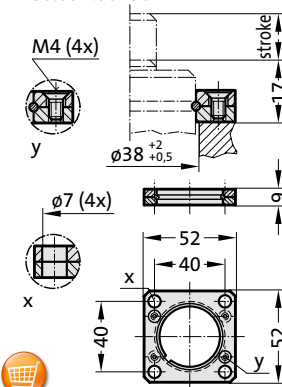
2480.022.00250



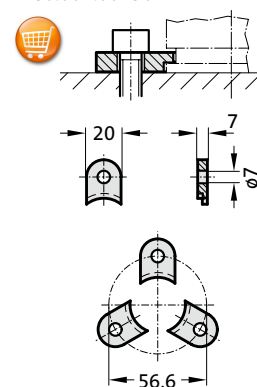
2480.055.00250



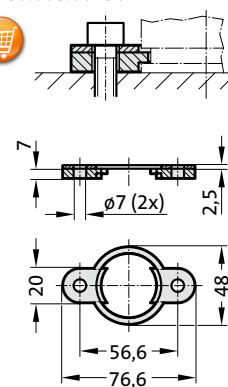
2480.057.00250



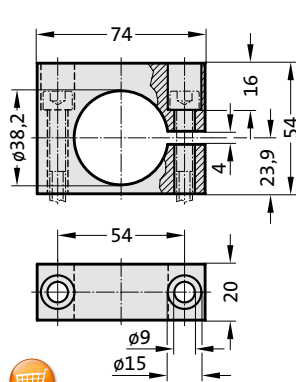
2480.007.00250



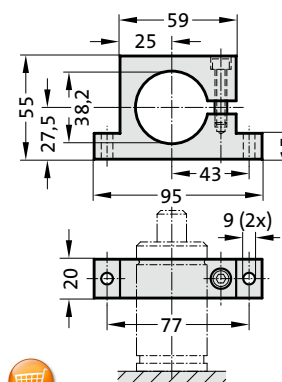
2480.008.00250<sup>3)</sup>



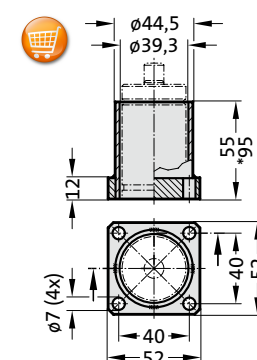
2480.044.03.00250<sup>2)</sup>



2480.044.00250<sup>2)</sup>



2480.010.00250.055<sup>3)</sup>  
2480.010.00250.095<sup>3)</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.



# Gas spring POWERLINE



FIBRO

## Note:

Initial spring force at 150 bar = 470 daN

Order No for spare parts kit: 2487.12.00500

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

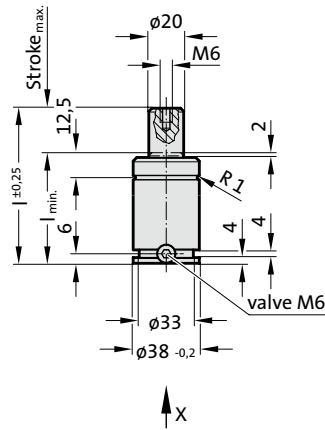
Working temperature: 0°C to +80°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

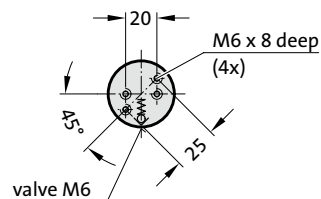
Max. recommended extensions per minute:  
approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.00500.



View X

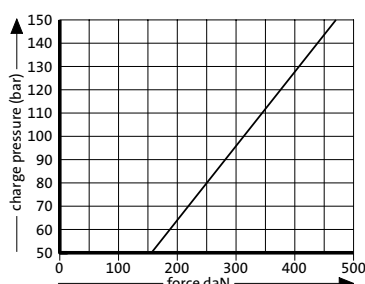


2487.12.00500.

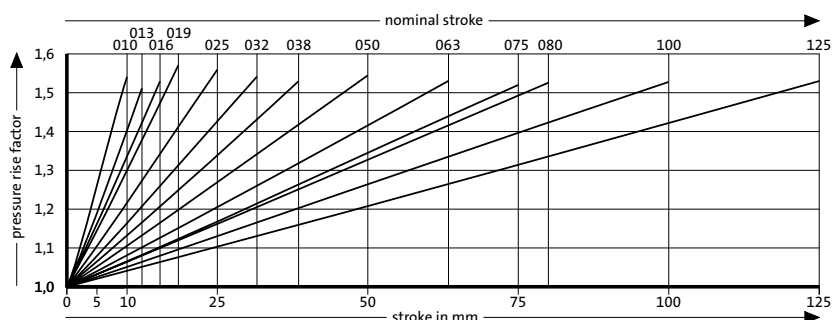
Gas spring POWERLINE

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2487.12.00500.010	10	40	50
2487.12.00500.013	13	43	56
2487.12.00500.016	16	46	62
2487.12.00500.019	19	49	68
2487.12.00500.025	25	55	80
2487.12.00500.032	32	62	94
2487.12.00500.038	38	68	106
2487.12.00500.050	50	80	130
2487.12.00500.063	63	93	156
2487.12.00500.075	75	105	180
2487.12.00500.080	80	110	190
2487.12.00500.100	100	130	230
2487.12.00500.125	125	155	280

Initial spring force  
versus charge pressure



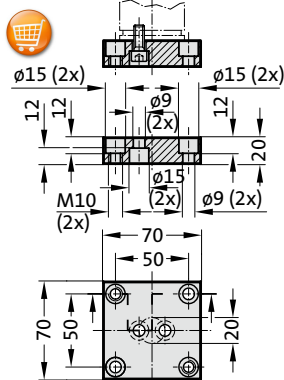
Spring force Diagram displacement versus stroke rise



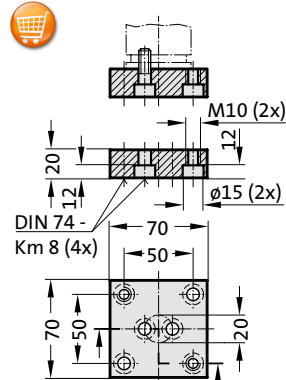
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

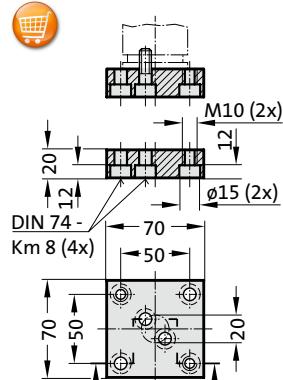
2480.011.00500.2



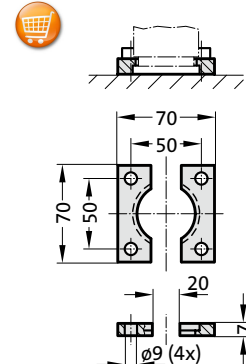
2480.011.00500



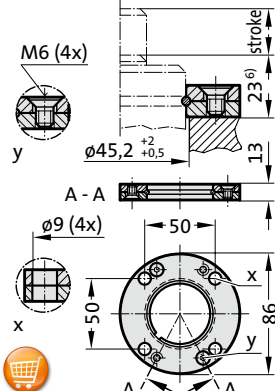
2480.011.00500.1



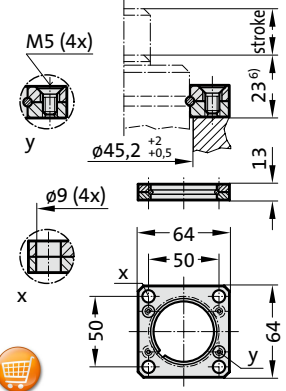
2480.022.00500



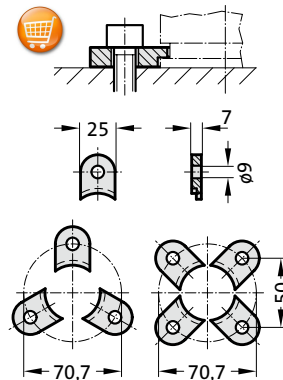
2480.055.00500



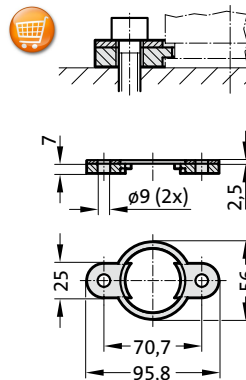
2480.057.00500



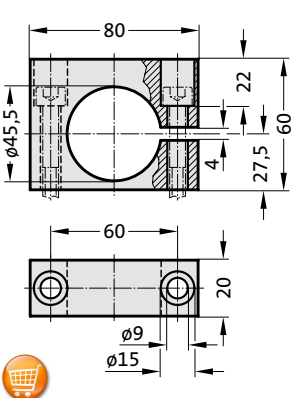
2480.007.00500



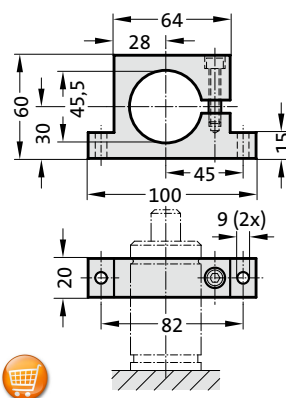
2480.008.00500<sup>3)</sup>



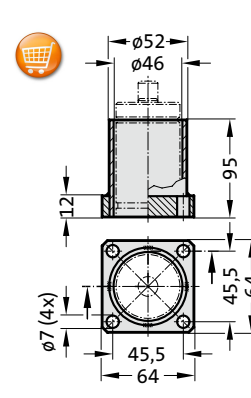
2480.044.03.00500<sup>2)</sup>



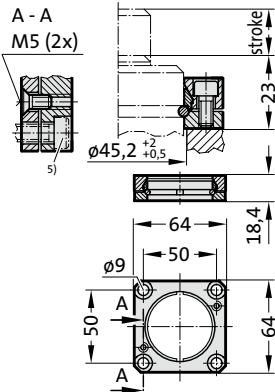
2480.044.00500<sup>2)</sup>



2480.010.00500.095<sup>3)</sup>



2480.064.00500<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)
- <sup>6)</sup> Installation height increased from 22 mm to 24 mm, installation position from 3 mm to 5 mm according to VDI 3003.

Note:

Initial spring force at 150 bar = 750 daN

Order No for spare parts kit: 2487.12.00750

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

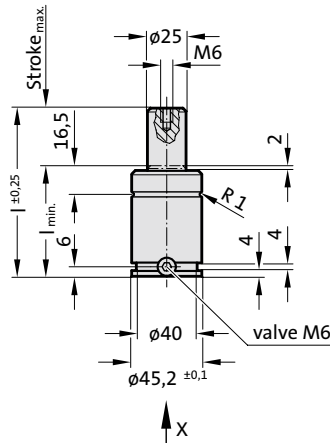
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

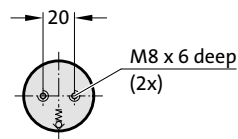
approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.00750..1



View X

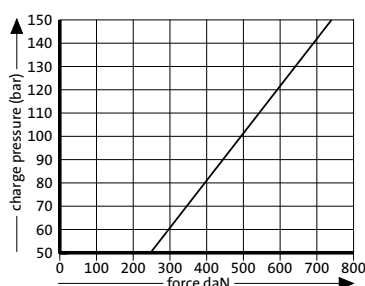


2487.12.00750..1

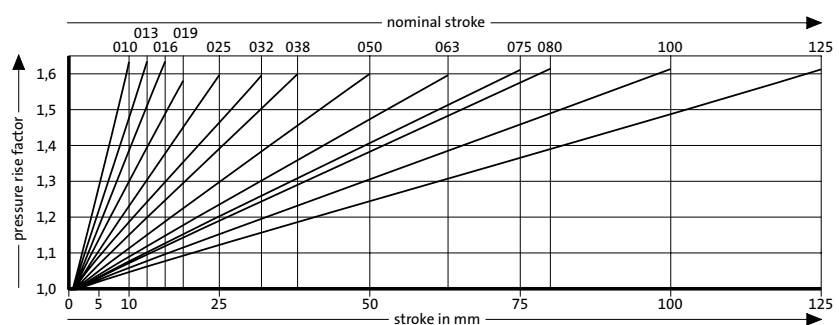
## Gas spring POWERLINE

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2487.12.00750.010.1	10	42	52
2487.12.00750.013.1	13	45	58
2487.12.00750.016.1	16	48	64
2487.12.00750.019.1	19	51	70
2487.12.00750.025.1	25	57	82
2487.12.00750.032.1	32	64	96
2487.12.00750.038.1	38	70	108
2487.12.00750.050.1	50	82	132
2487.12.00750.063.1	63	95	158
2487.12.00750.075.1	75	107	182
2487.12.00750.080.1	80	112	192
2487.12.00750.100.1	100	132	232
2487.12.00750.125.1	125	157	282

### Initial spring force versus charge pressure



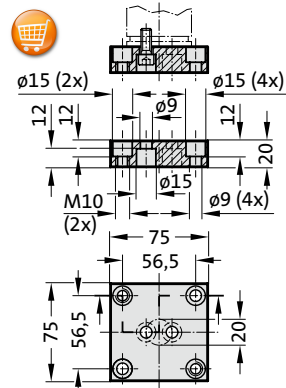
Spring force Diagram displacement versus stroke rise



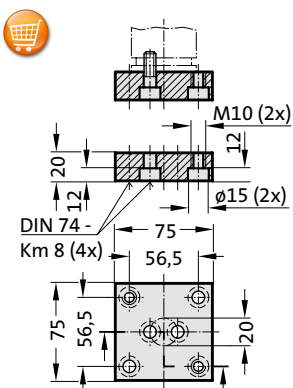
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

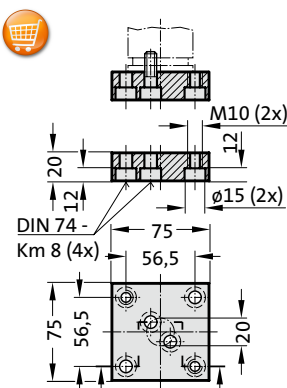
2480.011.00750.3



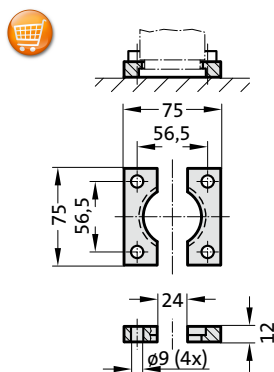
2480.011.00750



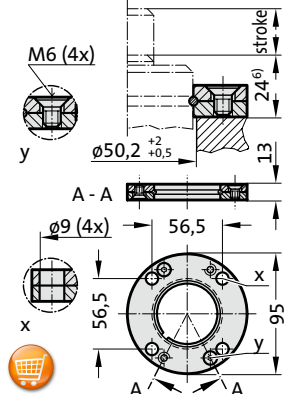
2480.011.00750.1



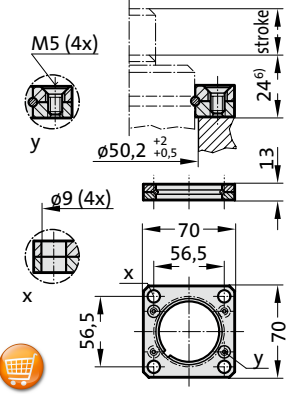
2480.022.00750



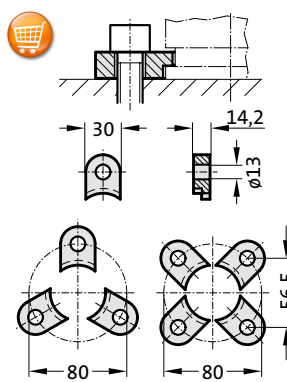
2480.055.00750



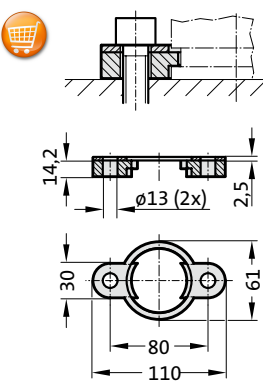
2480.057.00750



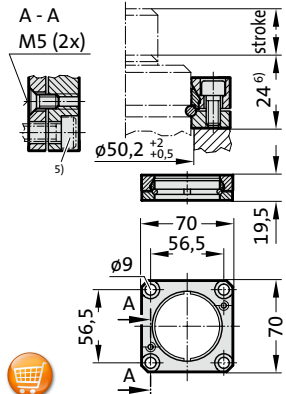
2480.007.00750



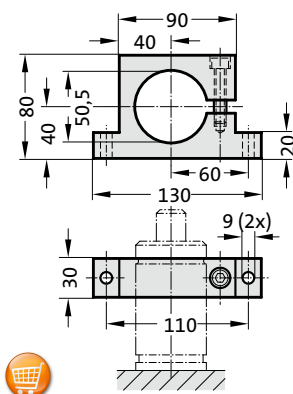
2480.008.00750<sup>3)</sup>



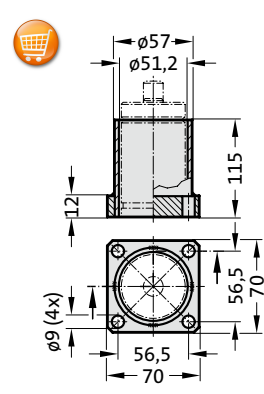
2480.064.00750<sup>4)</sup>



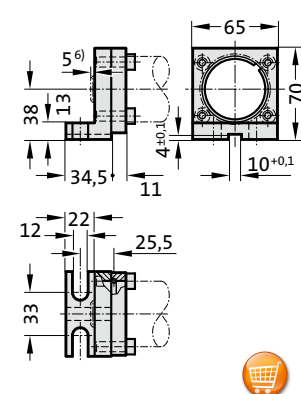
2480.044.00750<sup>2)</sup>



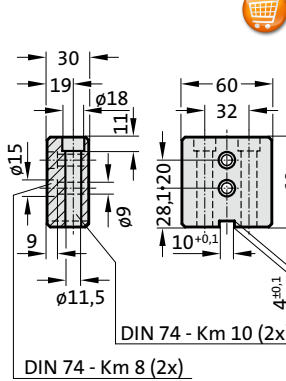
2480.010.00750.115<sup>3)</sup>



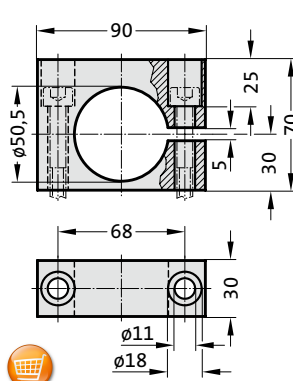
2480.045.00750<sup>2)</sup>



2480.047.00750<sup>2)</sup>



2480.044.03.00750<sup>2)</sup>



### Note:

- 2) Attention:  
The spring force must be absorbed by the stop surface!
- 3) Not for use with composite connection.
- 4) Square collar flange, non-rotating, fixing for composite connection.
- 5) Machine screws with hexagonal socket (compact head recommended)
- 6) Installation height increased from 22 mm to 24 mm, installation position from 3 mm to 5 mm according to VDI 3003.

Note:

Initial spring force at 150 bar = 920 daN

Order No for spare parts kit: 2487.12.01000

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

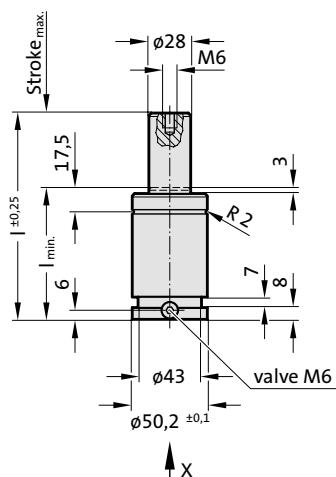
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

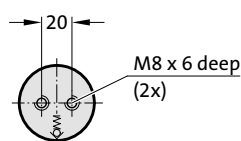
approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.01000..1



View X

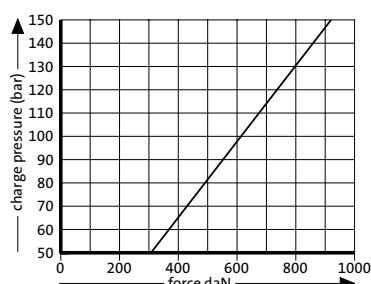


2487.12.01000..1

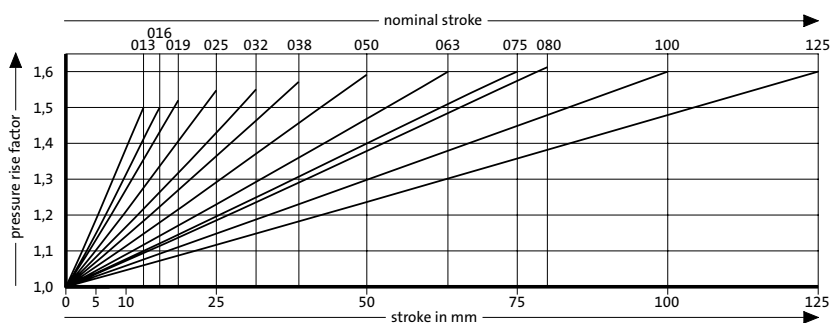
## Gas spring POWERLINE

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2487.12.01000.013.1	13	51	64
2487.12.01000.016.1	16	54	70
2487.12.01000.019.1	19	57	76
2487.12.01000.025.1	25	63	88
2487.12.01000.032.1	32	70	102
2487.12.01000.038.1	38	76	114
2487.12.01000.050.1	50	88	138
2487.12.01000.063.1	63	101	164
2487.12.01000.075.1	75	113	188
2487.12.01000.080.1	80	118	198
2487.12.01000.100.1	100	138	238
2487.12.01000.125.1	125	163	288

### Initial spring force versus charge pressure



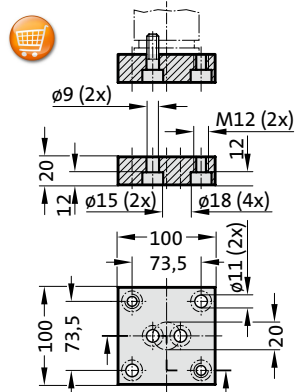
Spring force Diagram displacement versus stroke rise



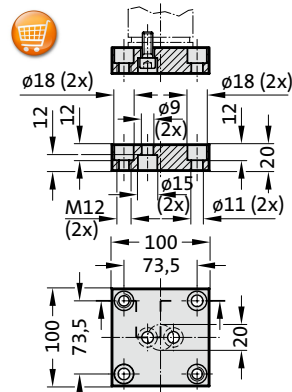
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

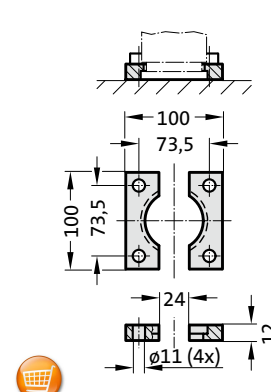
2480.011.01000



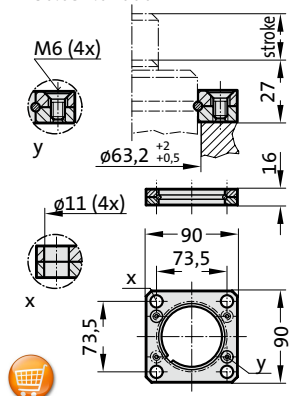
2480.011.01000.2



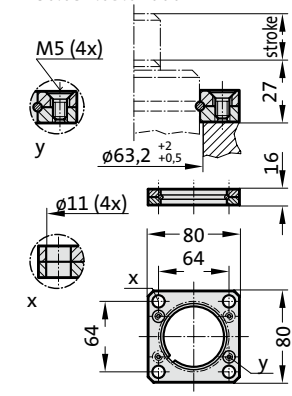
2480.022.01000



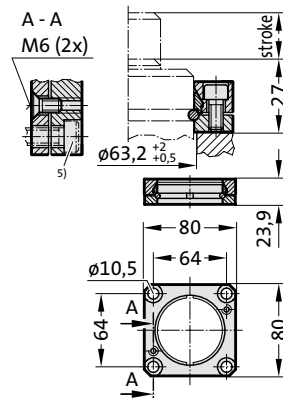
2480.057.01000



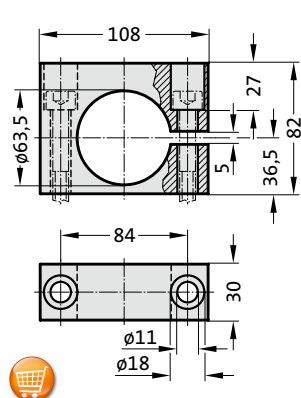
2480.057.03.01000



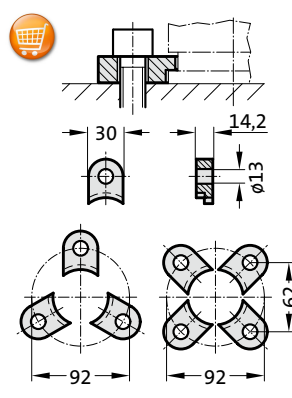
2480.064.01000<sup>4)</sup>



2480.044.03.01000<sup>2)</sup>



2480.007.01000



### Note:

- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop surface!
- <sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.
- <sup>5)</sup> Machine screws with hexagonal socket (compact head recommended)

# Gas spring POWERLINE



FIBRO

## Note:

Initial spring force at 150 bar = 1500 daN

Order No for spare parts kit: 2487.12.01500

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

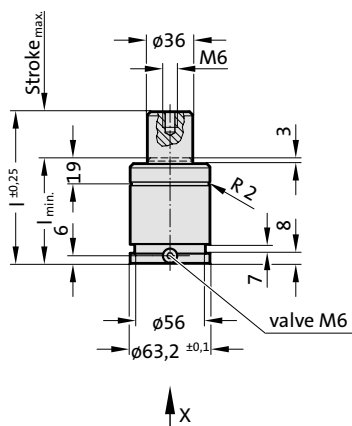
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

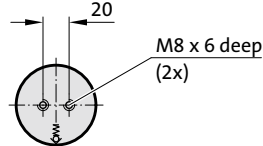
approx. 50 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.01500.



View X

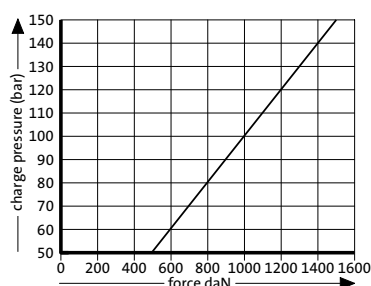


2487.12.01500.

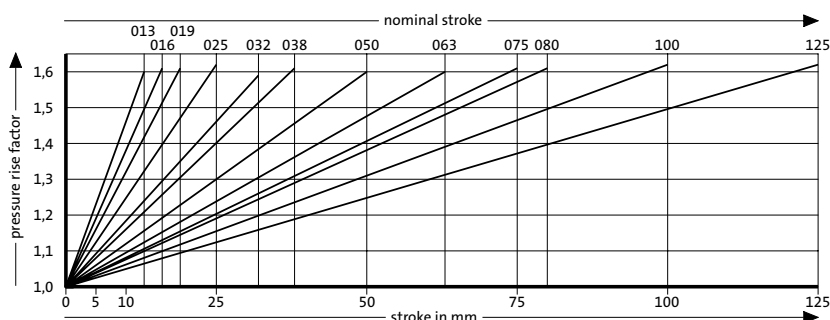
Gas spring POWERLINE

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2487.12.01500.013	13	57	70
2487.12.01500.016	16	60	76
2487.12.01500.019	19	63	82
2487.12.01500.025	25	69	94
2487.12.01500.032	32	76	108
2487.12.01500.038	38	82	120
2487.12.01500.050	50	94	144
2487.12.01500.063	63	107	170
2487.12.01500.075	75	119	194
2487.12.01500.080	80	124	204
2487.12.01500.100	100	144	244
2487.12.01500.125	125	169	294

Initial spring force  
versus charge pressure



Spring force Diagram displacement versus stroke rise

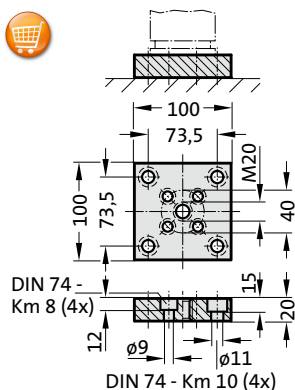


Pressure rise factor accounts for displacement but not external influences!

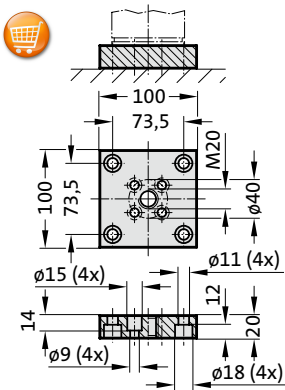


## Gas spring POWERLINE Mounting variations

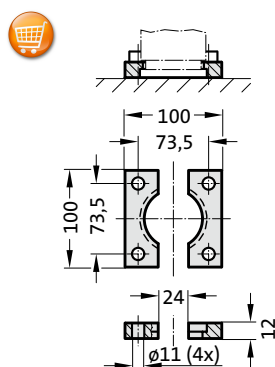
2480.011.01500



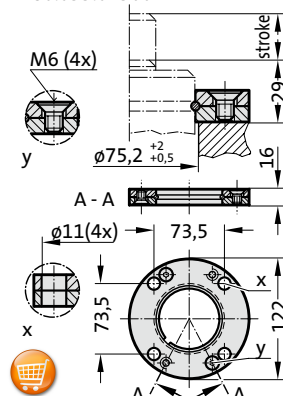
2480.011.01500.2



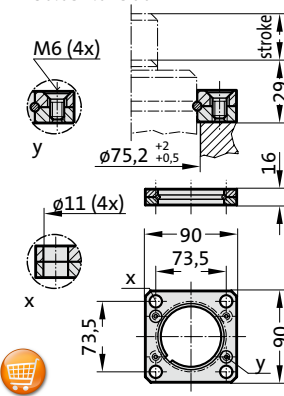
2480.022.01500



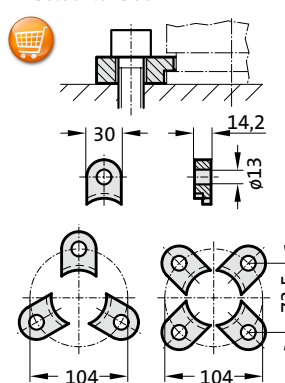
2480.055.01500



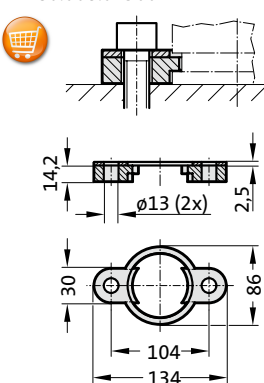
2480.057.01500



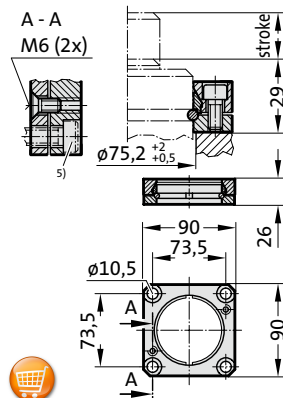
2480.007.01500



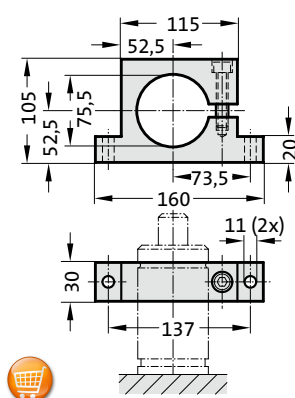
2480.008.01500<sup>3)</sup>



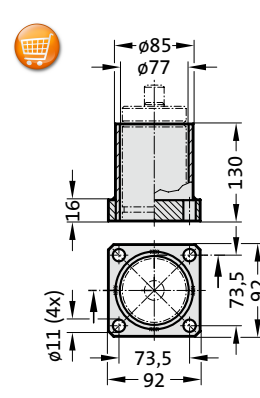
2480.064.01500<sup>4)</sup>



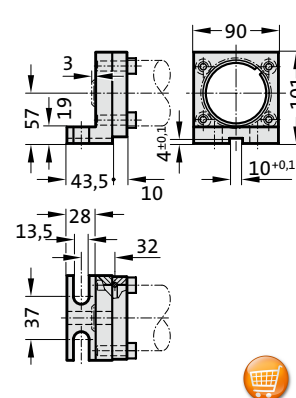
2480.044.01500<sup>2)</sup>



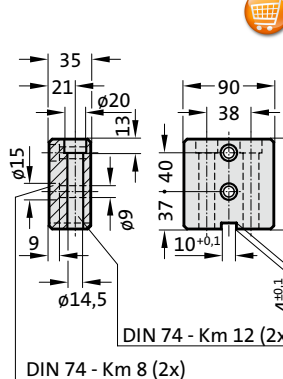
2480.010.01500.130<sup>3)</sup>



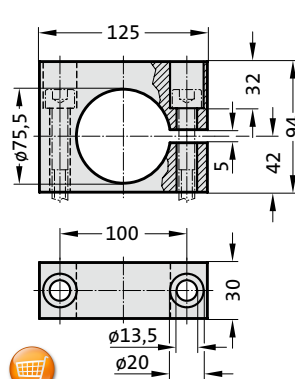
2480.045.01500<sup>2)</sup>



2480.047.01500<sup>2)</sup>



2480.044.03.01500<sup>2)</sup>



### Note:

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



Note:

Initial spring force at 150 bar = 2400 daN

Order No for spare parts kit: 2487.12.02400

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

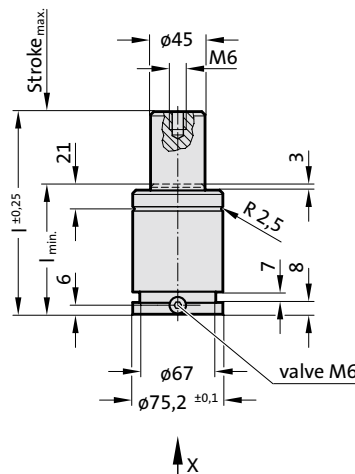
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

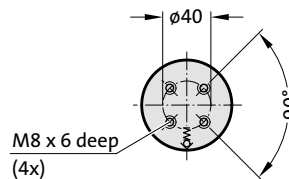
approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.02400.



View X

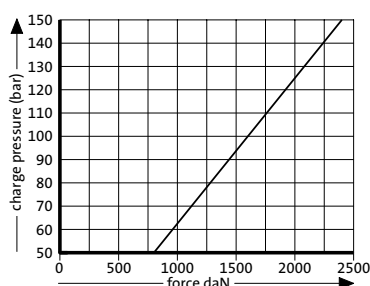


2487.12.02400.

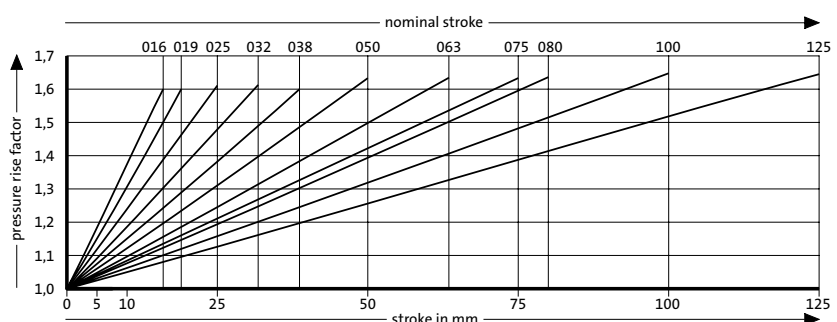
## Gas spring POWERLINE

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2487.12.02400.016	16	61	77
2487.12.02400.019	19	64	83
2487.12.02400.025	25	70	95
2487.12.02400.032	32	77	109
2487.12.02400.038	38	83	121
2487.12.02400.050	50	95	145
2487.12.02400.063	63	108	171
2487.12.02400.075	75	120	195
2487.12.02400.080	80	125	205
2487.12.02400.100	100	145	245
2487.12.02400.125	125	170	295

### Initial spring force versus charge pressure



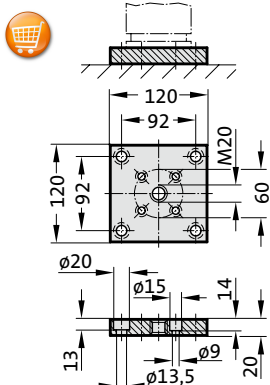
### Spring force Diagram displacement versus stroke rise



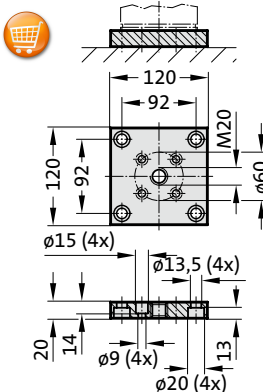
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

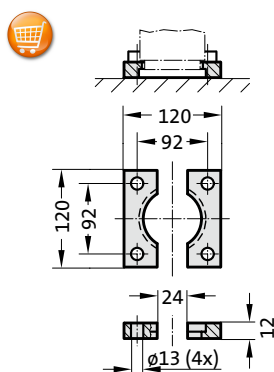
2480.011.03000



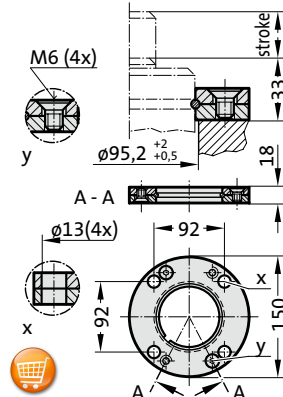
2480.011.03000.2



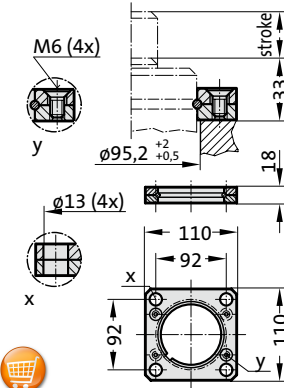
2480.022.03000



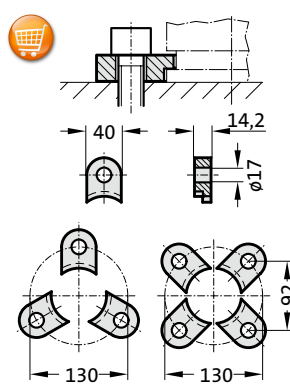
2480.055.03000



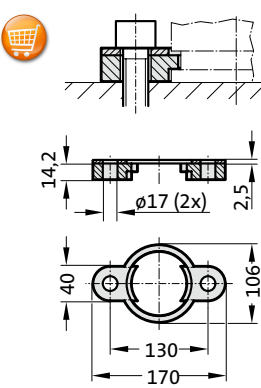
2480.057.03000



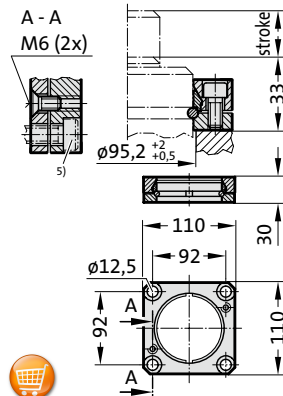
2480.007.03000



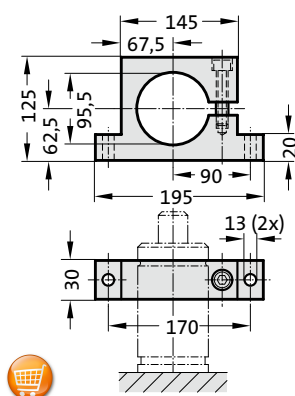
2480.008.03000<sup>3)</sup>



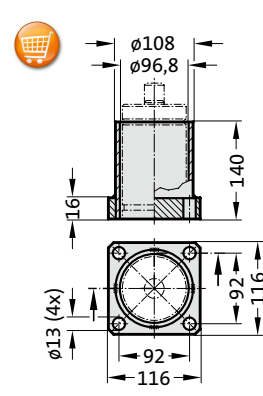
2480.064.03000<sup>4)</sup>



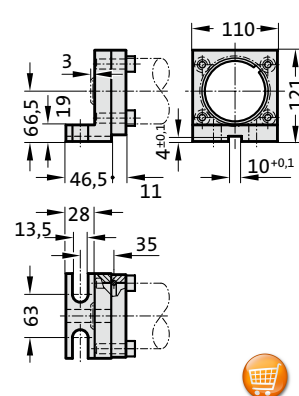
2480.044.03000<sup>2)</sup>



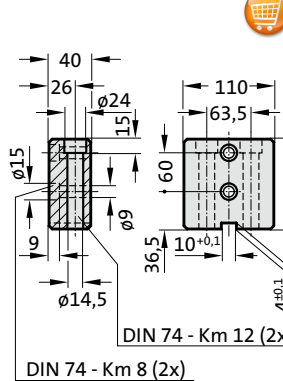
2480.010.03000.140<sup>3)</sup>



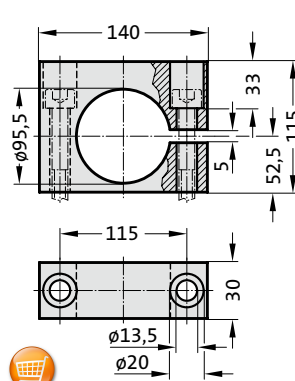
2480.045.03000<sup>2)</sup>



2480.047.03000<sup>2)</sup>



2480.044.03.03000<sup>2)</sup>



### Note:

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

Note:

Initial spring force at 150 bar = 4200 daN

Order No for spare parts kit: 2487.12.04200

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

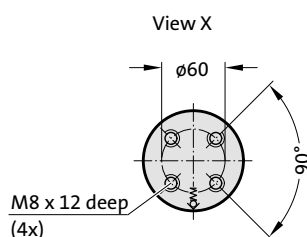
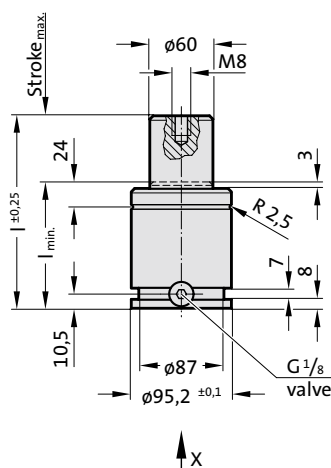
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.04200.

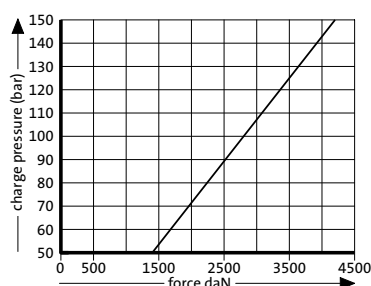


2487.12.04200.

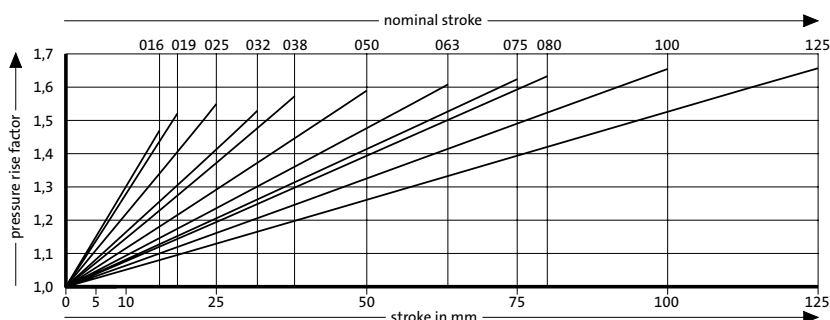
## Gas spring POWERLINE

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2487.12.04200.016	16	74	90
2487.12.04200.019	19	77	96
2487.12.04200.025	25	83	108
2487.12.04200.032	32	90	122
2487.12.04200.038	38	96	134
2487.12.04200.050	50	108	158
2487.12.04200.063	63	121	184
2487.12.04200.075	75	133	208
2487.12.04200.080	80	138	218
2487.12.04200.100	100	158	258
2487.12.04200.125	125	183	308

### Initial spring force versus charge pressure



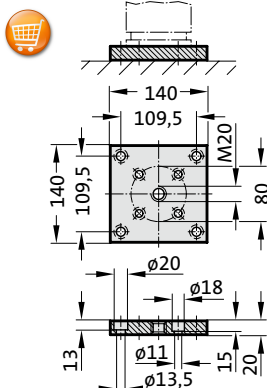
Spring force Diagram displacement versus stroke rise



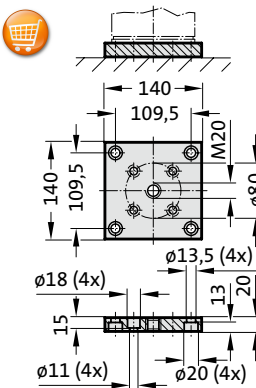
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

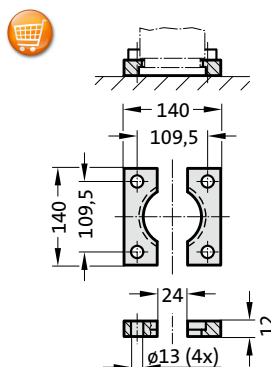
2480.011.05000



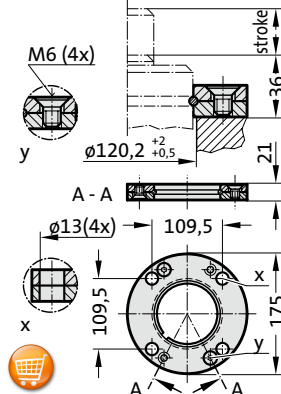
2480.011.05000.2



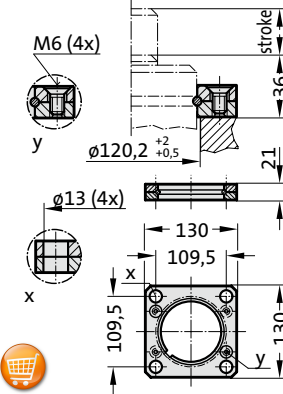
2480.022.05000



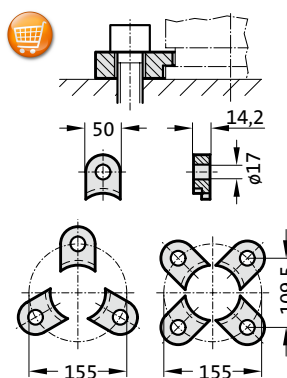
2480.055.05000



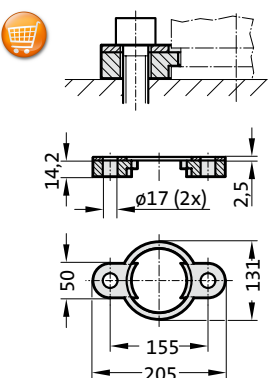
2480.057.05000



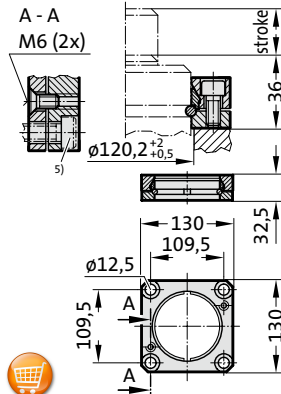
2480.007.05000



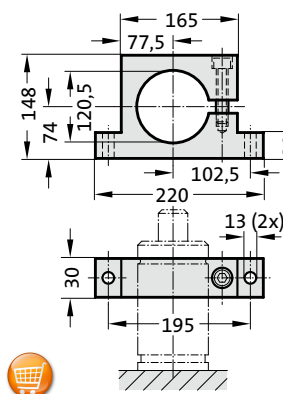
2480.008.05000<sup>3)</sup>



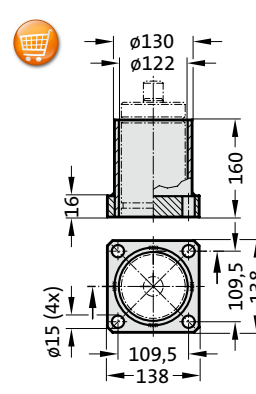
2480.064.05000<sup>4)</sup>



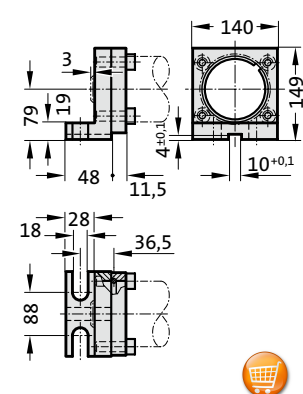
2480.044.05000<sup>2)</sup>



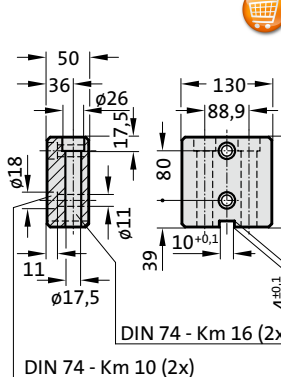
2480.010.05000.160<sup>3)</sup>



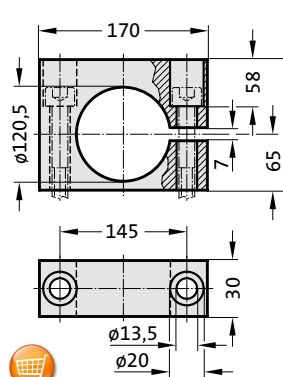
2480.045.05000<sup>2)</sup>



2480.047.05000<sup>2)</sup>



2480.044.03.05000<sup>2)</sup>



### Note:

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

Note:

Initial spring force at 150 bar = 6630 daN

Order No for spare parts kit: 2487.12.06600

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

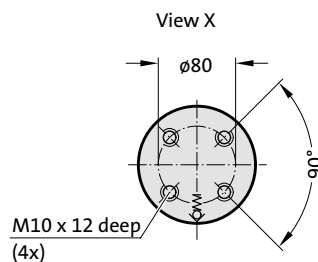
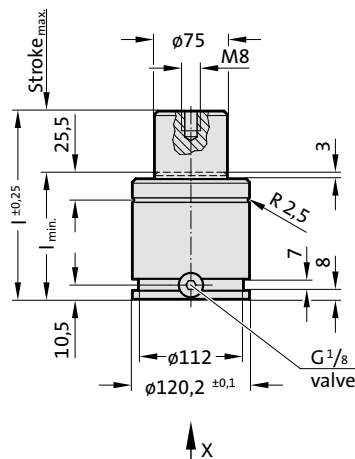
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.06600.

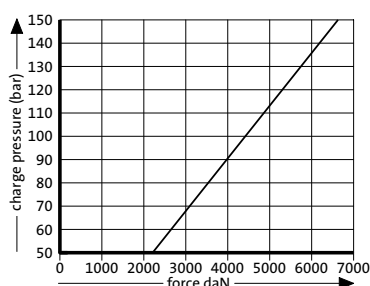


2487.12.06600.

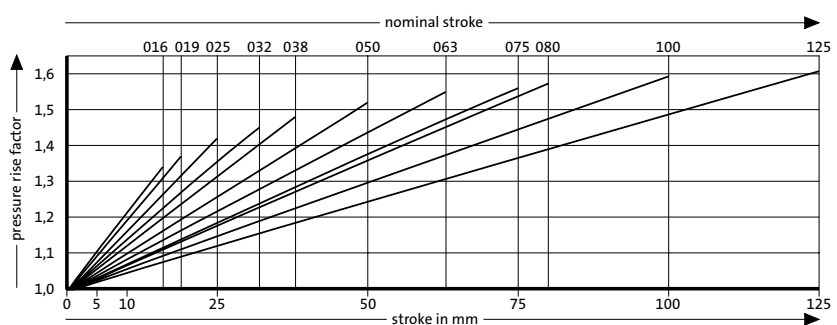
## Gas spring POWERLINE

Order No	Stroke <sub>max</sub>	l <sub>min</sub>	l
2487.12.06600.016	16	84	100
2487.12.06600.019	19	87	106
2487.12.06600.025	25	93	118
2487.12.06600.032	32	100	132
2487.12.06600.038	38	106	144
2487.12.06600.050	50	118	168
2487.12.06600.063	63	131	194
2487.12.06600.075	75	143	218
2487.12.06600.080	80	148	228
2487.12.06600.100	100	168	268
2487.12.06600.125	125	193	318

### Initial spring force versus charge pressure



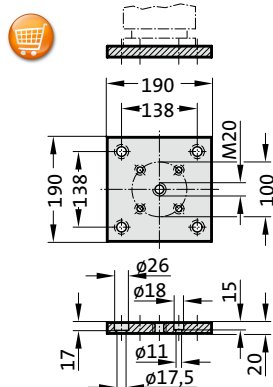
### Spring force Diagram displacement versus stroke rise



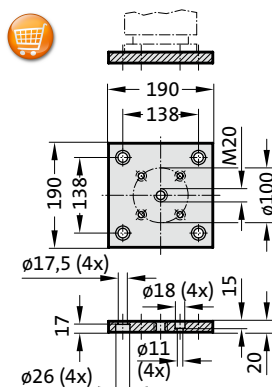
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

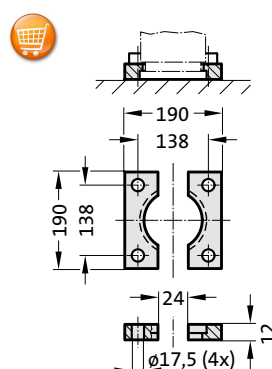
2480.011.07500



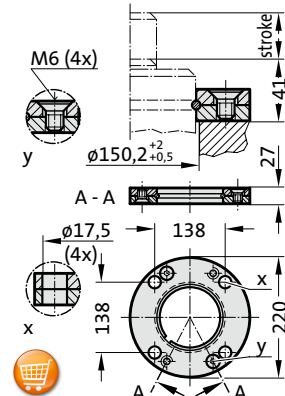
2480.011.07500.2



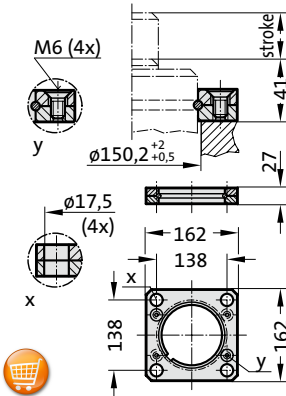
2480.022.07500



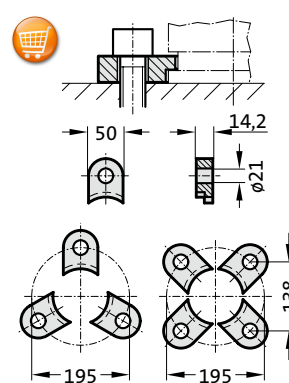
2480.055.07500



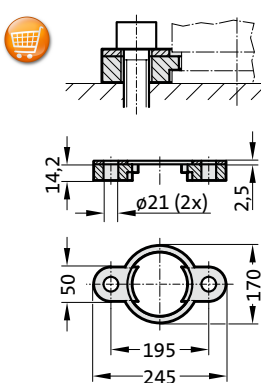
2480.057.07500



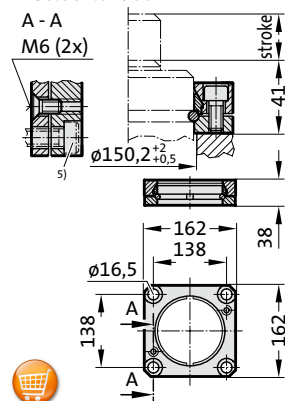
2480.007.07500



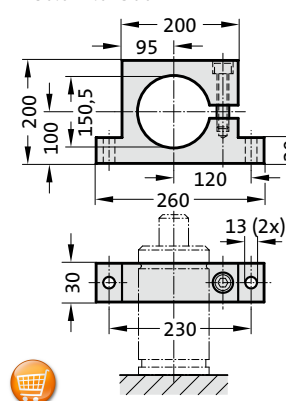
2480.008.07500<sup>3)</sup>



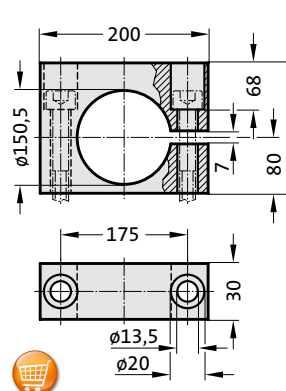
2480.064.07500<sup>4)</sup>



2480.044.07500<sup>2)</sup>



2480.044.03.07500<sup>2)</sup>



### Note:

- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop surface.
- <sup>3)</sup> Note:  
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).

Note:

Initial spring force at 150 bar = 9500 daN

Order No for spare parts kit: 2487.12.09500

Pressure medium: Nitrogen N<sub>2</sub>

Max. filling pressure: 150 bar

Min. filling pressure: 25 bar

Working temperature: 0°C to +80°C

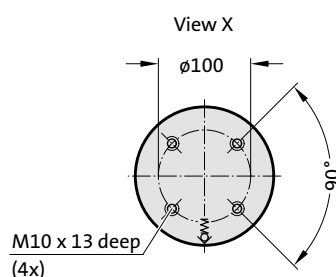
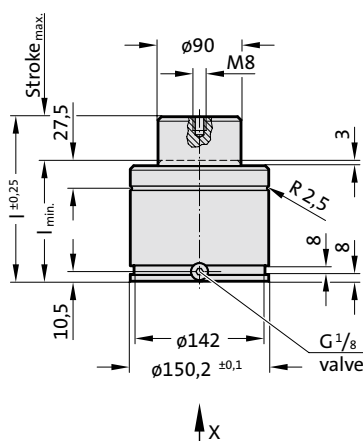
Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

approx. 20 to 100 (at 20°C)

Max. piston speed: 1.6 m/s

2487.12.09500.

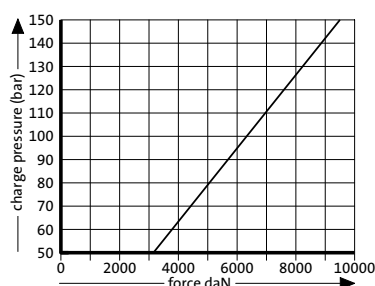


2487.12.09500.

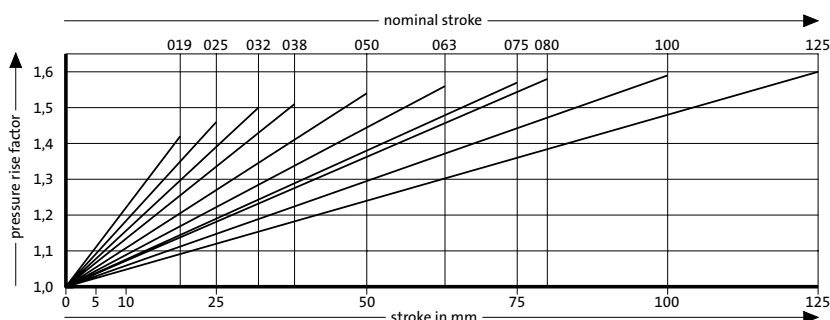
## Gas spring POWERLINE

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2487.12.09500.019	19	97	116
2487.12.09500.025	25	103	128
2487.12.09500.032	32	110	142
2487.12.09500.038	38	116	154
2487.12.09500.050	50	128	178
2487.12.09500.063	63	141	204
2487.12.09500.075	75	153	228
2487.12.09500.080	80	158	238
2487.12.09500.100	100	178	278
2487.12.09500.125	125	203	328

### Initial spring force versus charge pressure



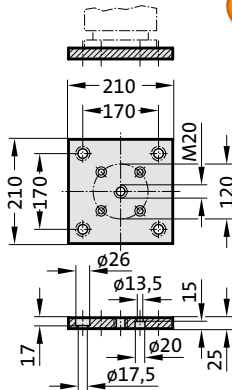
Spring force Diagram displacement versus stroke rise



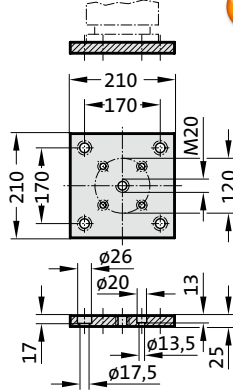
Pressure rise factor accounts for displacement but not external influences!

## Gas spring POWERLINE Mounting variations

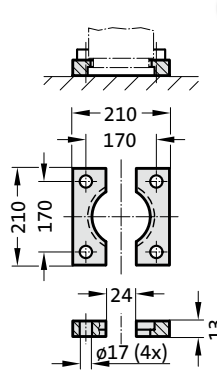
2480.011.10000.2



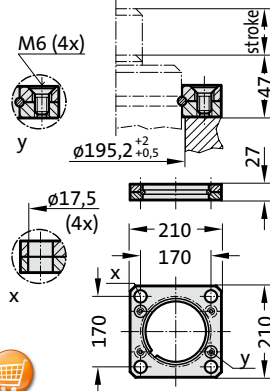
2480.011.10000



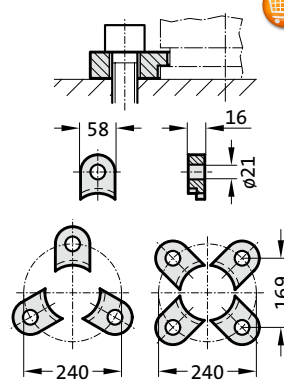
2480.022.10000



2480.057.10000



2480.007.10000





# Gas spring POWERLINE



FIBRO

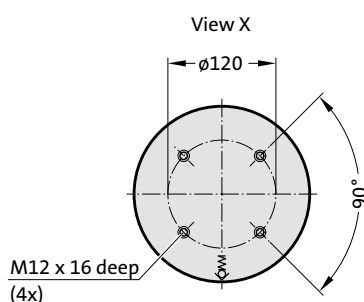
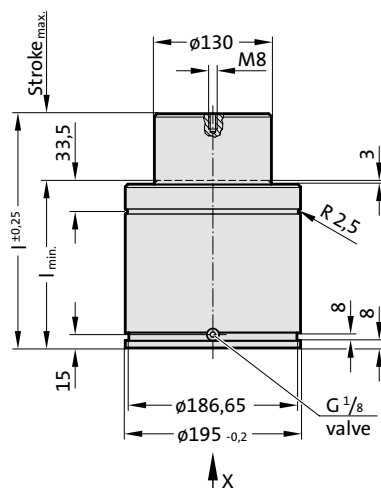
## Note:

Initial spring force at 150 bar = 20000 daN

Order No for spare parts kit: 2487.12.20000

Pressure medium: Nitrogen N<sub>2</sub>  
 Max. filling pressure: 150 bar  
 Min. filling pressure: 25 bar  
 Working temperature: 0°C to +80°C  
 Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$   
 Max. recommended extensions per minute:  
 approx. 10 to 100 (at 20°C)  
 Max. piston speed: 1.6 m/s

2487.12.20000.

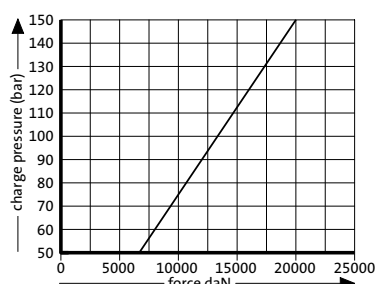


2487.12.20000.

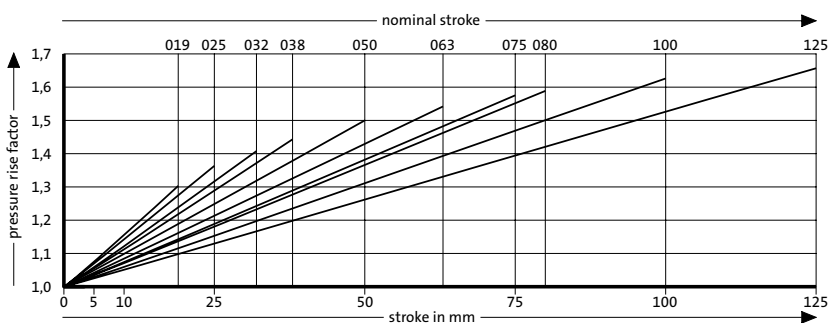
Gas spring POWERLINE

Order No	Stroke <sub>max.</sub>	l <sub>min.</sub>	l
2487.12.20000.019	19	129	148
2487.12.20000.025	25	135	160
2487.12.20000.032	32	142	174
2487.12.20000.038	38	148	186
2487.12.20000.050	50	160	210
2487.12.20000.063	63	173	236
2487.12.20000.075	75	185	260
2487.12.20000.080	80	190	270
2487.12.20000.100	100	210	310
2487.12.20000.125	125	235	360

Initial spring force  
versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!

