Soft Absorber

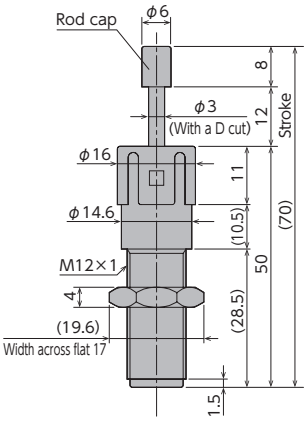
Bellofram Seal Type | Dashpot Structure
Fixed Type | Adjustable type | Self-adjusting

FA-1212C Series

RoHS Compliant

●Products specification might be changed without notice.





Specifications

Model	Max. absorption energy J(kgf·m)	Speed range m/s	Max. equivalent mass kg(kgf)	Max. drag N(kgf)	Absorption energy per minute J/min(kgf·m/min)	Max. cycle rate cycle/min	Rod cap colour
FA-1212C1-C	0.29(0.03)	0.1～1.0	1.5(1.5)	245(25)	14.7(1.5)	45	White
FA-1212C2-C	0.49(0.05)		3(3)	294(30)			Black
FA-1212C3-C	1.0(0.10)		5(5)		5.0(0.5)	5	Yellow
FA-1212C4-C		0.1～0.7	7.5(7.5)				Green
FA-1212C5-C		0.1～0.5	10(10)				Red

Common Specifications

Stroke	mm	12
Recovering power of the piston rod	N(kgf)	2.45(0.25)or less
Operating temperature	℃	−10～50
Mass	g	15
Main unit material		Resin

Precautions for Use

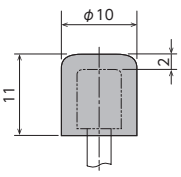
* Do not use this product without carefully reading the attached owner's manual.
* Use with an external stopper.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not turn the oil inlet screw located at the bottom of the main unit.
* 2 or more of this product can be used in parallel.
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: within ±2.5°)
* Do not over-tighten the main unit and nuts. Please use the tightening torque (1.5N·m) listed in the owner's manual. If anchoring the absorber against the ø14.6 unit, please use a tightening torque of 1.0N·m.

Optional Parts

Muting cap OP-090-M12B/C/D

Model
OP-090-M12B
OP-090-M12C
OP-090-M12D

●A muting cap reduces the collision noise.
●To use, place it over a rod cap in the FA-1212C series.
●Stroke length is 11mm.



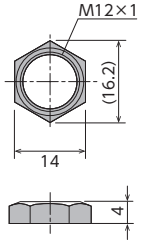
B : Black
C : White
D : Gray

Material : Elastomer

Small hexagon nut M12B

Model
M12B

● It is ideal for tight spaces, as it is smaller than the conventional hexagon nuts.



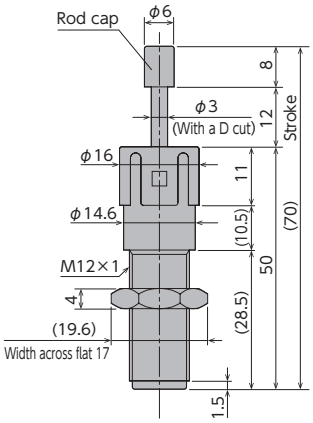
Standard nuts are sold separately as well.

Applicable Models	Model
FA-1212C	FA-1212C nut

Soft Absorber

FA-1212L Series





Operating Performance

Model	Load (kg)	Thrust (N)	Impact rate (m/s)	Motion-time (sec)	Recovering power of the piston rod (N)	Rod cap color
FA-1212L1-C	3	30	0.7 or lower	0.3～2.0	9以下	White
FA-1212L3-C			0.5 or lower	2.3～4.0		Yellow
FA-1212L5-C			0.3 or lower	4.3～6.0		Red

The performance above is based on the measuring machine of our company. Refer to the above to select the damper, confirm its performance in an actual machine, and finally select the model.

Specifications

Stroke	mm	12
Max. absorption en ergy	J(kgf･m)	1.5(0.15)
Max. thrust :FA-1212L1	N(kgf)	49(5)
:FA-1212L3	N(kgf)	78(8)
:FA-1212L5	N(kgf)	117(12)
Max. drag	N(kgf)	490(50)
Range of ope rating temperature	℃	−10～50
Ma ss	g	15
Main unit material		Resin

Precautions for Use

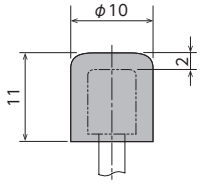
* Do not use this product without carefully reading the attached owner's manual.
* Use with an external stopper.
* Ensure that sufficient mounting strength is secured for this product.
  (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalog.)
* Do not turn the oil inlet screw located at the bottom of the main unit.
* 2 or more of this product can be used in parallel.
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: within ±2.5˚)
* Do not over-tighten the main unit and nuts. Please use the tightening torque (1.5N･m) listed in the owner's manual.
  However, to fix the nut while pressing it against the ϕ14.6 part, use the tightening torque of 1 N･m.

Optional Parts

Muting cap OP-090-M12B/C/D

Model
OP-090-M12B
OP-090-M12C
OP-090-M12D

- A muting cap reduces the collision noise.
- To use, place it over a rod cap in the FA-1212L series.
- Stroke length is 11mm.



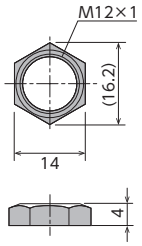
B : Black
C : White
D : Gray

Material: Elastomer

Small hexagon nut M12B

Model
M12B

- It is ideal for tight spaces, as it is smaller than the conventional hexagon nuts.



The standard nut is also sold separately.

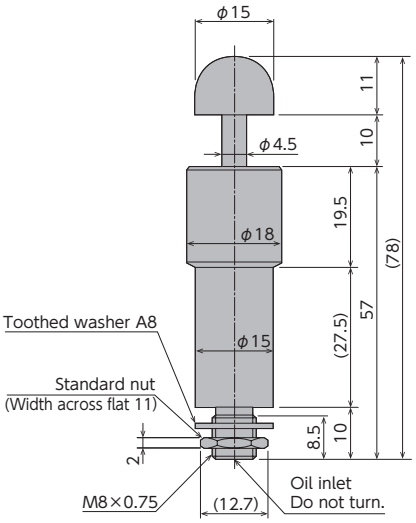
Applicable Models	Model
FA-1212L	Nut for FA-1212C

Soft Absorber

FA-1010D/FA-1215B Series

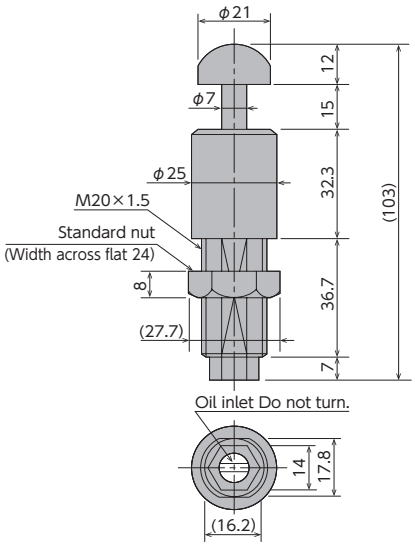


FA-1010D□-C
(Groove orifice)





FA-1215B□-C
(Groove orifice)



Specifications

Model	Stroke mm	Max. absorption energy J(kgf•m)	Max. equivalent mass kg(kgf)	Max. drag N(kgf)	Absorption energy per minute J/min(kgf•m/min)	Recovering power of the piston rod N(kgf)	Mass g
FA-1010D2-C	10	0.98(0.1)	10(10)	980(100)	44.1(4.5)	5.88(0.6)or lower	41.5
FA-1010D3-C		2.05(0.21)	15(15)		78.4(8.0)		
FA-1010D4-C		3.23(0.33)	20(20)				
FA-1215B1-C	15	7.84(0.8)	30(30)	1470(150)	245(25)	11.8(1.2)or lower	116
FA-1215B2-C		11.7(1.2)	40(40)	1960(200)			

Common Specifications

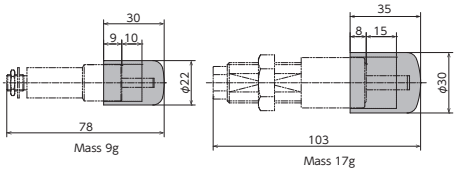
Operating speed range	m/s	0.1～1.0(0.1 to 0.5 for the FA-1215 series)
Max. cycle rate	cycle/min	45((30 for the FA-1215 series)
Operating temperature	℃	−10～50

Optional Parts

Liquid-proof cap -060

Model
FA-1010D□-C-060
FA-1215B□-C-060

●A drip-proof cap is fitted on the main unit when shipped from the factory.
● Ideal for use in environments where oil splatter poses a problem.
● Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.



FA-1010D□-C-060※1　　FA-1215B□-C-060※2

*1 □ will be filled in with a type indication code 2, 3 or 4
*2 □ will be filled in with a type indication code 1 or 2.

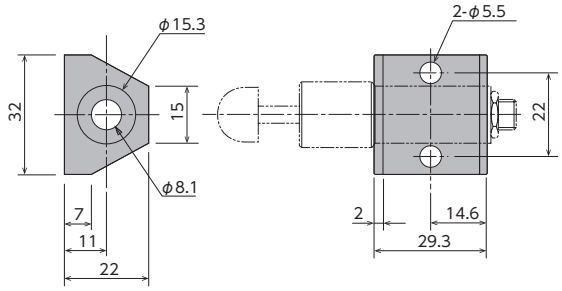
***Standard nuts are sold separately as well.**

Applicable Models	Model
FA-1010D	FA-1010D M08 nut
FA-1215B	M20 nut

Bracket OP-1012A

Model
OP-1012A

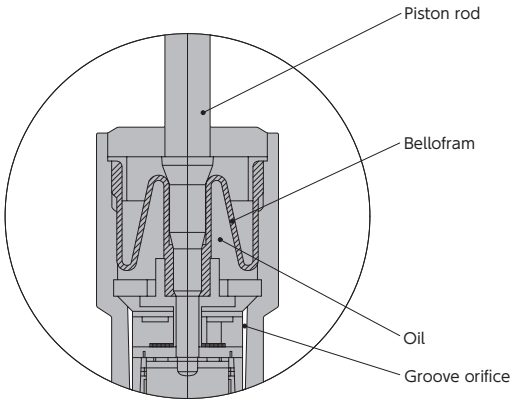
● This is a mounting fixture for FA-1010D.



Mass 25g

Bellofram Seal Type

Unlike the conventional U packing type, it uses a Bellofram seal, as shown below. Because it does not generate sliding resistance between the piston rod and the packing, the spring power required to recover the piston rod can be reduced. The Bellofram also acts as an accumulator based on its ability to change shape. In principle, as long as the Bello is not damaged, oil will never leak.



Groove-orifice type

The cross-sectional area of the orifice in the groove-orifice type changes continuously as the piston strokes, thereby enabling smooth energy absorption.

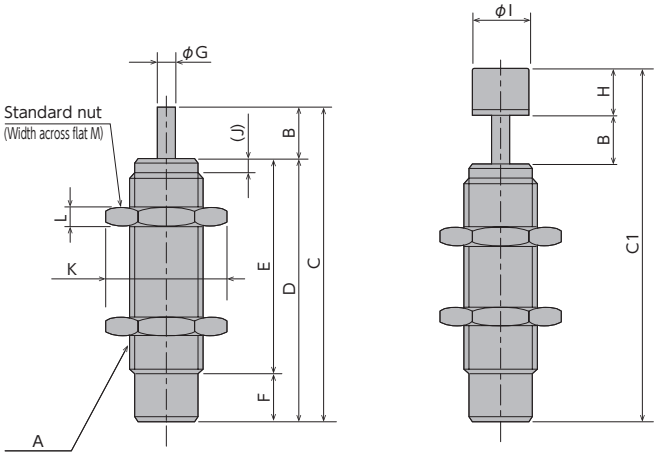
Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Use with an external stopper.
* Ensure that sufficient mounting strength is secured for this product.
  (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not turn the oil inlet screw located at the bottom of the main unit.
* 2 or more of this product can be used in parallel.
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber.
  (Allowable eccentric angle: within ±2.5°)

Soft Absorber

FA-0805/FA-1005/FA-1008/FA-1210 Series





Dimensions

Model	A	B	C	C1	D	E	F	ϕG	H	ϕI	J	K	L	M
FA-0805SB*-S/C	M8×0.75(M8×1)	5	32	37	27	22	5	2	5	6	1.5	12.7	2	11
FA-1005PMB*-S/C	M10×1	5	32	39	27	22	5	3	7	6	1.5	15	3	13
FA-1008PB*-S/C	M10×1	8	46	53	38	33	5	3	7	6	1.5	15	3	13
FA-1210KB*-S/C	M12×1	10	60	68	50	45	5	3.5	8	8	1.5	16.2	4	14

Specifications

Model	Stroke mm	Max. absorption energy J(kgf•m)	Max. equivalent mass kg(kgf)	Max. drag N(kgf)	Absorption energy per minute J/min(kgf•m/min)	Recovering power of the piston rod N(kgf)	Mass g
FA-0805SB1-S ▲	5	0.39(0.04)	3(3)	490(50)	17.6(1.8)	4.9 or lower (0.5)	8.6
FA-0805SB1-C ▲							8.8
FA-0805SB2-S ▲		0.68(0.07)	5(5)	588(60)	22.5(2.3)		8.6
FA-0805SB2-C ▲							8.8
FA-1005PMB1-S	5	0.68(0.07)	5(5)	735(75)	41.1(4.2)	5.88 or lower (0.6)	13.2
FA-1005PMB1-C							14.2
FA-1005PMB2-S		0.98(0.1)	8(8)				13.2
FA-1005PMB2-C							14.2
FA-1008PB1-S	8	0.98(0.1)	7(7)	735(75)	58.8(6.0)	5.88 or lower (0.6)	17.2
FA-1008PB1-C							18.2
FA-1008PB2-S		1.47(0.15)	10(10)				17.2
FA-1008PB2-C							18.2
FA-1210KB1-S	10	1.96(0.2)	15(15)	1470(150)	98(10)	9.8 or lower (1.0)	30.6
FA-1210KB1-C							32.6
FA-1210KB2-S		2.45(0.25)	30(30)				30.6
FA-1210KB2-C							32.6

▲ The thread pitch P1.0 is supplied as well.

Common Specifications

Range of impact rate	m/s	0.3～1.0
Max. cycle rate	cycle/min	60(45 for the FA-0805 series)
Operating temperature	℃	−5～70

Note) M8 X 1.0 is also available as the main body's screw pitch specifications for the FA-0805 series. Please order using the model number FA-0805SB □-S-P1.0 or FA-0805SB □-C-P1.0. However, please note that there are no optional parts for it.
Note) To place an order without a cap, put -S, and to place an order with a cap, put -C.
Note) Cap colour: **1 is white and **2 is black.

Precautions for Use

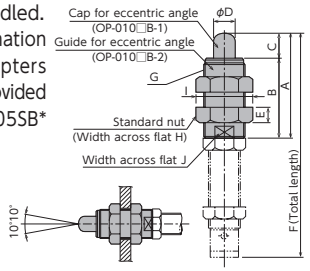
* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020**) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: within ±2.5°)

Optional Parts

Eccentric angle adaptor OP-010SB, PMB, PB, KB

Model
OP-010SB
OP-010PMB
OP-010PB
OP-010KB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.
- The inclination angle adapters are not provided for FA-0805SB* -SP1.0.



Note) Material of cap for eccentric angle: POM

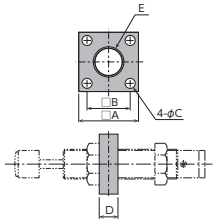
Model	A	B	C	ϕD	E	F
OP-010SB	28	23	5	6	4	44.5
OP-010PMB	28	23	5	8	6	44.5
OP-010PB	38	30	8	8	6	62.8
OP-010KB	48	38	10	10	5	81.8

Model	G	H	I	J	Mass g
OP-010SB	M12×1	14	16.2	10	13
OP-010PMB	M16×1.5	19	21.9	13	29
OP-010PB	M16×1.5	19	21.9	13	35
OP-010KB	M18×1.5	21	24.3	14	48

Square flange OP-040SB, PB, KB

Model
OP-040SB
OP-040PB
OP-040KB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

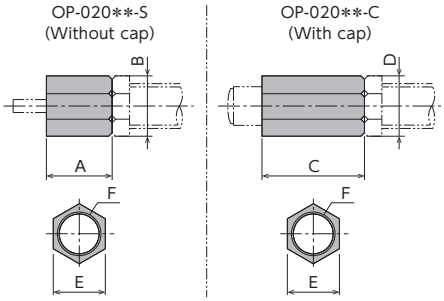


Model	A	B	C	D	E	Mass g
OP-040SB	25	18	3.2	4	M8×0.75	17
OP-040PB					M10×1	16
OP-040KB					M12×1	15

Stopper nut OP-020SB, PB, KB

Model
OP-020SB-S
OP-020SB-C
OP-020PB-S
OP-020PB-C
OP-020KB-S
OP-020KB-C

- Adjust so that it stops 1mm before the stroke end, and fasten with the main unit's nut until secured.



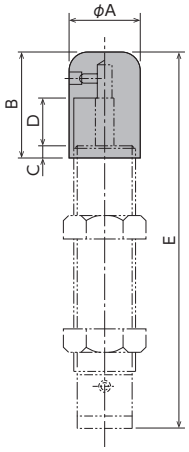
Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Model	A	B	C	D	E	F	Mass g	
OP-020SB-*	10	12.7	15	12.7	11	M8×0.75	S	5
							C	7
OP-020PB-*	10	15	16	15	13	M10×1	S	6
							C	9
OP-020KB-*	12	16.2	16	16.2	14	M12×1	S	6
							C	8

Liquid-proof cap -060

Model
FA-1005PMB□-C-060
FA-1008PB□-C-060
FA-1210KB□-C-060

- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.

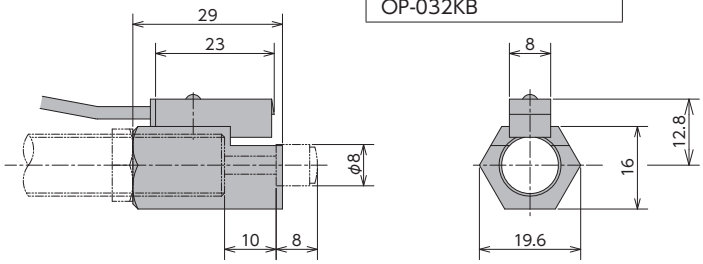


Model	ϕA	B	C	D	E	Mass g
FA-1005PMB□-C-060	13	15	3	5	39	9
FA-1008PB□-C-060	13	18	3	8	53	10
FA-1210KB□-C-060	17	28	9.5	10	68.5	25

●Model indication 1 or 2 is inserted in □.

Holder with switch OP-030KB-2

Model
OP-032KB



Mass 38g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

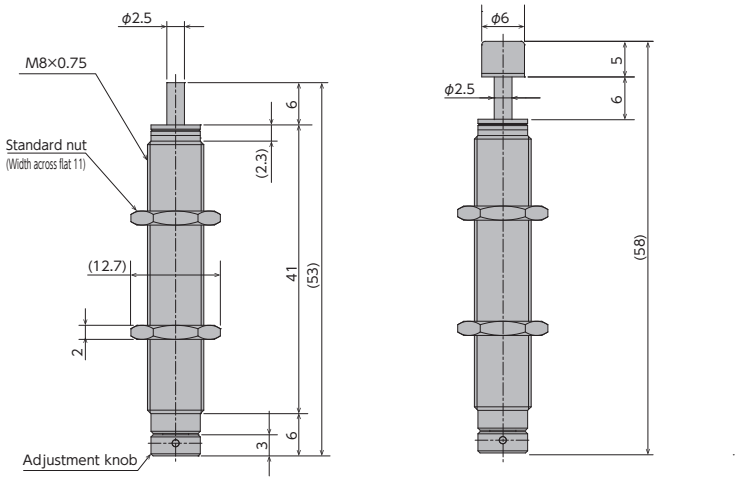
Standard nuts are sold separately as well.

Applicable Models	Model
FA-0805SB	M08 nut
FA-0805SB P1.0	M08-P1 nut
FA-1005PMB	M10 nut
FA-1008PB	M10 nut
FA-1210KB	M12 nut

Soft Absorber

FA-0806 Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf•m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-0806-S	6	1.4(0.14)	15(15)	0.3～2	Single-orifice type
FA-0806-C					
FA-0806-S-P1.0					
FA-0806-C-P1.0					

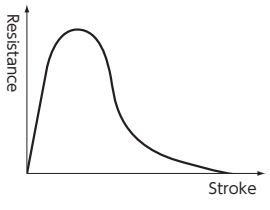
Note: There are no optional parts for M8 x 1.0.

Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	670(68.3)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	45	Mass :S type	g	13.8
Max. absorption energy per minute	J/min(kgf•m/min)	36.7(3.74)	:C type	g	14.1
Recovering power of the piston rod	N(kgf)	9 or lower(0.92)			

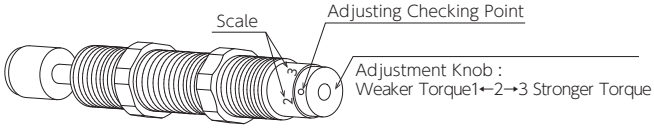
Absorption characteristics

Orifice type	Single-orifice type
Model number	FA-0806 Series
Application	For low to medium speed
Absorption characteristics	

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* We recommend that you use it with an external stopper (Stopper nut OP-020SB).
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: within ± 2.5°)

Adjustment Method



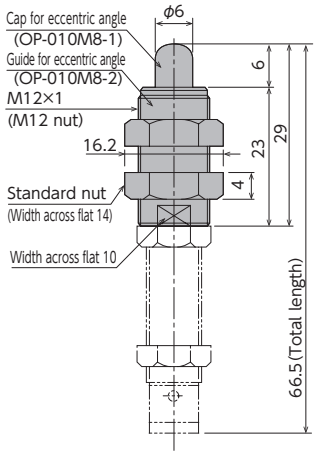
* To adjust, turn the adjustment knob.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

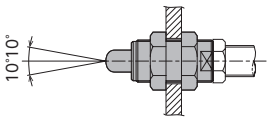
Eccentric angle adaptor OP-010M8

Model
OP-010MB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5˚ or larger.
- The main unit can also be used as a stopper.
- Use it with FA-0806-S.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10˚.
- The maximum inclination angle using an inclination angle adapter is ± 10˚
- The caps and the guides for inclined use are not unbundled.



Mass 13g

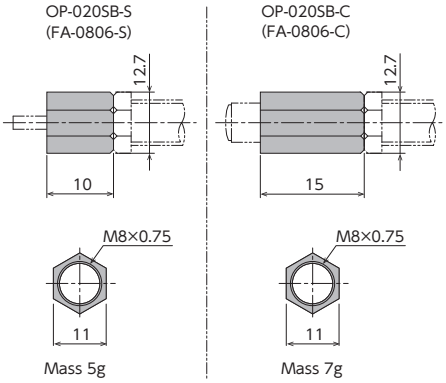


Note) Material of cap for eccentric angle: POM

Stopper nut OP-020SB

Model
OP-020SB-S
OP-020SB-C

- Adjust so that it stops 1mm before the stroke end, and fasten with the main unit's nut until secured.



Mass 5g

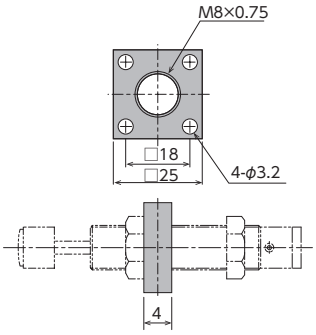
Mass 7g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Square flange OP-040SB

Model
OP-040SB

- Once the attachment site is determined, use the main unit's nut to securely fasten in place.



Mass 17g

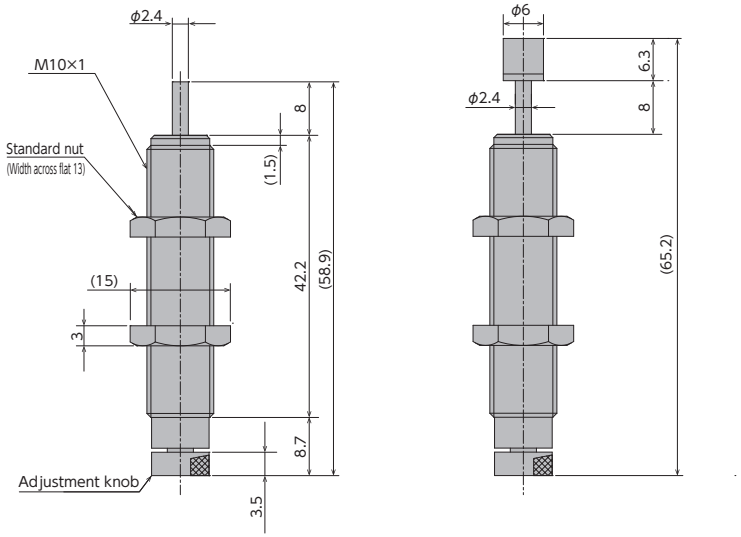
Standard nuts are sold separately as well.

Applicable Models	Model
FA-0806-S/C	M08 nut
FA-0806-S/C-P1.0	M08-P1.0 nut

Soft Absorber

FA-1008VB/FA-1008VD/FWM-1008VBD Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf•m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-1008VB-S	8	1.47(0.15)	10(10)	0.3～1	Single-orifice type
FA-1008VB-C					
FA-1008VD-S		1.76(0.18)	2.5(2.5)	0.7～3	Multiple-orifice type
FA-1008VD-C					
FWM-1008VBD-S			10(10)	0.3～2	Multiple-varying orifice type
FWM-1008VBD-C					

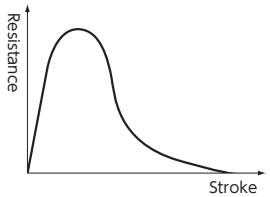
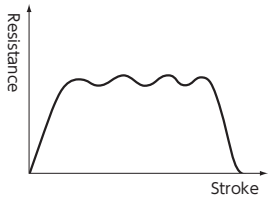
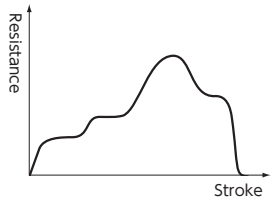
Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	637(65)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	26.5
Max. absorption energy per minute	J/min(kgf•m/min)	58.8(6)	: C type	g	27
Recovering power of the piston rod	N(kgf)	5.88(0.6)or lower			

Selection Guideline

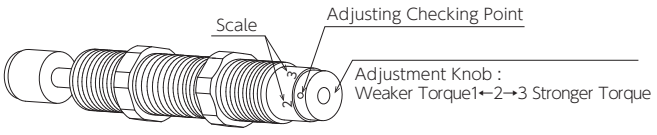
The FA-1008 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-1008VB series	FA-1008VD series	FWM-1008VBD series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020PB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



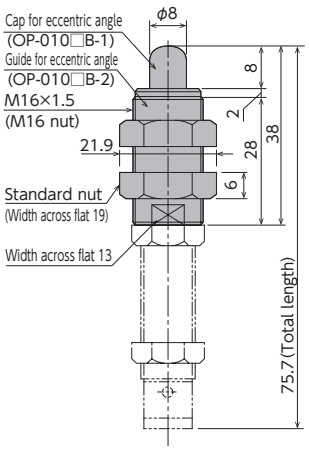
* To adjust, turn the adjustment knob.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

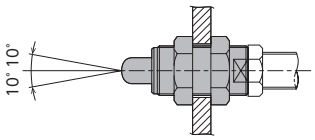
Eccentric angle adaptor OP-010PB

Model
OP-010PB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



Mass 35g

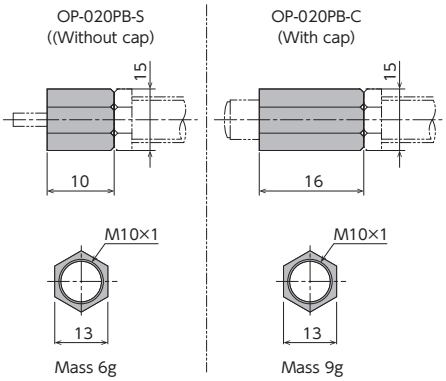


Note) Material of cap for eccentric angle: POM

Stopper nut OP-020PB-□

Model
OP-020PB-S
OP-020PB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



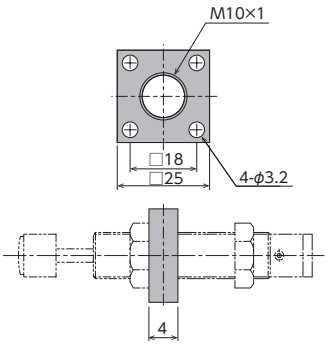
Mass 6g　　Mass 9g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Square flange OP-040PB

Model
OP-040PB

- Once the attachment site is determined, use the main unit's nut to securely fasten in place.



Mass 16g

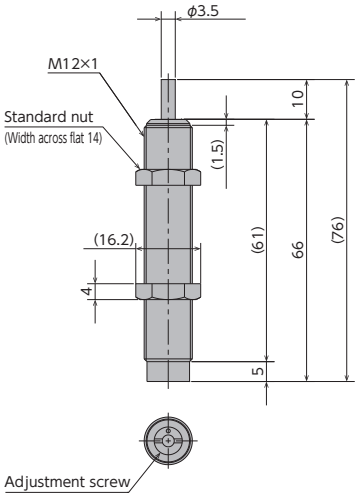
Standard nuts are sold separately as well.

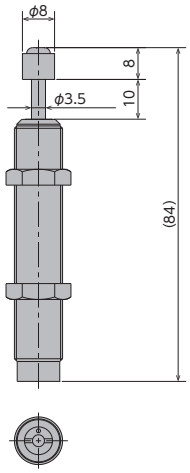
Applicable Models	Model
FA-1008VB	M10 nut
FA-1008VD	
FWM-1008VBD	

Soft Absorber

FA-1210MB/FA-1210MD/FWM-1210MBD Series







Specifications

Model	Stroke mm	Max. absorption energy J(kgf•m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-1210MB-S	10	2.94(0.3)	30(30)	0.3～1	Single-orifice type
FA-1210MB-C					
FA-1210MD-S		4.9(0.5)	4(4)	0.7～3	Multiple-orifice type
FA-1210MD-C					
FWM-1210MBD-S			30(30)	0.3～2	Multiple-varying orifice type
FWM-1210MBD-C					

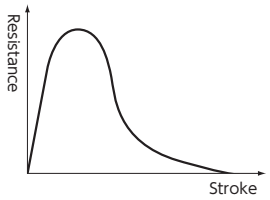
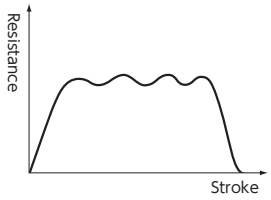
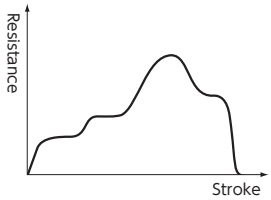
Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	1,470(150)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	44
Max. absorption energy per minute	J/min(kgf•m/min)	98(10)	: C type	g	47
Recovering power of the piston rod	N(kgf)	9.8(1.0) or lower			

Selection Guideline

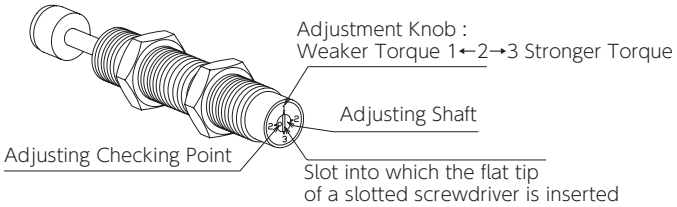
The FA-1210 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-1210MB series	FA-1210MD series	FWM-1210MBD series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020KB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



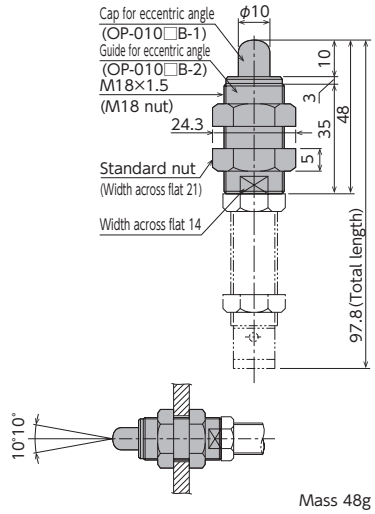
* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

Eccentric angle adaptor OP-010PB

Model
OP-010KB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



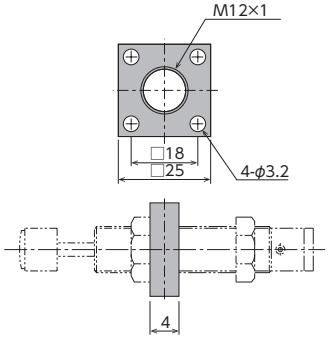
Mass 48g

Note) Material of cap for eccentric angle: POM

Square flange OP-040KB

Model
OP-040KB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

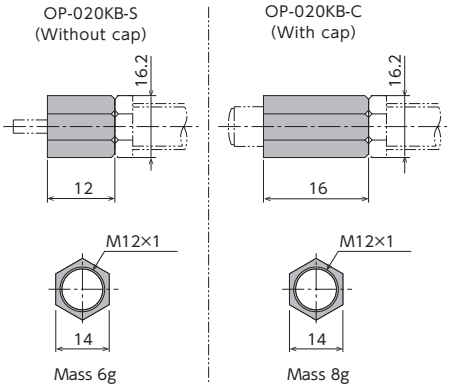


Mass 15g

Stopper nut OP-020KB- □

Model
OP-020KB-S
OP-020KB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 6g

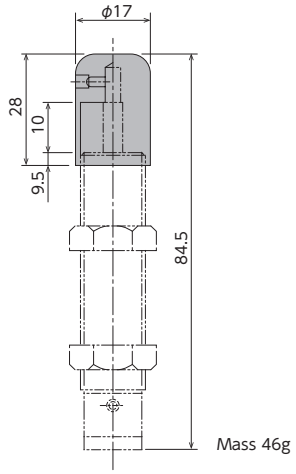
Mass 8g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap F□□-1210M□□-C-060

Model
FA-1210MB-C-060
FA-1210MD-C-060
FWM-1210MBD-C-060

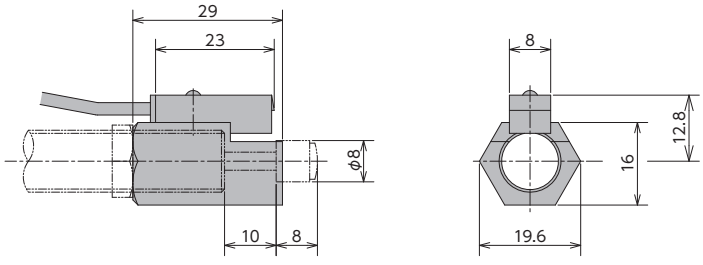
- Ideal for use in environments where oil splatter poses a problem.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-1210M□□-C-060
  - Model indication A or WM is inserted in □ of F□□.
  - Model indication B, D or BD is inserted in □ of M□□.



Mass 46g

Holder with a switch OP-030KB-2 (With a stopper function)

Model
OP-032KB



Mass 38g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

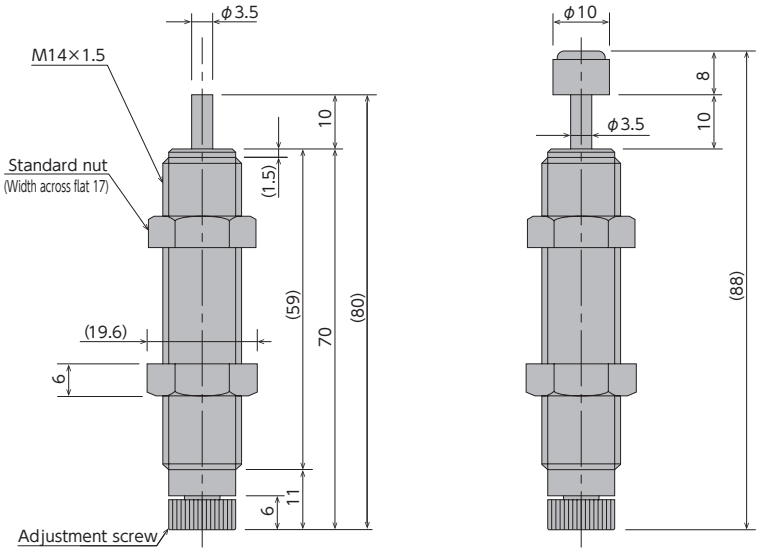
Standard nuts are sold separately as well.

Applicable Models	Model
FA-1210MB	M12 nut
FA-1210MD	
FWM-1210MBD	

Soft Absorber

FA-1410RB/FA-1410RD/FWM-1410RBD Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-1410RB-S	10	3.92(0.4)	30(30)	0.3～1	Single-orifice type
FA-1410RB-C					
FA-1410RD-S		5.88(0.6)	4.5(4.5)	0.7～3	Multiple-orifice type
FA-1410RD-C					
FWM-1410RBD-S			35(35)	0.3～2	Multiple-varying orifice type
FWM-1410RBD-C					

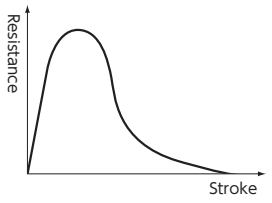
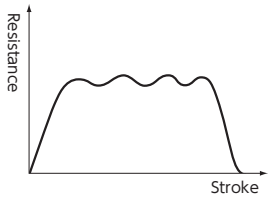
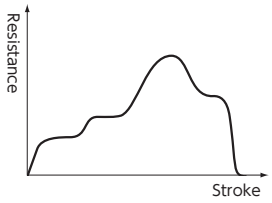
Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	1,813(185)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	68
Max. absorption energy per minute	J/min(kgf·m/min)	147(15)	: C type	g	73
Recovering power of the piston rod	N(kgf)	9.8(1.0) or lower			

Selection Guideline

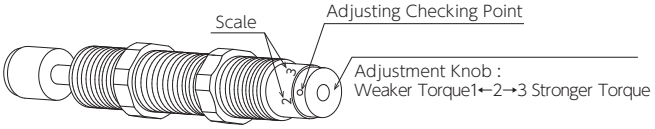
The FA-1410 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-1410RB series	FA-1410RD series	FWM-1410RBD series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorbance Properties			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020RB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



* To adjust, turn the adjustment knob located at the bottom of the main unit.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

RoHS Compliant

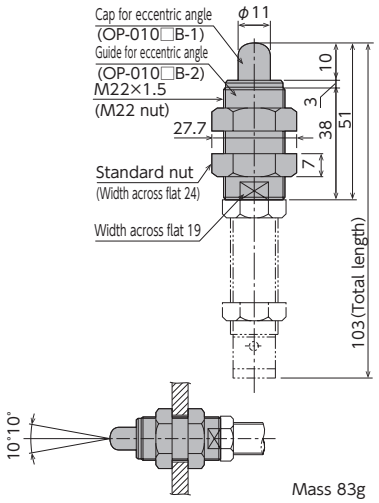
●Products specification might be changed without notice.

Optional Parts

Eccentric angle adaptor OP-010RB

Model
OP-010RB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



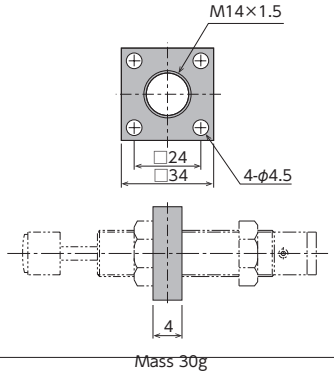
Mass 83g

Note) Material of cap for eccentric angle: POM

Square flange OP-040RB

Model
OP-040RB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

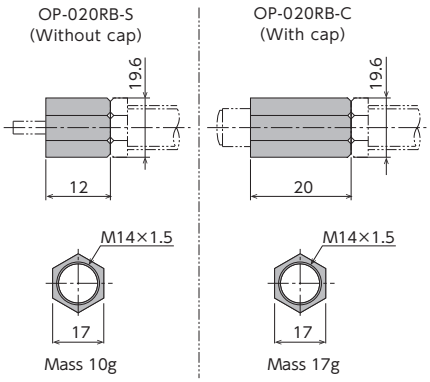


Mass 30g

Stopper nut OP-020RB- □

Model
OP-020RB-S
OP-020RB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 10g

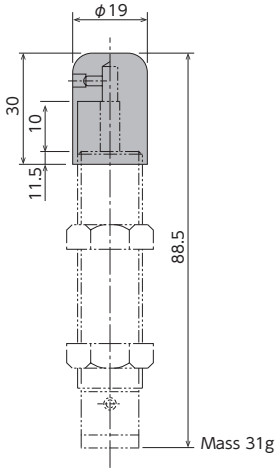
Mass 17g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap F□□-1410R □□-C-060

Model
FA-1410RB-C-060
FA-1410RD-C-060
FWM-1410RBD-C-060

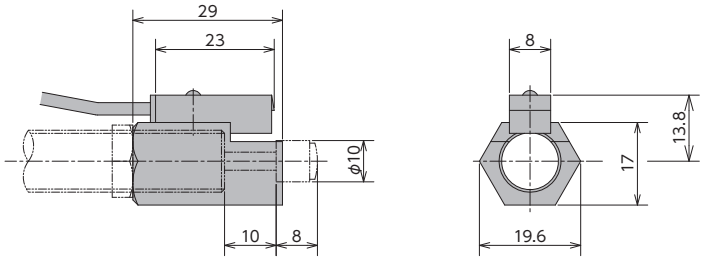
- Ideal for use in environments where oil splatter poses a problem.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-1410M□□-C-060
  - Model indication A or WM is inserted in □ of F□□.
  - Model indication B, D or BD is inserted in □ of M□□.



Mass 31g

Holder with a switch OP-030RB-2 (With a stopper function)

Model
OP-032RB



Mass 34g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

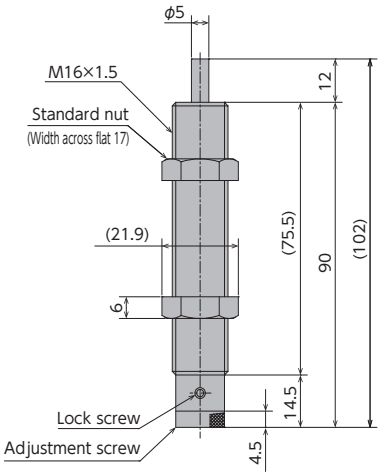
Standard nuts are sold separately as well.

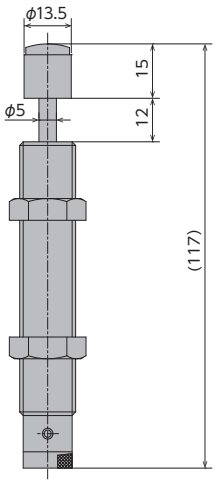
Applicable Models	Model
FA-1410RB	M14 nut
FA-1410RD	
FWM-1410RBD	

Soft Absorber

FA-1612XB/FA-1612XD/FWM-1612XBD Series







Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-1612XB-S	12	9.8(1.0)	50(50)	0.3～1	Single-orifice type
FA-1612XB-C					
FA-1612XD-S			10(10)	0.7～3	Multiple-orifice type
FA-1612XD-C					
FWM-1612XBD-S			50(50)	0.3～2	Multiple-varying orifice type
FWM-1612XBD-C					

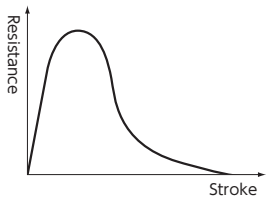
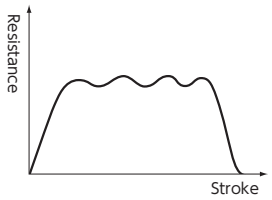
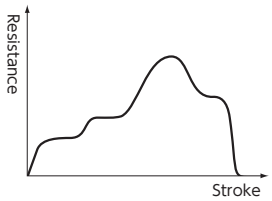
Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	2,646(270)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	108
Max. absorption energy per minute	J/min(kgf·m/min)	235(24)	: C type	g	117
Recovering power of the piston rod	N(kgf)	14.7(1.5)or lower			

Selection Guideline

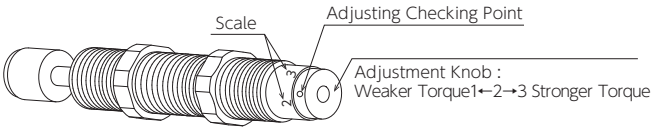
The FA-1612 series series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-1612XB series	FA-1612XD series	FWM-1612XBD series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020HB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



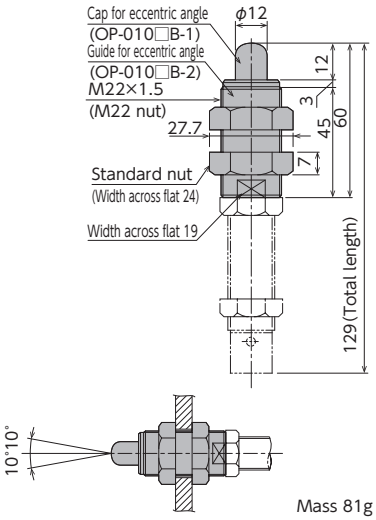
* To adjust, turn the adjustment knob located at the bottom of the main unit.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

Optional Parts

Eccentric angle adaptor OP-010XB

Model
OP-010XB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5˚ or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10˚.
- The caps and the guides for inclined use are not unbundled.



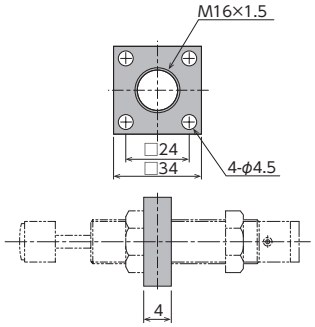
Mass 81g

Note) Material of cap for eccentric angle: POM

Square flange OP-040XB

Model
OP-040XB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

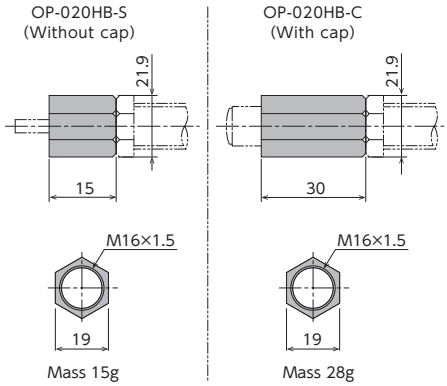


Mass 29g

Stopper nut OP-020HB

Model
OP-020HB-S
OP-020HB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 15g

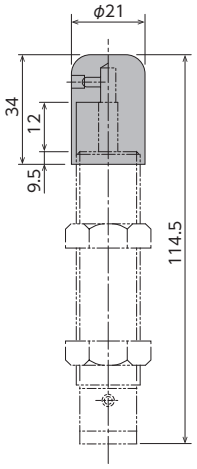
Mass 28g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap F□□-1612X□□-C-060

Model
FA-1612XB-C-060
FA-1612XD-C-060
FWM-1612XBD-C-060

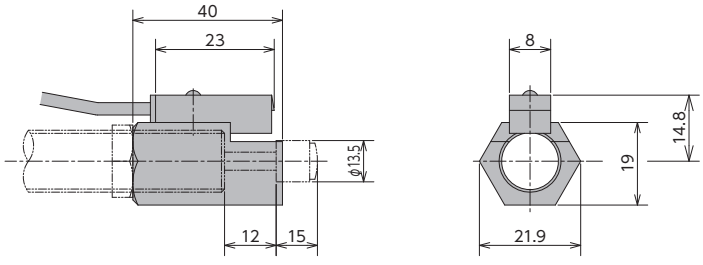
- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-16120M□□-C-060
  - Model indication A or WM is inserted in □ of F□□.
  - Model indication B, D or BD is inserted in □ of M□□.



Mass 46g

Holder with a switch OP-030HB-□

Model
OP-032HB



Mass 46g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

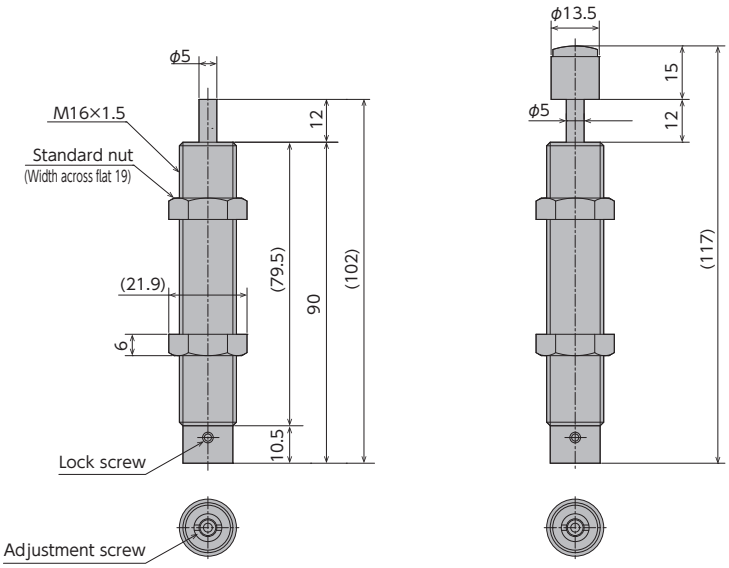
Standard nuts are sold separately as well.

Applicable Models	Model
FA-1612XB	M16 nut
FA-1612XD	
FWM-1612XBD	

Soft Absorber

FA-1612X Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-1612X1-S	12	14.7	200(200)	0.3～1	Single-orifice type
FA-1612X1-C					
FA-1612X2-S			120(120)	0.3～2	Multiple-varying orifice type
FA-1612X2-C					
FA-1612X3-S			35(35)	0.7～3	Multiple-orifice type
FA-1612X3-C					

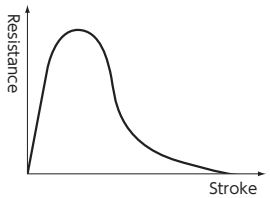
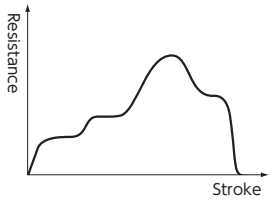
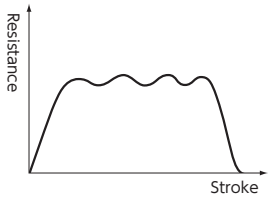
Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	3,528(360)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	98
Max. absorption energy per minute	J/min(kgf·m/min)	235(24)	: C type	g	107
Recovering power of the piston rod	N(kgf)	19.6(2.0)or lower			

Selection Guideline

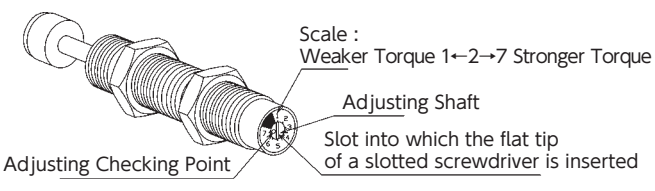
The FA-1612-FWM series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-varying orifice type	Multiple-orifice type
Model number	FA-1612X1 series	FA-1612X2 series	FA-1612X3 series
Application	For low-speed	For medium speed, in particular with a pneumatic cylinder	For high-speed
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020HB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



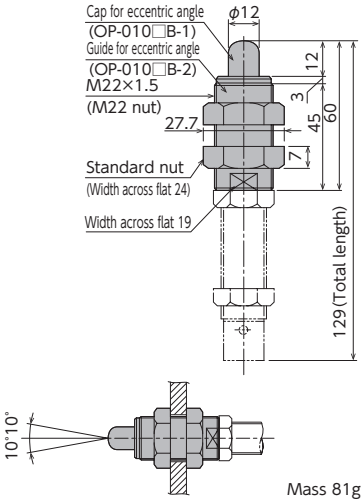
* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

Eccentric angle adaptor OP-010XB

Model
OP-010XB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



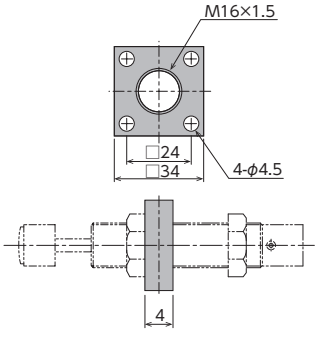
Mass 81g

Note) Material of cap for eccentric angle: POM

Square flange OP-040XB

Model
OP-040XB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

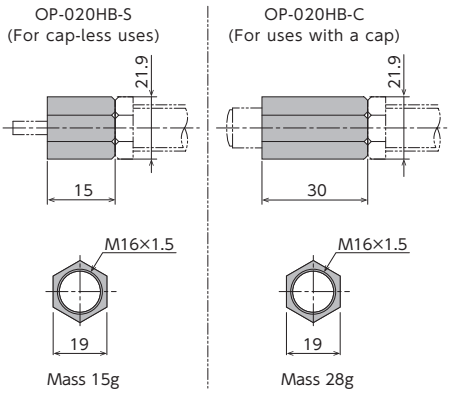


Mass 29g

Stopper nut OP-020HB

Model
OP-020HB-S
OP-020HB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 15g

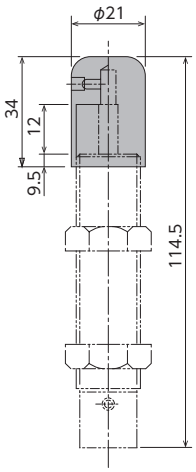
Mass 28g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap FA-1612X□-C-060

Model
FA-1612X□-C-060

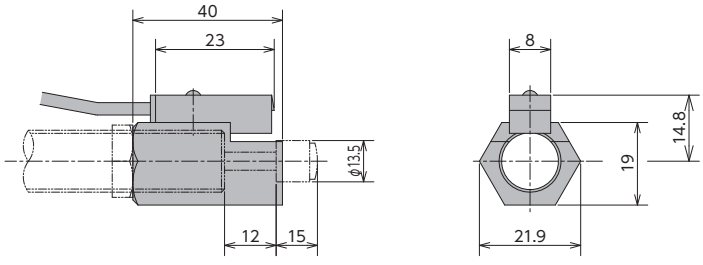
- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-16120M□□-C-060
  - The model number 1, 2, or 3 is inserted in the □ of X□.



Mass 46g

Holder with a switch OP-032HB (With a stopper function)

Model
OP-032HB



Mass 46g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

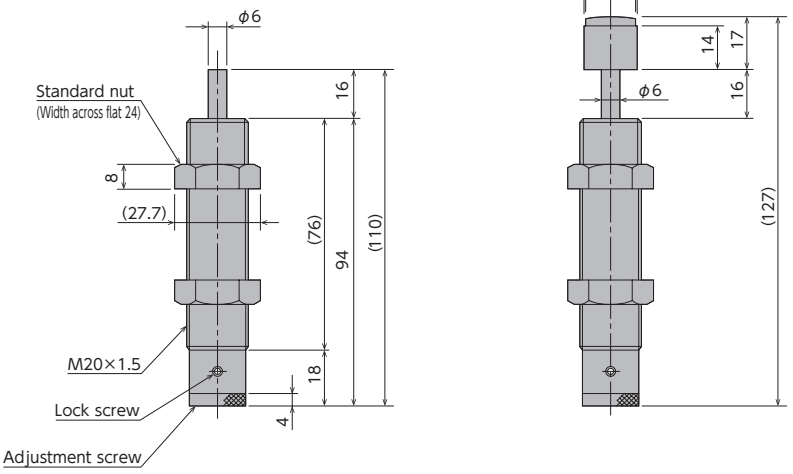
Standard nuts are sold separately as well.

Applicable Models	Model
FA-1612X	M16 nut

Soft Absorber

FA-2016EB/FA-2016ED/FWM-2016EBD Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-2016EB-S	16	29.4(3.0)	300(300)	0.3～1	Single-orifice type
FA-2016EB-C					
FA-2016ED-S			120(120)	0.7～3	Multiple-orifice type
FA-2016ED-C					
FWM-2016EBD-S			200(200)	0.3～2	Multiple-varying orifice type
FWM-2016EBD-C					

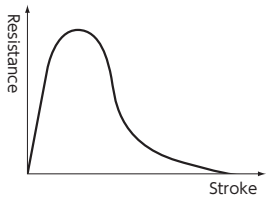
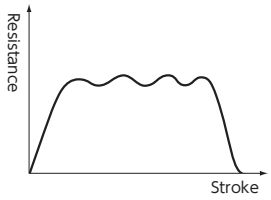
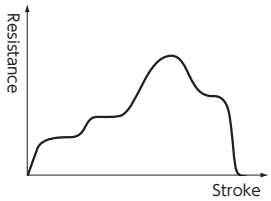
Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	3,528(360)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	180
Max. absorption energy per minute	J/min(kgf·m/min)	343(35)	: C type	g	202
Recovering power of the piston rod	N(kgf)	18.1(1.84)or lower			

Selection Guideline

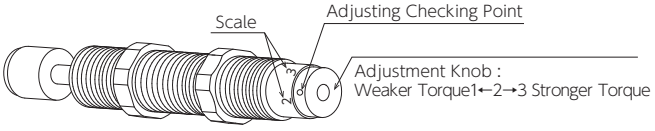
The FA-2016 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-2016EB series	FA-2016ED series	FWM-2016EBD series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020EB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



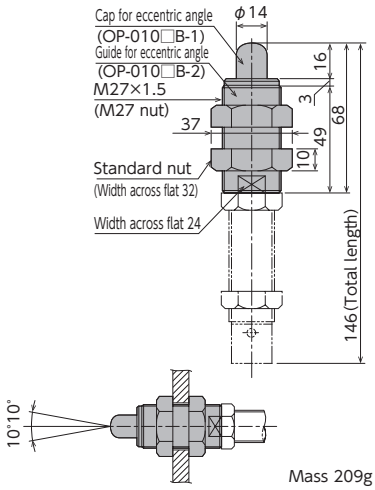
* To adjust, turn the adjustment knob located at the bottom of the main unit.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

Optional Parts

Eccentric angle adaptor OP-010EB

Model
OP-010EB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



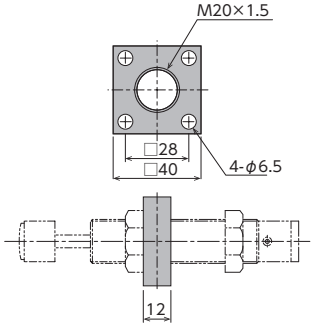
Mass 209g

Note) Material of cap for eccentric angle: Metal

Square flange OP-040EB

Model
OP-040EB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

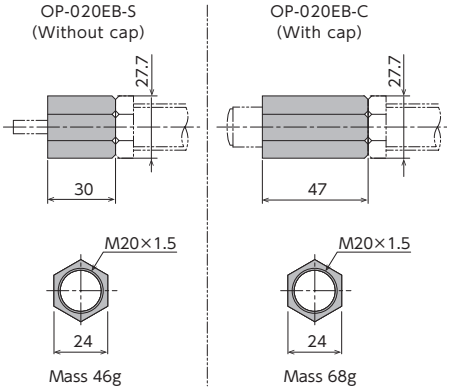


Mass 109g

Stopper nut OP-020EB-□

Model
OP-020EB-S
OP-020EB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 46g

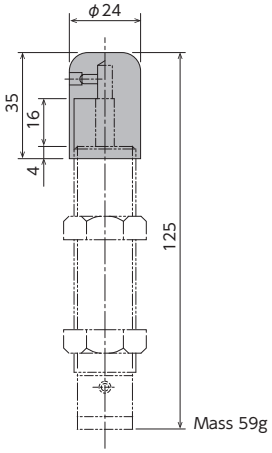
Mass 68g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap FA-2016E□-C-060

Model
FA-2016EB-C-060
FA-2016ED-C-060
FWM-2016EBD-C-060

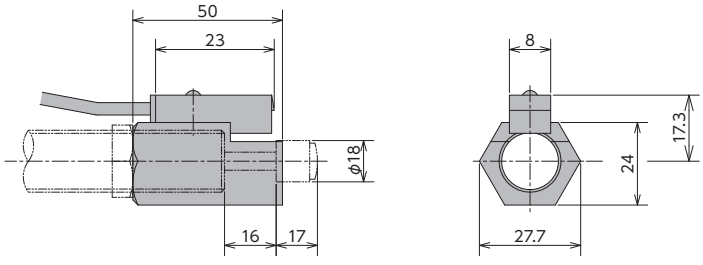
- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-16120M□□-C-060
  - Model indication A or WM is inserted in □ of F□□.
  - Model indication B, D or BD is inserted in □ of M□□.



Mass 59g

Holder with a switch OP-030EB-□

Model
OP-032EB



Mass 80g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

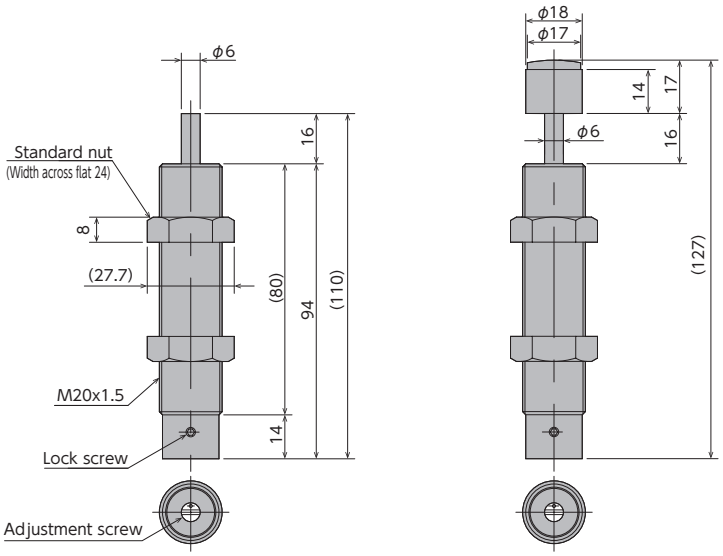
Standard nuts are sold separately as well.

Applicable Models	Model
FA-2016EB	M20 nut
FA-2016ED	
FWM-2016EBD	

Soft Absorber

FA-2016E Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-2016E1-S	16	35(3.57)	300(300)	0.3～1	Single-orifice type
FA-2016E1-C					
FA-2016E2-S			200(200)	0.3～2	Multiple-varying orifice type
FA-2016E2-C					
FA-2016E3-S			120(120)	0.7～3	Multiple-orifice type
FA-2016E3-C					

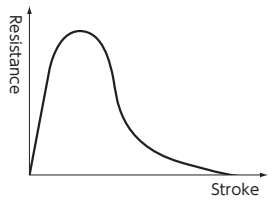
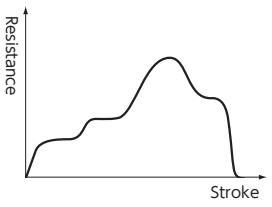
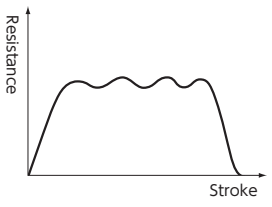
Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	6,370(650)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	185
Max. absorption energy per minute	J/min(kgf·m/min)	343(35)	: C type	g	207
Recovering power of the piston rod	N(kgf)	18.1(1.84)or lower			

Selection Guideline

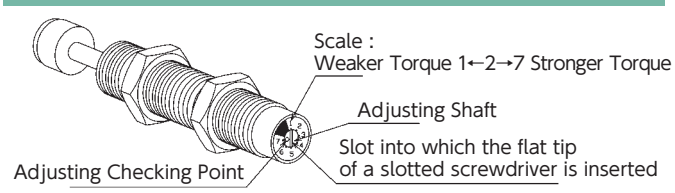
The FA-2016 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-varying orifice type	Multiple-orifice type
Model number	FA-2016E1 series	FA-2016E2 series	FA-2016E3 series
Application	For low-speed	For medium speed, in particular with a pneumatic cylinder	For high-speed
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020EB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



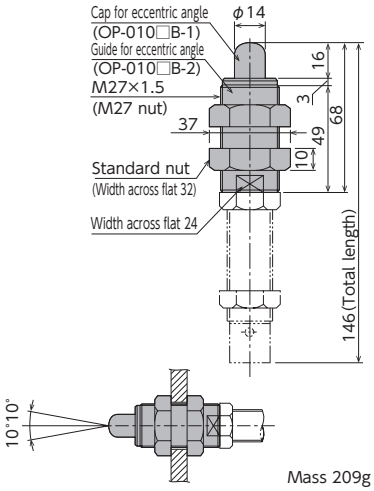
* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

Eccentric angle adaptor OP-010EB

Model
OP-010EB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



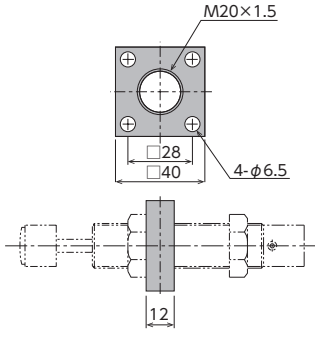
Mass 209g

Note) Material of cap for eccentric angle: Metal

Square flange OP-040EB

Model
OP-040EB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

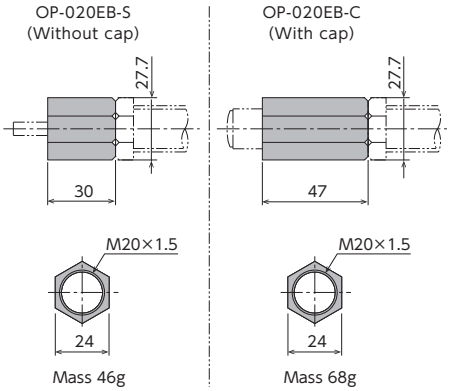


Mass 109g

Stopper nut OP-020EB-□

Model
OP-020EB-S
OP-020EB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 46g

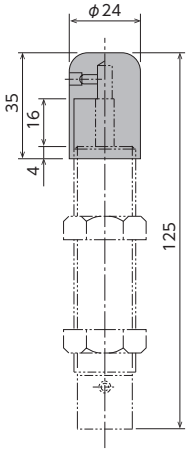
Mass 68g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap FA-2016E□-C-060

Model
FA-2016E□-C-060

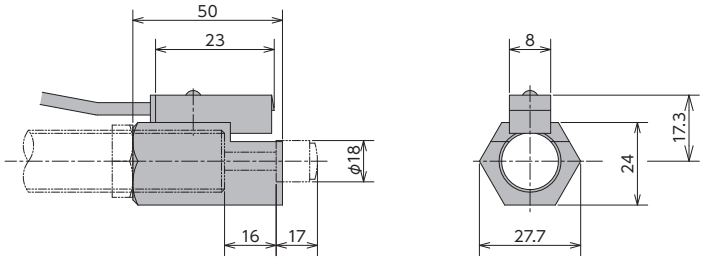
- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-16120M□□-C-060
  - The model number 1, 2, or 3 is inserted in the □ of X□.



Mass 59g

Holder with a switch OP-030EB-□

Model
OP-032EB



Mass 80g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

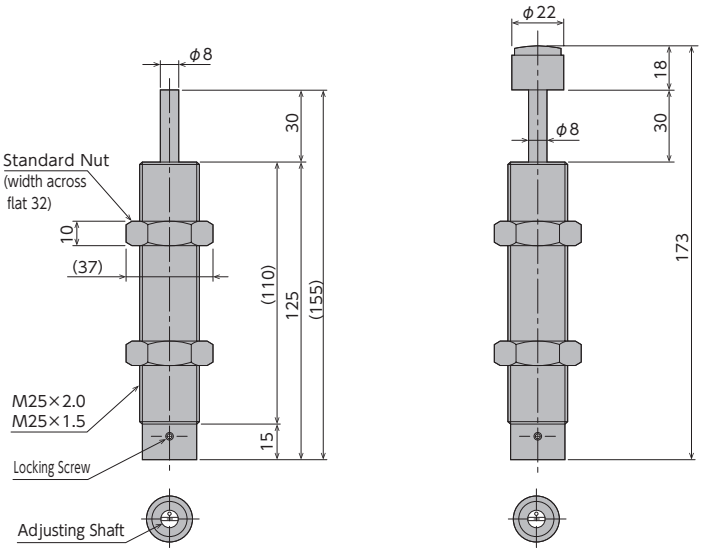
Standard nuts are sold separately as well.

Applicable Models	Model
FA-2016E	M20 nut

Soft Absorber

FA-2530GB/FA-2530GD/FWM-2530GBD Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf•m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-2530GB-S ▲	30	49(5.0)	400(400)	0.3～1	Single-orifice type
FA-2530GB-C ▲					
FA-2530GD-S ▲			150(150)	0.7～3	Multiple-orifice type
FA-2530GD-C ▲					
FWM-2530GBD-S ▲			300(300)	0.3～2	Multiple-varying orifice type
FWM-2530GBD-C ▲					

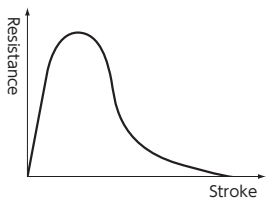
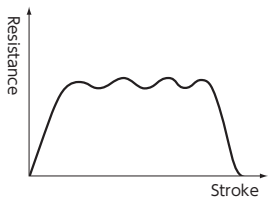
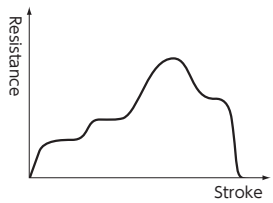
▲ Thread pitch P2.0 is supplied as well.
Note) To place an order without a cap, put –S at the end of the model number, and to place an order with a cap, put –C at the end of the model number.
Note: M25 x 2.0 is included in main unit thread pitch specification for FA-2530. A designation shall include the model symbols such as FA-2530GB- * -P2.0, FA-2530GD- * -P2.0, FWM-2530GBD- *-P2.0, etc. for ordering. Note: "*" will be filled in with "-S" or "-C"

Common Specifications

Max. drag	N(kgf)	3,920(400)	Operating temperature	℃	–5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	406
Max. absorption energy per minute	J/min(kgf•m/min)	490(50)	: C type	g	436
Recovering power of the piston rod	N(kgf)	33.2(3.38)or lower			

Selection Guideline

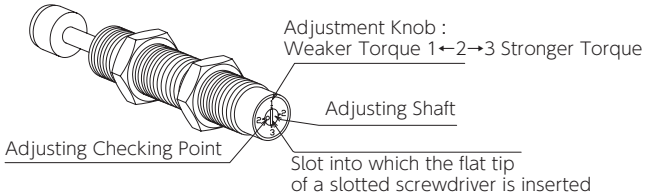
The FA-2530 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-2530GB series	FA-2530GD series	FWM-2530GBD series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020GB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

RoHS Compliant

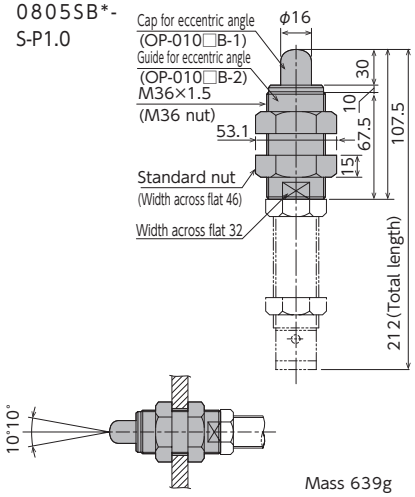
●Products specification might be changed without notice.

Optional Parts

Eccentric angle adaptor OP-010GB

Model
OP-010GB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.
- The inclined adapter is not available for FA-0805SB*-S-P1.0



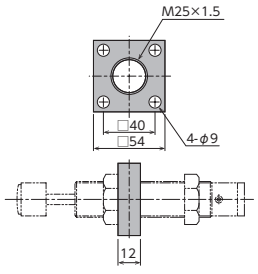
Mass 639g

Note) Material of cap for eccentric angle: Metal

Square flange OP-040GB

Model
OP-040GB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

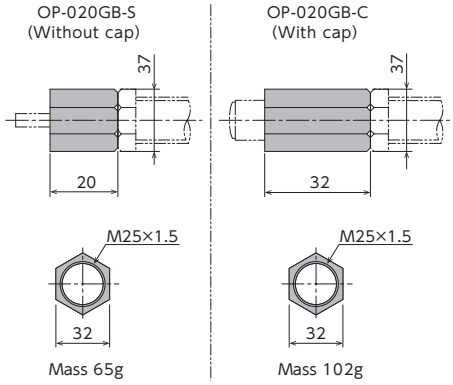


Mass 206g

Stopper nut OP-020GB-□

Model
OP-020GB-S
OP-020GB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



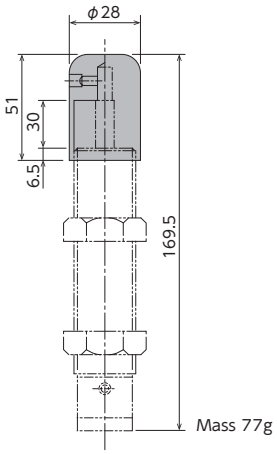
Mass 65g　Mass 102g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.
M25 X 2.0 is also available as a screw pitch specification.
Model number is either OP-020GB-S or C-P2.0

Liquid-proof cap F□□-2530G□□-C-060

Model
FA-2530GB-C-060
FA-2530GD-C-060
FWM-2530GBD-C-060

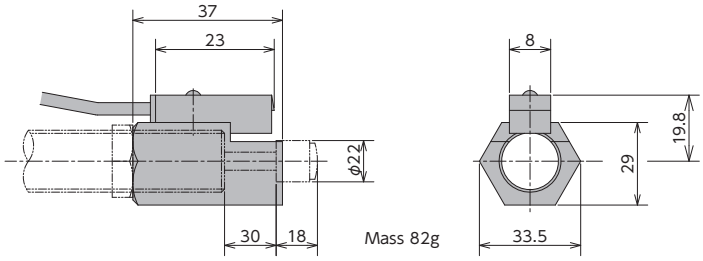
- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-2530G□□-C-060
  - Model indication A or WM is inserted in □ of F□□.
  - Model indication B, D or BD is inserted in □ of M□□.



Mass 77g

Holder with a switch OP-030GB-□

Model
OP-032GB



Mass 82g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

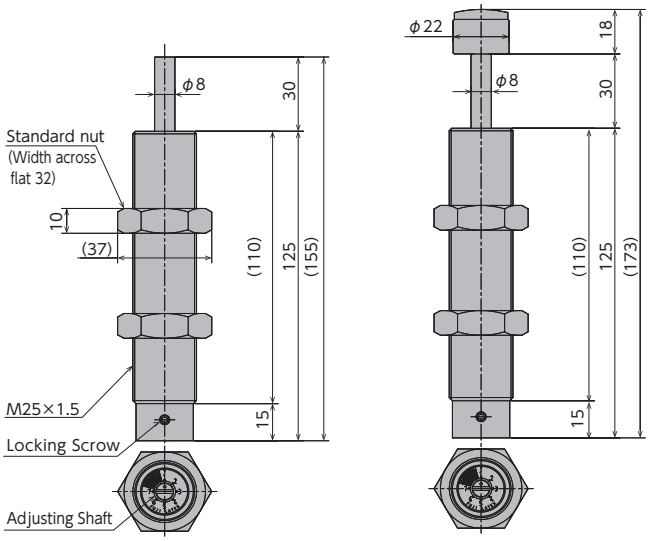
Standard nuts are sold separately as well.

Applicable Models	Model
FA-2530GB	M25 nut
FA-2530GD	
FWM-2530GBD	
FA-2530GB P2.0	M25-P2 nut
FA-2530GD P2.0	
FWM-2530GBD P2.0	

Soft Absorber

FA-2530G/FA-2530SL Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf•m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-2530G1-S	30	49(5.0)	400(400)	0.3～1	Single-orifice type
FA-2530G1-C					
FA-2530G2-S		58.8(6.0)	300(300)	0.3～2	Multiple-varying orifice type
FA-2530G2-C					
FA-2530G3-S			150(150)	0.7～3	Multiple-orifice type
FA-2530G3-C					
FA-2530SL-S		49(5.0)	4,150(4,150)	0.05～0.5	Multiple-varying orifice type
FA-2530SL-C					

Note) To place an order without a cap, put -S at the end of the model number, and to place an order with a cap, put -C at the end of the model number.

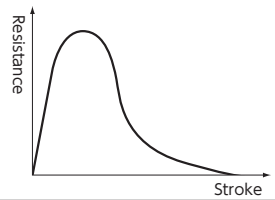
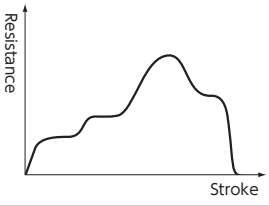
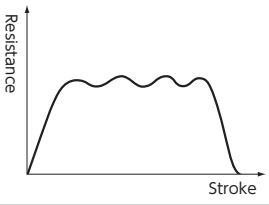
Common Specifications

Max. drag	N(kgf)	6,370(650)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	388
Max. absorption energy per minute	J/min(kgf•m/min)	490(50)	: C type	g	418
Recovering power of the piston rod	N(kgf)	30.8(3.14)or lower			

Note) M25 X 2.0 is also available as the main unit' s screw pitch specifications for the FA-2530 series. Please your order using the model number FA-2530G*-S-P2.0 or FA-2530G*-C-P2.0.pitch specifications for the FA-2530 series. Please your order using the model number FA-2530G*-S-P2.0 or FA-2530G*-C-P2.0.

Selection Guideline

TThe FA-2530 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

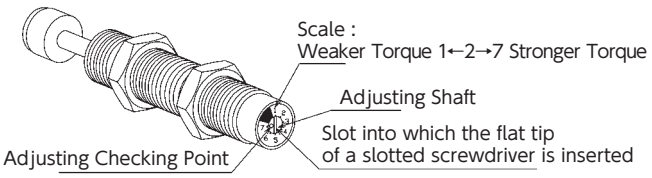
Orifice type	Single-orifice type	Multiple-varying orifice type	Multiple-orifice type
Model number	FA-2530G1 series	FA-2530G2, SL series	FA-2530G3 series
Application	For low-speed	For medium speed, in particular with a pneumatic cylinder	For high-speed
Absorption characteristics			

* The super low speed models are applicable for a lower collision speed range than low speed models.

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020GB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



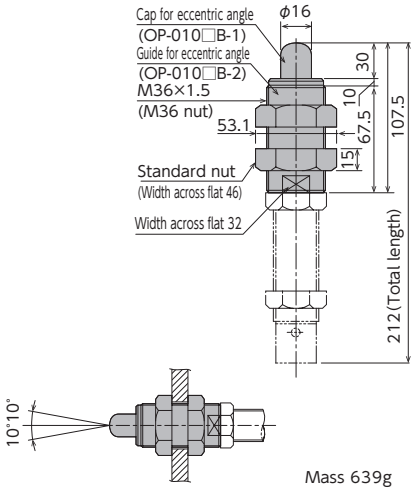
* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

Eccentric angle adaptor OP-010GB

Model
OP-010GB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



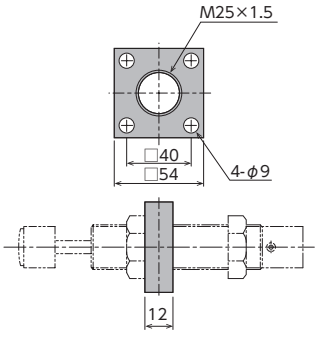
Mass 639g

Note) Material of cap for eccentric angle: Metal

Square flange OP-040GB

Model
OP-040GB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

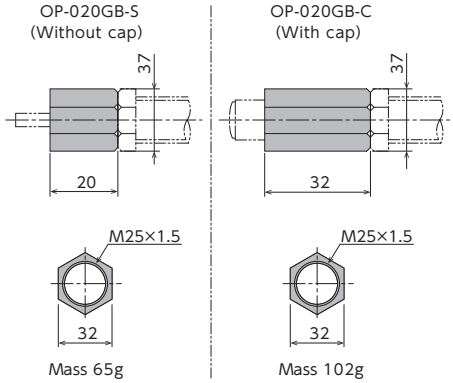


Mass 206g

Stopper nut OP-020GB-□

Model
OP-020GB-S
OP-020GB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 65g

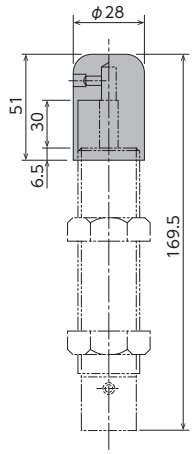
Mass 102g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap F□□-2530G□□-C-060

Model
FA-2530G1-C-060
FA-2530G2-C-060
FA-2530G3-C-060
FA-2530SL-C-060

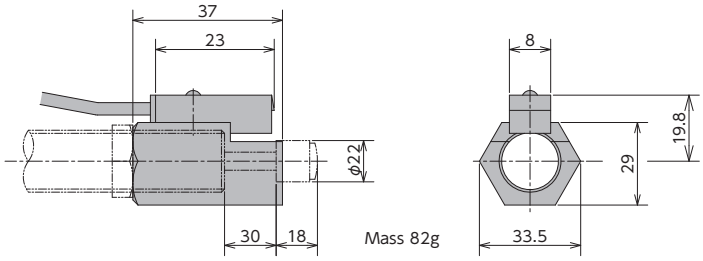
- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- FA-2530G□-C-060
  - The model number 1, 2, or 3 is inserted in the □ of X□.



Mass 77g

Holder with a switch OP-030GB-□

Model
OP-032GB



Mass 82g

- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

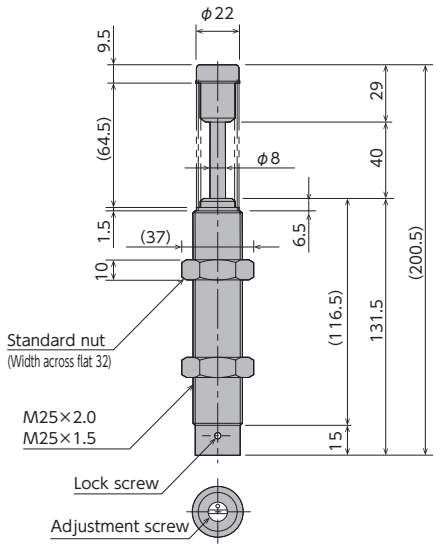
Standard nuts are sold separately as well.

Applicable Models	Model
FA-2530G	M25 nut
FA-2530SL	

Soft Absorber

FA-2540LB/FA-2540LD/FWM-2540LBD Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-2540LB-C ▲	40	63.7(6.5)	500(500)	0.3～1	Single-orifice type
FA-2540LD-C ▲			200(200)	0.7～3	Multiple-orifice type
FWM-2540LBD-C ▲			350(350)	0.3～2	Multiple-varying orifice type

▲ Thread pitch P2.0 is supplied as well.

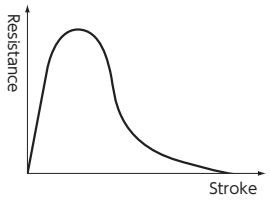
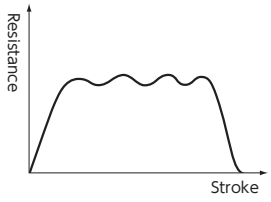
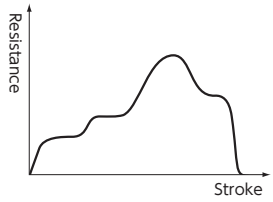
Common Specifications

Max. drag	N(kgf)	3,920(400)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : C type	g	475.1
Max. absorption energy per minute	J/min(kgf·m/min)	637(65)			
Recovering power of the piston rod	N(kgf)	71.4(7.29)or lower			

Note) M25 X 2.0 is also available as the main unit's screw pitch specifications for the FA-2540 series. Please order using the model number FA-2540L*-C-P.2.0. However, please note that there are no optional parts for it.

Selection Guideline

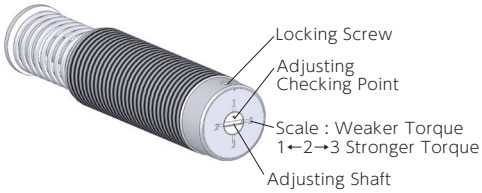
The FA-FWM-2540 series series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-2540LB series	FA-2540LD series	FWM-2540LBD series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics			

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020LB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



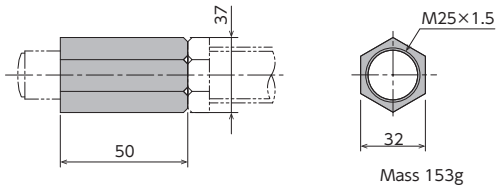
* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

Stopper nut OP-020LB

Model
OP-020LB

● Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



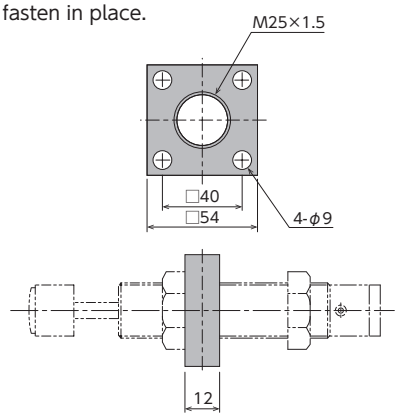
Mass 153g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Square flange OP-040GB

Model
OP-040GB

● Once the attachment site is determined, use the main unit's nut to securely fasten in place.



Mass 206g

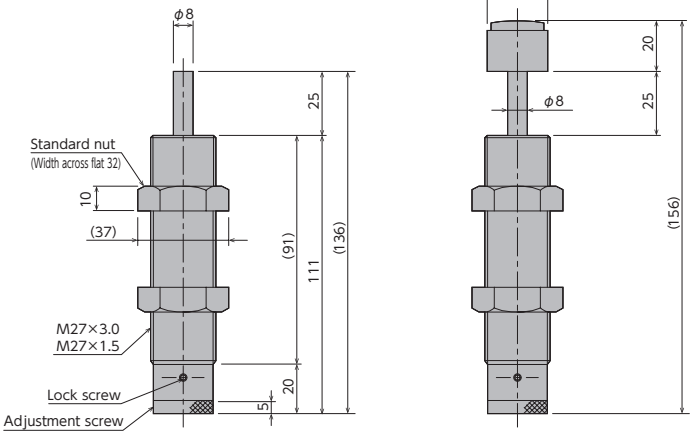
Standard nuts are sold separately as well.

Applicable Models	Model
FA-2540LB	M25 nut
FA-2540LD	
FWM-2540LBD	
FA-2540LB P2.0	M25-P2 nut
FA-2540LD P2.0	
FWM-2540LBD P2.0	

Soft Absorber

FA-2725FB/FA-2725FD/FWM-2725FBD/FA-2725SL Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-2725FB-S ▲	25	79.3(8.1)	650(650)	0.3～1	Single-orifice type
FA-2725FB-C ▲					
FA-2725FD-S ▲			300(300)	0.7～3	Multiple-orifice type
FA-2725FD-C ▲					
FWM-2725FBD-S ▲			450(450)	0.3～2	Multiple-varying orifice type
FWM-2725FBD-C ▲					
FA-2725SL-S ▲			5,000(5,000)	0.05～0.5	Multiple-varying orifice type
FA-2725SL-C ▲					

▲ Thread pitch P3.0 is supplied as well.

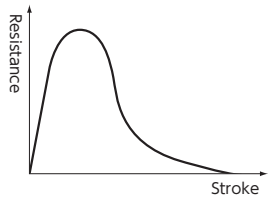
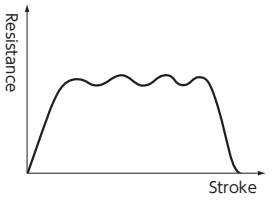
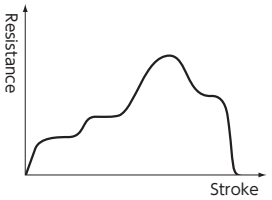
Common Specifications

Max. drag	N(kgf)	6,370(650)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	60	Mass : S type	g	411
Max. absorption energy per minute	J/min(kgf·m/min)	539(55)	: C type	g	460
Recovering power of the piston rod	N(kgf)	27.3(2.78) or lower			

Note) M27X3.0 is also available as the main unit's screw pitch specification for the FA-2725 series. Please order using the model number FA-2725F*-S-P3.0 or FA-2725F*-C-P3.0.
Note: "*" will be filled in with "-S" or "-C"
Note: The maximum operation cycle of FA-2725SL is 30 (cycle/min). Note: The piston rod returning force of FA-2725SL is lower than 40.6N (4.14 kgf).

Selection Guideline

The FA-FWM-2725 series series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

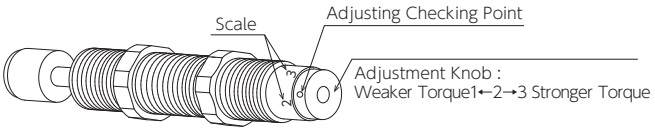
Orifice type	Single-orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-2725FB series	FA-2725FD series	FWM-2725FBD, FA-2725SL series
Application	For low-speed	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics			

* The super low speed models are applicable to a collision speed range lower than that of low speed models.

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020FB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



To adjust, turn the adjustment knob located at the bottom of the main unit.

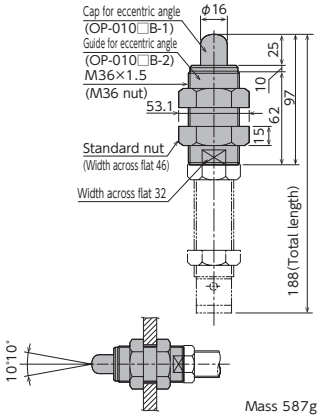
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

Optional Parts

Eccentric angle adaptor OP-010FB

Model
OP-010FB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.

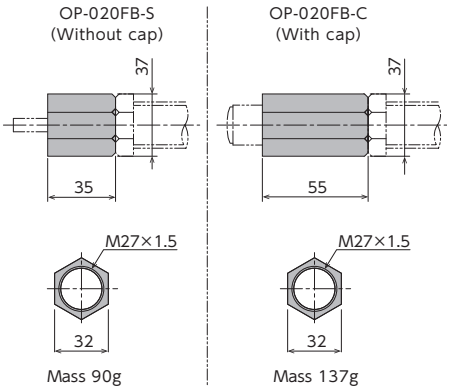


Note) Material of cap for eccentric angle: Metal

Stopper nut OP-020FB-□

Model
OP-020FB-S
OP-020FB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.

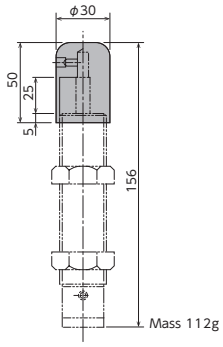


Note) When attaching, make sure that the side without a bearing chamfer is the impact surface. M27 X 3.0 is also available as a screw pitch specification. Model number is either OP-020FB-S or C-P3.0

Liquid-proof cap F□□-2725F□□-C-060

Model
FA-2725FB-C-060
FA-2725FD-C-060
FWM-2725FBD-C-060
FA-2725SL-C-060

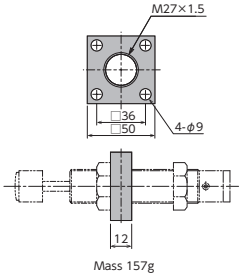
- A drip-proof cap is fitted on the unit on delivery.
- Liquid-proof caps are not sold separately.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-2725F□□-C-060
  - Model indication A or WM is inserted in □ of F□□.
  - Model indication B, D or BD is inserted in □ of M□□.



Square flange OP-040FB

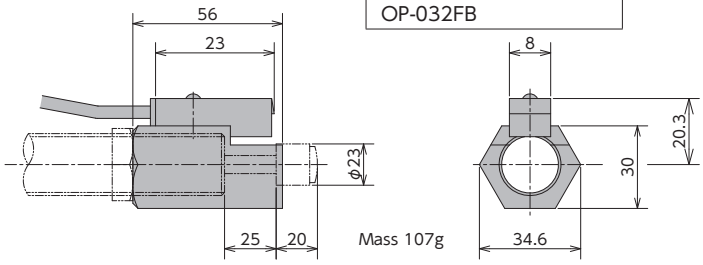
Model
OP-040FB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.



Holder with a switch OP-030FB-□

Model
OP-032FB



- Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit's model number when placing an order.
- For switch specifications and precautions for use, please refer to page 23.

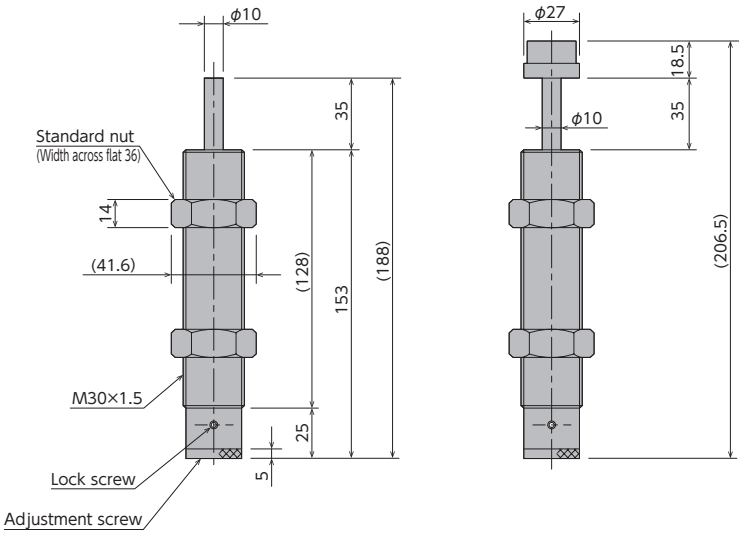
Standard nuts are sold separately as well.

Applicable Models	Model
FA-2725FB	M27 nut
FA-2725FD	
FWM-2725FBD	
FA-2725SL	
FA-2725FB P3.0	M27-P3 nut
FA-2725FD P3.0	
FWM-2725FBD P3.0	
FA-2725SL P3.0	

Soft Absorber

FA-3035TD/FWM-3035TBD/FA-3035SL Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-3035TD-S	35	196(20)	700(700)	0.7～3	Multiple-orifice type
FA-3035TD-C					
FWM-3035TBD-S			1,300(1,300)	0.3～2	Multiple-varying orifice type
FWM-3035TBD-C					
FA-3035SL-S			30,000(30,000)	0.05～0.5	Multiple-varying orifice type
FA-3035SL-C					

Note) To place an order without a cap, put –S at the end of the model number, and to place an order with a cap, put –C at the end of the model number.

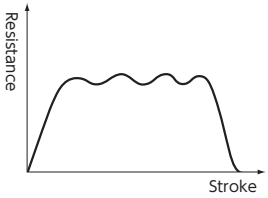
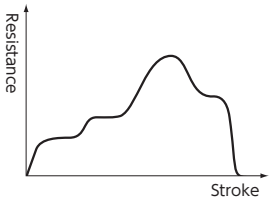
Common Specifications

Max. drag	N(kgf)	16,660(1,700)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	30	Mass : S type	g	710
Max. absorption energy per minute	J/min(kgf·m/min)	1,176(120)	: C type	g	760
Recovering power of the piston rod	N(kgf)	60(6.1)or lower			

Note: The maximum operation cycle of FA-3035SL is 15 (cycle/min).

Selection Guideline

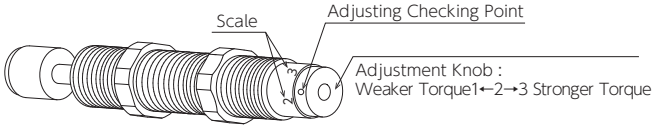
FA-3035 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-3035TD series	FWM-3035TBD, FA-3035SL series
Application	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics		

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020TB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



To adjust, turn the adjustment knob located at the bottom of the main unit.

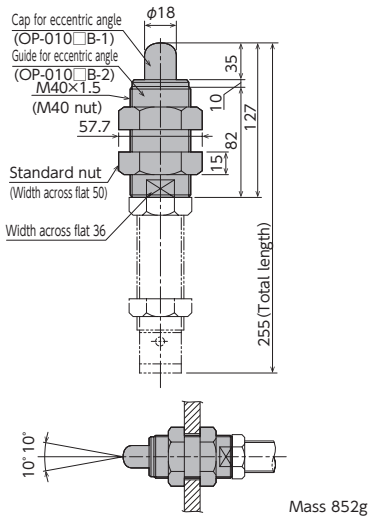
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

Optional Parts

Eccentric angle adaptor OP-010TB

Model
OP-010TB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5° or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10°.
- The caps and the guides for inclined use are not unbundled.



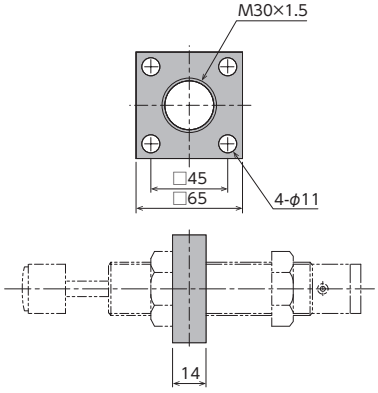
Mass 852g

Note) Material of cap for eccentric angle: Metal

Square flange OP-040TB

Model
OP-040TB

- Once the attachment site is determined, uset he main unit's nut to securely fasten in place.

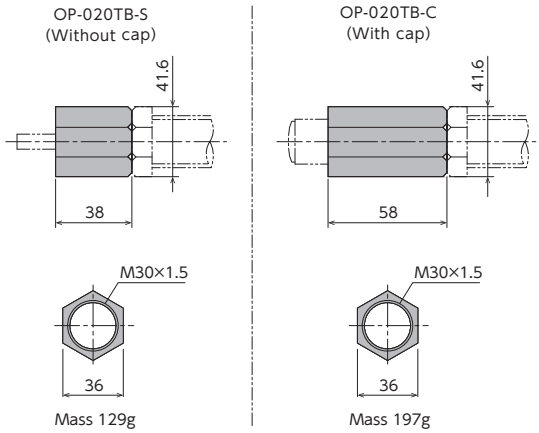


Mass 344g

Stopper nut OP-020TB-□

Model
OP-020TB-S
OP-020TB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.



Mass 129g

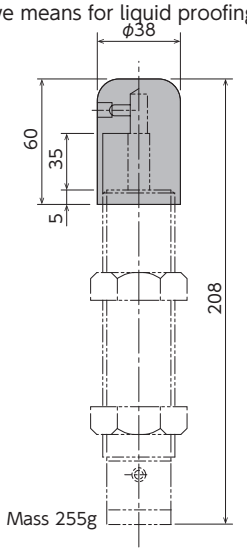
Mass 197g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Liquid-proof cap F□□-3035T□□-C-060

Model
FA-3035TD-C-060
FWM-3035TBD-C-060

- Supplied in assembly
- Ideal for use in environments where oil splatter poses a problem.
- Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
- F□□-3035T□□-C-060
  - Model indication A or WM is inserted in □ of F□□.
  - Model indication D or BD is inserted in □ of T□□.



Note) Liquid-proof caps are not sold separately

Mass 255g

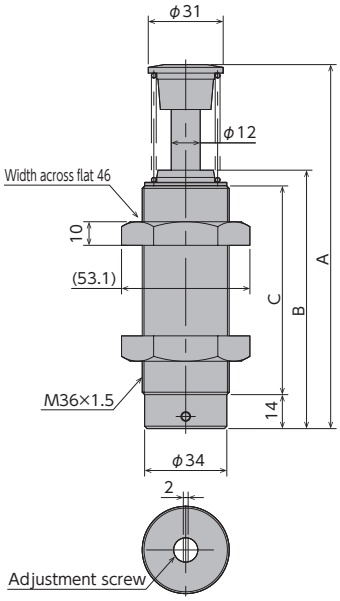
Standard nuts are sold separately as well.

Applicable Models	Model
FA-3035TD	M30 nut
FWM-3035TBD	
FA-3035SL	

Soft Absorber

FA-3625A/FA-3650A/FA-3625SL/FA-3650SL Series





Dimensions

Model	A	B	C
FA-3625A1/A3/SL-C	150	106.5	86
FA-3650A2/A3/SL-C	217	148.5	128

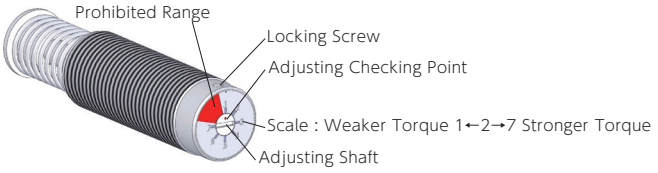
Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max.cycle rate cycle/min	Absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g
FA-3625A1-C	25	200(20.4)	2,000(2,000)	0.3～1.0	25,000 (2,551)	30	1,500(153)	100(10.2) or lower	−5～70	780
FA-3625A3-C			700(700)	0.7～3.0						
FA-3625SL-C			62,500(62,500)	0.05～0.5		15				
FA-3650A2-C	50	400(40.8)	2,700(2,700)	0.3～2.0		30	2,352(240)	120(12.2) or lower		980
FA-3650A3-C			1,400(1,400)	0.7～3.0						
FA-3650SL-C			124,800(124,800)	0.05～0.5		15				

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020M36) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



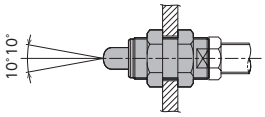
* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

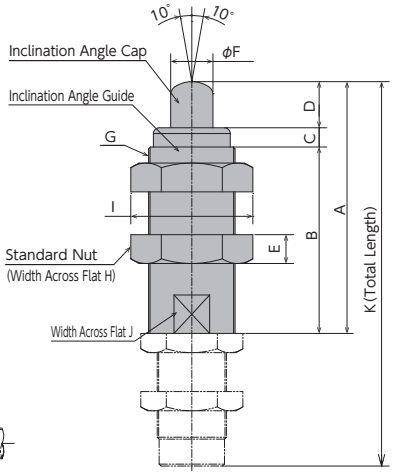
Optional Parts

Inclination angle Adapter OP-010-M3625/M3650

Model
OP-010-M3625
OP-010-M3650

- Screw an inclination angle adapter in the main unit until the backlash between the inclination angle cap and the piston rod is eliminated, and securely tighten the nut for the main unit at that position.
- For an inclination angle 2.5°≦
- The inclination angle guide can be used as a stopper as well
- The soft absorber cannot be used with an optional urethane cap on.
- The maximum inclination angle for use with inclination angle adapter is ± 10°
- The caps and the guides for inclined use are not unbundled.





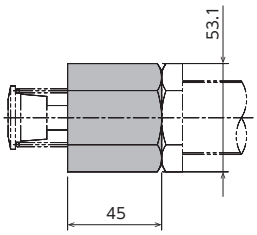
Model	A	B	C	D	ϕF	E	K	G	H	I	J	Mass g
OP-010-M3625	131	107	10	24	22	15	200	M45×1.5	55	63.5	41	880
OP-010-M3650	201	152	10	29			312					1,270

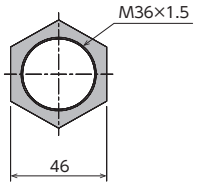
Stopper nut OP-020M36

Model
OP-020M36

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit' s nut until secured.

OP-020M36





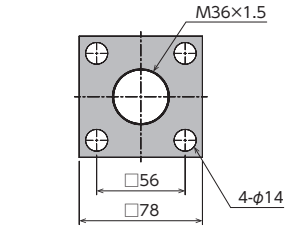
Mass 291g

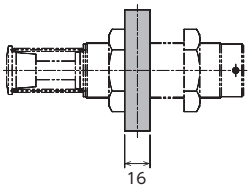
Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Square flange OP-040UB

Model
OP-040UB

- Once the attachment site is determined, uset he main unit' s nut to securely fasten in place.



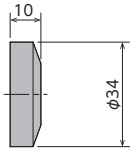


Mass 566g

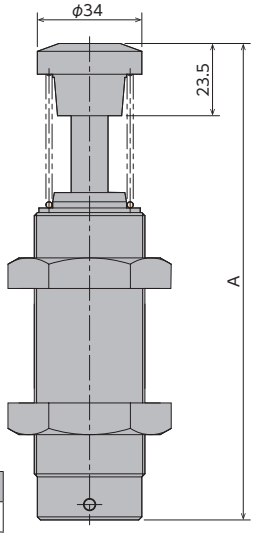
Urethane cap OP-090M36B

Model
OP-090M36B

OP-090M36B



Mass 7g



Model	A Dimensions
FA-3625A1/A3/SL-C	155
FA-3650A2/A3/SL-C	222

Dimensions with urethane cap attached

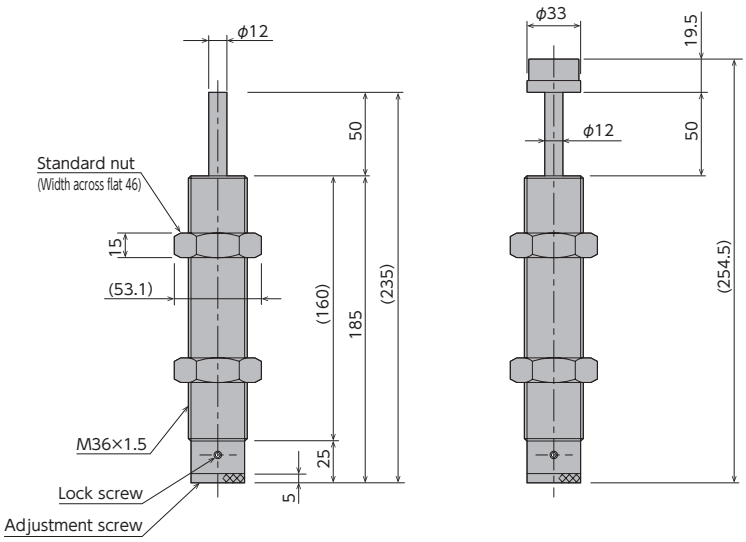
Standard nuts are sold separately as well.

Applicable Models	Model
FA-3625A	M36A nut
FA-3625SL	
FA-3650A	
FA-3650SL	

Soft Absorber

FA-3650UD/FWM-3650UBD Series





Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Range of impact rate m/s	Orifice type
FA-3650UD-S	50	392(40)	1,400(1,400)	0.7～3	Single-orifice type
FA-3650UD-C					
FWM-3650UBD-S			2,700(2,700)	0.3～2	Multiple-varying orifice type
FWM-3650UBD-C					

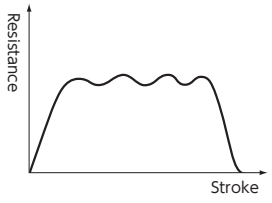
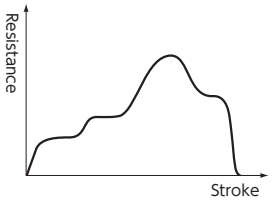
Note) To place an order without a cap, put –S at the end of the model number, and to place an order with a cap, put –C at the end of the model number.

Common Specifications

Max. drag	N(kgf)	23,520(2,400)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	30	Mass : S type	g	1,330
Max. absorption energy per minute	J/min(kgf·m/min)	2,352(240)	: C type	g	1,410
Recovering power of the piston rod	N(kgf)	68.6(7.0)or lower			

Selection Guideline

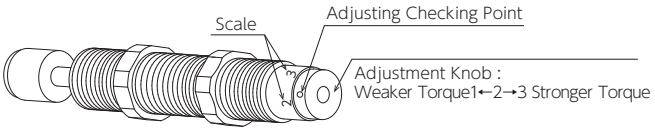
FA-3650 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-3650UD series	FWM-3650UBD series
Application	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics		

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020UB) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)

Adjustment Method



To adjust, turn the adjustment knob located at the bottom of the main unit.

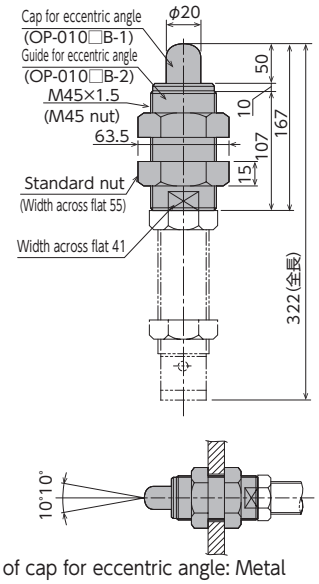
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

Optional Parts

Eccentric angle adaptor OP-010UB

Model
OP-010UB

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit' s nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5˚ or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10˚.
- The caps and the guides for inclined use are not unbundled.



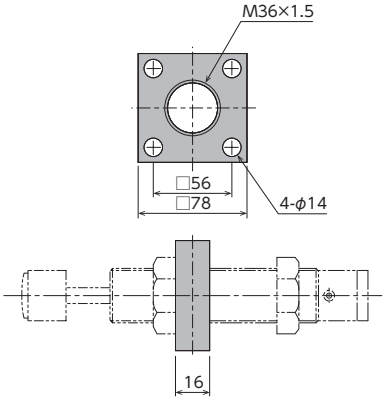
Mass 1,273g

Note) Material of cap for eccentric angle: Metal

Square flange OP-040UB

Model
OP-040UB

- Once the attachment site is determined, uset he main unit' s nut to securely fasten in place.

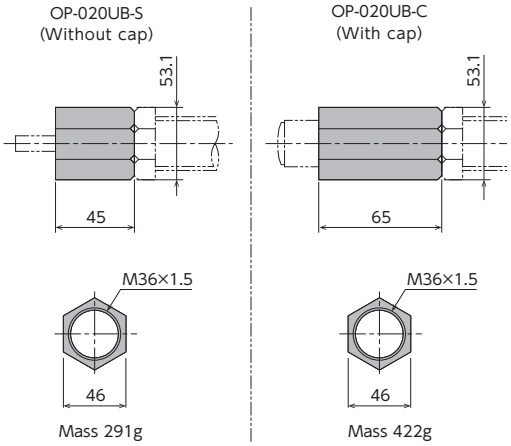


Mass 566g

Stopper nut OP-020UB- □

Model
OP-020UB-S
OP-020UB-C

- Adjust so that it stops 1mm before thestroke end, and fasten with the main unit' s nut until secured.



Mass 291g

Mass 422g

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

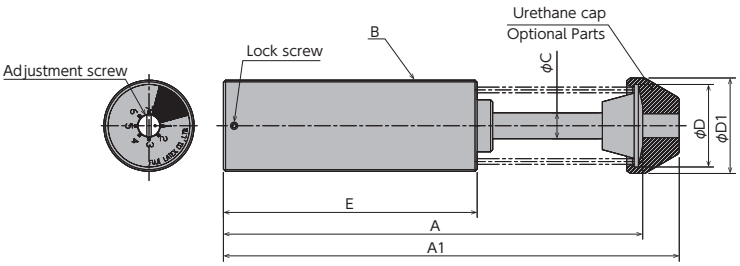
Standard nuts are sold separately as well.

Applicable Models	Model
FA-3650UD	M36 nut
FWM-3650UBD	

Soft Absorber

FA-4225B/FA-4250B/FA-4225SL/FA-4250SL/FA-4275B Series





*The absorber's main unit does not come with nuts.

Dimensions

Model	A	A1	B	C	D	D1	E
FA-4225B3/SL-C	144	162	M42×1.5	12	38	44	92
FA-4250B3/SL-C	195	213					118
FA-4275B3-C	246	264					143

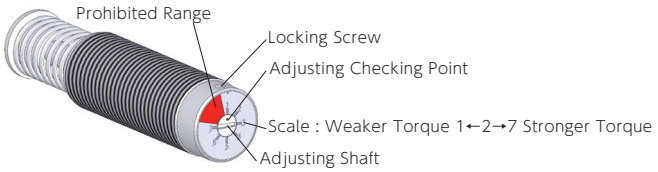
Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max.cycle rate cycle/min	Absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g
FA-4225B3-C	25	260(26.5)	3,400(3,400)	0.3~3.0	31,590 (3,223)	20	1,858(190)	120(12.2)	−5~70	795
FA-4225SL-C			81,400(81,400)	0.05~0.5		10				
FA-4250B3-C	50	520(53.1)	6,500(6,500)	0.3~3.0		10	2,372(242)			1,020
FA-4250SL-C			162,700(162,700)	0.05~0.5		5				
FA-4275B3-C	75	780(79.6)	9,700(9,700)	0.3~3.0		6	3,345(341)			1,240

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that an external stopper (Stopper nut OP-020M42) is also used.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber (Allowable eccentric angle: within ±2.5°)
* The urethane caps are consumables. Please replace them when necessary.

Adjustment Method

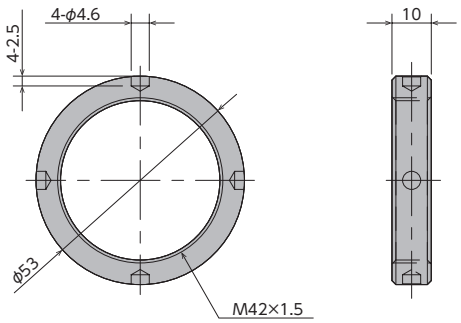


* To adjust, turn the adjustment knob located at the bottom of the main unit.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using the attached hex wrench.

Optional Parts

Nut OP-M42

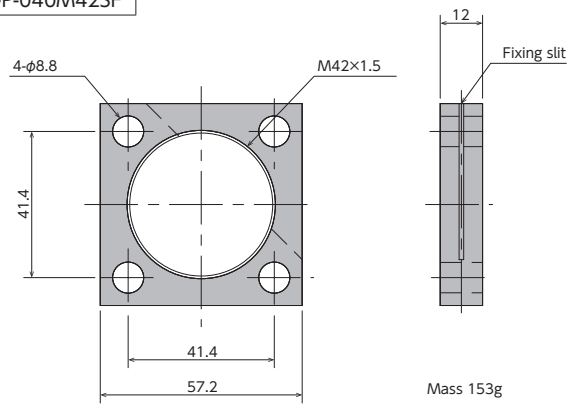
Model
OP-M42



Mass 64g

Square flange OP-040 M42SF

Model
OP-040M42SF

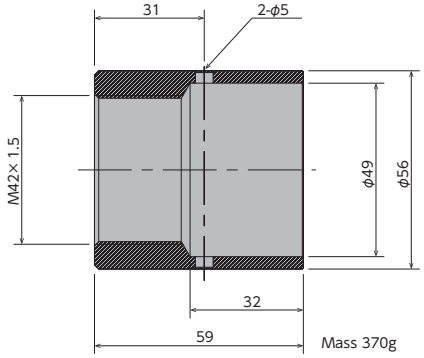


Mass 153g

Stopper nut OP-020 M42

Model
OP-020M42

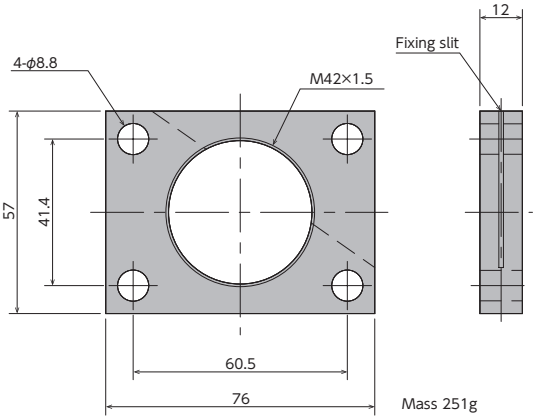
● Once the attachment site is determined, uset he main unit' s nut to securely fasten in place.



Mass 370g

Rectangle flange OP-040 M42RF

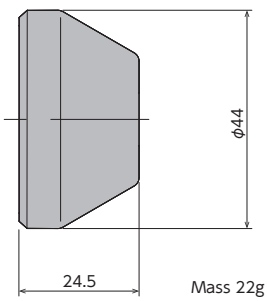
Model
OP-040M42RF



Mass 251g

Urethane cap OP-090 M42A

Model
OP-090M42A

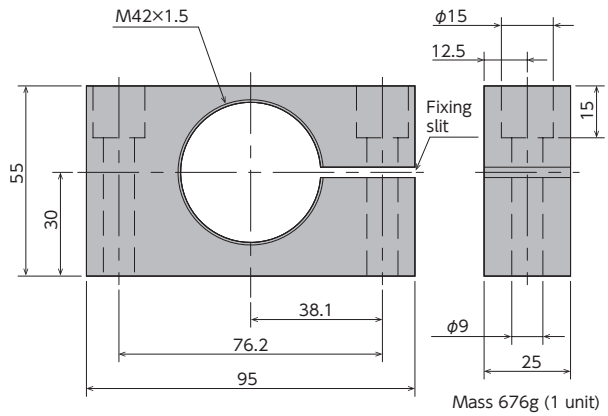


Mass 22g

Side mount OP-M42SM

Model
OP-M42SM

* Side mount is sold as a set of two.
* Recommended bolt: M8 X 50 hexagon socket head bolt



Mass 676g (1 unit)

Soft Absorber

Fixed Type | Adjustable type | Self-adjusting

FA-4225B/FA-4225SL/FA-4250B/FA-4250SL Series

RoHS Compliant

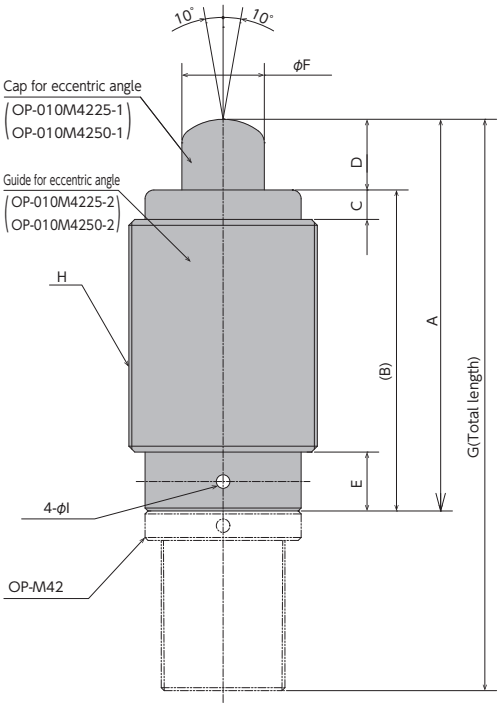
●Products specification might be changed without notice.

Optional Parts

Eccentric angle adaptor OP-010M4225/M4250

Model
OP-010M4225
OP-010M4250

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit' s nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5˚ or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber.
- The maximum operating eccentric angle with an eccentric angle adaptor is ±10˚.
- Nut for unit is not inclusive.
- Not usable for FA-4250YD-C, FWM-4250YBD-C.
- The caps and the guides for inclined use are not unbundled.

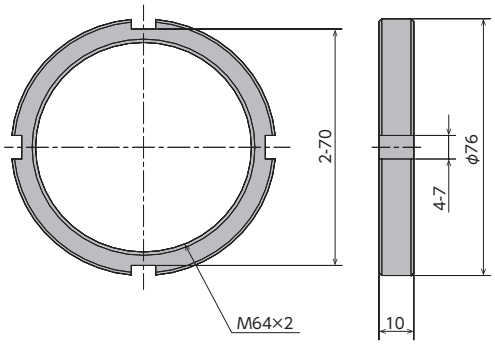


Model	A	B	C	D	E	ϕF	G	H	ϕI	Weight g
OP-010M4225	133	109	10	24	20	28	194	M64×2	4.6	1,600
OP-010M4250	203	154		49			290			2,500

Nut OP-M64

Model
OP-M64

- Usable as the nut for eccentric angle adaptor



Mass 100g

Soft Absorber

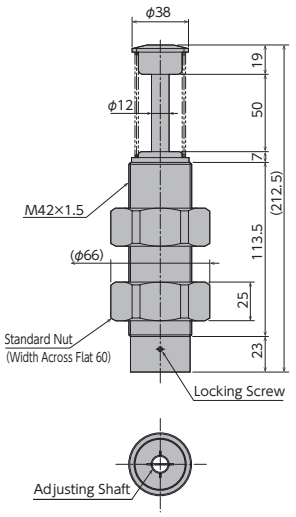
Fixed Type | **Adjustable type** | Self-adjusting

FA-4250YD/FWM-4250YBD Series

RoHS Compliant

●Products specification might be changed without notice.





Specifications

Model	Stroke mm	Max. absorption energy J (kgf•m)	Max. equivalent mass kg (kgf)	Range of impact rate m/s	Orifice type
FA-4250YD-C	50	441 (45)	390 (390)	0.7～3	Multiple-orifice type
FWM-4250YBD-C			3,500 (3,500)	0.3～2	Multiple-varying orifice type

Common Specifications

Max. drag	N (kgf)	27,030 (2,758)	Operating temperature	℃	−5～70
Max. cycle rate	cycle/min	10	Mass : C type	g	1,940
Max. absorption energy per minute	J/min (kgf•m/min)	2,744 (280)			
Recovering power of the piston rod	N (kgf)	83.3 (8.5) or lower			

Selection Guideline

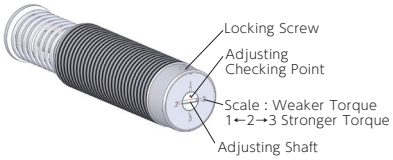
FA-4250 series has the following three patterns of absorption characteristics depending on the orifice type. Please use the following information as a guideline when making your selection.

Orifice type	Multiple-orifice type	Multiple-varying orifice type
Model number	FA-4250YD series	FWM-4250YBD series
Application	For high-speed	For medium speed, in particular with a pneumatic cylinder
Absorption characteristics		

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* We recommend that you use it with an external stopper.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5˚)

Adjustment Method

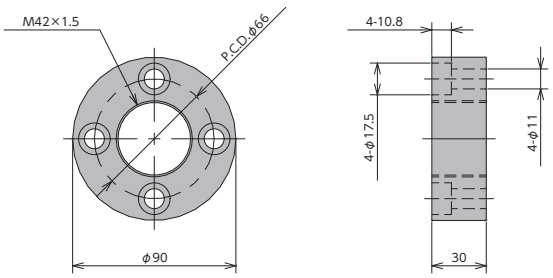


* To adjust, turn the adjustment knob with a slotted screw driver.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* It does not have a lock screw for locking the adjusted setting.

Optional Parts

Square flange OP-040YB

Applicable Models	Model
FA-4250YD	OP-040YB
FWM-4250YBD	



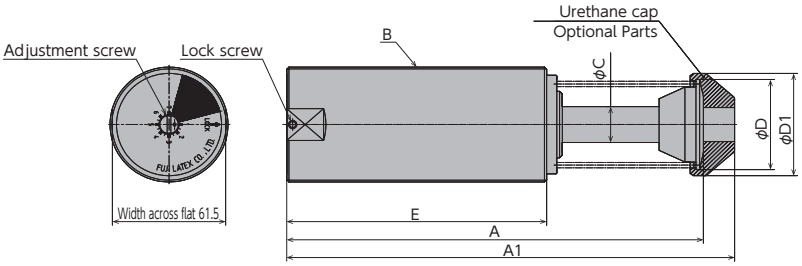
Standard nuts are sold separately as well.

Applicable Models	Model
FA-4250YD	M42 nut
FWM-4250YBD	

Soft Absorber

FA-6450/FA64100/FA64150 Series





* The absorber's main unit does not come with nuts.

Dimensions

Model	A	A1	B	C	D	D1	E
FA-6450□-C	226	243	M64×2	20	50.2	57	141
FA-64100□-C	328	345					191
FA-64150□-C	456	473			60		241

* A1 and D1 are dimensions with the optional urethane cap attached. (Urethane cap type: OP-090M64A)

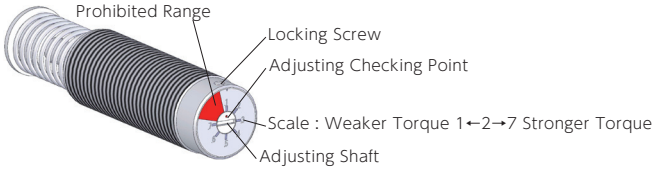
Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max.cycle rate cycle/min	Absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g	Allowable eccentric angle °
FA-6450Z-C	50	2,300 (234.7)	10,000~110,000(10,000~110,000)	0.02~0.3	90,000 (9,184)	3	164,608 (16,797)	150 (15.3)	−5~70	2.5	±2.5
FA-6450L-C			1,000~11,000(1,000~11,000)	0.3~1.0		15					
FA-6450H-C			200~1,800(200~1,800)	0.3~3.6		15					
FA-64100L-C	100	4,550 (464.3)	2,000~38,000(2,000~38,000)	0.3~1.0		10	214,118 (21,849)	180 (18.4)		3.2	±1.0
FA-64100H-C			250~2,500(250~2,500)	0.3~3.6		10					
FA-64150L-C	150	6,800 (693.9)	4,000~52,000(4,000~52,000)	0.3~1.0		8	275,556 (28,118)	370 (37.8)		4.2	
FA-64150H-C			300~5,500(300~5,500)	0.3~3.6		8					

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* We recommend that you use it with an external stopper(Stopper nut OP-020M64).
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber.
* The urethane caps are consumables. Please replace them when necessary. (Allowable eccentric angle: within ±2.5°)

Adjustment Method

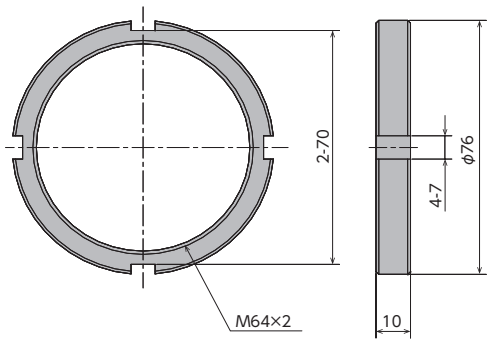


* To adjust, turn the adjustment knob located at the bottom of the main unit.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

Optional Parts

Nut OP-M64

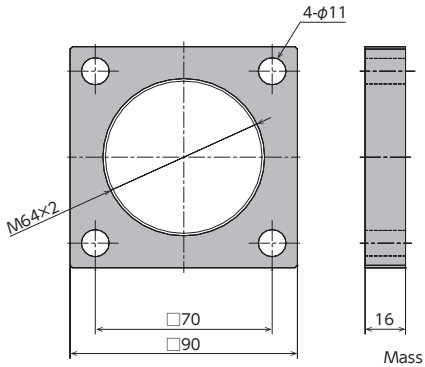
Model
OP-M64



Mass 100g

Square flange OP-040 M64SF

Model
OP-040M64SF

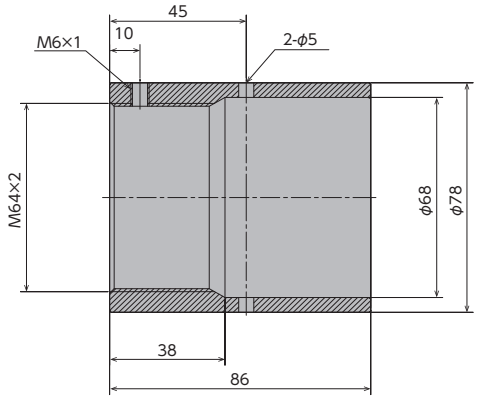


Mass 400g

Stopper nut S OP-020 M64S

Model
OP-020M64S

● Adjust so that it stops 1mm before thestroke end, and fasten with the main unit' s nut until secured.

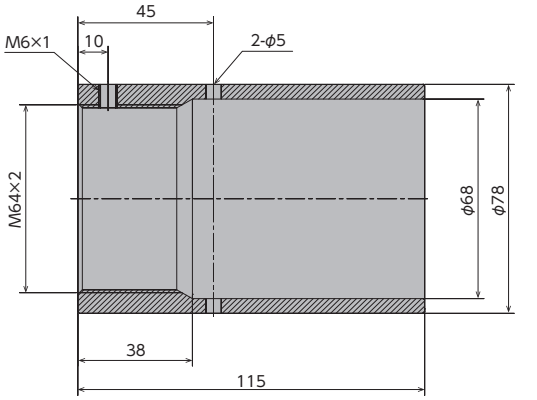


Mass 850g

Stopper nut L OP-020 M64L * Exclusive for FA (FK) -64150

Model
OP-020M64L

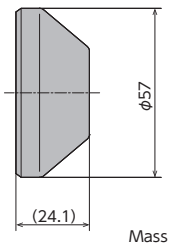
● Adjust so that it stops 1mm before thestroke end, and fasten with the main unit' s nut until secured.



Mass 1,150g

Urethane cap OP-090 M64A

Model
OP-090M64A

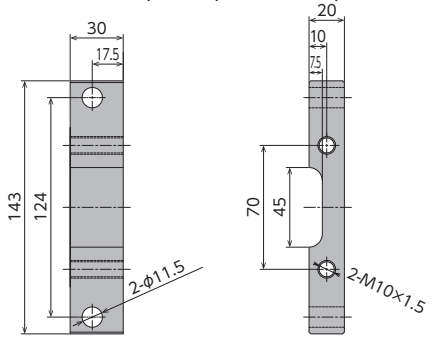


Mass 35g

Foot mount OP-M64FM

Model
OP-M64FM

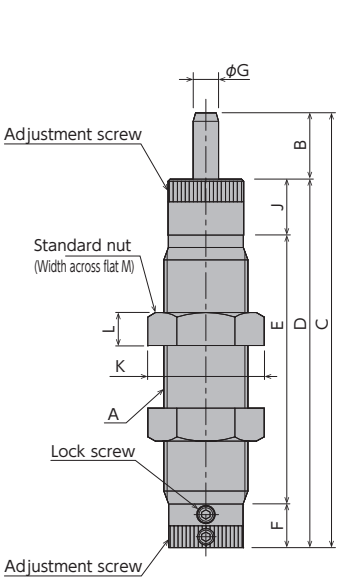
- 1 set consists of 2 mounts.
- 4 hexagon socket head cap screws of M10×1.5 are contained in the set.
- The mount is common to the FA series and the FK series.
- 2 nuts OP-M64 (sold separately) will be required.

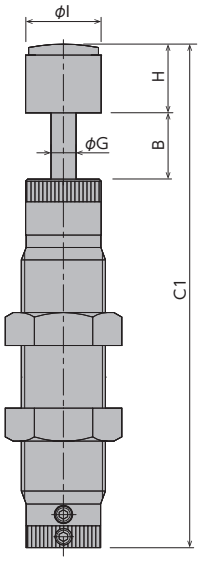


Soft Absorber

FA-2016EA/FA-2725FA Series







Dimensions

Model	A	B	C	C1	D	E	F	ϕG	H	ϕI	J	K	L	M
FA-2016EA-S/C	M20×1.5	16	105	122	89	65	10.5	6	17	18	13.5	27.7	8	24
FA-2725FA-S/C	M27×1.5	25	136	156	111	86.5	10.5	8	20	23	14	37	10	32

Note) To place an order without a cap, put -S at the end of the model number; to place an order with a cap, put -C at the end of the model number; and to place an order for a crevice type, put -U at the end of the model number.

Specifications

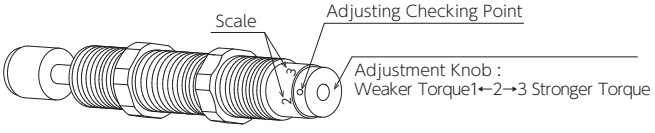
Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max.cycle rate cycle/min	Absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g	Allowable eccentric angle °
FA-2016EA-S	16	25.4 (2.6)	200(200)	0.15～3.0	3,610	60	343(35)	35.2(3.59) or lower	−5～70	173	±2.5
FA-2016EA-C										191	
FA-2725FA-S	25	79.3 (8.1)	500(500)	0.15～3.0	7,200	60	539(55)	44.2(4.51) or lower		402	±2.5
FA-2725FA-C										446	

※ FA-2725FA-□シリーズは偏角度アダプター、防滴キャップはご使用できません。

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* We recommend that you use it with an external stopper(Stopper nut OP-020EB).
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber.
* The urethane caps are consumables. Please replace them when necessary.

Adjustment Method



* To adjust, turn the adjustment knob located at the bottom of the main unit.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using a hex wrench.

RoHS Compliant

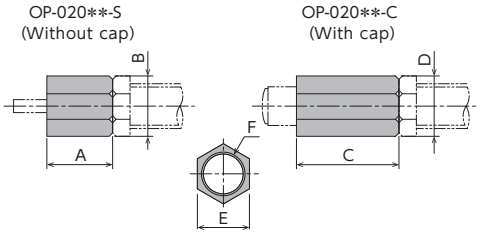
●Products specification might be changed without notice.

Optional Parts

Stopper nut　OP-020EB、OP-020FB

Model
OP-020EB-S
OP-020EB-C
OP-020FB-S
OP-020FB-C

● Adjust so that it stops 1mm before thestroke end, and fasten with the main unit' s nut until secured.



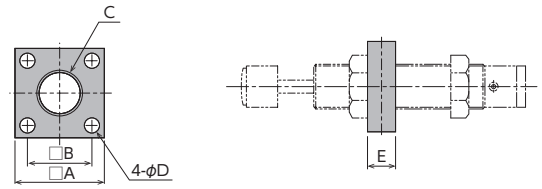
Note) When attaching, make sure that theside without a bearing chamfer is the impact surface.

Model	A	B	C	D	E	F	Mass g	
OP-020EB-*	30	27.7	47	27.7	24	M20X1.5	S	46
							C	68
OP-020FB-*	35	37	55	37	32	M27X1.5	S	90
							C	137

Square flange　OP-040EB、OP-040FB

Model
OP-040EB
OP-040FB

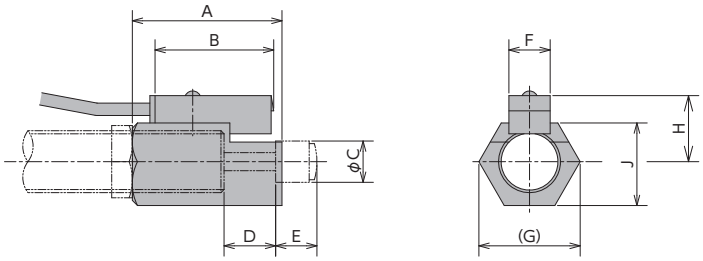
● Once the attachment site is determined, uset he main unit' s nut to securely fasten in place.



Model	A	B	C	ϕD	E	Mass g
OP-040EB	40	28	M20×1.5	6.5	12	109
OP-040FB	50	36	M27×1.5	9	12	157

Holder with a switch　OP-032**(With stopper function)

Model
OP-032EB
OP-032FB



Model	A	B	C	D	E	F	G	H	J	Mass g
OP-032EB	50	21	18	16	17	8	28	18	24	80
OP-032FB	56	21	23	25	20	8	34.6	21	30	107

● Although a holder with a switch can be ordered on its own, we strongly recommend ordering one with the main unit. Please include the main unit' s model number when placing an order.

● For switch specifications and precautions for use, please refer to page 23.

Standard nuts are sold separately as well.

Applicable Models	Model
FA-2016EA	M20 nut
FA-2725FA	M27 nut

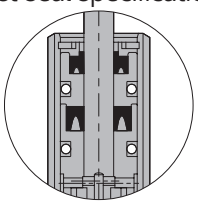
Soft Absorber

FA-S Series (Dust Seal Specifications)

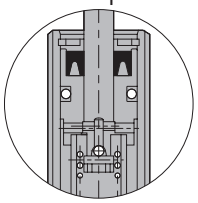
●Products specification might be changed without notice.

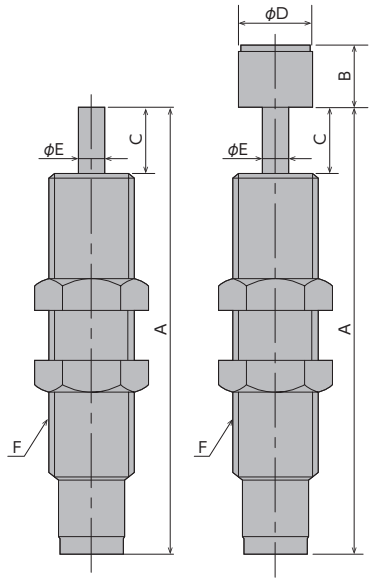


Dust seal specifications



Standard product





Dimensions

Model	A	B	C	D	E	F	Mass g	Specification Page
FA-S1210M□-S	76		10		3.5	M12×1	41	50
FA-S1210M□-C		8		8			44	50
FA-S1410R□-S	80					M14×1.5	63	52
FA-S1410R□-C		8		10			68	52
FA-S1612X□-S	102		12		5	M16×1.5	105	54
FA-S1612X□-C		15		13.5			114	54
FA-S2016E□-S	120		16		6	M20×1.5	196	58
FA-S2016E□-C		17		18			218	58
FA-S2530G□-S	155		30		8	M25×1.5	396	62
FA-S2530G□-C		18		22			427	62
FA-S2540L□-C	171.5	29	40	22.5			475	66
FA-S2725F□-S	136		25			M27×1.5	402	68
FA-S2725F□-C		20		24			451	68
FA-S3035TD-S	188		35		10	M30×1.5	708	70
FA-S3035TD-C		18.5		27			755	70
FA-S3650UD-S	235		50		12	M36×1.5	1330	74
FA-S3650UD-C		19.5		33			1410	74

Note) B or D is inserted in the □. Insert B for a single-orifice type, and insert D for a multiple-orifice type.

Specifications

* The specification is identical with the standard models for each type

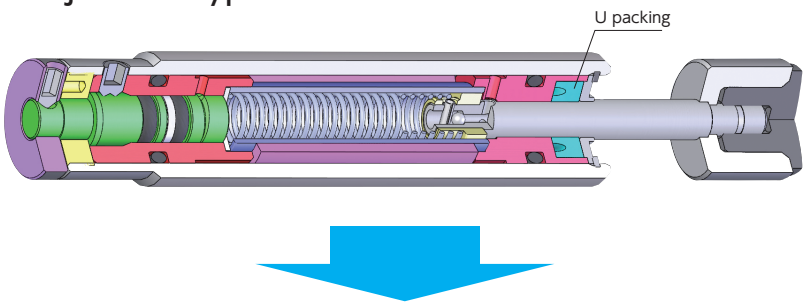
Precautions for Use

* Do not use this product in places where it may come in contact with oil as it does not have a liquid-proof structure.
* Please contact our sales department when the use of optional parts is planned.
* Although the dimensions are identical to those of the FA series standard products (adjustable), the FA-S2016 series has a longer overall length (dimension A).

●Products specification might be changed without notice.

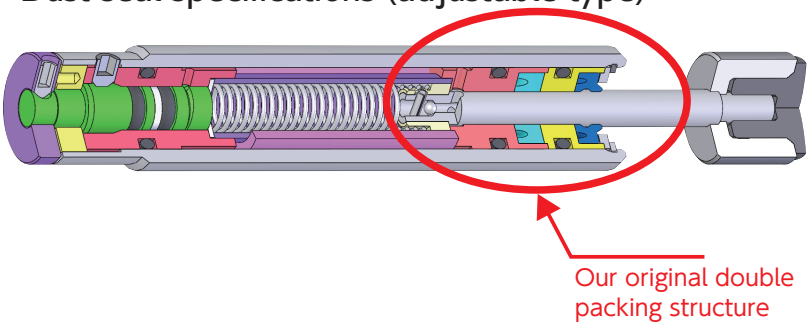
Overview

Adjustable type



In the case of a normal absorber, dust that has adhered to it may intrude the inside with each stroke. This can damage the seal and may lead to a defect such as oil leakage.

Dust seal specifications (adjustable type)



In the case of a product with dust-seal specifications, since double internal U-packings are used, thus having a structure that prevents the dust that has adhered from entering the inside.

Specifications

*The specifications is identical with the standard models for each model (refer to the relevant page in the specifications listed in the dimensions table on the previous page).

Key to Model Number

FA - S 25 30 GB - S

With/Without cap	S : Without cap C : With cap R : With urethane cap
Orifice type	☐ B : Single-orifice type for low-speed ☐ BD : Multiple-varying orifice type for middle-speed ☐ D : Multiple-orifice type for high-speed
Stroke	(indicated in min)
External screw size	(indicated in min)
Specifications	S : Dust seal specifications
Series name	FA : Single-orifice type/Multiple-orifice type FWM : Multiple-varying orifice type

Precautions for use

* Since the absorber is not designed to have a drip-proof structure, avoid its use in an environment where oils are splashed.
* If you use the optional parts, please contact our sales department.
* Although the dimensions are the same as those of the FA series (adjustable type) with the standard specifications, only the FA-S2016/FWM-2016 series have a greater overall length (dimension A).

Soft Absorber

Multiple-varying orifice
Fixed Type | Adjustable type | Self-adjusting

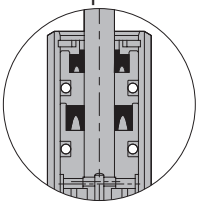
FWM-S Series (Dust Seal Specifications)

RoHS Compliant

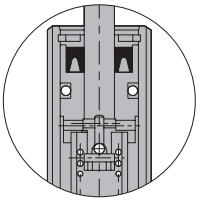
●Products specification might be changed without notice.

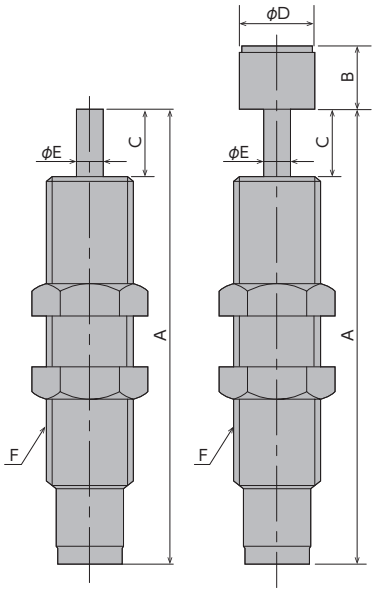


Dust seal specifications



Standard product





Dimensions

Model	A	B	C	D	E	F	Mass g	Specification Page
FWM-S1210MBD-S	76		10		3.5	M12×1	41	50
FWM-S1210MBD-C		8		8			44	50
FWM-S1410RBD-S	80					M14×1.5	63	52
FWM-S1410RBD-C		8		10			68	52
FWM-S1612XBD-S	102		12		5	M16×1.5	105	54
FWM-S1612XBD-C		15		13.5			114	54
FWM-S2016EBD-S	120		16		6	M20×1.5	196	58
FWM-S2016EBD-C		17		18			218	58
FWM-S2530GBD-S	155		30		8	M25×1.5	396	62
FWM-S2530GBD-C		18		22			427	62
FWM-S2540LBD-C	171.5	29	40	22.5			475	66
FWM-S2725FBD-S	136		25			M27×1.5	402	68
FWM-S2725FBD-C		20		24			451	68
FWM-S3035TBD-S	188		35		10	M30×1.5	708	70
FWM-S3035TBD-C		18.5		27			755	70
FWM-S3650UBD-S	235		50		12	M36×1.5	1330	74
FWM-S3650UBD-C		19.5		33			1410	74

Specifications

* The specification is identical with the standard models for each type

Precautions for Use

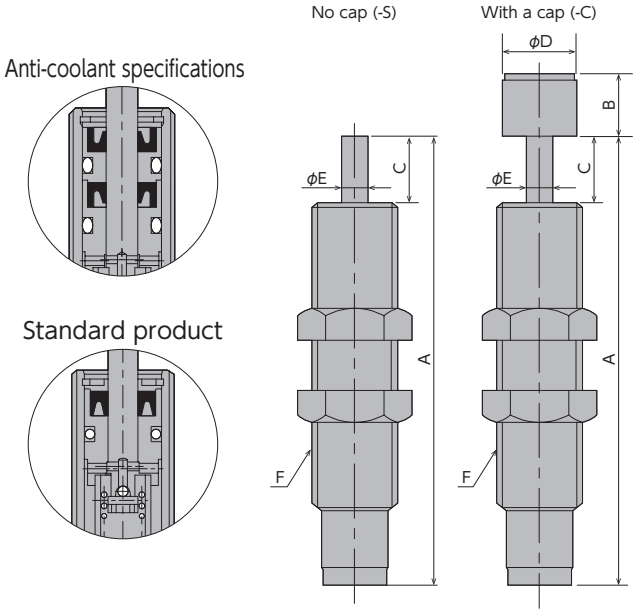
* Do not use this product in places where it may come in contact with oil as it does not have a liquid-proof structure.
* Please contact our sales department when the use of optional parts is planned.
* Although the dimensions are identical to those of the FA series standard products (adjustable), the FWM-S2016 series has a longer overall length (dimension A).

MEMO

Soft Absorber

FA-F/FWM-F Series





Dimensions

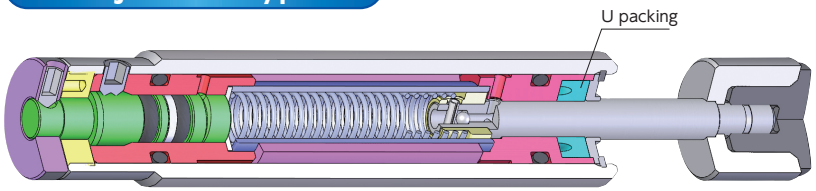
Model	A	B	C	D	E	F	Weight g	Specification Page
FA-F0806-S	59	–	6	–	2.5	M8×0.75	14	58
FA-F0806-C		5		6				
FA-F1008V□-S	73.2	–	8	–	2.4	M10×1	31	60
FA-F1008V□-C		6.3		6			32	
FWM-F1008VBD-S		–		–			31	
FWM-F1008VBD-C		6.3		6			32	
FA-F1210M□-S	82.6	–	10	–	3.5	M12×1	48	62
FA-F1210M□-C		8		8			51	
FWM-F1210MBD-S		–		–			48	
FWM-F1210MBD-C		8		8			51	
FA-F1410RB-S	98.2	–	10	–	4	M14×1.5	84	64
FA-F1410RB-C		10		10			87	
FA-F1410RD-S		–		–			84	
FA-F1410RD-C		10		10			87	
FWM-F1410RBD-S		–		–			84	
FWM-F1410RBD-C		10		10			87	
FA-F1612XB-S	107.7	–	12	–	5	M16×1.5	111	66
FA-F1612XB-C		15		13.5			120	
FA-F1612XD-S		–		–			111	
FA-F1612XD-C		15		13.5			120	
FWM-F1612XBD-S		–		–			111	
FWM-F1612XBD-C		15		13.5			120	
FA-F2016E□-S	120	–	16	–	6	M20×1.5	195	70
FA-F2016E□-C		17		18			218	
FWM-F2016EBD-S		–		–			195	
FWM-F2016EBD-C		17		18			218	
FA-F2530G□-S	168	–	30	–	8	M25×1.5	441	74
FA-F2530G□-C		18		22			471	
FWM-F2530GBD-S		–		–			441	
FWM-F2530GBD-C		18		22			471	
FA-F2725F□-S	148.2	–	25	–	8	M27×1.5	455	80
FA-F2725F□-C		20		23			504	
FWM-F2725FBD-S		–		–			455	
FWM-F2725FBD-C		20		23			504	

Note) B or D is inserted in the □. Insert B for a single-orifice type, and insert D for a multiple-orifice type.

●Products specification might be changed without notice.

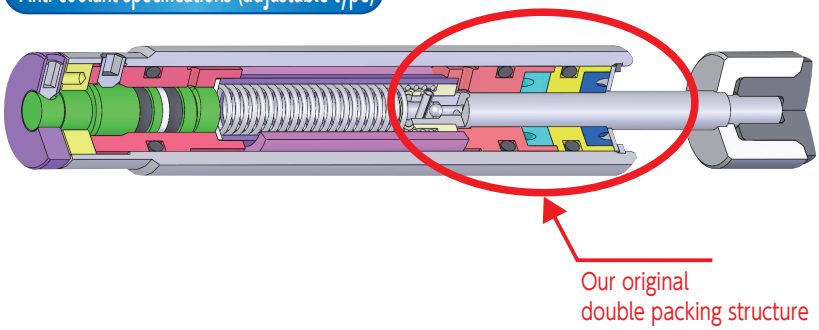
Overview

Adjustable type



In a normal absorber, adhering liquid is pushed inside with each stroke. This can block the accumulator and the flow of oil, ultimately preventing the rod from inserting or causing other trouble.

Anti-coolant specifications (adjustable type)



In the anti-coolant specifications, two internal U-packings are used (double packing structure) to form a wiper seal structure that prevents the adhering liquid from being pushed inside.

Specifications

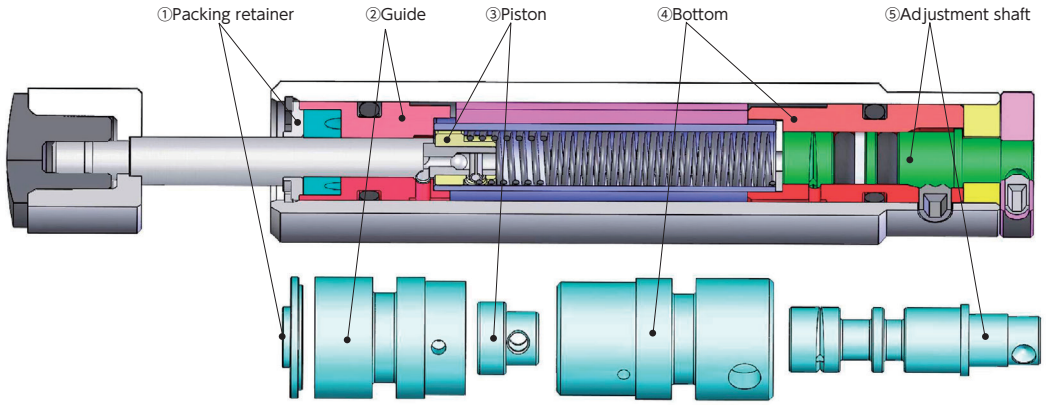
* The specifications is identical with the standard models for each model (refer to the relevant page in the specifications listed in the dimensions table on the previous page).

Precautions for Use

* This product may not offer sufficient durability, depending on the liquid you use or its quantity. It is recommended to perform tests for adequacy in advance.
* When the piston rod is not pressed all the way down to the stroke end during operation, stop use and exchange the product for the product life. If the product is used continuously, damage of the product may be caused.
* This product has a unique packing structure. Because of this, using this product in places where the piston rod remains dry may cause the inside oil to leak early on in its product life.
* If you use the optional parts, please contact our sales department.

Soft Absorber

FA/FWM-B Series



In many production lines of lithium ion batteries, use of the c opper-containing materials is unacceptable, so Fuji Latex has developed the product that can be used under such condition.

Product Features

- The product is not made from copper-containing materials at all and can be used in an environment where copper ion is unacceptable.
- Models of M8 to M27 in external diameter with the FA/FWM adjusting function are available.
- It is very easy to replace the product because the external diameter of the product is the same as that of the standard specifications.

About Model

Please add "B" to the model of the standard specifications.
Example: FWM-B1008VBD-S (Model of the standard specification: FWM-1008VBD-S)

[List of materials of main parts changed * When FA-2016 is changed to FA-B2016] ( ): surface treatment

	Standard product FA-2016	Copper-free absorber FA-B2016
① Packing retainer	Brass(*1)	Free-cutting steel (electroless nickel plating)
② Guide	Phosphor bronze(*1)	Free-cutting steel (blackening)
③ Piston	Brass(*1)	Cast iron (*1)
④ Bottom	Brass(*1)	Free-cutting steel (blackening)
⑤ Adjustment shaft	Brass(*1)	Free-cutting steel (electroless nickel plating)

*1 Without surface treatment

Dimensions and Specifications

* The dimensions and specifications are similar to those of the standard products of the FA/FWM series.

Precautions for Use

* If you use the optional part, please contact our sales department.

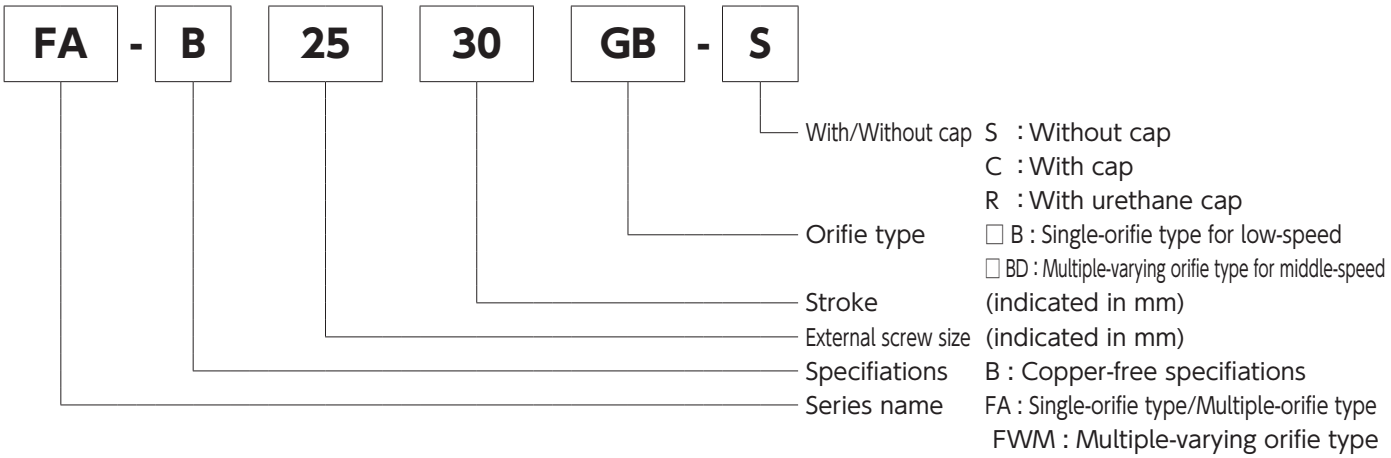
●Products specification might be changed without notice.

Specifications

Model	Stroke mm	Max. absorption energy J (kgf·m)	Max. equivalent mass kg (kgf)	Range of impact rate m/s	Orifice type	Specification Page
FA-B0806-□	6	1.4	15	0.3~2	Single-orifice type	54
FA-B1008VB-□	8	1.47	10	0.3~1	Single-orifice type	56
FA-B1008VD-□		1.76	2.5	0.7~3	Multiple-orifice type	
FWM-B1008VBD-□			10	0.3~2	Multiple-varying orifice type	
FA-B1210MB-□	10	2.94	30	0.3~1	Single-orifice type	58
FA-B1210MD-□		4.9	4	0.7~3	Multiple-orifice type	
FWM-B1210MBD-□			30	0.3~2	Multiple-varying orifice type	
FA-B1410RB-□	10	3.92	30	0.3~1	Single-orifice type	60
FA-B1410RD-□		5.88	4.5	0.7~3	Multiple-orifice type	
FWM-B1410RBD-□			35	0.3~2	Multiple-varying orifice type	
FA-B1612XB-□	12	9.8	50	0.3~1	Single-orifice type	62
FA-B1612XD-□			10	0.7~3	Multiple-orifice type	
FWM-B1612XBD-□			50	0.3~2	Multiple-varying orifice type	
FA-B2016EB-□	16	29.4	300	0.3~1	Single-orifice type	66
FA-B2016ED-□			120	0.7~3	Multiple-orifice type	
FWM-B2016EBD-□			200	0.3~2	Multiple-varying orifice type	
FA-B2530GB-□	30	49	400	0.3~1	Single-orifice type	70
FA-B2530GD-□			150	0.7~3	Multiple-orifice type	
FWM-B2530GBD-□			300	0.3~2	Multiple-varying orifice type	
FA-B2540LB-C	40	63.7	500	0.3~1	Single-orifice type	74
FA-B2540LD-C			200	0.7~3	Multiple-orifice type	
FWM-B2540LBD-C			350	0.3~2	Multiple-varying orifice type	
FA-B2725FB-□	25	79.3	650	0.3~1	Single-orifice type	76
FA-B2725FD-□			300	0.7~3	Multiple-orifice type	
FWM-B2725FBD-□			450	0.3~2	Multiple-varying orifice type	

Note 1) S (without tip cap) or C (with tip cap) is inserted in* .
Note 2) For the specifications and external dimensions, please see the pages of detailed specifications.

Key to Model Number



Soft Absorber

FK Series (M4～M16)



Characteristics

- With a fixed, specially-designed orifice structure, an optimal impact absorption can be achieved, even under variable operating conditions.
  (FK-0404 and FK-0604 series have a grooveorifice structure.)
- We have three available types to accommodate various speeds.
  For low-speed: L, for medium-speed: M, for highspeed: H
- Urethane cap specification is also available.
- 2 or more of this product can be used in parallel.
- This product can also be custom-designed for optimal impact absorption.

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max.cycle rate cycle/min	Max. absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass Stype g (Ctype g)	Urethane Cap Specification (Type-R)
FK-0404L-□	4	0.1(0.01)	1(1)	0.3～1	214(21.8)	45	4.5(0.46)	2.5(0.25) or lower	−5～70	2.4(2.5)	×
FK-0404H-□		0.3(0.03)	3(3)				13.5(1.38)				
FK-0604L-□	4	0.1(0.01)	1(1)	0.3～1	363 (37)	45	4.5(0.46)	3(0.3) or lower	−5～70	4.1(4.2)	×
FK-0604H-□		0.5(0.05)	3(3)				22.5(2.29)				
FK-1008L-□	8	2.94(0.3)	20(20)	0.3～1	1,078 (110)	60	58.8(6.0)	4.9(0.5) or lower	−5～70	20(21)	○
FK-1008M-□			6(6)	0.3～2							
FK-1008H-□			2.5(2.5)	0.3～3							
FK-1210L-□	10	6.86(0.7)	50(50)	0.3～1	1,960 (200)	60	98(10)	9.8(1.0) or lower	−5～70	36(37)	○
FK-1210M-□			14(14)	0.3～2							
FK-1210H-□			6(6)	0.3～3							
FK-1412L-□	12	9.8(1.0)	75(75)	0.3～1	2,156 (220)	60	176(18)	8.9(0.9) or lower	−5～70	55(57)	○
FK-1412M-□			20(20)	0.3～2							
FK-1412H-□			8(8)	0.3～3							
FK-1417L-□	17	14.7(1.5)	110(110)	0.3～1	2,646 (270)	60	235(24)	8.9(0.9) or lower	−5～70	76(77)	○
FK-1417M-□			30(30)	0.3～2							
FK-1417H-□			13(13)	0.3～3							
FK-1612L-□	12	14.7(1.5)	110(110)	0.3～1	2,940 (300)	60	235(24)	9.8(1.0) or lower	−5～70	76(82)	○
FK-1612M-□			30(30)	0.3～2							
FK-1612H-□			13(13)	0.3～3							

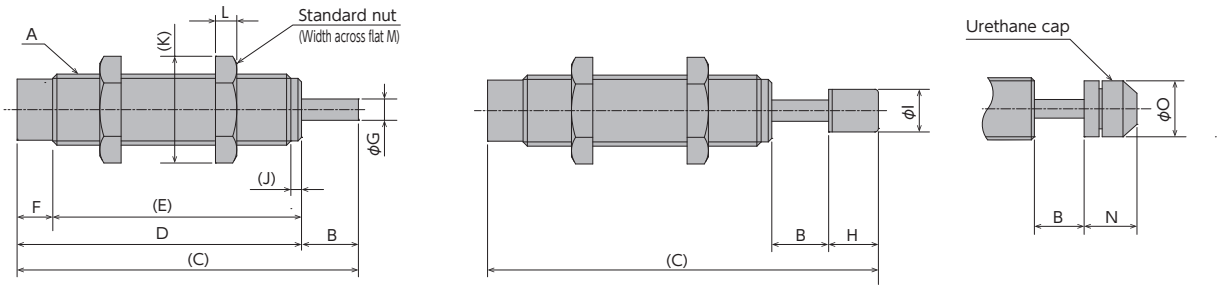
Note) Insert S in the □ to order without a cap, and insert C in the □ to order with a cap (R if ordering urethane cap).

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Urethane caps are consumable goods that need to be replaced with new ones if necessary.
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°)
* Ensure that an external stopper (OP-020**) is also used.
  (The FK-0404 and FK-0604 series can be used without a stopper.)

RoHS Compliant

●Products specification might be changed without notice.



Dimensions

Model	A	B	C	D	E	F	ϕG	H	ϕI	J	K	L	M	N	ϕO
FK-0404□-S	M4×0.5	4	28.6	24.6	20.1	4.5	1.2	–	–	–	8.1	2	7	–	–
FK-0404□-C			32.6					4	3					–	–
FK-0604□-S	M6×0.75	4	29	25	20.5	4.5	1.8	–	–	–	9.2	2	8	–	–
FK-0604□-C			33					4	4.6					–	–
FK-1008□-S	M10×1.0	8	48	40	34.5	5.5	3	–	–	1.5	15	3	13	–	–
FK-1008□-C			55					7	6					7.3	8
FK-1210□-S	M12×1.0	10	63	53	47.5	5.5	3.5	–	–	–	16.2	4	14	–	–
FK-1210□-C			71					8	8					8.8	10
FK-1412□-S	M14×1.5	12	70	58	52.5	5.5	3.5	–	–	–	19.6	6	17	–	–
FK-1412□-C			78					8	10					8.8	10
FK-1417□-S	M14×1.5	17	97	80	74.5	5.5	4	–	–	1.5	19.6	6	17	–	–
FK-1417□-C			107					10	10					11	12
FK-1612□-S	M16×1.5	12	75	63	57.5	5.5	5	–	–	–	21.9	6	19	–	–
FK-1612□-C			90					15	13.5					13.1	14

Note) Urethane cap specification is not available for FK-0404 and FK0604.

Key to Model Number

FK - 14 12 M - C

- With/Without cap: S : Without cap; C : With cap; R : With urethane cap
- Performance classification: L : For low speed (Impact rate 0.3～1m/s); M : For medium speed (Impact rate 0.3～2m/s); H : For high speed (Impact rate 0.3～3m/s)
- Stroke (indicated in mm)
- External screw size (indicated in mm)
- Series name

Please refer to pages 112-115 for optional parts.

Soft Absorber

FK Series (M20～M25)



Characteristics

- With a fixed, specially-designed orifice structure, an optimal impact absorption can be achieved, even under variable operating conditions.
- The main unit can also be used as a stopper. (No external stopper required)
- We have three available types to accommodate various speeds.
  For low-speed: L, for medium-speed: M, for highspeed:H
- Urethane cap specification is also available.
- 2 or more of this product can be used in parallel.
- This product can also be custom-designed for optimal impact absorption.

Specifications

Model	Stroke mm	Max. absorption energy J (kgf·m)	Max. equivalent mass kg (kgf)	Rarge of impact rate m/s	Max. drag N (kgf)	Max.cycle rate cycle/min	Max. absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N (kgf)	Operating temperature ℃	Mass Stype g (Ctype g)	Urethane Cap Specification (Type-R)
FK-2016L-□	16	29.4 (3.0)	230 (230)	0.3～1	3,528 (360)	60	343 (35)	18.1 (1.85) or lower	−5～70	147 (168)	○
FK-2016M-□			60 (60)	0.3～2							
FK-2016H-□			25 (25)	0.3～3							
FK-2022L-□	22	44.1 (4.5)	73 (73)	0.3～1	3,920 (400)	60	392 (40)	39.2 (4) or lower	−5～70	163 (178)	○
FK-2022M-□			30 (30)	0.3～2							
FK-2022H-□			15 (15)	0.3～3							
FK-2050L-R	50	98 (10)	30 (30)	0.3～2	4,900 (500)	30	490 (50)	39.2 (4) or lower	−5～70	294 (294)	○
FK-2050M-R			15 (15)	0.3～3							
FK-2050H-R			8 (8)	0.3～3							
FK-2530L-□	30	88.2 (9.0)	390 (390)	0.3～1	6,370 (650)	60	490 (50)	29.4 (3.0) or lower	−5～70	361 (391)	○
FK-2530M-□			175 (175)	0.3～2							
FK-2530H-□			75 (75)	0.3～3							
FK-2540L-□	40	117 (12)	480 (480)	0.3～1	6,370 (650)	60	490 (50)	71.5 (7.3) or lower	−5～70	437 (437)	○
FK-2540M-□			235 (235)	0.3～2							
FK-2540H-□			30 (30)	0.3～3							
FK-2550L-R	50	147 (15)	100 (100)	0.3～1.5	6,370 (650)	30	637 (65)	39.2 (4) or lower	−5～70	516 (516)	○
FK-2550M-R			50 (50)	0.3～2							
FK-2550H-R			30 (30)	0.3～3							

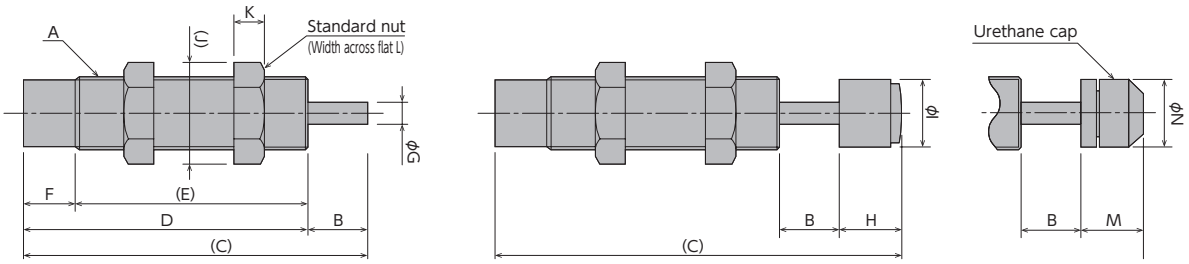
Note) Insert S in the □ to order without a cap, and insert C in the □ to order with a cap (R if ordering urethane cap). (-S is not available for FK-2540.)
Note) Urethane cap is the only available specification for FK-2022, 2050, and 2550 with a cap.

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°) Allowable eccentric angle in FK-2050 and 2550: ±1.0°
* Urethane caps are consumable goods that need to be replaced with new ones if necessary

RoHS Compliant

●Products specification might be changed without notice.



Dimensions

Model	A	B	C	D	E	F	ϕG	H	ϕI	J	K	L	M	ϕN
FK-2016□-S	M20×1.5	16	93	77	63	14	6	–		27.7	8	24	–	–
FK-2016□-C			110					17	18				17	18
FK-2022□-S	M20×1.5	22	112	90	76	14	6	–	–	27.7	8	24	–	–
FK-2022□-R			126.5					–	–				14.5	18
FK-2050□-R	M20×1.5	50	223.5	156.5	142.5	14	6	–	–	27.7	8	24	17	18
FK-2530□-S	M25×1.5	30	140	110	95	15	8	–	–	37	10	32	–	–
FK-2530□-C			158					18	22				18	22
FK-2540□-C	M25×1.5	40	185.5	124.5	109.5	15	8	21	22	37	10	32	26	22
FK-2550□-R	M25×2.0	50	228	160	145	15	8	–	–	37	10	32	18	22

Note) Urethane cap is the only available specification for FK-2022, 2050, and 2550 with a cap.

Key to Model Number

FK - 20 16 M - C

- With/Without cap: S : Without cap; C : With cap; R : With urethane cap
- Performance classification: L : For low speed (Impact rate 0.3～1m/s); M : For medium speed (Impact rate 0.3～2m/s); H : For high speed (Impact rate 0.3～3m/s)
- Stroke (indicated in mm)
- External screw size (indicated in mm)
- Series name

Please refer to pages 112-115 for optional parts.

Soft Absorber

FK Series (M27～M36)



Characteristics

- With a fixed, specially-designed orifice structure,an optimal impact absorption can be achieved,even under variable operating conditions.
- The main unit can also be used as a stopper. (Noexternal stopper required, except for FK-3625A□)
- We have three available types to accommodate various speeds.
  For low-speed: L, for medium-speed: M, for high-speed: H
- Urethane cap specification is also available.
- 2 or more of this product can be used in parallel.
- This product can also be custom-designed for optimal impact absorption.

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max. cycle rate cycle/min	Max. absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass Stype g (Ctype g)	Urethane Cap Specification (Type-R)
FK-2725L-□	25	79(8.1)	420(420)	0.3～1	60	539 (55)	6,370(650)	27.3(2.78) or lower	−5～70	341(385)	×
FK-2725M-□			105(105)	0.3～2							
FK-2725H-□			47(47)	0.3～3							
FK-3035L-□	35	196(20)	1,560(1,560)	0.3～1	30	1,176 (120)	14,700(1,500)	47.1(4.8) or lower	−5～70	628(681)	○
FK-3035M-□			390(390)	0.3～2							
FK-3035H-□			173(173)	0.3～3							
FK-3625AL-C	25	150(15.3)	2,000	0.3～1	30	1,500 (153)	25,000(2,551)	100(10.2) or lower	−5～70	– (900)	○
FK-3625AM-C		200(20.4)	800	0.3～2							
FK-3625AH-C			150	0.3～3							
FK-3650AL-C	50	400	3,400	0.3～1	30	2,352 (240)	25,000(2,551)	120(12.2) or lower	−5～70	– (980)	○
FK-3650AM-C			1,400	0.3～2							
FK-3650AH-C			300	0.3～3							
FK-3650L-□	50	392(40)	3,137(3,137)	0.3～1	30	2,352 (240)	21,110(2,154)	68.6(7.0) or lower	−5～70	1,177 (1,259)	○
FK-3650M-□			784(784)	0.3～2							
FK-3650H-□			306(306)	0.3～3							

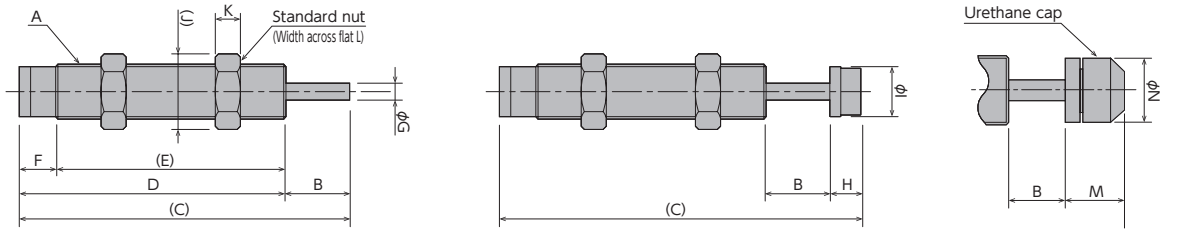
Note) Insert S in the □ to order without a cap, and insert C in the □ to order with a cap (R if ordering urethane cap). (-S is not available for FK-3625 □.)
Note : An additional urethane cap (OP-090M36B) can be mounted on FK-3625A□-C, FK-3650A□-C

Precautions for Use

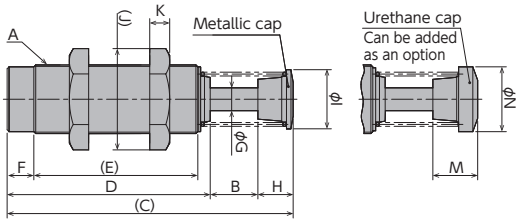
* Do not use this product without carefully reading the attached owner’ s manual.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°)
* We recommend that you use it with an external stopper(OP-020**).
* Urethane caps are consumable goods that need to be replaced with new ones if necessary.

RoHS Compliant

●Products specification might be changed without notice.



FK-3625A□
FK-3650A□



Dimensions

Model	A	B	C	D	E	F	φG	H	φI	J	K	L	M	φN
FK-2725□-S	M27×1.5	25	117.5	92.5	77.5	15	8	–	–	37	10	32	–	–
FK-2725□-C			137.5					20	23				–	–
FK-3035□-S	M30×1.5	35	171.5	136.5	116.5	20	10	–	–	41.6	14	36	–	–
FK-3035□-C			190					18.5	27				25	27
FK-3625A□-C	M36×1.5	25	150	106.5	86	14	12	18.5	31	53.1	10	46	23.5	34
FK-3650A□-C	M36×1.5	50	217	148.5	128	14	12	18.5	31	53.1	10	46	23.5	34
FK-3650□-S	M36×1.5	50	218.5	168.5	148.5	20	12	–	–	53.1	15	46	–	–
FK-3650□-C			238					19.5	33				24.3	33

Key to Model Number

FK - 27 25 M - C

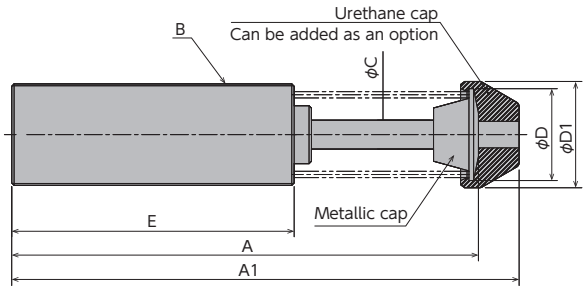
- With/Without cap: S : Without cap; C : With cap; R : With urethane cap
- Performance classification: L : For low speed (Impact rate 0.3～1m/s); M : For medium speed (Impact rate 0.3～2m/s); H : For high speed (Impact rate 0.3～3m/s)
- Stroke (indicated in mm)
- External screw size (indicated in mm)
- Series name

Please refer to pages 112-115 for optional parts.

Soft Absorber

FK-4225B/FK-4250B/FK-4275B Series





* The absorber's main unit does not come with nuts.

Dimensions

Model	A	A1	B	C	D	D1	E
FK-4225B□-C	144	162	M42×1.5	12	38	44	92
FK-4250B□-C	195	213					118
FK-4275B□-C	246	264					143

* A1 and D1 are the dimensions with a mounted urethane cap (optional). (Urethane Cap Type: OP-090M42A)

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max.cycle rate cycle/min	Max. absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g	Allowable eccentric angle °
FK-4225BL-C	25	260(26.5)	14,000	0.1～0.5	31,590 (3,223)	16	1,858(190)	120(12.2)	−5～70	795	±2.5
FK-4225BM-C			1,350	0.3～1.5		20					
FK-4225BH-C			200	0.3～3.6							
FK-4250BL-C	50	520(53.1)	23,000	0.1～0.5		8	2,372(242)			1,020	
FK-4250BM-C			2,800	0.3～1.5		10					
FK-4250BH-C			450	0.3～3.6							
FK-4275BL-C	75	780(79.6)	30,000	0.1～0.5		5	3,345(341)			1,240	
FK-4275BM-C			3,400	0.3～1.5		6					
FK-4275BH-C			670	0.3～3.6							

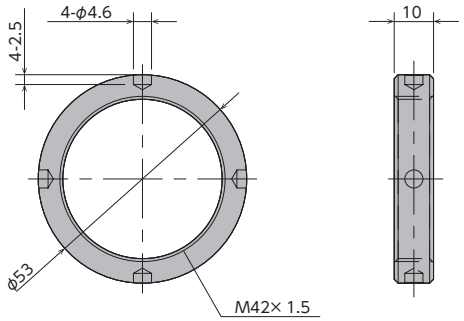
Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* We recommend that you use it with an external stopper (Stopper nut OP-020M42).
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°)
* Ensure that an eccentric load is not applied to the soft absorber.
* Urethane caps are consumable goods that need to be replaced with new ones if necessary.

Optional Parts

Nut OP-M42

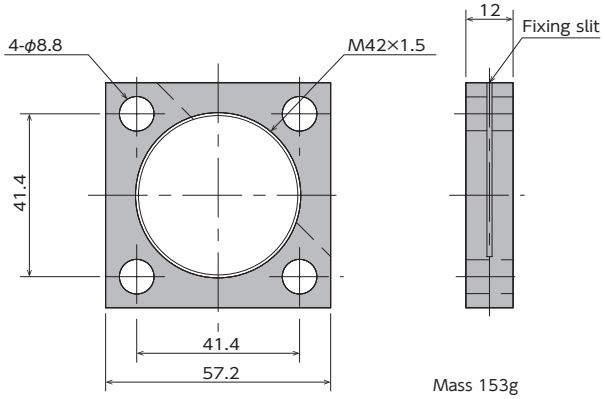
Model
OP-M42



Mass 64g

Square flange OP-040 M42SF

Model
OP-040M42SF

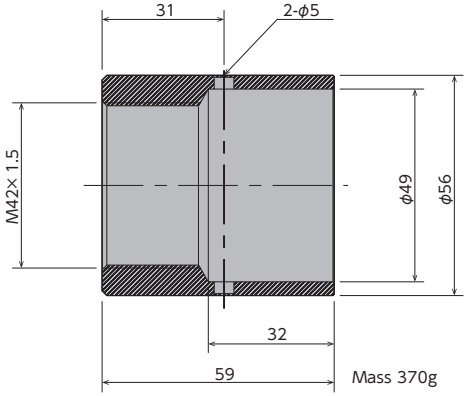


Mass 153g

Stopper nut OP-020 M42

Model
OP-020M42

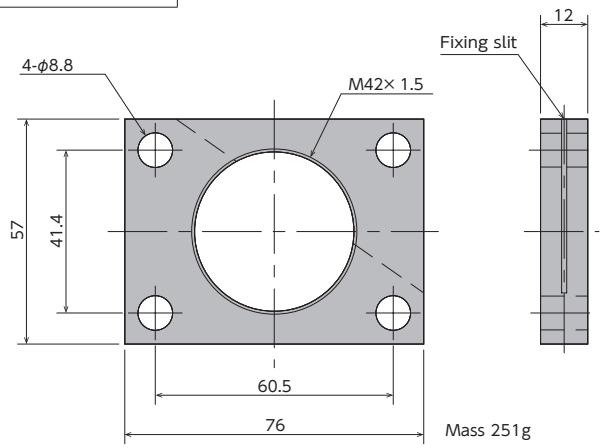
● Adjust so that it stops 1mm before thestroke end, and fasten with the main unit' s nut until secured.



Mass 370g

Rectangle flange OP-040 M42RF

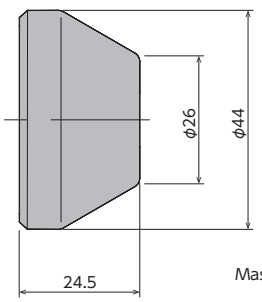
Model
OP-040M42RF



Mass 251g

Urethane cap OP-090 M42A

Model
OP-090M42A

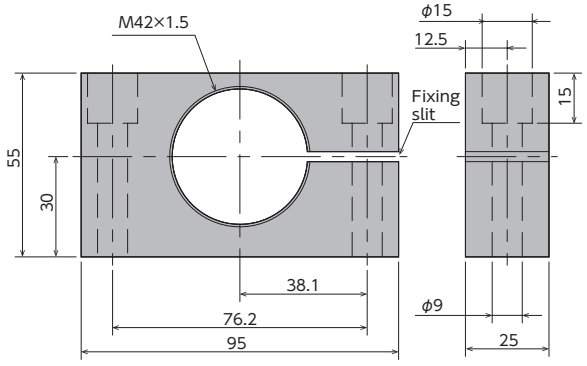


Mass 26g

Side mount OP-M42SM

Model
OP-M42SM

*Side mount is sold as a set of two.
*Recommended bolt: M8 X 50 hexagon socket head bolt



Mass 676g(1 unit)

Soft Absorber

Fixed Type | Adjustable type | Self-adjusting

FK-4225B/FK-4250B Series

RoHS Compliant

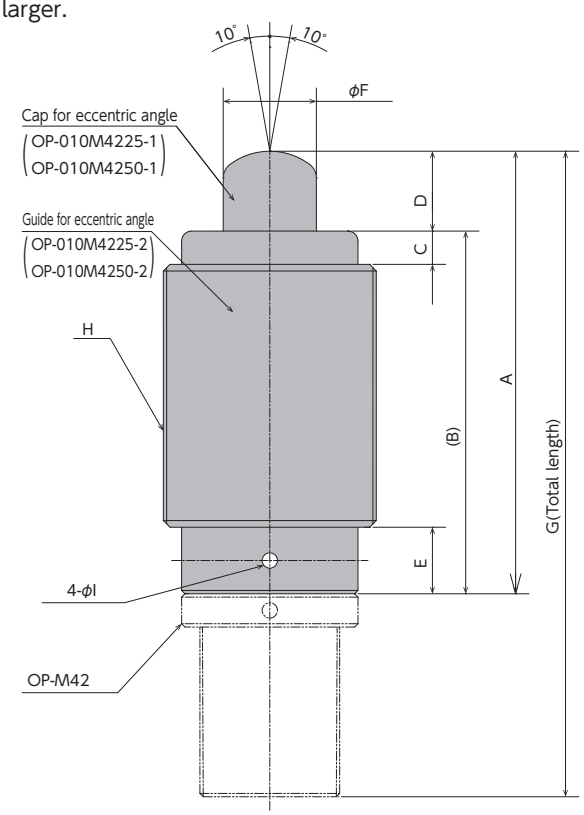
●Products specification might be changed without notice.

Optional Parts

Eccentric angle adaptor OP-010M4225/M4250

Model
OP-010M4225
OP-010M4250

- Screw the eccentric angle adaptor into the main unit until the cap for the eccentric angle and the piston rod form tight connection. While maintaining this position, fasten the main unit's nut until secured.
- Use the eccentric angle adaptor when the eccentric angle is 2.5˚ or larger.
- The main unit can also be used as a stopper.
- Use it with a capless soft absorber
- The maximum operating eccentric angle with an eccentric angle adaptor is ± 10˚.
- Nut for unit is not inclusive.
- Not usable for FA-4250YD-C, FWM-4250YBD-C.

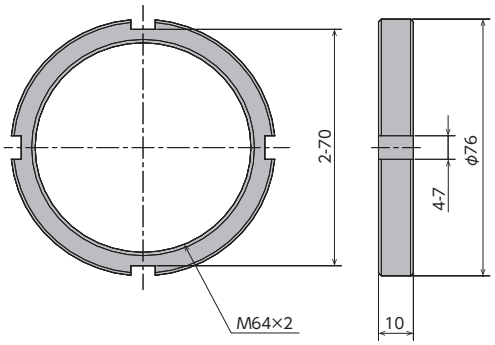


Model	A	B	C	D	E	ϕF	G	H	ϕI	Weight g
OP-010M4225	133	109	10	24	20	28	194	M64×2	4.6	1,600
OP-010M4250	203	154		49			290			2,500

Nut OP-M64

Model
OP-M64

- Usable as the nut for eccentric angle adaptor



Weight 100g

Soft Absorber

Fixed Type Adjustable type Self-adjusting

FK-6450/64100/64150/※64200 Series

RoHS Compliant

●Products specification might be changed without notice.



Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max.drag N(kgf)	Max. cycle rate cycle/min	Max. absorption energy per minute J/min (kgf·m/min)	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass kg	Allowable eccentric angle °
FK-6450L-C	50	2,000 (204.7)	2,800~36,000(2,800~36,000)	0.1～0.5	90,000 (9,184)	10	164,608 (16,797)	150(15.3)	−5～70	2.5	±2.5
FK-6450M-C			390~4,000(390~4,000)	0.3～1.5		15					
FK-6450H-C			130~500(130~500)	0.3～3.6		15					
FK-64100L-C	100	4,000 (408.2)	4,000~40,000(4,000~40,000)	0.1～0.6		8	214,118 (21,849)	180(18.4)		3.2	±1.0
FK-64100M-C			1,000~7,000(1,000~7,000)	0.3～1.5		10					
FK-64100H-C			250~1,300(250~1,300)	0.3～3.6		10					
FK-64150L-C	150	6,000 (612.2)	9,000~56,000(9,000~56,000)	0.1～0.6		6	275,556 (28,118)	370(37.8)		4.2	
FK-64150M-C			1,200~11,000(1,200~11,000)	0.3～1.5		8					
FK-64150H-C			350~2,200(350~2,200)	0.3～3.6		8					
FK-64200-C-□□□ Note 1	200	8,000(816.3)	———	———		———	———	400(40.8)		5.5	

Note 1) □ for FK-64200-C-□□□ will be filled in with a branch number. (made to order product)

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* We recommend that you use it with an external stopper (Stopper nut OP-020M64□).
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalog.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber.
* The urethane caps are consumables. Please replace them when necessary.
* FK-64200-C-□□□ is only for emergency stop; it is not designed for normal use. (Customized orders)

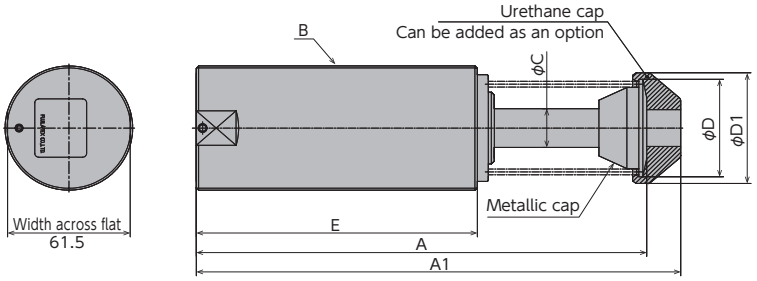
Soft Absorber

Fixed Type | Adjustable type | Self-adjusting

FK Series (M64)

RoHS Compliant

●Products specification might be changed without notice.



* The absorber's main unit does not come with nuts.

Dimensions

Model	A	A1	B	ϕC	ϕD	ϕD1	E
FK-6450□-C	226	243	M64×2	20	50.2	57	141
FK-64100□-C	328	345					191
FK-64150□-C	456	473			60		241
※FK-64200-C-□□□	556	573					291

* A1 and D1 are dimensions with the optional urethane cap attached. (Urethane cap type: OP-090M64A)
* The optional parts are common with those of the adjustable type. Please refer to page 81.
* FK-64200-C-□□□ are made to order.

Key to Model Number

FK - 64 50 M - C

- With/Without cap: C : With cap
- Performance classification: H : For high speed (Impact rate 0.3～3m/s); M : For medium speed (Impact rate 0.3～2m/s); L : For low speed (Impact rate 0.3～1m/s)
- Stroke (indicated in mm)
- External screw size (indicated in mm)
- Series name

Soft Absorber

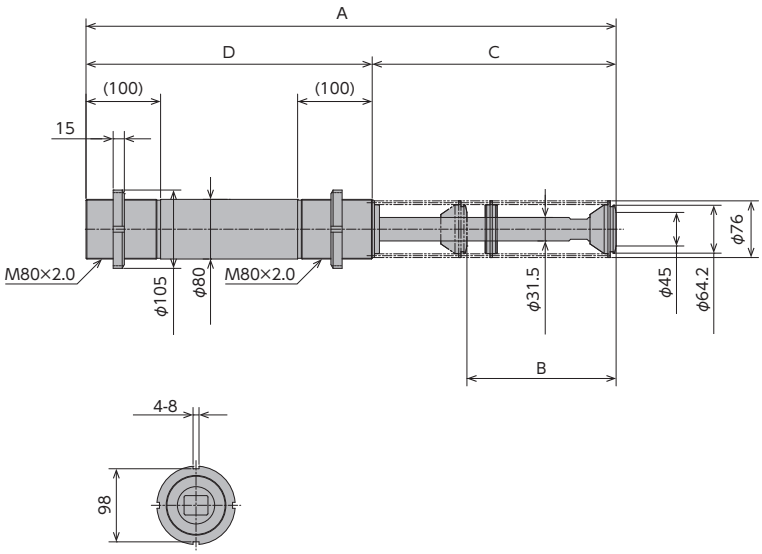
Customized orders | For emergency stop
Fixed Type | Adjustable type | Self-adjusting

FK-80200-C-□□□/FK-80300-C-□□□/FK-80400-C-□□□

RoHS Compliant

●Products specification might be changed without notice.





Dimensions

Model	A	B	C	D
FK-80200-C-□□□	710.7	200	327	383.7
FK-80300-C-□□□	910.7	300	427	483.7
FK-80400-C-□□□	1,162.7	400	547	615.7

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Rarge of impact rate m/s	Max. drag N(kgf)	Max. absorption energy per minute J/min	Max. cycle rate cycle/min	ecovering power of the piston rod N(kgf)	Operating temperature ℃	Mass kg
FK-80200-C-□□□	200	19,000 (1,938.8)	0.1～5.5	149,226 (15,227.1)	11,680	1	400 (40.8)	−5～70	11
FK-80300-C-□□□	300	28,900 (2,949)			17,770		510 (52)		14
FK-80400-C-□□□	400	38,800 (3,959.2)			23,852		510 (52)		18

* □ will be filled in with a branch number of a custom model

Soft Absorber

FK Series

RoHS Compliant

●Products specification might be changed without notice.

Optional Parts Compatibility Chart

Model	Eccentric angle adaptor	Stopper nut		Holder with a switch	Flange	Liquid-proof cap	Urethane cap	Nut
		Without cap	With cap					
FK-1008□-*	OP-010PB	OP-020PB-S	OP-020PB-C	–	OP-040PB	FK-1008□-C-060	OP-090M10A	–
FK-1210□-*	OP-010KB	OP-020KB-S	OP-020KB-C	OP-032KB	OP-040KB	FK-1210□-C-060	OP-090M12A	–
FK-1412□-*	OP-010RD	OP-020RB-S	OP-020RB-C	OP-032RB	OP-040RB	FK-1412□-C-060	OP-090M14A	–
FK-1417□-*	–	OP-020RB-S	OP-020RB-C	–	OP-040RB	–	OP-090M14B	–
FK-1612□-*	OP-010XB	OP-020HB-S	OP-020HB-C	OP-032HB	OP-040XB	FK-1612□-C-060	OP-090M16A	–
FK-2016□-*	OP-010EB	OP-020EB-S	OP-020EB-C	OP-032EB	OP-040EB	FK-2016□-C-060	OP-090M20A	–
FK-2022□-*	–	OP-020EB-S	OP-020EB-C	–	OP-040EB	–	OP-090M20A	–
FK-2050□-R	–	OP-020EB-S	OP-020EB-C	–	OP-040EB	–	OP-090M20A	–
FK-2530□-*	OP-010GB	OP-020GB-S	OP-020GB-C	OP-032GB	OP-040GB	FK-2530□-C-060	OP-090M25A	–
FK-2540□-*	–	OP-020LB	OP-020LB	–	OP-040GB	–	OP-090M25A	–
FK-2550□-R	–	–	–	–	–	–	OP-090M25A	–
FK-2725□-*	OP-010FB	OP-020FB-S	OP-020FB-C	OP-032FB	OP-040FB	FK-2725□-C-060	–	–
FK-3035□-*	OP-010TB	OP-020TB-S	OP-020TB-C	–	OP-040TB	FK-3035□-C-060	OP-090M30A	–
FK-3625A□-C	OP-010M3625	–	OP-020M36	–	OP-040UB	–	OP-090M36B	–
FK-3650A□-C	OP-010M3650	–	OP-020M36	–	OP-040UB	–	OP-090M36B	–
FK-3650□-*	OP-010UB	OP-020UB-S	OP-020UB-C	–	OP-040UB	–	OP-090M36A	–
FK-4225B□-C	OP-010M4225	–	OP-020M42	–	Square flange OP-040M42SF Rectangle flange OP-040M42RF	–	OP-090M42A	OP-M42
FK-4250B□-C	OP-010M4250	–	OP-020M42	–		–	OP-090M42A	OP-M42
FK-4275B□-C	–	–	OP-020M42	–		–	OP-090M42A	OP-M42
FK-6450□-C	–	–	OP-020M64S	–	Square flange OP-040M64SF	–	OP-090M64A	OP-M64
FK-64100□-C	–	–	OP-020M64S	–		–	OP-090M64A	OP-M64
FK-64150□-C	–	–	OP-020M64L	–		–	OP-090M64A	OP-M64

*Standard nuts are sold separately as well.

Applicable Models	Model
FK-0404	M04 nut
FK-0604	M06 nut
FK-1008	M10 nut
FK-1210	M12 nut
FK-1412	M14 nut
FK-1417	M14 nut
FK-1612	M16 nut
FK-2016	M20 nut
FK-2022	M20 nut
FK-2050	M20 nut
FK-2530	M25 nut
FK-2540	M25 nut
FK-2550 P2.0	M25-P2 nut
FK-2725	M27 nut
FK-3035	M30 nut
FK-3625A	M36A nut
FK-3650A	M36A nut
FK-3650	M36 nut

Soft Absorber

FK Series

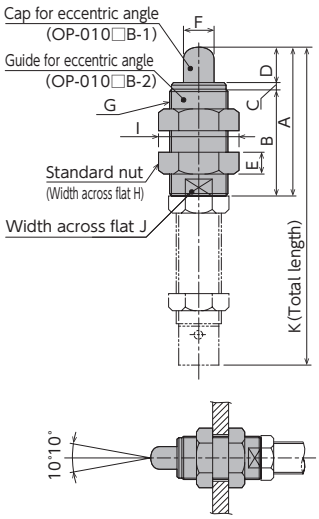
RoHS Compliant

●Products specification might be changed without notice.

Optional Parts

Eccentric angle adaptor OP-010

Model	A	B	C	D	E	F	G	H	I	J	K	Mass g
OP-010PB	38	28	2	8	6	8	M16×1.5	19	21.9	13	65	35
OP-010KB	48	35	3	10	5	10	M18×1.5	21	24.3	14	85	48
OP-010RD	53	38	3	12	7	11	M22×1.5	24	27.7	19	95	84
OP-010XB	60	45	3	12	7	12	M22×1.5	24	27.7	19	102	81
OP-010EB	68	49	3	16	10	14	M27×1.5	32	37	24	129	209
OP-010GB	107.5	67.5	10	30	15	16	M36×1.5	46	53.1	32	197.5	639
OP-010FB	97	62	10	25	15	16	M36×1.5	46	53.1	32	170	587
OP-010TB	127	82	10	35	15	18	M40×1.5	50	57.7	36	239	852
OP-010UB	167	107	10	50	15	20	M45×1.5	55	63.5	41	306	1,273
OP-010M3625	131	97	10	24	15	22	M45×1.5	55	63.5	41	200	880
OP-010M3650	201	142	10	49	15	22	M45×1.5	55	63.5	41	312	1,270
OP-010M4225	133	99	10	24	–	28	M64×2	–	–	–	194	1,600
OP-010M4250	203	144	10	49	–	28	M64×2	–	–	–	290	2,500



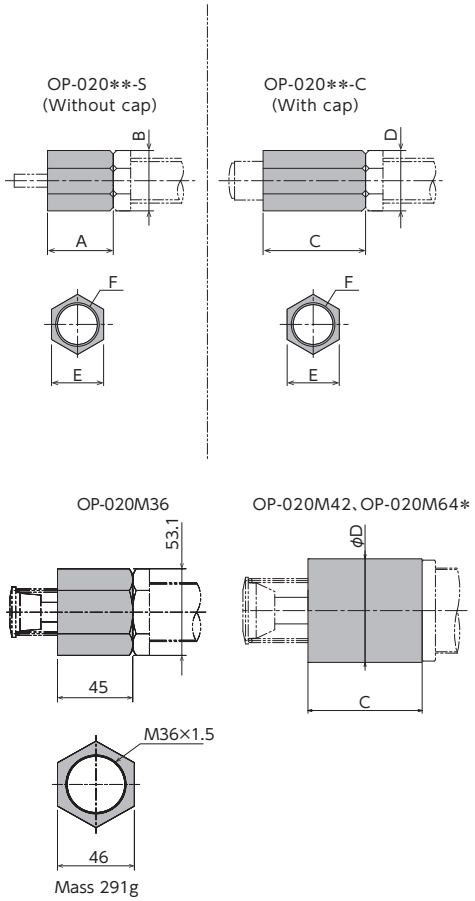
When attaching the eccentric angle adaptor, screw it into the main unit until the cap for eccentric angle and the piston rod form a tight connection. While maintaining this position, fasten the main unit's nut until secured.

* If the eccentric angle adaptor is secured without establishing a tight fit, a sufficient stroke cannot be obtained. Furthermore, if the eccentric angle adaptor is further screwed in, after it has formed a tight connection, and then secured in place, the cap for eccentric angle cannot be pushed all the way to the stroke end.

● The inclined adapter is not available for models with soft absorber cap (-C) and urethane cap (-R)
● The cap for eccentric angle and the guide for eccentric angle are not sold as single parts.
● The eccentric angle adaptors for M42 (OP-010M4225, OP-010M4250) are not provided with nuts. OP-M64 should be purchased separately.

Stopper nut OP-020

Model	Standard OP-020□-S		With cap OP-020□-C		Common dimensions		Mass g	
	A	B	C	D	E	F		
OP-020PB-S・C	10	15	16	15	13	M10×1	S	6
							C	9
OP-020KB-S・C	12	16.2	16	16.2	14	M12×1	S	6
							C	8
OP-020RB-S・C	12	19.6	20	19.6	17	M14×1.5	S	10
							C	17
OP-020HB-S・C	15	21.9	30	21.9	19	M16×1.5	S	15
							C	28
OP-020EB-S・C	30	27.7	47	27.7	24	M20×1.5	S	46
							C	68
OP-020GB-S・C	20	37	32	37	32	M25×1.5	S	65
							C	102
OP-020LB	–	–	50	37	32	M25×1.5	153	
OP-020FB-S・C	35	37	55	37	32	M27×1.5	S	90
							C	137
OP-020TB-S・C	38	41.6	58	41.6	36	M30×1.5	S	129
							C	197
OP-020UB-S・C	45	53.1	65	53.1	46	M36×1.5	S	291
							C	422
OP-020M36	–	–	45	53.1	46	M36×1.5	291	
OP-020M42	–	–	59	ϕ56	–	M42×1.5	370	
OP-020M64S	–	–	86	ϕ78	–	M64×2	850	
OP-020M64L	–	–	115	ϕ78	–	M64×2	1,150	



● Adjust so that it stops 1mm before the stroke end, and fasten with the main unit's nut until secured.

Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Soft Absorber

FK Series

RoHS Compliant

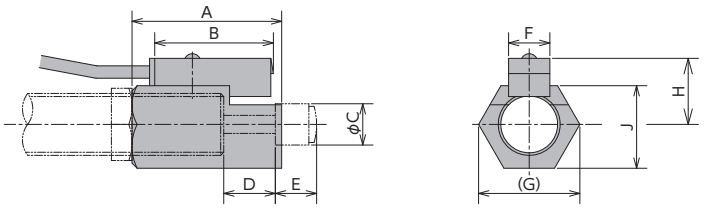
●Products specification might be changed without notice.

Optional Parts

Holder with a switch OP-032

Model	A	B	ϕC	D	E	F	(G)	H	J	Mass g
OP-032KB	29	23	8	10	8	8	19.6	12.8	16	38
OP-032RB	29	23	10	12	8	8	19.6	13.8	17	34
OP-032HB	40	23	13.5	12	15	8	21.9	14.8	19	46
OP-032EB	50	23	18	16	17	8	27.7	17.3	24	80
OP-032GB	37	23	22	30	18	8	33.5	19.8	29	82
OP-032FB	56	23	23	25	20	8	34.6	20.3	30	107

● Position the holder in such a way that the tip of the switch and one of the ends of the metal ring for the rod cap are separated more than 0.5 mm. Cause of malfunction.
● Please refer to below for the specification of switches and precautions for use.



Model GXL-8F specifications Manufactured by SUNX

Item	Summary	Specification
Detection distance	Standard detected object 15X15X1 (Iron)	2.1mm
Power voltage		12～24VDC±10%
Consumption current		15mA or lower
	Behaviour form	NO type
	Output form	NPN open collector
	Output capacity (with 24VDC power voltage)	100mA or lower
	Protection feature	Comes with a surge absorption circuit
	Residual voltage At 100mA inflowing current	2V or lower
	入Input/Output circuit diagram +V (Brown) Load Main circuit 12～24V DC±10% Output (Black) 0 (Blue) Operation indicator light Red LED (lights up when the output is ON)	
Response frequency		500Hz
Ambient operating temperature		−25～70℃
Ambient storage temperature		−40～85℃
Ambient operating humidity		35～85%RH
Ambient storage humidity		35～95%RH
Lead wire length		Approximately 1m
Mass	Including cable	Approximately15g

1) Do not use when it is in a transient state after the power is turned on (approx.10ms).
2) Keep the cables as short as possible when using in places with a lot of noise.
Also, please take all precautions, such as avoiding the parallel wiring ofelectric lines and power lines, as well as wiring within the same conduit.
3) Ensure that the switch does not come in direct contact with thinner-type chemicals.
4) Because it does not have a short-circuit protection circuit, wiring must be done correctly.
5) Since copper wires are used in the cable, exercise caution when using the cable in an environment where copper ions are unacceptable.

Soft Absorber

FK Series

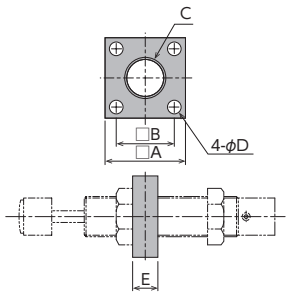
RoHS Compliant

●Products specification might be changed without notice.

Optional Parts

Flange OP-040

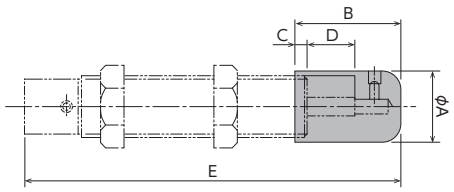
Model	A	B	C	D	E	Mass g
OP-040PB	25	18	M10×1	3.2	4	16
OP-040KB	25	18	M12×1	3.2	4	15
OP-040RB	34	24	M14×1.5	4.5	4	30
OP-040XB	34	24	M16×1.5	4.5	4	29
OP-040EB	40	28	M20×1.5	6.5	12	109
OP-040GB	54	40	M25×1.5	9	12	206
OP-040FB	50	36	M27×1.5	9	12	157
OP-040TB	65	45	M30×1.5	11	14	344
OP-040UB	78	56	M36×1.5	14	16	566



● This is a mounting fixture for soft absorbers.

Liquid-proof cap -060

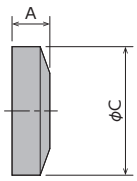
Model	A	B	C	D	E	Mass g
FK-1008□-C-060	13	18	3	8	55	10
FK-1210□-C-060	17	28	9.5	10	71.5	25
FK-1412□-C-060	19	30	9	12	78.5	31
FK-1612□-C-060	21	34	9.5	12	87.5	46
FK-2016□-C-060	24	35	4	16	108	59
FK-2530□-C-060	28	51	6.5	30	154.5	77
FK-2725□-C-060	30	50	5	25	137.5	112
FK-3035□-C-060	38	60	5	35	191.5	255



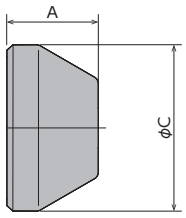
● The main unit is supplied in assembly
● □ will be filled in with either one of L, M, or H indicated in the catalog.
● Ideal for use in environments where oil splatter poses a problem.
● Ensure that the cap is facing upward. If the cap is facing sideways or downward, it cannot provide an effective means for liquid proofing.
Note) Liquid-proof caps are not sold separately.

Urethane cap OP-090

Model	A	C	Mass g
OP-090M36B	10	34	7
OP-090M42A	24.5	44	22
OP-090M64A	(24.1)	57	35



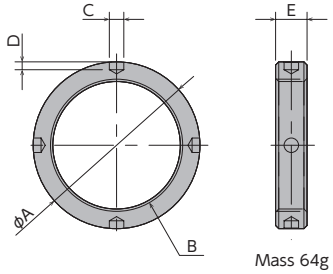
OP-090M36B



OP-090M42A
OP-090M64A

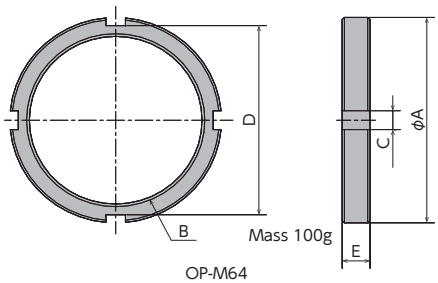
Nut

Model	A	B	C	D	E	Mass g
OP-M42	53	M42×1.5	4-ϕ4.6	4-2.5	10	64
OP-M64	76	M64×2.0	4-7	2-70	10	100



Mass 64g

OP-M42



Mass 100g

OP-M64

Soft Absorber

Multiple-orifice type
Fixed Type | Adjustable type | Self-adjusting

FL Series (M12～M16)

RoHS Compliant

●Products specification might be changed without notice.



Characteristics

- With an adjustable multiple-orifice structure, an optimal impact absorption can be achieved by making adjustments, even under variable operating conditions.
- This product is a long-stroke type that is suitable for high-speed (3m/s) collisions.

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m	Max. equivalent mass kg(kgf)	Rarge of impact rate m/s	Max. drag N(kgf)	Max.cycle rate cycle/min	Max. absorption energy per minute J/min (kgf·m/min)	Recovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g	
										S type	C type
FL-1214H-□	14	5.4(0.55)	30(30)	0.3～3	1,156(118)	60	98 (10)	12.7(1.3) or lower	−5～70	46	49
FL-1417H-□	17	14.7(1.5)	50(50)	0.3～3	2,646(270)	60	176 (18)	15.7(1.6) or lower	−5～70	80	85
FL-1620H-□	20	17.6(1.8)	60(60)	0.3～3	2,646(270)	60	235 (24)	19.6(2.0) or lower	−5～70	124	136

Note) Insert S in the □ to order without a cap, and insert C in the □ to order with a cap (R if ordering urethane cap).

Key to Model Number

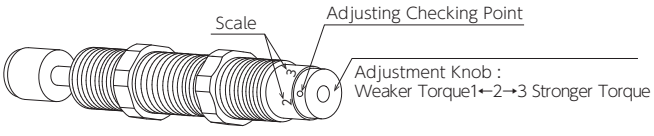
FL - 16 20 H - C

- With/Without cap S : Without cap / C : With cap
- Performance classification H : For high speed (Impact rate 0.3～3m/s)
- Stroke (indicated in mm)
- External screw size (indicated in mm)
- Series name

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* We recommend that you use it with an external stopper (Stopper nut OP-020**).
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°)

Adjustment Method



* To adjust, turn the adjustment knob located at the bottom of the main unit.
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.
* Once the adjustment is complete, secure with a lock screw using the attached hex wrench.

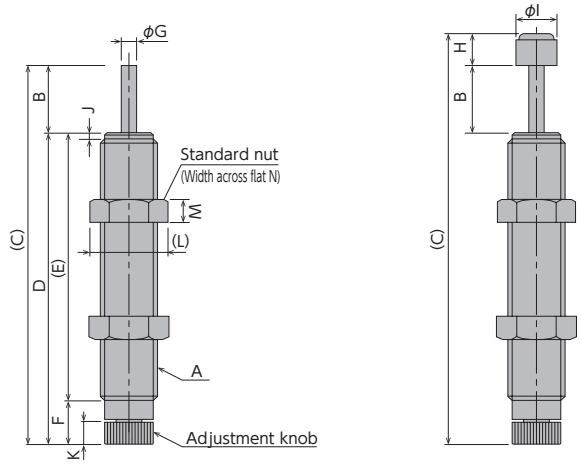
Soft Absorber

Fixed Type | Adjustable type | Self-adjusting

FL Series

RoHS Compliant

●Products specification might be changed without notice.



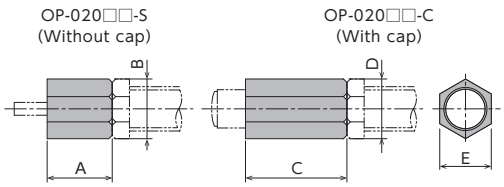
Dimensions

Model	A	B	C	D	E	F	ϕG	H	ϕI	J	K	L	M	N
FL-1214H-S	M12×1.0	14	84	70	59.5	10.5	3.5	–	–	1.5	5	16.2	4	14
FL-1214H-C			92					8	8					
FL-1417H-S	M14×1.5	17	105	88	77.8	10.2	4	–	–	1.5	5	19.6	6	17
FL-1417H-C			115					10	10					
FL-1620H-S	M16×1.5	20	128	108	93.5	14.5	5	–	–	–	4.4	21.9	6	19
FL-1620H-C			143					15	13.5					

Optional Parts

Stopper nut OP-020 □□ - □

Model	Without cap OP-020□□-S		With cap P-020□□-C		E	Applicable model	Mass g	
	A	B	C	D				
OP-020KB-S·C	12	16.2	16	16.2	14	FL-1214H	S	6
							C	8
OP-020RB-S·C	12	19.6	20	19.6	17	FL-1417H	S	10
							C	17
OP-020HB-S·C	15	21.9	30	21.9	19	FL-1620H	S	15
							C	28

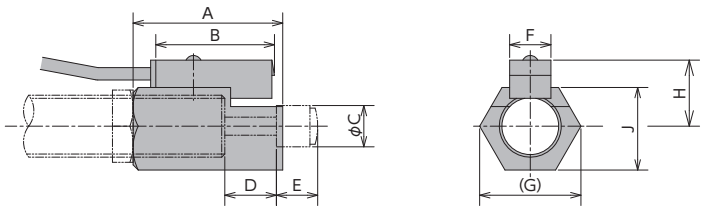


● Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.
Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Holder with a switch OP-032 □□

Model	A	B	ϕC	D	E	F	(G)	H	J	Applicable model	Mass g
OP-032KB	29	23	8	14	8	8	19.6	12.8	16	FL-1214H-C	38
OP-032HB	40	23	13.5	20	15	8	21.9	14.8	19	FL-1620H-C	46

Note) For switch specifications and precautions for use, please refer to page 23.
Note) A holder with a switch cannot be used with the FL-1417 series.



Standard nuts are sold separately as well.

Applicable model	Model
FL-1214H	M12 nut
FL-1417H	M14 nut
FL-1620H	M16 nut

Soft Absorber

Double Direction Type | Multiple-orifice type
Fixed Type | Adjustable type | Self-adjusting

FW Series (M12～M25)

RoHS Compliant

●Products specification might be changed without notice.



Characteristics

- This product is a double-rod type that can absorb impact from both directions.
- Because of its multiple-orifice structure, a smooth impact absorption is possible.
- Idea for small spaces.

Specifications

Model	Stroke mm mm	Max. absorption energy J (kgf·m)	Max. equivalent mass kg (kgf)	Range of impact rate m/s	Max. drag N (kgf)	Max. cycle rate cycle/min	Max. absorption energy per minute J/min (kgf·m/min)	Recovering power of the piston rod N (kgf)	Operating temperature ℃	Mass g	
										S type	C type
FW-1212L-C	12	4.9 (0.5)	39 (39)	0.3～1	1,078 (110)	60	41 (4.2)	7.8 (0.8) or lower	−5～70	–	64
FW-1616M-□	16	13.7 (1.4)	30 (30)	0.3～2	2,646 (270)	60	235 (24)	17.6 (1.8)) or lower	−5～70	130	142
FW-2025M-□	25	39.2 (4.0)	87 (87)	0.3～2	4,900 (500)	60	343 (35)	24.5 (2.5)) or lower	−5～70	234	271
FW-2530M-□	30	62.7 (6.4)	140 (140)	0.3～2	6,370 (650)	60	490 (50)	29.4 (3.0)) or lower	−5～70	460	527

Note) Insert S in the □ to order without a cap, and insert C in the □ to order with a cap (R if ordering urethane cap).。

Key to Model Number

FW - 12 12 L - C

- With/Without cap: S : Without cap; C : With cap
- Performance classification: L : For low speed (Impact rate 0.3～1m/s); M : For medium speed (Impact rate 0.3～2m/s)
- Stroke (indicated in mm)
- External screw size (indicated in mm)
- Series name

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* It cannot absorb impact from both directions at the same time.
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°C)
* Ensure that an external stopper is also used.

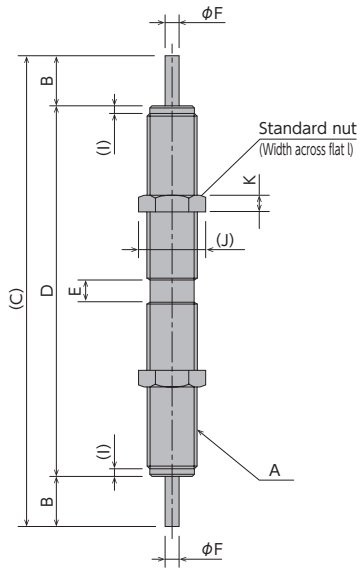
Soft Absorber

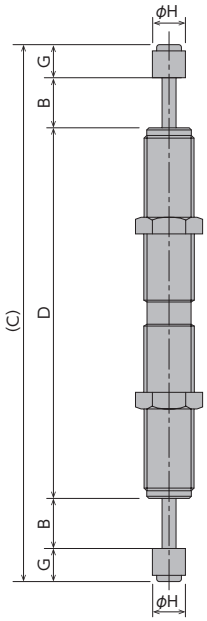
Double Direction Type | Multiple-orifice type
Fixed Type | Adjustable type | Self-adjusting

FW Series (M12～M25)

RoHS Compliant

●Products specification might be changed without notice.





Dimensions

Model	A	B	C	D	E	ϕF	G	ϕH	I	J	K	L
FW-1212L-C	M12×1.0	12	130	90	5	3.5	8	8	2	16.2	4	14
FW-1616M-S	M16×1.5	16	134	102	–	5	–	–	6	21.9	6	19
FW-1616M-C			164				15	13.5	6			
FW-2025M-S	M20×1.5	25	170	120	–	6	–	–	6	27.7	8	24
FW-2025M-C			204				17	18	6			
FW-2530M-S	M25×1.5	30	205	145	–	8	–	–	6	37	10	32
FW-2530M-C			241				18	22	6			

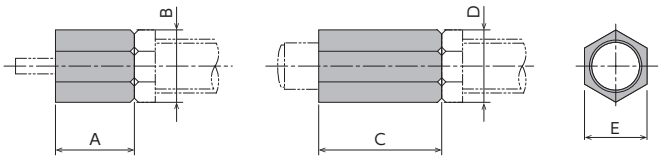
Optional Parts

Stopper nut OP-020 ** - □

Model	A	B	C	Applicable model	Mass g
OP-020KB-C	16	16.2	14	FW-1212L-C	8
OP-020HB-S	15	21.9	19	FW-1616M-S	15
OP-020HB-C	30	21.9	19	FW-1616M-C	28
OP-020EB-S	30	27.7	24	FW-2025M-S	46
OP-020EB-C	47	27.7	24	FW-2025M-C	68
OP-020GB-S	20	37	32	FW-2530M-S	65
OP-020GB-C	32	37	32	FW-2530M-C	102

OP-020**-S
(Without cap)

OP-020**-C
(With cap)



● Adjust so that it stops 1mm before thestroke end, and fasten with the main unit's nut until secured.
Note) When attaching, make sure that the side without a bearing chamfer is the impact surface.

Standard nuts are sold separately as well.

Applicable model	Model
FW-1212L	M12 nut
FW-1616M	M16 nut
FW-2025M	M20 nut
FW-2530M	M25 nut

Soft Absorber

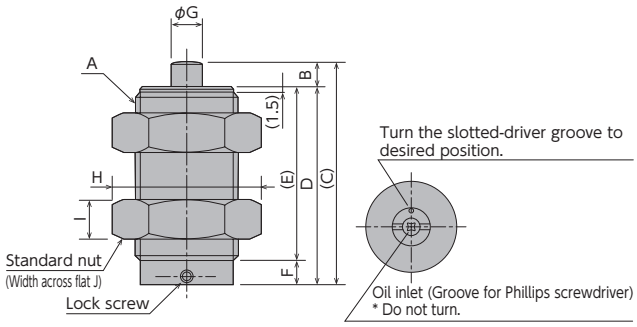
Short Stroke Type | Single-Orifice
Fixed Type | Adjustable type | Self-adjusting

FS Series

RoHS Compliant

●Products specification might be changed without notice.





Dimensions

Model	A	B	C	D	E	F	ϕG	H	I	J
FS-1406L-S	M14×1.5	6	55	49	41	8	4	19.6	6	17
FS-1606L-S	M16×1.5	6	55	49	41	8	5	21.9	6	19
FS-2006L-S	M20×1.5	6	55	49	43	6	6	27.7	8	24
FS-2506L-S	M25×1.5	6	55	49	43	6	8	37	10	32
FS-2706L-S	M27×1.5	6	55	49	43	6	8	37	10	32

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg (kgf)	Range of impact rate m/s	Max. drag N (kgf)	Max. cycle rate cycle/min	Max.absorption energy per minute J/min(kgf·m/min)	Recovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g
FS-1406L-S	6	3.5(0.36)	80(80)	0.3~1	2,000(204)	45	100 (10.2)	20(2) or lower	−5~70	49
FS-1606L-S	6	4.8(0.49)	120(120)	0.3~1	2,700(276)	45	130 (13.3)	20(2) or lower	−5~70	63
FS-2006L-S	6	7.8(0.8)	60(60)	0.3~1	3,920(400)	60	200 (20.4)	16.7(1.7) or lower	−5~70	114
FS-2506L-S	6	11.7(1.2)	90(90)	0.3~1	5,880(600)	60	300 (30.6)	19.6(2.0) or lower	−5~70	210
FS-2706L-S	6	15.6(1.6)	120(120)	0.3~1	7,840(800)	60	350 (35.7)	22.6(2.3) or lower	−5~70	221

Key to Model Number

FS - 20 06 L - S

- With/Without cap — S : Without cap
- Performance classification — L : For low speed (Impact rate 0.3 ~1m/s)
- Stroke — (indicated in mm)
- External screw size — (indicated in mm)
- Series name

Precautions for Use

* Do not use this product without carefully reading the attached own' se rmanual.
* Ensure that an external stopper is also used.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°)
* Do not turn the oil inlet screw located at the bottom of the main unit.

Characteristics

* To adjust, turn the adjustment knob with a slotted screw driver
* Because the adjustment can be done in an analog manner, a value between two integers on the indicator can be set.

Standard nuts are sold separately as well.

Applicable model	Model
FS-1406L	M14 nut
FS-1606L	M16 nut
FS-2006L	M20 nut
FS-2506L	M25 nut
FS-2706L	M27 nut

Soft Absorber

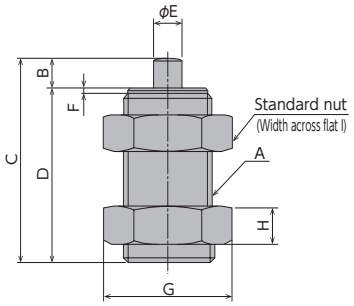
Short Stroke Type | Multiple-orifice type
Fixed Type | Adjustable type | Self-adjusting

FV Series

RoHS Compliant

●Products specification might be changed without notice.





Dimensions

Model	A	B	C	D	ϕE	F	G	H	I
FV-1406L-S	M14×1.5	6	46	40	4	2	19.6	6	17
FV-1606L-S	M16×1.5	6	46	40	5	2	21.9	6	19
FV-2008L-S	M20×1.5	8	55	47	6	1.5	27.7	8	24
FV-2508L-S	M25×1.5	8	55	47	8	1.5	37	10	32
FV-2708L-S	M27×1.5	8	55	47	8	1.5	37	10	32

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg (kgf)	Range of impact rate m/s	Max. drag N (kgf)	Max. cycle rate cycle/min	Max.absorption energy per minute J/min(kgf·m/min)	Recovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g
FV-1406L-S	6	4.5(0.46)	80(80)	0.3～1	2,000(204)	45	100 (10.2)	15(1.5)以下	−5～70	42
FV-1606L-S	6	5.5(0.56)	120(120)	0.3～1	2,700(276)	45	130 (13.3)	20(2)以下	−5～70	53
FV-2008L-S	8	8.8(0.9)	70(70)	0.3～1	3,430(350)	60	200 (20.4)	14.7(1.5)以下	−5～70	108
FV-2508L-S	8	13.7(1.4)	110(110)	0.3～1	5,390(550)	60	300 (30.6)	21.6(2.2)以下	−5～70	199
FV-2708L-S	8	19.6(2.0)	150(150)	0.3～1	7,350(750)	60	350 (35.7)	23.5(2.4)以下	−5～70	206.7

Key to Model Number

FV - **20** **08** **L** - **S**

- With/Without cap S : Without cap
- Performance classification L : For low speed (Impact rate 0.3～1m/s)
- Stroke (indicated in mm)
- External screw size (indicated in mm)
- Series name

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Do not turn the oil inlet screw located at the bottom of the main unit.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°)
* Ensure that an external stopper is also used.

Standard nuts are sold separately as well.

Applicable model	Model
FV-1406L	M14 nut
FV-1606L	M16 nut
FV-2008L	M20 nut
FV-2508L	M25 nut
FV-2708L	M27 nut

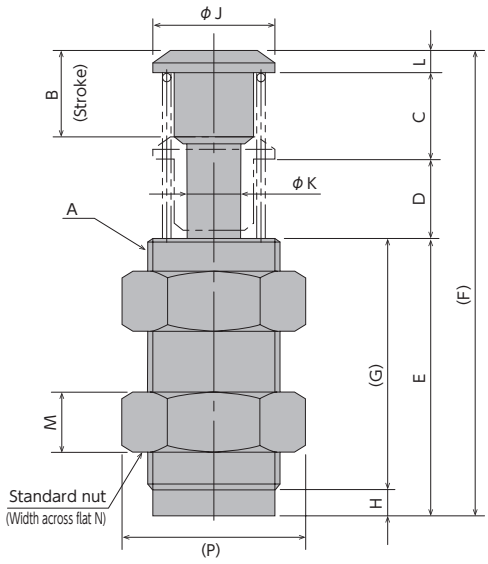
Soft Absorber

Emergency Absorber | Variable-Groove Orifice
Fixed Type | Adjustable type | Self-adjusting

FED Series

●Products specification might be changed without notice.





Dimensions

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P
FED-2010M-C	M20×1.5	10	11	14	37.5	62.5	30.5	7	16	8	3	8	24	27.7
FED-3020M-C	M30×1.5	20	25	18	64	107	58	6	28	12	5	14	36	41.6

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg (kgf)	Range of impact rate m/s	Max. drag N (kgf)	Recovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g g
FED-2010M-C	10	19.6(2.0)	30(30)	0.5~2	6,860(700)	41.2(4.2) or lower	−5~70	79
FED-3020M-C	20	98(10)	140(140)		11,760(1,200)	68.6(7.0) or lower		350

* This product is an affordable compact soft absorber for emergencies.
* Light weight - made of aluminum.
* As an emergency absorber, it will last for approximately 100 uses.

Precautions for Use

* Do not use this product without carefully reading the attached owner' s manual.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Never apply eccentric load to the piston rod. In particular, when using in a rotating motion, the distance between the rotational centre of the impacted part and the mounted soft absorber should be at least 12 times the stroke length. The soft absorber should also be mounted so that it is perpendicular halfway through the stroke.
* Do not over-tighten the standard nut. (Tightening torque: 14.7H·m)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Please use with an external stopper

Standard nuts are sold separately as well.

Applicable model	Model
FED-2010M	M20 nut Black
FED-3020M	M30 nut Black

Soft Absorber

Multiple-Orifice (M12 is Single-Orifice)
Fixed Type Adjustable type Self-adjusting

FSB Series (M12、M14、M16)

RoHS Compliant

●Products specification might be changed without notice.



Characteristics

- High functionality stopper bolt (with an implemented absorber)
- Easy to mount external geometry

Material	Main unit	SUM
	Cap	Polyacetal
Surface treatment	Main unit	Nitriding treatment

Specifications

Model	Stroke mm	Max. absorption energy J(kgf·m)	Max. equivalent mass kg (kgf)	Range of impact rate m/s	Max. drag N (kgf)	Max.cycle rate cycle/min	Max.absorption energy per minute J/min (kgf·m/min	Recovering power of the piston rod N(kgf)	Operating temperature ℃	Mass g
FSB-1205-C	5	0.68(0.07)	5(5)	0.3～1.0	588(60)	45	65 (6.63)	4.9 or lower(0.5)	−5～70	40
FSB-1407-C	7	2.5(0.25)	20(20)		1,078(110)	60	120 (12.2)	4.9 or lower(0.5)		70
FSB-1609-C	9	6(0.61)	50(50)		1,960(200)	60	200 (20.4)	9.8 or lower(1.0)		115

Key to Model Number

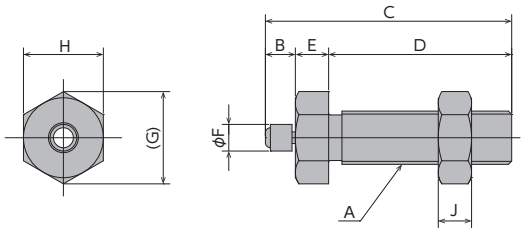
FSB - **16** **09** - **C**

- C : With cap (With/Without cap)
- (indicated in mm) (Stroke)
- (indicated in mm) (External screw size)
- Series name

Dimensions

Model	A	B	C	D	E	F	G	H	J
FSB-1205-C	M12×1.75	5	43	30	8	6	21.9	19	7
FSB-1407-C	M14×2	7	56	40	9	6	25.4	22	8
FSB-1609-C	M16×2	9	74	55	10	8	27.7	24	10

● The thread pitch is different from other absorbers.



Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalogue.)
* Do not use this product in a vacuum or a location where it may come in contact with oil.
* Ensure that an eccentric load is not applied to the soft absorber. (Allowable eccentric angle: ±2.5°)
* Do not over-tighten the main unit and nuts. Please use the tightening torque as listed in the owner's manual.
* Due to the structure of this product, using the absorber (piston rod side) in an upright position in a dusty environment causes the dust to collect on the absorber, which may affect the durability.

Standard nuts are sold separately as well.

Applicable model	Model
FSB-1205	FSB-1205 nut
FSB-1407	FSB-1407 nut
FSB-1609	FSB-1609 nut

Soft Absorber

FES Series



Type Descriptions

F E S − 12 15

① ② ③

① Series name
② Mounting screw size (metric coarse screw thread)
③ Max. stroke

Product Description

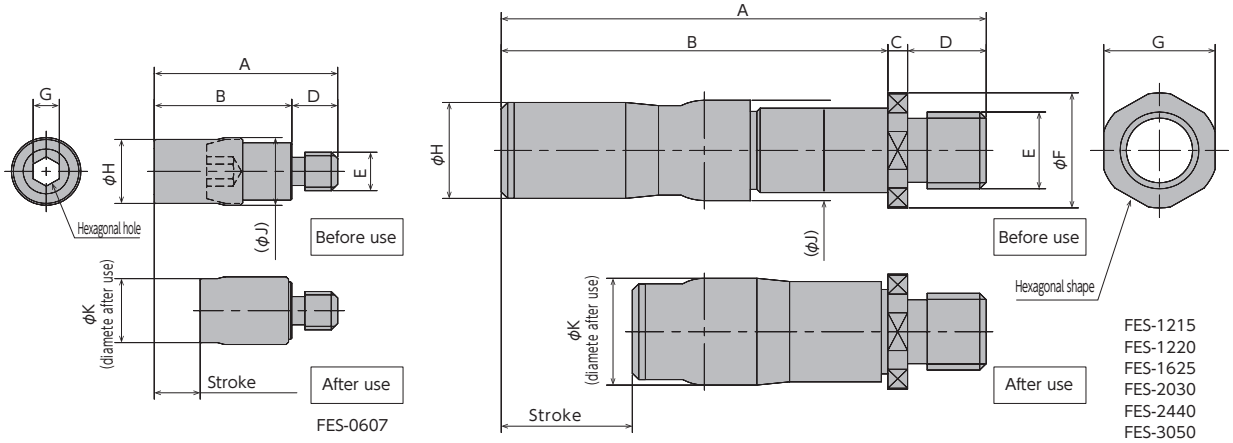
The emergency stopper, available for only one-time use, is designed to urgently stop in runway of the devices with an linear motor or servomotor.
Absorbs the energy using the plastic deformation of metal. Differs from the general hydraulic pressure shock absorber, impervious to an oil leak.
Designed more compact than a hydraulic pressure shock absorber with the similar absorption capacity.
Also, a rebound, frequently seen in a rubber stopper, does not occur and the excellent absorption characteristics cause no damage to the device.

Specifications

Model	Max. absorption energy J(kgf·m)	Maximum stroke mm	Range of impact rate m/s	Max. drag N(kgf)	Range of operating temperature ℃	Mass g
FES-0607	7(0.7)	7	3以下	2,500(255)	−25～60	9
FES-1215	45(4.6)	15		6,500(663)		50
FES-1220	80(8.2)	20		8,500(867)		70
FES-1625	160(16.3)	25		9,500(969)		100
FES-2030	450(45.9)	30		27,000(2,755)		300
FES-2440	1,000(102)	40		45,000(4,592)		650
FES-3050	1,800(183.7)	50		60,000(6,122)		1,200

Dimensions

Model	A	B	C	D	E	F	G	H	J	K
FES-0607	28	21	–	7	M6×1	–	4	10	10.6	10.6
FES-1215	62	47	3	12	M12×1.75	15	14	14	14.6	15.4
FES-1220	74	59	3	12	M12×1.75	18	17	15	15.7	16.7
FES-1625	89	70	3	16	M16×2	19	17	15	16.5	17.5
FES-2030	109	84	5	20	M20×2.5	30	27	26	27.8	28.8
FES-2440	138	107	6	25	M24×3	40	36	33	36.7	37.7
FES-3050	172	134	8	30	M30×3.5	50	46	41	45	46



Selection Method

1. Based on the equations for the selection, please calculate the kinetic energy (E1) of the application to be used and tentatively select the model with grater maximum absorption energy than the calculated energy value.

* According to the expected number of units to be used (n), multiply the maximum absorption energy by n.

↓

2. Calculate the stroke of the tentatively selected model (St) based on the stroke equations and the table of coefficient for each model, and calculate the thrusting energy (E2) using the equations for the selection.

↓

3. Confirm that the total energy (E) and stroke (St) calculated above meet the specifications of the tentatively selected model. When the specifications are met, the selection is complete. If not, please calculate again with another model with greater maximum absorption energy.

Equations for the Selection

With thrust (horizontal)

$$E_1=\frac{1}{2}MV^2 \qquad E_2=F\times St$$

$$St=\frac{1}{2}MV^2\times\frac{1}{((\text{max. drag}\times n\times\text{coefficient})-F}$$

$$E=E_1+E_2$$

Without thrust (horizontal)

$$E_1=\frac{1}{2}MV^2$$

$$E=E_1$$

You can calculate the approximate stroke using the equations below (no need to use the equation of E2 = F × St).

$$St=\frac{1}{2}MV^2\times\frac{1}{\text{max. drag}\times n\times\text{coefficient}}$$

For free fall

$$E_1=M\cdot g\cdot H \qquad E_2=M\cdot g\cdot St$$

$$St=\frac{1}{2}MV^2\times\frac{1}{(\text{max. drag}\times n\times\text{coefficient})-(M\times g)}$$

$$E=E_1+E_2$$

Equations to calculate a stroke

Equations to calculate St (stroke) of E2=F×St

$$St=\frac{1}{2}MV^2\times\frac{1}{\text{max. drag}\times n\times\text{coefficient}-F}$$

(n: Number of FES; F: Thrust)

Table of coefficient for each model

Model	Stroke mm	Max. absorption energy J	Max. drag N	Coefficient
FES−0607	7	7	2,500	0.5
FES−1215	15	45	6,500	0.7
FES−1220	20	80	8,500	0.7
FES−1625	25	160	9,500	0.7
FES−2030	30	450	27,000	0.6
FES−2440	40	1,000	45,000	0.7
FES−3050	50	1,800	60,000	0.7

Product Characteristics

* Excellent absorption characteristic
* Compact with large absorption capacity
* Usable without an external stopper
* Maintenance-free
* Little changes in the characteristics with operating temperature

How to Mount

Tightening torque when attaching N·m (kg·f m)	
FES-0607	9(0.9)
FES-1215	61.4(6.26)
FES-1220	66.5(6.78)
FES-1625	107(10.9)
FES-2030	315(32.1)
FES-2440	564(57.6)
FES-3050	1,125(114.7)

* Attach the product with tightening torque above using the hexagonal part of the main unit.
* Using another part to attach the product causes insufficient tightening or damage.
* When using in a place where vibration easily causes loosening, take measures so that loosening does not occur.

FES-0607		
Material	SUS	
Surface treatment	Main unit	Bright quenching

FES-1215、1220、1625、2030、2440、3050		
Material	Carbon steel	
Surface treatment	Cap	Galvanized
	Main unit	Nitriding treatment

Precautions for Use

* Do not use this product without carefully reading the attached owner's manual.
* Ensure that sufficient mounting strength is secured for this product. (As a guideline, it should be 2 to 3 times the maximum drag listed in the catalog.)
* 2 or more of this product can be used in parallel.
* Ensure that an eccentric load is not applied to the product.
* You can use the product only once. Not available repeatedly.