

# EGS Gas Springs *and* Hydraulic Dampers

*Includes EHBD Hydraulic Dampers  
without Free Travel*



***Enertrols***<sup>®</sup>

EXPERTS IN DECELERATION & MOTION CONTROL

## Gas Springs

Enertrols gas springs are reliable units designed to handle the demanding needs of the industrial and commercial markets. They are maintenance free, self-contained and PRICED RIGHT with QUICK DELIVERY.

Enertrols gas springs remove the need for muscle power and provide controlled motion for lids, hoods, machine guards, panels and more.

Body diameter models are available from 15 mm to 28 mm with forces ranging from 10 N to 2,500 N.

Enertrols gas springs offer a high service life with a treated steel piston rod and precision steel body. In addition, these durable models offer an integrated low friction bearing with a grease chamber that provides a very low break away force. These unique features make the Enertrols gas springs superior to conventional gas springs.

They can be mounted in any orientation, although mounting with the rod in the downward position is preferred. The internal valve allows the force to be adjusted to your specific requirements.

A wide variety of end fittings make installation easy and versatile.

***Self-Contained,***

***Maintenance Free***

***Treated Steel Rod***

***Precision Steel Body***

***Variety of End Fittings***

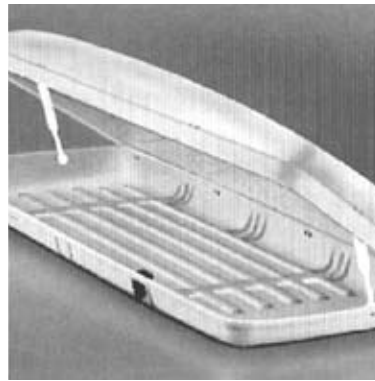
***Priced Right***

***Quick Delivery***



***Aerospace • Defense • Transportation • RV  
Medical • Furniture • Packaging • Printing  
Amusement and More***





## Additional Gas Spring Applications Include:

Computers  
Photocopiers  
Aircraft Overhead Compartments  
Aircraft Galley Equipment  
Truck Engine Covers  
Truck Side Panels  
Electrical Enclosure Cabinets

Boat Engine Hatches  
Bus/Coach Engine Covers  
Bus/Coach Courier Seats  
Fork Lifts  
Conveyor Belt Tensioning  
Roof Ventilation Hatches  
Manhole/Access Covers

Molding Machines  
Executive Desks  
Smoke Vents  
Stair Lifts  
Security Cabinets  
Washing Machine Lids  
Automatic Cash Dispensers

## Function

In every action involving a lifting or lowering motion, e.g. when opening a hatch lid, there are moving masses which must be controlled.

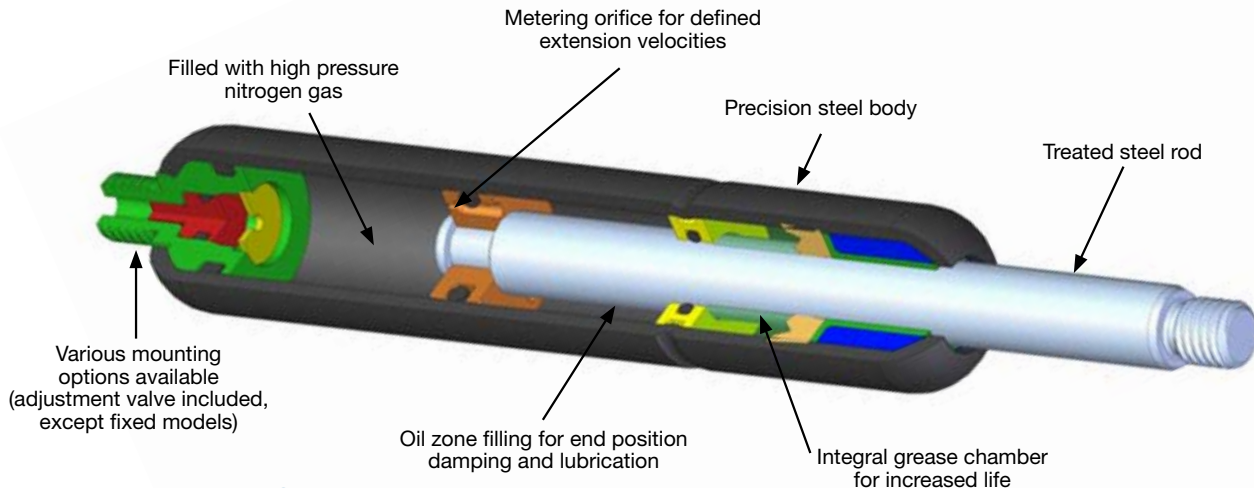
If this is ignored, then the kinetic energy caused by the moving mass can result in considerable damage. There are several ways that Enertrols offers to control this motion.

- a) **Shock absorbers** - used when no return assistance is required and no restriction of the velocity is required. Control is provided shortly before the mechanical components make contact.
- b) **Velocity controls** - used when no return assistance is required, and control of velocity throughout the motion is required.
- c) **Gas springs** - used when return assistance or load support (counterbalance) is required throughout the motion.

On the extension stroke of the gas spring, for example when opening a car tailgate, the nitrogen gas flows through the metering orifice in the piston to provide a controlled opening speed and the oil zone provides damping at the fully open position to avoid impact damage.

The gas spring should be mounted rod down for this damping to be effective. On closing the tailgate the gas spring helps support the weight.

Gas springs can be provided in a wide range of body sizes and stroke lengths. The force provided can be specified to suit the specific application. The extension velocity can also be customized on request.



## Construction and Operation

Enertrols gas springs are maintenance free self-contained systems which are filled with high pressure nitrogen gas to a defined force. They also contain a small quantity of oil to provide end position damping.

During operation, the nitrogen gas flows through the metering orifice and allows the load to be lowered in a controlled manner. The force of the gas spring works against the weight and prevents it from accelerating and damaging mechanical components on closure.

Upon reversal, the nitrogen flows back through the piston orifice and the gas spring force assists the action, reducing the effort required to reset the mechanism.

The extension speed can be varied by altering the size of the metering orifice.

For cushioning at the end of the extension stroke, mount with the rod down. For cushioning at the end of the compression stroke, mount with the rod up.

An integral grease chamber behind the rod seals ensures lasting lubrication which can increase the life of Enertrols gas springs by at least 100% compared to other products on the market.

The treated steel rod and painted precision steel body offer excellent corrosion protection and provide a long maintenance free working life.

The wide variety of available mounting accessories provide mounting versatility and options.

**Safety note:** if very high demands are placed on durability and stability, please avoid the combination of small diameter + long stroke + high force.

## Calculations

In order to save time we recommend that the calculation and selection of the most suitable gas spring be completed by Enertrols.

With our sophisticated selection software we can quickly determine the resultant opening or closing forces throughout the complete movement and recommend the optimum mounting points, gas spring model and nominal force.

Please fax the completed Application Data form on page 10 to 734-595-6410.

Use the following application parameters to calculate a suitable Enertrols gas spring:

1. Weight of the lid or flap lbs (kg)
2. Position of the center of gravity in (mm)
3. Sketch of the application layout

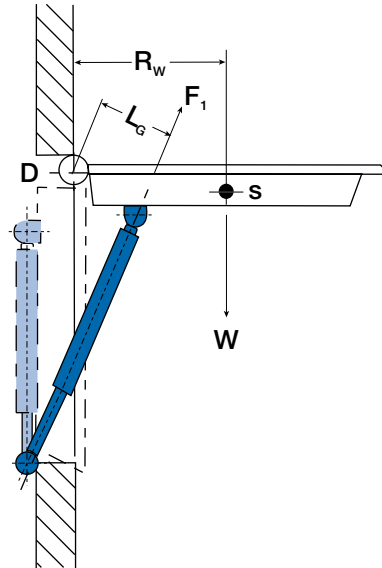
### Symbols used:

W	Force due to weight of the lid	lbs (kg)
R <sub>w</sub>	Radius of center of gravity	in (mm)
L <sub>G</sub>	Distance to gas spring	in (mm)
s	Center of gravity	-
D	Pivot point	
n	Number of gas springs in parallel	

Basic formula for calculating required extension force:

$$F_1 = \frac{W \cdot R_w}{L_G \cdot n} \text{ lbs (N)}$$

The basic formula given enables an approximate calculation of the required gas spring force for one mounting position geometry.



### Example

**W** = 90 lbs (41 kg)  
**R<sub>w</sub>** = 30 in (762 mm)  
**L<sub>G</sub>** = 6 in (152.4 mm)  
**n** = 2  
**F<sub>1</sub>** =  $\frac{90 \cdot 30}{6 \cdot 2}$   
**F<sub>1</sub>** = 225 lbs (1000 N)

### Chosen force:

**F<sub>1</sub>** = 225 lbs (1000 N)  
 Chosen gas spring:  
 EGS-22-200-AA-1000

## Mounting Instructions

Enertrols gas springs are self contained, maintenance free devices and are supplied ready for installation.

The following points should be noted to ensure the longest possible working life:

Gas spring force **F<sub>1</sub>**: Gas springs are filled with nitrogen at very high pressures and under no circumstances should they be opened or subjected to excessive tensile loads.

External force **F<sub>H</sub>**: for example manual (hand) force to close the flap.

Weight force **W**: due to mass acting at center of gravity.

Gas spring orientation as desired:  
 With piston rod downward – damping effective at end of extension stroke.  
 With piston rod upward – damping effective at end of compression stroke.

Choose a standard available gas spring from the Enertrols range featured in this catalog before determining the mounting position coordinates, or preferably allow Enertrols to do the calculations and provide a printout suggesting the most suitable model and mounting positions.

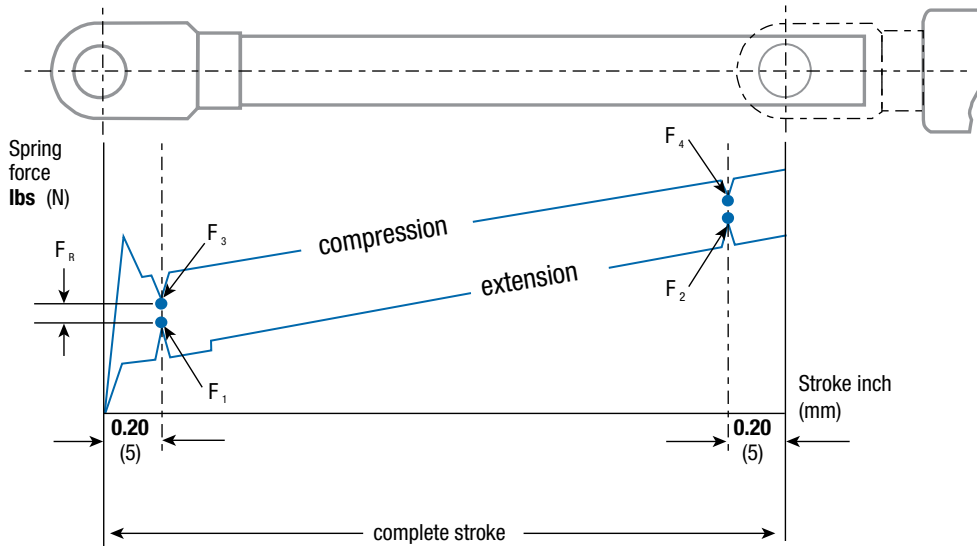
Where possible arrange the mounting positions so that the effective torque provided by the gas spring positively holds the flap in its closed position.

Protect the rod from impact damage, scratches, dirt or paint contamination. The gas spring body must not be deformed or damaged.

The gas spring must not be exposed to bending forces or side loads. If using eyelet fittings support the eye on both sides and allow some float. We recommend using ball joints on most applications as these help to eliminate misalignment.

## Gas Spring Force - Stroke Characteristics

### Gas Springs – Push Type



$F_1$  = Nominal Force at 68° F (20° C) (this figure is normally used when specifying gas springs)

$F_2$  to  $F_1$  = Force on extension stroke

$F_3$  to  $F_4$  = Force on compression stroke

Model	Progression* approximate %
EGS-15	27
EGS-19	39-41 <sup>2</sup>
EGS-22	52 - 56 <sup>2</sup>
EGS-28	82-87 <sup>2</sup>

<sup>1</sup> The progression (slope of the force line in the characteristic diagram above) is due to the reduction of the internal gas volume as the rod moves from its initial position to its fully stroked position.

<sup>2</sup> Depending on stroke

Effect of temperature: the nominal  $F_1$  force figure is given at 68° F (20° C).

An increase in temperature of 18° F or 10° C will result in approximately a 3.4% increase in the force.

General extension force tolerance is  $\pm 7\%$ .

Note: Initial breakaway force may be higher if units are stored for a long period without use.

## Additional Gas Spring Available Options

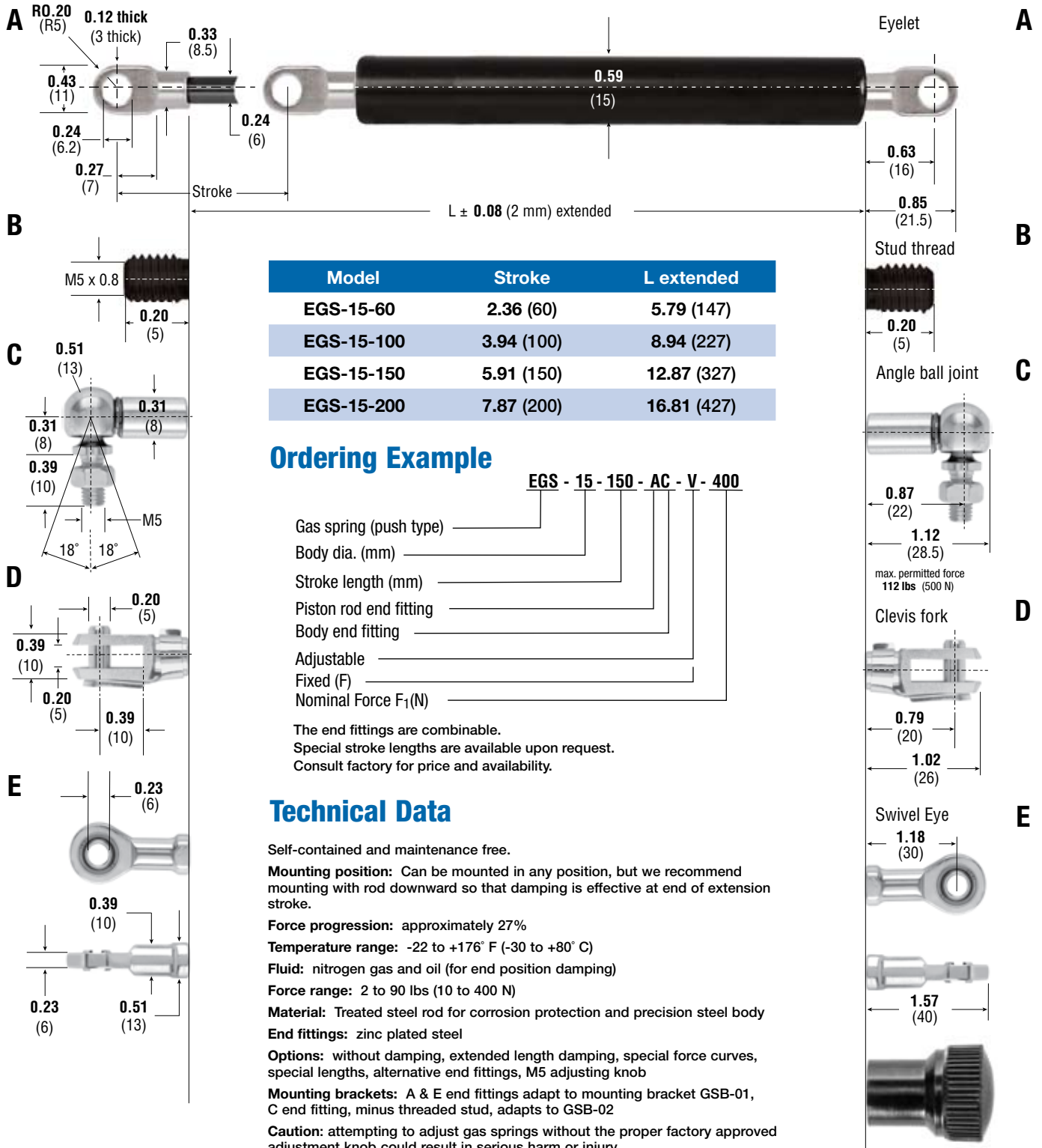
1. Gas spring (push type): EGS-40

2. Gas springs (pull type): EGZ-19, EGZ-28 (EGZ models are a special order)

Note: EGS-15 to 40 and EGZ-19 & 28 gas springs are available as fixed force options with optional lengths.

Dimensions in inches and (mm)

Extension force range 2 to 90 lbs (10 to 400 N)



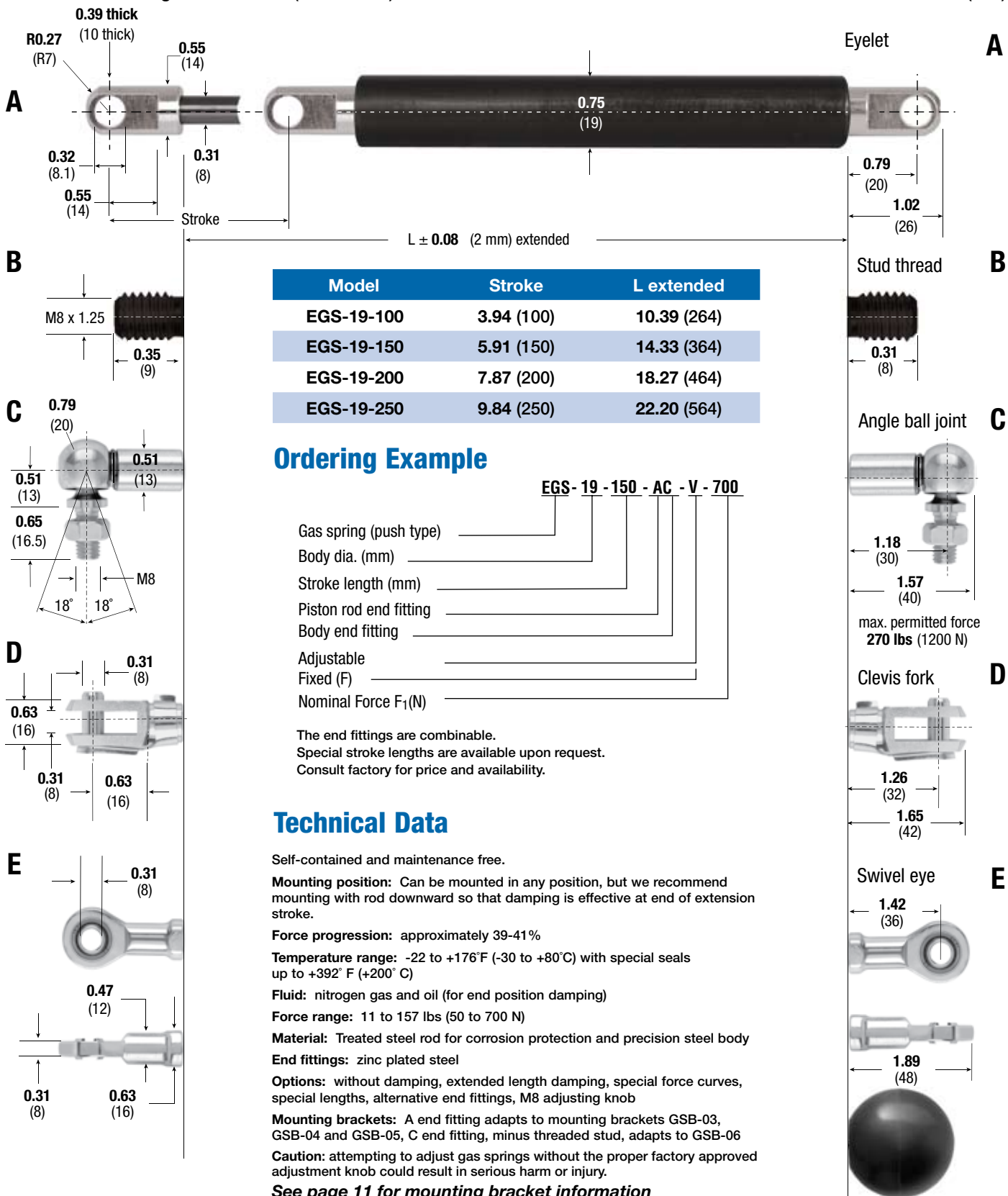
See page 11 for mounting bracket information

Optional M5 adjustment knob for adjusting gas pressure on adjustable models only



Extension force range 11 to 157 lbs (50 to 700 N)

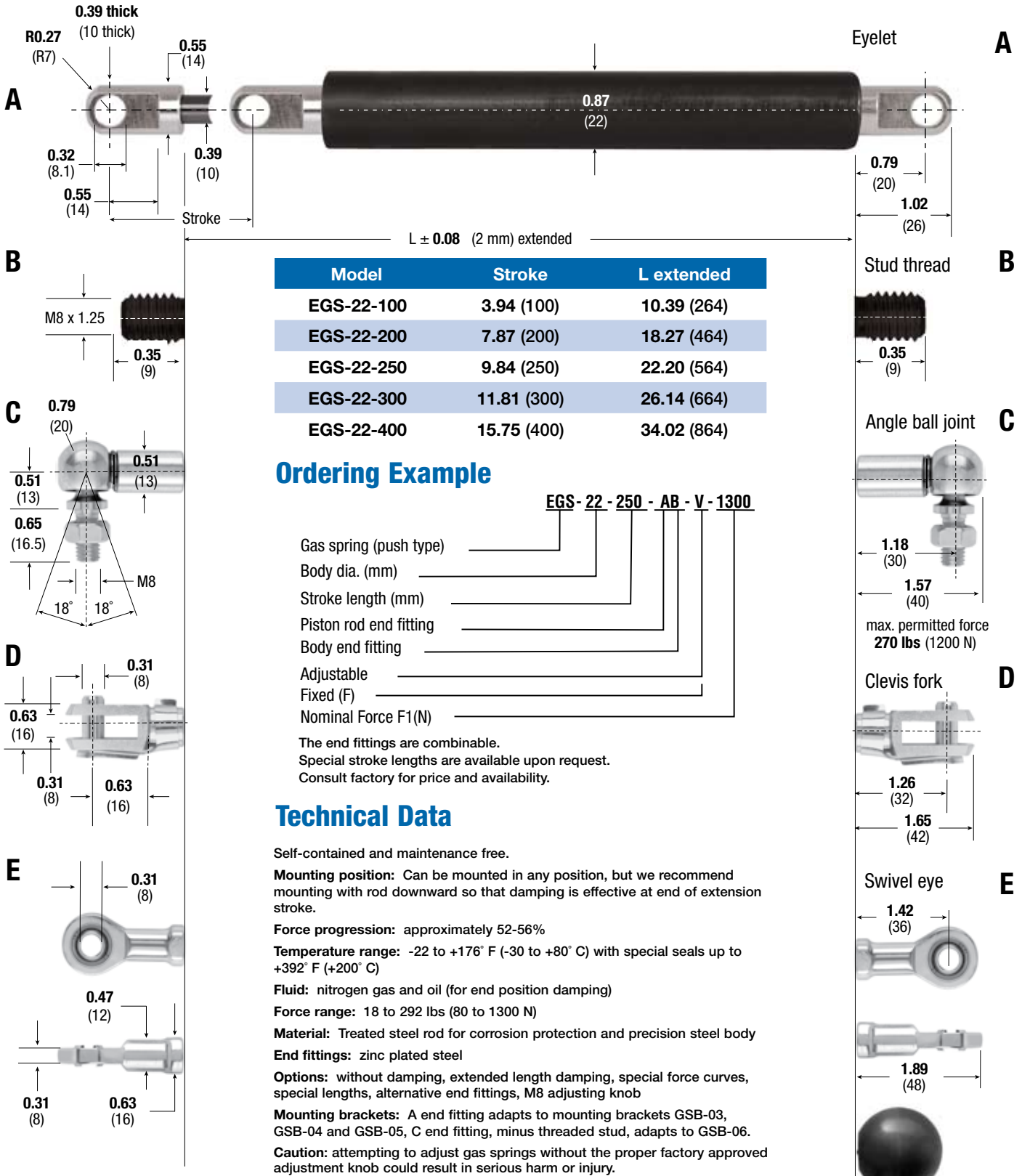
Dimensions in inches and (mm)





Dimensions in inches and (mm)

Extension force range 18 to 292 lbs (80 to 1,300 N)

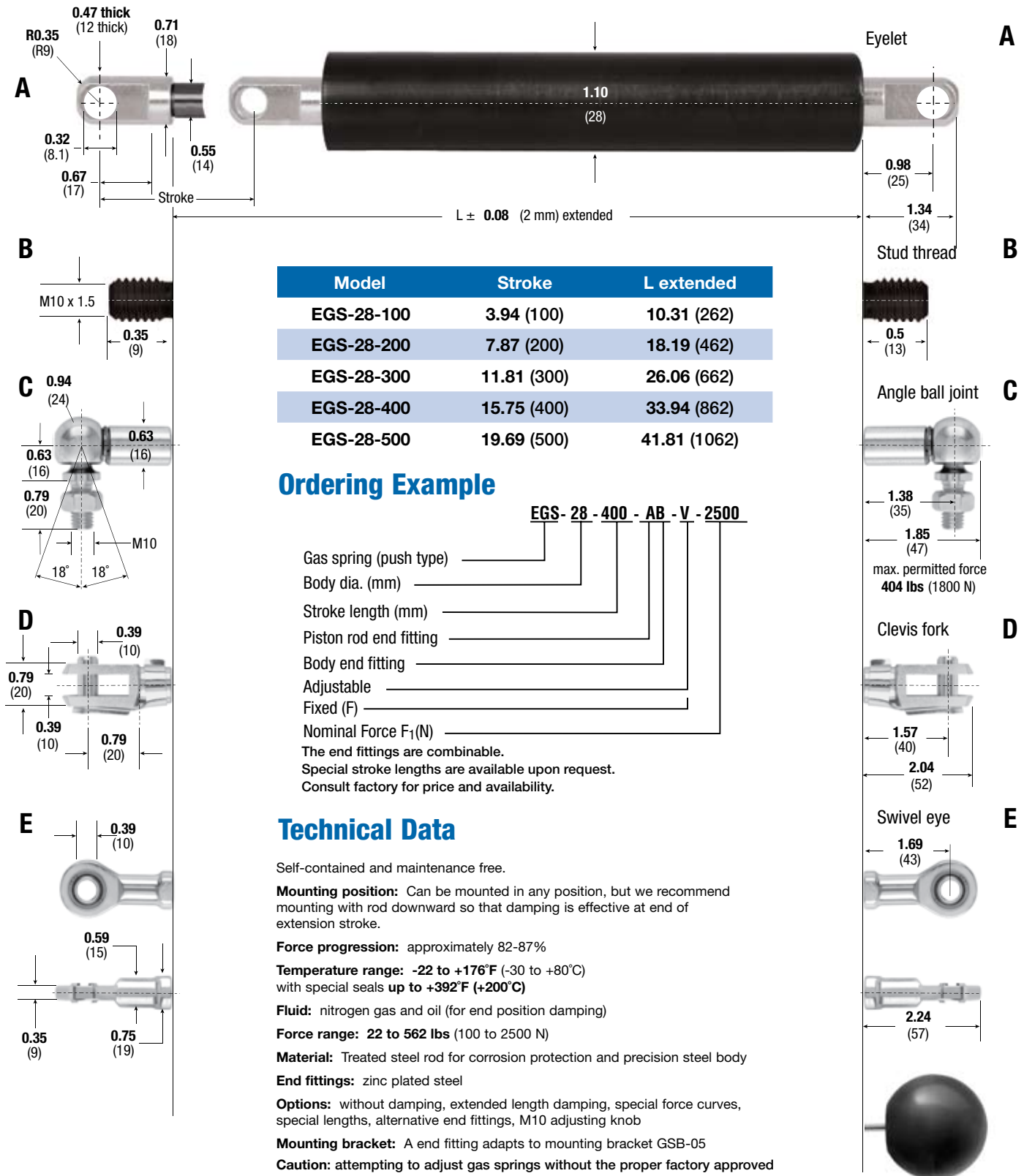


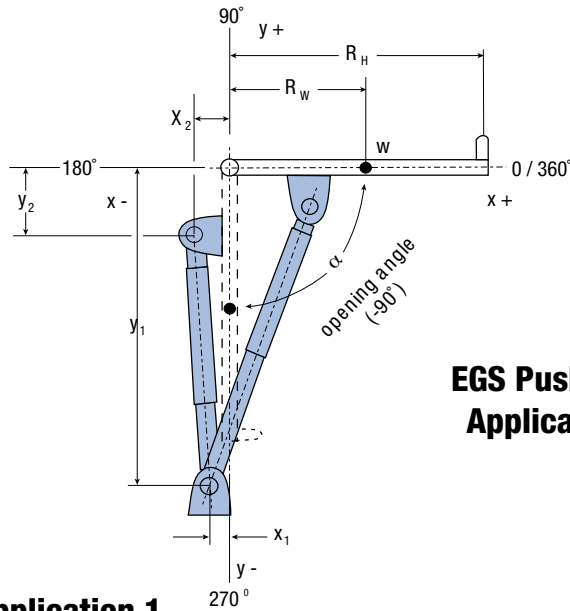
See page 11 for mounting bracket information

Optional M8 adjustment knob for adjusting gas pressure on adjustable models only

Extension force range 34 to 562 lbs (150 to 2,500 N)

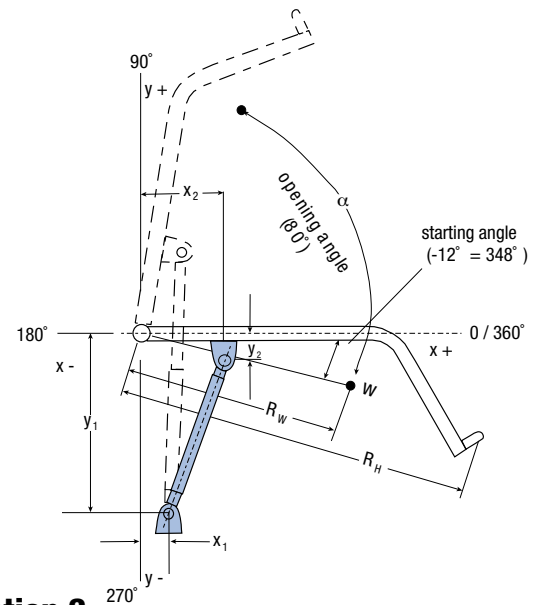
Dimensions in inches and (mm)





### EGS Push Type Applications

#### ☐ Application 1



#### ☐ Application 2

Requirement per year \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

Fax \_\_\_\_\_

E-mail \_\_\_\_\_

Comments \_\_\_\_\_

### Gas Spring Type

Input Data

Radius of center of gravity  $R_W$  \_\_\_\_\_ in (mm)

Moving weight  $w$  \_\_\_\_\_ lbs (kg)

Radius of hand force  $R_H$  \_\_\_\_\_ in (mm)

Desired max. handforce  $F_H$  \_\_\_\_\_ lbs (N)

Number of gas springs in parallel  $n$  \_\_\_\_\_ pcs

Starting angle (0 to 360°) \_\_\_\_\_ °

Opening angle (-360 to +360°)  $\alpha$  \_\_\_\_\_ °

Gas spring fixing points (complete if desired)

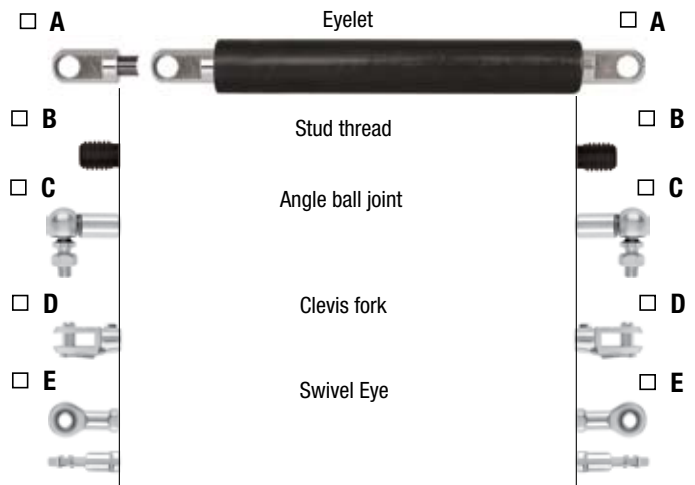
Fixed point (x-coord.)  $x_1$  \_\_\_\_\_ in (mm)

Fixed point (y-coord.)  $y_1$  \_\_\_\_\_ in (mm)

Moving point (x-coord.)  $x_2$  \_\_\_\_\_ in (mm)

Moving point (y-coord.)  $y_2$  \_\_\_\_\_ in (mm)

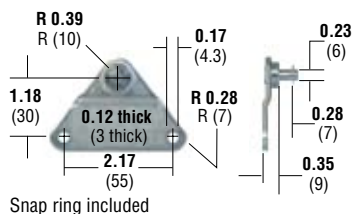
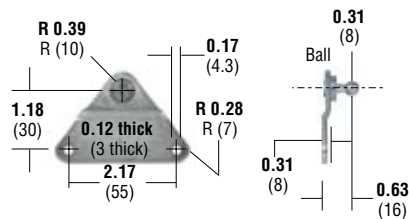
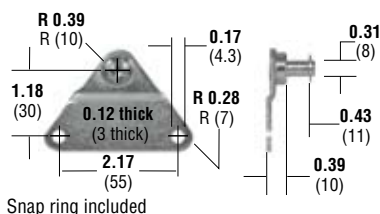
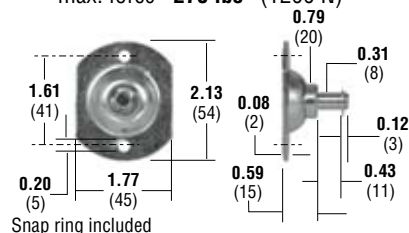
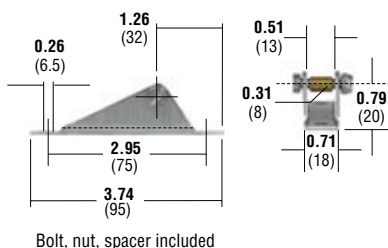
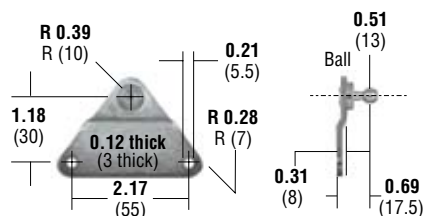
### Desired End Fittings



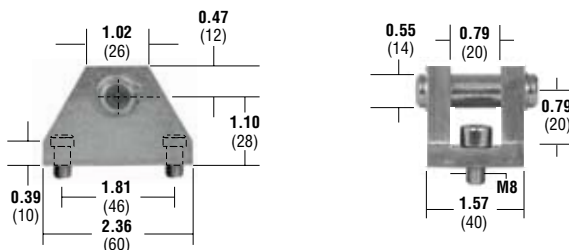
For application assistance please  
fill out and fax to Enertrols at  
**734-595-6410**

Dimensions in inches and (mm)

Material: zinc plated steel

**GSB-01**max. force **112 lbs** (500 N)**GSB-02**max. force **112 lbs** (500 N)**GSB-03**max. force **270 lbs** (1200 N)**GSB-04**max. force **270 lbs** (1200 N)**GSB-05**max. force **405 lbs** (1800 N)**GSB-06**max. force **270 lbs** (1200 N)

Note: Rising force curve on compression for gas springs.

**ME14**max. force **2,248 lbs** (10,000 N)

See individual model pages for specific information on the correct end fittings for each mounting bracket.

**Mounting brackets are identical to those on page 22.**



**EHB Hydraulic Dampers from Enertrols are maintenance free, self-contained and sealed units.**

They are available with body diameters from 15 mm to 40 mm and with stroke lengths of up to 800 mm (40 mm model).

Enertrols Hydraulic Dampers are durable and feature single or double-acting designs. The travel speed can be easily adjusted and remains constant throughout the stroke. The single acting version is controllable in one direction only, with free flow in the opposite direction.

Adjustment is easily achieved by pulling out fully and turning the rod until the desired damping speed is attained. A variety of end fittings are available for ease of operation and installation.

**These dependable units offer a minimum of 250,000 cycles and are available for QUICK DELIVERY.**

Enertrols EHB Hydraulic Dampers are the ideal fit for applications in industries such as: defense, medical, packaging, bottling, printing, fitness equipment, transportation, RV, lawn equipment, furniture, amusement and more.

Specific selected applications include: machine guards, drilling and tapping equipment, pick and place operations, swinging loads, tooling fixtures, fire safety doors as well as lids and slides.



***Single & Double Acting***

***A, C, & D End Fittings  
Included***

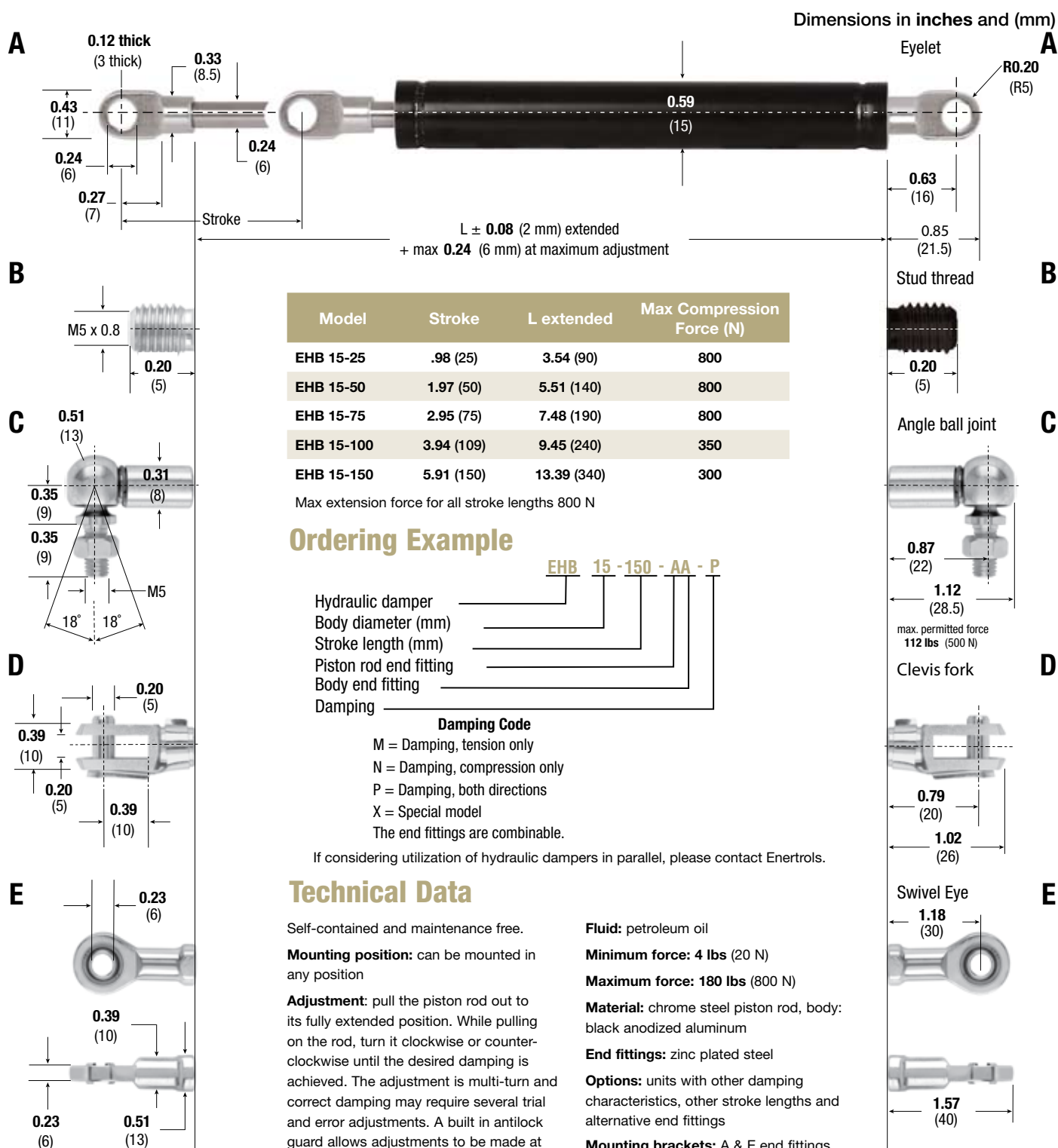
***250,000+ Cycle Life***

***Maintenance Free***

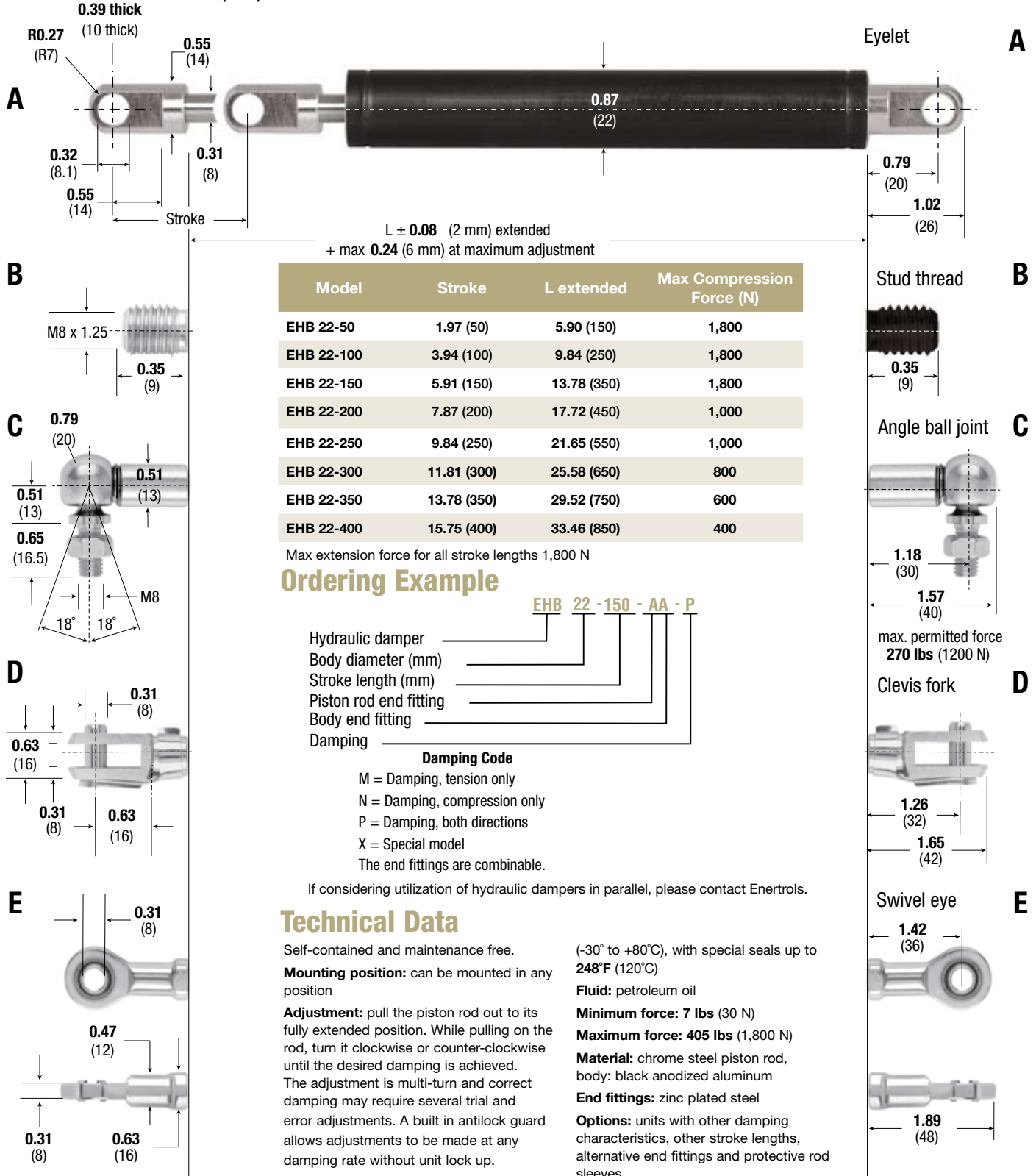
***Easily Adjusted***

***Quick Delivery***

***Medical • Packaging • Printing • Defense  
Furniture • RV • Fitness Equipment • Amusement  
Transportation • Lawn Equipment • and More***



Dimensions in inches and (mm)



## Technical Data

Self-contained and maintenance free.

**Mounting position:** can be mounted in any position

**Adjustment:** pull the piston rod out to its fully extended position. While pulling on the rod, turn it clockwise or counter-clockwise until the desired damping is achieved. The adjustment is multi-turn and correct damping may require several trial and error adjustments. A built in antilock guard allows adjustments to be made at any damping rate without unit lock up.

**Attention:** dampers have free travel accounting for approximately 20% of stroke

**Mechanical stop:** required 1 to 1.5 mm before end of stroke

**Temperature range:** -22° to +176°F

(-30° to +80°C), with special seals up to 248°F (120°C)

**Fluid:** petroleum oil

**Minimum force:** 7 lbs (30 N)

**Maximum force:** 405 lbs (1,800 N)

**Material:** chrome steel piston rod, body: black anodized aluminum

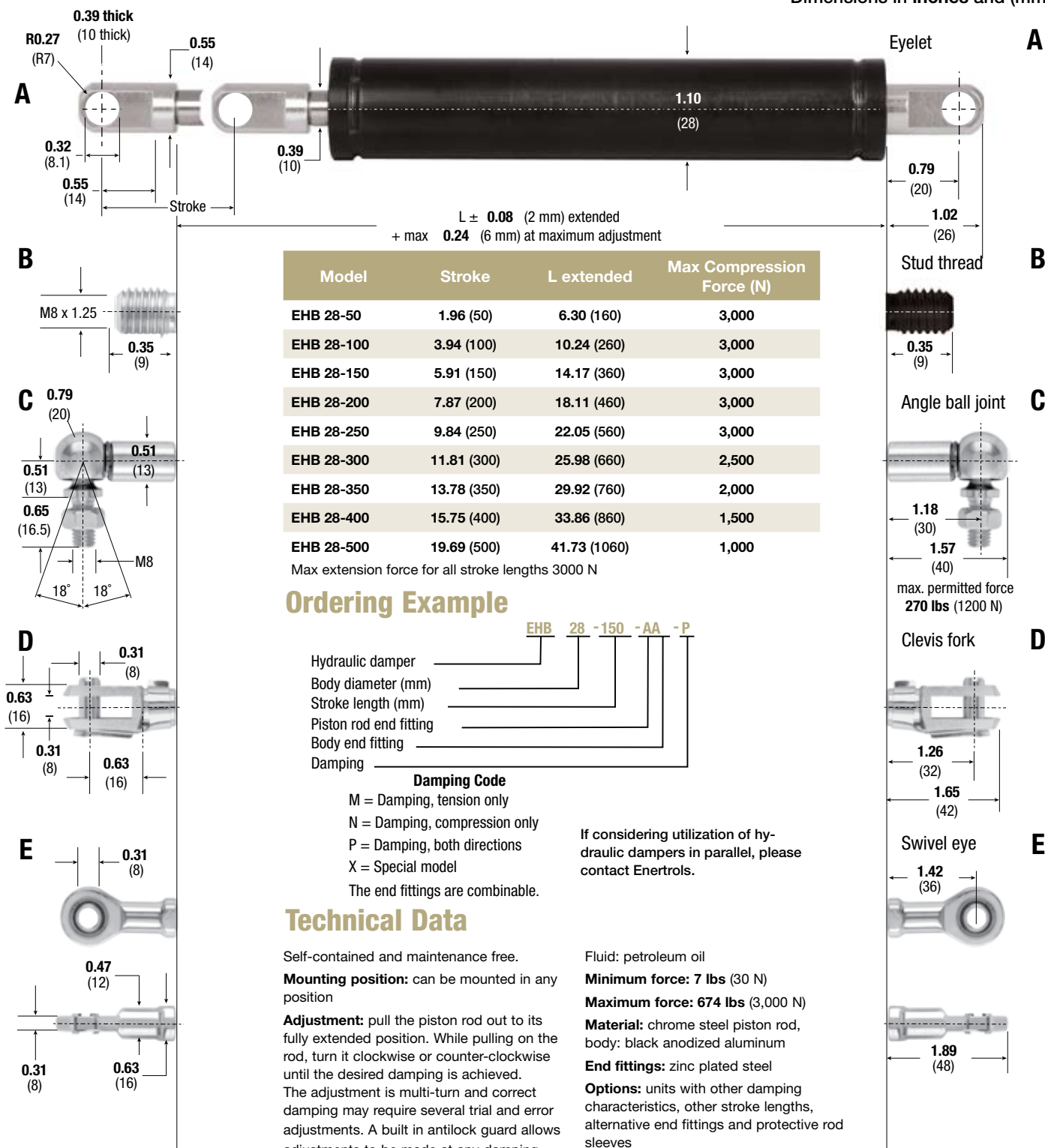
**End fittings:** zinc plated steel

**Options:** units with other damping characteristics, other stroke lengths, alternative end fittings and protective rod sleeves

**Mounting brackets:** A end fitting adapts to mounting brackets GSB-03, GSB-04 and GSB-05. C end fitting, minus threaded stud adapts to GSB-06.

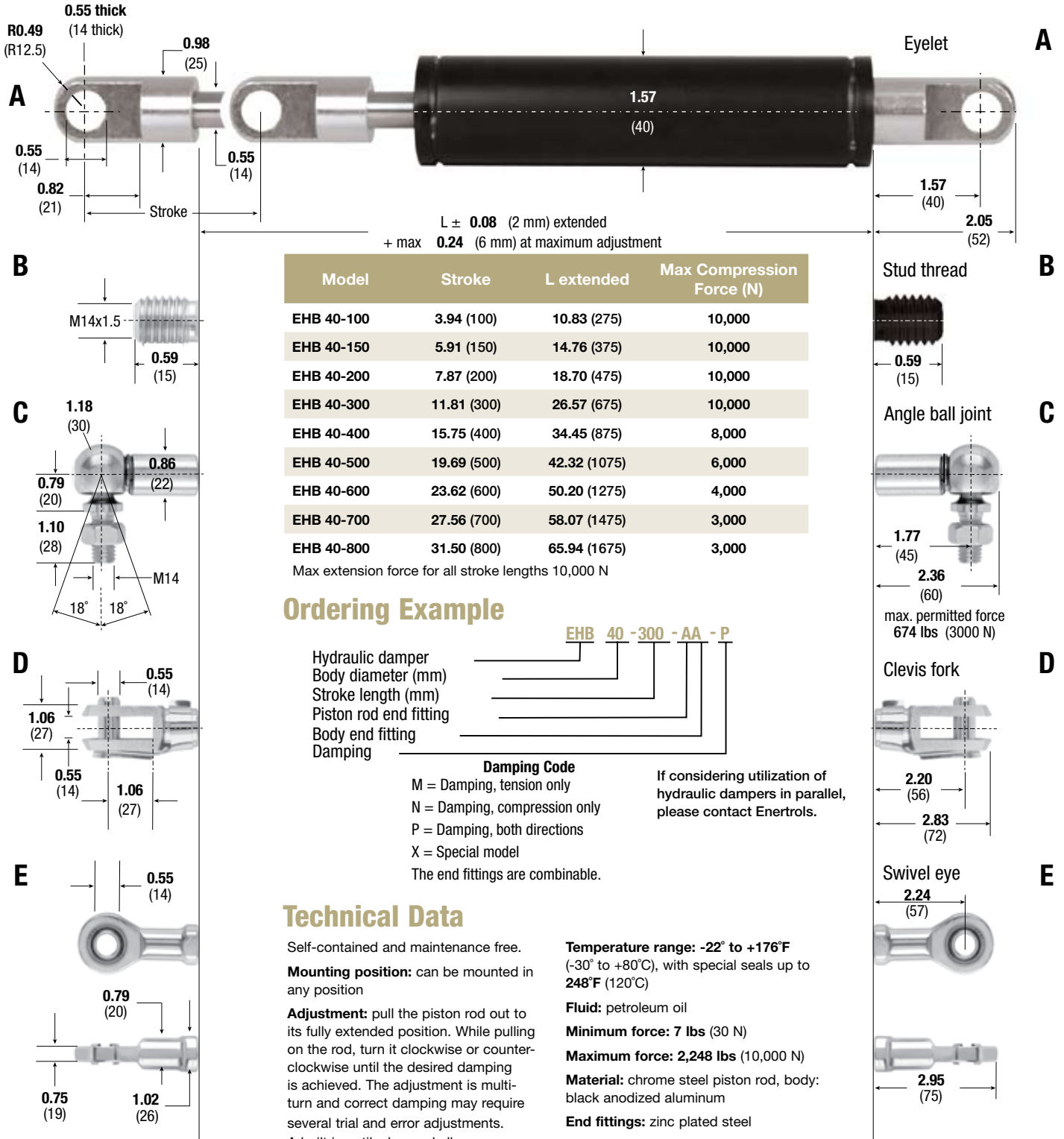
See page 22 for mounting bracket information

Dimensions in inches and (mm)





## Dimensions in inches and (mm)



Enertrols EHBD Hydraulic Dampers are maintenance-free, self-contained and sealed units. They are available with body diameters from 0.59 in (15 mm) to 1.57 in (40 mm) and with stroke lengths of up to 31.51 in (800 mm).

**Unlike standard Hydraulic Dampers that include free travel up to 20% of stroke, these dependable units have no free travel and are ideal for applications that require this level of performance.**

Double-acting Hydraulic Dampers are standard. However, a single acting design is available. Adjustment is easily achieved by pulling and turning the rod until the desired damping speed is achieved.

The travel speed is adjustable and remains constant

throughout the stroke. The single acting version is controllable in one direction only, with free-flow in the opposite direction. **A built-in antilock guard allows adjustment to be made at any damping rate without unit lock up.**

**These reliable units offer a minimum of 250,000 cycles and are available for QUICK DELIVERY. A variety of end fittings are available for ease of operation and installation. A, C & D end fittings are included with the damper.**

Typical applications include: process control, machine guards, lids, hatches, fire safety doors, arms for medical equipment, conveyors, swinging loads, machine tools, lift gates, drill feed control, amusement park rides, and more.

### ***Single & Double Acting***

### ***A, C & D End Fittings Included***

### ***250,000+ Cycle Life***

### ***Maintenance Free***

### ***Easily Adjusted***

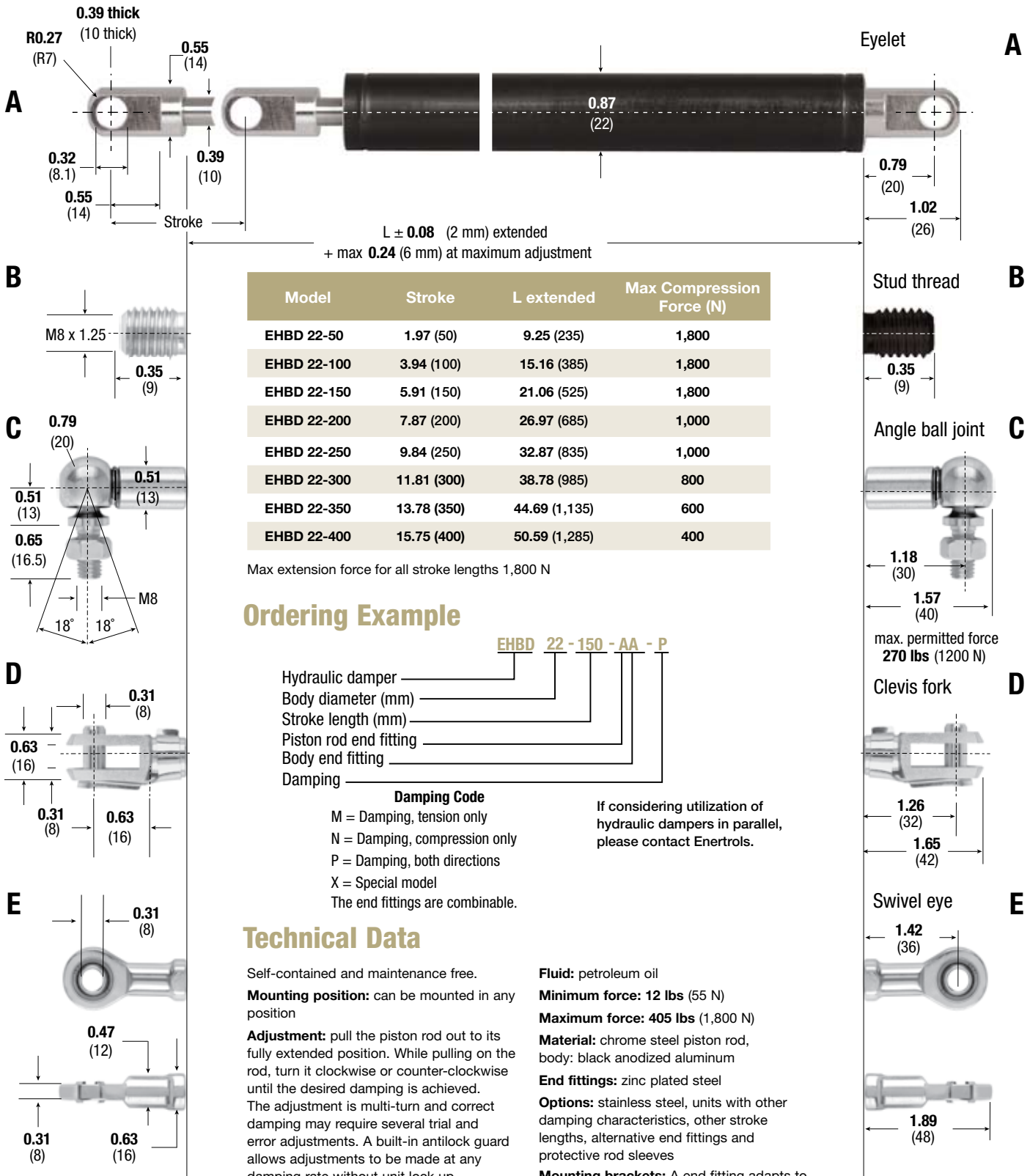


***An outstanding value line of Hydraulic Dampers with QUICK DELIVERY...wide range of body sizes, stroke lengths and damping forces***

***Medical • Furniture • Wind & Solar Energy •  
Fitness • Transportation • RV • Amusement • and More***

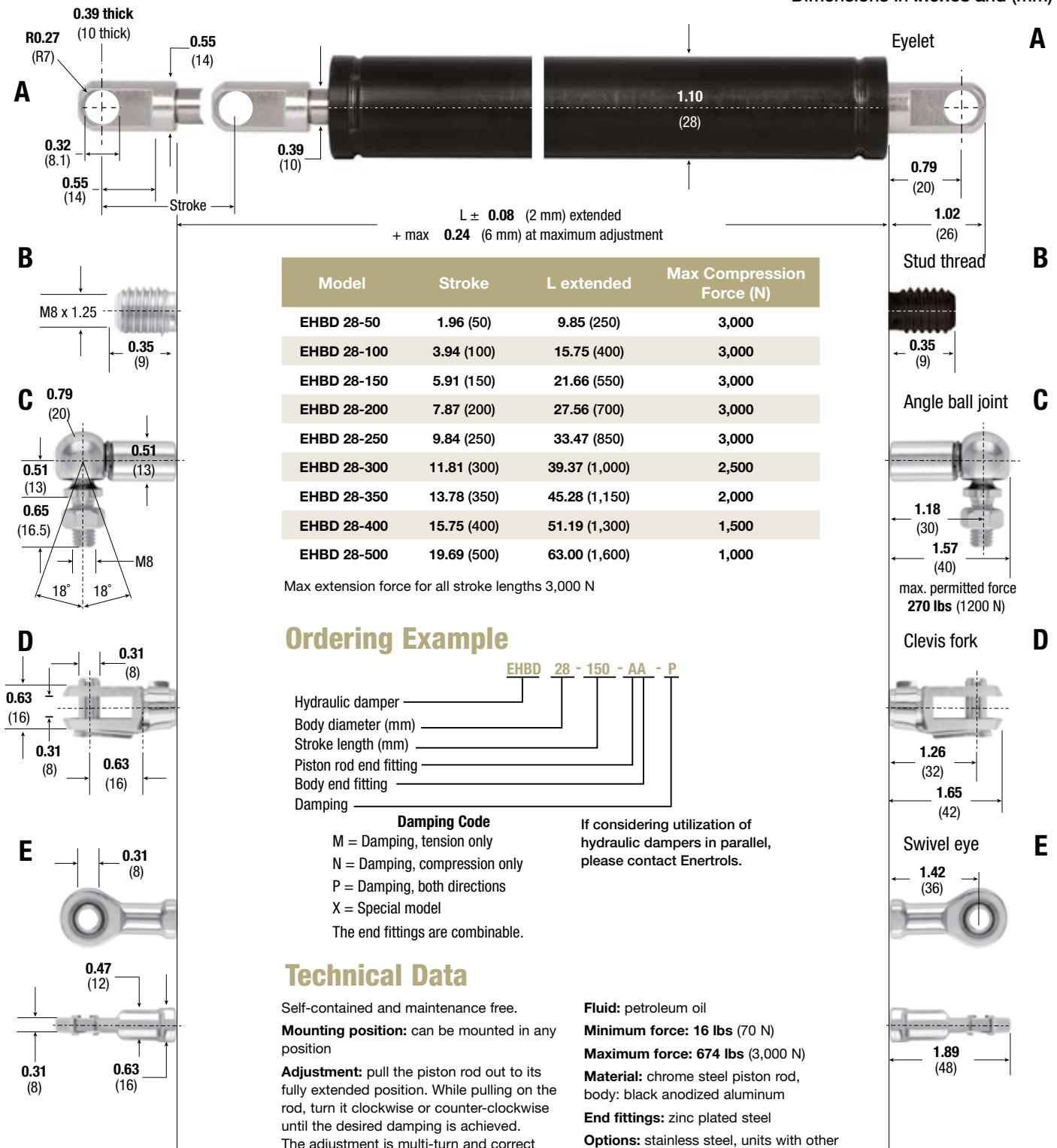


Dimensions in inches and (mm)

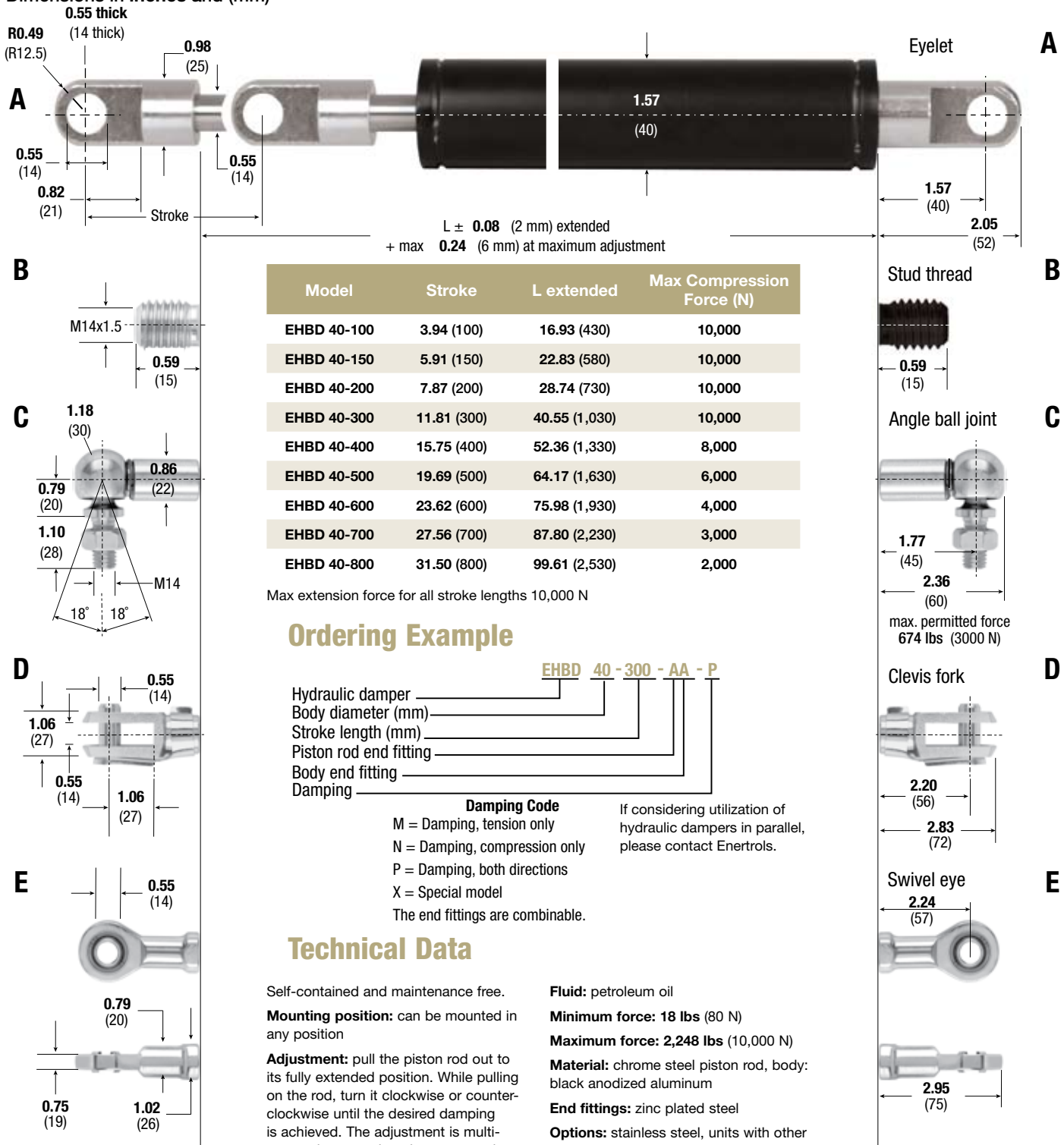




Dimensions in inches and (mm)



Dimensions in inches and (mm)

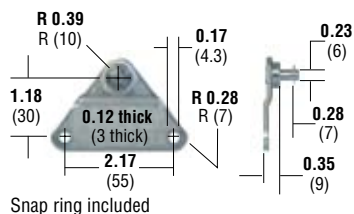


Dimensions in inches and (mm)

Material: zinc plated steel

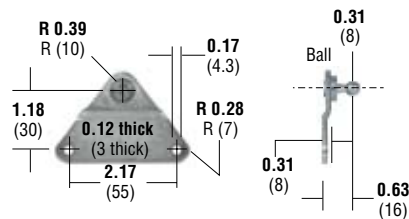
## GSB-01

max. force **112 lbs** (500 N)



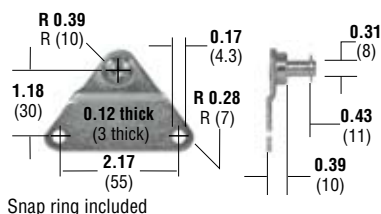
## GSB-02

max. force **112 lbs** (500 N)



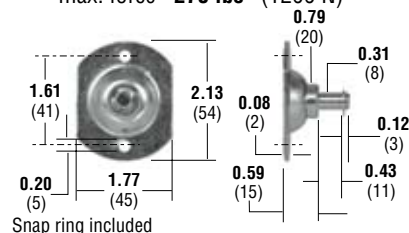
## GSB-03

max. force **270 lbs** (1200 N)



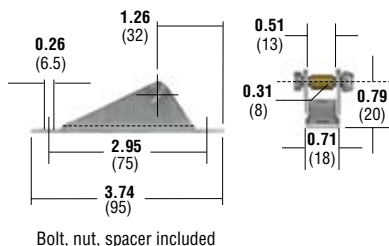
## GSB-04

max. force **270 lbs** (1200 N)



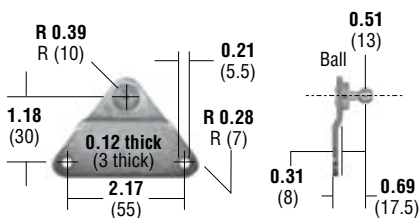
## GSB-05

max. force **405 lbs** (1800 N)



## GSB-06

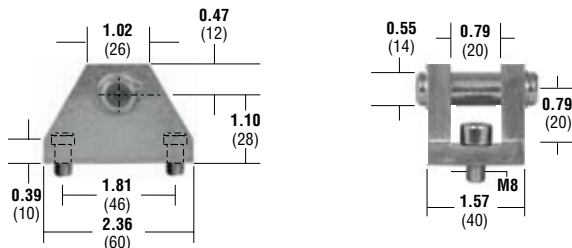
max. force **270 lbs** (1200 N)



Note: Rising force curve on compression for gas springs.

## ME14

max. force **2,248 lbs** (10,000 N)



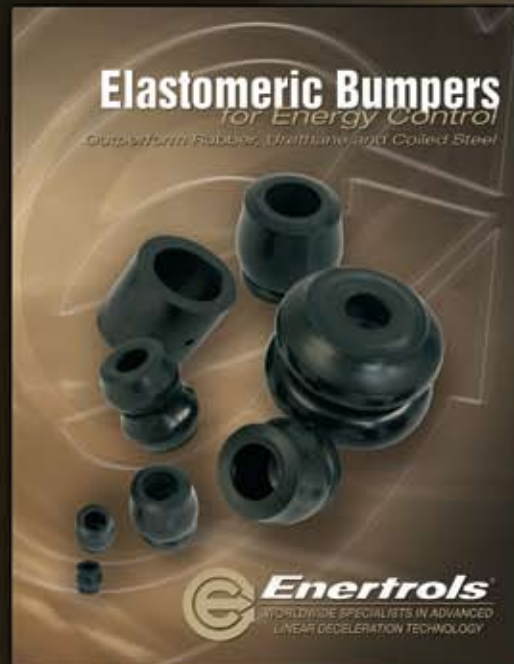
See individual model pages for specific information on the correct end fittings for each mounting bracket.

Mounting brackets are identical to those on page 11.

## Additional Enertrols Products



**Industrial & Safety Shock Absorbers, Hydraulic Dampers and Velocity & Feed Controllers**



**Elastomeric Bumpers Outperform Rubber, Urethane & Coiled Steel**

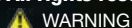
Enertrols reserves the right to change models, dimensions or specifications without notice or obligation.



**23435 Industrial Park Drive, Farmington Hills, MI 48335**

**734-595-4500 fax: 734-595-6410 email: [customerservice@enertrols.com](mailto:customerservice@enertrols.com) [www.enertrols.com](http://www.enertrols.com)**

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**WARNING**



**Made in USA**

**Catalog No. 200-0101**

IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE PERSONAL OR FATAL INJURY AND/OR PROPERTY DAMAGE.