Industrial Shock Absorbers

M8x1 - M12x1

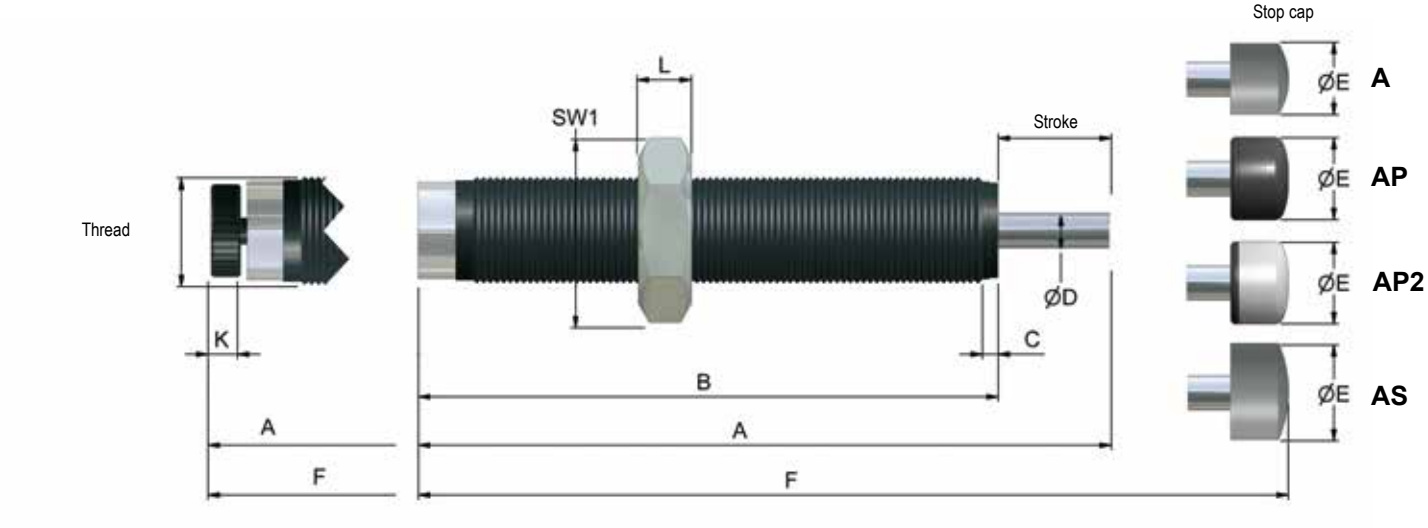
3/8-32 - 1/2-20 UNF

FEATURES

Enlarged Piston ..... Max. +400% Energy
..... Max. - 50% Costs / Nm
Extended Life Time ..... Nitrated Guidance System
..... Piston: Hardened, Aluminium-Titanium-Nitride coated
..... Special Seals + Oils
Temperature ..... -20°C - +80°C / option: -50°C - +120°C (-4°F- +176°F / option: -58°F - +248°F)
Integrated End Stop ..... Max. security
Special models available from stock ..... Stainless steel (Page 56,57)
..... for pressure chambers up to 7 bar
..... USDA-H1-compliant for food industry

SPECIFICATIONS

Weight	**0,1**: 10 g (0.022 lbs) **0,15**: 20 g (0.045 lbs) **0,2**: 36 g (0.080 lbs)
Impact Speed	WE-M: **0,2** - 3,5 m/s (0.65 - 11.5 ft/s) WS-M: **0,2** - 5,0 m/s (0.65 - 16.5 ft/s) WP-M: **0,2** - 5,0 m/sa (0.65 - 16.5 ft/s)
Return spring force	**0,1**: 2,5 N/min - 6 N/max (0.56 lbs/min - 1.35 lbs/max) **0,15**: 3,6 N/min - 8 N/max (0.81 lbs/min - 1.8 lbs/max) **0,2**: 3,5 N/min - 7 N/max (0.65 lbs/min - 16.5 lbs/max)
Torque: max. force by using the flats	**0,1**: 2 Nm (17 lbs) / **0,15**: 6 Nm (53 lbs) / **0,2**: 10 Nm (88 lbs)
RoHS - conform	Directive 2002/95/EC
Included	1 Lock nut



***A:** Plastic / AP: Soft Touch / AS: Steel

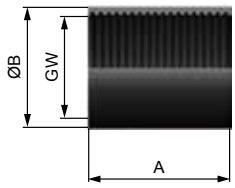
DIMENSIONS

	GW	A	B	C	ø D	øE (A)	øE (AP / AP2)	øE (AS)	F (A)	F (AP / AP2)	F (AS)	L	SW1	K
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
WE-M 0,1	M 8 x 1	56 (2.44)	45 (1.91)	2,5 (0.1)	2,5 (0.12)	6 (0.24)	6,5 (0.33)	-	61,5 (2.7)	63 (1.52)	-	3 (0.12)	11 (0.5)	3,5 (0.14)
WS-M 0,1	M 8 x 1	51 (2.34)	44 (1.95)	2,5 (0.1)	2,5 (0.12)	6 (0.24)	6,5 (0.33)	-	57 (2.6)	58 (2.6)	-	3 (0.12)	11 (0.5)	-
WP-M 0,1	M 8 x 1	51 (2.34)	44 (1.95)	2,5 (0.1)	2,5 (0.12)	6 (0.24)	6,5 (0.33)	-	57 (2.6)	58 (2.6)	-	3 (0.12)	11 (0.5)	-
WE-M 0,15	M 10 x 1	62 (2.44)	48,5 (1.91)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	68,5 (2.7)	68,5 (1.52)	68,5 (2.7)	3 (0.12)	13 (0.56)	3,5 (0.14)
WE-M 0,15U	3/8-32 UNEF													
WS-M 0,15	M 10 x 1	59,5 (2.34)	49,5 (1.95)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	66 (2.6)	66 (2.6)	66 (2.6)	3 (0.12)	13 (0.56)	-
WS-M 0,15U	3/8-32 UNEF													
WP-M 0,15	M 10 x 1	59,5 (2.34)	49,5 (1.95)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	66 (2.6)	66 (2.6)	66 (2.6)	3 (0.12)	13 (0.56)	-
WP-M 0,15U	3/8-32 UNEF													
WE-M 0,15UF	7/16-28 UNEF	62 (2.44)	48,5 (1.91)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	68,5 (2.7)	68,5 (1.52)	68,5 (2.7)	3 (0.12)	13 (0.56)	3,5 (0.14)
WS-M 0,15UF	7/16-28 UNEF	59,5 (2.34)	49,5 (1.95)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	66 (2.6)	66 (2.6)	66 (2.6)	3 (0.12)	13 (0.56)	-
WP-M 0,15UF	7/16-28 UNEF	59,5 (2.34)	49,5 (1.95)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	66 (2.6)	66 (2.6)	66 (2.6)	3 (0.12)	13 (0.56)	-
WE-M 0,2	M 12 x 1	81,5 (3.21)	66 (2.6)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	89,5 (3.52)	90 (3.54)	89,5 (3.52)	4 (0.16)	14 (0.63)	3,5 (0.14)
WE-M 0,2UH	1/2-20 UNF													
WS-M 0,2	M 12 x 1	77 (3.03)	65 (2.56)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	85 (3.35)	86 (3.39)	85 (3.35)	4 (0.16)	14 (0.63)	-
WS-M 0,2UH	1/2-20 UNF													
WP-M 0,2	M 12 x 1	77 (3.03)	65 (2.56)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	85 (3.35)	86 (3.39)	85 (3.35)	4 (0.16)	14 (0.63)	-
WP-M 0,2UH	1/2-20 UNF													

PERFORMANCE

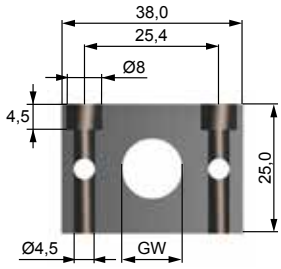
	Stroke	Energy absorption		Effective mass							
		Constant load		-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)	
	mm (inch)	Nm/HB max. (in lbs/HB max.)	Nm/h max. (in lbs/h max.)	min kg (min lbs)	max kg (max lbs)	min kg (min lbs)	max kg (max lbs)	min kg (min lbs)	max kg (max lbs)	min kg (min lbs)	max kg (max lbs)
WE-M 0,1	7 (0.39)	4 (133)	14400 (213)	0,65 (2.2)	50 (1100)	-	-	-	-	-	-
WS-M 0,1	7 (0.39)	4 (133)	14400 (213)	0,65 (3.5)	2 (16.5)	1,3 (13.5)	5,5 (157)	1,7 (135)	50 (555)	-	-
WP-M 0,1	7 (0.39)	4 (133)	14400 (213)	0,3 (2.2)	0,9 (4.9)	0,65 (4.4)	2 (16.5)	1,8 (13.5)	8 (156)	-	-
WE-M 0,15 WE-M 0,15U WE-M 0,15UF	10 (0.39)	15 (133)	24000 (213)	1 (2.2)	500 (1100)	-	-	-	-	-	-
WS-M 0,15 WS-M 0,15U WS-M 0,15UF	10 (0.39)	15 (133)	24000 (213)	1,6 (3.5)	7,5 (16.5)	6,1 (13.5)	71 (157)	61 (135)	252 (555)	232 (512)	750 (1.66)
WP-M 0,15 WP-M 0,15U WP-M 0,15UF	10 (0.39)	15 (133)	24000 (213)	1 (2.2)	2,2 (4.9)	2 (4.4)	7,5 (16.5)	6,1 (13.5)	71 (156)	-	-
WE-M 0,2 WE-M 0,2UH	12 (0.47)	22 (195)	35200 (311.5)	9 (19.8)	800 (1765)	-	-	-	-	-	-
WS-M 0,2 WS-M 0,2UH	12 (0.47)	22 (195)	35200 (311.5)	2 (4.4)	11 (24.3)	10 (22)	107 (236)	104 (230)	360 (795)	343 (56)	1100 (2.43)
WP-M 0,2 WP-M 0,2UH	12 (0.47)	22 (195)	35200 (311.5)	1,5 (3.3)	2,8 (6.2)	2 (4.4)	21 (46.3)	17 (37.5)	92 (202)	-	-

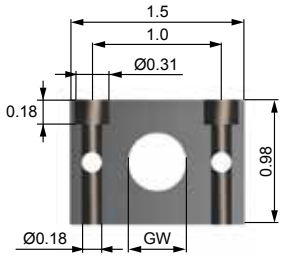
STOP LIMIT NUT



Thread	A mm (inch)	ØB mm (inch)
M 6 x 0,5	8 (0.31)	10 (0.39)
M 8 x 1	12 (0.47)	11 (0.43)
M 10 x 1	15 (0.59)	14 (0.55)
3/8-32 UNEF	15 (0.59)	14 (0.55)
7/16-28 UNEF	15 (0.59)	14 (0.55)
M 12 x 1	20 (0.79)	16 (0.63)
1/2-20 UNF	20 (0.79)	16 (0.63)

RECTANGULAR FLANGE

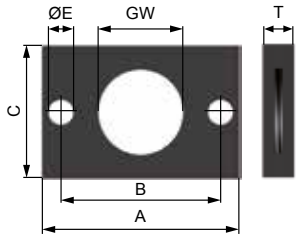




Thread	T mm (inch)
M 10 x 1	12 (0.47)
3/8-32 UNEF	12 (0.47)
7/16-28 UNEF	12 (0.47)
M 12 x 1	12 (0.47)
1/2-20 UNF	12 (0.47)

Width = T

CLAMPING FLANGE

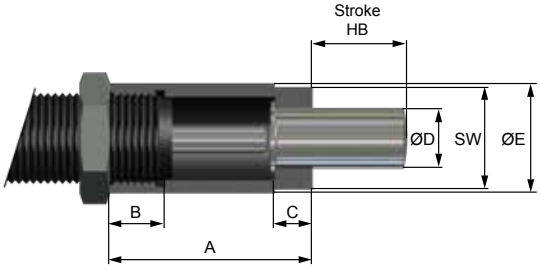


GW*	A mm (inch)	B mm (inch)	C mm (inch)	E mm (inch)	T mm (inch)
M6x0,5	20 (0.79)	14 (0.55)	10 (0.39)	3,2 (0.13)	5 (0.20)
M8x1	25 (0.98)	18 (0.71)	15(0.59)	4,2 (0.17)	6 (0.24)
M10x1	28 (1.10)	20 (0.79)	15 (0.59)	4,2 (0.17)	6 (0.24)
M12x1	32 (1.26)	24 (0.94)	20 (0.79)	5,5 (0.22)	6 (0.24)

LOCK NUT

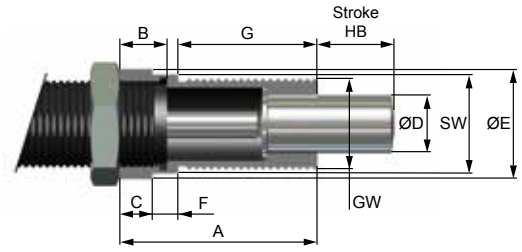
Thread
M4x0,35
M5x0,5
M6x0,5
M8x1
M10x1
3/8-32 UNEF
7/16-28 UNEF
M12x1
1/2-20 UNF

AK 1 FOR SIDE FORCES



	GW	A mm (inch)	B mm (inch)	C mm (inch)	ø D mm (inch)	ø E mm (inch)	SW mm (inch)
M10x6	M10x1	17,5 (0.69)	7 (0.28)	5 (0.20)	7 (0.28)	14 (0.55)	13 (0.51)
M10x8	M10x1	20,5 (0.81)	7 (0.28)	5 (0.20)	7 (0.28)	14 (0.55)	13 (0.51)
M12x10	M12x1	23,0 (0.91)	7 (0.28)	5 (0.20)	9 (0.35)	15 (0.59)	14 (0.55)
0,15	M10x1	23,5 (0.93)	7 (0.28)	5 (0.20)	6 (0.24)	14 (0.55)	13 (0.51)
0,2	M12x1	25,0 (0.98)	7 (0.28)	5 (0.20)	9 (0.35)	15 (0.59)	14 (0.55)

AK 2 FOR SIDE FORCES



	GW	A mm (inch)	B mm (inch)	C mm (inch)	ø D mm (inch)	ø E mm (inch)	F mm (inch)	G mm (inch)	SW mm (inch)
M8x5	M8x1	19 (0.75)	7 (0.28)	5 (0.20)	4 (0.16)	12 (0.47)	4 (0.16)	10 (0.39)	10 (0.39)
M10x6	M10x1	22 (0.87)	7 (0.28)	5 (0.20)	6 (0.24)	14 (0.55)	5 (0.20)	12 (0.47)	13 (0.51)
M12x10	M12x1	28 (1.10)	7 (0.28)	5 (0.20)	7 (0.28)	15 (0.59)	5 (0.20)	18 (0.71)	14 (0.55)

Industrial Shock Absorbers

M14x1 - M16x1

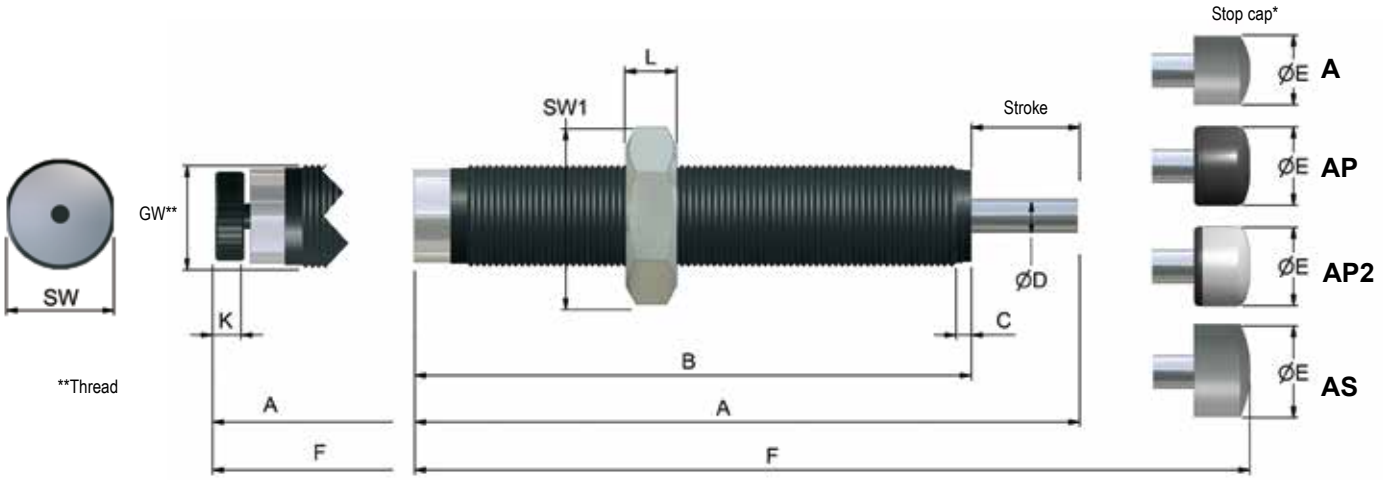
1/2-20 - 9/16-18 UNF

FEATURES

Enlarged Piston ..... Max. +400% Energy
..... Max. - 50% Costs / Nm
Extended Life Time ..... Nitrated Guidance System
..... Piston: Hardened, Aluminium-Titanium-Nitride coated
..... Special Seals + Oils
Temperature ..... -20°C - +80°C / option: -50°C - +120°C (-4°F - +176°F / option: -58°F - +248°F)
Integrated End Stop ..... Max. security
Flats ..... Cost Effective Mounting
Special models available from stock ..... Stainless steel (Page 56,57)
..... for pressure chambers up to 7 bar
..... USDA-H1-compliant for food industry

SPECIFICATIONS

Weight	**0,25**: 0,05 kg (0.11 lbs) / **0,35**: 0,07 kg (0.16 lbs)
Impact Speed	WE-M: 0,08 - 6,0 m/s (0.27 - 19.7 ft/s) WS-M: 0,08 - 6,0 m/s (0.27 - 19.7 ft/s) WP-M: 0,30 - 8,0 m/s (1.0 - 26.3 ft/s)
Return spring force	**0,25** / **0,35**: 13 N/min - 23 N/max (2.93 lbs/min - 5.17 lbs/max) Version "BO": 25 N/min - 35 N/max (5.62 lbs/min - 7.83 lbs/max)
Torque: max. force by using the flats	**0,25** / **0,35**: 20 Nm (177 lbs)
Housing	ProSurf
Piston rod	Hardened stainless steel
RoHS - conform	Directive 2002/95/EC
Included	1 Lock nut



***A:** Plastic / AP: Soft Touch / AS: Steel

Shock absorbers with protection bellow

Material: PTFE / Stop cap: stainless steel
Ordering information: **W**S-M **0,25 - 1BO**

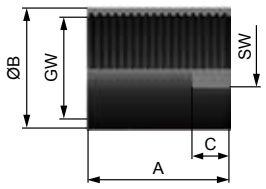
DIMENSIONS

	GW*	A	B	C	øD	øE (A)	øE (AP)	øE (AS)	F (A)	F (AP)	F (AS)	K	L	SW	SW1	F (B)	øM	H
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
WE-M 0,25UC	9/16-18	97 (3.82)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	105 (4.13)	105 (4.13)	105 (4.13)	4,5 (0.18)	5 (0.2)	13 (0.51)	22 (0.87)	109 (4.29)	20 (0.79)	33 (1.3)
WE-M 0,25UF	1/2-20																	
WS-M 0,25UC	9/16-18	92 (3.62)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	100 (3.94)	101 (3.98)	100 (3.94)	-	5 (0.2)	13 (0.51)	22 (0.87)	104 (4.09)	20 (0.79)	33 (1.3)
WS-M 0,25UF	1/2-20																	
WP-M 0,25UC	9/16-18	92 (3.62)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	100 (3.94)	101 (3.98)	100 (3.94)	-	5 (0.2)	13 (0.51)	22 (0.87)	104 (4.09)	20 (0.79)	33 (1.3)
WP-M 0,25UF	1/2-20																	
WE-M 0,25	M 14 x 1	97 (3.82)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	105 (4.13)	105 (4.13)	105 (4.13)	4,5 (0.18)	5 (0.2)	13 (0.51)	17 (0.67)	109 (4.29)	20 (0.79)	33 (1.3)
WS-M 0,25	M 14 x 1	92 (3.62)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	100 (3.94)	100 (3.94)	100 (3.94)	-	5 (0.2)	13 (0.51)	17 (0.67)	104 (4.09)	20 (0.79)	33 (1.3)
WP-M 0,25	M 14 x 1	92 (3.62)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	100 (3.94)	100 (3.94)	100 (3.94)	-	5 (0.2)	13 (0.51)	17 (0.67)	104 (4.09)	20 (0.79)	33 (1.3)
WE-M 0,35	M 16 x 1	97 (3.82)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	105 (4.13)	105 (4.13)	105 (4.13)	4,5 (0.18)	6 (0.24)	14 (0.55)	19 (0.75)	109 (4.29)	22 (0.87)	33 (1.3)
WS-M 0,35	M 16 x 1	92 (3.62)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	100 (3.94)	101 (3.98)	100 (3.94)	-	6 (0.24)	14 (0.55)	19 (0.75)	104 (4.09)	22 (0.87)	33 (1.3)
WP-M 0,35	M 16 x 1	92 (3.62)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	100 (3.94)	101 (3.98)	100 (3.94)	-	6 (0.24)	14 (0.55)	19 (0.75)	104 (4.09)	22 (0.87)	33 (1.3)

PERFORMANCE

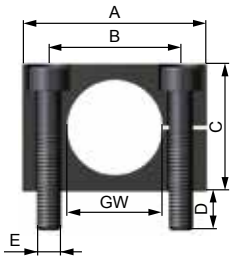
	Stroke	Energy absorption		Effective mass									
		Constant load		-0 (very soft)		-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)	
	mm (inch)	Nm/HB (in lbs/HB) (max.)	Nm/h (in lbs/h) (max.)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)
WE-M 0,25UC WE-M 0,25UF WE-M 0,25	14 (0.55)	30 (265)	50000 (442.5)	-	-	1,6 (3.5)	1500 (3.3)	-	-	-	-	-	-
WS-M 0,25UC WS-M 0,25UF WS-M 0,25	14 (0.55)	30 (265)	50000 (442.5)	0,9 (2)	8 (17.6)	3,5 (7.7)	17 (37.5)	9,9 (21.8)	76 (167)	62 (137)	252 (555)	250 (551)	950 (2.1)
WP-M 0,25UC WP-M 0,25UF WP-M 0,25	14 (0.55)	30 (265)	50000 (442.5)	-	-	0,8 (1.8)	3,7 (8.1)	3 (6.6)	26 (57)	21 (42)	165 (364)	-	-
WE-M 0,35	14 (0.55)	35 (310)	52500 (465)	-	-	6,5 (14.3)	1750 (3.85)	-	-	-	-	-	-
WS-M 0,35	14 (0.55)	35 (310)	52500 (465)	1,9 (4.2)	4,5 (9.9)	4 (8.8)	25 (55)	22 (48.5)	90 (199)	85 (187)	428 (944)	420 (926)	1320 (2.91)
WP-M 0,35	14 (0.55)	35 (310)	52500 (465)	-	-	1,1 (2.4)	6,4 (14.1)	5 (11)	28 (62)	25 (55)	280 (617)	-	-

STOP LIMIT NUT



Thread	A mm (inch)	ØB mm (inch)	C mm (inch)	SW mm (inch)
9/16-18	20 (0.79)	18 (0.71)	8 (0.31)	19 (0.75)
M14x1	20 (0.79)	18 (0.71)	6 (0.24)	19 (0.75)
M16x1	25 (0.98)	21 (0.83)	8 (0.31)	19 (0.75)

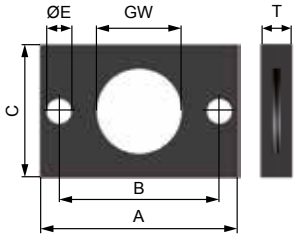
RECTANGULAR FLANGE



Width = T

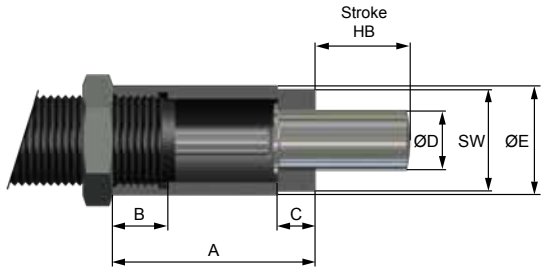
Thread	A mm (inch)	B mm (inch)	C mm (inch)	D mm (inch)	E mm (inch)	T mm (inch)
9/16-18UNEF	32 (1.26)	20 (0.79)	20 (0.79)	5 (0.20)	M5	12 (0.47)
M14x1	32 (1.26)	20 (0.79)	20 (0.79)	5 (0.20)	M5	12 (0.47)
M16x1	40 (1.57)	28 (1.10)	25 (0.98)	6 (0.26)	M6	20 (0.79)

CLAMPING FLANGE



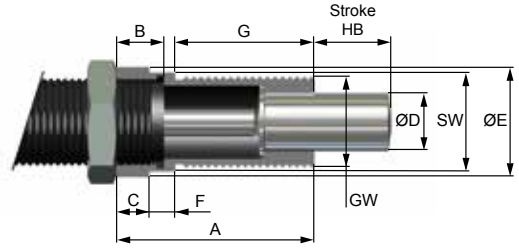
Thread	A mm (inch)	B mm (inch)	C mm (inch)	E mm (inch)	T mm (inch)
M14x1	34 (1.34)	26 (1.02)	20 (0.79)	5,5 (0.22)	6 (0.24)
M16x1	34 (1.34)	26 (1.02)	20 (0.79)	5,5 (0.22)	6 (0.24)

AK 1 FOR SIDE FORCES



	GW*	A mm (inch)	B mm (inch)	C mm (inch)	ø D mm (inch)	ø E mm (inch)	SW mm (inch)
WE-M; WS-M; WP-M 0,25	M14x1	32 (1.26)	10 (0.39)	6 (0.24)	9 (0.35)	18 (0.71)	15 (0.59)
WE-M; WS-M; WP-M 0,35	M16x1	33 (1.30)	10 (0.39)	5 (0.20)	12 (0.47)	20 (0.79)	17 (0.67)

AK 2 FOR SIDE FORCES

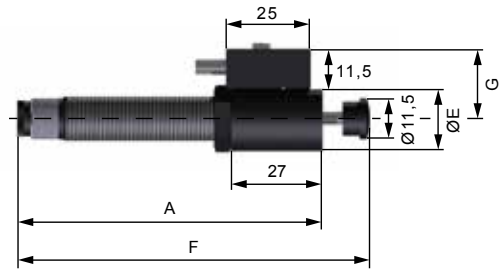


	GW*	A mm (inch)	B mm (inch)	C mm (inch)	ø D mm (inch)	ø E mm (inch)	F mm (inch)	G mm (inch)	SW mm (inch)
WE-M; WS-M; WP-M 0,25	M14x1	32 (1.26)	8 (0.31)	8 (0.31)	8 (0.31)	18 (0.71)	4 (0.16)	20 (0.79)	16 (0.63)
WE-M; WS-M; WP-M 0,35	M16x1	32 (1.26)	8 (0.31)	8 (0.31)	8 (0.31)	20 (0.79)	4 (0.16)	20 (0.79)	19 (0.75)

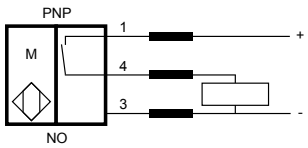
LOCK NUT

Thread
M14x1
M16x1

PROXIMITY SWITCH



	A mm (inch)	ØE mm (inch)	F mm (inch)	G mm (inch)
WE-M 0,25	92,0 (3.62)	19 (0.75)	100 (3.94)	20,5 (0.81)
WS-M 0,25	87,5 (3.44)	19 (0.75)	105 (4.13)	20,5 (0.81)
WP-M 0,25	87,5 (3.44)	19 (0.75)	105 (4.13)	20,5 (0.81)
WE-M 0,35	90,0 (3.54)	21 (0.83)	100 (3.94)	21,5 (0.85)
WS-M 0,35	85,5 (3.37)	21 (0.83)	105 (4.13)	21,5 (0.85)
WP-M 0,35	85,5 (3.37)	21 (0.83)	105 (4.13)	21,5 (0.85)



Included

Proximity Switch, Switch cap, Stop limit nut

Industrial Shock Absorbers

M20x1

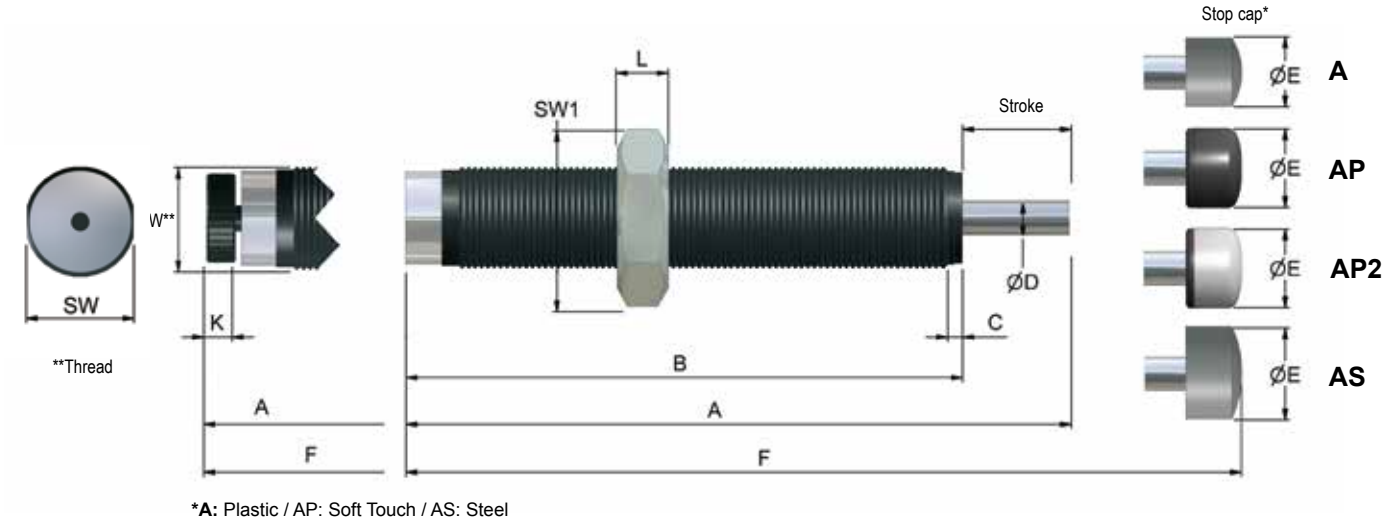
3/4-16 UNF

FEATURES

Enlarged Piston ..... Max. +400% Energy
..... Max. - 50% Costs / Nm
Extended Life Time ..... Nitrated Guidance System
..... Piston: Hardened, Aluminium-Titanium-Nitride coated
..... Special Seals + Oils
Temperature ..... -20°C - +80°C / option: -50°C - +120°C (-4°F - +176°F / option: -58°F - +248°F)
Integrated End Stop ..... Max. security
Flats ..... Cost Effective Mounting
Special models available from stock ..... Stainless steel (Page 56,57)
..... for pressure chambers up to 7 bar
..... USDA-H1-compliant for food industry

SPECIFICATIONS

Weight	0,5 : 0,14 kg (0.30 lbs) / 0,5 x 40 : 0,20 kg (0.45 lbs)
Impact Speed	WE-M: 0,08 - 6,0 m/s (0.27 - 19.7 ft/s) WS-M: 0,08 - 6,0 m/s (0.27 - 19.7 ft/s) WP-M: 0,30 - 8,0 m/s (1.0 - 26.3 ft/s)
Return spring force	**0,5 / 0,5x40**: 12 N/min - 23 N/max (2.7 lbs/min - 5.17 lbs/max) Version "BO": 50 N/min - 70 N/max (1.3 lbs/min - 15.8 lbs/max)
Torque: max. force by using the flats	**0,5 / 0,5x40**: 25 Nm (220 lbs)
Housing	ProSurf
Piston rod	Hardened stainless steel
RoHS - conform	Directive 2002/95/EC
Included	1 Lock nut



***A:** Plastic / AP: Soft Touch / AS: Steel

Shock absorbers with protection bellow

Material: PTFE / Stop cap: stainless steel
Ordering **information: WS-M 0,5 x 19 - 1BO**

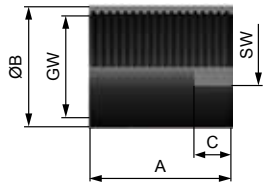
DIMENSIONS

	Thread	A	B	C	øD	øE (A)	øE	øE (AS)	F (A)	F	F (AS)	K	L	SW	SW1	F (B)	øM	H
		mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch
WE-M 0,5 x 13	M 20 x 1	94 (3.7)	75 (2.95)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	104 (4.09)	105 (4.13)	104 (4.09)	6 (0.24)	6 (0.24)	18 (0.71)	24 (0.94)	104 (4.09)	25 (0.98)	30 (1.18)
WS-M 0,5 x 13	M 20 x 1	88 (3.46)	75 (2.95)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	98 (3.86)	99 (3.9)	98 (3.86)	-	6 (0.24)	18 (0.71)	24 (0.94)	98 (3.86)	25 (0.98)	30 (1.18)
WP-M 0,5 x 13	M 20 x 1	88 (3.46)	75 (2.95)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	98 (3.86)	99 (3.9)	98 (3.86)	-	6 (0.24)	18 (0.71)	24 (0.94)	98 (3.86)	25 (0.98)	30 (1.18)
WE-M 0,5 x 19	M 20 x 1	113 (4.45)	88 (3.46)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	123 (4.84)	125 (4.92)	123 (4.84)	6 (0.24)	6 (0.24)	18 (0.71)	24 (0.94)	123 (4.84)	25 (0.98)	36 (1.18)
WE-M 0,5 x 19U	3/4-16 UNF																	
WS-M 0,5 x 19	M 20 x 1	107 (4.21)	88 (3.46)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	117 (4.61)	119 (4.69)	117 (4.61)	-	6 (0.24)	18 (0.71)	24 (0.94)	117 (4.61)	25 (0.98)	36 (1.18)
WS-M 0,5 x 19U	3/4-16 UNF																	
WP-M 0,5 x 19	M 20 x 1	107 (4.21)	88 (3.46)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	117 (4.61)	119 (4.69)	117 (4.61)	-	6 (0.24)	18 (0.71)	24 (0.94)	117 (4.61)	25 (0.98)	36 (1.18)
WP-M 0,5 x 19U	3/4-16 UNF																	
WE-M 0,5 x 40	M 20 x 1	171 (6.73)	125 (4.92)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	181 (7.13)	183 (7.2)	181 (7.13)	6 (0.24)	6 (0.24)	18 (0.71)	24 (0.94)	-	-	-
WS-M 0,5 x 40	M 20 x 1	165 (6.5)	125 (4.92)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	175 (6.89)	177 (6.97)	177 (6.97)	-	6 (0.24)	18 (0.71)	24 (0.94)	-	-	-
WP-M 0,5 x 40	M 20 x 1	165 (6.5)	125 (4.92)	2,5 (0.1)	6 (0.24)	12 (0.47)	17 (0.67)	16 (0.63)	175 (6.89)	177 (6.97)	177 (6.97)	-	6 (0.24)	18 (0.71)	24 (0.94)	-	-	-

PERFORMANCE

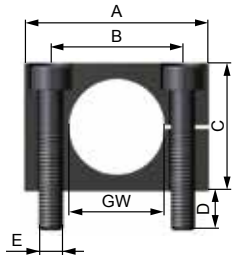
	Stroke	Energy absorption		Effective mass									
		Constant load		-0 (very soft)		-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)	
	mm inch	Nm/Stroke in lbs/Stroke (max.)	Nm/h in lbs/h (max.)	min. kg (min. lbs)	max. kg max. lbs	min. kg (min. lbs)	max. kg max. lbs	min. kg (min. lbs)	max. kg max. lbs	min. kg (min. lbs)	max. kg max. lbs	min. kg (min. lbs)	max. kg max. lbs
WE-M 0,5 x 13	13 (0.51)	65 (575)	52000 (460000)	-	-	6 (132)	3250 (7165)	-	-	-	-	-	-
WS-M 0,5 x 13	13 (0.51)	65 (575)	52000 (460000)	18 (4)	85 (188)	75 (165)	36 (80)	20 (44)	160 (353)	130 (287)	610 (1345)	520 (1147)	3500 (7715)
WP-M 0,5 x 13	13 (0.51)	65 (575)	52000 (460000)	-	-	18 (4)	85 (188)	64 (141)	58 (128)	44 (97)	360 (794)	-	-
WE-M 0,5 x 19	19 (0.75)	100 (885)	76500 (677000)	-	-	9 (20)	4500 (9920)	-	-	-	-	-	-
WE-M 0,5 x 19U													
WS-M 0,5 x 19	19 (0.75)	100 (885)	76500 (677000)	26 (57)	106 (234)	10 (22)	86 (190)	40 (88)	209 (209)	170 (375)	800 (1765)	680 (1500)	4050 (8930)
WS-M 0,5 x 19U													
WP-M 0,5 x 19	19 (0.75)	100 (885)	76500 (677000)	-	-	26 (57)	125 (275)	10 (22)	89 (460)	69 (152)	555 (1225)	-	-
WP-M 0,5 x 19U													
WE-M 0,5 x 40	40 (1.57)	125 (1106)	95625 (846000)	-	-	12 (265)	6300 (13900)	-	-	-	-	-	-
WS-M 0,5 x 40	40 (1.57)	125 (1106)	95625 (846000)	35 (77)	16 (353)	14 (31)	69 (152)	40 (88)	305 (675)	250 (551)	1180 (2601)	1000 (2205)	6250 (13780)
WP-M 0,5 x 40	40 (1.57)	125 (1106)	95625 (846000)	-	-	35 (77)	20 (44)	13 (286)	100 (220)	90 (199)	690 (1520)	-	-

STOP LIMIT NUT



Thread	A mm (inch)	ØB mm (inch)	C mm (inch)	SW mm (inch)
3/4-16 UNF	35 (1.38)	25 (0.98)	8 (0.31)	22 (0.87)
M20x1	35 (1.38)	25 (0.98)	8 (0.31)	22 (0.87)

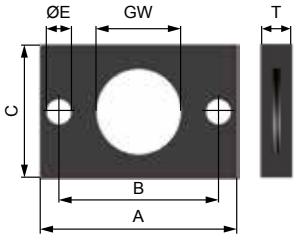
RECTANGULAR FLANGE



GW*	A mm (inch)	B mm (inch)	C mm (inch)	D mm (inch)	E mm (inch)	T mm (inch)
3/4-16 UNF	40 (1.57)	28 (1.10)	25 (0.98)	6 (0.24)	M6	20 (0.79)
M20x1	40 (1.57)	28 (1.10)	25 (0.98)	6 (0.24)	M6	20 (0.79)

Width = T

CLAMPING FLANGE

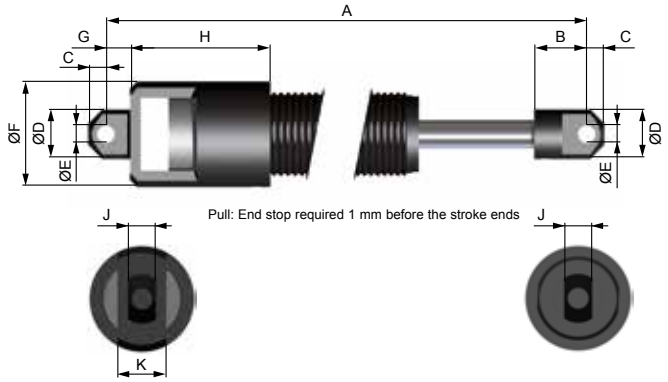


GW*	A mm (inch)	B mm (inch)	C mm (inch)	E mm (inch)	T mm (inch)
M20x1	46 (1.81)	36 (1.42)	30 (1.18)	6,6 (0.26)	8 (0.31)

LOCK NUT

Thread	3/4-16 UNF	M20x1

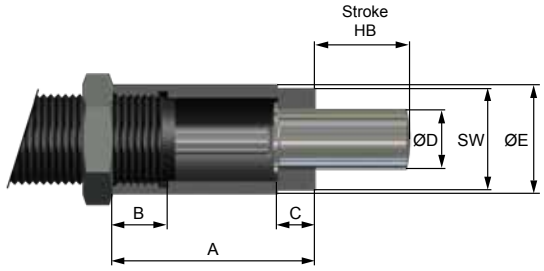
CLEVIS MOUNTING



Pull: End stop required 1 mm before the stroke ends

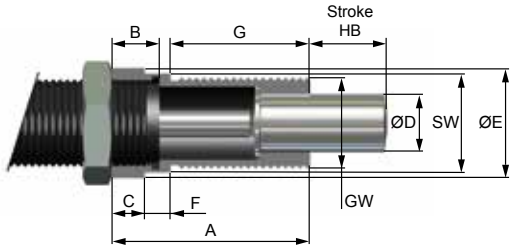
	GW*	A mm (inch)	B mm (inch)	C / G / øE mm (inch)	øD / K mm (inch)	øF mm (inch)	H mm (inch)	J mm (inch)
WE-M 0,5x13SB	M20x1	119 (4.69)	13 (0.51)	5 (0.20)	12 (0.47)	26 (1.02)	35 (1.38)	6 (0.24)
WS/P-M0,5x13SB	M20x1	111 (4.37)	13 (0.51)	5 (0.20)	12 (0.47)	26 (1.02)	35 (1.38)	6 (0.24)
WE-M 0,5x19SB	M20x1	138 (5.43)	13 (0.51)	5 (0.20)	12 (0.47)	26 (1.02)	35 (1.38)	6 (0.24)
WS/P-M0,5x19SB	M20x1	130 (5.12)	13 (0.51)	5 (0.20)	12 (0.47)	26 (1.02)	35 (1.38)	6 (0.24)

AK 1 FOR SIDE FORCES



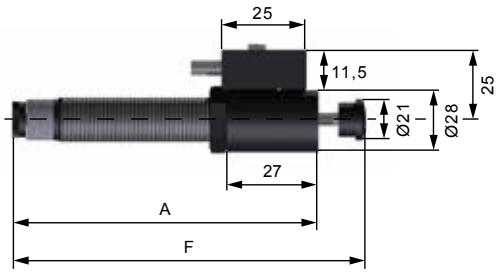
	Thread	A mm (inch)	B mm (inch)	C mm (inch)	ø D mm (inch)	ø E mm (inch)	SW mm (inch)
WE-M; WS-M; WP-M 0,5x19	M20x1	42 (1.65)	16 (0.63)	8 (0.31)	12 (0.47)	24 (0.94)	22 (0.87)

AK 2 FOR SIDE FORCES



	GW*	A mm (inch)	B mm (inch)	C mm (inch)	ø D mm (inch)	ø E mm (inch)	F mm (inch)	G mm (inch)	SW mm (inch)
WE-M; WS-M; WP-M 0,5x13	M20x1	34 (1.34)	9 (0.35)	7 (0.28)	12 (0.47)	24 (0.94)	7 (0.28)	20 (0.79)	22 (0.87)
WE-M; WS-M; WP-M 0,5x19	M20x1	38 (1.50)	9 (0.35)	6 (0.24)	12 (0.47)	24 (0.94)	7 (0.28)	25 (0.98)	22 (0.87)

PROXIMITY SWITCH

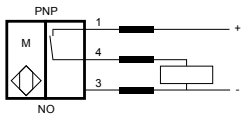


Included

Proximity Switch,
Switch cap, Stop limit nut

	A mm (inch)	F mm (inch)
WE-M 0,5x13	88,5 (3.48)	104 (4.09)
WS-M 0,5x13	82,5 (3.25)	98 (3.86)
WP-M 0,5x13	82,5 (3.25)	98 (3.86)
WE-M 0,5x19	101,5 (4)	123 (4.84)
WS-M 0,5x19	95,5 (3.76)	117 (4.61)
WP-M 0,5x19	95,5 (3.76)	117 (4.61)

	A mm (inch)	F mm (inch)
WE-M 0,5x40	138,5 (5.45)	181 (7.13)
WS-M 0,5x40	132,5 (5.22)	177 (6.97)
WP-M 0,5x40	132,5 (5.22)	177 (6.97)



Industrial Shock Absorbers

M24x1,5

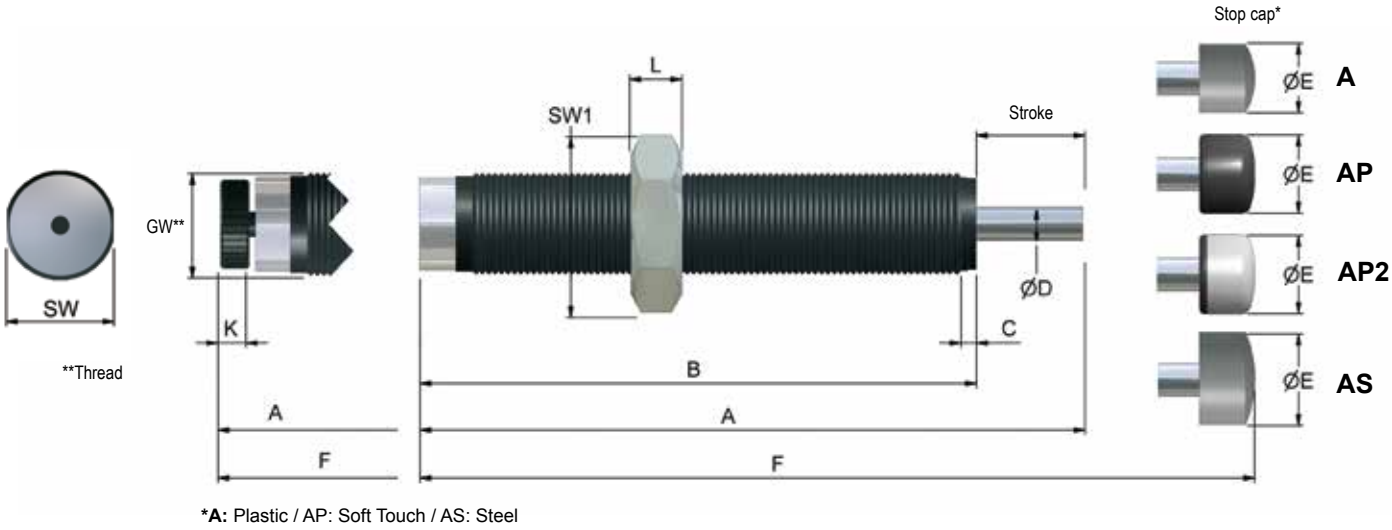
1-12 UNF

FEATURES

Enlarged Piston ..... Max. +400% Energy
..... Max. - 50% Costs / Nm
Extended Life Time ..... Nitrated Guidance System
..... Piston: Hardened, Aluminium-Titanium-Nitride coated
..... Special Seals + Oils
Temperature ..... -20°C - +80°C / option: -50°C - +120°C (-4°F - +176°F / option: -58°F - +248°F)
Integrated End Stop ..... Max. security
Flats ..... Cost Effective Mounting
Special models available from stock ..... Stainless steel (Page 56,57)
..... for pressure chambers up to 7 bar
..... USDA-H1-compliant for food industry

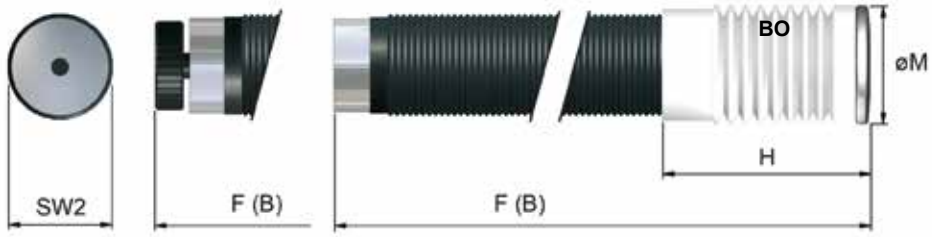
SPECIFICATIONS

Weight	1,0: 0,29 kg (0.65 lbs) / 1,0 x 40: 0,39 kg (0.86 lbs) / 1,0 x 80: 0,63 kg (1.4 lbs)
Impact Speed	WE-M: 0,08 - 6,0 m/s (0.27 - 19.7 ft/s) WS-M: 0,08 - 6,0 m/s (0.27 - 19.7 ft/s) WP-M: 0,30 - 8,0 m/s (1.0 - 26.3 ft/s)
Return spring force	1,0: 15 N/min - 31 N/max (3.38 lbs/min - 6.97 lbs/max) Version "BO": 60 N/min - 80 N/max (13.5 lbs/min - 18 lbs/max) 1,0 x 40: 11 N/min - 20 N/max (2.47 lbs/min - 4.5 lbs/max) 1,0 x 80: 14 N/min - 31 N/max (3.15 lbs/min - 6.97 lbs/max)
Torque: max. force by using the flats	1,0 / 1,0 x 40 / 1,0 x 80: 30 Nm (265 lbs)
Housing	ProSurf
Piston rod	Hardened stainless steel
RoHS - conform	Directive 2002/95/EC
Included	1 Lock nut



***A:** Plastic / AP: Soft Touch / AS: Steel

Shock absorbers with protection bellow



Material: PTFE / Stop cap: stainless steel
Ordering **information: WS-M 1,0 - 1BO**

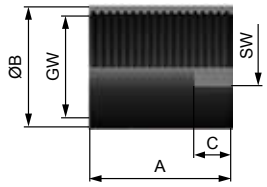
DIMENSIONS

	GW*	A	B	C	øD	øE (A)	øE	øE (AS)	F (A)	F	F (AS)	K	L	SW	SW1	F (B)	øM	H
		mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch
WE-M 1,0	M 24 x 1,5	141 (5.55)	108 (4.25)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	154 (6.06)	156 (6.14)	154 (6.06)	8 (0.31)	8 (0.25)	23 (0.91)	30 (1.25)	154 (6.06)	30 (1.18)	50 (1.97)
WE-M 1,0U	1-12																	
WS-M 1,0	M 24 x 1,5	133 (5.24)	108 (4.25)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	146 (5.75)	148 (5.83)	146 (5.75)	-	8 (0.25)	23 (0.91)	30 (1.25)	146 (5.75)	30 (1.18)	50 (1.97)
WS-M 1,0U	1-12																	
WP-M 1,0	M 24 x 1,5	133 (5.24)	108 (4.25)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	146 (5.75)	148 (5.83)	146 (5.75)	-	8 (0.25)	23 (0.91)	30 (1.25)	146 (5.75)	30 (1.18)	50 (1.97)
WP-M 1,0U	1-12																	
WE-M 1,0 x 40	M 24 x 1,5	178 (7.01)	130 (5.12)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	191 (7.52)	193 (7.6)	191 (7.52)	8 (0.31)	8 (0.25)	23 (0.91)	30 (1.25)	-	-	-
WE-M 1,0 x 40U	1-12																	
WS-M 1,0 x 40	M 24 x 1,5	170 (6.69)	130 (5.12)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	183 (7.2)	185 (7.28)	183 (7.2)	-	8 (0.25)	23 (0.91)	30 (1.25)	-	-	-
WS-M 1,0 x 40U	1-12																	
WP-M 1,0 x 40	M 24 x 1,5	170 (6.69)	130 (5.12)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	183 (7.2)	185 (7.28)	183 (7.2)	-	8 (0.25)	23 (0.91)	30 (1.25)	-	-	-
WP-M 1,0 x 40U	1-12																	
WE-M 1,0 x 80	M 24 x 1,5	321 (12.64)	233 (9.17)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	334 (13.15)	336 (13.23)	334 (13.15)	8 (0.31)	8 (0.31)	-	30 (1.18)	-	-	-
WS-M 1,0 x 80	M 24 x 1,5	313 (12.32)	233 (9.17)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	326 (12.83)	328 (12.91)	326 (12.83)	-	8 (0.31)	-	30 (1.18)	-	-	-
WP-M 1,0 x 80	M 24 x 1,5	313 (12.32)	233 (9.17)	3,5 (0.14)	8 (0.31)	16 (0.63)	21 (0.83)	20 (0.79)	326 (12.83)	328 (12.91)	326 (12.83)	-	8 (0.31)	-	30 (1.18)	-	-	-

PERFORMANCE

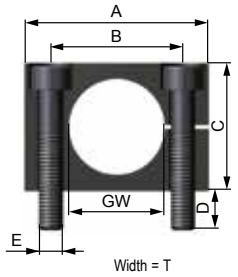
	Stroke	Energy absorption		Effective mass									
		Constant load		-0 (very soft)		-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)	
	mm (inch)	Nm/HB (in lbs/HB) (max.)	Nm/h (in lbs/h) (max.)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)	min. kg (min. lbs)	max. kg (max. lbs)
WE-M 1,0	25 (0.98)	220 (1950)	105600 (934650)	-	-	22 (48.5)	11000 (24250)	-	-	-	-	-	-
WE-M 1,0U													
WS-M 1,0	25 (0.98)	220 (1950)	105600 (934650)	6 (13.2)	29 (64)	24 (53)	120 (265)	70 (154)	460 (1014)	440 (970)	2050 (4520)	1760 (3880)	10800 (23810)
WS-M 1,0U													
WP-M 1,0	25 (0.98)	220 (1950)	105600 (934650)	-	-	6 (13.2)	27,5 (60.6)	21 (46.3)	195 (430)	150 (330)	1200 (2645)	-	-
WP-M 1,0U													
WE-M 1,0 x 40	40 (1.57)	390 (3450)	175500 (1553300)	-	-	38 (83.8)	18000 (39700)	-	-	-	-	-	-
WE-M 1,0 x 40U													
WS-M 1,0 x 40	40 (1.57)	390 (3450)	175500 (1553300)	15 (33.1)	103 (227)	44 (97)	216 (477)	135 (298)	962 (2120)	780 (1720)	3600 (7940)	3100 (6835)	19500 (42990)
WS-M 1,0 x 40 U													
WP-M 1,0 x 40	40 (1.57)	390 (3450)	175500 (1553300)	-	-	10 (22)	48 (106)	39 (86)	340 (750)	270 (595)	2150 (4740)	-	-
WP-M 1,0 x 40U													
WE-M 1,0 x 80	80 (3.15)	390 (3450)	175500 (1553300)	-	-	38 (38)	18000 (39700)	-	-	-	-	-	-
WS-M 1,0 x 80	80 (3.15)	390 (3450)	175500 (1553300)	15 (33.1)	103 (227)	44 (83.8)	216 (477)	135 (298)	962 (2120)	780 (1720)	3600 (7940)	3100 (6835)	19500 (42990)
WP-M 1,0 x 80	80 (3.15)	390 (3450)	175500 (1553300)	-	-	10 (22)	48 (106)	39 (86)	340 (750)	270 (595)	2150 (4740)	-	-

STOP LIMIT NUT



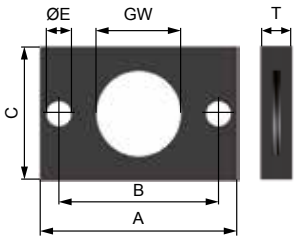
Thread	A mm (inch)	ØB mm (inch)	C mm (inch)	SW mm (inch)
1-12	38 (1.50)	31 (1.22)	10 (0.39)	30 (1.18)
M24x1,5	38 (1.50)	31 (1.22)	10 (0.39)	30 (1.18)

RECTANGULAR FLANGE



Thread	A mm (inch)	B mm (inch)	C mm (inch)	D mm (inch)	E mm (inch)	T mm (inch)
1-12	46 (1.81)	33 (1.30)	32 (1.26)	6 (0.24)	M6	25 (0.98)
M24x1,5	46 (1.81)	33 (1.30)	32 (1.26)	6 (0.24)	M6	25 (0.98)

CLAMPING FLANGE

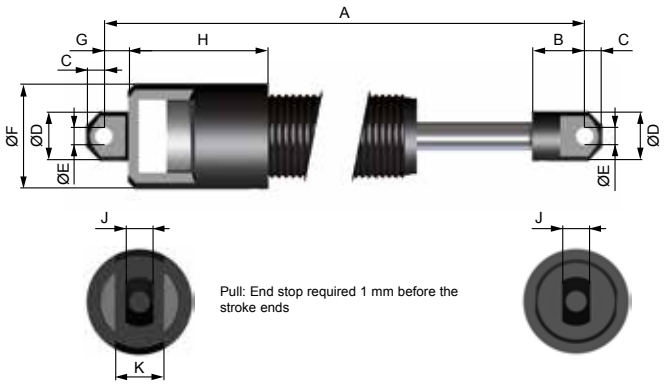


Thread	**A mm (inch)**	**B mm (inch)**	**C mm (inch)**	**E mm (inch)**	**T mm (inch)**
M24x1,5	52 (2.05)	42 (1.65)	35 (1.38)	6,6 (0.26)	8 (0.31)

LOCK NUT

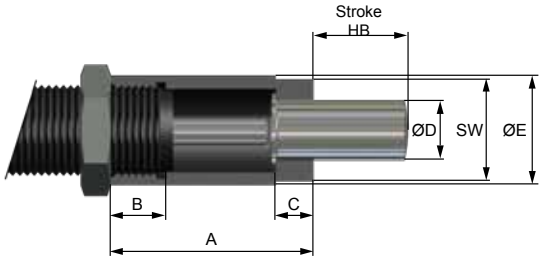
Thread	1-12	M24x1,5

CLEVIS MOUNTING



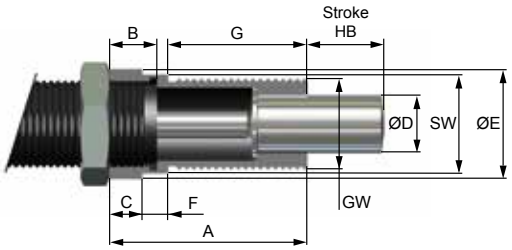
	A mm (inch)	B mm (inch)	C mm (inch)	øD mm (inch)	øE mm (inch)	øF mm (inch)	G mm (inch)	H mm (inch)	J mm (inch)	K mm (inch)
WE-M 1,0SB	168 (6.61)	15 (0.59)	5 (0.20)	14 (0.55)	5 (0.20)	30 (1.18)	7 (0.28)	40 (1.57)	8 (0.31)	14 (0.55)
WS-M 1,0SB WP-M 1,0SB	158 (6.22)	15 (0.59)	5 (0.20)	14 (0.55)	5 (0.20)	30 (1.18)	7 (0.28)	40 (1.57)	8 (0.31)	14 (0.55)

AK 1 FOR SIDE FORCES



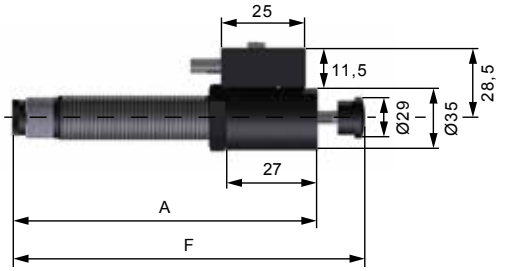
	GW*	**A mm (inch)**	**B mm (inch)**	**C mm (inch)**	**ø D mm (inch)**	**ø E mm (inch)**	**SW mm (inch)**
WE-M; WS-M; WP-M 1,0	M24x1,5	53,5 (2.11)	14,5 (0.57)	10 (0.39)	16 (0.63)	29 (1.14)	27 (1.06)

AK 2 FOR SIDE FORCES



	Thread	A mm (inch)	B mm (inch)	C mm (inch)	ø D mm (inch)	ø E mm (inch)	F mm (inch)	G mm (inch)	SW mm (inch)
WE-M; WS-M; WP-M 1,0	M24x1,5	54 (2.13)	13 (0.51)	9 (0.35)	16 (0.63)	30 (1.18)	7 (0.28)	38 (1.50)	27 (1.06)

PROXIMITY SWITCH



Included

Proximity Switch, Switch cap, Stop limit nut

	A mm (inch)	F mm (inch)
WE-M 1,0	122,5 (4.82)	154 (6.06)
WS-M 1,0	114,5 (4.51)	146 (5.75)
WP-M 1,0	114,5 (4.51)	146 (5.75)
WE-M 1,0x40	144,5 (5.69)	191 (7.52)
WS-M 1,0x40	136,5 (5.37)	183 (7.20)
WP-M 1,0x40	136,5 (5.37)	183 (7.20)

	A mm (inch)	F mm (inch)
WE-M 1,0x80	247,5 (9.74)	334 (13.15)
WS-M 1,0x80	239,5 (9.43)	326 (12.83)
WP-M 1,0x80	239,5 (9.43)	326 (12.83)