

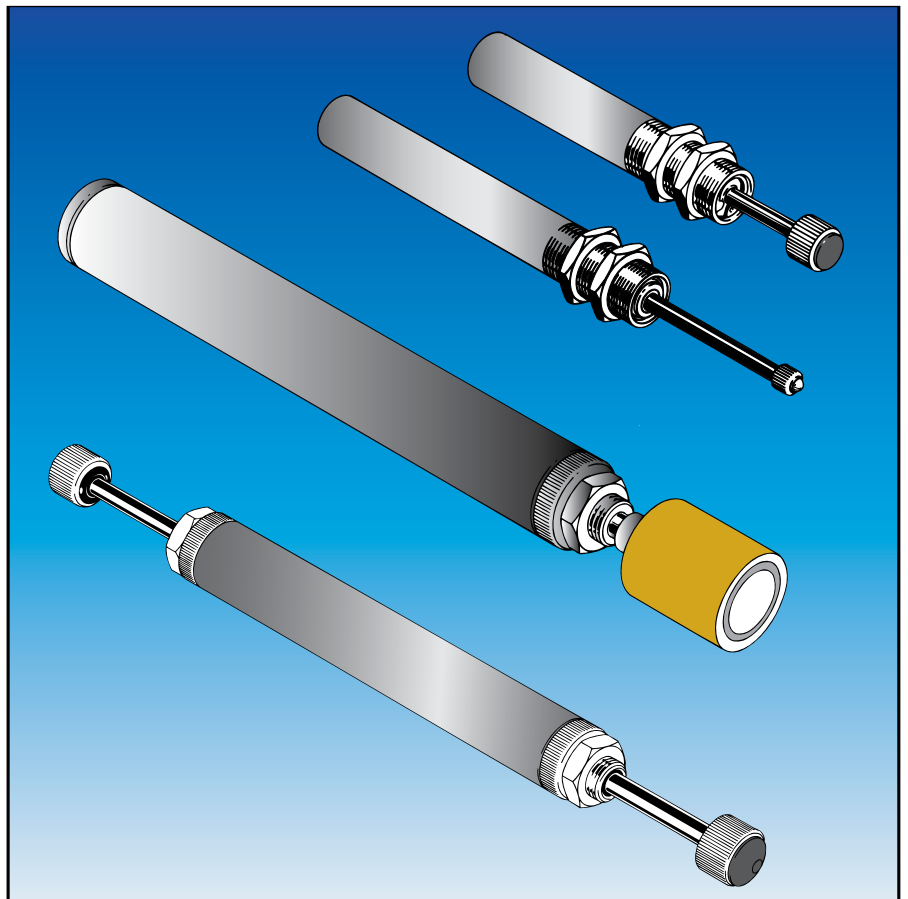
DICTATOR Final Dampers

DICTATOR final dampers are needed to slow down all kinds of rotative or linear movement. Their relatively long strokes offer sufficient safety distances. The final dampers are available in both single (EDH) and bi-directional (ZDH) configurations.

A large variety of dimensions is on stock. In addition we furnish customised dampers, same as with the oil dampers with fixings on both ends and the gas springs (see extra chapter) - even single pieces.

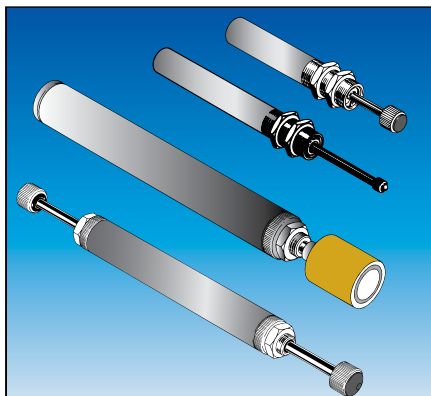
The DICTATOR production programme is very comprehensive and thus offers solutions for a broad spectrum of applications. The most important characteristics of the DICTATOR final dampers are:

- many different diameters
- stroke depends on application
- different buffers or piston rod end fittings
- different possibilities of resetting
- fixing possibilities
- all final dampers are adjustable
- with and without overload safety valve
- partly with authorisation for fire protection applications



Technical Data

| | |
|---------------------|---|
| Diameter piston rod | 4, 6, 8.5, 10, 12, 25 mm (as standard) |
| Diameter cylinder | 14, 20, 28, 35, 69 mm (as standard) |
| Material piston rod | hard chromed, AISI 304, AISI 316 |
| Material cylinder | steel tube zinc or nickel plated, painted, AISI 304, -316, aluminium |
| Stroke lengths | 20 mm to 1000 mm |
| Damping fluids | hydraulic oil, biological oil (on demand also with FDA authorisation) |
| Damping forces | up to 12.000 N |



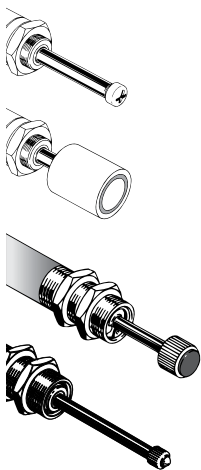
Final Damper Variations

Almost all dampers of the DICTATOR standard program can be produced as modified types. Generally just the relation between the diameter of piston rod and cylinder has to be observed.

Apart from other dimensions a large range of other features is variable: material, finish, damping characteristics, end fittings, type of fixing, special damping fluids etc.

On the following pages you will find the standard dampers of the different diameter series. Here all the above mentioned variables may be adapted to your requirements. Just ask our technical department.

End Fittings



Most final dampers are equipped with a **rubber buffer (PF)** on the piston rod.

Wherever there is any danger that the integrated return spring of the damper might push back e.g. the door (as it is moving very smoothly), the damper is delivered with a **magnet (M)** on the piston rod. When the damped object is removed from the damper, the magnet adheres to it until the piston rod is completely extended. Besides the standard magnet there are other dimensions/forces available as well as the **neodyn magnet**. This special magnet represents a very economic alternative. However it can not be used when there are high surrounding temperatures (max. temperature 80 °C compared to 120 °C of the standard magnets). Furthermore the neodyn magnet has a higher back reflection and therefore should not be used anywhere where this might cause problems.

A further possibility is the **ball head (K)**. It is mainly used when the impact of the mass is not exactly in-line.

The dampers can also be produced with **customised threads on cylinder and piston rod** (there an inside thread is also possible). This allows for the use of other buffers or fixing parts.

Fixing

The cylinders of the **final dampers** are normally provided with a thread at the front and partly also at the rear of the cylinder. Furthermore they can be furnished with a thread on the cylinder itself, either end-to-end or just part of it.

For the dampers of the series EDH 28 and ZDH 28 we provide standard fixing accessories (see page 03.026.00).

Resetting of the Piston Rod

With final dampers it must be assured that the piston rod always returns to its extended position in order to be ready to work again on the next impact of the load. This normally is achieved with a **built-in return spring (RF)**. During the entering of the piston rod into the cylinder this spring is compressed and automatically pushes out the piston rod as soon as the damped object is withdrawn.

The second standard option with single final dampers (EDH) is a **permanent magnet** on the piston rod (see above). As counterpart to the permanent magnet there is needed on the door either an even iron area or an extra counter plate (part no. 040025) has to be installed.

Further possibilities are (on request):

- an outside return spring (reduces the total length of the damper)
- nitrogen (when the damping has to be as linear as possible)

For the bi-directional dampers **ZDH** we offer the following resetting alternatives:

- built-in return springs for both piston rods (**ZDHa**)
- return spring for one piston rod (side A), the other piston rod (side B) is pushed out by the entering piston rod of side A (**ZDHaeg**)
- without return spring: the piston rods are pushed outside by one another (**ZDHbg**)

Final Damper Variations, cont.

Adjustment of the Damping Force

The damping force of final dampers can be **adjusted** continuously. Depending on the application or the requirements this is either done with a screw in the front of the piston rod (**screw adjustment = NR**) or by pulling and turning the piston rod (**stepped adjustment = ZR**).

A self-acting adjustment of the stepped adjustment is not possible, as this adjustment only works when you pull the piston rod sufficiently to engage two toothed discs on the piston. Only then you can adjust the damping force by turning the piston rod.

The screw adjustment allows an absolutely precise adjustment. A misadjustment by mistake is almost impossible. It is however only available for dampers of the \varnothing 28 mm series. Dampers for high loads (for reasons of stability) can only be produced with the stepped adjustment.

Types of Damping

Depending on the requirements of the application hydraulic dampers offer different damping characteristics. The three types are:

- Constant (**K**): uniform damping during the whole travel
- Progressive (**P**): gentle start and then progressive damping
- **ABS**: In case of a too high impact the overload safety valve in the piston opens and thus prevents blocking. Otherwise this impact could cause the piston rod to bend.

Dampers for Fire Protection Doors

To slow down fire protection doors/gates in each of the final positions you have to use special, approved dampers. Because of the high safety risks due to improper operation these dampers are checked in a permanent test at the National Material Testing Office (MPA) in Dortmund, Germany. In addition this office also checks on their production and twice a year takes some dampers from the actual production to also check them in a permanent test.

On the following pages the dampers approved for the use on fire protection doors are marked.

Safety Instructions

The damper has to be installed in a way that the impact hits the piston rod exactly in-line. This prevents lateral forces which could damage/destroy the damper.

To avoid loss of oil or complete failure, the surface of the piston rod should be protected against damages and heavy soiling (e.g. colour).

As a failure could provoke dangerous situations, you should fix the damper securely and look for oil leakage. Due to the oil and/or gas pressure, dampers are not to be opened or damaged (risk of injuries).

Calculation Instructions

Starting on page 03.077.00 you will find instructions how to choose the appropriate damper and formula to calculate the needed damping force. The correction factor needed for this purpose you will find on the following pages.

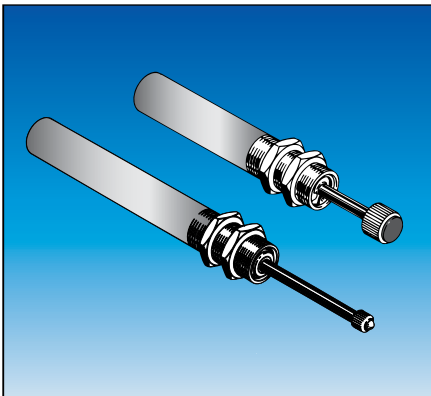
But DICTATOR would be glad to do this work for you. Just fill in the questionnaires on pages 03.072.00 and 03.073.00 and send it to us.

Overview Production Range of Final Dampers

| Final Dampers | Series | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 4 | 6 | 8,5 | 10 | 12 | 25 |
| ø piston rod [mm] | 4 | 6 | 8,5 | 10 | 12 | 25 |
| ø cylinder [mm] | 14 | 20 | 28 | 28 | 35 | 69 |
| Stroke max. [mm] | 50 | 75 | 120 | 200 | 500 | 1000 |
| Damping force max. [N] <i>(depending on the stroke: the shorter the stroke, the stronger the damping force)</i> | 1750 | 3100 | 5200 | 5200 | 17500 | 22000 |
| Type of adjustment | ZR | ZR | NR/ZR | ZR | ZR | ZR |
| Type of damper - single (EDH) - bi-directional (ZDH) | x | x | x x | x x | x o | x |
| End fitting piston rod - damper EDH - damper ZDH | PF/K M | PF/K M | PF/M PF | PF/M PF | PF/M | point |
| Resetting of the piston rod - damper EDH - damper ZDH <i>(customised dampers on request)</i> | RF/M | RF/M | RF/M a, aeg | RF/M a, aeg bg | RF/M a, aeg bg | RF bg |
| Damping | K, ABS | K/ABS ABS | K, P ABS | K/P ABS | K/P ABS | K/P |
| Material piston rod - hard chromed - AISI 304 - AISI 316 | x o o | x o o | x x o | x x o | x o o | x o o |
| Material cylinder - steel nickel-plated - steel zinc-plated - steel powder-coated - AISI 304 - AISI 316 | x o o o o | x o o o o | o x o x o | o x o x o | o x o o o | x o o o o |
| Temperature range 0° to +60 °C to +80 °C to -30 °C | x o o | x o o | x o o | x o o | x o o | x o o |
| Damping medium - hydraulic oil - biological oil - silicone oil | x o o | x o o | x o o | x o o | x o o | x o o |

Key:
 ZR stepped adjustment
 NR needle adjustmen
 PF rubber buffer
 K ball head
 M permanent magnet
 RF return spring
 a extending automatically
 aeg side A extending automatically
 side B pushed out by side A
 bg sides A and B push out one
 another
 K constant/uniform damping
 P progressive damping
 ABS overload safety valve
 x standard
 o on request

For explications please see the previous pages.



Final Dampers Series EDH 14

For impact loads up to 100 kg

The series EDH 14 comprises the smallest standard final dampers. The diameter of the piston rod of 4 mm allows them to be used with accordingly short strokes for loads up to 100 kg.

The damping force can continuously be adjusted by turning the piston rod.

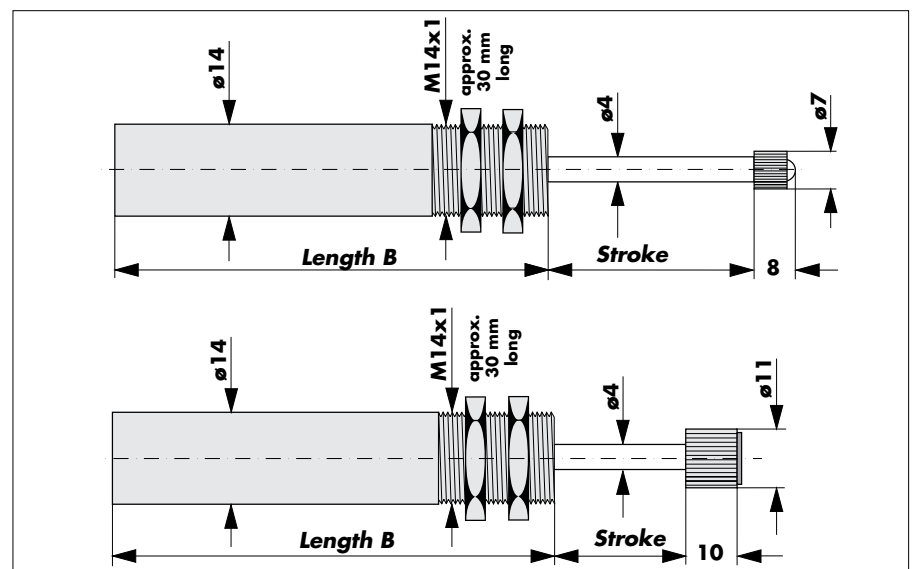
The dampers EDH 14 are available with and without overload safety valve (ABS).

Dampers of the series EDH 14 and EDH 20 are for example used in handling systems, small robots, turnstiles and for slowing down rotative movements.

Technical Data

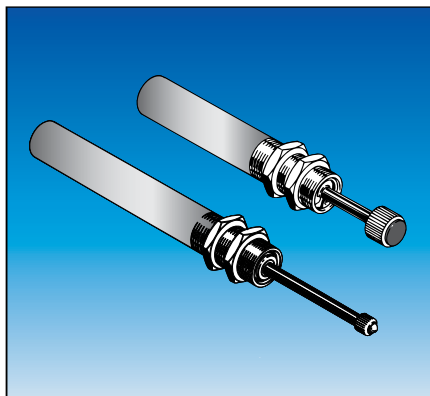
| | |
|--------------------------------------|--|
| Finish | nickel-plated, piston rod hard chromed |
| Adjustment | pulling and turning of the piston rod |
| Types of damping | constant, ABS |
| End fittings for the piston rod | buffer, ball head (for rotary motion) |
| Fixing | thread on cylinder with two nuts |
| Impact speed | 0.1 to 0.9 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.0$ |
| Returning force (internal spring) | 30 N |
| Energy per stroke | max. 16 Nm |
| Ø piston rod / Ø cylinder | 4 mm / 14 mm |
| Length of stroke | max. 50 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

Dimensions



Order Information Standard Types

| Part no. with ABS ball head | Part no. without ABS ball head | Part no. with ABS buffer | Part no. without ABS buffer | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | Length B [mm] |
|-----------------------------------|--------------------------------------|--------------------------------|-----------------------------------|----------------|--------------------------|------------------------------|------------------|
| 201923 | 201823 | 201920 | 201820 | 20 | 100 | 1750 | 87 |
| 201924 | 201824 | 201921 | 201821 | 35 | 75 | 900 | 102 |
| 201925 | 201825 | 201922 | 201822 | 50 | 50 | 700 | 117 |



Final Dampers Series EDH 20

For impact loads up to 250 kg

The construction of the series EDH 20 mostly corresponds to the series EDH 14. Due to the larger diameter of 6 mm of the piston rod it can slow down impact loads up to 250 kg. Please keep in mind that the longer the stroke the less is the maximum admissible impact load (see table below).

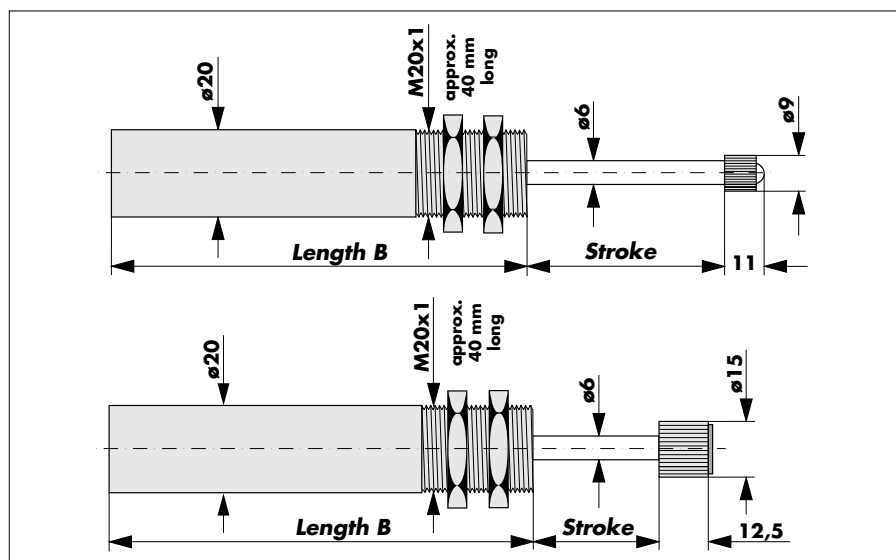
The damping force can continuously be adjusted by turning the piston rod.

The final dampers EDH 20 are available with and without overload safety valve (ABS). If the impact is too heavy, this valve in the piston opens and prevents blocking. Otherwise the piston rod might bend.

Technical Data

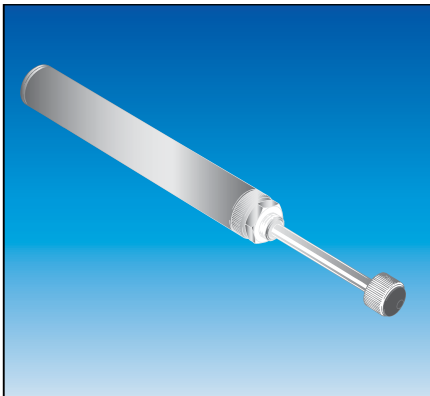
| | |
|--------------------------------------|--|
| Finish | nickel-plated, piston rod hard chromed |
| Adjustment | Pulling and turning of the piston rod |
| Types of damping | constant, ABS |
| End fittings for the piston rod | buffer, ball head (for rotary motion) |
| Fixing | thread on cylinder with two nuts |
| Impact speed | 0.1 to 0.9 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.0$ |
| Returning force (internal spring) | 30 N |
| Energy per stroke | max. 54 Nm |
| Ø piston rod / Ø cylinder | 6 mm / 20 mm |
| Length of stroke | max. 75 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

Dimensions



Order Information Standard Types

| Part no. with ABS ball head | Part no. without ABS ball head | Part no. with ABS buffer | Part no. without ABS buffer | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | LengthB [mm] |
|-----------------------------------|--------------------------------------|--------------------------------|-----------------------------------|----------------|-----------------------------|------------------------------|-----------------|
| 201915 | 201815 | 201911 | 201811 | 25 | 250 | 3100 | 107 |
| 201916 | 201816 | 201912 | 201812 | 50 | 125 | 2150 | 132 |
| 201917 | 201817 | 201913 | 201813 | 75 | 75 | 1440 | 157 |



Final Dampers Series EDH 28

For impact loads up to 3000 kg - Return spring, one fixing thread

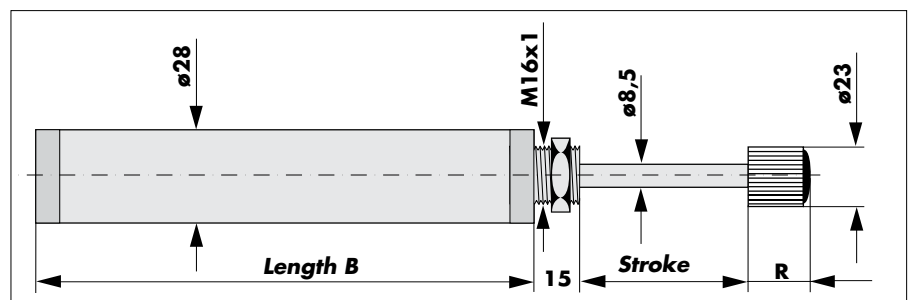
The series EDH 28 is the one of the final dampers offering the greatest variety: many different stroke lengths, with and without return spring, also in AISI 304 and AISI 316, different possibilities of adjusting, some types approved for the use on fire protection doors. For this series we also offer standard fixing accessories.

The adjusting is done either by stepped adjustment ZR (pulling and turning of the piston rod) or by screw adjustment NR (adjustment screw in the front of the piston rod). This series with one fixing thread is intended for stroke lengths up to 120 mm.

Technical Data

| | |
|--------------------------------------|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | screw or stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fitting for the piston rod | buffer |
| Fixing | one thread at the front of the cylinder |
| Impact speed | 0.08 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (internal spring) | 30 N (from 120 mm stroke: 40 N) |
| Energy per stroke | max. 154 Nm |
| Ø piston rod / Ø cylinder | 8.5 mm / 28 mm |
| Length of stroke | max. 120 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

Dimensions



Order Information Standard Types

| Part no. | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | Energy/stroke max. [Nm] | Length B [mm] | Buffer size R [mm] | Damping type | Adjustment |
|----------|-------------|-----------------------|------------------------|-------------------------|---------------|--------------------|--------------|------------|
| 200000 | 50 | 3000 | 5200 | 154 | 130 | 14 | K | NR |
| 200400 | 50 | 3000 | 5200 | 149 | 157 | 25 | ABS | ZR |
| 200002 | 50 | 3000 | 5200 | 154 | 130 | 25 | K | ZR |
| 200100 | 70 | 3000 | 4400 | 154 | 159 | 14 | K | NR |
| 200410 | 70 | 3000 | 4400 | 149 | 192 | 25 | ABS | ZR |
| 200102 | 70 | 3000 | 4400 | 154 | 159 | 25 | K | ZR |
| 200209* | 75 | 3000 | 3100 | 154 | 185 | 25 | K | ZR |
| 200200 | 100 | 3000 | 3100 | 154 | 193 | 14 | K | NR |
| 200420 | 100 | 3000 | 3100 | 149 | 225 | 25 | ABS | ZR |
| 200202 | 100 | 3000 | 3100 | 154 | 193 | 25 | K | ZR |
| 200206* | 100 | 3000 | 3100 | 154 | 257 | 25 | K | ZR |
| 200300 | 120 | 3000 | 2600 | 154 | 212 | 14 | K | NR |
| 200302 | 120 | 3000 | 2600 | 154 | 212 | 25 | K | ZR |

* Damper with **Approval for fire protection doors**, no. of certificate DO 18.3



Final Dampers Series EDH 28

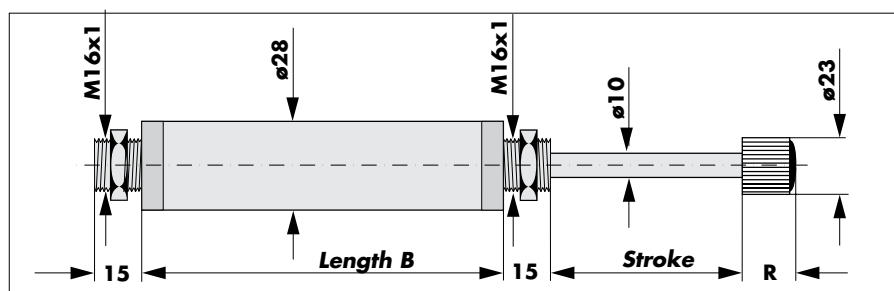
For impact loads up to 3000 kg - Return spring, two fixing threads

For applications where you need a damper EDH 28 with a longer stroke (120 mm to 200 mm) we furnish the version with two fixing threads and a \varnothing 10 mm piston rod.

Technical Data

| | |
|---|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | screw or stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fittings for the piston rod | buffer P28-ZR, P28-NR, P28-BS |
| Fixing | thread at both ends of the cylinder |
| Impact speed | 0.08 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (internal spring) | 30 N (from 120 mm stroke: 40 N) |
| Energy per stroke | max. 154 Nm |
| \varnothing piston rod / \varnothing cylinder | 10 mm / 28 mm |
| Length of stroke | max. 200 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

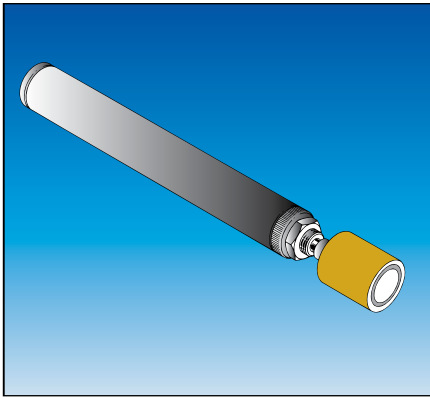
Dimensions



Order Information Standard Types

| Part no. | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | Energy/stroke max. [Nm] | Length B [mm] | Buffer size R [mm] | Damping type | Adjustment |
|-----------|-------------|-----------------------|------------------------|-------------------------|---------------|--------------------|--------------|------------|
| 200207* | 90 | 3000 | 3100 | 154 | 220 | 25 | K | ZR |
| 200203 | 100 | 3000 | 3100 | 154 | 200 | 25 | K | ZR |
| 200303 | 120 | 3000 | 3100 | 154 | 220 | 25 | K | ZR |
| 203115-28 | 200 | 3000 | 2400 | 149 | 314 | 25 | ABS | ZR |

* Damper with **Approval for fire protection doors**, no. of certificate DO 18.3, diameter of piston rod 8.5 mm



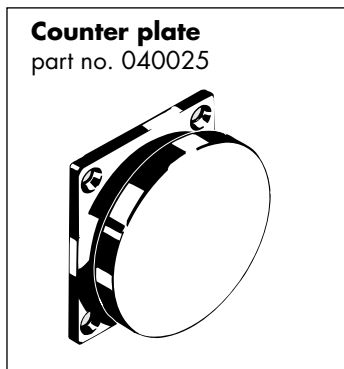
Final Dampers Series EDHM 28

For impact loads up to 3000 kg - Resetting by magnet

The dampers of the series EDHM 28 are especially used with sliding doors moving very smoothly. When opening the door the magnet adheres as long to the counter plate until the piston rod has been extracted completely. These dampers don't have an internal return spring.

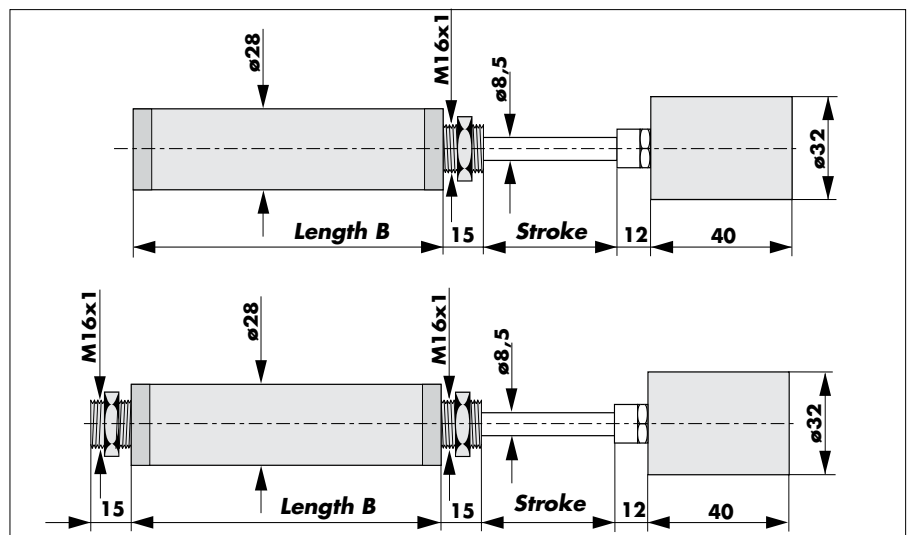
As counterpiece for the permanent magnet on the piston rod you either need an even iron area or a separate counter plate (part no. 040025).

Technical Data



| | |
|--------------------------------------|---|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fittings for the piston rod | permanent magnet (standard or Neodyn) |
| Fixing | thread at one or two ends of the cylinder |
| Impact speed | 0.08 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force | 0 N |
| Energy per stroke | max. 154 Nm |
| Ø piston rod / Ø cylinder | 8.5 or 10 mm / 28 mm |
| Length of stroke | max. 200 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

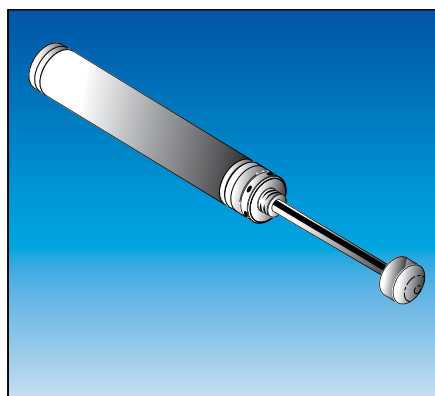
Dimensions



Order Information Standard Types

* Damper with **Approval for fire protection doors**
no. of certificate DO 18.3

| Part no. | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Length B [mm] | Damping type | Fixing thread |
|-----------|-------------|-----------------------|------------------------|-----------------------------|---------------|--------------|---------------|
| 203150* | 50 | 3000 | 5200 | 154 | 130 | K | 1 |
| 200101 | 70 | 3000 | 4400 | 154 | 163 | K | 1 |
| 203015* | 120 | 3000 | 2600 | 149 | 220 | K | 2 |
| 200600-28 | 200 | 3000 | 2400 | 149 | 329 | K | 2 |



Final Dampers Series EDH 28 in Stainless Steel

For impact loads up to 1000 kg - Return spring, one fixing thread

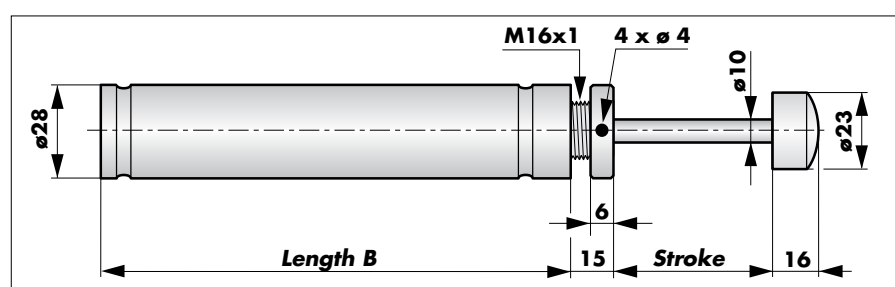
Final dampers of the series EDH 28 also can be produced in stainless steel. They are designed e.g. for applications in the food processing industry (AISI 304) or in tunnels (AISI 316).

A special application area for stainless steel dampers (AISI 304) is the medical sector. If necessary, all parts including the inner components can be produced out of unmagnetic material.

Technical Data

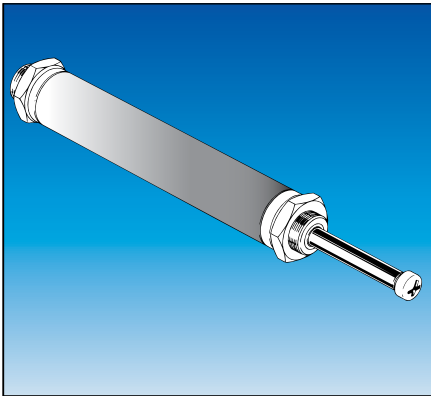
| | |
|--------------------------------------|--|
| Finish | AISI 304 (standard) or AISI 316 |
| Adjustment | stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fitting for the piston rod | buffer from Delrin |
| Fixing | one thread at the front of the cylinder |
| Impact speed | 0.1 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (internal spring) | 30 N (from 120 mm stroke: 40 N) |
| Energy per stroke | max. 149 Nm |
| Ø piston rod / Ø cylinder | 10 mm / 28 mm |
| Length of stroke | max. 200 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

Dimensions



Order Information Standard Types

| Part no. | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Length B [mm] | Damping type | Material |
|----------|-------------|-----------------------|------------------------|-----------------------------|---------------|--------------|----------|
| 200520 | 50 | 1000 | 5200 | 149 | 130 | K | AISI304 |
| 200525 | 100 | 1000 | 3100 | 149 | 193 | K | AISI304 |
| 200530 | 200 | 1000 | 2400 | 149 | 314 | K | AISI304 |



Final Dampers Series EDH 35

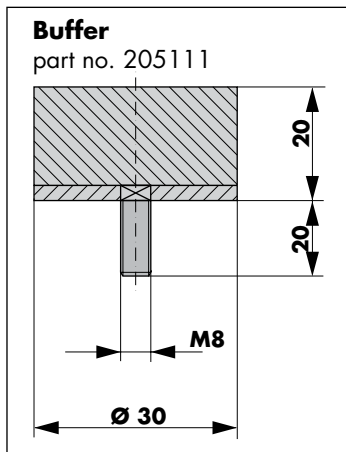
For impact loads up to 6000 kg - Return spring, two fixing threads

The DICTATOR final dampers of the series EDH 35 are intended for heavy impact loads. The maximum damping force depends on the stroke length: the shorter the stroke the higher the damping force.

The standard version is supplied with inside thread in the piston rod. As accessories a buffer, part no. 205111, is available.

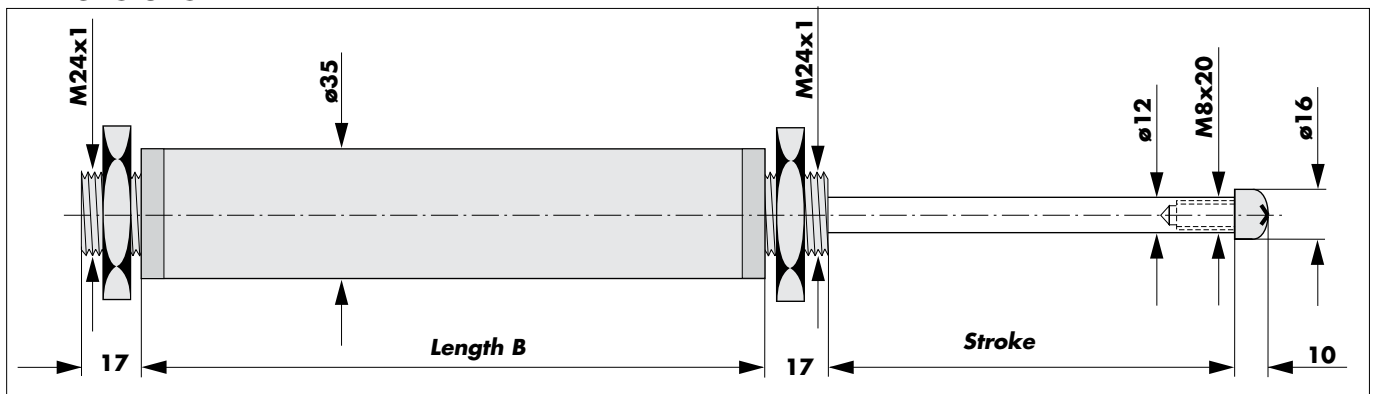
The field of application comprises heavy sliding gates, shifting racks in storage rooms, machine slides.

Technical Data



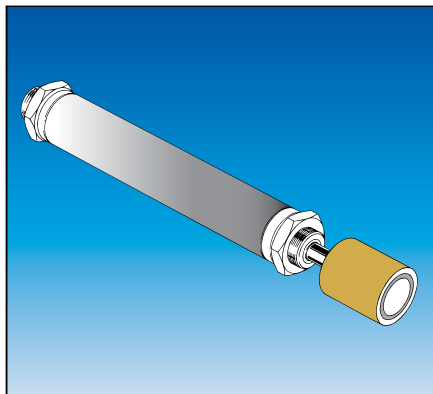
| | |
|--------------------------------------|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | stepped adjustment |
| Types of damping | constant, progressive |
| End fitting for the piston rod | inside thread M8x20 with screw |
| Fixing | threads at both ends of the cylinder |
| Impact speed | 0.08 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (internal spring) | 45 N - 60 N |
| Energy per stroke | max. 438 Nm |
| Ø piston rod / Ø cylinder | 12 mm / 35 mm |
| Length of stroke | max. 500 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

Dimensions



Order Information Standard Types

| Part no. | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Length B [mm] | Damping type | Returning force max. [N] |
|----------|-------------|-----------------------|------------------------|-----------------------------|---------------|--------------|--------------------------|
| 200309 | 50 | 6000 | 17500 | 438 | 184 | K | 45 |
| 200310 | 70 | 6000 | 12500 | 438 | 204 | K | 45 |
| 200311 | 100 | 6000 | 8800 | 438 | 230 | K | 48 |
| 200312 | 150 | 6000 | 5800 | 438 | 288 | K | 50 |
| 200500 | 200 | 6000 | 4400 | 438 | 330 | K | 50 |
| 200320 | 500 | 6000 | 1800 | 438 | 739 | K | 60 |



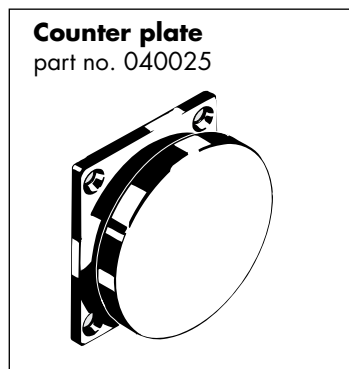
Final Dampers Series EDHM 35

For impact loads up to 6000 kg - Resetting by magnet

The technical data of the DICTATOR final dampers series EDHM 35 correspond to those of the series EDH 35. The only difference is the missing internal return spring. When the door is opened the magnet pulls the piston rod back to its extended position.

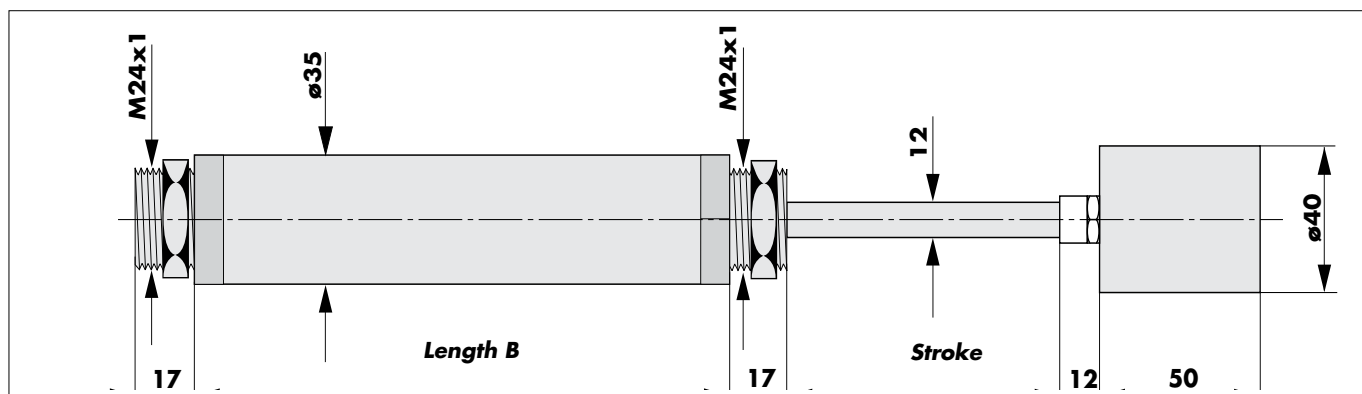
As counterpiece for the permanent magnet on the piston rod you either need an even iron area or a separate counter plate (part no. 040025).

Technical Data



| | |
|--------------------------------------|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | stepped adjustment |
| Types of damping | constant, progressive |
| End fitting for the piston rod | permanent magnet |
| Fixing | threads at both ends of the cylinder |
| Impact speed | 0.08 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force | 0 N |
| Energy per stroke | max. 438 Nm |
| Ø piston rod / Ø cylinder | 12 mm / 35 mm |
| Length of stroke | max. 500 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

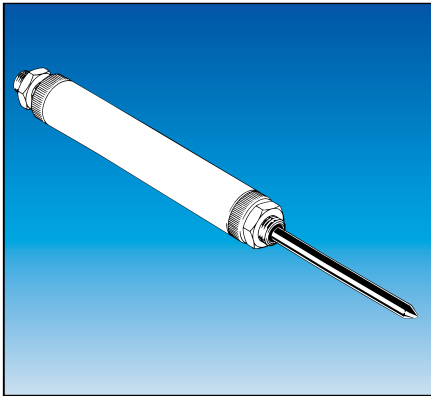
Dimensions



Order Information Standard Types

* Damper with **Approval for fire protection doors**
no. of certificate DO 18.3

| Part no. | Stroke [mm] | Impact load | Damping force max. [kg] | Energy per stroke max. [N] | Length B [mm] max. [Nm] | Damping type | Returning force max. [N] |
|----------|-------------|-------------|-------------------------|----------------------------|-------------------------|--------------|--------------------------|
| 200313 | 100 | 6000 | 8800 | 438 | 224 | K | 0 |
| 200600* | 200 | 6000 | 4400 | 438 | 330 | K | 0 |



Final Dampers Series EDH 69

For impact loads up to 15000 kg - Return spring, two fixing threads

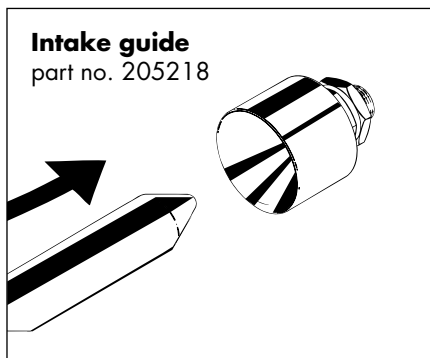
The series EDH 69 represents the largest and strongest DICTATOR final dampers. The maximum damping force depends on the stroke length: the shorter the stroke the higher the damping force.

The field of application comprises e.g. heavy sliding gates, shifting racks in storage rooms, machine slides.

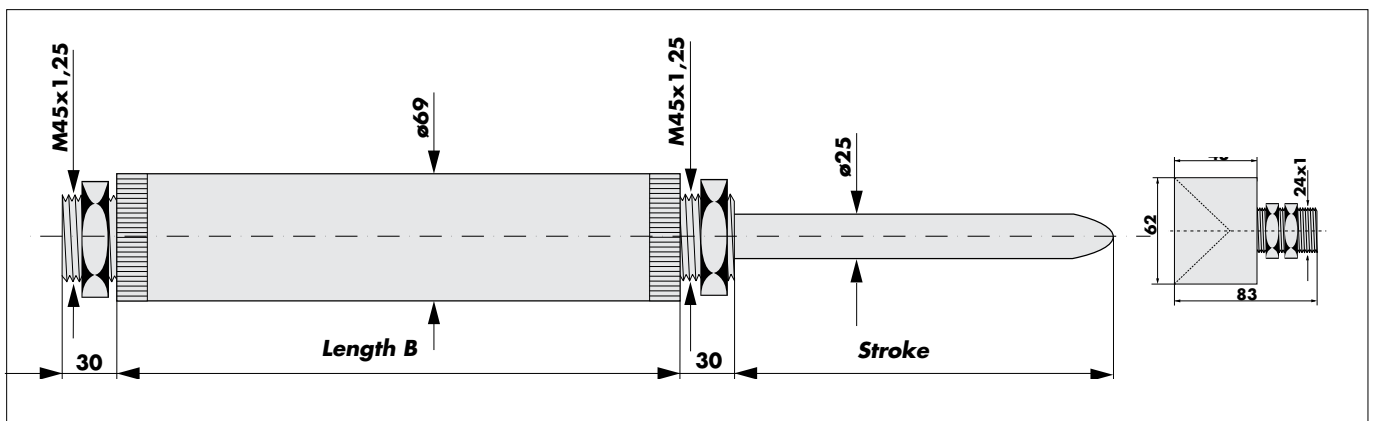
As counter piece for the piston rod we furnish an intake guide.

Technical Data

| | |
|--------------------------------------|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | stepped adjustment |
| Types of damping | constant, progressive |
| End of piston rod | tip (standard) or thread |
| Fixing | threads at both ends of the cylinder |
| Impact speed | 0.1 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (internal spring) | 80 N |
| Energy per stroke | max. 4000 Nm |
| Ø piston rod / Ø cylinder | 25 mm / 69 mm |
| Length of stroke | max. 1000 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

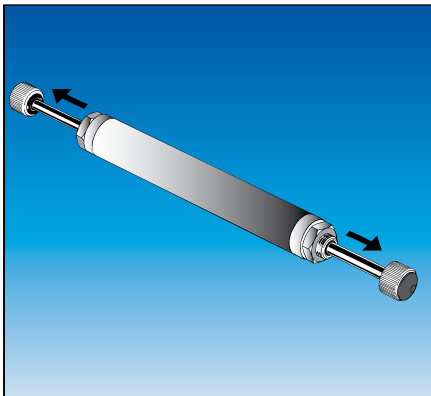


Dimensions



Order Information Standard Types

| Part no. | Stroke [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Length B [mm] | Damping type | Returning force max. [N] |
|----------|-------------|-----------------------|------------------------|-----------------------------|---------------|--------------|--------------------------|
| 200780 | 100 | 15000 | 12000 | 4000 | 297 | K | 80 |
| 200800 | 200 | 15000 | 12000 | 4000 | 397 | K | 80 |
| 200820 | 300 | 15000 | 10000 | 4000 | 520 | K | 80 |
| 200840 | 400 | 15000 | 8000 | 4000 | 620 | K | 80 |
| 200940 | 1000 | 15000 | 6000 | 4000 | 1420 | K | 80 |



Bi-Directional Final Dampers Series ZDHa 28

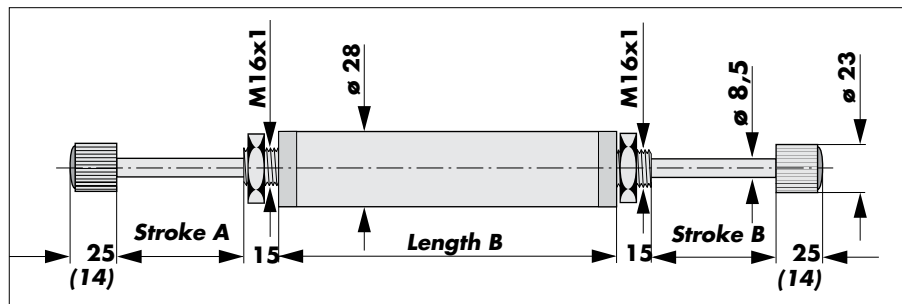
For impact loads up to 1000 kg - Both sides with return spring

The final dampers of the series ZDHa 28 are characterised by their two piston rods extending independently from one another by an internal return spring. The damper ZDHa 28 is directly fixed to the moving object, thus damping with only one damper both final positions.

Technical Data

| | |
|--------------------------------------|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | screw or stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fittings for the piston rod | buffer (dimensions buffer NR in parentheses) |
| Fixing | threads at both ends of the cylinder |
| Impact speed | 0.1 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (internal spring) | min. 30 N, max. 60 N |
| Energy per stroke | max. 165 Nm |
| Ø piston rod / Ø cylinder | 8.5 mm / 28 mm |
| Length of stroke | max. 200 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

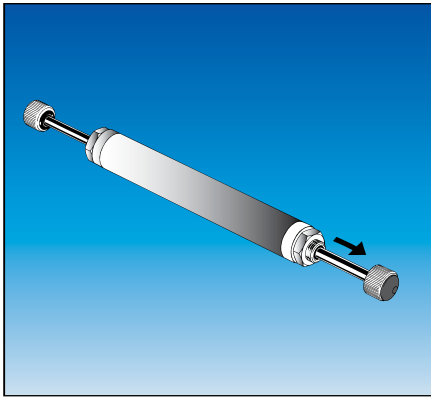
Dimensions



Order Information Standard Types

| Part no. | Stroke A [mm] | Stroke B [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Returning force max. [N] | Length B [mm] | Damping type | Adjustment |
|----------|---------------|---------------|-----------------------|------------------------|-----------------------------|--------------------------|---------------|--------------|------------|
| 210000 | 50 | 50 | 560 | 4300 | 120 | 45 | 137 | K | NR |
| 210001 | 50 | 50 | 1000 | 5000 | 135 | 45 | 165 | P | NR |
| 212000 | 70 | 70 | 500 | 3500 | 130 | 50 | 164 | K | NR |
| 210410 | 70 | 70 | 700 | 3200 | 150 | 35 | 232 | ABS | ZR |
| 210400 | 65 | 65 | 700 | 3200 | 125 | 30 | 260 | ABS | ZR |
| 210420* | 60 | 80 | 700 | 4200 | 125 | 30 | 260 | ABS | ZR |
| 216000 | 100 | 100 | 500 | 2400 | 130 | 50 | 221 | K | NR |
| 214000 | 120 | 120 | 500 | 1700 | 130 | 60 | 235 | K | NR |
| 218000 | 100 | 100 | 1000 | 2800 | 165 | 50 | 260 | P | NR |
| 213000 | 120 | 120 | 1000 | 1900 | 165 | 60 | 232 | P | NR |

* Length of thread at stroke A: 44 mm



Bi-Directional Final Dampers Series ZDHaeg 28

For impact loads up to 1000 kg - Return spring for one side only

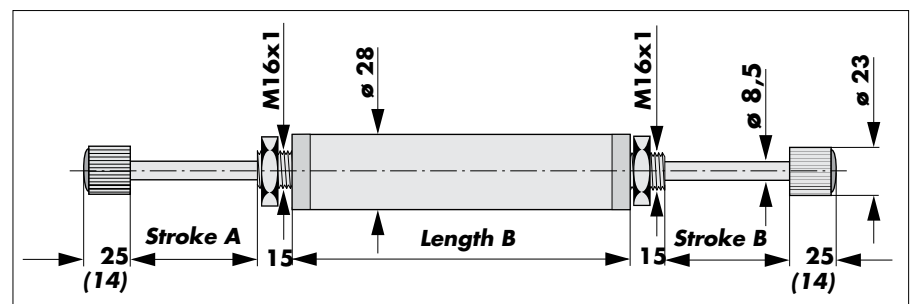
The final dampers of the series ZDHaeg 28 only have on one side (stroke A) a return spring that automatically returns the piston rod. The piston rod on the other side (stroke B) is pushed out by the entering piston rod A. Dampers of this type are often used on sliding doors.

The automatically returning piston rod (stroke A) should point into the opening direction of the door to damp the opening of the door even then when the door, e.g. because of a new opening command, hadn't completely been closed before. The opposite piston rod damps the closing of the door. As on this side there is no return spring, the door won't be reopened.

Technical Data

| | |
|--------------------------------------|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | screw or stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fittings for the piston rod | buffer (dimensions buffer NR in parentheses) |
| Fixing | threads at both ends of the cylinder |
| Impact speed | 0.1 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (stroke A) | min. 30 N, max. 50 N |
| Energy per stroke | max. 160 Nm |
| Ø piston rod / Ø cylinder | 8.5 mm / 28 mm |
| Length of stroke | max. 200 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

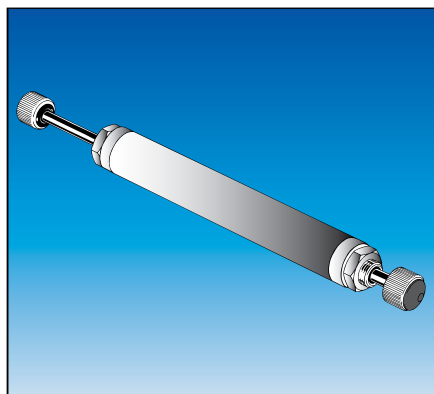
Dimensions



Order Information Standard Types

| Part no. | Stroke A [mm] | Stroke B [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Returning force max. [N] | Length B [mm] | Damping type | Adjustment |
|----------|---------------|---------------|-----------------------|------------------------|-----------------------------|--------------------------|---------------|--------------|------------|
| 203190 | 50 | 50 | 1000 | 5000 | 135 | 0/45 | 220 | P | ZR |
| 211000* | 70 | 50 | 560 | 4300 | 120 | 20/0 | 137 | K | NR |
| 203191 | 70 | 70 | 1000 | 4000 | 160 | 0/50 | 260 | P | ZR |
| 212300 | 80 | 80 | 800 | 4200 | 140 | 0/50 | 291 | P | NR |
| 217000 | 100 | 100 | 500 | 2400 | 130 | 0/50 | 328 | K | NR |

* **Attention:** The side A piston rod of damper 211000 extends automatically only 20 mm. The missing 50 mm will be pushed out only when side B piston rod enters.



Bi-Directional Final Dampers Series ZDHbg 28

For impact loads up to 560 kg - No return spring

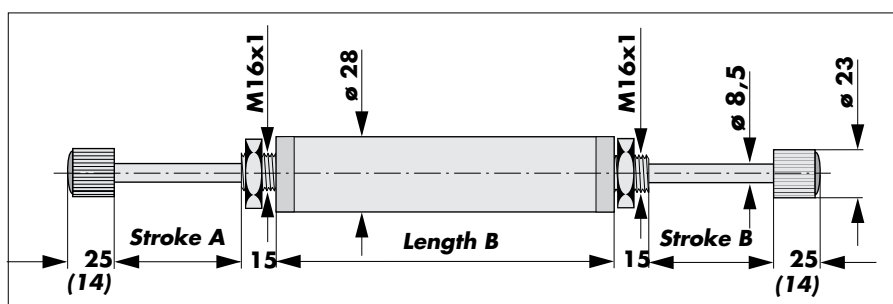
The final dampers ZDHbg 28 have no return spring. Each piston rod is pushed out by the opposite piston rod when it enters. The damper ZDHbg 28 is mounted directly on the moving object, thus damping it in both final positions.

These dampers are mostly used on smoothly moving doors, slides or free pendulums, because there are no return forces to move the object from its final position.

Technical Data

| | |
|--------------------------------------|--|
| Finish | zinc-plated, piston rod hard chromed |
| Adjustment | screw or stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fittings for the piston rod | buffer (dimensions buffer for NR in parentheses) |
| Fixing | threads at both ends of the cylinder |
| Impact speed | 0.1 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (no spring) | 0 |
| Energy per stroke | max. 130 Nm |
| Ø piston rod / Ø cylinder | 8.5 mm / 28 mm |
| Length of stroke | max. 120 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

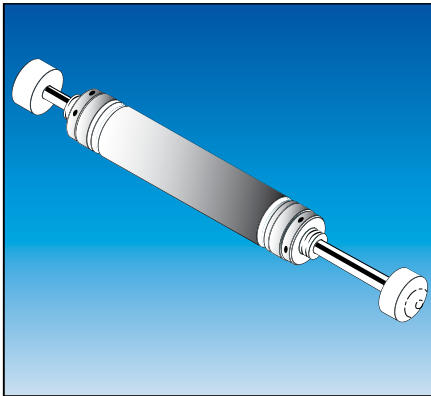
Dimensions



Order Information Standard Types

| Part no. | Stroke A [mm] | Stroke B [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Returning force max. [N] | Length B [mm] | Damping type | Adjustment |
|----------|---------------|---------------|-----------------------|------------------------|-----------------------------|--------------------------|---------------|--------------|------------|
| 210110 | 50 | 50 | 560 | 4300 | 120 | 0 | 137 | K | NR |
| 203195* | 55 | 55 | 560 | 5000 | 120 | 0 | 132 | K | ZR |
| 203162 | 120 | 120 | 500 | 1700 | 130 | 0 | 208 | K | ZR |

* cylinder Ø 35 mm, buffer Ø 23 mm, piston rod Ø 12 mm, thread on one side M24x1, length 17 mm



Bi-Directional Final Dampers ZDHa 28 in AISI 304/316 For impact loads up to 500 kg - Both sides with return spring

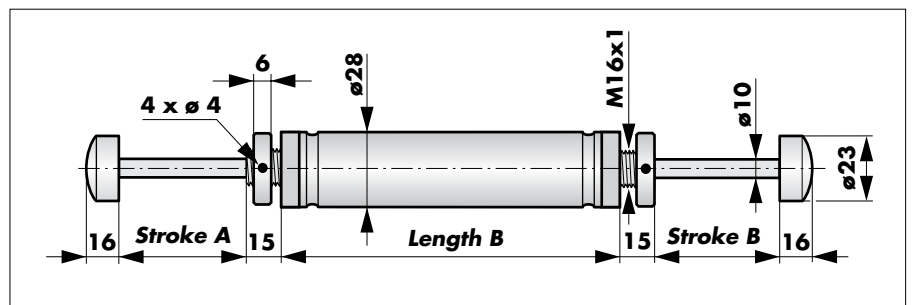
The final dampers of the series ZDHa 28 can also be produced in stainless steel. They are designed for the use in the food processing industry (AISI 304) and in tunnels (AISI 316).

A special application area for stainless steel dampers is the medical sector. If necessary, all parts including the inner components can be produced out of unmagnetic material.

Technical Data

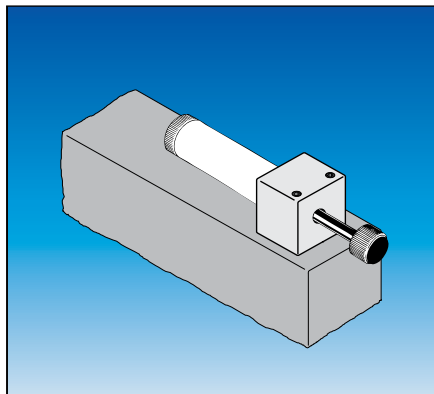
| | |
|--------------------------------------|--|
| Finish | AISI 304 (standard) or AISI 316 |
| Adjustment | stepped adjustment |
| Types of damping | constant, ABS, progressive |
| End fitting for the piston rod | buffer from Delrin |
| Fixing | threads at both ends of the cylinder |
| Impact speed | 0.1 to 2.0 m/s |
| Correction factor (see p. 03.078.00) | $f_k = 2.5$ |
| Returning force (internal spring) | 30 N (from 120 mm stroke: 40 N) |
| Energy per stroke | max. 160 Nm |
| Ø piston rod / Ø cylinder | 10 mm / 28 mm |
| Length of stroke | max. 200 mm |
| Strokes per minute | maximum 10 |
| Operating temperature | 0° to 60 °C (on request: -30 °C, +80 °C) |

Dimensions



Order Information Standard Types

| Part no. | Stroke A [mm] | Stroke B [mm] | Impact load max. [kg] | Damping force max. [N] | Energy per stroke max. [Nm] | Returning force max. [N] | Length B [mm] | Damping type | Adjustment |
|----------|---------------|---------------|-----------------------|------------------------|-----------------------------|--------------------------|---------------|--------------|------------|
| 210525 | 100 | 100 | 500 | 2400 | 130 | 50 | 221 | K | ZR |



Fixing Accessories for Final Dampers

Series EDH 28 and ZDH 28

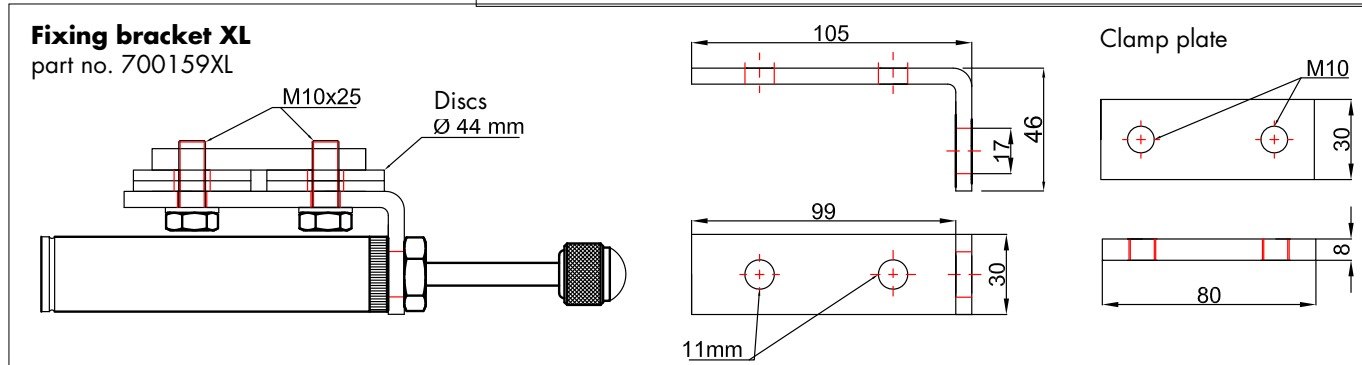
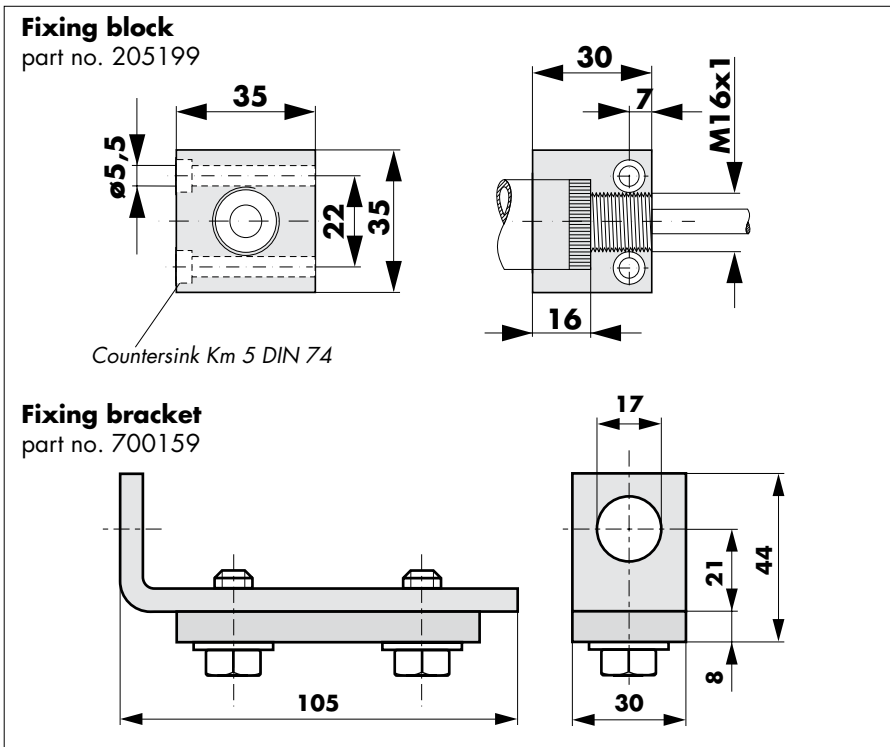
For the final dampers of the series EDH 28 and ZDH 28 we also supply fixing accessories. The fixing bracket is especially intended to be used when the dampers are mounted on sliding doors with tubular travelling gear. With the aid of the counter plate it can directly be fixed to the guide rail.

The XL fixing bracket is especially intended for guide rails larger than e.g. Helm 400. With this bracket the threaded holes are in the clamp plate.

Technical Data

| | |
|----------------|-------------------|
| Fixing block | aluminium |
| Fixing bracket | steel zinc-plated |

Dimensions



Order Information

| | |
|---|-------------------|
| Fixing block | part no. 205199 |
| Fixing bracket | part no. 700159 |
| Fixing bracket with clamp plate with threaded holes | part no. 700159XL |