



# Shock absorber—ACA, ACJ Series

## Compendium of ACA/ACJ Series

### Excellent and stable deceleration and shock absorbing

If impacted by load, the resistance will automatically adjust.

### Three kinds of prevention crash cap



### Three kinds of impact speed

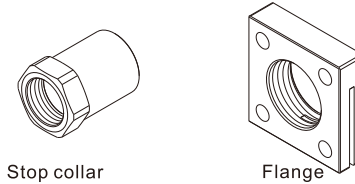
High speed(Light load)  
Middle speed(Middle load)  
Low speed(Heavy load)

### All threaded outer body

It is easy to install and adjust and has good heat dissipation.

### Integrated structure

### Two kinds of mounting accessories



### Two kinds of type

ACA: Self-compensation type shock absorber  
ACJ: Adjustable type shock absorber

## Specification

| Model   | Stroke (mm) | Max. energy absorbed (Nm) | Max. energy absorbed/hour(Nm/h) | Max. effective mass(kg) |              |           | Max. impact speed(m/s) |              |           | Weight (g) |
|---------|-------------|---------------------------|---------------------------------|-------------------------|--------------|-----------|------------------------|--------------|-----------|------------|
|         |             |                           |                                 | High speed              | Middle speed | Low speed | High speed             | Middle speed | Low speed |            |
| ACA0806 | 6           | 3                         | 5400                            | 5                       | 20           | 25        | 4                      | 2            | 1         | 12         |
| ACA1007 | 7           | 6                         | 14500                           | 10                      | 40           | 50        | 4                      | 2            | 1         | 26         |
| ACA1210 | 10          | 10                        | 30000                           | 18                      | 60           | 80        | 4                      | 2            | 1         | 40         |
| ACA1215 | 15          | 14                        | 35000                           | 25                      | 90           | 115       | 4                      | 2            | 1         | 48         |
| ACA1412 | 12          | 18                        | 36000                           | 30                      | 110          | 150       | 4                      | 2            | 1         | 70         |
| ACA1416 | 16          | 22                        | 39000                           | 40                      | 140          | 180       | 4                      | 2            | 1         | 78         |
| ACA1420 | 20          | 25                        | 45000                           | 45                      | 155          | 200       | 4                      | 2            | 1         | 85         |
| ACA1616 | 16          | 35                        | 43000                           | 60                      | 220          | 285       | 4                      | 2            | 1         | 105        |
| ACA1620 | 20          | 40                        | 47000                           | 70                      | 250          | 325       | 4                      | 2            | 1         | 115        |
| ACA1625 | 25          | 45                        | 51000                           | 80                      | 280          | 365       | 4                      | 2            | 1         | 125        |
| ACA2020 | 20          | 60                        | 50000                           | 240                     | 660          | 960       | 4                      | 2            | 1         | 175        |
| ACA2025 | 25          | 65                        | 54000                           | 260                     | 720          | 1040      | 4                      | 2            | 1         | 185        |
| ACA2030 | 30          | 70                        | 58000                           | 280                     | 780          | 1120      | 4                      | 2            | 1         | 210        |
| ACA2040 | 40          | 80                        | 65000                           | 320                     | 890          | 1280      | 4                      | 2            | 1         | 225        |
| ACA2525 | 25          | 100                       | 75000                           | 400                     | 1100         | 1600      | 4                      | 2            | 1         | 290        |
| ACA2550 | 50          | 150                       | 85000                           | 600                     | 1650         | 2400      | 4                      | 2            | 1         | 370        |
| ACA2725 | 25          | 140                       | 85000                           | 560                     | 1550         | 2240      | 4                      | 2            | 1         | 372        |
| ACA2750 | 50          | 250                       | 95000                           | 1000                    | 2780         | 4000      | 4                      | 2            | 1         | 475        |
| ACA3325 | 25          | 180                       | 100000                          | 720                     | 2000         | 2880      | 4                      | 2            | 1         | 596        |
| ACA3350 | 50          | 300                       | 120000                          | 1200                    | 3300         | 4800      | 4                      | 2            | 1         | 750        |
| ACA3625 | 25          | 220                       | 135000                          | 880                     | 2400         | 3500      | 4                      | 2            | 1         | 702        |
| ACA3650 | 50          | 350                       | 150000                          | 1400                    | 2500         | 5600      | 4                      | 2            | 1         | 889        |

| Model   | Stroke(mm) | Max. energy absorbed (Nm) | Max. energy absorbed/hour(Nm/h) | Max. effective mass(kg) | Max. impact speed(m/s) | Weight(g) |
|---------|------------|---------------------------|---------------------------------|-------------------------|------------------------|-----------|
| ACJ1007 | 7          | 6                         | 14500                           | 50                      | 4                      | 28        |
| ACJ1210 | 10         | 10                        | 30000                           | 80                      | 4                      | 43        |
| ACJ1412 | 12         | 20                        | 36000                           | 160                     | 4                      | 75        |
| ACJ2020 | 20         | 60                        | 50000                           | 960                     | 4                      | 189       |
| ACJ2525 | 25         | 100                       | 75000                           | 1600                    | 4                      | 308       |
| ACJ2550 | 50         | 150                       | 85000                           | 2400                    | 4                      | 395       |
| ACJ2725 | 25         | 140                       | 85000                           | 2240                    | 4                      | 396       |
| ACJ2750 | 50         | 250                       | 95000                           | 4000                    | 4                      | 510       |
| ACJ3325 | 25         | 180                       | 100000                          | 2880                    | 4                      | 540       |
| ACJ3350 | 50         | 300                       | 110000                          | 4800                    | 4                      | 800       |
| ACJ3625 | 25         | 220                       | 125000                          | 2500                    | 4                      | 750       |
| ACJ3650 | 50         | 350                       | 130000                          | 5600                    | 4                      | 950       |
| ACJ4225 | 25         | 350                       | 150000                          | 5600                    | 4                      | 1150      |
| ACJ4250 | 50         | 700                       | 180000                          | 11200                   | 4                      | 1420      |
| ACJ4275 | 75         | 1050                      | 210000                          | 16800                   | 4                      | 1720      |



## ACA, ACJ Series



### Product feature

1. Excellent and stable deceleration and shock absorbing; if impacted by load, the resistance will automatically adjust.
2. Outer body of integrated structure is treated by QPQ, which has optimum corrosion and wear resistance and can withstand high pressure; it is easy to install and adjust for all threaded outer body which has good heat dissipation.
3. With high hardness stainless steel shaft, the shock absorber has better impact and corrosion resistance, and it can work under adverse conditions.
4. Special oiling process leads to stable shock absorbing.
5. Compact structure and high max. absorbed energy.
6. We use Special lubricants as buffer medium, which adapts to wide temperature range and ensures stable cushioning.

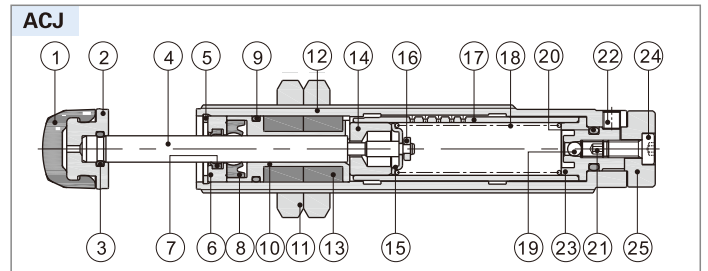
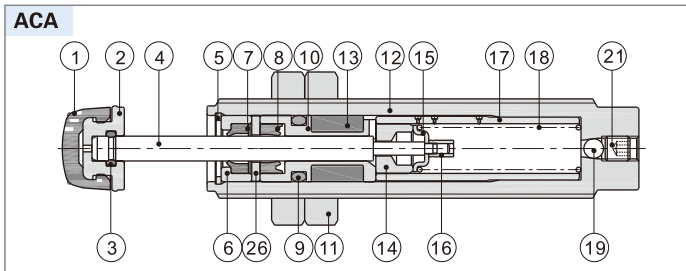
### Ordering code

ACA 20 20 - 1 N

① ② ③ ④ ⑤

| ① Model                                    | ② Body male thread                | ③ Stroke                    | ④ Impact speed  | ⑤ Prevention crash cap                         |
|--|-----------------------------------|-----------------------------|---|--|
| ACA: Self-compensation type shock absorber | 08:M8                             | The pecification for detail | 1: High speed(Light load)<br>2: Middle speed(Middle load)<br>3: Low speed(Heavy load) | Blank: Plastic cap<br>N: No cap                |
|  | 10:M10                            |                             |   | Blank: Plastic cap<br>F: Iron cap<br>N: No cap |
|  | 12:M12                            |                             |   | Blank: Plastic cap<br>F: Iron cap              |
|  | 14:M14                            |                             |   | Blank: Plastic cap<br>F: Iron cap              |
|  | 16:M16                            |                             |   | Blank: Plastic cap<br>F: Iron cap              |
|  | 20:M20                            |                             |   | Blank: Plastic cap<br>F: Iron cap              |
|  | 25:M25                            |                             |   | Blank: Plastic cap<br>F: Iron cap              |
| ACJ: Adjustable type shock absorber        | 27:M27                            |                             | Not this code   | Blank: Plastic cap<br>N: No cap                |
|  | 33:M33                            |                             |   | Blank: Plastic cap<br>F: Iron cap<br>N: No cap |
|  | 36:M36                            |                             |   | Blank: Plastic cap<br>F: Iron cap              |
|  | 10:M10                            |                             |   | Blank: Plastic cap<br>N: No cap                |
|  | 12:M12                            |                             |   | Blank: Plastic cap<br>N: No cap                |
|  | 14:M14                            |                             |   | Blank: Plastic cap<br>N: No cap                |
|  | 20:M20                            |                             |   | Blank: Plastic cap<br>F: Iron cap<br>N: No cap |
| 25:M25                                     | Blank: Plastic cap<br>F: Iron cap |                             |   |  |
| 27:M27                                     | Blank: Plastic cap<br>F: Iron cap |                             |   |  |
| 33:M33                                     | Blank: Plastic cap<br>F: Iron cap |                             |   |  |
| 36:M36                                     | Blank: Plastic cap<br>F: Iron cap |                             |   |  |
| 42:M42                                     | Blank: Plastic cap<br>F: Iron cap |                             |   |  |

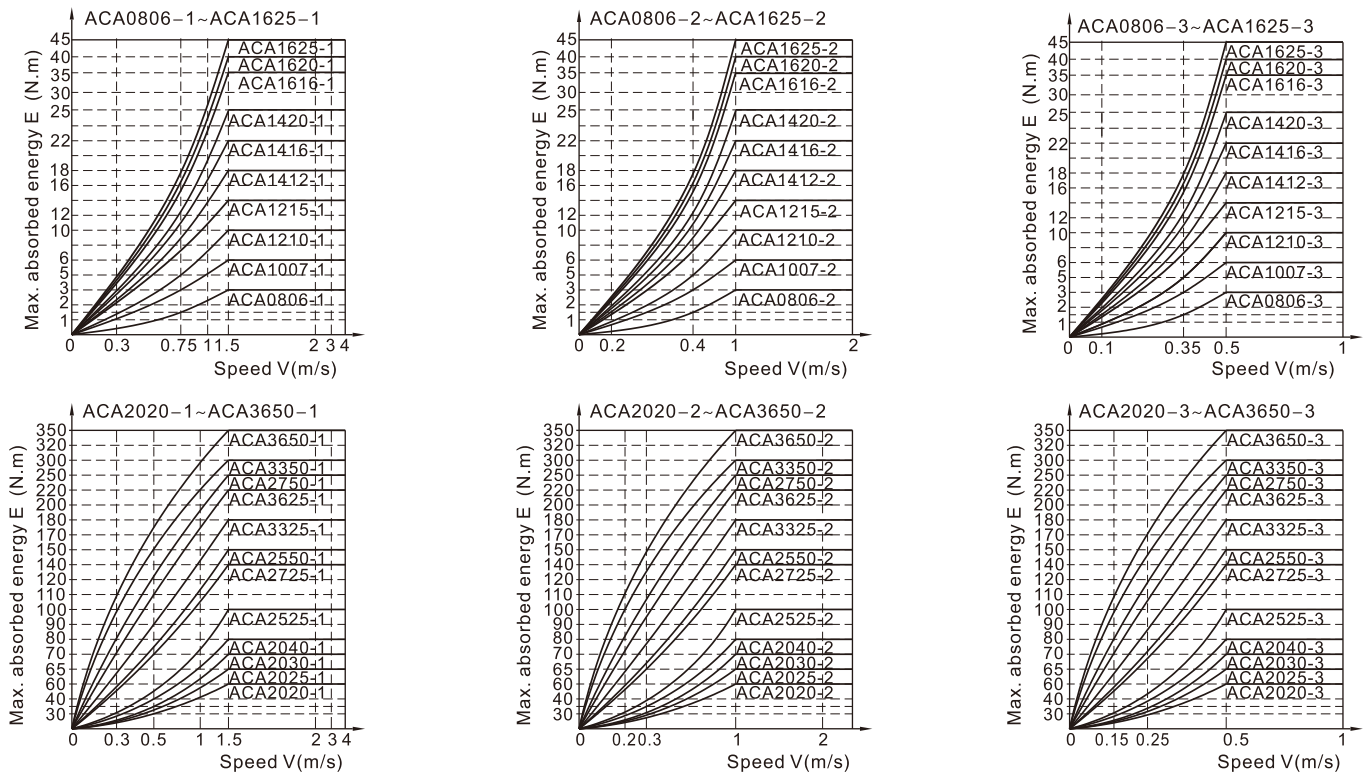
### Inner structure and material of major parts



| No. | Item               | Material                                       | No. | Item        | Material   |
|-----|--------------------|--|-----|-------------|--|
| 1   | Bump cap           | PA66(M8)\TPU(M10~M14)\TPU or S45C(M20~M42)     | 14  | Piston      | Brass  |
| 2   | Bump cap(core)     | No(M8)\Cutting steel(Othres)                   | 15  | Spring seat | Spring steel                                       |
| 3   | O-ring             | NBR  | 16  | Busher      | Brass(M8~M12)\Aluminum(M20~M27)                    |
| 4   | Piston rod         | Stainless steel(M8~M27)\S45C(M33~M42)          | 17  | Inlet body  | Cutting steel(M8~M14)\Seamless steel tube(M20~M42) |
| 5   | Clip               | No(M8~M10)\Spring steel(M12~M42)               | 18  | Spring      | SWPB   |
| 6   | Front cover        | Brass(M8)\Cutting steel(M10)\Aluminum(M12~M42) | 19  | Ball        | GCr15  |
| 7   | Front cover gasket | No(M8)\TPU(M10~M42)                            | 20  | O-ring      | NBR  |
| 8   | Front cover gasket | NBR  | 21  | Set screw   | Low alloy steel                                    |
| 9   | O-ring             | NBR  | 22  | Set screw   | Low alloy steel                                    |
| 10  | Correcting body    | Brass  | 23  | Back cover  | Brass  |
| 11  | Nut                | SS41   | 24  | Screw       | Low alloy steel                                    |
| 12  | Body               | Cutting steel                                  | 25  | Knob        | Aluminum alloy                                     |
| 13  | Accumulator        | Foamex   | 26  | Washer      | SUS304(M10~M14)\No(Othres)                         |

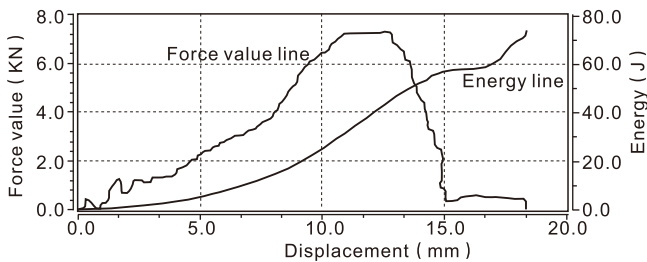
## ACA, ACJ Series

### Max. absorbed energy and speed curve



Note 1. The interval under the red line shows the energy range absorbed by corresponding shock absorber.  
 2. It is better to use 20%-80% of the Max. absorbed energy.

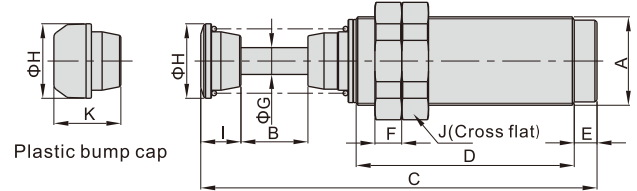
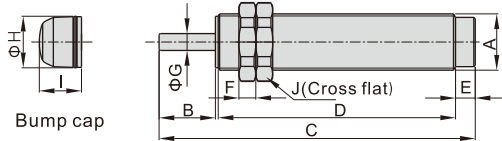
### Buffer curve



Note: As the chart shows, energy is absorbed by a lower reaction force at the beginning of the stroke, then by a smooth linear deceleration. It decelerates smoothly at last.

### Dimensions

#### ACA



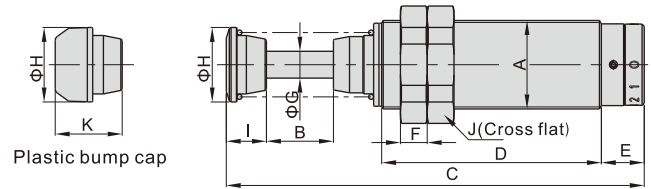
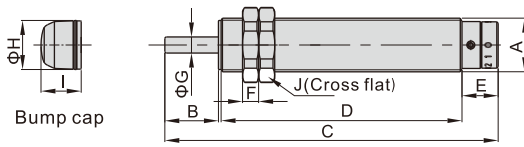
| Model\Item | A       | B  | C     | D     | E | F | G | H    | I   | J  |
|------------|---------|----|-------|-------|---|---|---|------|-----|----|
| ACA0806    | M8×1.0  | 6  | 46    | 32    | 5 | 4 | 3 | 6.5  | 6   | 11 |
| ACA1007    | M10×1.0 | 7  | 56    | 41    | 5 | 4 | 3 | 8.5  | 7.5 | 14 |
| ACA1210    | M12×1.0 | 10 | 63    | 47    | 5 | 4 | 3 | 10   | 7.5 | 17 |
| ACA1412    | M14×1.5 | 12 | 80.5  | 62.5  | 5 | 6 | 4 | 12   | 12  | 19 |
| ACA1416    | M14×1.5 | 16 | 92.5  | 70.5  | 5 | 6 | 4 | 12   | 12  | 19 |
| ACA1420    | M14×1.5 | 20 | 103   | 77    | 5 | 6 | 4 | 12   | 12  | 19 |
| ACA1616    | M16×1.5 | 16 | 100.5 | 78.5  | 5 | 6 | 5 | 14   | 12  | 21 |
| ACA1620    | M16×1.5 | 20 | 109   | 83    | 5 | 6 | 5 | 14   | 12  | 21 |
| ACA1625    | M16×1.5 | 25 | 125   | 94    | 5 | 6 | 5 | 14   | 12  | 21 |
| ACA2020    | M20×1.5 | 20 | 112.5 | 84.5  | 7 | 6 | 6 | 18   | 15  | 26 |
| ACA2025    | M20×1.5 | 25 | 122.5 | 89.5  | 7 | 6 | 6 | 18   | 15  | 26 |
| ACA2030    | M20×1.5 | 30 | 142   | 104   | 7 | 6 | 6 | 18   | 15  | 26 |
| ACA2040    | M20×1.5 | 40 | 167.5 | 119.5 | 7 | 6 | 6 | 18   | 15  | 26 |
| ACA2525    | M25×1.5 | 25 | 123   | 89    | 8 | 6 | 6 | 23   | 16  | 32 |
| ACA2550    | M25×1.5 | 50 | 183   | 124   | 8 | 6 | 6 | 23   | 16  | 32 |
| ACA2725    | M27×1.5 | 25 | 127   | 93    | 8 | 6 | 8 | 24.5 | 17  | 36 |
| ACA2750    | M27×1.5 | 50 | 192   | 133   | 8 | 6 | 8 | 24.5 | 17  | 36 |

| Model\Item | A       | B  | C   | D     | E   | F  | G  | H    | I  | J  | K  |
|------------|---------|----|-----|-------|-----|----|----|------|----|----|----|
| ACA3325    | M33×1.5 | 25 | 148 | 81.5  | 8.5 | 10 | 10 | 27.8 | 15 | 41 | 25 |
| ACA3350    | M33×1.5 | 50 | 213 | 121.5 | 8.5 | 10 | 10 | 27.8 | 15 | 41 | 25 |
| ACA3625    | M36×1.5 | 25 | 148 | 81.5  | 8.5 | 10 | 10 | 27.8 | 15 | 46 | 25 |
| ACA3650    | M36×1.5 | 50 | 213 | 121.5 | 8.5 | 10 | 10 | 27.8 | 15 | 46 | 25 |

# Accessories—Shock absorber

## ACA, ACJ Series

### ACJ

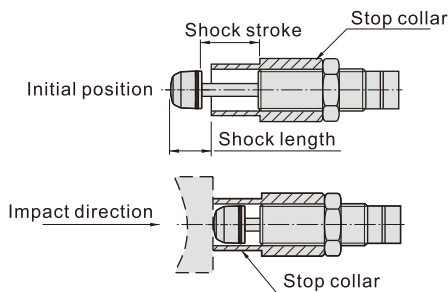


| Model\Item | A       | B  | C     | D     | E    | F | G | H    | I   | J  |
|------------|---------|----|-------|-------|------|---|---|------|-----|----|
| ACJ1007    | M10×1.0 | 7  | 67    | 45.5  | 11   | 4 | 3 | 8.5  | 7.5 | 14 |
| ACJ1210    | M12×1.0 | 10 | 74    | 52    | 11   | 4 | 3 | 10   | 7.5 | 17 |
| ACJ1412    | M14×1.5 | 12 | 91    | 66.5  | 11.5 | 6 | 4 | 12   | 12  | 19 |
| ACJ2020    | M20×1.5 | 20 | 124.5 | 90    | 13.5 | 6 | 6 | 18   | 15  | 26 |
| ACJ2525    | M25×1.5 | 25 | 132.5 | 92    | 14.5 | 6 | 6 | 23   | 16  | 32 |
| ACJ2550    | M25×1.5 | 50 | 192.5 | 127   | 14.5 | 6 | 6 | 23   | 16  | 32 |
| ACJ2725    | M27×1.5 | 25 | 137   | 96.5  | 14.5 | 6 | 8 | 24.5 | 17  | 36 |
| ACJ2750    | M27×1.5 | 50 | 202   | 136.5 | 14.5 | 6 | 8 | 24.5 | 17  | 36 |

| Model\Item | A       | B  | C     | D     | E  | F  | G  | H    | I  | J  | K  |
|------------|---------|----|-------|-------|----|----|----|------|----|----|----|
| ACJ3325    | M33×1.5 | 25 | 156   | 82    | 16 | 10 | 10 | 27.8 | 15 | 41 | 25 |
| ACJ3350    | M33×1.5 | 50 | 221   | 122   | 16 | 10 | 10 | 27.8 | 15 | 41 | 25 |
| ACJ3625    | M36×1.5 | 25 | 156   | 82    | 16 | 10 | 10 | 27.8 | 15 | 46 | 25 |
| ACJ3650    | M36×1.5 | 50 | 221   | 122   | 16 | 10 | 10 | 27.8 | 15 | 46 | 25 |
| ACJ4225    | M42×1.5 | 25 | 161.5 | 85.5  | 16 | 12 | 12 | 34.8 | 15 | 50 | 25 |
| ACJ4250    | M42×1.5 | 50 | 226.5 | 125.5 | 16 | 12 | 12 | 34.8 | 15 | 50 | 25 |
| ACJ4275    | M42×1.5 | 75 | 291.5 | 165.5 | 16 | 12 | 12 | 34.8 | 15 | 50 | 25 |

## Accessories

### How to set stop collar

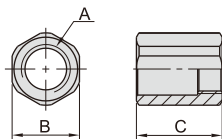


### Ordering code

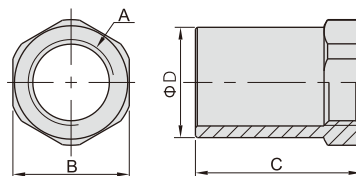
### F - ACA 08 LM

| ① Accessory | ② Model | ③ Female thread size | ④ Accessories type |
|-------------|---------|----------------------|--------------------|
|             |         | 08: M8               | LM: Stop collar    |
|             |         | 10: M10              |                    |
|             |         | 12: M12              |                    |
|             |         | 14: M14              |                    |
|             |         | 16: M16              |                    |
|             |         | 20: M20              |                    |
|             |         | 25: M25              |                    |
|             |         | 27: M27              |                    |
|             |         | 33: M33              |                    |
|             |         | 36: M36              |                    |
|             |         | 42: M42              | FA: Flange         |

### Dimensions

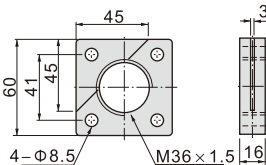


| Model\Item | A       | B  | C  |
|------------|---------|----|----|
| F-ACA08LM  | M8×1.0  | 11 | 14 |
| F-ACA10LM  | M10×1.0 | 14 | 16 |
| F-ACA12LM  | M12×1.0 | 17 | 20 |

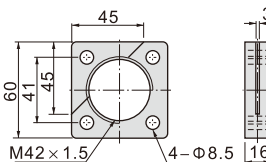


| Model\Item | A       | B  | C  | D  |
|------------|---------|----|----|----|
| F-ACA14LM  | M14×1.5 | 19 | 27 | 18 |
| F-ACA16LM  | M16×1.5 | 21 | 32 | 20 |
| F-ACA20LM  | M20×1.5 | 26 | 35 | 25 |
| F-ACA25LM  | M25×1.5 | 32 | 45 | 31 |
| F-ACA27LM  | M27×1.5 | 36 | 50 | 35 |
| F-ACA33LM  | M33×1.5 | 41 | 80 | 40 |
| F-ACA36LM  | M36×1.5 | 46 | 80 | 45 |

### F-ACA36FA



### F-ACA42FA



### Selecting list

| Model     | Compatible absorber                         |
|-----------|---|
| F-ACA08LM | ACA0806                                     |
| F-ACA10LM | ACA1007, ACJ1007                            |
| F-ACA12LM | ACA1210, ACA1215, ACJ1210                   |
| F-ACA14LM | ACA1412, ACA1416, ACA1420, ACJ1412          |
| F-ACA16LM | ACA1616, ACA1620, ACA1625                   |
| F-ACA20LM | ACA2020, ACA2025, ACA2030, ACA2040, ACJ2020 |
| F-ACA25LM | ACA2525, ACA2550, ACJ2525, ACJ2550          |
| F-ACA27LM | ACA2725, ACA2750, ACJ2725, ACJ2750          |
| F-ACA33LM | ACA3325, ACA3350, ACJ3325, ACJ3350          |
| F-ACA36LM | ACA3625, ACA3650, ACJ3625, ACJ3650          |
| F-ACA36FA | ACA3625, ACA3650, ACJ3625, ACJ3650          |
| F-ACA42FA | ACJ4225, ACJ4250, ACJ4275                   |

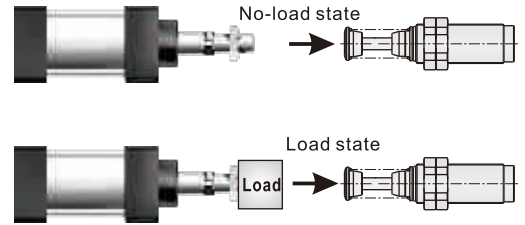
## ACA, ACJ Series

### How to select

Theoretical energy parameter table for cylinders under no-load state

Unit: J (N.m)

| Stroke(mm)     | 6     | 7     | 10    | 12    | 15    | 16    | 20    | 25     | 30     | 40     | 50     | 75     |        |
|----------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Bore size (mm) | 6     | 0.102 | 0.119 | 0.170 | 0.203 | 0.254 | 0.271 | 0.339  | 0.424  | 0.509  | 0.678  | 0.848  | 1.27   |
|                | 8     | 0.181 | 0.211 | 0.301 | 0.362 | 0.452 | 0.482 | 0.603  | 0.754  | 0.904  | 1.21   | 1.51   | 2.26   |
|                | 10    | 0.283 | 0.330 | 0.471 | 0.565 | 0.707 | 0.754 | 0.942  | 1.18   | 1.413  | 1.88   | 2.36   | 3.53   |
|                | 12    | 0.407 | 0.475 | 0.678 | 0.814 | 1.017 | 1.085 | 1.36   | 1.70   | 2.035  | 2.71   | 3.39   | 5.09   |
|                | 16    | 0.723 | 0.844 | 1.21  | 1.45  | 1.809 | 1.929 | 2.41   | 3.01   | 3.617  | 4.82   | 6.03   | 9.04   |
|                | 20    | 1.13  | 1.32  | 1.88  | 2.26  | 2.826 | 3.014 | 3.77   | 4.71   | 5.652  | 7.54   | 9.42   | 14.13  |
|                | 25    | 1.77  | 2.06  | 2.94  | 3.53  | 4.416 | 4.710 | 5.89   | 7.36   | 8.831  | 11.8   | 14.7   | 22.1   |
|                | 32    | 2.89  | 3.38  | 4.82  | 5.79  | 7.235 | 7.717 | 9.65   | 12.1   | 14.47  | 19.3   | 24.1   | 36.2   |
|                | 40    | 4.52  | 5.28  | 7.54  | 9.04  | 11.3  | 12.06 | 15.1   | 18.8   | 22.6   | 30.1   | 37.7   | 56.5   |
|                | 50    | 7.07  | 8.24  | 11.8  | 14.1  | 17.7  | 18.84 | 23.6   | 29.4   | 35.33  | 47.1   | 58.9   | 88.3   |
|                | 63    | 11.2  | 13.1  | 18.7  | 22.4  | 28.0  | 29.91 | 37.4   | 46.7   | 56.08  | 74.8   | 93.5   | 140.2  |
|                | 80    | 18.1  | 21.1  | 30.1  | 36.2  | 45.2  | 48.23 | 60.3   | 75.4   | 90.43  | 120.6  | 150.7  | 226.1  |
|                | 100   | 28.3  | 33.0  | 47.1  | 56.5  | 70.7  | 75.36 | 94.2   | 117.8  | 141.3  | 188.4  | 235.5  | 353.3  |
|                | 125   | 44.2  | 51.5  | 73.6  | 88.3  | 110.4 | 117.8 | 147.2  | 184.0  | 220.8  | 204.4  | 368.0  | 552.0  |
|                | 160   | 72.3  | 84.4  | 120.6 | 144.7 | 180.9 | 192.9 | 241.2  | 301.4  | 361.7  | 482.3  | 602.9  | 904.3  |
|                | 200   | 113.0 | 131.9 | 188.4 | 226.1 | 282.6 | 301.4 | 376.8  | 471.0  | 565.2  | 753.6  | 942.0  | 1413.0 |
|                | 250   | 176.6 | 206.1 | 294.4 | 353.3 | 441.6 | 471.0 | 588.5  | 735.9  | 883.1  | 1177.5 | 1471.9 | 2207.8 |
| 320            | 289.4 | 337.6 | 482.3 | 578.8 | 723.5 | 771.7 | 964.6 | 1205.8 | 1446.9 | 1929.2 | 2411.5 | 3617.3 |        |



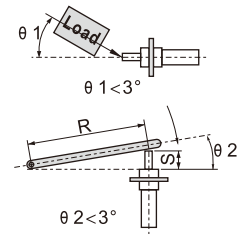
For example:

When the pressure is 0.6MPa, bore size of  $\phi 40$  under no-load state plus shock stroke of 12mm can produce energy of 9.04 N.m. Refer to the specification table, you will find ACA1412 fits.

Note: Cylinders under full-load state can produce as twice as the energy shown above.

### Installation and Operation

- The scale range of adjustable shock absorbers is 0 to 9 (8). Factory set is at 6 (4) position. 0 means the softest, while 9 means the hardest;
- Correct selection of shock absorbers can ensure a smooth deceleration and good shock absorbing properties;
- If there exists rebounding at the beginning of the stroke, it shows the effective weight is too high. In this case, self-compensation type shall be replaced by high speed type (-1), while adjustable type shall be adjusted to softer, that is closer to 0;
- If there exists rebounding at the end of the stroke, it shows the effective weight is too low. In this case, self-compensation type shall be replaced by low speed type (-3), while adjustable type shall be adjusted to harder, that is closer to 9;
- In the work process, lateral load should be avoided as possible as one can. Eccentric angle must be controlled within  $3^\circ$ . Shock absorbers shall be securely locked;
- The operating temperature range shall be  $-10$  to  $80^\circ\text{C}$ ;
- To extend the service life, piston shall be stopped 1mm before reaching the end. It is better to install set screw with positioning and precise adjustment;
- If two or more shock absorbers are installed at the same side, please make sure that they act synchronously;
- No painting, welding or cleaning with corrosive substance on the body as well as the piston rod.
- When installed the absorber, the moment forced on absorber can't be out of the range given in below list or may cause the absorber damage.



| Compatible absorber                     | Male thread Spec(of body) | Max. Assembly Force on absorber(N.m) |
|---|---------------------------|--------------------------------------|
| ACA0806                                 | M8 x 1.0                  | 2.0                                  |
| ACA1007、ACJ1007                         | M10 x 1.0                 | 3.5                                  |
| ACA1210、ACA1215、ACJ1210                 | M12 x 1.0                 | 8.0                                  |
| ACA1412、ACA1416、ACA1420、ACJ1412         | M14 x 1.5                 | 11.0                                 |
| ACA1616、ACA1620、ACA1625                 | M16 x 1.5                 | 15.0                                 |
| ACA2020、ACA2025、ACA2030、ACA2040、ACJ2020 | M20 x 1.5                 | 24.0                                 |
| ACA2525、ACA2550、ACJ2525、ACJ2550         | M25 x 1.5                 | 40.0                                 |
| ACA2725、ACA2750、ACJ2725、ACJ2750         | M27 x 1.5                 | 63.0                                 |

### Calculation of energy under load state

| Horizontal impact   |                                  |                     | Vertical impact   |   |      | Rotation impact  |   |                               |
|---|----------------------------------|---------------------|---|---|------|--|---|-------------------------------|
| 1) Horizontal impact<br><br>Impact weight (kg): m<br>Impact speed (m/s): v<br>Kinetic energy (J(N.m)): $E_1 = \frac{m \times v^2}{2}$<br>Propelling energy(J(N.m)): $E_2 = 0$<br>Gross energy (J(N.m)): $E = E_1 + E_2$                               |                                  |                     | 1) Free fall<br><br>Impact weight (kg): m<br>Impact speed (m/s): v<br>Kinetic energy (J(N.m)): $E_1 = m \times g \times h$<br>Propelling energy(J(N.m)): $E_2 = m \times g \times L$<br>Gross energy (J(N.m)): $E = E_1 + E_2$              |   |      | 1) Rocker<br><br>Impact weight (kg): m<br>Impact speed (m/s): $v = R \times \omega$<br>Kinetic energy (J(N.m)): $E_1 = \frac{I \times \omega^2}{2}$<br>Propelling energy(J(N.m)): $E_2 = \frac{T \times L}{R}$<br>Gross energy (J(N.m)): $E = E_1 + E_2$   |   |                               |
| 2) Horizontal impact with cylinder thrust<br><br>Impact weight (kg): m<br>Impact speed (m/s): v<br>Kinetic energy (J(N.m)): $E_1 = \frac{m \times v^2}{2}$<br>Propelling energy(J(N.m)): $E_2 = F \times L$<br>Gross energy (J(N.m)): $E = E_1 + E_2$ |                                  |                     | 2) Push-down by cylinder<br><br>Impact weight (kg): m<br>Impact speed (m/s): v<br>Kinetic energy (J(N.m)): $E_1 = \frac{m \times v^2}{2}$<br>Propelling energy(J(N.m)): $E_2 = (mg + F) \times L$<br>Gross energy (J(N.m)): $E = E_1 + E_2$ |   |      | 2) Rotation<br><br>Impact weight (kg): m<br>Impact speed (m/s): $v = R \times \omega$<br>Kinetic energy (J(N.m)): $E_1 = \frac{I \times \omega^2}{2}$<br>Propelling energy(J(N.m)): $E_2 = \frac{T \times L}{R}$<br>Gross energy (J(N.m)): $E = E_1 + E_2$ |   |                               |
| Code  | Explanation                      | Unit                | Code  | Explanation                             | Unit | Code   | Explanation   | Unit                          |
| m   | Impact weight                    | kg                  | F   | Thrust( $(\pi \times D^2 \times P)/4$ ) | N    | N  | Round per Minute  | rpm                           |
| v   | Impact speed                     | m/s                 | D   | Nore size                               | mm   | R  | Distance from rotation center to impact point                                 | m                             |
| E   | Gross energy                     | J(N.m)              | P   | Air pressure                            | MPa  | I  | Moment of Inertia ( $I = m \times r^2/2$ )                                    | $\text{kg} \times \text{m}^2$ |
| E1  | Kinetic energy(Potential energy) | J(N.m)              | L   | Shock stroke                            | m    | $\omega$   | Angular velocity( $\omega = 2\pi N/60$ )<br>( $90^\circ = 1.57\text{rad/s}$ ) | rad/s                         |
| E2  | Propelling energy                | J(N.m)              | h   | Height                                  | m    |  |   |                               |
| g   | Gravity acceleration             | $9.8(\text{m/s}^2)$ | T   | Torque                                  | N.m  |  |   |                               |