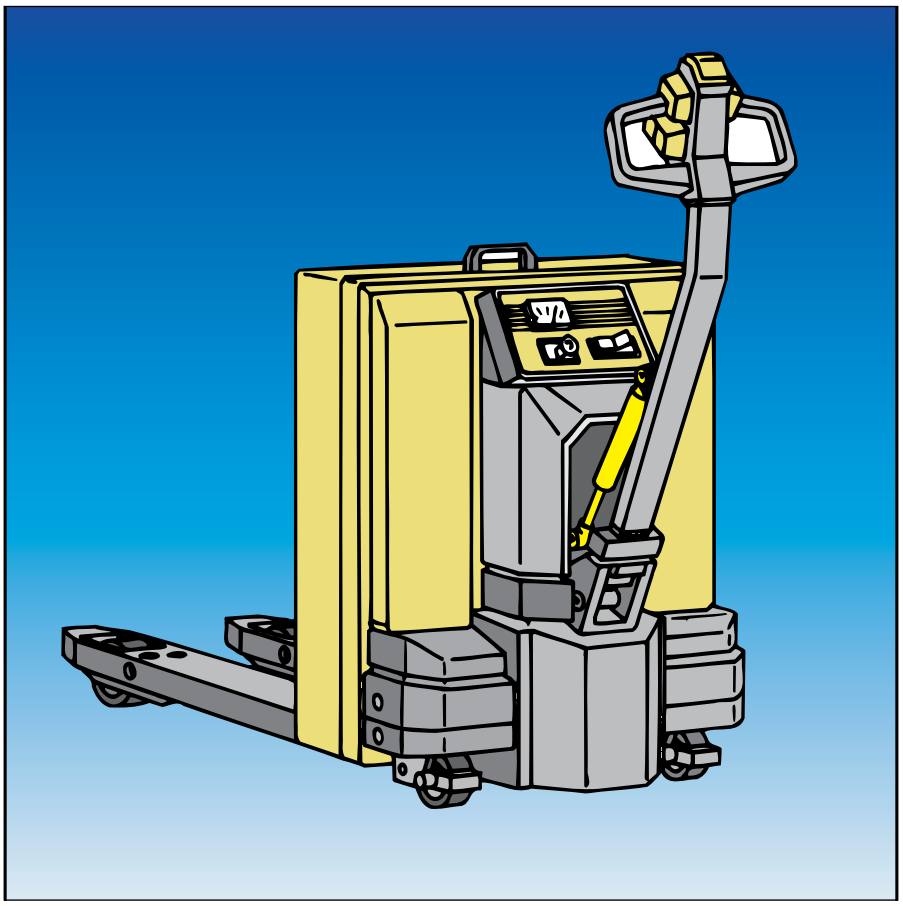
Pull Type Gas Springs

DICTATOR pull type gas springs are the answer to your problems if you are unable to use normal push type gas springs due to a lack of space. They work in the opposite way to push type gas springs as the **gas pressure inside the cylinder causes the piston rod to retract inwards**.

Depending on how they are installed, pull type gas springs either open or close flaps, windows and hatchways. **In the example opposite**, the pull type gas spring always pulls the fork lift truck shaft into a vertical position.

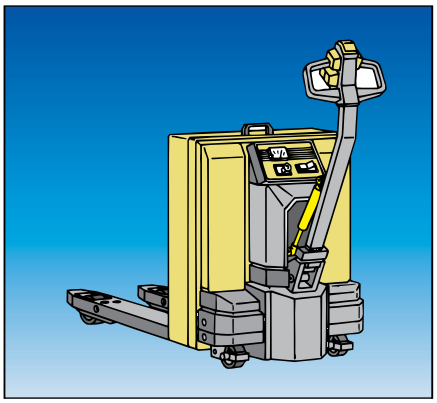
In the same way as with push type gas springs, we manufacture your pull type gas spring according to your **individual application requirements** - as a **single unit**, in small or large batches.

Along with their different function pull type gas springs differ from normal push type gas springs by their longer length and larger cylinder diameter, although they have the same piston rod diameter.



Technical Data

Piston rod diameter	6, 10, 28 mm
Cylinder diameter	19, 28, 40 mm
Pulling force	30 N - 5000 N
Stroke length	10 mm - 600 mm
Operating temperature	-10 °C (with special oil -30 °C) to +80 °C
Change in pressure	0.37 % per 1 °C (first filling at approx. 18° - 20 °C)
Gas	nitrogen (N), (non-flammable)
Maximum number of strokes	6 strokes per minute



Summary of Pull Type Gas Springs

DICTATOR pull type gas springs are usually manufactured according to your individual requirements. The following table gives you a short summary of pull type gas springs available.

Information concerning possible additional options for pull type gas springs can be found at the bottom of this page. Detailed data concerning each individual diameter range, which will help you when selecting your gas spring, can be found on the following pages. Or let us advise you!

Technical Data

Ø Piston rod **Ø Cylinder**	**6** **19**	**10** **28**	**10** **40**	**28** **40**
Min. stroke S (mm) **Max. stroke S (mm)**	30 300	10 600	10 590	50 700
Damping	0	0, 1, 2, 3	0	0
Min. force **Max. force**	30 N 330 N	150 N 1200 N	200 N 2000 N	500 N 5000 N
Comp. L (GZ-GZ) * **Ext. L (GZ-GZ) ***	**L** ext.- **S** 2 x S + 100	**L** ext.- **S** 3 x S + 65	**L** ext.- **S** 2 x S + 150	**L** ext.- **S** 2.5 x S + 125
End fittings	GZ, A, G WG, GK	GZ, A, G WG, GK	GZ, A, G WG, GK	GZ, A, G WG, GK
Oil chamber (4) * **Valve (5)** **Protective tube (6) ***	L + 20 standard L + 5	L + 30 option L + 5	L + 20 standard L + 5	no standard L + 5

* ***Stroke (S) or length (L) + additional lengths in mm [Example: 10-28 range; stroke 50; ext. L = 3 x 50 + 65 = 215 mm]***

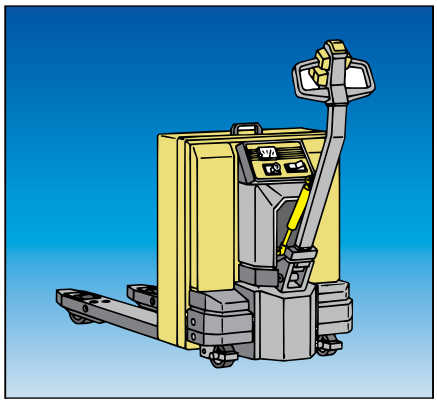
Advice: The given „fixed measurements" which are necessary when calculating the total length are accounted for in the standard progressivity of 30 - 40 %. If the progressivity may be higher, the measurements can be slightly reduced and the gas spring shortened (see page 06.009.00).

Additional Options

In pull type gas springs the piston rod should ideally point upwards in a vertical position. If this is not possible, please order your gas spring with an oil chamber (ATTENTION: observe the maximum force for oil chambers!). This ensures the seal is always covered by oil and does not become porous quickly. The **oil chamber** has **code no. 4.** (The total length increases by 20 or 30 mm.) (Please see page 06.010.00).

Almost all pull type gas springs are supplied with a valve on the piston rod as standard. The Z 10-28 range is an exception: for these the valve must be ordered separately. By using a valve the pressure can be released on site, until the required force is reached. A valve can therefore save you time and money especially in new applications. Should you release too much pressure, we can refill the gas spring for you. The **valve** in the Z10-28 range has **code no. 5**. (Please see page 06.010.00).

If your gas spring is going to be exposed to dirt, paint or other such hazards, and if there is danger of mechanical damage, please order a protective tube with your gas spring. The protective tube slides over the cylinder and piston rod and prevents damages. The gas spring can also be supplied with 2 protective tubes on request. The **protective tube** has **code no. 6**. (The total length increases by 5 mm per protective tube). (Please also see page 06.011.00).



Z 6-19 Pull Type Gas Springs
Force 30 N - 330 N

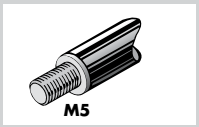
The smallest pull type gas springs are produced with a 6 mm piston rod diameter and 19 mm cylinder diameter. Please be aware that in contrast to push type gas springs, pull type gas springs should generally be installed with the piston rod pointing upwards.

Z 6-19 pull type gas springs are **supplied with a valve** on the piston rod **as standard**.

With Z 6-19 pull type gas springs the eyelet is screwed onto the cylinder. End fittings from the 6-15 range are generally used. (Please see end fittings beginning on page 06.061.00).

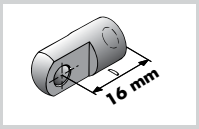
End Fittings

On piston rod | **On cylinder**

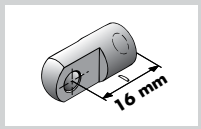


Threaded end **GZ**

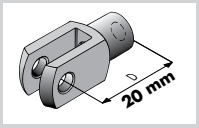
Threaded end **GZ**



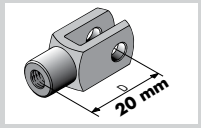
Eyelet **A**



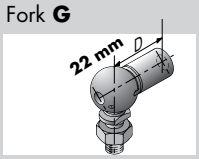
Eyelet **A**



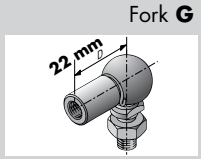
Fork **G**



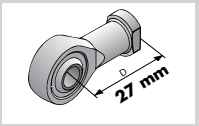
Fork **G**



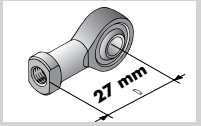
Ball and socket joint **WG**



Ball and socket joint **WG**



Rose bearing **GK**



Rose bearing **GK**

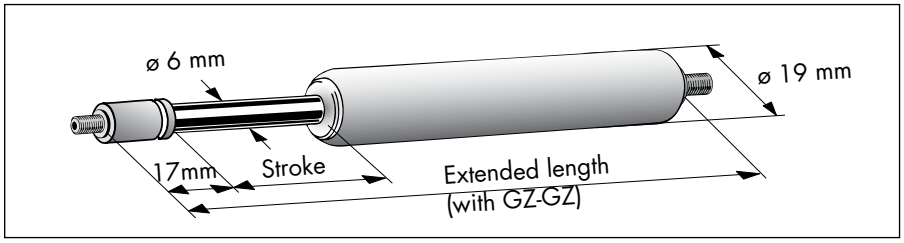
Exact dimensioned drawings for the above end fittings can be found on pages 06.061.00 - 06.064.00.

Types of damping for Z 6-19 range
0 = without damping

Determining Your Z 6-19 Pull Type Gas Spring

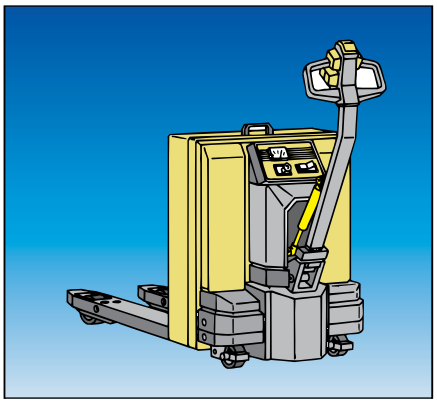
With help of the following table you can easily find the correct gas spring if you already know the necessary stroke and end fittings.

If you require a pull type gas spring not only with threaded ends, but also, for example, an eyelet on the piston rod or both ends, then simply add the measurement D given in the drawings of the end fittings to the extended length to achieve the total length. The same applies for additional options.



	Type Z	See page
1. Piston rod diameter:	6 mm	06.082.00
2. Cylinder diameter:	19 mm	06.082.00
3. Stroke (30 - 300 mm):		06.082.00
4. Type of damping:	0	06.005.00 06.083.00
5. Force (30 - 330 N):		06.083.00
6. Compressed length (= extended length - stroke):		06.084.00
7. Extended length (total length): (min. 2 x stroke + 100 mm + measurement D of end fittings + measurements of additional options)		06.084.00
8. Piston rod end fitting (see drawing for symbol):		06.061.00
9. Cylinder end fitting (see drawing for symbol):		06.061.00
10. Additional options: ☐ Oil chamber* (**4**) (total length + 20 mm) ☐ Protective tube (**6**) (total length + 5 mm) * maximum force with oil chamber: 200 N!		06.010.00 06.011.00

Additional details:



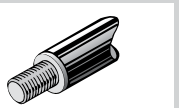
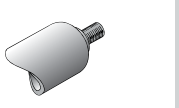
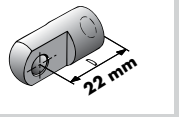
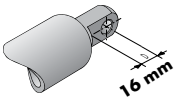
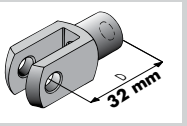
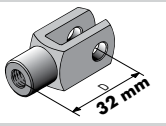
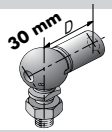
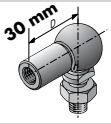
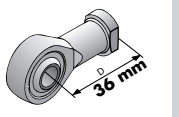
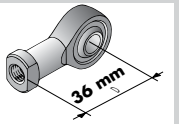
Z 10-28 Pull Type Gas Springs
Force 150 N - 1200 N

Most pull type gas springs are manufactured with a 10 mm piston rod diameter and 28 mm cylinder diameter. Please be aware that in contrast to push type gas springs, pull type gas springs should generally be installed with the piston rod pointing upwards.

If you order a pull type gas spring with end fitting A-A, the gas spring will be supplied with a cylinder with an eyelet from the 14-28 range. End fittings are usually those used in the 10-23 range. (Please see end fittings beginning on page 06.061.00).

Z 10-28 pull type gas springs can also be manufactured with a shorter total length on request. A valve is possible as an additional option.

End Fittings

On piston rod	**On cylinder**
 Threaded end **GZ**	 Threaded end **GZ**
 Eyelet **A**	 Eyelet **A**
 Fork **G**	 Fork **G**
 Ball and socket joint **WG**	 Ball and socket joint **WG**
 Rose bearing **GK**	 Rose bearing **GK**

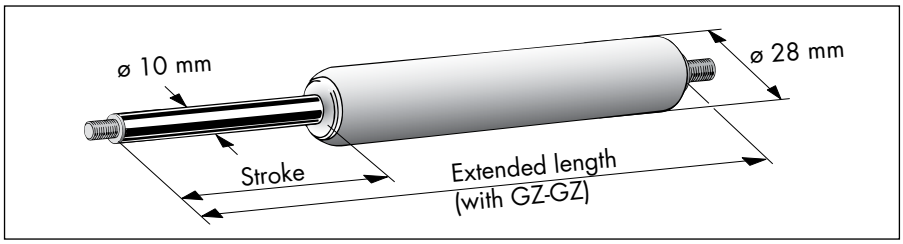
Exact dimensioned drawings for the above end fittings can be found on pages 06.061.00 - 06.064.00.

Types of damping for 10-28 range
0 = without damping
1 = damping on extending stroke
2 = damping on compression stroke
3 = damping on both extending and compression strokes

Determining Your Z 10-28 Pull Type Gas Spring

With help of the following table you can easily find the correct pull type gas spring if you already know the necessary stroke and end fittings.

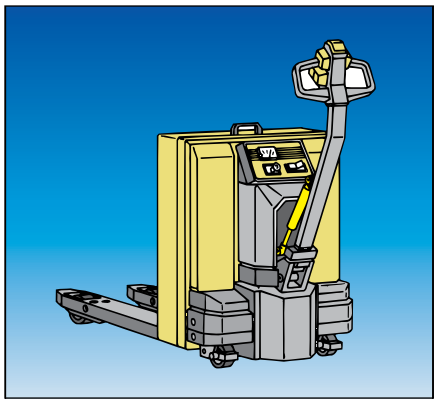
If you require a pull type gas spring not only with threaded ends, but also, for example, an eyelet on the piston rod or both ends, then simply add the measurement D given in the drawings of the end fittings to the extended length to achieve the total length. The same applies for additional options.



	Type Z	See page
1. Piston rod diameter:	10 mm	06.082.00
2. Cylinder diameter:	28 mm	06.082.00
3. Stroke (10 - 600 mm):		06.082.00
4. Type of damping: (choice between types **0**,**1**,**2**,**3**)		06.005.00 06.083.00
5. Force (150 - 1200 N): (maximum force with oil chamber: 600 N)		06.083.00
6. Compressed length (= extended length - stroke):		06.084.00
7. Extended length (total length): (min. 3 x stroke + 65 mm + measurement D of end fittings + measurements of additional options)		06.084.00
8. Piston rod end fitting (see drawing for symbol):		06.061.00
9. Cylinder end fitting (see drawing for symbol):		06.061.00
10. Additional options: ☐ Oil chamber (**4**) (total length + 30 mm)		06.010.00
☐ Valve on piston rod **(5)**		06.011.00
☐ Protective tube (**6**) (total length + 5 mm)		06.011.00

Standard model pull type gas spring as substitute on Steinbock fork lift trucks

Z10-28-80-2/800N-250-350-GZ10-GZ10-4 part no. 10280080Z-0001471



Z 10-40 Pull Type Gas Springs
Force 200 N - 2000 N

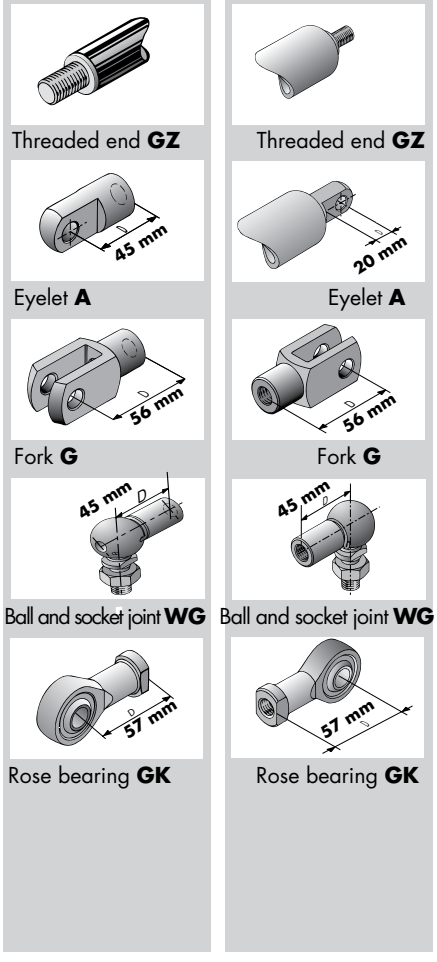
For forces from 200 N - 2000 N we supply pull type gas springs with a piston rod diameter of 10 mm and cylinder diameter of 40 mm. Please be aware that in contrast to push type gas springs, pull type gas springs should generally be installed with the piston rod pointing upwards.

Z 10-40 pull type gas springs are supplied with a valve on the piston rod as standard.

A thread-adapter is attached to the piston rod in the Z 10-40 range. End fittings from the 20-40 range are generally attached to this thread on the piston rod as well as on the cylinder.

End Fittings

On piston rod | **On cylinder**



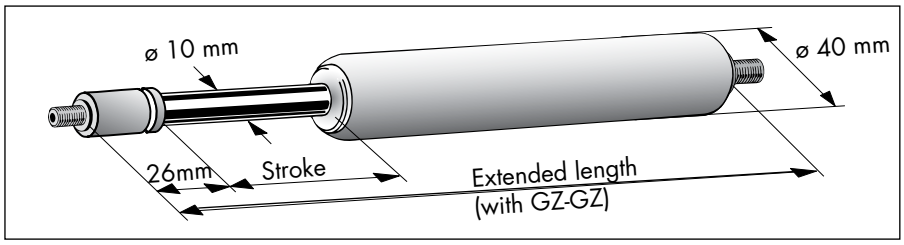
Exact dimensioned drawings for the above end fittings can be found on pages 06.061.00 - 06.064.00.

Types of damping for range Z 10-40
0 = without damping

Determining Your Z 10-40 Pull Type Gas Spring

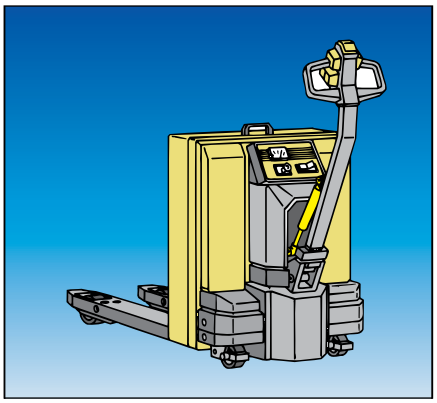
With help of the following table you can easily find the correct pull type gas spring if you already know the necessary stroke and end fittings.

If you require a pull type gas spring not only with threaded ends, but also, for example, an eyelet on the piston rod or both ends, then simply add the measurement D given in the drawings of the end fittings to the extended length to achieve the total length. The same applies for additional options.



	Type Z	See page
1. Piston rod diameter:	10 mm	06.082.00
2. Cylinder diameter:	40 mm	06.082.00
3. Stroke (10 - 590 mm):		06.082.00
4. Type of damping:	0	06.005.00 06.083.00
5. Force (200 - 2000 N):		06.083.00
6. Compressed length (= extended length - stroke):		06.084.00
7. Extended length (total length): (min. 2 x stroke + 150 mm + measurement D of end fittings + measurements of additional options)		06.084.00
8. Piston rod end fitting (see drawing for symbol):		06.061.00
9. Cylinder end fitting (see drawing for symbol):		06.061.00
10. Additional options: ☐ Oil chamber* (**4**) (total length + 20 mm) ☐ Protective tube (**6**) (total length + 5 mm) * maximum force with oil chamber: 1500 N		06.010.00 06.011.00

Additional details:



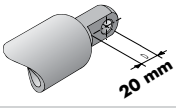
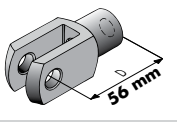
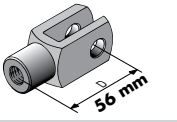
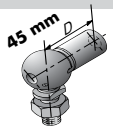
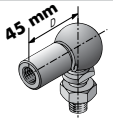
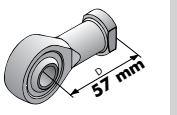
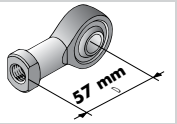
Z 28-40 Pull Type Gas Springs
Force 500 N - 5000 N

The highest pulling forces can be reached with Z 28-40 gas springs with a 28 mm piston rod diameter and 40 mm cylinder diameter. Please be aware that in contrast to push type gas springs, pull type gas springs should generally be installed with the piston rod pointing upwards.

Z 28-40 pull type gas springs are supplied with a valve on the piston rod as standard.

Z 28-40 pull type gas springs have an M14x1.5 thread on both ends. End fittings from the 20-40 range are generally used on the piston rod as well as on the cylinder.

End Fittings

On piston rod	On cylinder
 Threaded end **GZ**	 Threaded end **GZ**
 Eyelet **A**	 Eyelet **A**
 Fork **G**	 Fork **G**
 Ball and socket joint **WG**	 Ball and socket joint **WG**
 Rose bearing **GK**	 Rose bearing **GK**

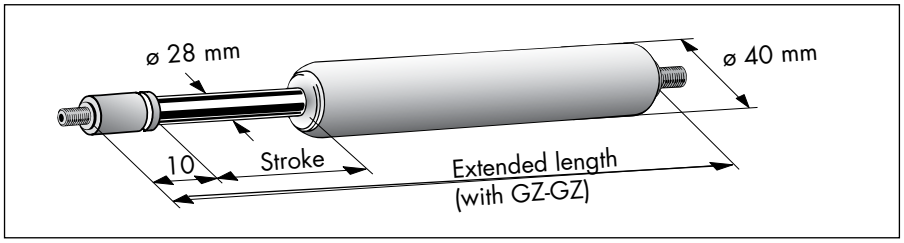
Exact dimensioned drawings for the above end fittings can be found on pages 06.061.00 - 06.064.00.

Types of damping for Z 28-40 range
0 = without damping

Determining Your Z 28-40 Pull Type Gas Spring

With help of the following table you can easily find the correct pull type gas spring if you already know the necessary stroke and end fittings.

If you require a pull type gas spring not only with threaded ends, but also, for example, an eyelet on the piston rod or both ends, then simply add the measurement D given in the drawings of the end fittings to the extended length to achieve the total length. The same applies for additional options.



	Type Z	See page
1. Piston rod diameter:	28 mm	06.082.00
2. Cylinder diameter:	40 mm	06.082.00
3. Stroke (50 - 700 mm):		06.082.00
4. Type of damping:	0	06.005.00 06.083.00
5. Force (500 - 5000 N):		06.083.00
6. Compressed length (= extended length - stroke):		06.084.00
7. Extended length (total length): (min. 2,5 x stroke + 125 mm + measurement D of end fittings + measurements of additional options)		06.084.00
8. Piston rod end fitting (see drawing for symbol):		06.061.00
9. Cylinder end fitting (see drawing for symbol):		06.061.00
10. Additional options: ☐ Protective tube (**6**) (total length + 5 mm)		06.010.00

Additional details: