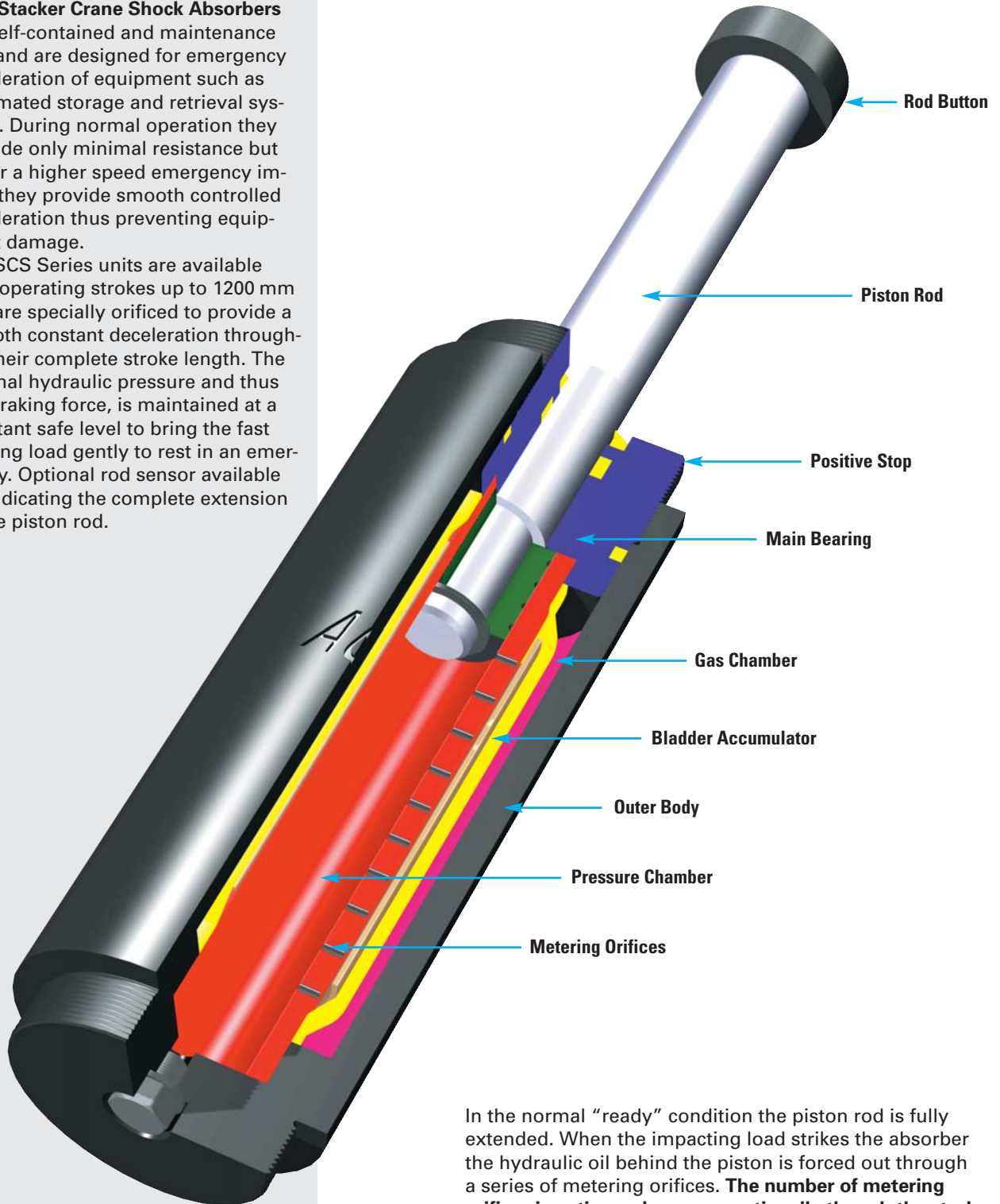


ACE Stacker Crane Shock Absorbers are self-contained and maintenance free and are designed for emergency deceleration of equipment such as automated storage and retrieval systems. During normal operation they provide only minimal resistance but under a higher speed emergency impact they provide smooth controlled deceleration thus preventing equipment damage.

The SCS Series units are available with operating strokes up to 1200 mm and are specially orificed to provide a smooth constant deceleration throughout their complete stroke length. The internal hydraulic pressure and thus the braking force, is maintained at a constant safe level to bring the fast moving load gently to rest in an emergency. Optional rod sensor available for indicating the complete extension of the piston rod.



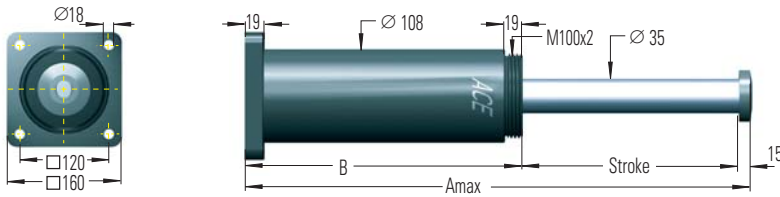
In the normal "ready" condition the piston rod is fully extended. When the impacting load strikes the absorber the hydraulic oil behind the piston is forced out through a series of metering orifices. **The number of metering orifices in action reduces proportionally though the stroke and the load velocity is thereby smoothly reduced to zero.** The internal pressure and thus the reaction force (Q) 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.



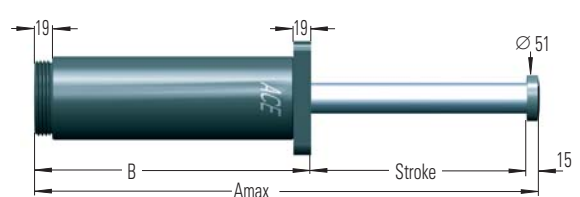
GENTLE AUTOMATIC SOLUTION SDN BHD
 No. 36 Jalan Industri USJ 1/13, Taman Perindustrian USJ 1, 47600 Subang Jaya, Selangor.
 TEL: 603-8023 7743 / 8743
 FAX: 603-8023 9743
 email: sales@gentle.com.my

Part Number SCS-38 . . .

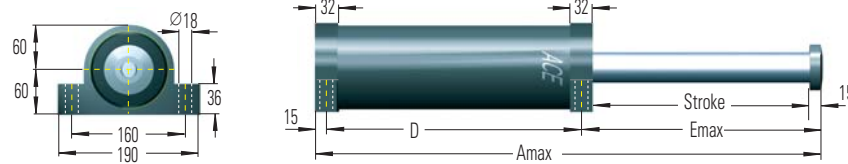
Rear Flange -R



Front Flange -F



Side Foot Mounting -S



Ordering Example

SCS-38-400-F-X

Stacker Crane Shock Absorber $\uparrow \uparrow \uparrow \uparrow$
 Bore Size \varnothing 38 mm $\uparrow \uparrow \uparrow \uparrow$
 Stroke 400 mm $\uparrow \uparrow \uparrow \uparrow$
 Mounting Style: Front Flange $\uparrow \uparrow \uparrow \uparrow$
 Identification No. (assigned by ACE) $\uparrow \uparrow \uparrow \uparrow$

Complete Details Required when Ordering:

| | |
|---------------------------------|-----------------|
| Moving Load | m (kg) |
| Full Load Speed | v (m/s) max. |
| Creep Speed | vs (m/s) max. |
| Motor Power | P (kW) |
| Stall Torque Factor | ST (normal 2.5) |
| Number of Absorbers in parallel | n |

or technical data according to formulae and calculations on page 13 to 15.

Technical Data

Impact velocity range v: 0.9 to 4.6 m/s.
Reaction force Q: at max. capacity rating = 80 kN max.
Energy capacity W₃: At max. side load angle do not exceed 80 % of rated max. energy capacity below.
Return force: 0.6 to 0.7 kN.
Filling pressure: approx. 2 bar.
Operating temperature range: -12°C to 66°C (For lower temperatures please consult ACE).

In creep speed: It is possible to use up to approx. 60 % of the buffer stroke.

In creep speed conditions the shock absorber provides minimal resistance and there is no braking effect.

Calculation: For further details of calculation and selection please consult ACE.

The calculation and selection of the correct ACE Stacker Crane Shock Absorber for your application should be referred to ACE for approval and assignment of unique identification number.

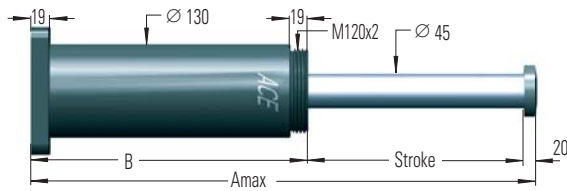
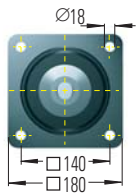
Dimensions and Capacity Chart

| Model Part Number | Stroke mm | A | B | D | E | Max. Energy Capacity per Cycle | | Max. Side Load Angle Mounting Style | | Weight kg Mounting Style | |
|----------------------|--------------|------|------|------|-----|--------------------------------|----------|--|-----|-----------------------------|----|
| | | | | | | W ₃ | max. kNm | F & S | R | F & R | S |
| SCS-38-50 | 50 | 270 | 205 | 175 | 80 | 3.6 | | 5 | 4 | 12 | 13 |
| SCS-38-100 | 100 | 370 | 255 | 225 | 132 | 7.2 | | 5 | 4 | 14 | 15 |
| SCS-38-150 | 150 | 470 | 305 | 275 | 180 | 10.8 | | 5 | 4 | 16 | 17 |
| SCS-38-200 | 200 | 570 | 355 | 325 | 230 | 14.4 | | 5 | 4 | 18 | 19 |
| SCS-38-250 | 250 | 670 | 405 | 375 | 280 | 18 | | 4.7 | 3.7 | 20 | 21 |
| SCS-38-300 | 300 | 785 | 470 | 440 | 330 | 21.6 | | 3.9 | 2.9 | 22 | 23 |
| SCS-38-350 | 350 | 885 | 520 | 490 | 380 | 25.2 | | 3.4 | 2.4 | 24 | 25 |
| SCS-38-400 | 400 | 1000 | 585 | 555 | 430 | 28.8 | | 3 | 2 | 26 | 27 |
| SCS-38-500 | 500 | 1215 | 700 | 670 | 530 | 36 | | 2.4 | 1.4 | 30 | 31 |
| SCS-38-600 | 600 | 1430 | 815 | 785 | 630 | 43.2 | | 1.9 | 0.9 | 34 | 35 |
| SCS-38-700 | 700 | 1645 | 930 | 900 | 730 | 50.4 | | 1.6 | 0.6 | 38 | 39 |
| SCS-38-800 | 800 | 1860 | 1045 | 1015 | 830 | 57.6 | | 1.3 | 0.3 | 43 | 44 |

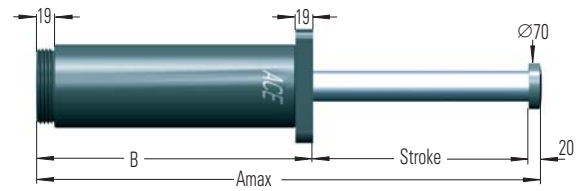
For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.

Part Number SCS-50 . . .

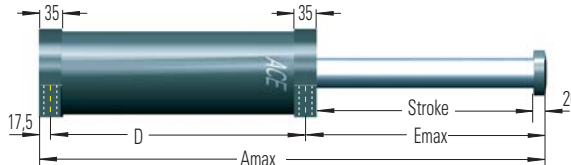
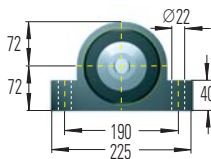
Rear Flange -R



Front Flange -F



Side Foot Mounting -S



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Ordering Example

SCS-50-400-F-X

Stacker Crane Shock Absorber $\uparrow \uparrow \uparrow \uparrow$
 Bore Size ϕ 50 mm $\uparrow \uparrow \uparrow \uparrow$
 Stroke 400 mm $\uparrow \uparrow \uparrow \uparrow$
 Mounting Style: Front Flange $\uparrow \uparrow \uparrow \uparrow$
 Identification No. (assigned by ACE) $\uparrow \uparrow \uparrow \uparrow$

Complete Details Required when Ordering:

Moving Load m (kg)
 Full Load Speed v (m/s) max.
 Creep Speed vs (m/s) max.
 Motor Power P (kW)
 Stall Torque Factor ST (normal 2.5)
 Number of Absorbers in Parallel n

or technical data according to formulae and calculations on page 13 to 15.

Technical Data

Impact velocity range v: 0.6 to 4.6 m/s.

Reaction force Q: At max. capacity rating = 160 kN max.

Energy capacity W_3 : At max side load angle do not exceed 80 % of rated max.energy capacity below.

Return force: 1.0 to 1.2 kN.

Filling pressure: Approx. 2 bar.

Operating temperature range: -12°C to 66°C.
 (For lower temperatures please consult ACE).

In creep speed: It is possible to use up to approx. 60 % of the buffer stroke.

In creep speed conditions the shock absorber provides minimal resistance and there is no braking effect.

Calculation: For further details of calculation and selection please consult ACE.

The calculation and selection of the correct ACE Stacker Crane Shock Absorber for your application should be referred to ACE for approval and assignment of unique identification number.

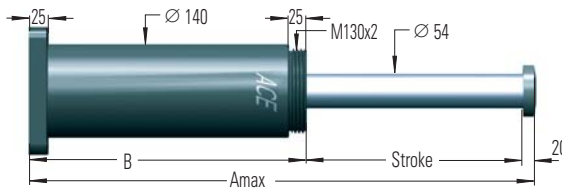
Dimensions and Capacity Chart

| Model Part Number | Stroke mm | A | B | D | E | Max. Energy Capacity per Cycle | | Max. Side Load Angle | | Weight kg | |
|----------------------|--------------|------|------|------|------|--------------------------------|----------|-------------------------|---------------------|-------------------------|---------------------|
| | | | | | | W_3 | max. kNm | Mounting Style F & S | Mounting Style R | Mounting Style F & R | Mounting Style S |
| SCS-50-100 | 100 | 390 | 270 | 235 | 138 | 14 | | 5 | 4 | 22 | 23 |
| SCS-50-150 | 150 | 490 | 320 | 285 | 188 | 21 | | 5 | 4 | 25 | 26 |
| SCS-50-200 | 200 | 590 | 370 | 335 | 238 | 28 | | 5 | 4 | 27 | 28 |
| SCS-50-250 | 250 | 690 | 420 | 385 | 288 | 35 | | 4.5 | 3.5 | 30 | 31 |
| SCS-50-300 | 300 | 805 | 485 | 450 | 338 | 42 | | 3.8 | 2.8 | 33 | 34 |
| SCS-50-350 | 350 | 905 | 535 | 500 | 388 | 49 | | 3.3 | 2.3 | 35 | 37 |
| SCS-50-400 | 400 | 1020 | 600 | 565 | 438 | 56 | | 2.9 | 1.9 | 38 | 40 |
| SCS-50-500 | 500 | 1235 | 715 | 680 | 538 | 70 | | 2.3 | 1.3 | 44 | 45 |
| SCS-50-600 | 600 | 1450 | 830 | 795 | 638 | 84 | | 1.9 | 0.9 | 50 | 51 |
| SCS-50-700 | 700 | 1665 | 945 | 910 | 738 | 98 | | 1.6 | 0.6 | 55 | 57 |
| SCS-50-800 | 800 | 1880 | 1060 | 1025 | 838 | 112 | | 1.3 | 0.3 | 61 | 63 |
| SCS-50-1000 | 1000 | 2310 | 1290 | 1255 | 1038 | 140 | | 1 | - | 72 | 74 |

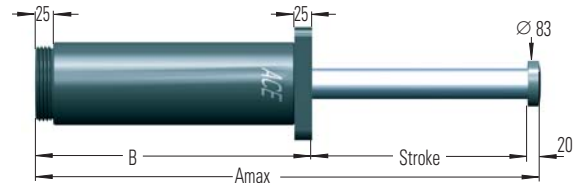
For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.

Part Number SCS-63 . . .

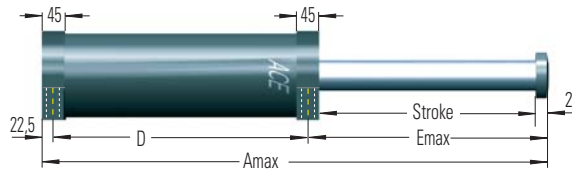
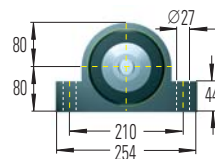
Rear Flange -R



Front Flange -F



Side Foot Mounting -S



Ordering Example

SCS-63-400-F-X

Stacker Crane Shock Absorber
 Bore Size ϕ 63 mm
 Stroke 400 mm
 Mounting Style: Front Flange
 Identification No. (assigned by ACE)

Complete Details Required when Ordering:

Moving Load m (kg)
 Full Load Speed v (m/s) max.
 Creep Speed vs (m/s) max.
 Motor Power P (kW)
 Stall Torque Factor ST (normal 2.5)
 Number of Absorbers in Parallel n

or technical data according to formulae and calculations on page 13 to 15.

Technical Data

Impact velocity range v : 0.5 to 4.6 m/s.
Reaction force Q : At max capacity rating = 210 kN max.
Energy capacity W_3 : at max. side load angle do not exceed 80% of rated max. energy capacity below.
Return force: 1.5 to 2.5 kN.
Filling pressure: Approx. 2 bar.
Operating temperature range: -12°C to $+66^{\circ}\text{C}$.
 (For lower temperatures please consult ACE).

In creep speed: It is possible to use up to approx. 60% of the buffer stroke.

In creep speed conditions the shock absorber provides minimal resistance and there is no braking effect.

Calculation: For further details of calculation and selection please consult ACE.

The calculation and selection of the correct ACE Stacker Crane Shock Absorber for your application should be referred to ACE for approval and assignment of unique identification number.

Dimensions and Capacity Chart

| Model Part Number | Stroke mm | Dimensions (mm) | | | | Max. Energy Capacity per Cycle | | Max. Side Load Angle | | Weight kg | |
|----------------------|--------------|-----------------|------|------|------|--------------------------------|----------|-------------------------|---------------------|-------------------------|---------------------|
| | | A | B | D | E | W_3 | max. kNm | Mounting Style F & S | Mounting Style R | Mounting Style F & R | Mounting Style S |
| SCS-63-100 | 100 | 405 | 285 | 240 | 143 | 18 | | 5 | 4 | 29 | 32 |
| SCS-63-150 | 150 | 505 | 335 | 290 | 193 | 27 | | 5 | 4 | 32 | 35 |
| SCS-63-200 | 200 | 605 | 385 | 340 | 243 | 36 | | 5 | 4 | 35 | 38 |
| SCS-63-250 | 250 | 705 | 435 | 390 | 293 | 45 | | 5 | 4 | 38 | 42 |
| SCS-63-300 | 300 | 805 | 485 | 440 | 343 | 54 | | 5 | 4 | 41 | 45 |
| SCS-63-350 | 350 | 925 | 555 | 510 | 393 | 63 | | 5 | 4 | 45 | 49 |
| SCS-63-400 | 400 | 1025 | 605 | 560 | 443 | 72 | | 5 | 4 | 48 | 52 |
| SCS-63-500 | 500 | 1245 | 725 | 680 | 543 | 90 | | 4.2 | 3.2 | 55 | 60 |
| SCS-63-600 | 600 | 1445 | 825 | 780 | 643 | 108 | | 3.4 | 2.4 | 62 | 66 |
| SCS-63-700 | 700 | 1665 | 945 | 900 | 746 | 126 | | 2.9 | 1.9 | 69 | 73 |
| SCS-63-800 | 800 | 1865 | 1045 | 1000 | 843 | 144 | | 2.5 | 1.5 | 75 | 79 |
| SCS-63-1000 | 1000 | 2285 | 1265 | 1220 | 1043 | 180 | | 1.9 | 0.9 | 89 | 93 |
| SCS-63-1200 | 1200 | 2705 | 1485 | 1440 | 1243 | 216 | | 1.4 | 0.4 | 102 | 106 |

For other stroke lengths, special options (such as higher or lower impact velocity etc.), please consult ACE.