



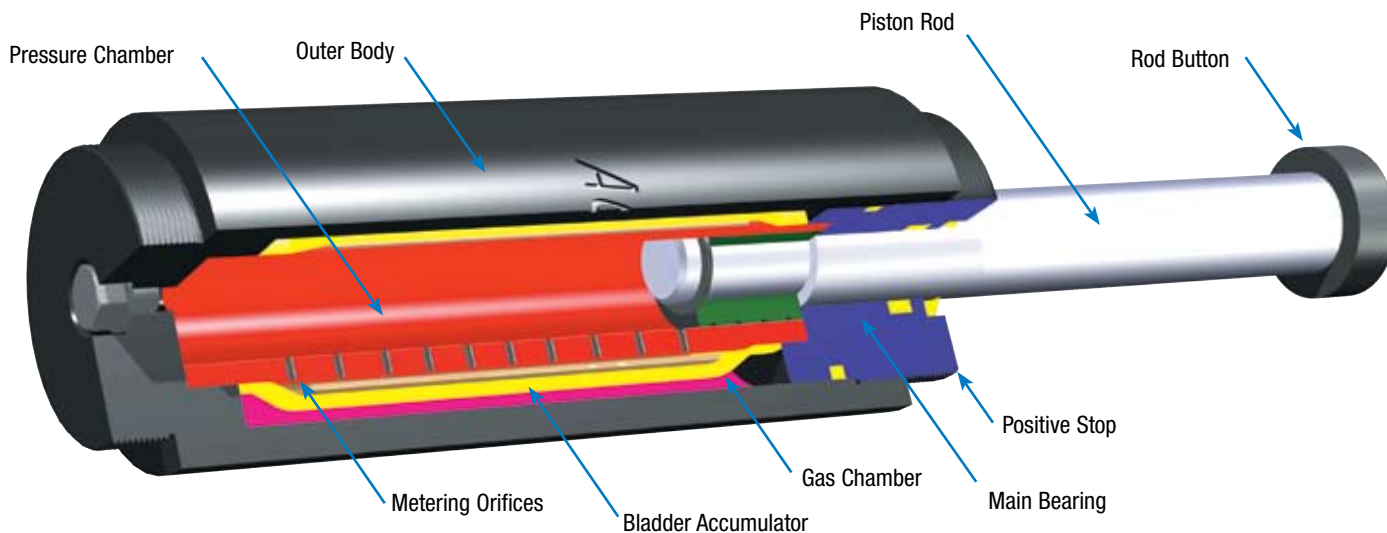
ACE Stacker Crane Shock Absorbers (SCS Series) are designed primarily for **emergency applications** to improve the performance and safe operation of equipment such as **automated storage and retrieval systems**. During normal operation, the shock absorbers are required to provide only minimal resistance, but are designed to function under full load conditions when necessary. In an emergency condition, when the velocity of the system carriage or trolley is greater than normal, the SCS shock absorber responds to protect the installation by providing controlled deceleration.

In the normal ready condition the piston rod is fully extended. When the impacting load strikes the absorber, the hydraulic oil behind the piston is forced out through a series of metering orifices. The number of metering orifices in action reduces proportionally through the stroke and the load velocity is thereby smoothly reduced to zero. The internal pressure and thus the reaction force remains constant throughout the entire stroke length. The displaced oil is stored in the bladder accumulator. The integrated gas chamber, containing low pressure nitrogen, provides the return force to reset the rod to its extended position and functions as an accumulator for the hydraulic oil displaced during operation.

Applications include: automated storage and retrieval systems, automotive manufacturing and production equipment, theme park rides, and small overhead cranes.

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SCS-38 to 63



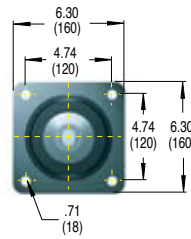
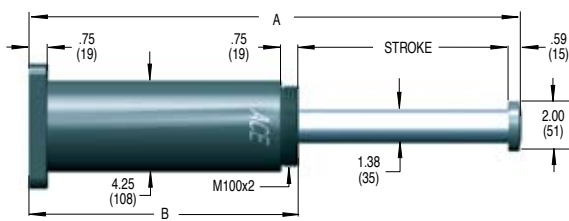
Ordering Information

SCS-38-200-F- -X

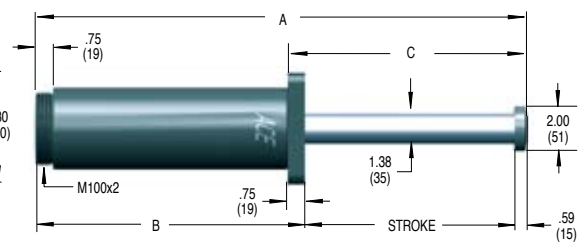
SCS Series	Bore Diameter (mm)	Stroke Length (mm)	Flange Location	Application Number	Specials
Stacker Crane Shock Absorbers	38	50	F Front Flange		Environmental Finish
	50	100	R Rear Flange		Custom Flanges
	63	150	S Side Mount		Fluid
		200			
		250			
		300			
		1000			
		1200			



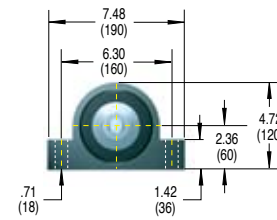
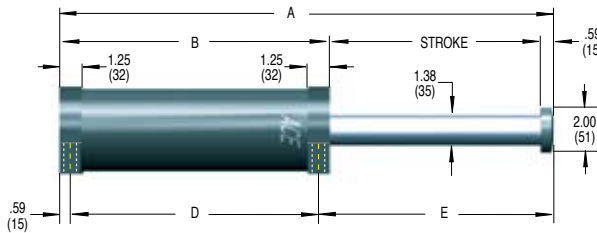
Rear Flange



Front Flange



Side Mount



Dimensions in inches (millimeters)

Model	Stroke	A	B	C	D	E	E_3	W_e	Shipping Weight	
							Energy per Cycle in lbs (kNm)	Effective Weight Range lbs (kg)	lbs (kg)	F&R S
SCS-38-50	1.97 (50)	10.63 (270)	8.07 (205)	3.31 (84)	6.89 (175)	3.15 (80)	32,000 (3.6)	750-19,600 (340-8,900)	27.3 (12.4)	29.1 (13.2)
SCS-38-100	3.94 (100)	14.57 (370)	10.04 (255)	5.28 (134)	8.77 (225)	5.21 (132)	64,000 (7.2)	1,500-39,200 (680-17,800)	32.0 (14.5)	33.8 (15.4)
SCS-38-150	5.91 (150)	18.50 (470)	12.01 (305)	7.24 (184)	10.83 (275)	7.08 (180)	96,000 (10.8)	2,250-58,900 (1,020-26,700)	35.9 (16.3)	37.8 (17.1)
SCS-38-200	7.87 (200)	22.44 (570)	13.98 (355)	9.21 (234)	12.80 (325)	9.05 (230)	127,000 (14.4)	3,000-78,500 (1,360-35,600)	39.9 (18.1)	41.7 (18.9)
SCS-38-250	9.84 (250)	26.38 (670)	15.94 (405)	11.18 (284)	14.77 (375)	11.02 (280)	159,000 (18.0)	3,750-97,900 (1,700-44,400)	43.8 (19.9)	45.6 (20.7)
SCS-38-300	11.81 (300)	30.91 (785)	18.50 (470)	13.15 (334)	17.33 (440)	12.99 (330)	191,000 (21.6)	4,500-117,500 (2,040-53,300)	48.9 (22.2)	50.7 (23.0)
SCS-38-350	13.78 (350)	34.84 (885)	20.47 (520)	15.12 (384)	19.29 (490)	14.96 (380)	223,000 (25.2)	5,250-137,100 (2,380-62,200)	52.8 (23.9)	54.6 (24.8)
SCS-38-400	15.75 (400)	39.37 (1,000)	23.03 (585)	17.09 (434)	21.85 (555)	16.93 (430)	255,000 (28.8)	6,000-156,700 (2,720-711,000)	57.9 (26.2)	59.7 (27.1)
SCS-38-500	19.69 (500)	47.83 (1,215)	27.56 (700)	21.02 (534)	26.38 (670)	20.56 (530)	319,000 (36.0)	7,500-196,000 (3,400-88,900)	66.9 (30.3)	68.7 (31.2)
SCS-38-600	23.62 (600)	56.30 (1,430)	32.09 (815)	24.96 (634)	30.91 (785)	24.80 (630)	382,000 (43.2)	8,990-235,200 (4,080-106,700)	75.9 (34.4)	77.7 (35.3)
SCS-38-700	27.56 (700)	64.76 (1,645)	36.61 (930)	28.90 (734)	35.43 (900)	28.74 (730)	446,000 (50.4)	10,490-274,300 (4,760-124,400)	84.9 (38.5)	86.7 (39.3)
SCS-38-800	31.50 (800)	73.23 (1,860)	41.14 (1,045)	32.83 (834)	39.97 (1,015)	32.67 (830)	510,000 (57.6)	11,990-313,500 (5,440-142,200)	93.9 (42.6)	95.7 (43.4)

Technical Data

Maximum force: 18,000 lbs (80 kN)

Impact velocity range: 3-15 ft/sec (0.9 to 4.6 m/s)

Minimum return force: 45 lbs. (0.2 kN)

Operating temperature: 10° to 150°F (-12°C to 66°C)
(Consult factory for optional ranges).

Mechanical stop: Integral mechanical stop is built into the front of all units.

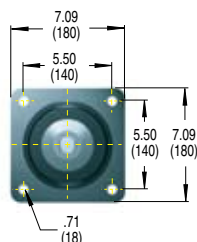
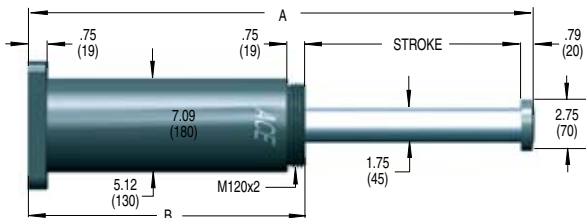
Custom environmental protection options of paint, plating, rod bellows, etc. are available. Consult factory for your specific needs.

Note: Buttons are standard on all stacker crane shock absorbers.

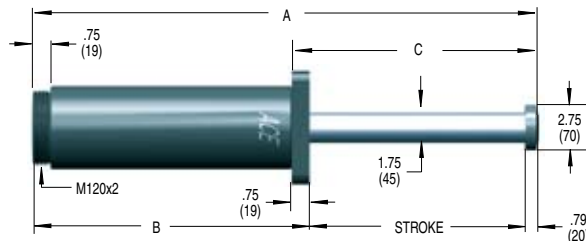
Oil type: ATF

All stacker crane shock absorbers have special orifice designs and must be sized per application.

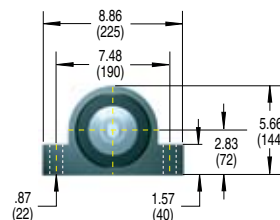
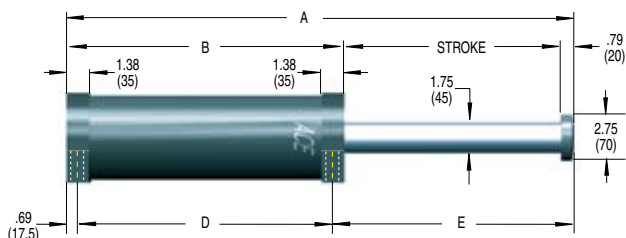
Rear Flange



Front Flange



Side Mount



74 Dimensions in inches (millimeters)

Model	Stroke	A	B	C	D	E	E_3	W_e	Shipping Weight	
							Energy per Cycle in lbs (kNm)	Effective Weight Range lbs (kg)	lbs (kg)	F&R S
SCS-50-100	3.94 (100)	15.35 (390)	10.63 (270)	5.47 (139)	9.25 (235)	5.41 (138)	124,000 (14)	2,950-172,000 (1,340-78,000)	48.1 (21.8)	51.3 (23.3)
SCS-50-150	5.91 (150)	19.29 (490)	12.60 (320)	7.44 (189)	11.22 (285)	7.38 (188)	186,000 (21)	4,430-258,000 (2,010-117,000)	53.7 (24.4)	57.0 (25.8)
SCS-50-200	7.87 (200)	23.23 (590)	14.57 (370)	9.41 (239)	13.19 (335)	9.35 (238)	248,000 (28)	5,910-344,000 (2,680-156,000)	59.1 (26.8)	62.3 (28.3)
SCS-50-250	9.84 (250)	27.17 (690)	16.54 (420)	11.38 (289)	15.16 (385)	11.32 (288)	310,000 (35)	7,390-428,000 (3,350-194,000)	64.9 (29.4)	68.1 (30.9)
SCS-50-300	11.81 (300)	31.69 (805)	19.09 (485)	13.35 (339)	17.71 (450)	13.29 (338)	372,000 (42)	8,860-514,000 (4,020-233,000)	71.6 (32.5)	74.9 (34.0)
SCS-50-350	13.78 (350)	35.63 (905)	21.06 (535)	15.31 (389)	19.69 (500)	15.25 (387)	434,000 (49)	10,340-600,000 (4,690-272,000)	77.2 (35.0)	80.4 (36.5)
SCS-50-400	15.75 (400)	40.16 (1,020)	23.62 (600)	17.28 (439)	22.25 (565)	17.22 (438)	496,000 (56)	11,820-686,000 (5,360-311,000)	84.2 (38.2)	87.5 (39.7)
SCS-50-500	19.69 (500)	48.62 (1,235)	28.15 (715)	21.22 (539)	26.77 (680)	21.16 (538)	620,000 (70)	14,750-858,000 (6,690-389,000)	96.8 (43.9)	100.1 (45.4)
SCS-50-600	23.62 (600)	57.09 (1,450)	32.68 (830)	25.16 (639)	31.30 (795)	25.10 (638)	743,000 (84)	17,700-1,030,000 (8,030-467,000)	109.4 (49.6)	112.7 (51.1)
SCS-50-700	27.56 (700)	65.55 (1,665)	37.20 (945)	29.09 (739)	35.83 (910)	29.03 (737)	867,000 (98)	20,660-1,199,000 (9,370-544,000)	122.0 (55.3)	125.2 (56.8)
SCS-50-800	31.50 (800)	74.02 (1,880)	41.73 (1,060)	33.03 (839)	40.36 (1,025)	32.97 (838)	991,000 (112)	23,590-1,371,000 (10,700-622,000)	134.6 (61.0)	137.8 (62.5)
SCS-50-1000	39.37 (1,000)	90.94 (2,310)	50.79 (1,290)	40.91 (1,039)	49.40 (1,255)	40.85 (1,038)	1,239,000 (140)	29,540-1,715,000 (13,400-778,000)	159.7 (72.4)	163.0 (73.9)

Technical Data

Maximum force: 36,000 lbs (160 kN)

Impact velocity range: 2-15 ft/sec (0.6 to 4.6 m/s)

Minimum return force: 72 lbs. (0.3 kN)

Operating temperature: 10° to 150°F (-12°C to 66°C)
(Consult factory for optional ranges).

Mechanical stop: Integral mechanical stop is built into the front of all units.

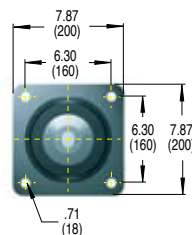
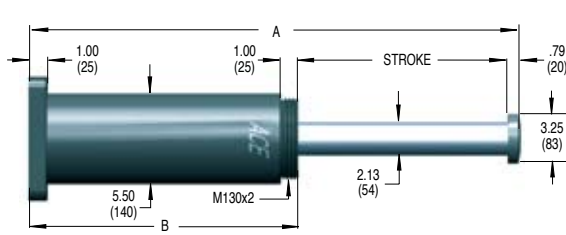
Oil type: ATF

Custom environmental protection options of paint, plating, rod bellows, etc. are available. Consult factory for your specific needs.

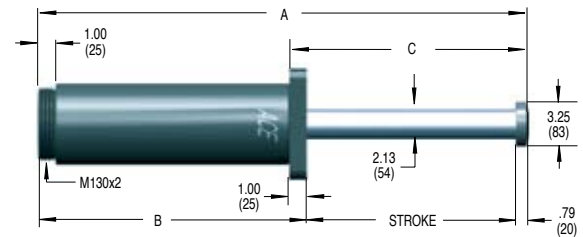
Buttons are standard on all stacker crane shock absorbers.

All stacker crane shock absorbers have special orifice designs and must be sized per application.

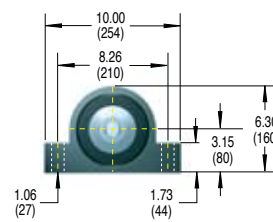
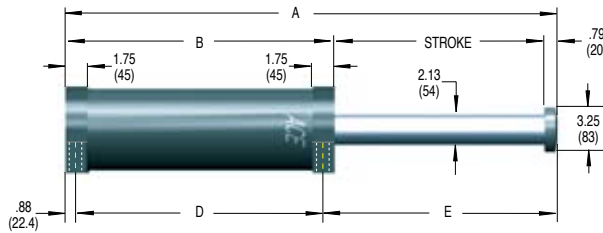
Rear Flange



Front Flange



Side Mount



Dimensions in inches (millimeters)

Model	Stroke	A	B	C	D	E	E ₃		W _e	
							Energy per Cycle in lbs (kNm)	Effective Weight Range lbs (kg)	Shipping Weight lbs (kg) F&R	S
SCS-63-100	3.94 (100)	15.94 (405)	11.22 (285)	5.71 (145)	9.47 (241)	5.59 (142)	159,000 (18)	3,750-317,000 (1,700-144,000)	62.8 (28.5)	71.2 (32.3)
SCS-63-150	5.91 (150)	19.88 (505)	13.19 (335)	7.68 (195)	11.44 (291)	7.56 (192)	239,000 (27)	5,620-476,000 (2,550-216,000)	69.6 (31.6)	78.0 (35.4)
SCS-63-200	7.87 (200)	23.82 (605)	15.16 (385)	9.65 (245)	13.41 (341)	9.53 (242)	319,000 (36)	7,500-635,000 (3,400-288,000)	76.4 (34.6)	84.7 (38.4)
SCS-63-250	9.84 (250)	27.76 (705)	17.13 (435)	11.61 (295)	15.39 (391)	11.49 (292)	398,000 (45)	9,370-794,000 (4,250-360,000)	83.2 (37.7)	91.6 (41.5)
SCS-63-300	11.81 (300)	31.69 (805)	19.09 (485)	13.58 (345)	17.35 (441)	13.46 (342)	478,000 (54)	11,240-952,000 (5,100-432,000)	90.0 (40.8)	98.3 (44.6)
SCS-63-350	13.78 (350)	36.42 (925)	21.85 (555)	15.55 (395)	20.11 (511)	15.43 (392)	558,000 (63)	13,120-1,111,000 (5,950-504,000)	99.3 (45.1)	107.7 (48.9)
SCS-63-400	15.75 (400)	40.35 (1,025)	23.82 (605)	17.52 (445)	22.01 (561)	17.40 (442)	637,000 (72)	15,010-1,270,000 (6,810-576,000)	106.1 (48.1)	114.5 (51.9)
SCS-63-500	19.69 (500)	49.02 (1,245)	28.54 (725)	21.46 (545)	26.80 (681)	21.34 (542)	797,000 (90)	18,760-1,587,000 (8,510-720,000)	122.3 (55.5)	130.7 (59.3)
SCS-63-600	23.62 (600)	56.89 (1,445)	32.48 (825)	25.39 (645)	30.74 (781)	25.30 (642)	956,000 (108)	22,510-1,905,000 (10,210-864,000)	135.9 (61.6)	144.2 (65.4)
SCS-63-700	27.56 (700)	65.55 (1,665)	37.20 (945)	29.33 (745)	35.46 (901)	29.21 (746)	1,115,000 (126)	26,260-2,222,000 (11,910-1,008,000)	152.0 (69.0)	160.4 (72.8)
SCS-63-800	31.50 (800)	73.43 (1,865)	41.14 (1,045)	33.27 (845)	39.40 (1,001)	33.15 (842)	1,275,000 (144)	29,980-2,540,000 (13,600-1,152,000)	165.6 (75.1)	174.0 (78.9)
SCS-63-1000	39.37 (1,000)	89.96 (2,285)	49.80 (1,265)	41.14 (1,045)	48.06 (1,221)	41.02 (1,042)	1,593,000 (180)	37,480-3,175,000 (17,000-1,440,000)	195.4 (88.6)	203.7 (92.4)
SCS-63-1200	47.24 (1,200)	106.50 (2,705)	58.46 (1,485)	49.02 (1,245)	56.72 (1,441)	48.90 (1,242)	1,912,000 (216)	44,970-3,810,000 (20,400-1,728,000)	225.1 (102.1)	233.5 (105.9)

Technical Data

- Maximum force: 47,200 lbs (210 kN)
- Impact velocity range: 1.6-15 ft/sec (0.5 to 4.6 m/s)
- Minimum return force: 106 lbs. (0.5 kN)
- Operating temperature: 10° to 150°F (-12°C to 66°C)
(Consult factory for optional ranges).
- Mechanical stop: Integral mechanical stop is built into the front of all units.

Oil type: ATF

Custom environmental protection options of paint, plating, rod bellows, etc. are available. Consult factory for your specific needs.

Buttons are standard on all stacker crane shock absorbers.

All stacker crane shock absorbers have special orifice designs and must be sized per application.



ACE CB Series Heavy Industrial Shock Absorbers

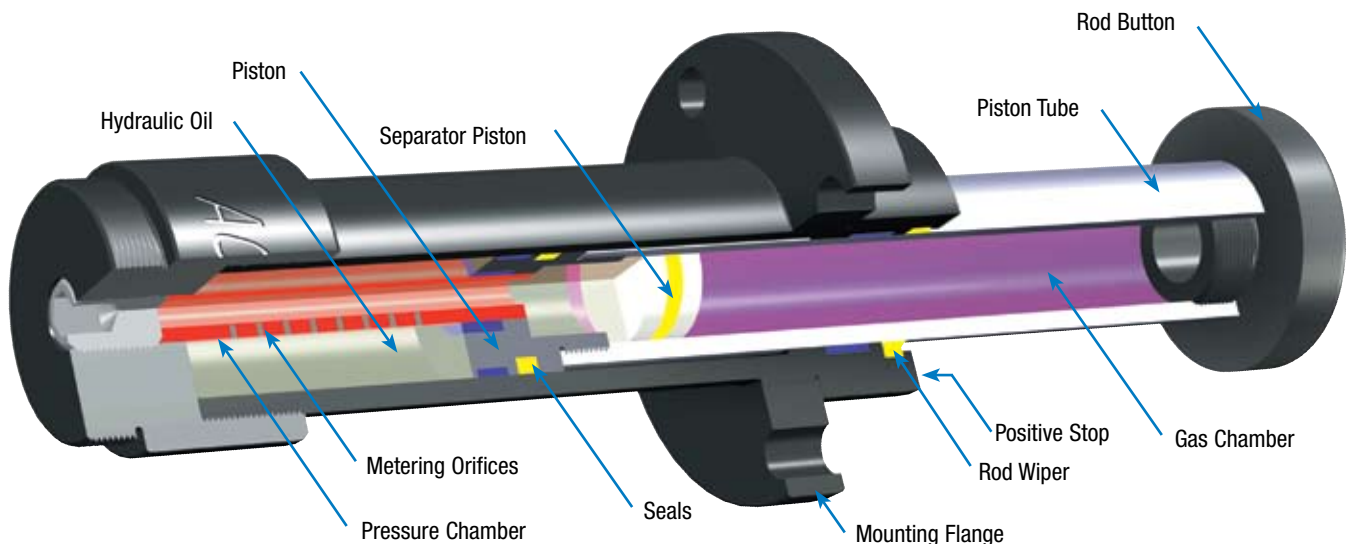
are designed for emergency deceleration and improved performance of large industrial equipment. During normal operation at low velocity, the shock absorbers provide minimal pneumatic resistance. In an emergency or high velocity condition, the shock absorbers respond hydraulically to protect the installation from damaging reaction forces by providing controlled deceleration.

ACE Crane and Heavy Industrial Shock Absorbers are self-contained devices which utilize multiple orifices to provide controlled linear deceleration while minimizing reaction forces. In the ready and normal position, the piston rod is extended. When the impact load strikes the shock absorber, hydraulic fluid is displaced by a piston through the orifices in the metering tube. As the shock absorber continues through the stroke, the orifices are progressively closed and the velocity is reduced while the kinetic energy is converted to thermal energy. As a result, the load is brought to rest without the high recoil forces and low efficiencies associated with helical springs and rubber bumpers. The displaced oil passes into a gas pressurized piston accumulator located within the piston rod. By controlling the flow of the fluid, the rod is smoothly returned to the extended and ready position for the next cycle.

Application include: overhead cranes, conveyors, turntables, dockside equipment, steel/foundries, elevators, lumber mills, offshore rigs and bridges.

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Industrial Crane Bumper Shocks **CB-63 to 160**



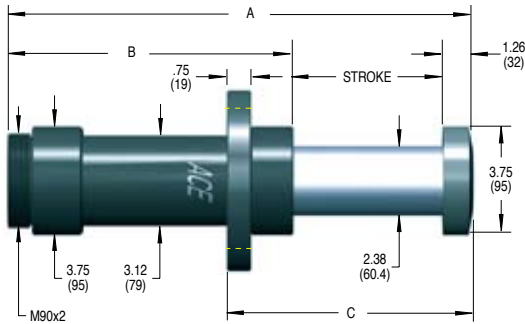
Ordering Information

CB-63-100-F-B- -X

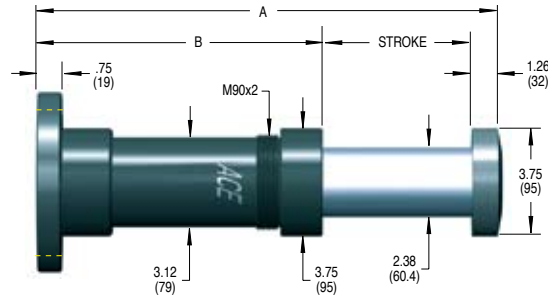
CB Series	Bore Diameter (mm)	Stroke Length (mm)	Flange Location	Crane Button and Safety Cable	Application Number	Specials
Industrial Crane	63	100 500	F Front Flange	Standard with Button		Environmental Finish
Bumper Shock	100	200 600	R Rear Flange	B Optional Larger Button (includes safety cable)		Custom Flanges
	160	300 800				Fluid
		400				



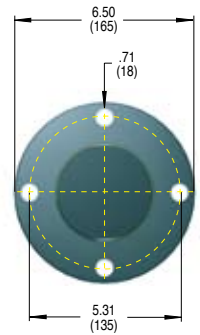
Front Flange



Rear Flange



Flange



Dimensions in inches (millimeters)

Model	Stroke	A	B	C	Rod Return Force		Energy per Cycle in lbs (kJNm)	Effective Weight Range lbs. (kg)	Shipping Weight lbs (kg)
					lbs (kN) Fully Out	lbs (kN) Fully In			
CB-63-100	3.94 (100)	16.54 (420)	11.34 (288)	7.56 (192)	393 (1.7)	4,110 (18.3)	141,600 (16)	3,330-282,000 (1,510-128,000)	28.0 (12.7)
CB-63-200	7.87 (200)	27.56 (700)	18.43 (468)	11.50 (292)	393 (1.7)	5,392 (24.0)	283,200 (32)	6,660-564,000 (3,020-256,000)	36.8 (16.7)
CB-63-300	11.81 (300)	38.58 (980)	25.51 (648)	15.43 (392)	393 (1.7)	6,038 (26.9)	424,800 (48)	10,010-847,000 (4,540-384,000)	45.8 (20.8)
CB-63-400	15.75 (400)	49.61 (1,260)	32.60 (828)	19.37 (492)	393 (1.7)	6,404 (28.5)	566,400 (64)	13,340-1,129,000 (6,050-512,000)	54.6 (24.8)
CB-63-500	19.69 (500)	60.63 (1,540)	39.69 (1,008)	23.31 (592)	393 (1.7)	6,660 (29.6)	708,000 (80)	16,670-1,411,000 (7,560-640,000)	63.5 (28.8)

Technical Data

Maximum force: 42,000 lbs. (187 kN)

Impact velocity range: 1.6-15 ft/sec (0.5 to 4.6 m/s)

Minimum return force: 106 lbs. (0.5kN)

Operating temperature: 10° to 150°F (-12°C to 66°C)
(Consult factory for optional ranges).

Mechanical stop: Integral mechanical stop is built into the front of all units.

Oil type: ATF

Buttons are standard on all industrial crane bumper shock absorbers. Safety cable is optional.

Custom environmental protection options of paint, plating, rod bellows, etc. are available. Consult factory for your specific needs.

Optional Larger Button

(Optional larger button includes safety cable)

Diameter Z	CB-63 EB-63	CB-100 EB-100	CB-160
inch	5.00	7.00	9.00
(mm)	(127)	(178)	(229)



EB Emergency Buffer Models

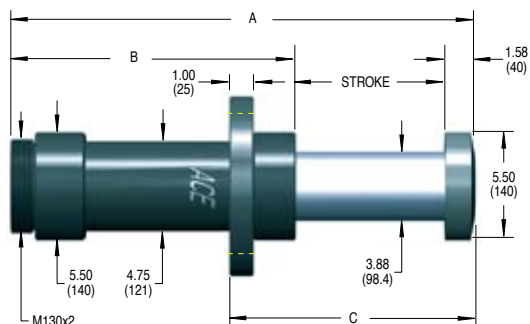
These low return force units are ideal for applications where it is preferred to have equipment not accelerate in the opposite direction after completing its linear deceleration.

Consult ACE Controls or your distributor for additional information.

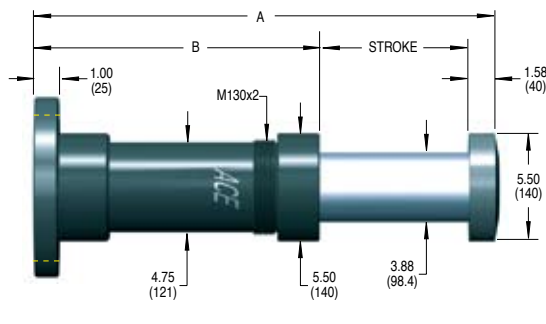
Model	Rod Return Force lbs (kN)	
	Fully Out	Fully In
EB-63-100	157 (0.70)	1,562 (6.9)
EB-63-200	172 (0.77)	2,084 (9.3)
EB-63-300	187 (0.83)	2,372 (10.6)
EB-63-400	136 (0.60)	2,496 (11.1)
EB-63-500	151 (0.67)	2,691 (12.0)

All crane bumper shock absorbers have special orifice designs and must be sized per application.
ACE Controls crane bumper shock absorbers are designed to AISE standards.

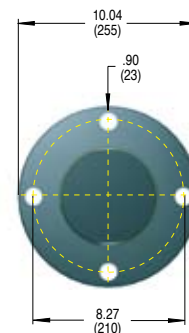
Front Flange



Rear Flange



Flange



Dimensions in inches (millimeters)

Model	Stroke	A	B	C	Rod Return Force lbs (kN)		E ₃ Energy per Cycle in lbs (kJm)	W _e Effective Weight Range lbs (kg)	Shipping Weight lbs (kg)
					Fully Out	Fully In			
CB-100-200	7.87 (200)	28.94 (735)	19.49 (495)	12.60 (320)	1,005 (4.5)	9,917 (44.1)	708,000 (80)	16,670-1,411,000 (7,560-640,000)	93.7 (42.5)
CB-100-300	11.81 (300)	39.57 (1,005)	26.18 (665)	16.54 (420)	1,005 (4.5)	12,540 (55.8)	1,062,000 (120)	25,000-2,116,000 (11,340-960,000)	112.1 (50.8)
CB-100-400	15.75 (400)	50.20 (1,275)	32.87 (835)	20.47 (520)	1,005 (4.5)	14,459 (64.9)	1,416,000 (160)	33,330-2,822,000 (15,120-1,280,000)	130.4 (59.1)
CB-100-500	19.69 (500)	60.83 (1,545)	39.57 (1,005)	24.41 (620)	1,005 (4.5)	15,916 (70.8)	1,770,000 (200)	41,670-3,527,000 (18,900-1,600,000)	148.7 (67.5)
CB-100-600	23.62 (600)	71.46 (1,815)	46.26 (1,175)	28.35 (720)	1,005 (4.5)	17,058 (75.9)	2,124,000 (240)	50,000-4,233,000 (22,680-1,920,000)	167.0 (75.8)

Technical Data

Maximum force: 105,000 lbs. (467 kN)

Impact velocity range: 1.6-15 ft/sec (0.5 to 4.6 m/s)

Minimum return force: 106 lbs. (0.5kN)

Operating temperature: 10° to 150°F (-12°C to 66°C)
(Consult factory for optional ranges).

Mechanical stop: Integral mechanical stop is built into the front of all units.

Oil type: ATF

Buttons are standard on all industrial crane bumper shock absorbers. Safety cable is optional.

Custom environmental protection options of paint, plating, rod bellows, etc. are available. Consult factory for your specific needs.

Optional Larger Button

(Optional larger button includes safety cable)

Diameter Z	CB-63 EB-63	CB-100 EB-100	CB-160
inch	5.00	7.00	9.00
(mm)	(127)	(178)	(229)



EB Emergency Buffer Models

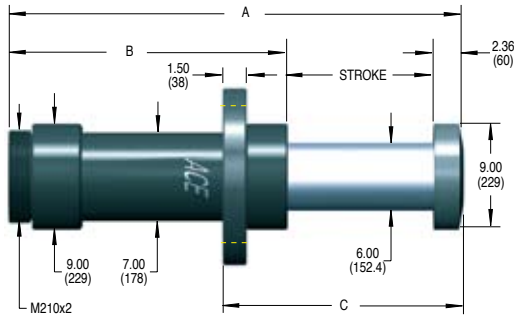
These low return force units are ideal for applications where it is preferred to have equipment not accelerate in the opposite direction after completing its linear deceleration.

Consult ACE Controls or your distributor for additional information.

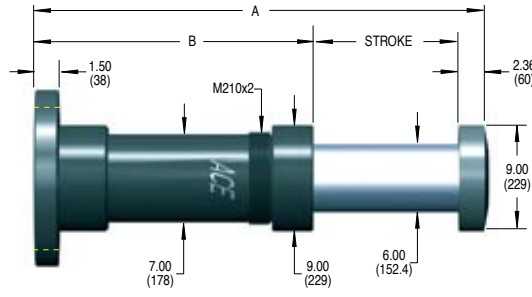
Model	Rod Return Force lbs (kN)	
	Fully Out	Fully In
EB-100-200	271 (1.20)	1,999 (8.9)
EB-100-300	213 (0.95)	3,163 (14.1)
EB-100-400	267 (1.19)	4,089 (18.2)
EB-100-500	209 (0.93)	4,686 (20.8)
EB-100-600	263 (1.17)	5,248 (23.3)

All crane bumper shock absorbers have special orifice designs and must be sized per application. ACE Controls crane bumper shock absorbers are designed to AISE standards.

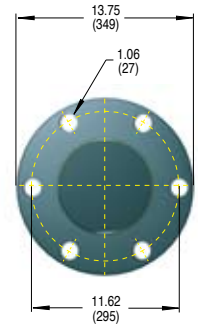
Front Flange



Rear Flange



Flange



Dimensions in inches (millimeters)

Model	Stroke	A	B	C	Rod Return Force		Energy per Cycle in lbs (kNm)	Effective Weight Range lbs (kg)	Shipping Weight lbs (kg)
					Fully Out	Fully In			
CB-160-400	15.75 (400)	55.12 (1,400)	37.01 (940)	23.62 (600)	2,455 (10.9)	15,845 (70.5)	2,124,000 (240)	50,000-4,233,000 (22,680-1,920,000)	340.9 (154.6)
CB-160-600	23.62 (600)	78.74 (2,000)	52.76 (1,340)	31.50 (800)	2,455 (10.9)	15,857 (70.5)	3,186,000 (360)	75,000-6,349,000 (34,020-2,880,000)	414.4 (188.0)
CB-160-800	31.50 (800)	102.36 (2,600)	68.50 (1,740)	39.37 (1,000)	2,455 (10.9)	15,869 (70.6)	4,248,000 (480)	100,000-8,466,000 (45,360-3,840,000)	487.9 (221.3)

Technical Data

Maximum force: 157,000 lbs. (700 kN)

Impact velocity range: 1.6-15 ft/sec (0.5 to 4.6 m/s)

Minimum return force: 106 lbs. (0.5kN)

Operating temperature: 10° to 150°F (-12°C to 66°C)
(Consult factory for optional ranges).

Mechanical stop: Integral mechanical stop is built into the front of all units.

Oil type: ATF

Buttons are standard on all industrial crane bumper shock absorbers. Safety cable is optional.

Custom environmental protection options of paint, plating, rod bellows, etc. are available. Consult factory for your specific needs.

EB Emergency Buffer Models

These low return force units are ideal for applications where it is preferred to have equipment not accelerate in the opposite direction after completing its linear deceleration.

Consult ACE Controls or your distributor for additional information.

Model	Rod Return Force lbs (kN)	
	Fully Out	Fully In
EB-160-400	421 (1.87)	4,071 (18.1)
EB-160-600	474 (2.1)	4,225 (18.8)
EB-160-800	535 (2.4)	4,380 (19.5)

Optional Larger Button

(Optional larger button includes safety cable)

Diameter Z	CB-63 EB-63	CB-100 EB-100	CB-160
inch	5.00	7.00	9.00
(mm)	(127)	(178)	(229)



All crane bumper shock absorbers have special orifice designs and must be sized per application. ACE Controls crane bumper shock absorbers are designed to AISE standards.