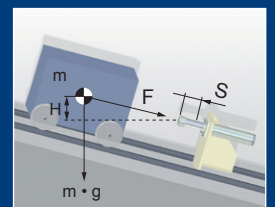


# Heavy-Duty Shock Absorbers

## LDS / HLS

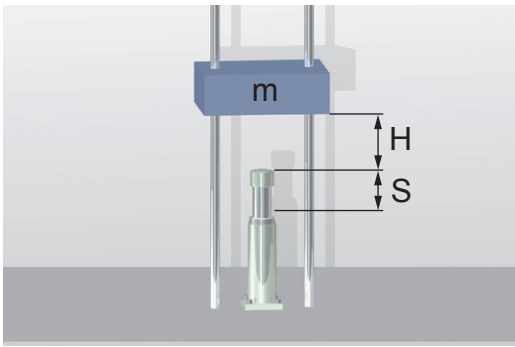
ONLINE  
Calculation +  
2D / 3D CAD Download



[www.weforma.com](http://www.weforma.com)

## Selection

### A FALLING MASS



#### Example

$m = 1000 \text{ kg}$   
 $H = 1,5 \text{ m}$   
 $S = 0,4 \text{ m}$   
 $X = 1/h$   
 $n = 1$

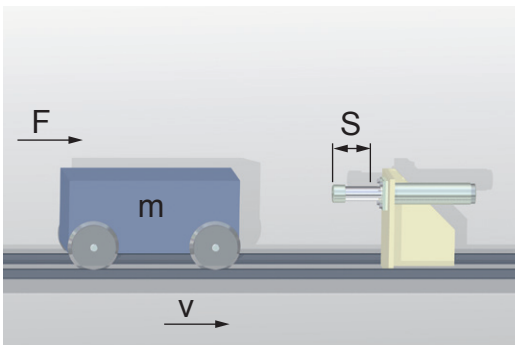
#### Formulae & Calculation

$$\begin{aligned}
 W_k &= m \cdot g \cdot H = 14.715 \text{ Nm} \\
 W_A &= m \cdot g \cdot S = 3.924 \text{ Nm} \\
 W_{kg} &= W_k + W_A = 18.639 \text{ Nm} \\
 W_{kgh} &= W_{kg} \cdot X = 18.639 \text{ Nm/h}
 \end{aligned}$$

#### Selection

LDS-40-400-XXXX

### B LOAD AGAINST SOLID STOP



#### Example

$m = 40.000 \text{ kg}$   
 $v = 2,5 \text{ m/s}$   
 $F = 6.000 \text{ N}$   
 $S = 0,2 \text{ m}$   
 $X = 5/h$   
 $n = 2$

#### Formulae & Calculation

$$W_k = \frac{m \cdot v^2}{2} = 125.000 \text{ Nm}$$

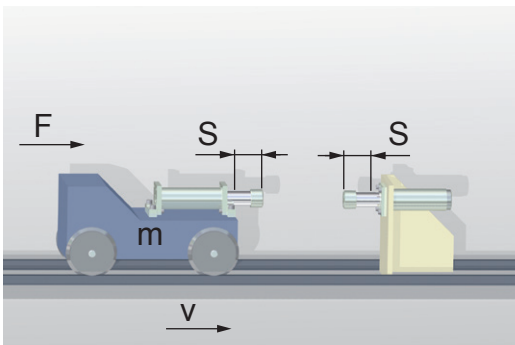
with propelling force

$$\begin{aligned}
 W_A &= F \cdot S = 1.200 \text{ Nm} \\
 W_{kg} &= (W_k + W_A) : n = 63.100 \text{ Nm} \\
 W_{kgh} &= W_{kg} \cdot X = 315.500 \text{ Nm/h} \\
 v_e &= v
 \end{aligned}$$

#### Selection

HLS-100-200-XXXX

### J LOAD AGAINST SOLID STOP WITH SHOCK ABSORBERS



#### Example

$m = 10.000 \text{ kg}$   
 $v = 2,6 \text{ m/s}$   
 $F = 4.000 \text{ N}$   
 $X = 10/h$   
 $S = 0,4 \text{ m}$

#### Formulae & Calculation

$$W_k = \frac{m \cdot v^2}{2} : 2 = 16.900 \text{ Nm}$$

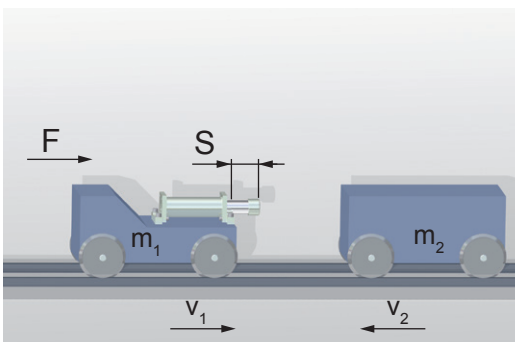
with propelling force

$$\begin{aligned}
 W_A &= F \cdot S = 1.600 \text{ Nm} \\
 W_{kg} &= W_k + W_A = 18.500 \text{ Nm} \\
 W_{kgh} &= W_{kg} \cdot X = 185.000 \text{ Nm/h} \\
 v_e &= v / 2 = 1,3 \text{ m/s}
 \end{aligned}$$

#### Selection

LDS-40-400-XXXX

### K LOAD AGAINST LOAD WITH ONE SHOCK ABSORBER



#### Example

$m1 = 5.000 \text{ kg}$   
 $v1 = 1,6 \text{ m/s}$   
 $m2 = 6.000 \text{ kg}$   
 $v2 = 2,0 \text{ m/s}$   
 $X = 6/h$   
 $S = 0,5 \text{ m}$

#### Formulae & Calculation

$$W_k = \frac{(m1 \cdot m2) \cdot (v1 + v2)^2}{2(m1 + m2)} = 17.672 \text{ Nm}$$

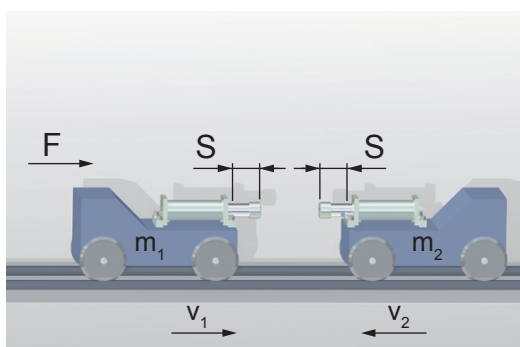
with propelling force

$$\begin{aligned}
 W_A &= F \cdot S \\
 W_{kg} &= W_k + W_A \\
 W_{kgh} &= W_{kg} \cdot X = 106.032 \text{ Nm/h} \\
 v_e &= v1 + v2 = 3,6 \text{ m/s}
 \end{aligned}$$

#### Selection

LDS-32-500-XXXX

**L** LOAD AGAINST LOAD WITH SHOCK ABSORBERS



**Example**

m1 = 15.000 kg  
 v1 = 1,9 m/s  
 m2 = 16.000 kg  
 v2 = 1,8 m/s  
 X = 12/h  
 S = 0,4 m

**Formulae & Calculation**

$$W_k = \frac{(m1 \cdot m2) \cdot (v1 + v2)^2}{4 (m1 + m2)} = 26.490 \text{ Nm}$$

with propelling force

$$W_A = F \cdot S$$

$$W_{kg} = W_k + W_A$$

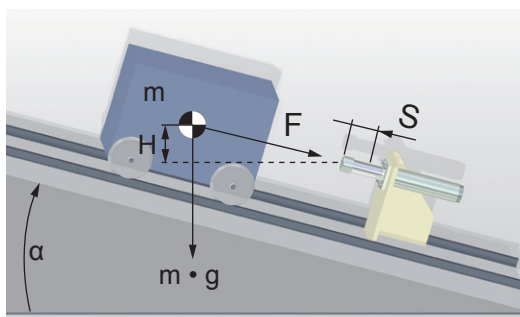
$$W_{kg/h} = W_{kg} \cdot X = 317.880 \text{ Nm/h}$$

$$v_e = (v1 + v2) / 2 = 1,85 \text{ m/s}$$

**Selection**

LDS-50-400-XXXX

**F** LOAD ON INCLINE



**Example**

m = 21.000 kg  
 H = 0,5 m  
 alpha = 22°  
 S = 0,6  
 X = 1/h

**Formulae & Calculation**

$$W_k = m \cdot g \cdot H = 103.005 \text{ Nm}$$

$$W_A = m \cdot g \cdot \sin \alpha \cdot S = 46.303 \text{ Nm}$$

$$W_{kg} = W_k + W_A = 149.308 \text{ Nm}$$

$$W_{kg/h} = W_{kg} \cdot X = 149.308 \text{ Nm/h}$$

$$v = \sqrt{2 \cdot g \cdot H}$$

**Selection**

HLS-100-600-XXXX



**!** For a utilization per stroke >80 % the approval of Weforma is necessary!  
 at 1/h: number of strokes per year required

Online calculation (imperial / metric) at [www.weforma.com](http://www.weforma.com)

**FORMULAE**

COUNTERFORCE

$$F_G = \frac{W_{kg} \cdot 1,2^*}{S}$$

DECELERATION TIME

$$t = \frac{2 \cdot S}{v_e} \cdot 1,2^*$$

DECELERATION RATE

$$a = \frac{v_e^2}{2 \cdot S} \cdot 1,2^*$$

STROKE

$$S = \frac{v_e^2}{2 \cdot a} \cdot 1,2^*$$

\*Calculation for optimum setting. Allow a safety margin!

**LEGEND**

<b>W<sub>k</sub></b>	(Nm)	Kinetic energy
<b>W<sub>A</sub></b>	(Nm)	Propelling force energy
<b>W<sub>kg</sub></b>	(Nm)	Total energy / W <sub>k</sub> + W <sub>A</sub>
<b>W<sub>kg/h</sub></b>	(Nm/h)	Total energy per hour
<b>m</b>	(kg)	Mass
<b>me</b>	(kg)	Effective mass

<b>v</b>	(m/s)	Impact speed
<b>v<sub>e</sub></b>	(m/s)	Effective speed
<b>X</b>	(1/h)	Number of strokes per hour
<b>S</b>	(m)	Stroke
<b>F</b>	(N)	Propelling force
<b>H</b>	(m)	Height

<b>g</b>	(m/s <sup>2</sup> )	Accerelation due to gravity (9,81 m/s <sup>2</sup> )
<b>alpha</b>	(°)	Angle
<b>a</b>	(m/s <sup>2</sup> )	Acceleration/Deceleration
<b>t</b>	(s)	Deceleration time
<b>F<sub>G</sub></b>	(N)	Counter force

## LDS 25 - 160

## HLS 40 - 160



### Energy absorption

max. 800.000 Nm / Stroke  
max. 7080640 in-lbs / Stroke

### Stroke

50 - 1800 mm  
1.97 - 70.87 in



### Energy absorption

max. 335.000 Nm / Stroke  
max. 2965018 in-lbs / Stroke

### Stroke

50 - 1200 mm  
1.97 - 47.24 in

## FEATURES

### Extended Life Time

Piston rod: hardened / hard chrome-plated

Special seals + oils

### Surface protection

Housing zinc plated / painted

### Deceleration

Customer specific

### Temperature

-20°C - +80°C / opt.: -40°C - +100°C

-4°F - +176°F / opt.: -40°F - +212°F

### RoHS compliant

Directive 2002/95/EC

### Applications LDS

Automated storage systems,

Stacker cranes,

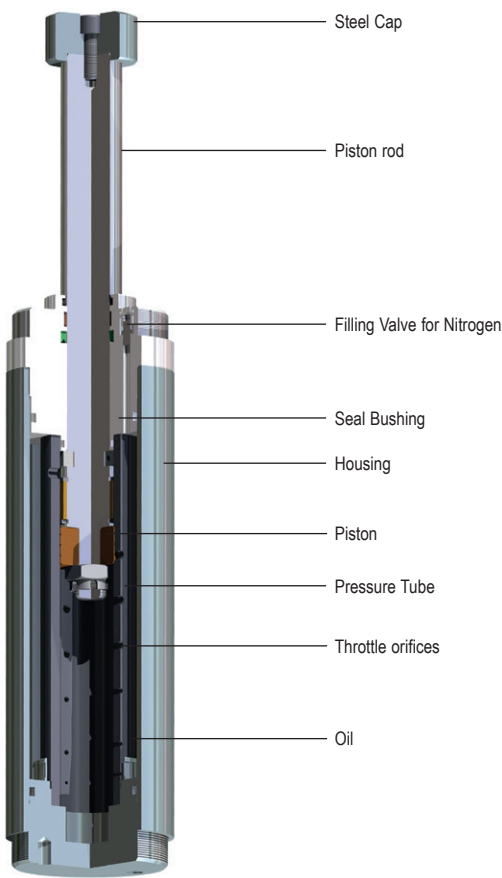
Cranes

### Applications HLS

Cranes

Swivel bridges

# Operating Principle



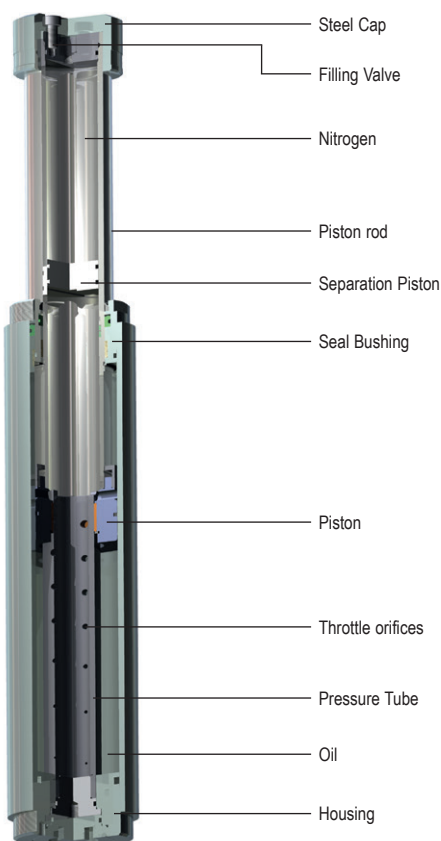
## LDS

LDS models are filled with hydraulic oil and nitrogen. This construction allows the reset of the piston with a low force.

When the piston rod is pushed into the cylinder, the piston displaces the oil through different sized holes which are progressively closed off.

As a result the speed of the piston rod proportionally decreases to the stroke covered. The displaced oil from the volume of the piston rod is compensated by an accumulator of nitrogen, which is above the oil.

During the stroke the pressure in the nitrogen is increased. When the mass is released the piston rod is returned by the pressure of the nitrogen.



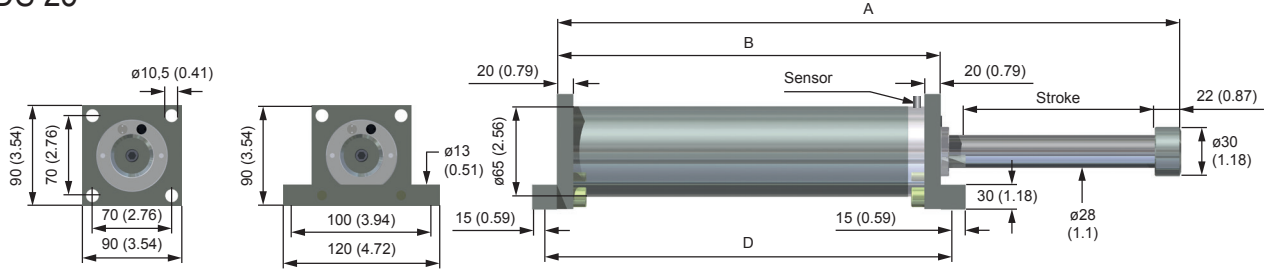
## HLS

HLS models have two chambers filled with hydraulic oil and nitrogen. The piston rod is used as an accumulator.

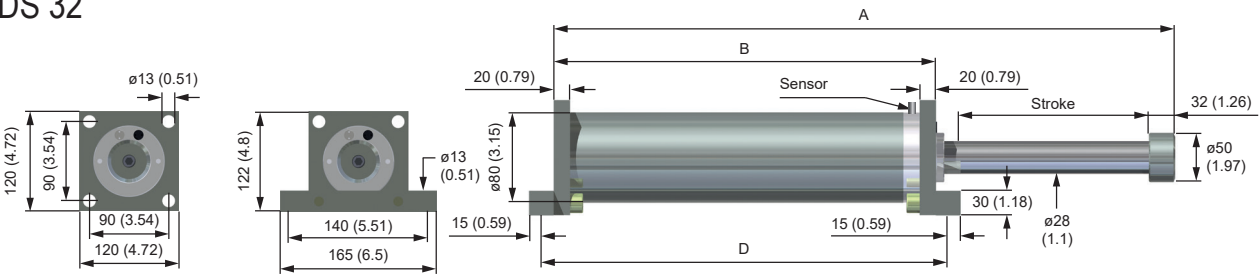
Under impact the piston rod is pushed into the cylinder displacing the oil through the orifices into the pressure tube, moving the separator piston towards the steel cap and compressing the nitrogen.

When the mass is released the pressure of the nitrogen sets back the piston rod.

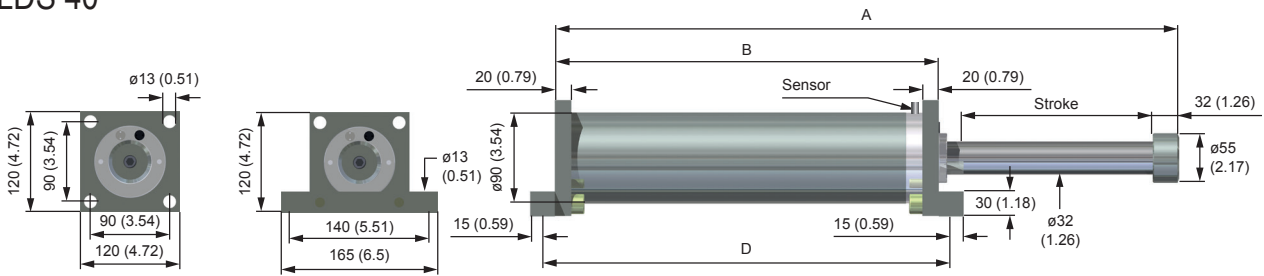
LDS 25



LDS 32



LDS 40



FH



FV



FB



LDS 25 / DIMENSIONS

	øPiston	Stroke	Energy/Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
					Emergency	Constant load	FV / FH	FB	A	B	D	A	B	D
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)			kg (lbs)	kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
LDS-25-050	25 (0.98)	50 (1.97)	1250 (11063.5)	30000 (6744.27)	2,5	2,5	2,4 (5.29)	3,8 (8.38)	240 (9.45)	158 (6.22)	178 (7.01)	240 (9.45)	158 (6.22)	178 (7.01)
LDS-25-100	25 (0.98)	100 (3.94)	2500 (22127)	30000 (6744.27)	2,5	2,5	3,1 (6.83)	4,5 (9.92)	340 (13.39)	208 (8.19)	228 (8.98)	340 (13.39)	215 (8.46)	235 (9.25)
LDS-25-150	25 (0.98)	150 (5.91)	3750 (33190.5)	30000 (6744.27)	1,5	1,0	4,1 (9.04)	5,5 (12.13)	440 (17.32)	258 (10.16)	278 (10.94)	440 (17.32)	275 (10.83)	295 (11.61)
LDS-25-200	25 (0.98)	200 (7.87)	5000 (44254)	30000 (6744.27)	1,5	1,0	5,4 (11.91)	6,8 (14.99)	540 (21.26)	308 (12.13)	328 (12.91)	540 (21.26)	335 (13.19)	355 (13.98)
LDS-25-250	25 (0.98)	250 (9.84)	6250 (55317.5)	26000 (5845.03)	1,0	0,5	6,8 (14.99)	8,2 (18.08)	678 (26.69)	396 (15.59)	416 (16.38)	678 (26.69)	396 (15.59)	416 (16.38)
LDS-25-300	25 (0.98)	300 (11.81)	7300 (64610.84)	22000 (4945.8)	1,0	0,5	8,5 (18.74)	9,9 (21.83)	788 (31.02)	456 (17.95)	476 (18.74)	788 (31.02)	456 (17.95)	476 (18.74)

## LDS 32 / DIMENSIONS

	øPiston mm (inch)	Stroke mm (inch)	Energy/ Stroke Nm (in lbs)	max. Counterforce N (lbs)	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
					Emergency	Constant load	FV / FH kg (lbs)	FB kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-32-050	32 (1.26)	50 (1.97)	3200 (28322)	65000 (14613)	2,5	2,5	6 (13.23)	8 (17.64)	314 (12.36)	216 (8.5)	246 (9.69)	314 (12.36)	216 (8.5)	246 (9.69)
LDS-32-100	32 (1.26)	100 (3.94)	6100 (53990)	65000 (14613)	2,5	2	8 (17.64)	10 (22.05)	414 (16.3)	266 (10.47)	296 (11.65)	464 (18.27)	316 (12.44)	346 (13.62)
LDS-32-150	32 (1.26)	150 (5.91)	9100 (80542)	65000 (14613)	2,5	2	9 (19.84)	11 (24.25)	514 (20.24)	316 (12.44)	346 (13.62)	564 (22.2)	346 (13.62)	376 (14.8)
LDS-32-200	32 (1.26)	200 (7.87)	12000 (106209)	65000 (14613)	2,5	2	11 (24.25)	13 (28.66)	614 (24.17)	366 (14.41)	396 (15.59)	664 (26.14)	416 (16.38)	446 (17.56)
LDS-32-250	32 (1.26)	250 (9.84)	15000 (132761)	65000 (14613)	2	1	12 (26.46)	14 (30.87)	714 (28.11)	416 (16.38)	446 (17.56)	814 (32.05)	516 (20.31)	546 (21.5)
LDS-32-300	32 (1.26)	300 (11.81)	17900 (158428)	65000 (14613)	2	1	14 (30.87)	16 (35.27)	814 (32.05)	466 (18.35)	496 (19.53)	914 (35.98)	566 (22.28)	596 (23.46)
LDS-32-350	32 (1.26)	350 (13.78)	20900 (184981)	65000 (14613)	1,5	1	16 (35.27)	18 (39.68)	914 (35.98)	516 (20.31)	546 (21.5)	1024 (40.31)	626 (24.65)	656 (25.83)
LDS-32-400	32 (1.26)	400 (15.75)	23300 (206222)	65000 (14613)	1,5	0,5	18 (39.68)	20 (44.09)	1014 (39.92)	566 (22.28)	596 (23.46)	1194 (47.01)	746 (29.37)	776 (30.55)
LDS-32-450	32 (1.26)	450 (17.72)	25000 (221269)	65000 (14613)	1	0,5	20 (44.09)	22 (48.5)	1126 (44.33)	626 (24.65)	656 (25.83)	1306 (51.42)	806 (31.73)	836 (32.91)
LDS-32-500	32 (1.26)	500 (19.69)	26300 (232775)	65000 (14613)	1	0,5	22 (48.5)	24 (52.91)	1236 (48.66)	686 (27.01)	716 (28.19)	1386 (54.57)	836 (32.91)	866 (34.09)
LDS-32-550	32 (1.26)	550 (21.65)	27000 (238970)	65000 (14613)	1	0,5	24 (52.91)	26 (57.32)	1346 (52.99)	746 (29.37)	776 (30.55)	1516 (59.69)	916 (36.06)	946 (37.24)
LDS-32-600	32 (1.26)	600 (23.62)	28200 (249591)	65000 (14613)	1	0,5	26 (57.32)	28 (61.73)	1456 (57.32)	806 (31.73)	836 (32.91)	1646 (64.8)	996 (39.21)	1026 (40.39)

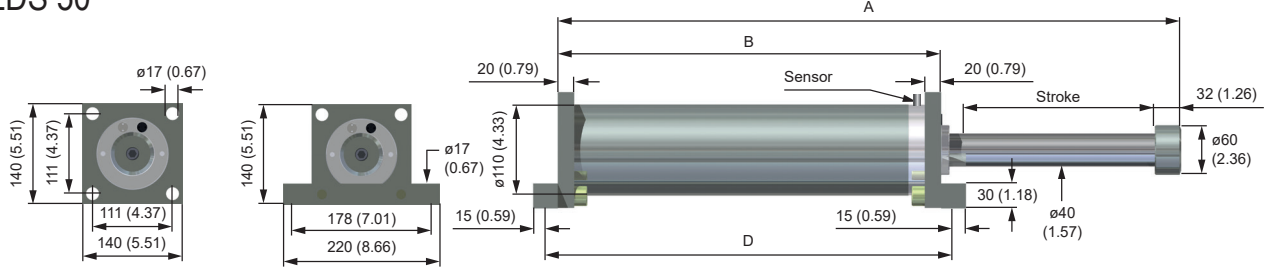


## LDS 40 / DIMENSIONS

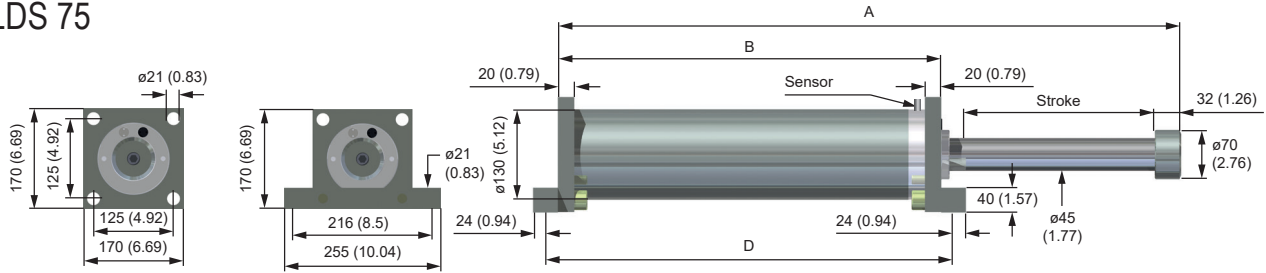
	øPiston mm (inch)	Stroke mm (inch)	Energy/ Stroke Nm (in lbs)	max. Counterforce N (lbs)	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
					Emergency	Constant load	FV / FH kg (lbs)	FB kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-40-050	40 (1.57)	50 (1.97)	4000 (35403)	90000 (20233)	2,5	2,5	10 (22.05)	12 (26.46)	298 (11.73)	206 (8.11)	236 (9.29)	298 (11.73)	206 (8.11)	236 (9.29)
LDS-40-100	40 (1.57)	100 (3.94)	8000 (70806)	90000 (20233)	2,5	2	12 (26.46)	13 (28.66)	398 (15.67)	256 (10.08)	286 (11.26)	448 (17.64)	306 (12.05)	336 (13.23)
LDS-40-150	40 (1.57)	150 (5.91)	12000 (106209)	90000 (20233)	2,5	2	13 (28.66)	15 (33.07)	498 (19.61)	306 (12.05)	336 (13.23)	548 (21.57)	356 (14.02)	386 (15.2)
LDS-40-200	40 (1.57)	200 (7.87)	16000 (141612)	90000 (20233)	2,5	2	15 (33.07)	17 (37.48)	598 (23.54)	356 (14.02)	386 (15.2)	648 (25.51)	406 (15.98)	436 (17.17)
LDS-40-250	40 (1.57)	250 (9.84)	20000 (177015)	90000 (20233)	2,5	1	16 (35.27)	18 (39.68)	698 (27.48)	406 (15.98)	436 (17.17)	798 (31.42)	506 (19.92)	536 (21.1)
LDS-40-300	40 (1.57)	300 (11.81)	24000 (212418)	90000 (20233)	2,5	1	18 (39.68)	20 (44.09)	798 (31.42)	456 (17.95)	486 (19.13)	908 (35.75)	566 (22.28)	596 (23.46)
LDS-40-350	40 (1.57)	350 (13.78)	28000 (247821)	90000 (20233)	2	1	19 (41.89)	21 (46.3)	898 (35.35)	506 (19.92)	536 (21.1)	998 (39.29)	606 (23.86)	636 (25.04)
LDS-40-400	40 (1.57)	400 (15.75)	32000 (283224)	90000 (20233)	2	0,5	21 (46.3)	23 (50.71)	1008 (39.69)	566 (22.28)	596 (23.46)	1128 (44.41)	686 (27.01)	716 (28.19)
LDS-40-450	40 (1.57)	450 (17.72)	36800 (325708)	90000 (20233)	1,5	0,5	23 (50.71)	25 (55.12)	1118 (44.02)	626 (24.65)	656 (25.83)	1298 (51.1)	806 (31.73)	836 (32.91)
LDS-40-500	40 (1.57)	500 (19.69)	40200 (355800)	90000 (20233)	1,5	0,5	25 (55.12)	27 (59.53)	1228 (48.35)	686 (27.01)	716 (28.19)	1348 (53.07)	806 (31.73)	836 (32.91)
LDS-40-550	40 (1.57)	550 (21.65)	42100 (372617)	90000 (20233)	1,5	0,5	26 (57.32)	29 (63.94)	1338 (52.68)	746 (29.37)	776 (30.55)	1458 (57.4)	866 (34.09)	896 (35.28)
LDS-40-600	40 (1.57)	600 (23.62)	45200 (400054)	90000 (20233)	1	0,5	28 (61.73)	30 (66.14)	1448 (57.01)	806 (31.73)	836 (32.91)	1568 (61.73)	926 (36.46)	956 (37.64)
LDS-40-650	40 (1.57)	650 (25.59)	48300 (427491)	90000 (20233)	1	0,5	30 (66.14)	32 (70.55)	1558 (61.34)	866 (34.09)	896 (35.28)	1738 (68.43)	1046 (41.18)	1076 (42.36)
LDS-40-700	40 (1.57)	700 (27.56)	51000 (451388)	90000 (20233)	1	0,5	33 (72.75)	35 (77.16)	1668 (65.67)	926 (36.46)	956 (37.64)	1848 (72.76)	1106 (43.54)	1136 (44.72)
LDS-40-750	40 (1.57)	750 (29.53)	55400 (490332)	80000 (17985)	1	0,5	35 (77.16)	37 (81.57)	1778 (70)	986 (38.82)	1016 (40)	1978 (77.87)	1166 (45.91)	1196 (47.09)
LDS-40-800	40 (1.57)	800 (31.5)	58000 (513344)	80000 (17985)	1	0,5	36 (79.37)	38 (83.78)	1888 (74.33)	1046 (41.18)	1076 (42.36)	2068 (81.42)	1226 (48.27)	1256 (49.45)
LDS-40-850	40 (1.57)	850 (33.46)	61000 (539896)	70000 (15737)	1	0,5	38 (83.78)	40 (88.19)	1998 (88.19)	1106 (43.54)	1136 (44.72)	2178 (85.75)	1286 (50.63)	1316 (51.81)
LDS-40-900	40 (1.57)	900 (35.43)	65000 (575299)	70000 (15737)	1	0,5	40 (88.19)	42 (92.6)	2108 (82.99)	1166 (45.91)	1196 (47.09)	2283 (89.88)	1341 (52.8)	1371 (53.98)
LDS-40-950	40 (1.57)	950 (37.4)	68000 (601851)	60000 (13489)	1	0,5	42 (92.6)	44 (97.01)	2218 (87.32)	1226 (48.27)	1256 (49.45)	2403 (94.61)	1411 (55.55)	1441 (46.73)
LDS-40-1000	40 (1.57)	1000 (39.37)	71000 (628403)	60000 (13489)	1	0,5	44 (97.01)	46 (101.41)	2328 (91.65)	1286 (50.63)	1316 (51.81)	2588 (101.1)	1526 (60.08)	1556 (61.26)
LDS-40-1200	40 (1.57)	1200 (47.24)	80000 (708060)	45000 (10116)	1	0,5	46 (101.41)	48 (105.82)	2768 (108.98)	1526 (60.08)	1556 (61.26)	2993 (117.73)	1751 (68.94)	1781 (70.12)

# LDS 50 / 75 / 80

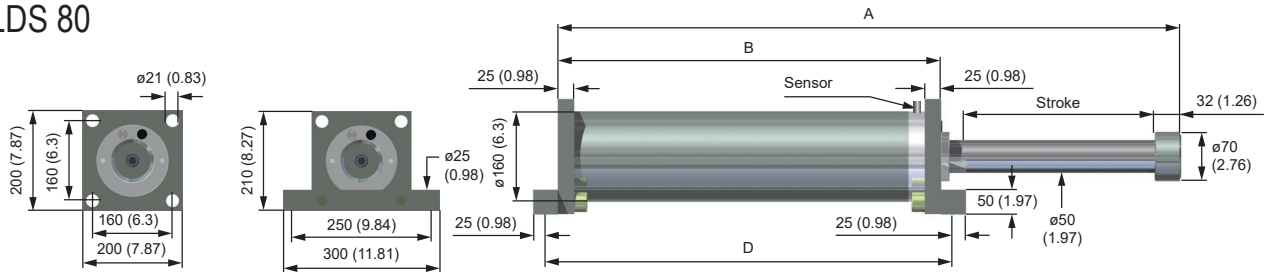
## LDS 50



## LDS 75



## LDS 80



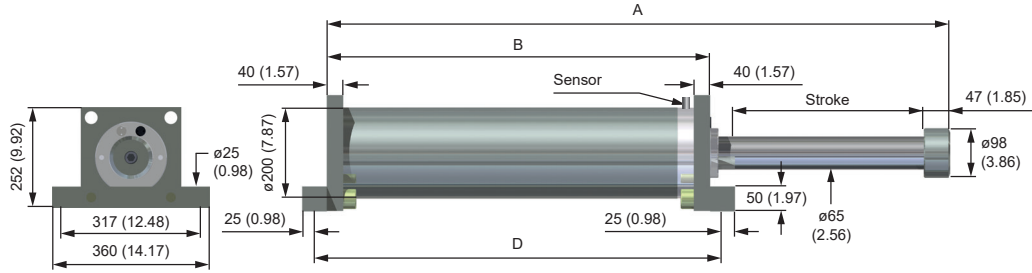
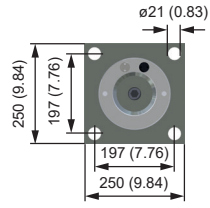
## LDS 50 / DIMENSIONS

	ØPiston mm (inch)	Stroke mm (inch)	Energy/Stroke Nm (in lbs)	max. Counterforce N (lbs)	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
					Emergency	Constant load	FV / FH kg (lbs)	FB kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-50-050	50 (1.97)	50 (1.97)	6000 (53105)	120000 (26977)	2.5	2.5	10 (22.05)	12 (26.46)	310 (12.2)	218 (8.58)	248 (9.76)	310 (12.2)	218 (8.58)	248 (9.76)
LDS-50-100	50 (1.97)	100 (3.94)	11000 (97358)	120000 (26977)	2.5	2	12 (26.46)	13 (28.66)	409 (16.1)	267 (10.51)	297 (11.69)	459 (18.07)	267 (10.51)	287 (11.3)
LDS-50-150	50 (1.97)	150 (5.91)	16500 (146037)	120000 (26977)	2.5	2	13 (28.66)	15 (33.07)	509 (20.04)	317 (12.48)	347 (13.66)	544 (21.42)	352 (13.86)	382 (15.04)
LDS-50-200	50 (1.97)	200 (7.87)	22000 (194717)	120000 (26977)	2.5	2	15 (33.07)	17 (37.48)	609 (23.98)	367 (14.45)	397 (15.63)	659 (25.94)	417 (16.42)	447 (17.6)
LDS-50-250	50 (1.97)	250 (9.84)	27000 (238970)	120000 (26977)	2.5	1	16 (35.27)	18 (39.68)	709 (27.91)	417 (16.42)	447 (17.6)	809 (31.85)	517 (20.35)	547 (21.54)
LDS-50-300	50 (1.97)	300 (11.81)	33000 (292075)	120000 (26977)	2.5	1	18 (39.68)	20 (44.09)	809 (31.85)	467 (18.39)	497 (19.57)	909 (35.79)	567 (22.32)	597 (23.5)
LDS-50-350	50 (1.97)	350 (13.78)	38000 (336329)	120000 (26977)	2	1	19 (41.89)	21 (46.3)	909 (35.79)	517 (20.35)	547 (21.54)	1019 (40.12)	627 (24.69)	657 (25.87)
LDS-50-400	50 (1.97)	400 (15.75)	44000 (389433)	120000 (26977)	2	0.5	21 (46.3)	23 (50.71)	1009 (39.72)	567 (22.32)	597 (23.5)	1129 (44.45)	687 (27.05)	717 (28.23)
LDS-50-450	50 (1.97)	450 (17.72)	49000 (433687)	120000 (26977)	1.5	0.5	23 (50.71)	25 (55.12)	1119 (44.06)	627 (24.69)	657 (25.87)	1299 (51.14)	807 (31.77)	837 (32.95)
LDS-50-500	50 (1.97)	500 (16.69)	55000 (486791)	120000 (26977)	1.5	0.5	25 (55.12)	27 (59.53)	1229 (48.39)	687 (27.05)	717 (28.23)	1409 (55.47)	867 (34.13)	897 (35.31)
LDS-50-550	50 (1.97)	550 (21.65)	60000 (531045)	120000 (26977)	1.5	0.5	26 (57.32)	29 (63.94)	1339 (52.72)	747 (29.41)	777 (30.59)	1519 (59.8)	927 (36.5)	957 (37.68)
LDS-50-600	50 (1.97)	600 (23.62)	66000 (584150)	120000 (26977)	1	0.5	28 (61.73)	30 (66.14)	1449 (57.05)	807 (31.77)	837 (32.95)	1629 (64.13)	987 (38.86)	1017 (40.04)
LDS-50-650	50 (1.97)	650 (25.59)	70000 (619553)	120000 (26977)	1	0.5	30 (66.14)	32 (70.55)	1559 (61.38)	867 (34.13)	897 (35.31)	1739 (68.46)	1047 (41.22)	1077 (42.4)
LDS-50-700	50 (1.97)	700 (27.56)	76000 (672657)	120000 (26977)	1	0.5	33 (72.75)	35 (77.16)	1669 (65.71)	927 (36.5)	957 (37.68)	1849 (72.8)	1107 (43.58)	1137 (44.76)
LDS-50-750	50 (1.97)	750 (29.53)	80000 (708060)	120000 (26977)	1	0.5	35 (77.16)	37 (81.57)	1779 (70.04)	987 (38.86)	1017 (40.04)	1959 (77.13)	1167 (45.94)	1197 (47.13)
LDS-50-800	50 (1.97)	800 (31.5)	83000 (734612)	120000 (26977)	1	0.5	36 (79.37)	38 (83.78)	1889 (74.37)	1047 (41.22)	1077 (42.4)	2129 (83.82)	1287 (50.67)	1317 (51.85)
LDS-50-850	50 (1.97)	850 (33.46)	85000 (752314)	100000 (22481)	1	0.5	38 (83.78)	40 (88.19)	1999 (78.7)	1107 (43.58)	1137 (44.76)	2319 (91.3)	1427 (56.18)	1457 (57.36)
LDS-50-900	50 (1.97)	900 (35.43)	88000 (778866)	100000 (22481)	1	0.5	40 (88.78)	42 (92.6)	2109 (83.03)	1167 (45.94)	1197 (47.13)	2369 (93.27)	1427 (56.18)	1457 (57.36)
LDS-50-950	50 (1.97)	950 (37.4)	90000 (796568)	90000 (20233)	1	0.5	42 (92.6)	44 (97.01)	2219 (87.36)	1227 (48.31)	1257 (49.49)	2518 (99.13)	1527 (60.12)	1557 (61.3)
LDS-50-1000	50 (1.97)	1000 (39.37)	92000 (814269)	90000 (20233)	1	0.5	44 (97.01)	46 (101.41)	2329 (91.69)	1287 (50.67)	1317 (51.85)	2569 (101.14)	1527 (60.12)	1557 (61.3)
LDS-50-1100	50 (1.97)	1100 (43.31)	94000 (831971)	80000 (17985)	1	0.5	45 (99.21)	47 (103.62)	2569 (101.14)	1427 (56.18)	1457 (57.36)	2819 (110.98)	1677 (66.02)	1707 (67.2)
LDS-50-1200	50 (1.97)	1200 (47.24)	96000 (849672)	67000 (15062)	1	0.5	46 (101.41)	48 (105.82)	2769 (109.02)	1527 (60.12)	1557 (61.3)	3169 (124.76)	1927 (75.87)	1957 (77.05)

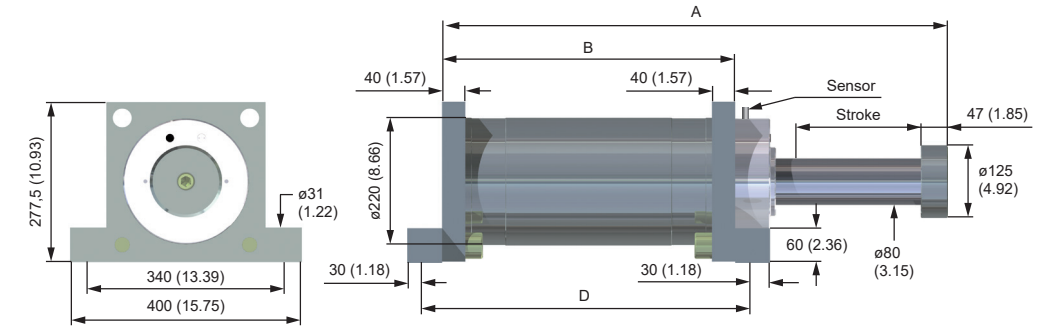
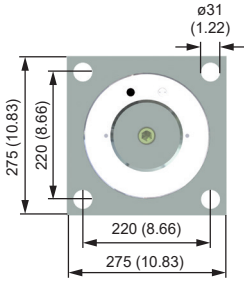




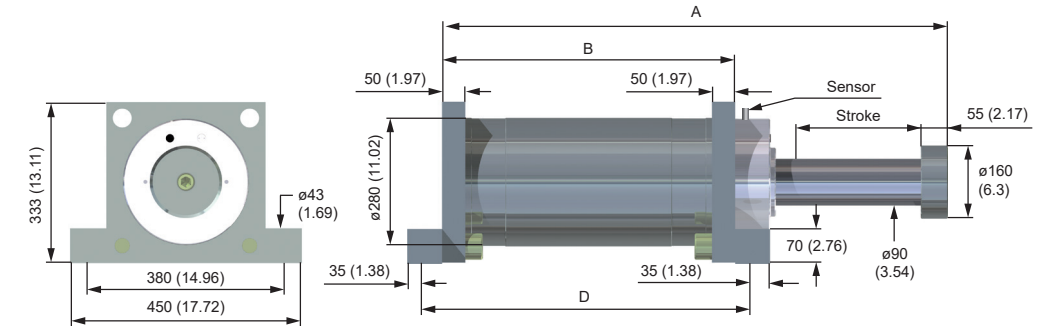
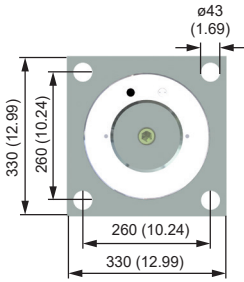
LDS 100



LDS 125



LDS 160



LDS 100 / DIMENSIONS

	øPiston mm (inch)	Stroke mm (inch)	Energy/ Stroke Nm (in lbs)	max. Counterforce N (lbs)	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
					Emergency	Constant load	FV / FH kg (lbs)	FB kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-100-050	100 (3.94)	50 (1.97)	15500 (137187)	360000 (80932)	2	2	55 (121.26)	90 (198.42)	425 (16.73)	425 (12.32)	425 (14.29)	425 (16.73)	313 (12.32)	363 (14.29)
LDS-100-100	100 (3.94)	100 (3.94)	31000 (274373)	360000 (80932)	2	1.5	60 (132.28)	95 (209.44)	525 (20.67)	363 (14.29)	413 (16.26)	535 (21.06)	373 (14.69)	423 (16.65)
LDS-100-150	100 (3.94)	150 (5.91)	46500 (411560)	360000 (80932)	2	1.5	65 (143.3)	100 (220.47)	625 (24.61)	413 (16.26)	463 (18.23)	645 (25.39)	433 (17.05)	483 (19.02)
LDS-100-200	100 (3.94)	200 (7.87)	62000 (548747)	360000 (80932)	1.5	1	70 (154.33)	105 (231.49)	725 (28.54)	463 (18.23)	513 (20.2)	755 (29.72)	493 (19.41)	543 (21.38)
LDS-100-250	100 (3.94)	250 (9.84)	77500 (685933)	360000 (80932)	1.5	0.5	75 (165.35)	110 (242.51)	825 (32.48)	513 (20.2)	563 (22.17)	865 (34.06)	553 (21.77)	603 (23.74)
LDS-100-300	100 (3.94)	300 (11.81)	93000 (823120)	360000 (80932)	1.5	0.5	85 (187.4)	120 (264.56)	1000 (39.37)	643 (25.31)	693 (27.28)	1000 (39.37)	643 (25.31)	693 (27.28)
LDS-100-400	100 (3.94)	400 (15.75)	124000 (1097493)	360000 (80932)	1.5	0.5	95 (209.44)	130 (286.61)	1200 (47.24)	743 (29.25)	793 (31.22)	1200 (47.24)	743 (29.25)	793 (31.22)
LDS-100-500	100 (3.94)	500 (16.69)	155000 (1371866)	360000 (80932)	1.5	0.5	105 (231.49)	140 (308.65)	1405 (55.31)	848 (33.39)	898 (35.35)	1405 (55.31)	848 (33.39)	898 (35.35)
LDS-100-600	100 (3.94)	600 (23.62)	186000 (1646240)	360000 (80932)	1.5	0.5	115 (253.54)	150 (330.7)	1605 (63.19)	948 (37.32)	998 (39.29)	1635 (64.37)	978 (38.5)	1028 (40.47)
LDS-100-700	100 (3.94)	700 (27.56)	217000 (1920613)	360000 (80932)	1	0.5	125 (275.58)	160 (352.75)	1805 (71.06)	1048 (41.26)	1098 (43.23)	1845 (72.64)	1088 (42.83)	1138 (44.8)
LDS-100-800	100 (3.94)	800 (31.5)	248000 (2194986)	360000 (80932)	1	0.5	135 (297.63)	170 (374.79)	2015 (79.33)	1153 (45.39)	1203 (47.36)	2065 (81.3)	1203 (47.36)	1253 (49.33)
LDS-100-900	100 (3.94)	900 (35.43)	279000 (2469359)	360000 (80932)	1	0.5	145 (319.68)	180 (396.84)	2215 (87.2)	1253 (49.33)	1303 (51.3)	2285 (89.96)	1323 (52.09)	1373 (54.06)
LDS-100-1000	100 (3.94)	1000 (39.37)	290000 (2566718)	360000 (80932)	1	0.5	155 (341.72)	190 (418.89)	2415 (95.08)	1353 (53.27)	1403 (55.24)	2515 (99.02)	1453 (57.2)	1503 (59.17)
LDS-100-1200	100 (3.94)	1200 (47.24)	330000 (2920748)	280000 (62947)	1	0.5	165 (363.77)	210 (462.98)	2815 (110.83)	1553 (61.14)	1603 (63.11)	2965 (116.73)	1703 (67.05)	1753 (69.02)

LDS 125 / DIMENSIONS

	øPiston mm (inch)	Stroke mm (inch)	Energy/ Stroke Nm (in lbs)	max. Counterforce N (lbs)	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
					Emergency	Constant load	FV / FH kg (lbs)	FB kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-125-050	125 (4.92)	50 (1.97)	23000 (203567)	552000 (124100)	2	2	85 (187.4)	127 (279.99)	462 (18.19)	295 (11.61)	355 (13.98)	462 (18.19)	295 (11.61)	355 (13.98)
LDS-125-100	125 (4.92)	100 (3.94)	47000 (415985)	552000 (124100)	2	1,5	90 (198.42)	132 (291.02)	562 (22.13)	345 (13.58)	405 (15.94)	562 (22.13)	345 (13.58)	405 (15.94)
LDS-125-150	125 (4.92)	150 (5.91)	71000 (628403)	552000 (124100)	2	1,5	99 (218.26)	141 (310.86)	662 (26.06)	395 (15.55)	455 (17.91)	662 (26.06)	395 (15.55)	455 (17.91)
LDS-125-200	125 (4.92)	200 (7.87)	94000 (831971)	552000 (124100)	1,5	1	105 (231.49)	147 (324.09)	762 (30)	445 (17.52)	505 (19.88)	788 (31.02)	471 (18.54)	531 (20.91)
LDS-125-250	125 (4.92)	250 (9.84)	128000 (1132896)	552000 (124100)	1,5	0,5	115 (253.54)	157 (346.13)	872 (34.33)	505 (19.88)	565 (22.24)	898 (35.35)	531 (20.91)	591 (23.27)
LDS-125-300	125 (4.92)	300 (11.81)	142000 (1256807)	552000 (124100)	1,5	0,5	120 (264.56)	162 (357.15)	984 (38.74)	567 (22.32)	627 (24.69)	1020 (40.16)	603 (23.74)	663 (26.1)
LDS-125-400	125 (4.92)	400 (15.75)	188000 (1663941)	552000 (124100)	1,5	0,5	135 (297.63)	177 (390.22)	1227 (48.31)	710 (27.95)	770 (30.31)	1278 (50.31)	761 (29.96)	#WERT!
LDS-125-500	125 (4.92)	500 (19.69)	235000 (2079926)	552000 (124100)	1,5	0,5	165 (363.77)	207 (456.36)	1475 (58.07)	858 (33.78)	918 (36.14)	1537 (60.51)	920 (36.22)	980 (38.58)
LDS-125-600	125 (4.92)	600 (23.62)	283000 (2504762)	552000 (124100)	1,5	0,5	180 (396.84)	222 (489.43)	1723 (67.83)	1006 (39.61)	1066 (41.97)	1783 (70.2)	1066 (41.97)	1126 (44.33)
LDS-125-700	125 (4.92)	700 (27.56)	330000 (2920748)	552000 (124100)	1	0,5	190 (418.89)	232 (511.48)	1970 (77.56)	1153 (45.39)	1213 (47.46)	2050 (80.71)	1233 (48.54)	1293 (50.91)
LDS-125-800	125 (4.92)	800 (31.5)	375000 (3319031)	552000 (124100)	1	0,5	205 (451.96)	247 (544.55)	2219 (87.36)	1302 (51.26)	1362 (53.62)	2321 (91.38)	1404 (55.28)	1464 (57.64)
LDS-125-900	125 (4.92)	900 (35.43)	420000 (3717315)	552000 (124100)	1	0,5	215 (474)	257 (566.6)	2467 (97.13)	1450 (57.09)	1510 (59.45)	2574 (101.34)	1557 (61.3)	1617 (63.66)
LDS-125-1000	125 (4.92)	1000 (39.37)	468000 (4142151)	552000 (124100)	1	0,5	230 (507.07)	272 (599.67)	2715 (106.89)	1598 (62.94)	1658 (65.28)	2837 (111.69)	1720 (67.72)	1780 (70.08)
LDS-125-1200	125 (4.92)	1200 (47.24)	536000 (4744002)	410000 (92200)	1	0,5	250 (551.17)	292 (643.76)	3211 (126.42)	1894 (74.57)	1954 (76.93)	3368 (132.6)	2051 (80.75)	2111 (83.11)

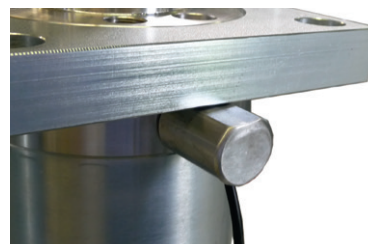
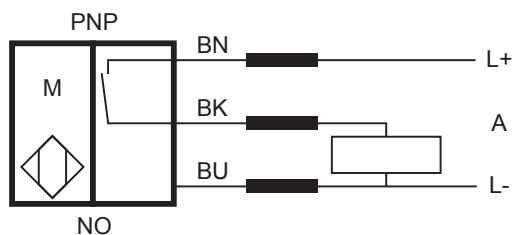
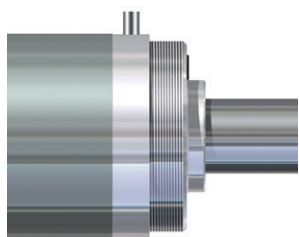


LDS 160 / DIMENSIONS

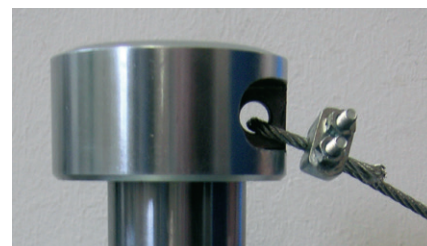
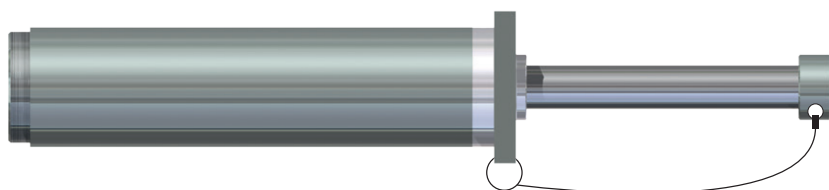
	øPiston mm (inch)	Stroke mm (inch)	Energy/ Stroke Nm (in lbs)	max. Counterforce N (lbs)	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
					Emergency	Constant load	FV / FH kg (lbs)	FB kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-160-050	160 (6.3)	50 (1.97)	37500 (331905)	900000 (202330)	2	2	160 (352.75)	215 (474)	512 (20.16)	340 (13.39)	410 (16.14)	512 (20.16)	340 (13.39)	410 (16.14)
LDS-160-100	160 (6.3)	100 (3.94)	75000 (663810)	900000 (202330)	2	1,5	170 (374.79)	225 (496.05)	612 (24.09)	390 (15.35)	460 (18.11)	612 (24.09)	390 (15.35)	460 (18.11)
LDS-160-150	160 (6.3)	150 (5.91)	112000 (991290)	900000 (202330)	2	1,5	185 (407.86)	240 (529.12)	712 (28.03)	440 (17.32)	510 (20.08)	712 (28.03)	440 (17.32)	510 (20.08)
LDS-160-200	160 (6.3)	200 (7.87)	150000 (1327620)	900000 (202330)	1,5	1	195 (429.91)	250 (551.17)	812 (31.97)	490 (19.29)	560 (22.05)	812 (31.97)	490 (19.29)	560 (22.05)
LDS-160-250	160 (6.3)	250 (9.84)	190000 (1681655)	900000 (202330)	1,5	0,5	205 (451.96)	260 (573.21)	902 (35.51)	530 (20.87)	600 (23.62)	902 (35.51)	530 (20.87)	600 (23.65)
LDS-160-300	160 (6.3)	300 (11.81)	220000 (1947180)	900000 (202330)	1,5	0,5	215 (474)	270 (595.26)	1007 (39.65)	585 (23.03)	655 (25.79)	1007 (39.65)	585 (23.03)	655 (25.79)
LDS-160-400	160 (6.3)	400 (15.75)	300000 (2655240)	900000 (202330)	1,5	0,5	235 (518.1)	290 (639.35)	1217 (47.91)	695 (27.36)	765 (30.12)	1227 (48.31)	705 (27.76)	775 (30.51)
LDS-160-500	160 (6.3)	500 (19.69)	380000 (3363305)	900000 (202330)	1,5	0,5	260 (573.21)	315 (694.47)	1457 (57.36)	835 (32.87)	905 (35.63)	1467 (57.76)	845 (33.27)	1005 (39.57)
LDS-160-600	160 (6.3)	600 (23.62)	455000 (4027115)	900000 (202330)	1,5	0,5	310 (683.44)	365 (804.7)	1697 (66.81)	975 (38.39)	1045 (41.14)	1707 (67.2)	985 (38.78)	1055 (41.54)
LDS-160-700	160 (6.3)	700 (27.56)	530000 (4690925)	900000 (202330)	1	0,5	330 (727.54)	385 (848.79)	1937 (76.26)	1115 (43.9)	1185 (46.65)	1957 (77.05)	1135 (44.69)	1205 (47.44)
LDS-160-800	160 (6.3)	800 (31.5)	605000 (5354735)	900000 (202330)	1	0,5	360 (793.68)	415 (914.93)	2177 (85.71)	1255 (49.41)	1325 (52.17)	2197 (86.5)	1275 (50.2)	1345 (52.95)
LDS-160-900	160 (6.3)	900 (35.43)	680000 (6018545)	900000 (202330)	1	0,5	390 (859.82)	445 (981.07)	2417 (95.16)	1395 (54.92)	1465 (57.68)	2437 (95.94)	1425 (56.1)	1495 (58.86)
LDS-160-1000	160 (6.3)	1000 (39.37)	795000 (7036390)	900000 (202330)	1	0,5	420 (925.96)	475 (1047.21)	2657 (104.61)	1535 (60.43)	1605 (63.19)	2697 (106.18)	1575 (62.01)	1645 (64.76)
LDS-160-1200	160 (6.3)	1200 (47.24)	800000 (7080640)	800000 (179850)	1	0,5	450 (992.1)	505 (1113.35)	3137 (123.5)	1815 (71.46)	1885 (74.21)	3187 (125.47)	1865 (73.43)	1935 (76.18)

## Accessories LDS

### PROXIMITY SWITCH

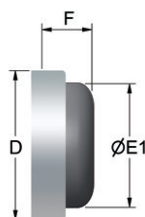
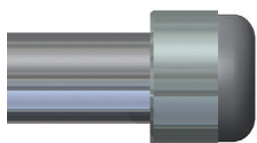


### SECURITY CHAIN



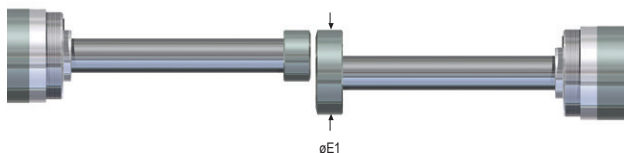
For safety reasons we recommend the use of a security chain when the installation height of the LDS / HLS heavy-duty shock absorber is 2 m or above.

### STOP CAP



	D	F	Ø E1
	mm (inch)		
LDS 25	30 (1.18)	16 (0.63)	21 (0.83)
LDS 32	39,5 (1.56)	18 (0.71)	31 (1.22)
LDS 40	59 (2.32)	25 (0.98)	49 (1.93)
LDS 50	59 (2.32)	25 (0.98)	49 (1.93)
LDS 75	80 (3.15)	25 (0.98)	66 (2.6)
LDS 80	80 (3.15)	25 (0.98)	66 (2.6)
LDS 100	98 (3.86)	17 (0.67)	80 (3.15)
LDS 125	125 (4.92)	42 (1.65)	100 (3.94)
LDS 160	160 (6.3)	50 (1.97)	120 (4.72)

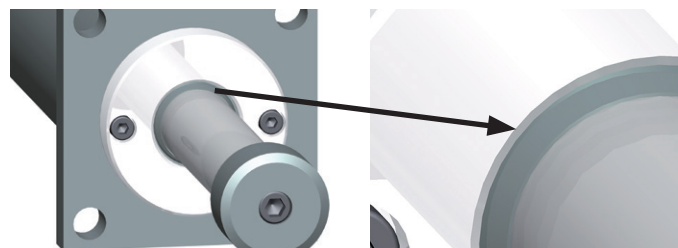
### ENLARGED STOP CAP



Application: Shock absorber against Shock absorber

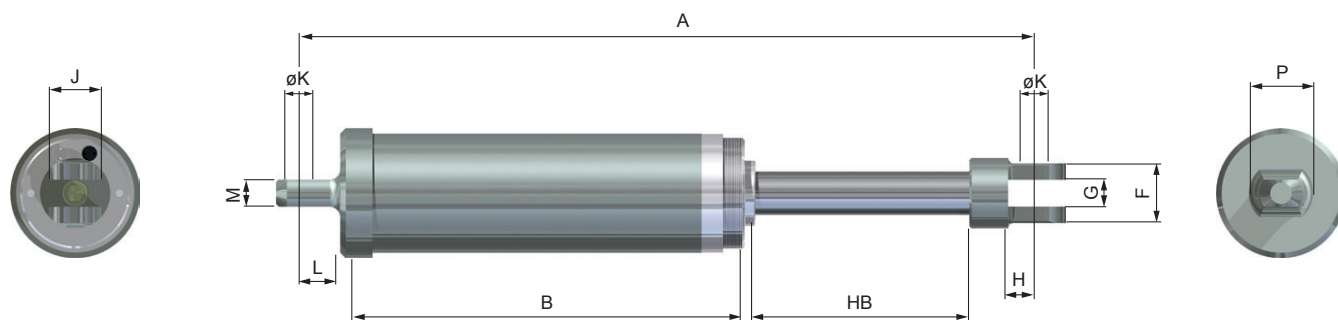
	Ø E1	Ø E1	
LDS 25	39,5 (1.56)	LDS 75	100 (3.94)
LDS 32	79 (3.11)	LDS 80	100 (3.94)
LDS 40	70 (2.76)	LDS 100	125 (4.92)
LDS 50	80 (3.15)		

### METAL WIPER



(Stroke: -10 mm)

# Clevis Mounting



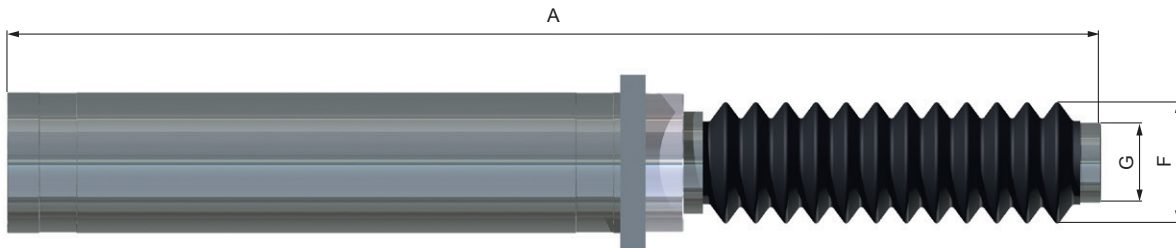
From series LDS-80  
Female rod clevis mounted on both sides!

## DIMENSIONS

	Stroke	A	F	G	H	J	øK	L	M	P
		mm (inch)								
LDS-32-050	50 (1.97)	398 (15.67)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-100	100 (3.94)	498 (19.61)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-150	150 (5.91)	598 (23.54)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-200	200 (7.87)	698 (27.48)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-250	250 (9.84)	798 (31.42)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-300	300 (11.81)	898 (35.35)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-050	50 (1.97)	382 (15.04)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-100	100 (3.94)	482 (18.98)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-150	150 (5.91)	582 (22.91)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-200	200 (7.87)	682 (26.85)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-250	250 (9.84)	782 (30.79)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-300	300 (11.81)	882 (34.72)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-50-050	50 (1.97)	398 (15.67)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-100	100 (3.94)	497 (19.57)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-150	150 (5.91)	597 (23.5)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-200	200 (7.87)	697 (27.44)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-250	250 (9.84)	797 (31.38)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-300	300 (11.81)	897 (35.31)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-75-050	50 (1.97)	432 (17.01)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-075	75 (2.95)	483 (19.02)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-100	100 (3.94)	520 (20.47)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-125	125 (4.92)	585 (23.03)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-150	150 (5.91)	642 (25.28)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-200	200 (7.87)	736 (28.98)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-250	250 (9.84)	838 (32.99)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-300	300 (11.81)	940 (37.01)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-80-050	50 (1.97)	551 (21.69)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-100	100 (3.94)	676 (26.61)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-150	150 (5.91)	776 (30.55)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-200	200 (7.87)	901 (35.47)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-250	250 (9.84)	1001 (39.41)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-300	300 (11.81)	1126 (44.33)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-100-050	50 (1.97)	570 (22.44)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-100	100 (3.94)	672 (26.46)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-150	150 (5.91)	772 (30.39)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-200	200 (7.87)	875 (34.45)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-250	250 (9.84)	976 (38.43)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-300	300 (11.81)	1143 (45)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-125-050	50 (1.97)	640 (25.2)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-100	100 (3.94)	751 (29.57)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-150	150 (5.91)	853 (33.58)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-200	200 (7.87)	955 (37.6)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-250	250 (9.84)	1055 (41.54)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-300	300 (11.81)	1157 (45.55)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-

We reserve the right to make changes without further notice!

# Protection Bellow



	LDS 25	LDS 32 / 40	LDS 50 / 75	LDS 80 / 100 / 125	LDS 160
ØG	30 (1,18)	55 (2,17)	70 (2,76)	125 (4,92)	160 (6,3)
ØF	80 (3,15)	120 (4,72)	130 (5,12)	190 (7,48)	220 (8,66)

## LDS 25

Stroke mm	A mm
50 (1,97)	313 (12,32)
100 (3,94)	413 (16,26)
150 (5,91)	513 (20,2)
200 (7,87)	613 (24,13)

## LDS 40

Stroke mm	A mm
50 (1,97)	370 (14,57)
100 (3,94)	470 (18,5)
150 (5,91)	570 (22,44)
200 (7,87)	670 (26,38)
250 (9,84)	770 (30,31)
300 (11,81)	925 (36,42)
350 (13,78)	1025 (40,35)
400 (15,75)	1135 (44,69)
450 (17,72)	1245 (49,02)
500 (19,69)	1355 (53,35)
550 (21,65)	1465 (57,68)
600 (23,62)	1575 (62,01)
650 (25,59)	1750 (68,9)
700 (27,56)	1860 (73,23)
750 (29,53)	1970 (77,56)
800 (31,5)	2080 (81,89)
850 (33,46)	2190 (86,22)
900 (35,43)	2300 (90,55)
950 (37,4)	2410 (94,88)
1000 (39,37)	2520 (99,21)
1200 (47,24)	2960 (116,54)

## LDS 50

Stroke mm	A mm
50 (1,97)	382 (15,04)
100 (3,94)	481 (18,94)
150 (5,91)	581 (22,87)
200 (7,87)	681 (26,81)
250 (9,84)	781 (30,75)
300 (11,81)	936 (36,85)
350 (13,78)	1036 (40,79)
400 (15,75)	1136 (44,72)
450 (17,72)	1246 (49,06)
500 (19,69)	1356 (53,39)
550 (21,65)	1466 (57,72)
600 (23,62)	1576 (62,05)
650 (25,59)	1751 (68,94)
700 (27,56)	1861 (73,27)
750 (29,53)	1971 (77,6)
800 (31,5)	2081 (81,93)
850 (33,46)	2191 (86,26)
900 (35,43)	2301 (90,59)
950 (37,4)	2411 (94,92)
1000 (39,37)	2521 (99,25)

## LDS 75

Stroke mm	A mm
50 (1,97)	390 (15,35)
75 (2,95)	436 (17,17)
100 (3,94)	490 (19,29)
125 (4,92)	540 (21,26)
150 (5,91)	612 (24,09)
200 (7,87)	690 (27,17)
250 (9,84)	790 (31,1)
300 (11,81)	945 (37,2)
350 (13,78)	1095 (43,11)
400 (15,75)	1196 (47,09)
450 (17,72)	1297 (51,06)
500 (19,69)	1398 (55,04)
600 (23,62)	1599 (62,95)
700 (27,56)	1866 (73,46)
800 (31,5)	2067 (81,38)
900 (35,43)	2316 (91,18)
1000 (39,37)	2516 (99,06)

## LDS 32

Stroke mm	A mm
50 (1,97)	380 (14,96)
100 (3,94)	480 (18,9)
150 (5,91)	580 (22,83)
200 (7,87)	680 (26,77)
250 (9,84)	780 (30,71)
300 (11,81)	935 (36,81)
350 (13,78)	1035 (40,75)
400 (15,75)	1135 (44,69)
450 (17,72)	1245 (49,02)
500 (19,69)	1355 (53,35)
550 (21,65)	1465 (57,68)
600 (23,62)	1575 (62,01)

## LDS 80

Stroke mm	A mm
50 (1,97)	484 (19,06)
100 (3,94)	609 (23,98)
150 (5,91)	709 (27,91)
200 (7,87)	834 (32,83)
250 (9,84)	934 (36,77)
300 (11,81)	1104 (43,46)
400 (15,75)	1304 (51,34)
500 (19,69)	1529 (60,2)
600 (23,62)	1729 (68,07)
700 (27,56)	2004 (78,9)
800 (31,5)	2204 (86,77)
900 (35,43)	2454 (96,61)
1000 (39,37)	2654 (104,49)

## LDS 100

Stroke mm	A mm
50 (1,97)	492 (19,37)
100 (3,94)	592 (23,31)
150 (5,91)	692 (27,24)
200 (7,87)	792 (31,18)
250 (9,84)	892 (35,12)
300 (11,81)	1112 (43,78)
400 (15,75)	1312 (51,65)
500 (19,69)	1517 (59,72)
600 (23,62)	1717 (67,6)
700 (27,56)	1967 (77,44)
800 (31,5)	2177 (85,71)
900 (35,43)	2377 (93,58)
1000 (39,37)	2577 (101,46)

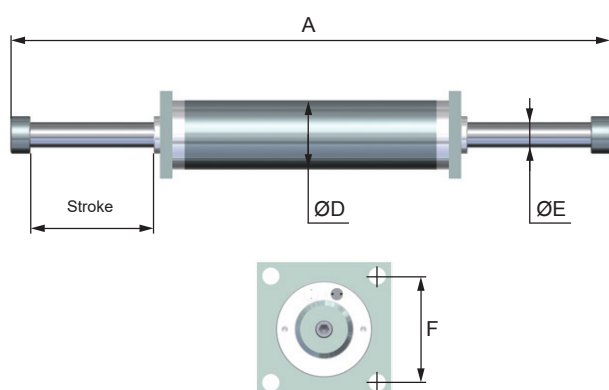
## LDS 125

Stroke mm	A mm
50 (1,97)	529 (20,83)
100 (3,94)	629 (24,76)
150 (5,91)	729 (28,7)
200 (7,87)	829 (32,64)
250 (9,84)	939 (36,97)
300 (11,81)	1096 (43,15)
400 (15,75)	1339 (52,72)
500 (19,69)	1587 (62,48)
600 (23,62)	1835 (72,24)
700 (27,56)	2132 (83,94)
800 (31,5)	2381 (93,74)
900 (35,43)	2629 (103,5)
1000 (39,37)	2877 (113,27)

## LDS 160

Stroke mm	A mm
50 (1,97)	587 (23,11)
100 (3,94)	687 (27,05)
150 (5,91)	787 (30,98)
200 (7,87)	887 (34,92)
250 (9,84)	1055 (41,54)
300 (11,81)	1160 (45,67)
400 (15,75)	1370 (53,94)
500 (19,69)	1610 (63,39)
600 (23,62)	1850 (72,83)
700 (27,56)	2090 (82,28)
800 (31,5)	2408 (94,8)
900 (35,43)	2648 (104,25)
1000 (39,37)	2888 (113,7)
1200 (47,24)	3368 (132,6)

## Double-Acting Heavy-Duty Shock Absorbers



### FEATURES

- Customer-specific modification to suit application scenario
- Strokes: 50 - 1000 mm
- Energy absorption: up to 400.000 Nm / stroke

For the selection the following information is required:

- |                         |                                       |
|-------------------------|---------------------------------------|
| • Mass (kg)             | • At 1/h: number of strokes per year  |
| • Speed (m/s)           | • Temperature (°C)                    |
| • Propelling force (N)  | • Stroke (mm)                         |
| • Drive power (kW)      | • Dimensions according to the drawing |
| • Number of strokes / h |                                       |

## Surface protection

### FEATURES

#### 1) Indoor applications (without humidity)

- Piston rod: chrome plated, hardened (LDS)
- Piston rod: chrome plated (HLS)
- Housing: zinc plated
- Seal bushing from high strength aluminium

#### 2) Outdoor

- Piston rod: nickel (30 µm) and hardchrome (20 µm) plated
- Housing and seal bushing painted conforming to DIN EN ISO 12944-2-C5-I

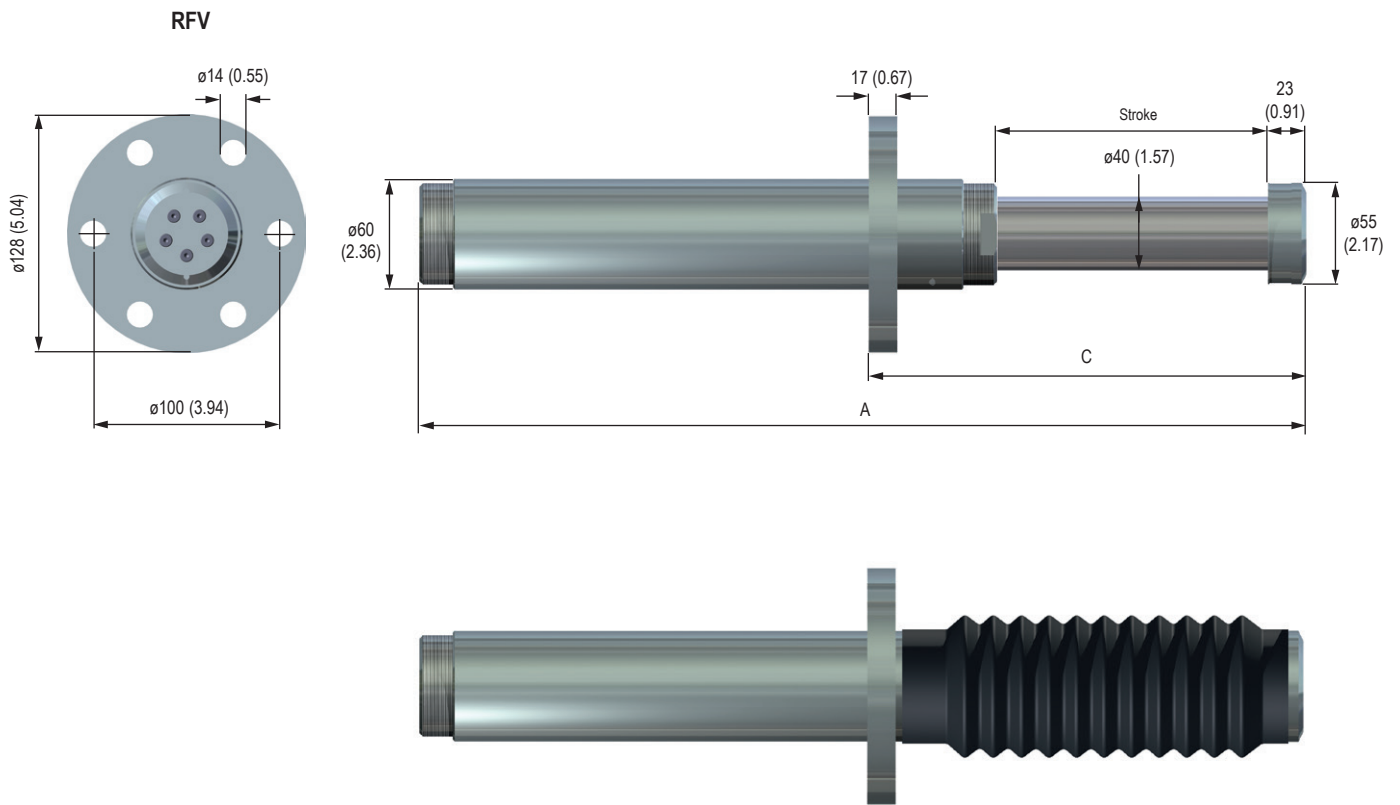
#### Cleaning agents!

- Before using cleaning agents please consult Weforma

#### Packaging

- Wooden boxes; depending on national regulations according to ISPM 15

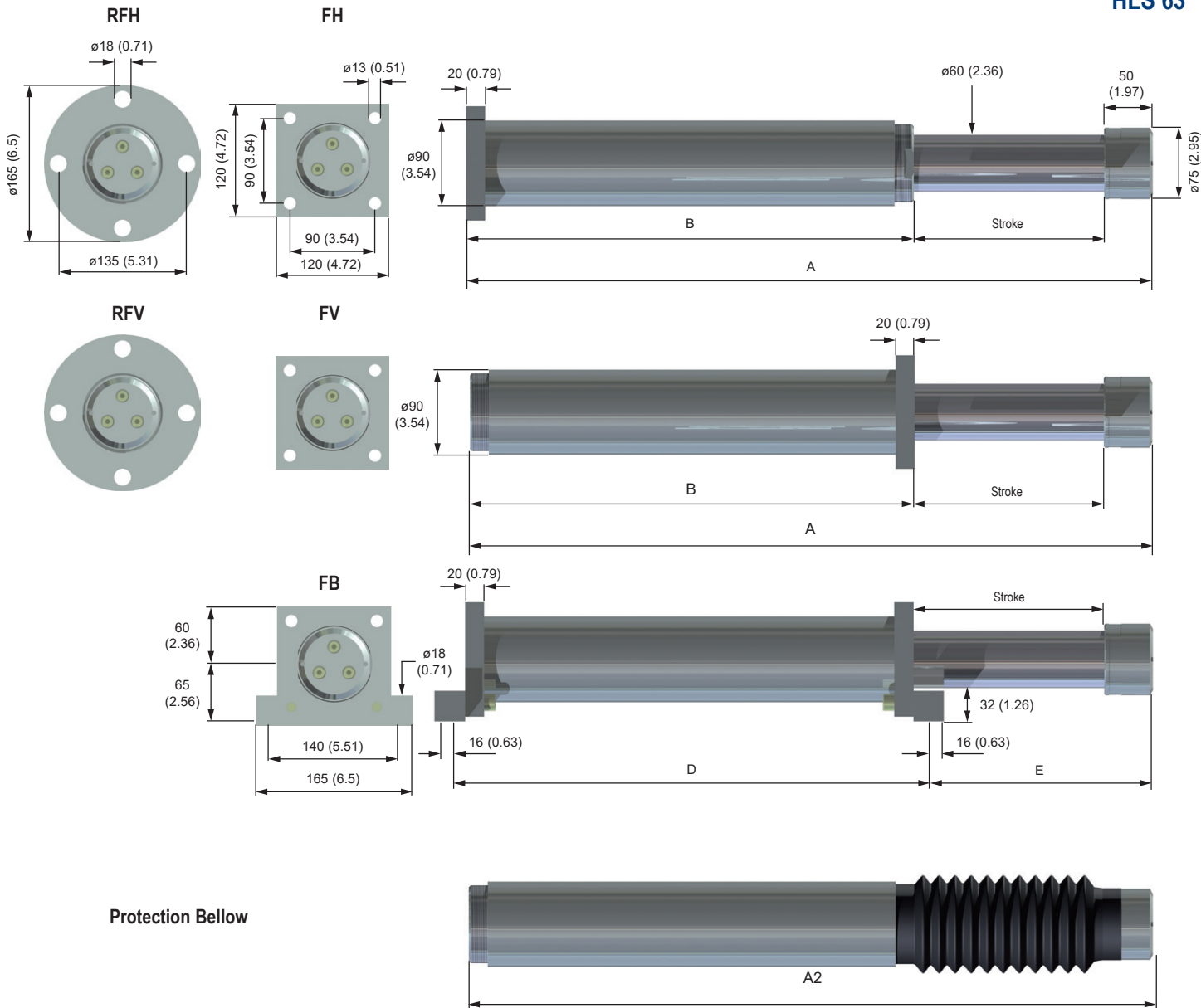




## DIMENSIONS

	Stroke mm (inch)	Energy/Stroke Nm (in lbs)	max. Counterforce N (lbs)	Piston return force		max. Angular Tolerance °	Weight RFV kg (lbs)	A mm (inch)	C mm (inch)
				min. N (min. lbs)	max. N (max. lbs)				
HLS-40-050	50 (1.97)	3800 (33633)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	2,5	6 (13.23)	300 (11.81)	150 (5.91)
HLS-40-100	100 (3.94)	7500 (66381)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	2,0	8 (17.64)	450 (17.72)	200 (7.87)
HLS-40-150	150 (5.91)	11000 (97358)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	2,0	9 (19.85)	600 (23.62)	250 (9.84)
HLS-40-200	200 (7.87)	14700 (130106)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	1,0	11 (24.26)	750 (29.53)	300 (11.81)
HLS-40-250	250 (9.84)	18300 (161969)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	1,0	12 (26.46)	900 (35.43)	350 (13.78)
HLS-40-300	300 (11.81)	22000 (194717)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	1,0	13 (28.67)	1050 (41.34)	400 (15.75)
HLS-40-350	350 (13.78)	25500 (225694)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	0,6	14 (30.87)	1200 (47.24)	450 (17.72)
HLS-40-400	400 (15.75)	28500 (252246)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	0,6	16 (35.28)	1350 (53.15)	500 (19.69)





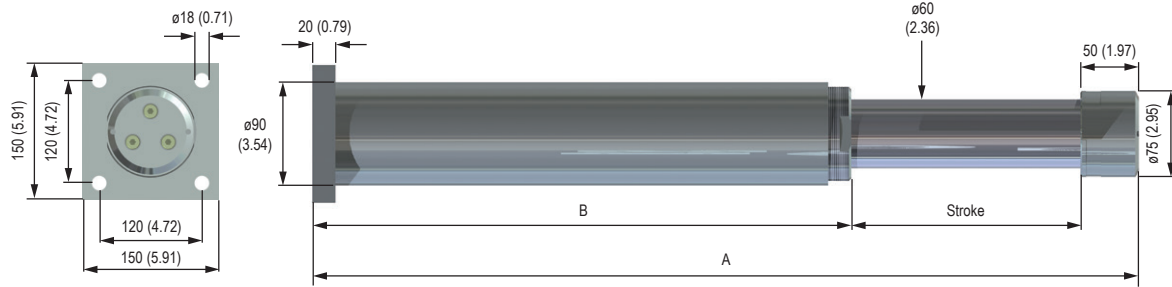
Rear flange recommended only for shock absorbers up to 300 mm stroke!

## DIMENSIONS

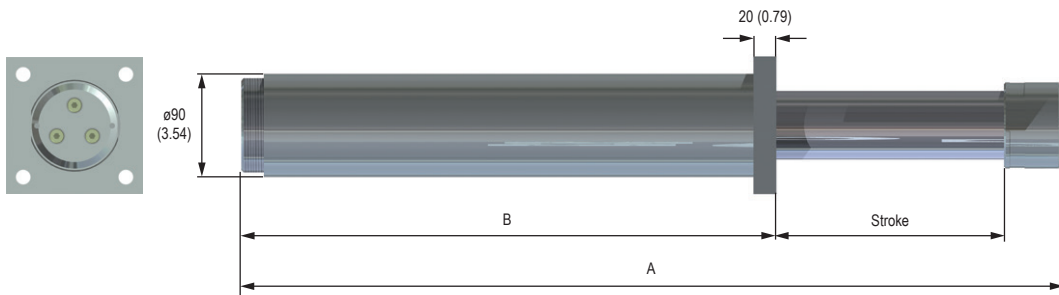
	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	D	E	A2*
	mm (inch)	Nm (lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	FB kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-63-050	50 (1.97)	7500 (66381)	180000 (40465.62)	1500 (337.21)	14000 (3147.33)	2.5	13,5 (29.76)	15,5 (34.17)	329 (12.95)	229 (9.02)	261 (10.28)	84 (3.31)	335 (13.19)
HLS-63-100	100 (3.94)	15000 (132762)	180000 (40465.62)	1500 (337.21)	14000 (3147.33)	2.5	14 (30.87)	17 (37.48)	440 (17.32)	290 (11.42)	322 (12.68)	134 (5.28)	466 (18.35)
HLS-63-150	150 (5.91)	22500 (199143)	180000 (40465.62)	1500 (337.21)	18000 (4046.56)	2.5	15,5 (34.17)	18,5 (40.79)	585 (23.03)	385 (15.16)	417 (16.42)	184 (7.24)	611 (24.06)
HLS-63-200	200 (7.87)	30000 (265524)	180000 (40465.62)	1500 (337.21)	19000 (4271.37)	2.5	17 (37.48)	20 (44.09)	720 (28.35)	470 (18.5)	502 (19.76)	234 (9.21)	746 (29.37)
HLS-63-250	250 (9.84)	37500 (331905)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	2.5	19,5 (42.99)	22 (48.5)	865 (34.06)	565 (22.24)	597 (23.5)	284 (11.18)	891 (35.08)
HLS-63-300	300 (11.81)	45000 (398286)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	2.5	22 (48.5)	25 (55.12)	1000 (39.37)	650 (25.59)	682 (26.85)	334 (13.15)	1081 (42.56)
HLS-63-350	350 (13.78)	52500 (464667)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	2.5	24 (52.91)	27 (59.53)	1145 (45.08)	745 (29.33)	777 (30.59)	384 (15.12)	1226 (48.27)
HLS-63-400	400 (15.75)	60000 (531048)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	1.5	27,5 (60.63)	30,5 (67.24)	1280 (50.39)	830 (32.68)	862 (33.94)	434 (17.09)	1361 (53.58)
HLS-63-500	500 (19.69)	75000 (663810)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	1.5	30 (66.14)	33 (72.75)	1560 (61.42)	1010 (39.76)	1042 (41.02)	534 (21.02)	1641 (64.61)
HLS-63-600	600 (23.62)	90000 (796572)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	1.5	32,5 (71.65)	35,5 (78.27)	1840 (72.44)	1190 (46.85)	1222 (48.11)	634 (24.96)	1921 (75.63)

\* Version with protection bellow: Stroke -20 mm!

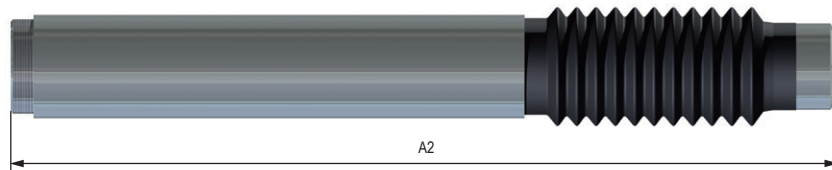
**FH**



**FV**



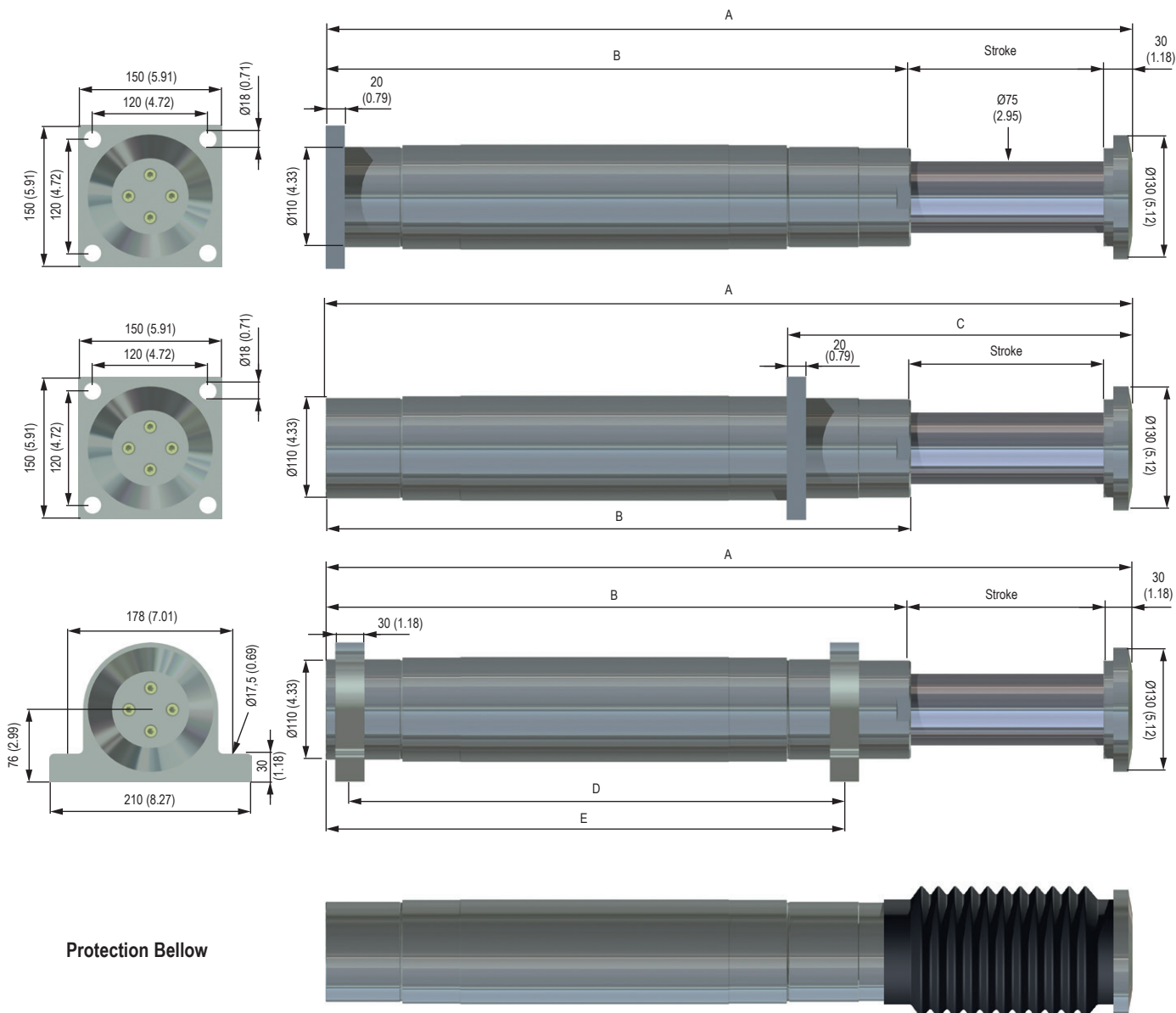
**Protection Bellow**



## DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	A	B	D	E	A2*
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-70-050	50 (1.97)	10000 (88508)	250000 (56202.25)	1500 (337.21)	14000 (3147.33)	2,5 (2.5)	13,5 (29.76)	329 (12.95)	229 (9.02)	261 (10.28)	84 (3.31)	355 (13.98)
HLS-70-100	100 (3.94)	20000 (177016)	250000 (56202.25)	1500 (337.21)	14000 (3147.33)	2,5 (2.5)	14 (30.87)	440 (17.32)	290 (11.42)	322 (12.68)	134 (5.28)	466 (18.35)
HLS-70-150	150 (5.91)	30000 (265524)	250000 (56202.25)	1500 (337.21)	18000 (4046.56)	2,5 (2.5)	15,5 (34.17)	585 (23.03)	385 (15.16)	417 (16.42)	184 (7.24)	611 (24.06)
HLS-70-200	200 (7.87)	40000 (354032)	250000 (56202.25)	1500 (337.21)	19000 (4271.37)	2,5 (2.5)	17 (37.48)	720 (28.35)	470 (18.5)	502 (19.76)	234 (9.21)	746 (29.37)

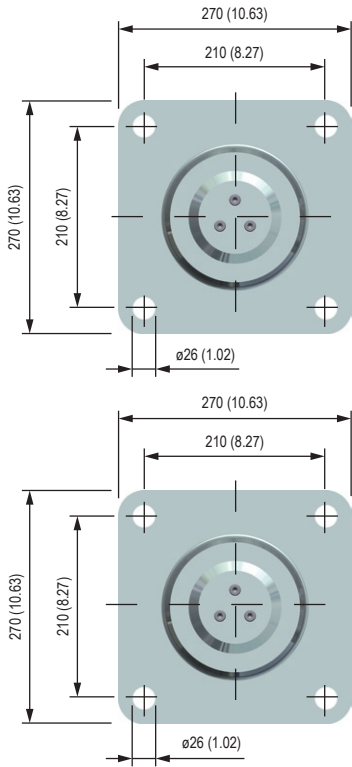
\* Version with protection bellow: Stroke -20 mm!



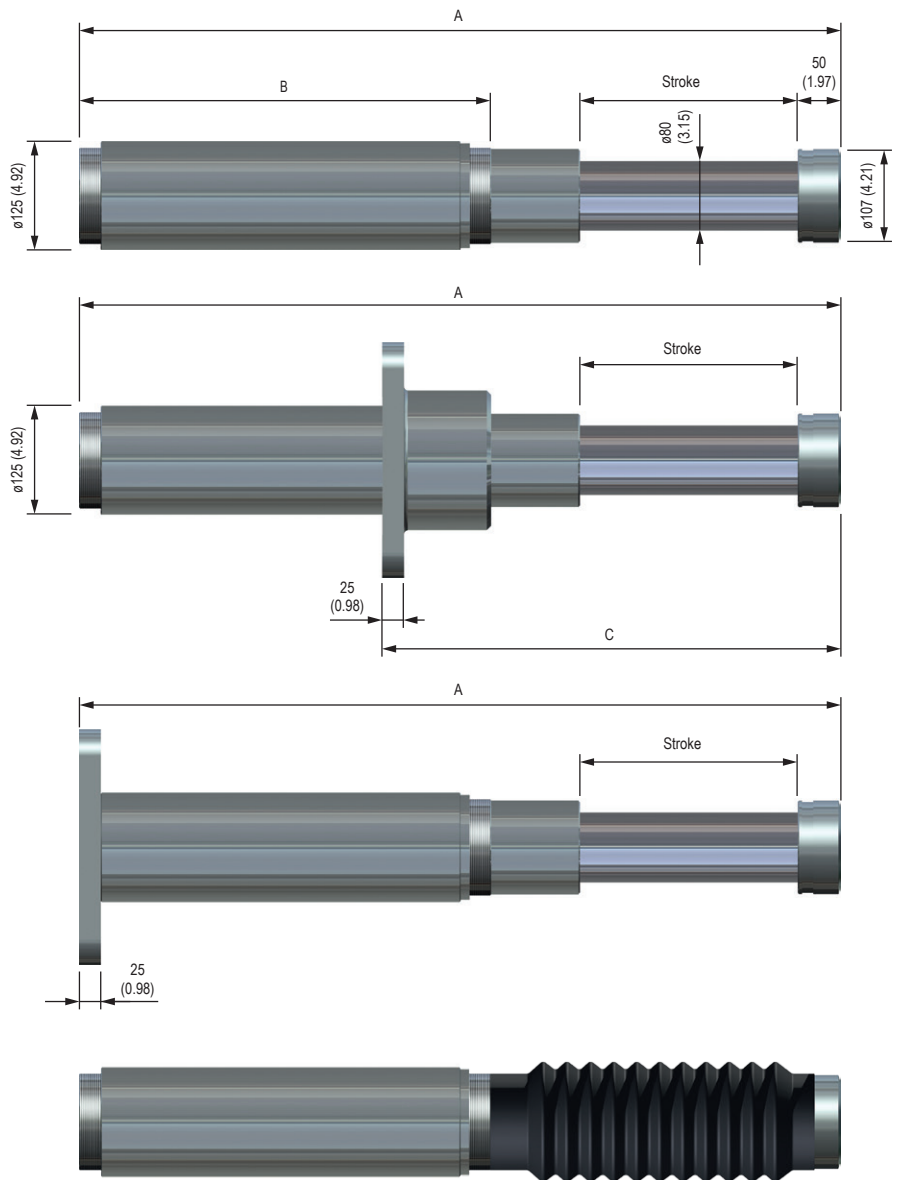
Rear flange recommended only for shock absorbers up to 300 mm stroke!

**DIMENSIONS**

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	C	D	E
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-75-050	50 (1.97)	15000 (132762)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2.5 (2.5)	20 (44.09)	26 (57.32)	363 (14.29)	283 (11.14)	153 (6.02)	174 (6.85)	239 (9.41)
HLS-75-100	100 (3.94)	30000 (265524)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2.5 (2.5)	24 (52.91)	30 (66.14)	493 (19.41)	363 (14.29)	213 (8.39)	254 (10)	319 (12.56)
HLS-75-150	150 (5.91)	45000 (398286)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2.5 (2.5)	29 (63.94)	35 (77.16)	623 (24.53)	443 (17.44)	273 (10.75)	334 (13.15)	399 (15.71)
HLS-75-200	200 (7.87)	60000 (531048)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2.5 (2.5)	34 (74.96)	40 (88.19)	838 (32.99)	608 (23.94)	359 (14.13)	474 (18.66)	539 (21.22)
HLS-75-300	300 (11.81)	90000 (796572)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2.5 (2.5)	44 (97.01)	50 (110.23)	1154 (45.43)	824 (32.44)	577 (22.72)	572 (22.52)	637 (25.08)
HLS-75-400	400 (15.75)	120000 (1062096)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2.5 (2.5)	54 (119.05)	60 (132.28)	1468 (57.8)	1038 (40.87)	677 (26.65)	786 (30.94)	851 (33.5)
HLS-75-500	500 (19.69)	130000 (1150604)	300000 (67442.7)	4000 (899.24)	35000 (7868.32)	2 (2.5)	60 (132.28)	66 (145.51)	1719 (67.68)	1189 (46.81)	777 (30.59)	938 (36.93)	1002 (39.45)
HLS-75-600	600 (23.62)	150000 (1327620)	300000 (67442.7)	4000 (899.24)	35000 (7868.32)	1.5 (2.5)	67 (147.71)	73 (160.94)	1974 (77.72)	1344 (52.91)	877 (34.53)	1092 (42.99)	1157 (45.55)
HLS-75-700	700 (27.56)	160000 (1416128)	250000 (56202.25)	4000 (899.24)	35000 (7868.32)	1.5 (2.5)	75 (165.35)	81 (178.58)	2269 (89.33)	1539 (60.59)	977 (38.46)	1288 (50.71)	1352 (53.23)
HLS-75-800	800 (31.5)	170000 (1504636)	250000 (56202.25)	4000 (899.24)	35000 (7868.32)	1.5 (2.5)	84 (185.19)	90 (198.42)	2563 (100.91)	1733 (68.23)	1077 (42.4)	1482 (58.35)	1546 (60.87)
HLS-75-1000	1000 (39.37)	190000 (1681652)	230000 (51706.07)	4000 (899.24)	35000 (7868.32)	1.5 (2.5)	96 (211.65)	102 (224.68)	3063 (120.59)	2033 (80.04)	1277 (50.28)	1781 (70.12)	1846 (72.68)
HLS-75-1200	1200 (47.24)	200000 (1770160)	210000 (47209.89)	4000 (899.24)	35000 (7868.32)	1.5 (2.5)	112 (246.92)	118 (260.15)	3634 (143.07)	2404 (94.65)	1477 (58.15)	2152 (84.72)	2217 (87.28)



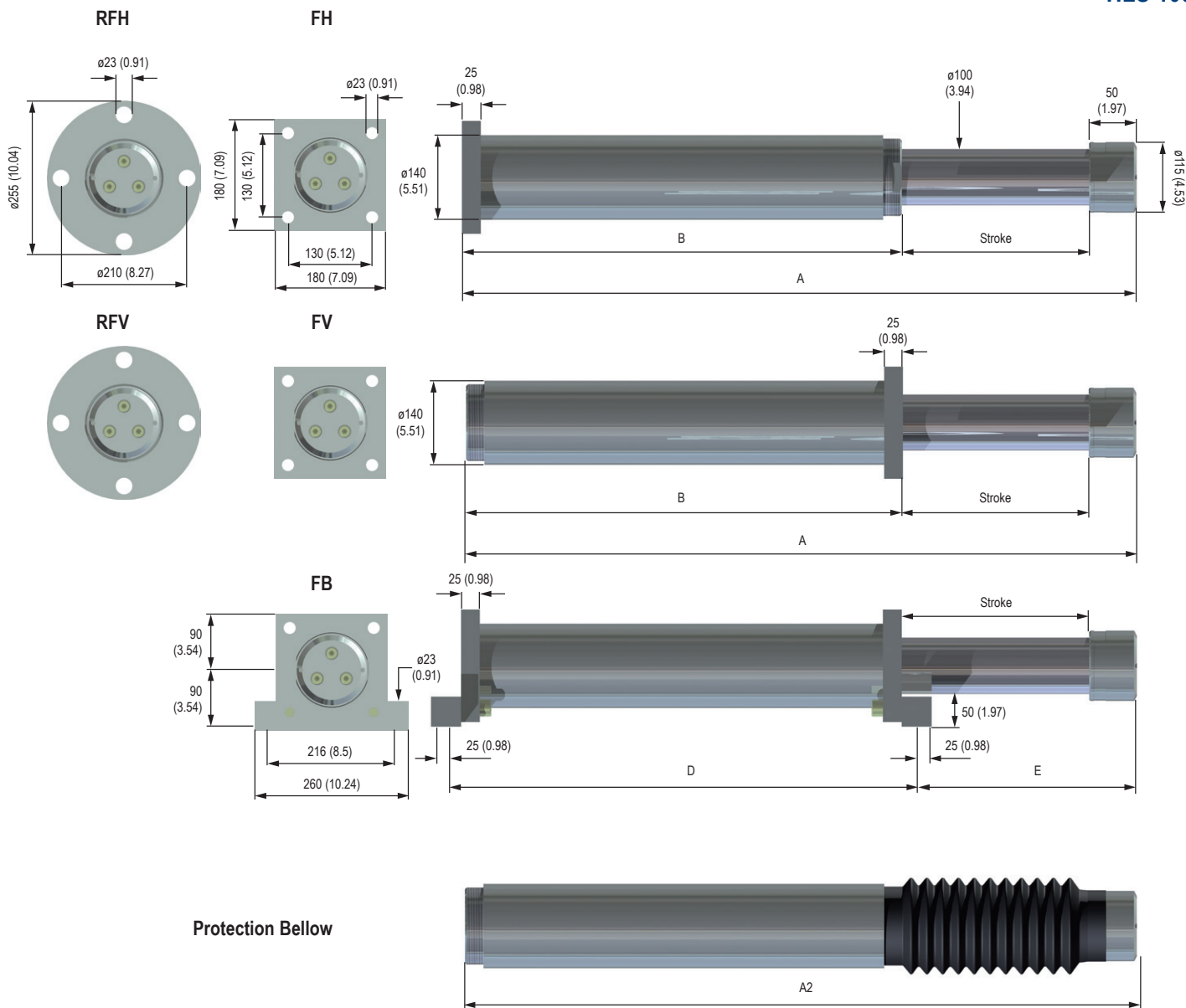
Protection Bellows



Rear flange recommended only for shock absorbers up to 300 mm stroke!

## DIMENSIONS

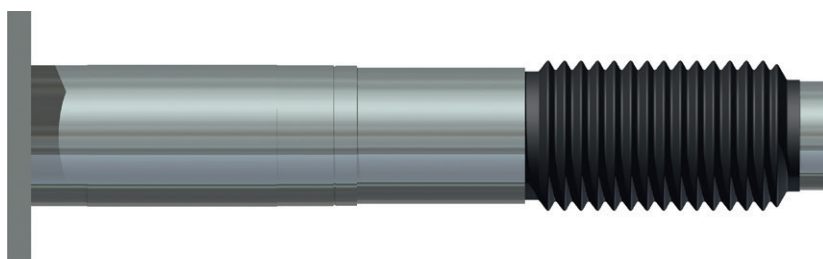
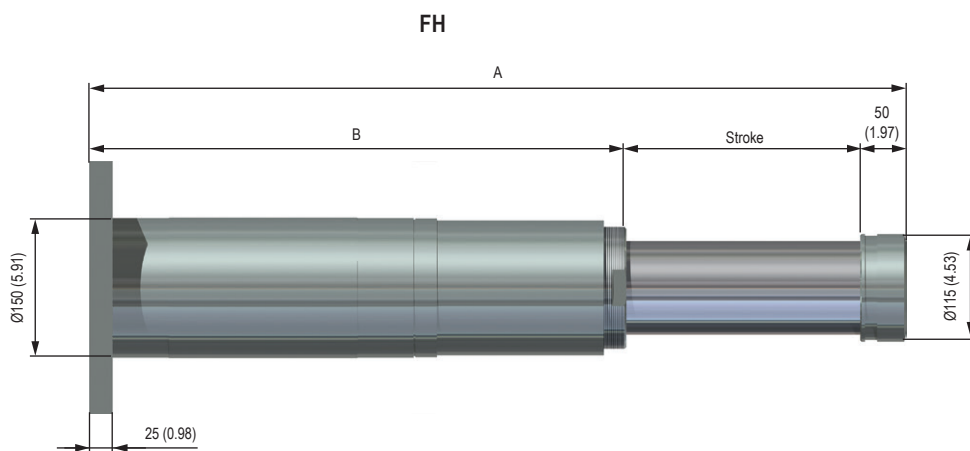
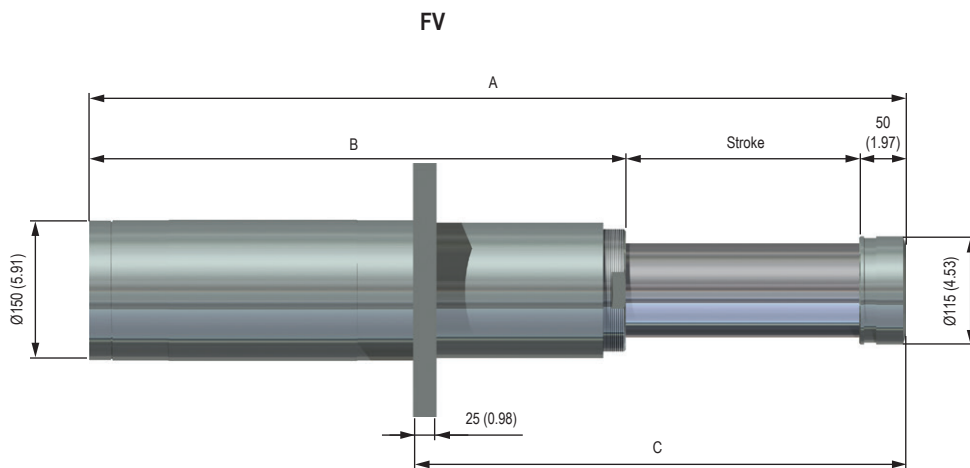
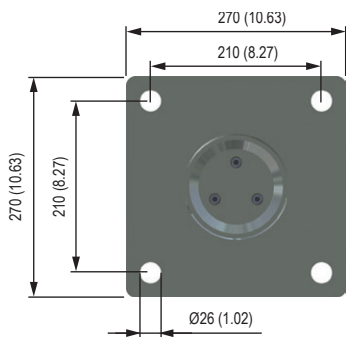
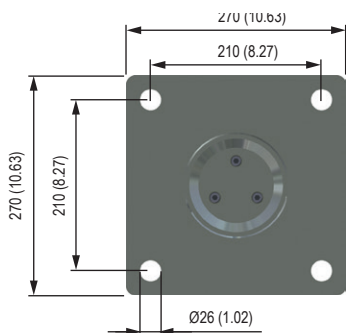
	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	C
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV kg (lbs)	FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)
HLS-90-250	250 (9.84)	100000 (885075)	500000 (112405)	4000 (899.24)	37000 (8317.97)	2,5	58 (127.89)	55 (121.28)	875 (34.45)	478 (18.82)	527 (20.75)
HLS-90-300	300 (11.81)	120000 (1062090)	500000 (112405)	4000 (899.24)	37000 (8317.97)	2,5	62 (136.71)	59 (130.1)	1006 (39.61)	559 (22.01)	577 (22.72)
HLS-90-400	400 (15.75)	160000 (1416120)	500000 (112405)	4000 (899.24)	37000 (8317.97)	1,5	71 (156.56)	68 (149.94)	1277 (50.28)	730 (28.74)	677 (26.65)



Rear flange recommended only for shock absorbers up to 300 mm stroke!

## DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	D	E	A2*
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-100-050	50 (1.97)	19000 (168165.2)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2.5 (2.5)	37,5 (82.67)	45 (99.21)	405 (15.94)	305 (12.01)	355 (13.98)	75 (2.95)	432 (17.01)
HLS-100-100	100 (3.94)	39000 (345181.2)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2.5 (2.5)	40 (88.19)	47,5 (104.72)	505 (19.88)	355 (13.98)	405 (15.94)	125 (4.92)	532 (20.94)
HLS-100-150	150 (5.91)	55000 (486794)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2.5 (2.5)	43 (94.8)	50,5 (111.34)	605 (23.82)	405 (15.94)	455 (17.91)	175 (6.89)	632 (24.88)
HLS-100-200	200 (7.87)	76000 (672660.8)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2.5 (2.5)	49 (108.03)	56,5 (124.56)	740 (29.13)	490 (19.29)	540 (21.26)	225 (8.86)	767 (30.2)
HLS-100-250	250 (9.84)	95000 (840826)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2.5 (2.5)	56 (123.46)	63,5 (140)	875 (34.45)	575 (22.64)	625 (24.61)	275 (10.83)	902 (35.51)
HLS-100-300	300 (11.81)	115000 (1017842)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2.5 (2.5)	62 (136.69)	69,5 (153.22)	1010 (39.76)	660 (25.98)	710 (27.95)	325 (12.8)	1092 (42.99)
HLS-100-350	350 (13.78)	135000 (1194858)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2.5 (2.5)	67 (147.71)	74,5 (164.25)	1145 (45.08)	745 (29.33)	795 (31.3)	375 (14.76)	1227 (48.31)
HLS-100-400	400 (15.75)	155000 (1371874)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	1.5 (2.5)	74 (163.14)	81,5 (179.68)	1280 (50.39)	830 (32.68)	880 (34.65)	425 (16.73)	1362 (53.62)
HLS-100-450	450 (17.72)	170000 (1504636)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	1.5 (2.5)	79 (174.17)	86,5 (190.7)	1415 (55.71)	915 (36.02)	965 (37.99)	475 (18.7)	1497 (58.94)
HLS-100-500	500 (19.69)	190000 (1681652)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	1.5 (2.5)	85 (187.4)	92,5 (203.93)	1550 (61.02)	1000 (39.37)	1050 (41.34)	525 (20.67)	1632 (64.25)
HLS-100-600	600 (23.62)	230000 (2035684)	455000 (102288.1)	3800 (854.27)	46000 (10341.21)	1.5 (2.5)	92,5 (203.93)	100 (220.47)	1820 (71.65)	1170 (46.06)	1220 (48.03)	625 (24.61)	1902 (74.88)

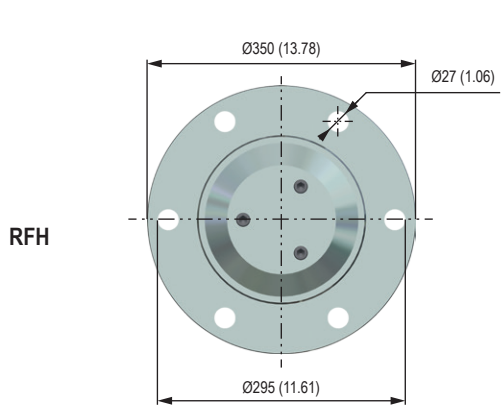


Protection Bellows

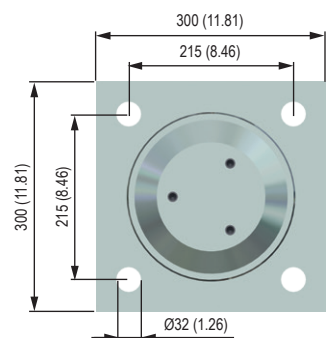
Rear flange recommended only for shock absorbers up to 300 mm stroke!

DIMENSIONS

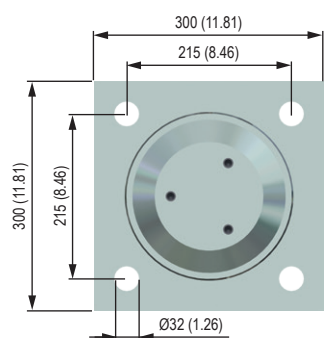
	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	A	B	C
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)
HLS-110-114	114 (4.49)	90000 (796572)	900000 (202328.1)	3800 (854.27)	40000 (20232.81)	2,5 (2.5)	45 (99.21)	529 (20.83)	365 (14.37)	235 (9.25)
HLS-110-250	250 (9.84)	100000 (885080)	500000 (112404.5)	3800 (854.27)	40000 (22480.9)	2,5 (2.5)	60 (132.28)	875 (34.45)	575 (22.64)	528 (20.79)
HLS-110-300	300 (11.81)	120000 (1062096)	500000 (112404.5)	3800 (854.27)	40000 (26977.08)	2,5 (2.5)	65 (143.3)	1010 (39.76)	660 (25.98)	577 (22.72)
HLS-110-400	400 (15.75)	220000 (1947176)	700000 (157366.3)	3800 (854.27)	40000 (49457.98)	1,5 (1.5)	80 (176.37)	1280 (50.39)	830 (32.68)	728 (28.66)
HLS-110-500	500 (19.69)	280000 (2478224)	700000 (157366.3)	3800 (854.27)	40000 (62946.52)	1,5 (1.5)	90 (198.42)	1550 (61.02)	1000 (39.37)	828 (32.6)
HLS-110-600	600 (23.62)	335000 (2965018)	700000 (157366.3)	3800 (854.27)	46000 (75311.02)	1,5 (1.5)	97 (213.85)	1820 (71.65)	1170 (46.06)	928 (36.54)



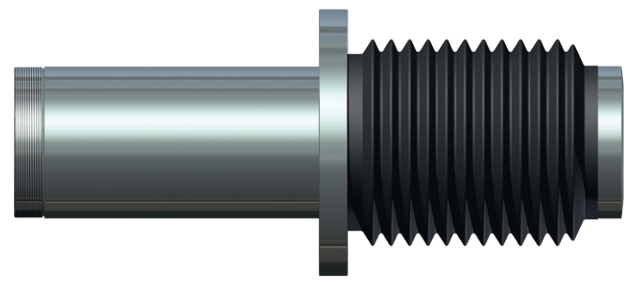
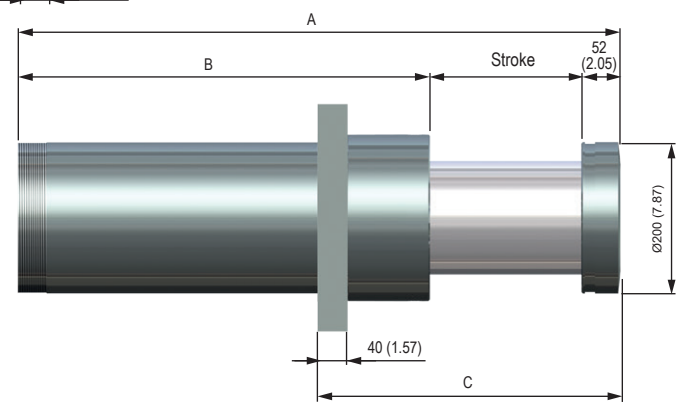
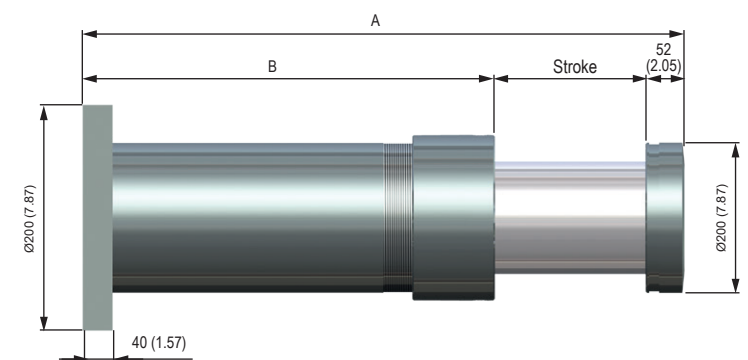
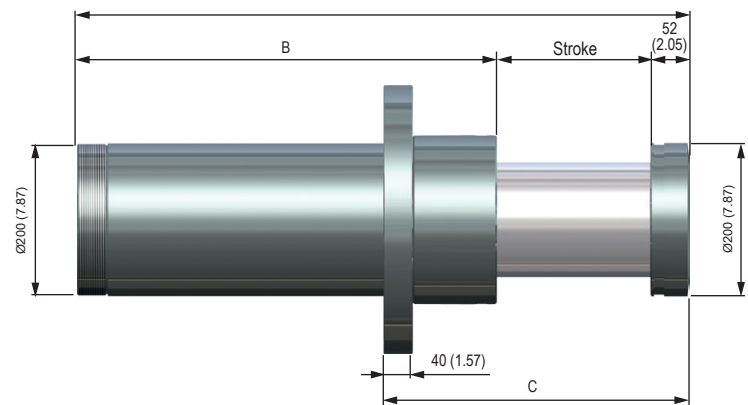
RFH



FH



FV



Rear flange recommended only for shock absorbers up to 300 mm stroke!

**DIMENSIONS**

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	A	B	C
	mm	Nm	N	min. N	max. N	°	FV / FH kg	mm	mm	mm
HLS-160-200	200 (7.87)	162000 (1433829.6)	950000 (213568.55)	15000 (3372.14)	70000 (36419.06)	2	145 (319.68)	800 (31.5)	548 (21.57)	400 (15.75)
HLS-160-400	400 (15.75)	324000 (2867659.2)	950000 (213568.55)	15000 (3372.14)	70000 (72838.12)	1,5	205 (451.96)	1400 (55.12)	948 (37.32)	600 (23.62)
HLS-160-600	600 (23.62)	486000 (4301488.8)	950000 (213568.55)	15000 (3372.14)	70000 (109257.17)	1	265 (584.23)	2000 (78.74)	1348 (53.07)	800 (31.5)
HLS-160-800	800 (31.5)	648000 (5735318.4)	950000 (213568.55)	15000 (3372.14)	70000 (145676.23)	1	325 (716.51)	2600 (102.36)	1748 (68.82)	1000 (39.37)