Weforma

Deceleration and Vibration Isolation

2021

Made in Germany

PRODUCTS FOR YOUR SUCCESS

As a specialist in innovative deceleration and vibration isolation technology, we develop and manufacture produtcts for machinery and plant engineering.

Our success is based on the development of modifications and customised solutions, backed by over 40 years experience and an in-house production facility.

Shock Absorbers
Heavy-Duty Shock Absorbers
Deceleration Cylinders
Speed Controls

Rotary Dampers
Gas Springs
Pallet Stoppers
Vibration Isolation

PRODUCTION

In a production space of 4000 m² (43055 sf), highly automated CNC machines manufacture our deceleration and vibration isolation components.
With a real net output ratio of over 90% and highly reliable processes, we achieve rapid and dependable product availability. From the prototype to series production, take advantage of our many years of experience.

INNOVATIONS

Our engineers are continuously pushing developments in our deceleration and vibration isolation components.

Patents, e.g. for Mega-Line industrial shock absorbers with high energy absorption, shock absorbers with protected adjustment, and electrical pallet stoppers, reflect the innovative power of our company.

QUALITY

Comprehensive in-process inspections during the production and assembly guarantee the high quality of our products. The final inspection is performed on computer-controlled test systems, which can record forces of up to 2 million newtons, and which amongst other things calculate and allow comparison of the precise deceleration curves.

Various test methods are used to check our deceleration and vibration isolation components in relation to temperature (-70 to +180°C), corrosion (salt spray), leakage and service life.

DIN ISO 9001:2015
EN 81-20/50
ASME A17.1-2004
EN 81-22:204

SPECIAL SOLUTIONS

A broad standard product portfolio makes us a competent partner.
In dialogue with leading mechanical engineering companies, we have developed a wide range of application-specific products.

This is where our company's strength lies. We supply optimised solutions: fast, flexible, and with high quality.

Weforma

INDEX

Industrial Shock Absorbers		6 - 51
Heavy-Duty-, Elasto-Fluid- and Elevator Shock Absorbers		52 - 97
Deceleration Cylinders, Speed Controls		98 - 115
Rotary Dampers		116 - 131
Gas Springs		132 -155
Pallet Stoppers		156 - 175
Air Springs		176 - 197
PUR Buffers		198 - 207
Metal cushions		208 - 215

tic tac

Industrial Shock Absorbers

ONLINE
Calculation +
2D / 3D CAD Download

www.weforma.com

Benefits

Stop Cap AP / AP2

Stop cap with steel core and PU cap (AP)
• 40% noise reduction
• Increased protection of the impact surface
Steel cap with steel core and PUM cap fiberglass-reinforced (AP2)
• Longer life time compared to stop cap AP and plastic cap A

Integrated end-stop

Pro Surf

• Improved surface protection against corrosion
• QPQ Coating, specialized type of carbonitriding case hardening (carbonitriding, polishing, post-oxidizing)

Enlarged Piston

hardened, aluminium-titanium-nitride coated
High energy absorption and extended life time

Salt spray test

1. linear deceleration
2. progressive deceleration

Shock absorbers are closed hydraulic components which operate on the basis of oil displacement. When the piston rod is pushed into the cylinder, the piston displaces the oil through differing sized holes which are progressively closed off. As a result the speed of the piston rod proportionally decreases to the stroke covered. The displaced oil is compensated by an accumulator.

Benefits

Noise reducing stop cap

with a high security steel-fixing ring

Integrated end stop

Pro Adjust

Protected Adjustment (patented)

Piston

Hardened, aluminium-titanium-nitride coated

Machined flats for spanner

Helix Principle

+ 300% Energy / - 50% Costs

Pressure Tube

Adjustable one-piece nitrite hardened pressure tube, that fits closely to the housing thus giving good guidance

ProTec

Solid base without retaining ring

Selection

Five basic criteria are required for sizing the shock absorbers

1.	Impacting mass m (kg)
2.	Impact speed v (m/s)
3.	Additional external forces acting on the mass e.g. propelling force F (N)
4.	Number of strokes of the shock absorber per hour X (1/h) (At 1/h: number of strokes per year)
5.	Number of parallel shock absorbers In individual cases, other additional information may be required.

Formulae

EFFECTIVE MASS

$$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$$

COUNTERFORCE

$$F_G = \frac{W_{kg} \cdot 1{,}2^*}{S}$$

DECELERATION TIME

$$t = \frac{2 \cdot S}{v_e} \cdot 1{,}2^*$$

DECELERATION RATE

$$a = \frac{v^2}{2 \cdot S} \cdot 1{,}2^*$$

STROKE

$$S = \frac{v^2}{2 \cdot a} \cdot 1{,}2^*$$

* Calculation for optimum setting.
Allow a safety margin!

! For a utilizaltion per stroke >80 % the approval of Weforma is necessary!

W_k	(Nm)	Kinetic energy
W_A	(Nm)	Propelling force energy
W_{kg}	(Nm)	Total energy / $W_k + W_A$
$W_{kg/h}$	(Nm/h)	Total energy per hour
m	(kg)	Mass
me	(kg)	Effective mass
S	(m)	Stroke

F	(N)	Propelling force
F_p	(N)	Pneumatic drive force
M	(Nm)	Torque
R/r	(m)	Radius
H	(m)	Height
J	(kgm²)	Moment of inertia

P	(kW)	Drive power
v	(m/s)	Impact speed
v_e	(m/s)	Effective speed
α	(°)	Angle
t	(s)	Deceleration time
F_G	(N)	Counter force

g	(m/s²)	Accerelation due to gravity (9,81 m/s²)
HM	(1)	Arresting torque factor for motors - (nomal=2,5)
μ	(1)	Coefficient of friction (steel: μ=0,2)
a	(m/s²)	Acceleration/Deceleration
X	(1/h)	Number of strokes per hour
ω	(1/s)	Angular velocity

Online calculation (imperial / metric) at www.weforma.com

A FALLING MASS

m = 20 kg
H = 0,2 m
S = 0,019 m
X = 400 / h

$W_k = m \cdot g \cdot H$ = 39 Nm
$W_A = m \cdot g \cdot S$ = 4 Nm
$W_{kg} = W_k + W_A$ = 43 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 17.187 Nm/h
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 21,9 kg
$v = v_e = \sqrt{2 \cdot g \cdot H}$

WS - M 0,5 x 19 - 1
WE - M 0,5 x 19

B MASS WITHOUT PROPELLING FORCE

m = 1.200 kg
v = 1,3 m / s
X = 210 / h

$W_{kg} = \frac{m \cdot v^2}{2}$ = 1.014 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 212.914 Nm
$v = v_e$
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 1.200 kg

WE - M 1,5 x 2 - 1
WS - M 1,5 x 2 - 2

C1 MASS WITH PROPELLING FORCE, HORIZONTAL

Mass vertical propelling force: downward (C2) / upward (C3)

C2 $W_A = (F + m \cdot g) \cdot S$

C3 $W_A = (F - m \cdot g) \cdot S$

m = 200 kg
v = 1,3 m / s
F_P = 2.400 N
S = 0,04 m
X = 210 / h

$W_k = \frac{m \cdot v^2}{2}$ = 169 Nm
$W_A = F \cdot S$ = 96 Nm
$W_{kg} = W_k + W_A$ = 265 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 55.650 Nm/h
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 313 kg

WE - M 1,0 x 40
WP - M 1,0 x 40

D SWINGING MASS WITH PROPELLING FORCE

m = 280 kg
v = 1,0 m / s
r = 0,3 m
M = 300 Nm
R = 0,9 m
S = 0,025 m
X = 320 / h

$W_k = \frac{m \cdot v^2}{2} = \frac{J \cdot \omega^2}{2}$ = 140 Nm
$W_A = \frac{M \cdot S}{r}$ = 25 Nm
$W_{kg} = W_k + W_A$ = 165 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 52.800 Nm/h
$v_e = r \cdot \omega = \frac{v \cdot r}{R}$ = 0,33 m/s
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 2.970 kg

WS - M 1,0 - 4
WE - M 1,0

E MASS ON DRIVEN ROLLERS

m = 30 kg
v = 2 m / s
S = 0,019 m
μ = 0,2 (Stål)
X = 300 / h

$W_k = \frac{m \cdot v^2}{2}$ = 60 Nm
$W_A = m \cdot g \cdot S \cdot \mu$ = 1,2 Nm
$W_{kg} = W_k + W_A$ = 61,2 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 18.335 Nm/h
$v = v_e$
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 30,6 kg

WE - M 0,5 x 19
WP - M 0,5 x 19 - 2

F MASS ON INCLINE

m = 200 kg
H = 0,3 m
a = 25°
S = 0,025 m
X = 200 / h

$W_k = m \cdot g \cdot H$ = 589 Nm
$W_A = m \cdot g \cdot \sin \alpha \cdot S$ = 21 Nm
$W_{kg} = W_k + W_A$ = 610 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 121.866 Nm/h
$v = v_e = \sqrt{2 \cdot g \cdot H}$
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 208 kg

WE - M 1,5 x 1 - 0
WP - M 1,5 x 1 - 1

G MASS WITH MOTOR DRIVE

m = 1.200 kg
v = 1,5 m / s
HM = 2,5
P = 3 kW
S = 0,075 m
X = 50 / h

$W_k = \frac{m \cdot v^2}{2}$ = 1.350 Nm
$W_A = \frac{P \cdot HM \cdot 1000 \cdot S}{v}$ = 375 Nm
$W_{kg} = W_k + W_A$ = 1.725 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 86.250 Nm/h
$v = v_e$
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 1.534 kg

WE - M 1,5 x 3 - 1
WS - M 1,5 x 3 - 2

H ROTARY TABLE WITH PROPELLING FORCE

J = 320 kgm²
ω = 2 s⁻¹
M = 1.000 Nm
r = 0,5 m
S = 0,025 m
X = 20 / h

$W_k = \frac{m \cdot v^2}{2} = \frac{J \cdot \omega^2}{2}$ = 640 Nm
$W_A = \frac{M \cdot S}{r}$ = 50 Nm
$W_{kg} = W_k + W_A$ = 690 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 13.800 Nm/h
$v_e = r \cdot \omega = \frac{v \cdot r}{R}$ = 1,0 m/s
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 1.380 kg

WE - M 1,5 x 1 - 1
WS - M 1,5 x 1 - 2

I MASS WITH PROPELLING FORCE

m = 180 kg
v = 1,1 m / s
F = 1.200 N
S = 0,025 m
r = 0,5 m
R1 = 0,6 m
R2 = 0,9 m
X = 120 / h

$W_k = \frac{m \cdot v^2}{2}$ = 109 Nm
$W_A = \frac{M \cdot S}{R1} = \frac{F \cdot r \cdot S}{R1}$ = 25 Nm
$W_{kg} = W_k + W_A$ = 134 Nm
$W_{kg/h} = W_{kg} \cdot X$ = 16.080 Nm/h
$v_e = R1 \cdot \omega = \frac{v \cdot R1}{R2}$ = 0,73 m/s
$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$ = 498 kg

WE - M 1,0
WS - M 1,0 - 3

Thread

Ordering Example

WE-M 0,25 **M14x1**

WE-M 0,25L **M14x1,5**

Legend

S - self-compensating linear
SB - self-compensating linear for side forces
SK - self-compensating linear, compact
E - adjustable, linear
EB - adjustable for side forces
P - self-compensating progressive
PB - self-compensating progressive for side forces

Thread	Series	Stroke mm (inch)	Energy absorption Nm / Stroke (in lbs)	Length mm (inch)	Page
M 4x0,35	WS-M 4x4-1 / 2	4 (0.16)	0,4 (3.54)	29 (1.14)	14 - 17
M 5x0,5	WS-M 5x4-1 / 2	4 (0.16)	0,6 (5.31)	29 (1.14)	14 - 17
M 6x0,5	WS-M 6x5-1 / 2 / 3	5 (0.2)	1 (8.85)	32 (1.26)	14 - 17
M 8x1 3/8-32 UNEF (U)	WS-M 8x5-1 / 2 / 3	5 (0.2)	1,5 (13.28)	35 (1.38)	14 - 17
	WE-M 0,1	7 (0.28)	4 (35.4)	56 (2.2)	14 - 17
	WS-M 0,1-1 / 2 / 3	7 (0.28)	4 (35.4)	51 (2.01)	14 - 17
	WP-M 0,1-1 / 2 / 3	7 (0.28)	4 (35.4)	51 (2.01)	14 - 17
M 10x1 3/8-32 UNEF (U) 7/16-28 UNEF (UF)	WS-M 10x6-1 / 2 / 3	6 (0.24)	2,2 (19.47)	37 (1.46)	14 - 17
	WS-M 10x8-1 / 2 / 3	8 (0.31)	3 (26.55)	48 (1.89)	14 - 17
	WE-M 0,15	10 (0.39)	15 (132.76)	59,5 (2.34)	14 - 17
	WS-M 0,15-1 / 2 / 3 / 4	10 (0.39)	15 (132.76)	59,5 (2.34)	14 - 17
	WP-M 0,15-1 / 2 / 3	10 (0.39)	15 (132.76)	59,5 (2.34)	14 - 17
	WEB-M 0,15	8 (0.31)	12 (106.21)	64 (2.52)	43
	WSB-M 0,15-1 / 2 / 3 / 4	8 (0.31)	12 (106.21)	64 (2.52)	43
	WPB-M 0,15-1 / 2 / 3	8 (0.31)	12 (106.21)	64 (2.52)	43
M 12x1 7/16-28 UNEF (UF) 1/2-20 UNF (UH)	WS-M 12x10-1 / 2 / 3	10 (0.39)	9 (79.66)	61 (2.4)	14 - 17
	WE-M 0,2	12 (0.47)	22 (195)	77 (3.03)	14 - 17
	WS-M 0,2-1 / 2 / 3 / 4	12 (0.47)	22 (195)	77 (3.03)	14 - 17
	WP-M 0,2-1 / 2 / 3	12 (0.47)	22 (195)	77 (3.03)	14 - 17
	WEB-M 0,2	10 (0.39)	18 (159)	84 (3.31)	43
	WSB-M 0,2-1 / 2 / 3 / 4	10 (0.39)	18 (159)	84 (3.31)	43
	WPB-M 0,2-1 / 2 / 3	10 (0.39)	18 (159)	84 (3.31)	43
M 14x1 M 14x1,5 (L) 1/2-20 UNF (UF) 9/16-18 UNEF (UC)	WE-M 0,25	14 (0.55)	30 (266)	96 (3.78)	18 - 23
	WS-M 0,25-0 / 1 / 2 / 3 / 4	14 (0.55)	30 (266)	92 (3.62)	18 - 23
	WP-M 0,25-1 / 2 / 3	14 (0.55)	30 (266)	92 (3.62)	18 - 23
	WEB-M 0,25	14 (0.55)	24 (212)	103,5 (4.07)	43
	WSB-M 0,25-0 / 1 / 2 / 3 / 4	14 (0.55)	24 (212)	100 (3.94)	43
	WPB-M 0,25-1 / 2 / 3	14 (0.55)	24 (212)	100 (3.94)	43
M 16x1 M 16x1,5 (L)	WE-M 0,35	14 (0.55)	35 (310)	96 (3.78)	18 - 23
	WS-M 0,35-0 / 1 / 2 / 3 / 4	14 (0.55)	35 (310)	92 (3.62)	18 - 23
	WP-M 0,35-1 / 2 / 3	14 (0.55)	35 (310)	92 (3.62)	18 - 23
M 20x1 M 20x1,5 (L) 3/4-16 UNF (U) M 22x1,5 (H)* nur für Wx-M 0,5x19 only for Wx-M 0,5x19	WE-M 0,5x19*	19 (0.75)	100 (885)	113 (4.45)	18 - 23
	WS-M 0,5x19-0 / 1 / 2 / 3 / 4*	19 (0.75)	100 (885)	107 (4.21)	18 - 23
	WP-M 0,5x19-1 / 2 / 3*	19 (0.75)	100 (885)	107 (4.21)	18 - 23
	WS-M 0,5x13-0 / 1 / 2 / 3 / 4	13 (0.51)	65 (575)	88 (3.46)	18 - 23
	WP-M 0,5x13-1 / 2 / 3	13 (0.51)	65 (575)	88 (3.46)	18 - 23
	WE-M 0,5x40	40 (1.57)	125 (1106)	171 (6.73)	18 - 23
	WS-M 0,5x40-0 / 1 / 2 / 3 / 4	40 (1.57)	125 (1106)	165 (6.5)	18 - 23
	WP-M 0,5x40-1 / 2 / 3	40 (1.57)	125 (1106)	165 (6.5)	18 - 23
	WEB-M 0,5x19	19 (0.75)	80 (708)	123 (4.84)	43
	WSB-M 0,5x19-0 / 1 / 2 / 3 / 4	19 (0.75)	80 (708)	117 (4.61)	43
	WPB-M 0,5x19-1 / 2 / 3	19 (0.75)	80 (708)	117 (4.61)	43
M 20x1,5	WSK-M 0,5-1 / 2 / 3	7 (0.28)	25 (221)	49 (1.93)	42
M 24x1,5 M 25x1,5 (T) M27x1,5 (G) M 27x3 (R) 1-12 UNF (U) M 26x1,5 (K)* nur für Wx-M 1,0 only for Wx-M 1,0 M 30x1,5 (L)** nur für Wx-M 1,0x40 only for Wx-M 1,0x40	WE-M 1,0*	25 (0.98)	220 (1947)	141 (5.55)	18 - 23
	WS-M 1,0-0 / 1 / 2 / 3 / 4*	25 (0.98)	220 (1947)	133 (5.24)	18 - 23
	WP-M 1,0-1 / 2 / 3*	25 (0.98)	220 (1947)	133 (5.24)	18 - 23
	WE-M 1,0x40**	40 (1.57)	390 (3452)	178 (7.01)	18 - 23
	WS-M 1,0x40-0 / 1 / 2 / 3 / 4**	40 (1.57)	390 (3452)	170 (6.69)	18 - 23
	WP-M 1,0x40-1 / 2 / 3**	40 (1.57)	390 (3452)	170 (6.69)	18 - 23
	WE-M 1,0x80	80 (3.15)	390 (3452)	321 (12.64)	18 - 23
	WS-M 1,0x80-0 / 1 / 2 / 3 / 4	80 (3.15)	390 (3452)	313 (12.32)	18 - 23
	WP-M 1,0x80-1 / 2 / 3	80 (3.15)	390 (3452)	313 (12.32)	18 - 23
	WEB-M 1,0	25 (0.98)	180 (1593)	154 (6.06)	43
	WSB-M 1,0-0 / 1 / 2 / 3 / 4	25 (0.98)	180 (1593)	146 (5.75)	43
	WPB-M 1,0-1 / 2 / 3	25 (0.98)	180 (1593)	146 (5.75)	43
M 25x1,5	WSK-M 1,0-1 / 2 / 3	8 (0.31)	40 (354)	58 (2.28)	42
M 30x1,5	WSK-M 1,1-1 / 2 / 3	12 (0.47)	70 (620)	67 (2.64)	42

Thread	Series	Stroke mm (inch)	Energy absorption Nm / Stroke (in lbs)	Length mm (inch)	Page
M 32x1,5 M 33x1,5 (H) M 36x1,5 (L) 1 1/4-12 UNF (U) 1 3/8-12 UNF (UF) M 37x1,5 (F)* nur für Wx-M 1,25x2 only for Wx-M 1,25x2	WE-M 1,25x1-0 / 1 / 2	25 (0.98)	300 (2655)	138 (5.43)	24 - 29
	WS-M 1,25x1-0 / 1 / 2 / 3 / 4	25 (0.98)	300 (2655)	138 (5.43)	24 - 29
	WP-M 1,25x1-1 / 2 / 3	25 (0.98)	300 (2655)	138 (5.43)	24 - 29
	WE-M 1,25x2-0 / 1 / 2*	50 (1.97)	500 (4425)	188 (7.4)	24 - 29
	WS-M 1,25x2-0 / 1 / 2 / 3 / 4*	50 (1.97)	500 (4425)	188 (7.4)	24 - 29
	WP-M 1,25x2-1 / 2 / 3*	50 (1.97)	500 (4425)	188 (7.4)	24 - 29
	WE-M 1,25x3-1	75 (2.95)	750 (6638)	243 (9.57)	24 - 29
	WS-M 1,25x3-0 / 1 / 2 / 3 / 4	75 (2.95)	750 (6638)	243 (9.57)	24 - 29
	WP-M 1,25x3-1 / 2 / 3	75 (2.95)	750 (6638)	243 (9.57)	24 - 29
M 32x1,5	WSK-M 1,25-1 / 2 / 3	12 (0.47)	90 (797)	67 (2.64)	42
M 45x2 M 42x1,5 (K) M 45x1,5 (L) 1 3/4-12 UN (U)	WE-M 1,5x1-0 / 1 / 2	25 (0.98)	870 (7700)	148 (5.83)	24 - 29
	WS-M 1,5x1-0 / 1 / 2 / 3 / 4	25 (0.98)	870 (7700)	148 (5.83)	24 - 29
	WP-M 1,5x1-1 / 2 / 3	25 (0.98)	870 (7700)	148 (5.83)	24 - 29
	WE-M 1,5x2-0 / 1 / 2	50 (1.97)	1350 (11949)	198 (7.8)	24 - 29
	WS-M 1,5x2-0 / 1 / 2 / 3 / 4	50 (1.97)	1350 (11949)	198 (7.8)	24 - 29
	WP-M 1,5x2-1 / 2 / 3	50 (1.97)	1350 (11949)	198 (7.8)	24 - 29
	WE-M 1,5x3-0 / 1 / 2	75 (2.95)	2100 (18587)	248 (9.76)	24 - 29
	WS-M 1,5x3-0 / 1 / 2 / 3 / 4	75 (2.95)	2100 (18587)	248 (9.76)	24 - 29
	WP-M 1,5x3-1 / 2 / 3	75 (2.95)	2100 (18587)	248 (9.76)	24 - 29
M 62x2 M 64x2 (L) 2 1/2-12 UNF (U)	WE-M 2,0x1-0 / 1 / 2	25 (0.98)	1500 (13276)	186 (7.32)	24 - 29
	WS-M 2,0x1-0 / 1 / 2 / 3 / 4	25 (0.98)	1500 (13276)	186 (7.32)	24 - 29
	WP-M 2,0x1-1 / 2 / 3	25 (0.98)	1500 (13276)	186 (7.32)	24 - 29
	WE-M 2,0x2-0 / 1 / 2	50 (1.97)	2500 (22127)	236 (9.29)	24 - 29
	WS-M 2,0x2-0 / 1 / 2 / 3 / 4	50 (1.97)	2500 (22127)	236 (9.29)	24 - 29
	WP-M 2,0x2-1 / 2 / 3	50 (1.97)	2500 (22127)	236 (9.29)	24 - 29
	WE-M 2,0x4-0 / 1 / 2	100 (3.94)	5000 (44254)	336 (13.23)	24 - 29
	WS-M 2,0x4-0 / 1 / 2 / 3 / 4	100 (3.94)	5000 (44254)	336 (13.23)	24 - 29
	WP-M 2,0x4-1 / 2 / 3	100 (3.94)	5000 (44254)	336 (13.23)	24 - 29
	WE-M 2,0x6-0 / 1 / 2	150 (5.91)	8000 (70806)	453 (17.83)	24 - 29
	WS-M 2,0x6-0 / 1 / 2 / 3 / 4	150 (5.91)	8000 (70806)	453 (17.83)	24 - 29
	WP-M 2,0x6-1 / 2 / 3	150 (5.91)	8000 (70806)	453 (17.83)	24 - 29
M 85x2	WE-M 3,0x2-1	50 (1.97)	4000 (35403)	319 (12.56)	30 - 34
	WS-M 3,0x2-1 / 2 / 3 / 4	50 (1.97)	4000 (35403)	319 (12.56)	30 - 34
	WP-M 3,0x2-1 / 2 / 3	50 (1.97)	4000 (35403)	319 (12.56)	30 - 34
	WE-M 3,0x4-1	100 (3.94)	9000 (79657)	419 (16.5)	30 - 34
	WS-M 3,0x4-1 / 2 / 3 / 4	100 (3.94)	9000 (79657)	419 (16.5)	30 - 34
	WP-M 3,0x4-1 / 2 / 3	100 (3.94)	9000 (79657)	419 (16.5)	30 - 34
	WE-M 3,0x6-1	150 (5.91)	14000 (123911)	569 (22.4)	30 - 34
	WS-M 3,0x6-1 / 2 / 3 / 4	150 (5.91)	14000 (123911)	569 (22.4)	30 - 34
	WP-M 3,0x6-1 / 2 / 3	150 (5.91)	14000 (123911)	569 (22.4)	30 - 34
	WE-M 3,0x8-1	200 (7.87)	19000 (168164)	669 (26.34)	30 - 34
	WS-M 3,0x8-1 / 2 / 3 / 4	200 (7.87)	19000 (168164)	669 (26.34)	30 - 34
	WP-M 3,0x8-1 / 2 / 3	200 (7.87)	19000 (168164)	669 (26.34)	30 - 34
	WE-M 3,0x10-1	250 (9.84)	24000 (212418)	769 (30.28)	30 - 34
	WS-M 3,0x10-1 / 2 / 3 / 4	250 (9.84)	24000 (212418)	769 (30.28)	30 - 34
	WP-M 3,0x10-1 / 2 / 3	250 (9.84)	24000 (212418)	769 (30.28)	30 - 34
M 115x2	WE-M 4,0x2-1	50 (1.97)	4000 (35403)	319 (12.56)	30 - 34
	WS-M 4,0x2-1 / 2 / 3 / 4	50 (1.97)	4000 (35403)	319 (12.56)	30 - 34
	WP-M 4,0x2-1 / 2 / 3	50 (1.97)	4000 (35403)	319 (12.56)	30 - 34
	WE-M 4,0x4-1	100 (3.94)	9000 (79657)	419 (16.5)	30 - 34
	WS-M 4,0x4-1 / 2 / 3 / 4	100 (3.94)	9000 (79657)	419 (16.5)	30 - 34
	WP-M 4,0x4-1 / 2 / 3	100 (3.94)	9000 (79657)	419 (16.5)	30 - 34
	WE-M 4,0x6-1	150 (5.91)	14000 (123911)	569 (22.4)	30 - 34
	WS-M 4,0x6-1 / 2 / 3 / 4	150 (5.91)	14000 (123911)	569 (22.4)	30 - 34
	WP-M 4,0x6-1 / 2 / 3	150 (5.91)	14000 (123911)	569 (22.4)	30 - 34
	WE-M 4,0x8-1	200 (7.87)	19000 (168164)	669 (26.34)	30 - 34
	WS-M 4,0x8-1 / 2 / 3 / 4	200 (7.87)	19000 (168164)	669 (26.34)	30 - 34
	WP-M 4,0x8-1 / 2 / 3	200 (7.87)	19000 (168164)	669 (26.34)	30 - 34
	WE-M 4,0x10-1	250 (9.84)	24000 (212418)	769 (30.28)	30 - 34
	WS-M 4,0x10-1 / 2 / 3 / 4	250 (9.84)	24000 (212418)	769 (30.28)	30 - 34
	WP-M 4,0x10-1 / 2 / 3	250 (9.84)	24000 (212418)	769 (30.28)	30 - 34

We reserve the right to make changes without further notice!

Mega-Line M4 - M12

Mega-Line 0,1 - 0,2

Energy absorption

0,4 - 9 Nm / Stroke
3.5 - 80 in-lbs / Stroke

Stroke

4 - 10 mm
0.16 - 0.39 in

Thread

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

Energy absorption

4 - 22 Nm / Stroke
35 - 195 in-lbs / Stroke

Stroke

7 - 12 mm
0.28 - 0.47 in

Thread

M8x1 / M10x1 / M12x1
3/8-32 UNEF
7/16-28 UNEF
1/2-20 UNF

FEATURES

Enlarged Piston
High energy absorption (M4-M12)
Max. +400% Energy (0,1 - 0,2)
Max. -50% Costs / Nm

ProSurf
Long-life surface protection

Characteristics
Adjustable (WE-M)
Self-compensating (WS-M)
Progressiv (WP-M)

Extended Life Time
Nitrated guidance system
Piston rod: hardened stainless steel (M4-M12)
Piston: hardened, Titanium
aluminium nitride (M4-M12)
Special seals + oils

Temperature
-20°C - +80°C / -4°F - 176°F
Option: -50°C - +60°C / -58°F - 140°F
0°C - +120°C / 32°F - 248°F

Integrated End Stop

Flats

Special models
Stainless steel (Page 40)
Pressure chambers up to 7 bar
USDA-H1-compliant for food industry

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

Weight
M4x4 / M5x4 / M6x5: 3 g (0.003 lbs)
M8x5: 7 g (0.015 lbs) / M10x6: 11 g (0.025 lbs)
M10x8: 14 g (0.03 lbs) / M12x10: 30 g (0.067 lbs)

Return spring force
M 4 x 4: 0,8 Nm (7 lbs) / M 5 x 4: 1,0 Nm (9 lbs)
M 6 x 5: 1,2 Nm (10 lbs) / M 8 x 5: 2 Nm (17 lbs)
M 10 x X: 4 Nm (35 lbs) / M 12 x 10: 8 Nm (70 lbs)

Included
1 Lock nut

DIMENSIONS

	GW		GW	A	B	C	ø D	øE (A)	øE (AP)	øE (AS)	F (A)	F (AP)	F (AS)	L	SW	SW1-U	SW1-M
				mm (inch)													
WS-M 4 x 4	M 4 x 0,35	-	-	29 (1.14)	25 (0.98)	2 (0.08)	1,5 (0.06)	3 (0.12)	4,3 (0.17)	-	33 (1.3)	33 (1.3)	-	3 (0.12)	3 (0.12)	7 (0.28)	7 (0.28)
WS-M 5 x 4	M 5 x 0,5	-	-	29 (1.14)	25 (0.98)	2 (0.08)	1,5 (0.06)	3 (0.12)	4,3 (0.17)	-	33 (1.3)	33 (1.3)	-	3 (0.12)	4 (0.16)	8 (0.31)	8 (0.31)
WS-M 6 x 5	M 6 x 0,5	-	-	32 (1.26)	27 (1.06)	2 (0.08)	2 (0.08)	5 (0.2)	5,3 (0.21)	-	37 (1.46)	37 (1.46)	-	3 (0.12)	4 (0.16)	8 (0.31)	8 (0.31)
WS-M 8 x 5	M 8 x 1	-	-	35 (1.38)	30 (1.18)	2,5 (0.1)	2,3 (0.09)	6 (0.24)	6,5 (0.26)	-	41 (1.61)	41,5 (1.61)	-	3 (0.12)	5,5 (0.22)	11 (0.43)	11 (0.43)
WS-M 10 x 6	M 10 x 1	WS-M 10 x 6U	3/8-32 UNEF	37 (1.46)	31 (1.22)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	43,5 (1.71)	43,5 (1.71)	43,5 (1.71)	3 (0.12)	7 (0.28)	13 (0.5)	13 (0.5)
WS-M 10 x 8	M 10 x 1	WS-M 10 x 8U	3/8-32 UNEF	48 (1.89)	40 (1.57)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	54,5 (2.15)	54,5 (2.15)	54,5 (2.15)	3 (0.12)	7 (0.28)	13 (0.5)	13 (0.5)
-	-	WS-M 10 x 6UF	7/16-28 UNEF	37 (1.46)	31 (1.22)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	43,5 (1.71)	43,5 (1.71)	43,5 (1.71)	4 (0.16)	7 (0.28)	-	14 (0.55)
-	-	WS-M 10 x 8UF	7/16-28 UNEF	48 (1.89)	40 (1.57)	2,5 (0.1)	3 (0.12)	6 (0.24)	8,5 (0.33)	8,5 (0.33)	54,5 (2.15)	54,5 (2.15)	54,5 (2.15)	4 (0.16)	7 (0.28)	-	14 (0.55)
WS-M 12 x 10	M 12 x 1	WS-M 12 x 10UH	1/2-20 UNF	61 (2.4)	51 (2.01)	2,5 (0.1)	4 (0.16)	10 (0.39)	10 (0.39)	10 (0.39)	69 (2.72)	69,5 (2.74)	69 (2.72)	4 (0.16)	9 (0.35)	14 (0.55)	14 (0.55)

PERFORMANCE

	Stroke	Energy absorption			Effective mass						Impact Speed		Return spring force	
		Constant load	Emergency		-1 (soft)		-2 (medium)		-3 (hard)					
	mm (inch)	Nm/HB (max. lbs)	Nm/HB (max. lbs)	Nm/h (max. lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	min m/s (ft/s)	max m/s (ft/s)	min. N (lbs)	max. N (lbs)
WS-M 4 x 4	4 (0.16)	0,4 (3.6)	0,7 (6.2)	1500 (13.3)	0,1 (0.22)	1 (2.2)	0,9 (2)	3,2 (7.1)	-	-	0,2 (0.66)	1,5 (4.9)	2 (0.45)	7 (1.58)
WS-M 5 x 4	4 (0.16)	0,6 (5.4)	1 (8.9)	1800 (16)	0,1 (0.22)	1,2 (2.7)	1 (2.2)	5 (11.1)	-	-	0,2 (0.66)	2 (6.6)	2 (0.45)	7 (1.58)
WS-M 6 x 5	5 (0.2)	1 (8,9)	1,5 (13.3)	3000 (26.6)	0,05 (0.11)	1 (2.2)	0,8 (1.8)	2,8 (13.7)	1,5 (3.3)	4 (8.9)	0,2 (0.66)	2,5 (8,2)	2 (0.45)	5 (1.13)
WS-M 8 x 5	5 (0.2)	1,5 (13.3)	2 (17.7)	4000 (35.4)	0,25 (0.55)	3 (6.6)	0,7 (1.6)	6 (6.2)	3 (6.6)	9 (19,9)	0,2 (0.66)	2,5 (8,2)	2 (0.45)	5 (1.13)
WS-M 10 x 6 WS-M 10 x 6U WS-M 10 x 6UF	6 (0.24)	2,2 (19.5)	3 (26.6)	12000 (110)	0,7 (1.55)	3 (6.6)	3 (6.6)	10 (22)	8 (17.7)	18 (39,7)	0,2 (0.66)	2,5 (8,2)	3 (0.68)	6 (1.35)
WS-M 10 x 8 WS-M 10 x 8U WS-M 10 x 8UF	8 (0.32)	3 (26,6)	4 (35,5)	24000 (215)	0,9 (2)	9 (19.9)	2 (4.4)	12 (26.5)	9 (19.9)	23 (50.7)	0,2 (0.66)	3 (9,9)	3 (0.68)	6 (1.35)
WS-M 12 x 10 WS-M 12 x 10UH	10 (0.39)	9 (79.7)	12 (106.2)	27450 (245)	1 (2.2)	15 (33)	10 (22)	42 (92.6)	25 (55.1)	61 (134.5)	0,2 (0.66)	3 (9.9)	4 (0.9)	10 (2.25)

Mega-Line 0,1 - 0,2

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

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 / WP-M: 0,2 - 5,0 m/s (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)

Included
1 Lock nut

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)												
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 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 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)	-
WS-M 0,15U 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 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 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)	-
WS-M 0,2UH 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	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 (GW)	Width mm (inch)
M 10 x 1; M 12 x 1	12 (0.47)
3/8-32 UNEF; 7/16-28 UNEF; 1/2-20 UNF	

Width = T

CLAMPING FLANGE

Thread (GW)	A	B	C	E	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	Thread
M4x0,35	M10x1
M5x0,5	3/8-32 UNEF
M6x0,5	7/16-28 UNEF
M8x1	M12x1

AK1 FOR SIDE FORCES

	GW	A	B	C	øD	øE	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)

AK2 FOR SIDE FORCES

	GW	A	B	C	øD	øE	F	G	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)

AK1 FOR SIDE FORCES (Mega-Line 0,2)

Included

Proximity Switch, Switch cap, Stop limit nut

Mega-Line 0,25 / 0,35

Energy absorption

30 - 35 Nm / Stroke
266 - 310 in-lbs / Stroke

Stroke

14 mm
0.55 in

Thread

M14x1 / M14x1,5
M16x1 / M16x1,5
1/2-20 UNF
9/16-18 UNEF

Mega-Line 0,5

Energy absorption

65 - 125 Nm / Stroke
575 - 1106 in-lbs / Stroke

Stroke

13 - 40 mm
0.51 - 1.57 in

Thread

M20x1 / M20x1,5
3/4-16 UNF

Mega-Line 1,0

Energy absorption

220 - 390 Nm / Stroke
1947 - 3452 in-lbs / Stroke

Stroke

25 - 80 mm
0.98 - 3.15 in

Thread

M24x1,5 / M25x1,5
M27x1,5 / M27x3
1-12 UNF

FEATURES

Helix Principle
Max +400% Energy
Max. -50% Costs / Nm

ProSurf
Long-life surface protection

Characteristics
Adjustable (WE-M)
Self-compensating (WS-M)
Progressiv (WP-M)

Extended Life Time
Nitrated guidance system
Piston: hardened,
Titanium aluminium nitride
Special seals + oils

Temperature
-20°C - +80°C / -4°F - 176°F
Option: -50°C - +60°C / -58°F - 140°F
0°C - +120°C / 32°F - 248°F

Integrated End Stop

Flats

Special models
Stainless steel (Page 40)
Pressure chambers up to 7 bar
USDA-H1-compliant for food industry

Weight
0,25: 0,05 kg (0.11 lbs) / 0,35: 0,07 kg (0.16 lbs)

Impact Speed
WE-M / 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)

Included
1 Lock nut

DIMENSIONS

	Thread	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)																
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 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 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)	-	-

Mega-Line 0,5

Weight
0,5 : 0,14 kg (0.30 lbs) / 0,5 x 40 : 0,20 kg (0.45 lbs)

Impact Speed
WE-M / 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)

Included
1 Lock nut

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)																
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 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 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)
WS-M 0,5 x 19U 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 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 WE-M 0,5 x 19U	19 (0.75)	100 (885)	76500 (677000)	-	-	9 (20)	4500 (9920)	-	-	-	-	-	-
WS-M 0,5 x 19 WS-M 0,5 x 19U	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)
WP-M 0,5 x 19 WP-M 0,5 x 19U	19 (0.75)	100 (885)	76500 (677000)	-	-	26 (57)	125 (275)	10 (22)	89 (460)	69 (152)	555 (1225)	-	-
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)	-	-

Weight
1,0: 0,29 kg (0.65 lbs) / 1,0x40: 0,39 kg (0.86 lbs) /
1,0x80: 0,63 kg (1.4 lbs)

Impact Speed
WE-M / 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)

Included
1 Lock nut

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)																
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 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)
WS-M 1,0U 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 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)	-	-	-
WS-M 1,0 x 40U 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 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 WE-M 1,0U	25 (0.98)	220 (1950)	105600 (934650)	-	-	22 (48.5)	11000 (24250)	-	-	-	-	-	-
WS-M 1,0 WS-M 1,0U	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)
WP-M 1,0 WP-M 1,0U	25 (0.98)	220 (1950)	105600 (934650)	-	-	6 (13.2)	27,5 (60.6)	21 (46.3)	195 (430)	150 (330)	1200 (2645)	-	-
WE-M 1,0 x 40 WE-M 1,0 x 40U	40 (1.57)	390 (3450)	175500 (1553300)	-	-	38 (83.8)	18000 (39700)	-	-	-	-	-	-
WS-M 1,0 x 40 WS-M 1,0 x 40 U	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)
WP-M 1,0 x 40 WP-M 1,0 x 40U	40 (1.57)	390 (3450)	175500 (1553300)	-	-	10 (22)	48 (106)	39 (86)	340 (750)	270 (595)	2150 (4740)	-	-
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	ØB	C	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)
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)
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 (GW)	A	B	C	D	E	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)
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)
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 (GW)	A	B	C	E	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)
M20x1	46 (1.81)	36 (1.42)	30 (1.18)	6,6 (0.26)	8 (0.31)
M24x1,5	52 (2.05)	42 (1.65)	35 (1.38)	6,6 (0.26)	8 (0.31)

LOCK NUT

Thread
M14x1
M16x1
3/4-16 UNF
M20x1
1-12
M24x1,5

AK1 FOR SIDE FORCES

	GW	A	B	C	øD	øE	SW
		mm (inch)					
0,25	M14x1	32 (1.26)	10 (0.39)	6 (0.24)	9 (0.35)	18 (0.71)	15 (0.59)
0,35	M16x1	33 (1.30)	10 (0.39)	5 (0.20)	12 (0.47)	20 (0.79)	17 (0.67)
0,5x19	M20x1	42 (1.65)	16 (0.63)	8 (0.31)	12 (0.47)	24 (0.94)	22 (0.87)
1,0	M24x1,5	53,5 (2.11)	14,5 (0.57)	10 (0.39)	16 (0.63)	29 (1.14)	27 (1.06)

AK2 FOR SIDE FORCES

	GW	A	B	C	øD	øE	F	G	SW
		mm (inch)							
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)
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)
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)
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)
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)

AK1 FOR SIDE FORCES

Included

Proximity Switch, Switch cap, Stop limit nut

	A	B	ØE	ØF	G
	mm (inch)				
WE-M 0,25	92,0 (3.62)	100 (3.94)	19 (0.75)	11,5 (0.45)	20,5 (0.81)
WS-M 0,25 WP-M 0,25	87,5 (3.44)	105 (4.13)	19 (0.75)	11,5 (0.45)	20,5 (0.81)
WE-M 0,35	90,0 (3.54)	100 (3.94)	21 (0.83)	11,5 (0.45)	21,5 (0.85)
WS-M 0,35 WP-M 0,35	85,5 (3.37)	105 (4.13)	21 (0.83)	11,5 (0.45)	21,5 (0.85)
WE-M 0,5x13	88,5 (3.48)	104 (4.09)	28 (1.10)	21 (0.83)	25 (0.98)
WS-M 0,5x13 WP-M 0,5x13	82,5 (3.25)	98 (3.86)	28 (1.10)	21 (0.83)	25 (0.98)
WE-M 0,5x19	101,5 (4)	123 (4.84)	28 (1.10)	21 (0.83)	25 (0.98)
WS-M 0,5x19 WP-M 0,5x19	95,5 (3.76)	117 (4.61)	28 (1.10)	21 (0.83)	25 (0.98)
WE-M 0,5x40	138,5 (5.45)	181 (7.13)	28 (1.10)	21 (0.83)	25 (0.98)
WS-M 0,5x40 WP-M 0,5x40	132,5 (5.22)	177 (6.97)	28 (1.10)	21 (0.83)	25 (0.98)
WE-M 1,0	122,5 (4.82)	154 (6.06)	35 (1.38)	29 (1.14)	28,5 (1.12)
WS-M 1,0 WP-M 1,0	114,5 (4.51)	146 (5.75)	35 (1.38)	29 (1.14)	28,5 (1.12)
WE-M 1,0x40	144,5 (5.69)	191 (7.52)	35 (1.38)	29 (1.14)	28,5 (1.12)
WS-M 1,0x40 WP-M 1,0x40	136,5 (5.37)	183 (7.20)	35 (1.38)	29 (1.14)	28,5 (1.12)
WE-M 1,0x80	247,5 (9.74)	334 (13.15)	35 (1.38)	29 (1.14)	28,5 (1.12)
WS-M 1,0x80 WP-M 1,0x80	239,5 (9.43)	326 (12.83)	35 (1.38)	29 (1.14)	28,5 (1.12)

CLEVIS MOUNTING

Pull: End stop required 1 mm before the stroke ends

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

Mega-Line 1,25

Energy absorption

300 - 900 Nm / Stroke
2655 - 7966 in-lbs / Stroke

Stroke

25 - 100 mm
0.98 - 3.94 in

Thread

M32x1,5 / M33x1,5 / M36x1,5
1-1/4-12 UNF
1-3/8-12 UNF

Mega-Line 1,5

Energy absorption

870 - 2400 Nm / Stroke
7700 - 21242 in-lbs / Stroke

Stroke

25 - 100 mm
0.98 - 3.94 in

Thread

M45x2 / M42x1,5 / M45x1,5
1-3/4-12 UNF

Mega-Line 2,0

Energy absorption

1500 - 8000 Nm / Stroke
13276 - 70806 in-lbs / Stroke

Stroke

25 - 150 mm
0.98 - 3.94 in

Thread

M62x2 / M64x2
2-1/2-12 UNF

FEATURES

Helix Principle
Max +300% Energy
Max. -50% Costs / Nm

ProAdjust
Protected Adjustment

ProTec
Solid body without retaining ring

Characteristics
Adjustable (WE-M)
Self-compensating (WS-M)
Progressiv (WP-M)

Extended Life Time
Nitrated guidance system
Piston: hardened,
Titanium aluminium nitride
Special seals + oils

Temperature
-20°C - +80°C / -4°F - 176°F
Option: -50°C - +60°C / -58°F - 140°F
0°C - +120°C / 32°F - 248°F

Integrated End Stop

Flats

Special models
Stainless steel (Page 40)
Pressure chambers up to 7 bar
USDA-H1-compliant for food industry

***A:** PU / **AS:** Steel
Add "A / AS" after the part no.

Weight
1,25 x 1 : 0,45 kg (1 lbs) / 1,25 x 2 : 0,55 kg (1.22 lbs) /
1,25 x 3 : 0,70 kg (1.55 lbs)

Impact Speed
WE-M : 0,02 - 6,0 m/s (0.07 - 19.7 ft/s)
WS-M : 0,10 - 6,0 m/s (0.33 - 19.7 ft/s)
WP-M : 0,40 - 8,0 (1.32 - 26.3 ft/s)

Return spring force
1,25 x 1 : 30 N/min - 50 N/max (6.75 lbs/min - 11.25 lbs/max)
1,25 x 2 : 23 N/min - 50 N/max (5.17 lbs/min - 11.25 lbs/max)
1,25 x 3 : 15 N/min - 100 N/max (3.38 lbs/min - 22.5 lbs/max)

Torque: max. force by using the flats
1,25 : 40 Nm (360 lbs)

DIMENSIONS

	GW		GW		GW	A mm (inch)	B mm (inch)
WE-M 1,25 x 1 WS-M 1,25 x 1 WP-M 1,25 x 1	M 32 x 1,5	WE-M 1,25 x 1U WS-M 1,25 x 1U WP-M 1,25 x 1U	1-1/4-12	WE-M 1,25 x 1UF WS-M 1,25 x 1UF WP-M 1,25 x 1UF	1-3/8-12	138 (5.43)	85 (3.35)
WE-M 1,25 x 2 WS-M 1,25 x 2 WP-M 1,25 x 2	M 32 x 1,5	WE-M 1,25 x 2U WS-M 1,25 x 2U WP-M 1,25 x 2U	1-1/4-12	WE-M 1,25 x 2UF WS-M 1,25 x 2UF WP-M 1,25 x 2UF	1-3/8-12	188 (7,4)	110 (4.33)
WE-M 1,25 x 3 WS-M 1,25 x 3 WP-M 1,25 x 3	M 32 x 1,5	WE-M 1,25 x 3U WS-M 1,25 x 3U WP-M 1,25 x 3U	1-1/4-12	WE-M 1,25 x 3UF WS-M 1,25 x 3UF WP-M 1,25 x 3UF	1-3/8-12	243 (9.57)	140 (5.51)
WS-M 1,25 x 4 WP-M 1,25 x 4	M 32 x 1,5	WS-M 1,25 x 4U WP-M 1,25 x 4U	1-1/4-12	WS-M 1,25 x 4UF WP-M 1,25 x 4UF	1-3/8-12	306 (12.05)	154 (6.06)

PERFORMANCE

	Stroke (HB)	Energy absorption			Effective mass									
		Constant load		External tank	-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.)	Nm/h (in lbs/h)	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 1,25 x 1 WE-M 1,25 x 1U WE-M 1,25 x 1UF	25 (0.98)	300 (2655)	120000 (1062100)	240000 (2124200)	10 (22)	100 (220)	60 (132)	2950 (6500)	600 (1322)	89000 (196215)	-	-	-	-
WS-M 1,25 x 1 WS-M 1,25 x 1U WS-M 1,25 x 1UF	25 (0.98)	300 (2655)	120000 (1062100)	240000 (2124200)	7 (15)	32 (70)	28 (62)	130 (286)	80 (176)	590 (1300)	440 (970)	2050 (4520)	2000 (4410)	12500 (27560)
WP-M 1,25 x 1 WP-M 1,25 x 1U WP-M 1,25 x 1UF	25 (0.98)	300 (2655)	120000 (1062100)	240000 (2124200)	-	-	7 (15)	35 (77)	30 (66)	260 (573)	207 (456)	1650 (3640)	-	-
WE-M 1,25 x 2 WE-M 1,25 x 2U WE-M 1,25 x 2UF	50 (1.97)	500 (4425)	150000 (1327600)	300000 (2655200)	15 (33)	160 (352)	100 (220)	4000 (8818)	800 (1763)	120000 (264560)	-	-	-	-
WS-M 1,25 x 2 WS-M 1,25 x 2U WS-M 1,25 x 2UF	50 (1.97)	500 (4425)	150000 (1327600)	300000 (2655200)	13 (28)	60 (132)	56 (123)	240 (529)	160 (352)	1200 (2645)	1000 (2205)	4200 (9260)	4000 (8820)	25000 (55120)
WP-M 1,25 x 2 WP-M 1,25 x 2U WP-M 1,25 x 2UF	50 (1.97)	500 (4425)	150000 (1327600)	300000 (2655200)	-	-	7 (15)	35 (77)	30 (66)	260 (573)	207 (456)	1650 (3640)	-	-
WE-M 1,25 x 3 WE-M 1,25 x 3U WE-M 1,25 x 3UF	75 (2.95)	750 (6640)	225000 (1991400)	450000 (3982900)	-	-	150 (330)	6000 (13230)	-	-	-	-	-	-
WS-M 1,25 x 3 WS-M 1,25 x 3U WS-M 1,25 x 3UF	75 (2.95)	750 (6640)	225000 (1991400)	450000 (3982900)	20 (44)	99 (218)	85 (187)	400 (882)	240 (529)	1850 (4080)	1000 (2205)	7000 (15435)	6000 (13230)	37000 (81575)
WP-M 1,25 x 3 WP-M 1,25 x 3U WP-M 1,25 x 3UF	75 (2.95)	750 (6640)	225000 (1991400)	450000 (392900)	-	-	20 (44)	99 (218)	75 (165)	660 (1455)	520 (1145)	4100 (9040)	-	-
WS-M 1,25 x 4 WS-M 1,25 x 4U WS-M 1,25 x 4UF	100 (3.94)	900 (7966)	270000 (2389701)	540000 (4779405)	25 (55)	112 (247)	100 (221)	500 (1103)	290 (639)	2200 (4851)	1800 (3969)	8500 (18743)	7200 (15876)	45000 (99225)
WP-M 1,25 x 4 WP-M 1,25 x 4U WP-M 1,25 x 4UF	100 (3.94)	900 (7966)	270000 (2389701)	540000 (4779405)	-	-	25 (55)	112 (247)	88 (194)	800 (1764)	622 (1371)	5000 (11025)	-	-

Mega-Line 1,5

***A:** PU / **AS:** Steel
Add "A / AS" after the part no.

Weight
1,5 x 1 : 0,95 kg (2.1 lbs) / 1,5 x 2 : 1,10 kg (2.5 lbs) /
1,5 x 3 : 1,20 kg (2.7 lbs)

Impact Speed
WE-M : 0,02 - 6,0 m/s (0.07 - 19.7 ft/s)
WS-M : 0,10 - 6,0 m/s (0.33 - 19.7 ft/s)
WP-M : 0,40 - 8,0 m/s (1.32 - 26.3 ft/s)

Return spring force
1,5 x 1 : 50 N/min - 70 N/max (11.3 lbs/min - 15.8 lbs/max)
1,5 x 2 : 35 N/min - 70 N/max (7.87 lbs/min - 15.8 lbs/max)
1,5 x 3 : 35 N/min - 80 N/max (7.87 lbs/min - 18 lbs/max)

Torque: max. force by using the flats
1,5 : 40 Nm (360 lbs)

DIMENSIONS

	GW		GW	A	B
				mm (inch)	
WE-M 1,5 x 1	M 45 x 2	WE-M 1,5 x 1U	1-3/4-12	148 (5.83)	89 (3.5)
WS-M 1,5 x 1	M 45 x 2	WS-M 1,5 x 1U	1-3/4-12	148 (5.83)	89 (3.5)
WP-M 1,5 x 1	M 45 x 2	WP-M 1,5 x 1U	1-3/4-12	148 (5.83)	89 (3.5)
WE-M 1,5 x 2	M 45 x 2	WE-M 1,5 x 2U	1-3/4-12	198 (7.8)	114 (4.49)
WS-M 1,5 x 2	M 45 x 2	WS-M 1,5 x 2U	1-3/4-12	198 (7.8)	114 (4.49)
WP-M 1,5 x 2	M 45 x 2	WP-M 1,5 x 2U	1-3/4-12	198 (7.8)	114 (4.49)

	Thread		Thread	A	B
				mm (inch)	
WE-M 1,5 x 3	M 45 x 2	WE-M 1,5 x 3U	1-3/4-12	248 (9.76)	139 (5.47)
WS-M 1,5 x 3	M 45 x 2	WS-M 1,5 x 3U	1-3/4-12	248 (9.76)	139 (5.47)
WP-M 1,5 x 3	M 45 x 2	WP-M 1,5 x 3U	1-3/4-12	248 (9.76)	139 (5.47)
WS-M 1,5 x 4	M 45 x 2	WS-M 1,5 x 4U	1-3/4-12	327 (12.87)	176 (6.93)
WP-M 1,5 x 4	M 45 x 2	WP-M 1,5 x 4U	1-3/4-12	327 (12.87)	176 (6.93)

PERFORMANCE

	Stroke (HB)	Energy absorption			Effective mass									
		Constant load		External tank	-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.)	Nm/h (in lbs/h)	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 1,5 x 1 WE-M 1,5 x 1U	25 (0.98)	870 (7700)	261000 (2310000)	450000 (3850000)	30 (66)	250 (551)	150 (330)	21000 (46300)	6200 (13670)	240000 (529120)	-	-	-	-
WS-M 1,5 x 1 WS-M 1,5 x 1U	25 (0.98)	870 (7700)	261000 (2310000)	450000 (3850000)	24 (53)	114 (251)	98 (216)	480 (1600)	280 (617)	2100 (4630)	1740 (3836)	8200 (18080)	6960 (15345)	43500 (95900)
WP-M 1,5 x 1 WP-M 1,5 x 1U	25 (0.98)	870 (7700)	261000 (2310000)	450000 (3850000)	-	-	24 (53)	108 (238)	85 (187)	770 (1698)	600 (1323)	4800 (10580)	-	-
WE-M 1,5 x 2 WE-M 1,5 x 2U	50 (1.97)	1350 (11950)	340000 (2987500)	544000 (4780000)	45 (99)	430 (948)	300 (661)	26000 (26000)	10800 (23810)	330000 (727540)	-	-	-	-
WS-M 1,5 x 2 WS-M 1,5 x 2U	50 (1.97)	1350 (11950)	340000 (2987500)	544000 (4780000)	35 (77)	170 (375)	160 (353)	680 (680)	440 (970)	2900 (6395)	2700 (5952)	12700 (28000)	10800 (23810)	67500 (148820)
WP-M 1,5 x 2 WP-M 1,5 x 2U	50 (1.97)	1350 (11950)	340000 (2987500)	544000 (4780000)	-	-	37 (82)	160 (160)	130 (287)	1200 (2645)	940 (2072)	7500 (16535)	-	-
WE-M 1,5 x 3 WE-M 1,5 x 3U	75 (2.95)	2100 (18600)	420000 (3720000)	670000 (5580000)	70 (155)	670 (1478)	450 (992)	27600 (57320)	16800 (37040)	500000 (1102330)	-	-	-	-
WS-M 1,5 x 3 WS-M 1,5 x 3U	75 (2.95)	2100 (18600)	420000 (3720000)	670000 (5580000)	40 (88)	270 (595)	240 (530)	1100 (2425)	670 (1477)	5000 (11025)	4200 (9260)	19500 (4300)	16800 (37040)	105000 (23150)
WP-M 1,5 x 3 WP-M 1,5 x 3U	75 (2.95)	2100 (18600)	420000 (3720000)	670000 (5580000)	-	-	58 (128)	260 (573)	200 (440)	1850 (4080)	1450 (3200)	11600 (25575)	-	-
WS-M 1,5 x 4 WS-M 1,5 x 4U	100 (3.94)	2400 (21241)	480000 (4248360)	720000 (6372540)	70 (154)	315 (694)	270 (595)	1330 (2932)	770 (1697)	5925 (13064)	4800 (10584)	22650 (49943)	19200 (42336)	120000 (264600)
WP-M 1,5 x 4 WP-M 1,5 x 4U	100 (3.94)	2400 (21241)	480000 (4248360)	720000 (6372540)	-	-	70 (154)	300 (661)	240 (529)	2130 (4696)	1660 (3660)	13300 (29326)	-	-

***A:** PU / **AS:** Steel
Add "A / AS" after the part no.

Weight
2,0 x 1 : 2,0 kg (4.5 lbs) / 2,0 x 2 : 3,0 kg (6.7 lbs)
2,0 x 4 : 3,9 kg (8.6 lbs) / 2,0 x 6 : 4,8 kg (10.6 lbs)

Impact Speed
WE-M : 0,02 - 6,0 m/s (0.07 - 19.7 ft/s)
WS-M : 0,10 - 6,0 m/s (0.33 - 19.7 ft/s)
WP-M : 0,40 - 8,0 m/s (1.32 - 26.3 ft/s)

Return spring force
2,0 x 1 : 50 N/min - 130 N/max (11.25 N/min - 29.23 lbs/max)
2,0 x 2 : 40 N/min - 130 N/max (9.00 lbs/min - 29.23 lbs/max)
2,0 x 4 : 45 N/min - 130 N/max (10.11 lbs/min - 29.23 lbs/max)
2,0 x 6 : 35 N/min - 130 N/max (7.87 lbs/min - 29.23 lbs/max)

Torque: max. force by using the flats
2,0 : 40 Nm (360 lbs)

DIMENSIONS

	GW		GW	A	B
				mm (inch)	
WE-M 2,0 x 1	M 62 x 2	WE-M 2,0 x 1U	2-1/2-12	186 (7.32)	104 (4.09)
WS-M 2,0 x 1	M 62 x 2	WS-M 2,0 x 1U	2-1/2-12	186 (7.32)	104 (4.09)
WP-M 2,0 x 1	M 62 x 2	WP-M 2,0 x 1U	2-1/2-12	186 (7.32)	104 (4.09)
WE-M 2,0 x 2	M 62 x 2	WE-M 2,0 x 2U	2-1/2-12	236 (9.29)	129 (5.08)
WS-M 2,0 x 2	M 62 x 2	WS-M 2,0 x 2U	2-1/2-12	236 (9.29)	129 (5.08)
WP-M 2,0 x 2	M 62 x 2	WP-M 2,0 x 2U	2-1/2-12	236 (9.29)	129 (5.08)

	GW		GW	A	B
				mm (inch)	
WE-M 2,0 x 4	M 62 x 2	WE-M 2,0 x 4U	2-1/2-12	336 (13.23)	179 (7.05)
WS-M 2,0 x 4	M 62 x 2	WS-M 2,0 x 4U	2-1/2-12	336 (13.23)	179 (7.05)
WP-M 2,0 x 4	M 62 x 2	WP-M 2,0 x 4U	2-1/2-12	336 (13.23)	179 (7.05)
WE-M 2,0 x 6	M 62 x 2	WE-M 2,0 x 6U	2-1/2-12	453 (17.83)	246 (9.69)
WS-M 2,0 x 6	M 62 x 2	WS-M 2,0 x 6U	2-1/2-12	453 (17.83)	246 (9.69)
WP-M 2,0 x 6	M 62 x 2	WP-M 2,0 x 6U	2-1/2-12	453 (17.83)	246 (9.69)

PERFORMANCE

	Stroke (HB)	Energy absorption			Effective mass									
		Constant load		External tank	-0 (very soft)		-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)	
	mm (inch)	Nm/HB (max.) (in lbs/HB)	Nm/h (in lbs/h) (max.)	Nm/h (in lbs/h)	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 2,0 x 1 WE-M 2,0 x 1U	25 (0.98)	1500 (13.28)	150000 (1327500)	240000 (2124000)	60 (132)	480 (1060)	300 (660)	41150 (90725)	12000 (26455)	470000 (1036200)	-	-	-	-
WS-M 2,0 x 1 WS-M 2,0 x 1U	25 (0.98)	1500 (13.28)	150000 (1327500)	240000 (2124000)	31 (68)	197 (435)	170 (375)	830 (1830)	480 (1060)	3700 (8160)	3000 (6615)	14100 (31085)	12000 (26455)	75000 (165350)
WP-M 2,0 x 1 WP-M 2,0 x 1U	25 (0.98)	1500 (13.28)	150000 (1327500)	240000 (2124000)	-	-	31 (68)	187 (412)	150 (330)	1330 (2.94)	1030 (2270)	8300 (18300)	-	-
WE-M 2,0 x 2 WE-M 2,0 x 2U	50 (1.97)	2500 (22.13)	250000 (2213000)	400000 (3540800)	80 (176)	800 (1765)	500 (1105)	63700 (140435)	14000 (30865)	600000 (1322800)	-	-	-	-
WS-M 2,0 x 2 WS-M 2,0 x 2U	50 (1.97)	2500 (22.13)	250000 (2213000)	400000 (3540800)	52 (115)	330 (730)	280 (620)	1385 (3055)	800 (1765)	6150 (13600)	5000 (11025)	23500 (51810)	20000 (44095)	125000 (275585)
WP-M 2,0 x 2 WP-M 2,0 x 2U	50 (1.97)	2500 (22.13)	250000 (2213000)	400000 (3540800)	-	-	52 (115)	310 (6.85)	250 (550)	2200 (4850)	1730 (3815)	13800 (30425)	-	-
WE-M 2,0 x 4 WE-M 2,0 x 4U	100 (3.94)	5000 (44.26)	350000 (3097850)	525000 (4646775)	160 (352)	1600 (3.53)	1000 (2205)	62500 (137795)	40000 (88190)	1000000 (2204660)	-	-	-	-
WS-M 2,0 x 4 WS-M 2,0 x 4U	100 (3.94)	5000 (44.26)	350000 (3097850)	525000 (4646775)	104 (230)	650 (1435)	565 (1245)	2770 (6110)	1600 (3530)	12350 (27230)	10000 (22050)	47200 (104060)	40000 (88190)	250000 (551165)
WP-M 2,0 x 4 WP-M 2,0 x 4U	100 (3.94)	5000 (44.26)	350000 (3097850)	525000 (4646775)	-	-	100 (220)	625 (1380)	490 (1080)	4400 (970)	3460 (7630)	27700 (61070)	-	-
WE-M 2,0 x 6 WE-M 2,0 x 6U	150 (5.91)	8000 (70.81)	400000 (3540250)	650000 (5735205)	250 (551)	2400 (5290)	1250 (2755)	105000 (231490)	64000 (141100)	1000000 (2204660)	-	-	-	-
WS-M 2,0 x 6 WS-M 2,0 x 6U	150 (5.91)	8000 (70.81)	400000 (3540250)	650000 (5735205)	160 (353)	1050 (2315)	905 (1995)	4430 (9770)	2560 (5645)	19750 (43545)	16000 (35275)	75500 (166450)	64000 (141100)	400000 (881865)
WP-M 2,0 x 6 WP-M 2,0 x 6U	150 (5.91)	8000 (70.81)	400000 (3540250)	650000 (5735205)	-	-	160 (355)	1000 (2205)	790 (1740)	7100 (15655)	5330 (11750)	44000 (97005)	-	-

LOCK NUT

Thread		ø A	B
		mm (inch)	
M32x1,5; 1-1/4-12; 1-3/8-12	1,25	38 (1.50)	6,5 (0.26)
M45x2; 1-3/4-12	1,5	54 (2.13)	8 (0.31)
M62x2 ; 2-1/2-12	2,0	74 (2.91)	10 (0.39)

SQUARE FLANGE

Thread		C	D	E	øF
		mm (inch)			
M32x1,5; 1-1/4-12; 1-3/8-12	1,25	45 (1.77)	31 (1.22)	12 (0.47)	6,6 (0.26)
M45x2; 1-3/4-12	1,5	55 (2.17)	43 (1.69)	12 (0.47)	9 (0.35)
M62x2 ; 2-1/2-12	2,0	80 (3.15)	60 (2.36)	20 (0.79)	11 (0.43)

STOP LIMIT NUT

Thread		G	øH	øI	J
		mm (inch)			
M32x1,5; 1-1/4-12; 1-3/8-12	1,25	60 (2.36)	38 (1.50)	33 (1.30)	35 (1.38)
M45x2; 1-3/4-12	1,5	65 (2.56)	54 (2.13)	47 (1.85)	35 (1.38)
M62x2 ; 2-1/2-12	2,0	100 (3.94)	74 (2.91)	65 (2.56)	60 (2.36)

FOOT MOUNTING

Thread (GW)				A	B max	C	D	E	F	G	H
				mm (inch)							
1,25 x 1	1-1/4-12	1-3/8-12	M32x1,5	138 (5.43)	65 (2.56)	10 (0.39)	20 (0.79)	56 (2.20)	40 (1.57)	M6	41 (1.61)
1,25 x 2	1-1/4-12	1-3/8-12	M32x1,5	188 (7.40)	90 (3.54)	10 (0.39)	20 (0.79)	56 (2.20)	40 (1.57)	M6	41 (1.61)
1,25 x 3	1-1/4-12	1-3/8-12	M32x1,5	243 (9.57)	120 (4.72)	10 (0.39)	20 (0.79)	56 (2.20)	40 (1.57)	M6	41 (1.61)
1,25 x 4	1-1/4-12	1-3/8-12	M32x1,5	306 (12.05)	134 (2.28)	10 (0.39)	20 (0.79)	56 (2.20)	40 (1.57)	M6	41 (1.61)
1,5 x 1	1-3/4-12	M 45 x 2		148 (5.83)	64 (2.52)	12,5 (0.49)	25 (0.98)	80 (3.15)	56 (2.20)	M8	58 (2.28)
1,5 x 2	1-3/4-12	M 45 x 2		198 (7.80)	89 (3.50)	12,5 (0.49)	25 (0.98)	80 (3.15)	56 (2.20)	M8	58 (2.28)
1,5 x 3	1-3/4-12	M 45 x 2		248 (9.76)	114 (4.49)	12,5 (0.49)	25 (0.98)	80 (3.15)	56 (2.20)	M8	58 (2.28)
2,0 x 1	2-1/2-12	M62 x 2		186 (7.32)	79 (3.11)	12,5 (0.49)	25 (0.98)	100 (3.94)	80 (3.15)	M10x80	76 (2.99)
2,0 x 2	2-1/2-12	M62 x 2		236 (9.29)	104 (4.09)	12,5 (0.49)	25 (0.98)	100 (3.94)	80 (3.15)	M10x80	76 (2.99)
2,0 x 4	2-1/2-12	M62 x 2		336 (13.23)	154 (6.06)	12,5 (0.49)	25 (0.98)	100 (3.94)	80 (3.15)	M10x80	76 (2.99)
2,0 x 6	2-1/2-12	M62 x 2		453 (17.83)	221 (8.70)	12,5 (0.49)	25 (0.98)	100 (3.94)	80 (3.15)	M10x80	76 (2.99)

CLEVIS MOUNTING

Pull: End stop required 1 mm before the stroke ends

Standard: Shock absorber with clevis mounting is delivered without return spring.
Return spring is available on request.

Clevis flange

	Thread	Thread	A max	B	B1	ø C	D	ø E	ø F	G	H	I	J	ø K	L	M	N	ø O	P
			mm (inch)																
1,25 x 1	M32x1,5	1-1/4-12 1-3/8-12	168 (6.61)	14 (0.55)	14 (0.55)	10 (0.39)	13 (0.51)	20 (0.79)	38 (1.50)	45 (1.77)	32 (1.26)	14 (0.55)	34 (1.34)	6,5 (0.26)	22 (0.87)	13 (0.51)	5 (0.20)	10 (0.39)	20 (0.79)
1,25 x 2	M32x1,5	1-1/4-12 1-3/8-12	218 (8.58)	14 (0.55)	14 (0.55)	10 (0.39)	13 (0.51)	20 (0.79)	38 (1.50)	45 (1.77)	32 (1.26)	14 (0.55)	34 (1.34)	6,5 (0.26)	22 (0.87)	13 (0.51)	5 (0.20)	10 (0.39)	20 (0.79)
1,25 x 3	M32x1,5	1-1/4-12 1-3/8-12	273 (10.75)	14 (0.55)	14 (0.55)	10 (0.39)	13 (0.51)	20 (0.79)	38 (1.50)	45 (1.77)	32 (1.26)	14 (0.55)	34 34 (1.34)	6,5 (0.26)	22 (0.87)	13 (0.51)	5 5 (0.20)	10 (0.39)	20 (0.79)
1,25 x 4	M32x1,5	1-1/4-12 1-3/8-12	336 (13.23)	14 (0.55)	14 (0.55)	10 (0.39)	13 (0.51)	20 (0.79)	38 (1.50)	45 (1.77)	32 (1.26)	14 (0.55)	34 (1.34)	6,5 (0.26)	22 (0.87)	13 (0.51)	5 (0.20)	10 (0.39)	20 (0.79)
1,5 x 1	M45x2	1-3/4-12	203 (7.99)	28 (1.10)	18 (0.71)	16 (0.63)	20 (0.79)	28 (1.10)	53 (2.09)	65 (2.56)	46 (1.81)	21 (0.83)	45 (1.77)	9 (0.35)	27 (1.06)	15 (0.59)	6 (0.24)	16 (0.63)	29 (1.14)
1,5 x 2	M45x2	1-3/4-12	253 (9.96)	28 (1.10)	18 (0.71)	16 (0.63)	20 (0.79)	28 (1.10)	53 (2.09)	65 (2.56)	46 (1.81)	21 (0.83)	45 (1.77)	9 (0.35)	27 (1.06)	15 (0.59)	6 (0.24)	16 (0.63)	29 (1.14)
1,5 x 3	M45x2	1-3/4-12	303 (11.93)	28 (1.10)	18 (0.71)	16 (0.63)	20 (0.79)	28 (1.10)	53 (2.09)	65 (2.56)	46 (1.81)	21 (0.83)	45 (1.77)	9 (0.35)	27 (1.06)	15 (0.59)	6 (0.24)	16 (0.63)	29 (1.14)
2,0 x 1	M62x2	2-1/2-12	272 (10.71)	35 (1.38)	35 (1.38)	20 (0.79)	24 (0.94)	40 (1.57)	74 (2.91)	95 (3.74)	72 (2.83)	25 (0.98)	65 (2.56)	11 (0.43)	36 (1.42)	22 (0.87)	10 (0.39)	20 (0.79)	42 (1.65)
2,0 x 2	M62x2	2-1/2-12	322 (12.68)	35 (1.38)	35 (1.38)	20 (0.79)	24 (0.94)	40 (1.57)	74 (2.91)	95 (3.74)	72 (2.83)	25 (0.98)	65 (2.56)	11 (0.43)	36 (1.42)	22 (0.87)	10 (0.39)	20 (0.79)	42 (1.65)
2,0 x 4	M62x2	2-1/2-12	422 (16.61)	35 (1.38)	35 (1.38)	20 (0.79)	24 (0.94)	40 (1.57)	74 (2.91)	95 (3.74)	72 (2.83)	25 (0.98)	65 (2.56)	11 (0.43)	36 (1.42)	22 (0.87)	10 (0.39)	20 (0.79)	42 (1.65)
2,0 x 6	M62x2	2-1/2-12	539 (21.22)	35 (1.38)	35 (1.38)	20 (0.79)	24 (0.94)	40 (1.57)	74 (2.91)	95 (3.74)	72 (2.83)	25 (0.98)	65 (2.56)	11 (0.43)	36 (1.42)	22 (0.87)	10 (0.39)	20 (0.79)	42 (1.65)

AK1 FOR SIDE FORCES

	GW1	GW2	A	B	C	ø D
			mm (inch)			
1,25 x 1	M32x1,5	M45x2	132,0 (5.20)	73 (2.87)	32,0 (1.26)	25 (0.98)
1,25 x 2	M32,1,5	M45x2	184,5 (7.26)	98 (3.86)	59,5 (2.34)	25 (0.98)
1,5 x 1	M45x2	M62x2	135,5 (5.33)	77 (3.03)	31,5 (1.24)	35 (1.38)
1,5 x 2	M45x2	M62x2	182,0 (7.17)	102 (4.02)	53,0 (2.09)	35 (1.38)
2,0 x 1	M62x2	M85x2	158,5 (6.24)	102 (4.02)	29,5 (1.16)	55 (2.17)
2,0 x 2	M62x2	M85x2	208,5 (8.21)	127 (5.00)	54,5 (2.15)	55 (2.17)

Mega-Line 3,0

Energy absorption

4000 - 24000 Nm / Stroke
35403 - 212419 in-lbs / Stroke

Stroke

50 - 250 mm
1.97 - 9.84 in

Thread

M85x2

Mega-Line 4,0

Energy absorption

4000 - 24000 Nm / Stroke
35403 - 212419 in-lbs / Stroke

Stroke

50 - 250 mm
1.97 - 9.84 in

Thread

M115x2

FEATURES

Helix Principle
Max. +200% Energy (Mega-Line 3,0)
Max. +50% Energy (Mega-Line 4,0)
Max. -50% Costs / Nm

ProAdjust
Protected Adjustment

ProTec
Solid body without retaining ring

Characteristics
Adjustable (WE-M)
Self-compensating (WS-M)
Progressiv (WP-M)

Extended Life Time
Nitrated guidance system
Piston: hardened,
Titanium aluminium nitride
Special seals + oils

Temperature
-20°C - +80°C / -4°F - 176°F

Integrated End Stop

Special models
Stainless steel (Page 40)
Pressure chambers up to 7 bar
USDA-H1-compliant for food industry

***A:** PU / **AS:** Steel
Add "A / AS" after the part no.

Weight
3,0 x 2 : 7 kg (15.5 lbs) / 3,0 x 4 : 9 kg (20 lbs)
3,0 x 6 : 12 kg (26.5 lbs) / 3,0 x 8 : 15 kg (33.1 lbs)
3,0 x 10 : 20 kg (44.1 lbs)

Impact Speed
WE-M : 0,0 - 6,0 m/s (0.07 - 19.7 ft/s)
WS-M : 0,10 - 6,0 m/s (0.33 - 19.7 ft/s)
WP-M : 0,40 - 8,0 m/s (1.32 - 26.3 ft/s)

Return spring force
3,0 x 2 : 120 N/min - 200 N/max (26.98 lbs/min - 44.97 lbs/max)
3,0 x 4 : 120 N/min - 250 N/max (26.98 lbs/min - 56.2 lbs/max)
3,0 x 6 : 170 N/min - 250 N/max (38.22 lbs/min - 56.2 lbs/max)
3,0 x 8 : 170 N/min - 250 N/max (38.22 lbs/min - 56.2 lbs/max)
3,0 x 10 : 170 N/min - 280 N/max (38.22 lbs/min - 69.95 lbs/max)

DIMENSIONS

	GW	A	B
		mm (inch)	
WE-M 3,0 x 2	M 85 x 2	319 (12.56)	225 (8.86)
WS-M 3,0 x 2	M 85 x 2	319 (12.56)	225 (8.86)
WP-M 3,0 x 2	M 85 x 2	319 (12.56)	225 (8.86)
WE-M 3,0 x 4	M 85 x 2	419 (16,5)	275 (10.83)
WS-M 3,0 x 4	M 85 x 2	419 (16,5)	275 (10.83)
WP-M 3,0 x 4	M 85 x 2	419 (16,5)	275 (10.83)
WE-M 3,0 x 6	M 85 x 2	569 (22,4)	325 (12,8)
WS-M 3,0 x 6	M 85 x 2	569 (22,4)	325 (12,8)
WP-M 3,0 x 6	M 85 x 2	569 (22,4)	325 (12,8)

	GW	A	B
		mm (inch)	
WE-M 3,0 x 8	M 85 x 2	669 (26.34)	375 (14.76)
WS-M 3,0 x 8	M 85 x 2	669 (26.34)	375 (14.76)
WP-M 3,0 x 8	M 85 x 2	669 (26.34)	375 (14.76)
WE-M 3,0 x 10	M 85 x 2	769 (30.28)	425 (16.73)
WS-M 3,0 x 10	M 85 x 2	769 (30.28)	425 (16.73)
WP-M 3,0 x 10	M 85 x 2	769 (30.28)	425 (16.73)

PERFORMANCE

	Stroke	Energy absorption			Effective mass							
		Constant load		External tank	-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)	
	mm (inch)	Nm/HB (max.) (in lbs/HB)	Nm/h (max.) (in lbs/h)	Nm/h (in lbs/h)	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 3,0 x 2	50 (1.97)	4000 (35405)	1200000 (10621500)	1500000 (13276875)	280 (620)	89000 (196215)	-	-	-	-	-	-
WS-M 3,0 x 2	50 (1.97)	4000 (35405)	1200000 (10621500)	1500000 (13276875)	695 (1535)	2480 (5470)	2000 (4410)	6050 (13340)	5550 (12125)	15400 (33955)	12500 (27560)	40000 (88190)
WP-M 3,0 x 2	50 (1.97)	4000 (35405)	1200000 (10621500)	1500000 (13276875)	165 (365)	500 (1105)	400 (885)	3550 (7830)	2800 (6175)	22000 (48505)	-	-
WE-M 3,0 x 4	100 (3.94)	9000 (79660)	1800000 (15932000)	2250000 (19915000)	600 (1325)	112500 (248025)	-	-	-	-	-	-
WS-M 3,0 x 4	100 (3.94)	9000 (79660)	1800000 (15932000)	2250000 (19915000)	1750 (3860)	550 (1215)	4500 (9920)	13600 (29985)	12500 (27560)	34700 (76505)	28800 (63495)	88000 (194010)
WP-M 3,0 x 4	100 (3.94)	9000 (79660)	1800000 (15932000)	2250000 (19915000)	360 (795)	1125 (2480)	890 (1965)	8000 (17640)	6300 (13890)	50000 (110235)	-	-
WE-M 3,0 x 6	150 (5.91)	14000 (123915)	2100000 (18587250)	2625000 (23172105)	925 (2040)	175000 (385815)	-	-	-	-	-	-
WS-M 3,0 x 6	150 (5.91)	14000 (123915)	2100000 (18587250)	2625000 (23172105)	3710 (8180)	11700 (25794)	7000 (15435)	21200 (46740)	19500 (42990)	54000 (119055)	44500 (98110)	138200 (304685)
WP-M 3,0 x 6	150 (5.91)	14000 (123915)	2100000 (18587250)	2625000 (23172105)	555 (1225)	1750 (3860)	1380 (3045)	12400 (27340)	9700 (21385)	7700 (16975)	-	-
WE-M 3,0 x 8	200 (7.87)	19000 (168165)	2660000 (23543100)	3325000 (29428875)	1250 (2755)	237500 (523610)	-	-	-	-	-	-
WS-M 3,0 x 8	200 (7.87)	19000 (168165)	2660000 (23543100)	3325000 (29428875)	2750 (6065)	8640 (19050)	7500 (16535)	28700 (62275)	26400 (58205)	73300 (161605)	59400 (130960)	187600 (413595)
WP-M 3,0 x 8	200 (7.87)	19000 (168165)	2660000 (23543100)	3325000 (29428875)	750 (1655)	2375 (5240)	1870 (4125)	16800 (37040)	13100 (28880)	105000 (231490)	-	-
WE-M 3,0 x 10	250 (9.84)	24000 (212420)	2880000 (25490400)	3600000 (31863000)	1580 (3485)	300000 (661400)	-	-	-	-	-	-
WS-M 3,0 x 10	250 (9.84)	24000 (212420)	2880000 (25490400)	3600000 (31863000)	4680 (10320)	14800 (32630)	12000 (26455)	36200 (79810)	33300 (73415)	92600 (204150)	75000 (165350)	237300 (523165)
WP-M 3,0 x 10	250 (9.84)	24000 (212420)	2880000 (25490400)	3600000 (31863000)	950 (2095)	3000 (6615)	2370 (5225)	21300 (46960)	16600 (36600)	133300 (293885)	-	-

Mega-Line 4,0

***A:** PU / **AS:** Steel
Add "A / AS" after the part no.

Weight
4,0 x 2: 10 kg (22 lbs) / 4,0 x 4: 12 kg (26.5 lbs) /
4,0 x 6: 15 kg (33.1 lbs) / 4,0 x 8: 18 kg (39.68) /
4,0 x 10: 23 kg (50.71)

Impact Speed
WE-M : 0,02 - 6,0 m/s (0.07 - 19.7 ft/s)
WS-M : 0,10 - 6,0 m/s (0.33 - 19.7 ft/s)
WP-M : 0,40 - 8,0 m/s (1.32 - 26.3 ft/s)

Return spring force
4,0 x 2 : 120 N/min - 200 N/max (26.98 lbs/min - 44.97 lbs/max)
4,0 x 4 : 120 N/min - 250 N/max (26.98 lbs/min - 56.2 lbs/max)
4,0 x 6 : 170 N/min - 250 N/max (38.22 lbs/min - 56.2 lbs/max)
4,0 x 8 : 170 N/min - 250 N/max (38.22 lbs/min - 56.2 lbs/max)
4,0 x 10 : 170 N/min - 280 N/max (38.22 lbs/min - 69.95 lbs/max)

DIMENSIONS

	GW	A	B	C
		mm (inch)		
WE-M 4,0 x 2	M 115 x 2	319 (12.56)	225 (8.86)	205 (8.07)
WS-M 4,0 x 2	M 115 x 2	319 (12.56)	225 (8.86)	205 (8.07)
WP-M 4,0 x 2	M 115 x 2	319 (12.56)	225 (8.86)	205 (8.07)
WE-M 4,0 x 4	M 115 x 2	419 (16,5)	275 (10.83)	255 (10.04)
WS-M 4,0 x 4	M 115 x 2	419 (16,5)	275 (10.83)	255 (10.04)
WP-M 4,0 x 4	M 115 x 2	419 (16,5)	275 (10.83)	255 (10.04)
WE-M 4,0 x 6	M 115 x 2	569 (22,4)	325 (12,8)	305 (12.01)
WS-M 4,0 x 6	M 115 x 2	569 (22,4)	325 (12,8)	305 (12.01)
WP-M 4,0 x 6	M 115 x 2	569 (22,4)	325 (12,8)	305 (12.01)

	GW	A	B	C
		mm (inch)		
WE-M 4,0 x 8	M 115 x 2	669 (26.34)	375 (14.76)	355 (13.98)
WS-M 4,0 x 8	M 115 x 2	669 (26.34)	375 (14.76)	355 (13.98)
WP-M 4,0 x 8	M 115 x 2	669 (26.34)	375 (14.76)	355 (13.98)
WE-M 4,0 x 10	M 115 x 2	769 (30.28)	425 (16.73)	405 (15.94)
WS-M 4,0 x 10	M 115 x 2	769 (30.28)	425 (16.73)	405 (15.94)
WP-M 4,0 x 10	M 115 x 2	769 (30.28)	425 (16.73)	405 (15.94)

PERFORMANCE

	Stroke	Energy absorption			Effective mass							
		Constant load		External tank	-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)	
	mm (inch)	Nm/HB (max.) (in lbs/HB)	Nm/h (max.) (in lbs/h)	Nm/h (in lbs/h)	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 4,0 x 2	50 (1.97)	4000 (35405)	1200000 (10621500)	1500000 (13276875)	280 (620)	89000 (196215)	-	-	-	-	-	-
WS-M 4,0 x 2	50 (1.97)	4000 (35405)	1200000 (10621500)	1500000 (13276875)	695 (1535)	2480 (5470)	2000 (4410)	6050 (13340)	5550 (12125)	15400 (33955)	12500 (27560)	40000 (88190)
WP-M 4,0 x 2	50 (1.97)	4000 (35405)	1200000 (10621500)	1500000 (13276875)	165 (365)	500 (1105)	400 (885)	3550 (7830)	2800 (6175)	22000 (48505)	-	-
WE-M 4,0 x 4	100 (3.94)	9000 (79660)	1800000 (15932000)	2250000 (19915000)	600 (1325)	112500 (248025)	-	-	-	-	-	-
WS-M 4,0 x 4	100 (3.94)	9000 (79660)	1800000 (15932000)	2250000 (19915000)	1750 (3860)	550 (1215)	4500 (9920)	13600 (29985)	12500 (27560)	34700 (76505)	28800 (63495)	88000 (194010)
WP-M 4,0 x 4	100 (3.94)	9000 (79660)	1800000 (15932000)	2250000 (19915000)	360 (795)	1125 (2480)	890 (1965)	8000 (17640)	6300 (13890)	50000 (110235)	-	-
WE-M 4,0 x 6	150 (5.91)	14000 (123915)	2100000 (18587250)	2625000 (23172105)	925 (2040)	175000 (385815)	-	-	-	-	-	-
WS-M 4,0 x 6	150 (5.91)	14000 (123915)	2100000 (18587250)	2625000 (23172105)	3710 (8180)	11700 (25794)	7000 (15435)	21200 (46740)	19500 (42990)	54000 (119055)	44500 (98110)	138200 (304685)
WP-M 4,0 x 6	150 (5.91)	14000 (123915)	2100000 (18587250)	2625000 (23172105)	555 (1225)	1750 (3860)	1380 (3045)	12400 (27340)	9700 (21385)	7700 (16975)	-	-
WE-M 4,0 x 8	200 (7.87)	19000 (168165)	2660000 (23543100)	3325000 (29428875)	1250 (2755)	237500 (523610)	-	-	-	-	-	-
WS-M 4,0 x 8	200 (7.87)	19000 (168165)	2660000 (23543100)	3325000 (29428875)	2750 (6065)	8640 (19050)	7500 (16535)	28700 (62275)	26400 (58205)	73300 (161605)	59400 (130960)	187600 (413595)
WP-M 4,0 x 8	200 (7.87)	19000 (168165)	2660000 (23543100)	3325000 (29428875)	750 (1655)	2375 (5240)	1870 (4125)	16800 (37040)	13100 (28880)	105000 (231490)	-	-
WE-M 4,0 x 10	250 (9.84)	24000 (212420)	2880000 (25490400)	3600000 (31863000)	1580 (3485)	300000 (661400)	-	-	-	-	-	-
WS-M 4,0 x 10	250 (9.84)	24000 (212420)	2880000 (25490400)	3600000 (31863000)	4680 (10320)	14800 (32630)	12000 (26455)	36200 (79810)	33300 (73415)	92600 (204150)	75000 (165350)	237300 (523165)
WP-M 4,0 x 10	250 (9.84)	24000 (212420)	2880000 (25490400)	3600000 (31863000)	950 (2095)	3000 (6615)	2370 (5225)	21300 (46960)	16600 (36600)	133300 (293885)	-	-

LOCK NUT

Thread		ø A	B
		mm (inch)	
M 85 x 2	3,0x2 - 3,0x4	99 (3.90)	10 (0.39)
M 85 x 2	3,0x2A - 3,0x4A	99 (3.90)	10 (0.39)
M 85 x 2	3,0x6 - 3,0x10	99 (3.90)	10 (0.39)
M 85 x 2	3,0x6A - 3,0x10A	99 (3.90)	10 (0.39)
M115x2	4,0x2 - 4,0x4	127 (5.00)	15 (0.59)
M115x2	4,0x2A - 4,0x4A	127 (5.00)	15 (0.59)
M115x2	4,0x6 - 4,0x10	127 (5.00)	15 (0.59)
M115x2	4,0x6A - 4,0x10A	127 (5.00)	15 (0.59)

SQUARE FLANGE

Thread		C	D	øF	E
		mm (inch)			
M 85 x 2	3,0x2 - 3,0x4	140 (5.51)	111 (4.37)	17 (0.67)	20 (0.79)
M 85 x 2	3,0x2A - 3,0x4A	140 (5.51)	111 (4.37)	17 (0.67)	20 (0.79)
M 85 x 2	3,0x6 - 3,0x10	140 (5.51)	111 (4.37)	17 (0.67)	20 (0.79)
M 85 x 2	3,0x6A - 3,0x10A	140 (5.51)	111 (4.37)	17 (0.67)	20 (0.79)
M115x2	4,0x2 - 4,0x4	140 (5.51)	111 (4.37)	17 (0.67)	25 (0.98)
M115x2	4,0x2A - 4,0x4A	140 (5.51)	111 (4.37)	17 (0.67)	25 (0.98)
M115x2	4,0x6 - 4,0x10	140 (5.51)	111 (4.37)	17 (0.67)	25 (0.98)
M115x2	4,0x6A - 4,0x10A	140 (5.51)	111 (4.37)	17 (0.67)	25 (0.98)

STOP LIMIT NUT

Thread		G	øH	øI	J
		mm (inch)			
M 85 x 2	3,0x2 - 3,0x4	85 (3.35)	100 (3.94)	83 (3.27)	63 (2.48)
M 85 x 2	3,0x2A - 3,0x4A	110 (4.33)	100 (3.94)	83 (3.27)	88 (3.46)
M 85 x 2	3,0x6 - 3,0x10	135 (5.31)	100 (3.94)	83 (3.27)	113 (4.45)
M 85 x 2	3,0x6A - 3,0x10A	160 (6.30)	100 (3.94)	83 (3.27)	138 (5.43)
M115x2	4,0x2 - 4,0x4	106 (4.17)	130 (5.12)	110 (4.33)	66 (2.60)
M115x2	4,0x2A - 4,0x4A	131 (5.16)	130 (5.12)	110 (4.33)	91 (3.58)
M115x2	4,0x6 - 4,0x10	156 (6.14)	130 (5.12)	110 (4.33)	116 (4.57)
M115x2	4,0x6A - 4,0x10A	181 (7.13)	130 (5.12)	110 (4.33)	141 (5.55)

FOOT MOUNTING

	Thread (GW)	A	B max	C	D	E	F	G	H
		mm (inch)							
3,0 x 2	M85 x 2	319 (12.56)	186 (7.32)	10 (0.39)	20 (0.79)	157 (6.18)	105 (4.13)	M12	134 (5.28)
3,0 x 4	M85 x 2	419 (16.50)	286 (11.26)	10 (0.39)	20 (0.79)	157 (6.18)	105 (4.13)	M12	134 (5.28)
3,0 x 6	M85 x 2	569 (22.40)	286 (11.26)	10 (0.39)	20 (0.79)	157 (6.18)	105 (4.13)	M12	134 (5.28)
3,0 x 8	M85 x 2	669 (26.34)	336 (13.23)	10 (0.39)	20 (0.79)	157 (6.18)	105 (4.13)	M12	134 (5.28)
3,0 x 10	M85 x 2	769 (30.28)	386 (13.23)	10 (0.39)	20 (0.79)	157 (6.18)	105 (4.13)	M12	134 (5.28)
4,0 x 2	M 115 x 2	319 (12.56)	180 (7.09)	12,5 (0.49)	25 (0.98)	203 (7.99)	149 (5.87)	M16x80	165 (6.50)
4,0 x 4	M 115 x 2	419 (16.50)	230 (9.06)	12,5 (0.49)	25 (0.98)	203 (7.99)	149 (5.87)	M16x80	165 (6.50)
4,0 x 6	M 115 x 2	569 (22.40)	280 (11.02)	12,5 (0.49)	25 (0.98)	203 (7.99)	149 (5.87)	M16x80	165 (6.50)
4,0 x 8	M 115 x 2	669 (26.34)	330 (12.99)	12,5 (0.49)	25 (0.98)	203 (7.99)	149 (5.87)	M16x80	165 (6.50)
4,0 x 10	M 115 x 2	769 (30.28)	380 (14.96)	12,5 (0.49)	25 (0.98)	203 (7.99)	149 (5.87)	M16x80	165 (6.50)

CLEVIS MOUNTING

Code: S27016

Pull: End stop required 1 mm before the stroke ends

Standard: Shock absorber with clevis mounting is delivered without return spring. Return spring is available on request.

	GW*	A max	B	B1	ø C	D	E	ø F	D1	ø E1
		mm	mm	mm	mm	mm	mm	mm	mm	mm
3,0 x 2	M85 x 2	411 (16.18)	26 (1.02)	44 (1.73)	25,4 (1)	70 (2.76)	70 (2.76)	98 (3.86)	38 (1.5)	58 (2.28)
3,0 x 4	M85 x 2	511 (20.12)	26 (1.02)	44 (1.73)	25,4 (1)	70 (2.76)	70 (2.76)	98 (3.86)	38 (1.5)	58 (2.28)
3,0 x 6	M85 x 2	661 (26.02)	26 (1.02)	44 (1.73)	25,4 (1)	70 (2.76)	70 (2.76)	98 (3.86)	38 (1.5)	58 (2.28)
3,0 x 8	M85 x 2	761 (29.96)	26 (1.02)	44 (1.73)	25,4 (1)	70 (2.76)	70 (2.76)	98 (3.86)	38 (1.5)	58 (2.28)
3,0 x 10	M85 x 2	861 (33.9)	26 (1.02)	44 (1.73)	25,4 (1)	70 (2.76)	70 (2.76)	98 (3.86)	38 (1.5)	58 (2.28)
4,0 x 2	M115 x 2	428 (16.85)	44 (1.73)	55 (2.17)	25,4 (1)	89 (3.5)	51 (2.01)	127 (5)	38 (1.5)	57 (2.24)
4,0 x 4	M115 x 2	528 (20.79)	44 (1.73)	55 (2.17)	25,4 (1)	89 (3.5)	51 (2.01)	127 (5)	38 (1.5)	57 (2.24)
4,0 x 6	M115 x 2	680 (26.77)	44 (1.73)	55 (2.17)	25,4 (1)	89 (3.5)	51 (2.01)	127 (5)	38 (1.5)	57 (2.24)
4,0 x 8	M115 x 2	770 (30.31)	44 (1.73)	55 (2.17)	25,4 (1)	89 (3.5)	51 (2.01)	127 (5)	38 (1.5)	57 (2.24)
4,0 x 10	M115 x 2	880 (34.65)	44 (1.73)	55 (2.17)	25,4 (1)	89 (3.5)	51 (2.01)	127 (5)	38 (1.5)	57 (2.24)

PROTECTION BELLOW

	ø E mm (inch)
1,25 x 1	65 (2.56)
1,25 x 2	65 (2.56)
1,5 x 1	60 (2.36)
1,5 x 2	80 (3.15)
1,5 x 3	80 (3.15)

	ø E mm (inch)
2,0 x 1	90 (3.54)
2,0 x 2	90 (3.54)
2,0 x 4	90 (3.54)
2,0 x 6	90 (3.54)

EXTERNAL TANK

AT 1

WS-M 1,25 - WS-M 1,5
WE-M 1,25 - WE-M 1,5
WP-M 1,25

Code: 23810

AT 2

WS-M 2,0
WE-M 2,0

Code: 23820

WE-M 1,25 x 2 - 1AT
For shock absorbers without return spring

WE-M 1,25 x 2 - 1 ATF
For shock absorbers with return spring

WM-AT 1
For external tank

Optimum cooling and therefore
higher energy absorption per hour

Mega-Line 5,0 - 10,0

High energy absorption up to 11520 kNm/h

Deceleration	WS-M: self-compensating WE-M: adjustable
Extended Life Time	Piston rod: hardened / hard chrome-plated Housing: zinc plated
Temperature range	-20°C - +80°C -4°F - +176°F
Optional	Lower or higher impact speed Lower or higher temperatures

End stop required 2 – 3 mm before the stroke ends

Stop cap PU (Add "A" after the part no.)

DIMENSIONS

	A	B	D	øE	øF	øG	H	J	øK	L	M	H1	O	øP	Q	R	Weight
	mm (inch)																kg (lbs)
WS-M 5,0-050	313 (12.32)	214 (8.43)	244 (9.61)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	13 (28.66)
WS-M 5,0-100	414 (16.30)	262 (10.31)	292 (11.50)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	15 (33.07)
WS-M 5,0-150	516 (20.31)	317 (12.48)	347 (13.66)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	17 (37.48)
WS-M 5,0-200	648 (25.51)	361 (14.21)	391 (15.39)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	19,5 (43.00)
WS-M 5,0-250	750 (29.53)	413 (16.26)	443 (17.44)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	23 (50.70)

PERFORMANCE

	Stroke	Energy absorption		Effective mass								Impact Speed	Return spring force
				-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)			
	mm (inch)	Nm / HB (max. lbs)	Nm/h (max. lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	m/s min. - max. (ft/s min. - max.)	N min. - max. (lbs min. max.)
WS-M 5,0-050	50 (1.97)	4000 (35400)	1200000 (10620000)	690 (1520)	2470 (5445)	2000 (4410)	5555 (12250)	4730 (10430)	14220 (31350)	12500 (27560)	39500 (87085)	0,3 - 3,4 (0.98 - 11.15)	100 - 400 (22 - 90)
WS-M 5,0-100	100 (3.94)	8000 (70810)	1520000 (13453900)	1380 (3050)	4930 (10870)	4000 (8820)	11110 (24495)	9460 (20860)	28440 (62700)	25000 (55120)	79000 (174170)	0,3 - 3,4 (0.98 - 11.15)	100 - 400 (22 - 90)
WS-M 5,0-150	150 (5.91)	11000 (973360)	1650000 (10104000)	1900 (4190)	6790 (14970)	5500 (12125)	15280 (33690)	13000 (28660)	39110 (86225)	34375 (75785)	108640 (239515)	0,3 - 3,4 (0.98 - 11.15)	100 - 400 (22 - 90)
WS-M 5,0-200	200 (7.87)	15000 (132770)	1950000 (17260100)	2595 (5725)	9260 (20415)	7500 (16540)	20830 (45925)	17750 (39135)	53330 (117575)	46875 (103345)	148150 (326620)	0,3 - 3,4 (0.98 - 11.15)	100 - 400 (22 - 90)
WS-M 5,0-250	250 (9.84)	19000 (168165)	2280000 (20179800)	3290 (7260)	11730 (25860)	9500 (20950)	26390 (58180)	22485 (49570)	67555 (148935)	59375 (130900)	187650 (413705)	0,3 - 3,4 (0.98 - 11.15)	100 - 400 (22 - 90)

Mega-Line WS-M 7,5 / 10,0

End stop required 2 – 3 mm before the stroke ends

Stop cap PU (7,5)

Stop cap PU (10,0)

Add "A" after the part no.

DIMENSIONS

	A	B	D	øE	øF	øG	H	J	øK	L	M	H1	O	øP	Q	R	Weight
	mm (inch)																kg (lbs)
WS-M 7.5-125	490 (19.29)	301 (11.85)	333 (13.11)	130 (5.12)	45 (1.77)	80 (3.15)	170 (6.69)	125 (4.92)	22 (0.87)	20 (0.79)	255 (10.04)	160 (6.3)	40 (1.57)	22 (0.87)	216 (8.5)	24 (0.94)	29 (63.93)
WS-M 7.5-200	641 (25.24)	376 (14.8)	408 (16.06)	130 (5.12)	45 (1.77)	80 (3.15)	170 (6.69)	125 (4.92)	22 (0.87)	20 (0.79)	255 (10.04)	160 (6.3)	40 (1.57)	22 (0.87)	216 (8.5)	24 (0.94)	33.5 (73.85)
WS-M 7.5-300	895 (35.24)	471 (18.54)	503 (19.8)	130 (5.12)	45 (1.77)	80 (3.15)	170 (6.69)	125 (4.92)	22 (0.87)	20 (0.79)	255 (10.04)	160 (6.3)	40 (1.57)	22 (0.87)	216 (8.5)	24 (0.94)	41 (90.39)
WS-M 10,0-150	716 (28.19)	434 (17.09)	484 (19.06)	200 (7.87)	65 (2.56)	112 (4.41)	250 (9.84)	197 (7.76)	22 (0.87)	40 (1.57)	360 (14.17)	254 (10)	50 (1.97)	27 (1.06)	317 (12.48)	25 (0.98)	60 (132.2)
WS-M 10,0-200	818 (32.2)	536 (21.1)	586 (23.07)	200 (7.87)	65 (2.56)	112 (4.41)	250 (9.84)	197 (7.76)	22 (0.87)	40 (1.57)	360 (14.17)	254 (10)	50 (1.97)	27 (1.06)	317 (12.48)	25 (0.98)	68 (149.9)
WS-M 10,0-400	1300 (51.18)	733 (28.86)	783 (30.83)	200 (7.87)	65 (2.56)	112 (4.41)	250 (9.84)	197 (7.76)	22 (0.87)	40 (1.57)	360 (14.17)	254 (10)	50 (1.97)	27 (1.06)	317 (12.48)	25 (0.98)	146 (321.9)

PERFORMANCE

	Stroke	Energy absorption		Effective mass								Impact Speed	Return spring force
				-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)			
	mm (inch)	Nm / HB (max. lbs)	Nm/h (max. lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	m/s min. - max. (ft/s min. - max.)	N min. - max. (lbs min. max.)
WS-M 7,5-125	125 (4,92)	16000 (141620)	2560000 (22659200)	2770 (6110)	9870 (21760)	8000 (17640)	22200 (48500)	18935 (41745)	56880 (125400)	50000 (110235)	158025 (348400)	0,3 - 3,4 (0.98 - 11.15)	200 - 450 (45 - 102)
WS-M 7,5-200	200 (7,87)	25000 (221270)	4000000 (35403200)	4325 (9535)	15430 (34020)	12500 (27560)	34720 (76545)	29585 (65225)	88880 (195950)	78125 (172240)	246910 (544350)	0,3 - 3,4 (0.98 - 11.15)	200 - 450 (45 - 102)
WS-M 7,5-300	300 (11,81)	37000 (327480)	5920000 (52396800)	6400 (14110)	22840 (50360)	18500 (40790)	51390 (113300)	43790 (96545)	131555 (290040)	115625 (254920)	365430 (805650)	0,3 - 3,4 (0.98 - 11.15)	200 - 450 (45 - 102)
WS-M 10,0-150	150 (5,91)	50000 (442540)	3150000 (27880020)	3500 (7720)	9180 (20240)	8650 (19070)	18900 (41670)	17360 (38275)	44440 (97975)	-	-	0,3 - 5,0 (0.98 - 16.4)	350 - 900 (80 - 200)
WS-M 10,0-200	200 (7,87)	65000 (575300)	3575000 (31641500)	4630 (10210)	11930 (26300)	11250 (24800)	24570 (54170)	22570 (49760)	57700 (127210)	-	-	0,3 - 5,0 (0.98 - 16.4)	350 - 900 (80 - 200)
WS-M 10,0-400	400 (15,74)	128000 (1139200)	11520000 (102528000)	9115 (20095)	23500 (51810)	22145 (48825)	48395 (106700)	44440 (97975)	113770 (250825)	-	-	0,3 - 5,0 (0.98 - 16.4)	350 - 900 (80 - 200)

(Add "A" after the part no.)

DIMENSIONS

	A	B	D	øE	øF	øG	H	J	øK	L	M	H1	O	øP	Q	R	Weight
	mm (inch)																kg (lbs)
WE-M 5,0-050	313 (12.32)	214 (8.43)	244 (9.61)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	14 (30.86)
WE-M 5,0-100	414 (16.3)	262 (10.31)	292 (11.5)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	16 (35.27)
WE-M 5,0-150	516 (20.31)	317 (12.48)	347 (13.66)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	18 (39.68)
WE-M 5,0-200	648 (25.51)	361 (14.21)	391 (15.39)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	20 (44.09)
WE-M 5,0-250	750 (29.53)	413 (16.26)	443 (17.44)	110 (4.33)	40 (1.57)	70 (2.76)	140 (5.51)	111 (4.37)	18 (0.71)	20 (0.79)	220 (8.66)	140 (5.51)	30 (1.18)	18 (0.71)	178 (7.01)	15 (0.59)	24 (52.91)
WE-M 7,5-125	490 (19.29)	301 (11.85)	333 (13.11)	130 (5.12)	45 (1.77)	80 (3.15)	170 (6.69)	125 (4.92)	22 (0.87)	20 (0.79)	255 (10.04)	160 (6.3)	40 (1.57)	22 (0.87)	216 (8.5)	24 (0.94)	29 (63.93)
WE-M 7,5-200	641 (25.24)	376 (14.8)	408 (16.06)	130 (5.12)	45 (1.77)	80 (3.15)	170 (6.69)	125 (4.92)	22 (0.87)	20 (0.79)	255 (10.04)	160 (6.3)	40 (1.57)	22 (0.87)	216 (8.5)	24 (0.94)	33,5 (73.85)
WE-M 7,5-300	895 (35.24)	471 (18.54)	503 (19.8)	130 (5.12)	45 (1.77)	80 (3.15)	170 (6.69)	125 (4.92)	22 (0.87)	20 (0.79)	255 (10.04)	160 (6.3)	40 (1.57)	22 (0.87)	216 (8.5)	24 (0.94)	41 (90.39)

PERFORMANCE

	Stroke	Energy absorption		Effective mass				Return spring force
				-0		-1		
	mm (inch)	Nm / HB (max. lbs)	Nm/h (max. lbs)	min. kg (lbs)	max. kg (lbs)	min. kg (lbs)	max. kg (lbs)	N min. - max. (lbs min. - max.)
WE-M 5,0-050	50 (1.97)	4000 (35400)	1200000 (10620000)	-	-	260 (575)	65000 (143300)	100 - 400 (22 - 90)
WE-M 5,0-100	100 (3.94)	9000 (79660)	1350000 (11949000)	-	-	280 (620)	72000 (158735)	100 - 400 (22 - 90)
WE-M 5,0-150	150 (5.91)	14000 (123910)	1680000 (14869200)	-	-	430 (950)	78000 (171963)	100 - 400 (22 - 90)
WE-M 5,0-200	200 (7.87)	20000 (177020)	2000000 (17702000)	-	-	625 (1380)	111000 (244720)	100 - 400 (22 - 90)
WE-M 5,0-250	250 (9.84)	24000 (212420)	1920000 (16993600)	-	-	750 (1650)	133300 (293885)	100 - 400 (22 - 90)
WE-M 7,5-125	125 (4.92)	16000 (141610)	2320000 (20533450)	500 (1100)	1580 (3485)	1280 (2820)	158000 (348340)	200 - 450 (45 - 102)
WE-M 7,5-200	200 (7.87)	28000 (247825)	3640000 (32217250)	875 (1930)	2765 (6100)	2240 (4940)	224000 (493845)	200 - 450 (45 - 102)
WE-M 7,5-300	300 (11.81)	44000 (389435)	5280000 (46732200)	1375 (3030)	4345 (9580)	3520 (7760)	244000 (537940)	200 - 450 (45 - 102)

Stainless Steel Shock Absorbers

Stainless steel V4A / DIN 1.4404 / AISL 316L

Corrosion resistance in wet environments

Applications

Food industry, Outside machinery
Medical, Shipping, Electrical engineering

Ordering Information

Standard	Stainless Steel
WE-M 0,25	WE-M 0,25 **-VA**

Thread	Series	Page
M 4x0,35	WS-M 4x4-X	14 - 17
M 5x0,5	WS-M 5x4-X	14 - 17
M 6x0,5	WS-M 6x5-X	14 - 17
M 8x1 3/8-32 UNEF (U)	WS-M 8x5-X	14 - 17
	WS-M 0,1-X	14 - 17
	WP-M 0,1-X	14 - 17
M 10x1 3/8-32 UNEF (U) 7/16-28 UNEF (UF)	WS-M 10x6-X	14 - 17
	WS-M 10x8-X	14 - 17
	WE-M 0,15	14 - 17
	WS-M 0,15-X	14 - 17
	WP-M 0,15-X	14 - 17
	WEB-M 0,15	43
	WSB-M 0,15-X	43
	WPB-M 0,15-X	43
M 12x1 7/16-28 UNEF (UF) 1/2-20 UNF (UH)	WS-M 12x10-X	14 - 17
	WE-M 0,2	14 - 17
	WS-M 0,2-X	14 - 17
	WP-M 0,2-X	14 - 17
	WEB-M 0,2	43
	WSB-M 0,2-X	43
	WPB-M 0,2-X	43

Thread	Series	Page
M 14x1 M 14x1,5 (L) 1/2-20 UNF (UF) 9/16-18 UNEF (UC)	WE-M 0,25	18 - 23
	WS-M 0,25-X	18 - 23
	WP-M 0,25-X	18 - 23
	WEB-M 0,25	43
	WSB-M 0,25-X	43
	WPB-M 0,25-X	43
M 16x1 M 16x1,5 (L)	WE-M 0,35	18 - 23
	WS-M 0,35-X	18 - 23
	WP-M 0,35-X	18 - 23
M 20x1 M 20x1,5 (L) 3/4-16 UNF (U)	WE-M 0,5x19	18 - 23
	WS-M 0,5x19-X	18 - 23
	WP-M 0,5x19-X	18 - 23
	WS-M 0,5x13-X	18 - 23
	WP-M 0,5x13-X	18 - 23
	WE-M 0,5x40	18 - 23
	WS-M 0,5x40-X	18 - 23
	WP-M 0,5x40-X	18 - 23
	WEB-M 0,5x19	43
	WSB-M 0,5x19-X	43
	WPB-M 0,5x19-X	43
M 20x1,5	WSK-M 0,5-X	42

Thread	Series	Page
M 24x1,5 M 25x1,5 (T) M 27x3 (R) 1-12 UNF (U)	WE-M 1,0	18 - 23
	WS/P-M 1,0-X	18 - 23
	WE-M 1,0x40	18 - 23
	WS/P-M 1,0x40-X	18 - 23
	WEB-M 1,0	43
	WSB-M 1,0-X	43
	WPB-M 1,0-X	43
M 25x1,5	WSK-M 1,0-X	42
M 30x1,5	WSK-M 1,1-X	42
M 32x1,5 M 33x1,5 (H) M 36x1,5 (L) 1 1/4-12 UNF (U) 1 3/8-12 UNF (UF)	WS/P-M 1,25x1-X	24 - 29
	WS/P-M 1,25x2-X	24 - 29
M 32x1,5	WSK-M 1,25-X	42
M 45x2 M 42x1,5 (K) M 45x1,5 (L) 1 3/4-12 UN (U)	WS/P-M 1,5x1-X	24 - 29
	WS/P-M 1,5x2-X	24 - 29
	WS/P-M 1,5x3-X	24 - 29
M 62x2 M 64x2 (L) 2 1/2-12 UNF (U)	WS/P-M 2,0x1-X	24 - 29
	WS/P-M 2,0x2-X	24 - 29
	WS/P-M 2,0x4-X	24 - 29
	WS/P-M 2,0x6-X	24 - 29

Other models on request

WRE-M / WRS-M / WRP-M

Shock absorbers for cleanroom Kl.5 (ISO) / Kl. 100 (US) / Kl. 3 (VDI)

Ready for immediate use / Special packaging

Applications

Semiconductor industry, Food industry
Pharmaceutical industry

Ordering Information

Standard	Cleanroom
WE-M 0,25	WRE-M 0,25

Thread	Series	Page
M 4x0,35	WS-M 4x4-X	14 - 17
M 5x0,5	WS-M 5x4-X	14 - 17
M 6x0,5	WS-M 6x5-X	14 - 17
M 8x1	WS-M 8x5-X	14 - 17
	WS-M 0,1-X	14 - 17
	WP-M 0,1-X	14 - 17
M 10x1	WS-M 10x6-X	14 - 17
	WS-M 10x8-X	14 - 17
	WE-M 0,15	14 - 17
	WS-M 0,15-X	14 - 17
	WP-M 0,15-X	14 - 17
	WEB-M 0,15	43
	WSB-M 0,15-X	43
	WPB-M 0,15-X	43
M 12x1	WS-M 12x10-X	14 - 17
	WE-M 0,2	14 - 17
	WS-M 0,2-X	14 - 17
	WP-M 0,2-X	14 - 17
	WEB-M 0,2	43
	WSB-M 0,2-X	43
	WPB-M 0,2-X	43

Thread	Series	Page
M 14x1 M 14x1,5 (L)	WE-M 0,25	18 - 23
	WS-M 0,25-X	18 - 23
	WP-M 0,25-X	18 - 23
	WEB-M 0,25	43
	WSB-M 0,25-X	43
	WPB-M 0,25-X	43
M 16x1 M 16x1,5 (L)	WE-M 0,35	18 - 23
	WS-M 0,35-X	18 - 23
	WP-M 0,35-X	18 - 23
M 20x1 M 20x1,5 (L)	WE-M 0,5x19	18 - 23
	WS-M 0,5x19-X	18 - 23
	WP-M 0,5x19-X	18 - 23
	WS-M 0,5x13-X	18 - 23
	WP-M 0,5x13-X	18 - 23
	WE-M 0,5x40	18 - 23
	WS-M 0,5x40-X	18 - 23
	WP-M 0,5x40-X	18 - 23
	WEB-M 0,5x19	43
	WSB-M 0,5x19-X	43
	WPB-M 0,5x19-X	43

Thread	Series	Page
M 20x1,5	WSK-M 0,5-X	42
M 24x1,5 M 25x1,5 (T) M 27x3 (R)	WE-M 1,0	18 - 23
	WS-M 1,0-X	18 - 23
	WP-M 1,0-X	18 - 23
	WE-M 1,0x40	18 - 23
	WS-M 1,0x40-X	18 - 23
	WP-M 1,0x40-X	18 - 23
	WEB-M 1,0	43
	WSB-M 1,0-X	43
	WPB-M 1,0-X	43

WSK-M, WEK-M

Compact construction for limited installation space
High energy absorption up to 135.000 Nm/h

ProSurf	Long-life surface protection (p. 9)
Extended Life Time	Special Seals + Oils
	Piston rod: hardened stainless steel
Deceleration	WSK-M: self-compensating
	WEK-M: adjustable
Integrated End Stop	
RoHS compliant	Directive 2002/95/EG
Special models	Stainless steel
	Pressure chambers up to 7 bar
	USDA-H1-compliant for food industry

DIMENSIONS

	Thread	A	B	ø D	ø H	J	L	SW	SW1	SW2	M	K
		mm (inch)										
WSK-M 0,5	M 20 x 1,5	49 (1.93)	42 (1.65)	6 (0.24)	25 (0.98)	16 (0.63)	6 (0.24)	18 (0.71)	24 (0.94)	22 (0.87)	8 (0.31)	-
WSK-M 1,0	M 25 x 1,5	58 (2.28)	50 (1.97)	8 (0.31)	34 (1.34)	18 (0.71)	8 (0.31)	23 (0.91)	30 (1.18)	30 (1.18)	10 (0.39)	-
WEK-M 1,0G	M 27 x 1,5	72,5 (2.85)	56,2 (2.21)	6 (0.24)	40 (1.57)	20 (0.79)	8 (0.31)	-	30 (1.18)	36 (1.42)	10 (0.40)	2,6 (0.10)
WSK-M 1,1	M 30 x 1,5	67 (2.64)	55 (2.17)	10 (0.39)	40 (1.57)	20 (0.79)	8 (0.31)	28 (1.1)	36 (1.42)	36 (1.42)	10 (0.39)	-
WSK-M 1,25	M 32 x 1,5	67 (2.64)	55 (2.17)	10 (0.39)	40 (1.57)	25 (0.98)	8 (0.31)	30 (1.18)	41 (1.61)	36 (1.42)	10 (0.39)	-

PERFORMANCE

	Stroke	Energy absorption		Effective mass						Impact speed	Return spring force		Weight
				-1 (soft)		-2 (medium)		-3 (hard)					
	mm (inch)	Nm/HB (max.) (in lbs/HB (max.))	Nm/h (max.) (in lbs (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)	V max. m/s (V max. ft/s)	min. N (min. lbs)	max. N (max. lbs)	g (lbs)
WSK-M 0,5	7 (0.28)	25 (220)	67500 (597130)	5 (11)	22 (48.5)	20 (44.1)	180 (396.8)	150 (330.7)	480 (1058.2)	3,5 (11.5)	11 (2.5)	18 (4.1)	65 (0.15)
WSK-M 1,0	8 (0.31)	40 (355)	68000 (601860)	8 (17.6)	36 (79.4)	33 (72.8)	280 (617.3)	250 (551.2)	750 (1653.5)	3,5 (11.5)	15 (3.4)	20 (4.5)	105 (0.23)
WEK-M 1,0G	12 (0.47)	65 (575)	65.000 (575298)	10 (22)	3250 (7165)	-		-		3,5 (11.5)	12 (2.70)	23 (5.17)	160 (0.35)
WSK-M 1,1	12 (0.47)	70 (620)	105000 (929335)	10 (22)	80 (176.4)	50 (110.2)	490 (1080.3)	460 (1014.1)	1500 (3307)	3,5 (11.5)	17 (3.8)	30 (6.8)	200 (0.44)
WSK-M 1,25	12 (0.47)	90 (800)	135000 (1194860)	15 (33)	120 (264.5)	85 (187.4)	690 (1521.2)	600 (1322.8)	1870 (4122.7)	3,5 (11.5)	17 (3.8)	30 (6.8)	270 (0.6)

WSB, WPB, WEB

Designed for side forces up to 15° without additional mounting parts

ProSurf	Long-life surface protection (p. 9)
Extended Life Time	Piston rod: hardened, stainless steel Special Seals + Oils
Integrated End Stop	
Temperature	-20°C - +80°C / option: -50°C - +120°C Option: (-4°F- +176°F / option: -58°F - +248°F)
RoHS compliant	Directive 2002/95/EC
Special models	Stainless steel, Pressure chambers up to 7 bar USDA-H1-compliant for food industry
Included	1 Stop cap (steel), 1 Lock nut

DIMENSIONS

			Thread	A	A 1	B	C	D	E	L	SW	SW1
				mm (inch)								
WSB-M 0,15	WPB-M 0,15	WEB-M 0,15	M10x1	66 (2.6)	68,5 (2.7)	49,5 (1.95)	2,5 (0.1)	3 (0.12)	8,5 (0.33)	3 (0.12)	-	13 (0.51)
WSB-M 0,2	WPB-M 0,2	WEB-M 0,2	M12x1	85 (3.35)	89,5 (3.52)	66 (2.6)	2,5 (0.1)	4 (0.16)	10 (0.39)	4 (0.16)	-	14 (0.55)
WSB-M 0,25	WPB-M 0,25	WEB-M 0,25	M14x1	100 (3.94)	105 (4.13)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	5 (0.2)	13 (0.51)	17 (0.67)
WSB-M 0,5x19	WPB-M 0,5x19	WEB-M 0,5x19	M20x1	117 (4.61)	123 (4.84)	88 (3.46)	2,5 (0.1)	6 (0.24)	16 (0.63)	6 (0.24)	18 (0.71)	24 (0.94)
WSB-M 1,0	WPB-M 1,0	WEB-M 1,0	M24x1,5	146 (5.75)	154 (6.06)	108 (4.25)	3,5 (0.14)	8 (0.31)	20 (0.79)	8 (0.31)	23 (0.91)	30 (1.18)

PERFORMANCE

	Stroke	Energy absorption max.		Effective mass (kg / lbs) -0 (very soft)		-1 (soft)		-2 (medium)		-3 (hard)		-4 (very hard)		Return spring force		Torque	Weight
	mm (inch)	Nm/HB (lbs/HB)	Nm/h (lbs/h)	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min. N (min. lbs)	max. N (max. lbs)	Nm max. (lbs max.)	g (lbs)
WSB-M 0,15	8 (0.31)	12 (106)	24000 (212000)	-	-	1,6 (3.5)	7,5 (16.5)	6,1 (13.4)	71 (156)	61 (134)	252 (555)	232 (511)	750 (1653)	3,6 (0.8)	8 (1.8)	6 (53)	0,02 (0.04)
WSB-M 0,2	10 (0.39)	18 (160)	36000 (320000)	-	-	2 (4.4)	11 (24.3)	10 (22)	107 (236)	104 (229)	360 (793)	343 (756)	1100 (2425)	3,5 (0.79)	7 (1.57)	10 (88)	0,036 (0.08)
WSB-M 0,25	14 (0.55)	24 (212)	52800 (468000)	0,9 (2)	8 (17.6)	3,5 (7.7)	17 (37.5)	9,9 (99)	76 (167)	62 (136)	252 (555)	250 (551)	1550 (3417)	13 (2.92)	23 (5.17)	20 (177)	0,05 (0.11)
WSB-M 0,5x19	19 (0.75)	80 (710)	76800 (680000)	2,6 (5.7)	10,6 (23.3)	10 (22.1)	86 (189.6)	40 (21.8)	209 (460)	170 (374)	800 (1765)	680 (1500)	4050 (8928)	12 (2.7)	23 (5.17)	25 (221)	0,13 (0.29)
WSB-M 1,0	25 (0.98)	180 (1593)	108000 (960000)	6 (13.2)	29 (70)	24 (53)	120 (264.5)	70 (154.3)	460 (1014)	440 (970)	2050 (4520)	1760 (3880)	10800 (23810)	15 (3.37)	31 (7)	30 (265)	0,25 (0.55)
WPB-M 0,15	8 (0.31)	12 (106)	24000 (212000)	-	-	1 (2.2)	2,2 (4.8)	2 (4.4)	7,5 (16.5)	6,1 (13.4)	71 (156)	-	-	3,6 (0.8)	8 (1.8)	6 (53)	0,02 (0.04)
WPB-M 0,2	10 (0.39)	18 (160)	36000 (320000)	-	-	1,5 (3.3)	2,8 (6.2)	2 (4.4)	21 (46.3)	17 (37.5)	92 (202)	-	-	3,5 (0.79)	7 (1.57)	10 (88)	0,036 (0.08)
WPB-M 0,25	14 (0.55)	24 (212)	52800 (468000)	-	-	0,9 (2)	2,4 (5.3)	2,3 (5.1)	26 (57.3)	21 (46.3)	165 (363)	-	-	13 (2.92)	23 (5.17)	20 (177)	0,05 (0.11)
WPB-M 0,5x19	19 (0.75)	80 (710)	76800 (680000)	-	-	2,6 (5.7)	12,5 (27.6)	10 (22)	89 (196)	69 (152)	555 (1225)	-	-	12 (2.7)	23 (5.17)	25 (221)	0,13 (0.29)
WPB-M 1,0	25 (0.98)	180 (1593)	108000 (960000)	-	-	6 (13.2)	27,5 (60.6)	21 (46.3)	195 (430)	150 (330)	1200 (2645)	-	-	15 (3.37)	31 (7)	30 (265)	0,25 (0.55)
WEB-M 0,15	8 (0.31)	12 (106)	24000 (212000)	-	-	1 (2.2)	500 (1100)	-	-	-	-	-	-	3,6 (0.8)	8 (1.8)	6 (53)	0,02 (0.04)
WEB-M 0,2	10 (0.39)	18 (160)	36000 (320000)	-	-	9 (19.9)	800 (1700)	-	-	-	-	-	-	3,5 (0.79)	7 (1.57)	10 (88)	0,036 (0.08)
WEB-M 0,25	14 (0.55)	24 (212)	52800 (468000)	-	-	1,6 (3.5)	1600 (3530)	-	-	-	-	-	-	13 (2.92)	23 (5.17)	20 (177)	0,055 (0.12)
WEB-M 0,5x19	19 (0.75)	80 (710)	76800 (680000)	-	-	9 (19.9)	4500 (9920)	-	-	-	-	-	-	12 (2.7)	23 (5.17)	25 (221)	0,14 (0.31)
WEB-M 1,0	25 (0.98)	180 (1593)	108000 (960000)	-	-	22 (48.5)	11000 (24250)	-	-	-	-	-	-	15 (3.37)	31 (7)	30 (265)	0,29 (0.64)

Special Shock Absorbers

WN-M 0,1 - 1,0

Very high energy absorption

Individual adapted deceleration characteristic

Temperature:
-20°C - +80°C / option: -50°C - +120°C
(-4°F- +176°F / option: -58°F - +248°F)

Special models
- available in stainless steel
- for pressure chambers up to 7 bar
- USDA-H1-compliant for food industry

Order information: WN-M 1,0-XXXX
For the first order technical information
for the application is required

DIMENSIONS

	Thread	A	B	C	Ø D	Ø E	Ø G	L	SW	SW 1	SW 2
		mm (inch)									
WN-M 0,1	M 8 x 1,0	57 (2.24)	44 (1.73)	2,5 (0.1)	2,5 (0.1)	6 (0.24)	11 (0.43)	3 (0.12)	-	11 (0.43)	-
WN-M 0,15	M 10 x 1,0	66 (2.6)	49,5 (1.95)	2,5 (0.1)	3 (0.12)	8,5 (0.33)	14 (0.55)	3 (0.12)	-	13 (0.51)	-
WN-M 0,2	M 12 x 1,0	85 (3.35)	65 (2.56)	2,5 (0.1)	4 (0.16)	10 (0.39)	16 (0.63)	4 (0.16)	-	14 (0.55)	-
WN-M 0,25	M 14 x 1,0	100 (3.94)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	18 (0.71)	5 (0.2)	13 (0.51)	17 (0.67)	15 (0.59)
WN-M 0,35	M 16 x 1,0	100 (3.94)	78 (3.07)	2,5 (0.1)	4 (0.16)	10 (0.39)	21 (0.83)	6 (0.24)	14 (0.55)	19 (0.75)	19 (0.75)
WN-M 0,5 x 19	M 20 x 1,0	117 (4.61)	88 (3.46)	2,5 (0.1)	6 (0.24)	16 (0.63)	25 (0.98)	6 (0.24)	18 (0.71)	24 (0.94)	22 (0.87)
WN-M 1,0	M 24 x 1,5	146 (5.75)	108 (4.25)	3,5 (0.14)	8 (0.31)	20 (0.79)	31 (1.22)	8 (0.31)	23 (0.91)	30 (1.18)	30 (1.18)
WN-M 1,0 x 40	M 24 x 1,5	183 (7.2)	130 (5.12)	3,5 (0.14)	8 (0.31)	20 (0.79)	31 (0.12)	8 (0.31)	23 (0.91)	30 (1.18)	30 (1.18)

PERFORMANCE

	Stroke	Energy absorption (max.)	Return spring force		Torque	Weight
	mm (inch)	Nm/HB (lbs/HB)	min. N (min. lbs)	max. N (max. lbs)	Nm max. (lbs max.)	kg (lbs)
WN-M 0,1	7 (0.28)	6 (53)	2,5 (0.56)	6 (1.35)	2 (18)	0,01 (0.02)
WN-M 0,15	10 (0.39)	22,5 (199)	3,6 (0.81)	8 (1.8)	6 (53)	0,02 (0.04)
WN-M 0,2	12 (0.47)	35 (310)	3,5 (0.81)	7 (1.57)	10 (88)	0,036 (0.08)
WN-M 0,25	14 (0.55)	50 (442)	13 (2.92)	23 (5.17)	20 (177)	0,05 (0.11)
WN-M 0,35	14 (0.55)	55 (485)	13 (2.92)	23 (5.17)	20 (177)	0,07 (0.15)
WN-M 0,5 x 19	19 (0.75)	300 (2.66)	12 (2.7)	23 (5.17)	25 (221)	0,13 (0.29)
WN-M 1,0	25 (0.98)	430 (3.8)	15 (3.37)	31 (6.7)	30 (265)	0,25 (0.55)
WN-M 1,0 x 40	40 (1.57)	650 (5.75)	11 (2.47)	20 (4.5)	30 (265)	0,39 (0.86)

WN-M 1,25 - 3,0

Very high energy absorption

Individual adapted deceleration characteristic

Temperature:
-20°C - +80°C / option: -50°C - +120°C
(-4°F- +176°F / option: -58°F - +248°F)

Special models:
- available in stainless steel
- for pressure chambers up to 7 bar
- USDA-H1-compliant for food industry

Order information:WN-M 1,25x1-XXXX
For the first order technical information for the application is required

DIMENSIONS

	Thread	A	B	Ø E	Ø E1	F1	F2	SW
		mm (inch)						
WN-M 1,25 x 1	M 32 x 1,5	138 (5.43)	85 (3.35)	29 (1.14)	21 (0.83)	16 (0.63)	12 (0.47)	30 (1.18)
WN-M 1,25 x 2	M 32 x 1,5	188 (7.4)	110 (4.33)	29 (1.14)	21 (0.83)	16 (0.63)	12 (0.47)	30 (1.18)
WN-M 1,5 x 1	M 45 x 2	148 (5.83)	89 (3.5)	39,6 (1.56)	31 (1.22)	18 (0.71)	13 (0.51)	41 (1.61)
WN-M 1,5 x 2	M 45 x 2	198 (7.8)	114 (4.49)	39,6 (1.56)	31 (1.22)	18 (0.71)	13 (0.51)	41 (1.61)
WN-M 1,5 x 3	M 45 x 2	248 (9.76)	139 (5.47)	39,6 (1.56)	31 (1.22)	18 (0.71)	13 (0.51)	41 (1.61)
WN-M 2,0 x 1	M 62 x 2	186 (7.32)	104 (4.09)	59 (2.32)	49 (1.93)	25 (0.98)	14 (0.55)	60 (2.36)
WN-M 2,0 x 2	M 62 x 2	236 (9.29)	129 (5.08)	59 (2.32)	49 (1.93)	25 (0.98)	14 (0.55)	60 (2.36)
WN-M 2,0 x 4	M 62 x 2	336 (13.23)	179 (7.05)	59 (2.32)	49 (1.93)	25 (0.98)	14 (0.55)	60 (2.36)
WN-M 2,0 x 6	M 62 x 2	453 (17.83)	246 (9.69)	59 (2.32)	49 (1.93)	25 (0.98)	14 (0.55)	60 (2.36)

Dimensions Mega-Line 3,0 - Page 31

PERFORMANCE

	Stroke	Energy absorption	Return spring force		Torque	Weight
	mm (inch)	Nm/HB (max.) lbs/HB (max.)	min. N min. lbs	max. N max. lbs	Nm max. lbs max.	kg lbs
WN-M 1,25 x 1	25 (0.98)	600 (3840)	30 (6.75)	50 (11.25)	40 (9)	0,45 (1)
WN-M 1,25 x 2	50 (1.97)	1000 (8850)	23 (5.17)	50 (11.25)	40 (9)	0,55 (1.21)
WN-M 1,5 x 1	25 (0.98)	1400 (12390)	50 (11.25)	70 (15.74)	40 (9)	0,95 (2.1)
WN-M 1,5 x 2	50 (1.97)	2500 (22130)	35 (7.87)	70 (15.74)	40 (9)	1,1 (2.43)
WN-M 1,5 x 3	75 (2.95)	3500 (30980)	35 (7.87)	80 (17.99)	40 (9)	1,2 (2.65)
WN-M 2,0 x 1	25 (0.98)	2400 (21245)	50 (11.25)	130 (29.23)	40 (9)	2 (4.4)
WN-M 2,0 x 2	50 (1.97)	6000 (53105)	40 (9)	130 (29.23)	40 (9)	3 (6.61)
WN-M 2,0 x 4	100 (3.94)	12000 (106210)	45 (10.12)	130 (29.23)	40 (9)	3,9 (8.6)
WN-M 2,0 x 6	150 (5.91)	18000 (159320)	35 (7.87)	130 (29.23)	40 (9)	4,8 (10.6)
WN-M 3,0 x 2	50 (1.97)	5200 (46025)	120 (26.98)	200 (44.96)	-	7 (15.44)
WN-M 3,0 x 4	100 (3.94)	11700 (103555)	120 (26.98)	250 (56.2)	-	9 (19.85)
WN-M 3,0 x 6	150 (5.91)	18200 (161085)	170 (38.21)	250 (56.2)	-	12 (26.46)
WN-M 3,0 x 6	200 (7.87)	24700 (218615)	170 (38.21)	250 (56.2)	-	15 (33.07)
WN-M 3,0 x 6	250 (9.84)	31200 (276145)	170 (38.21)	280 (62.95)	-	20 (44.1)

W-PET

Shock Absorbers for Blow Molding Machines

Extended life time - Up to 20 mio strokes

Piston: Hardened, Aluminium-Titanium-Nitride coated

Integrated end stop: Max. security

Special Seals + Oils

Temperature: -30°C - +100°C (-22°F - +212°F)

Minimized scheduled maintenance requirements

Reduced replacement costs

Easy replacement of existing shock absorbers

RoHS Directive 2002/95/EC

Weforma PET shock absorbers are designed for use in blow molding machines. Due to high cycle times standard shock absorbers quickly fail. Series W-PET provides constant performance for up to 20 million cycles in approved applications such as:

- P.E.T. container manufacturers
- Blow molding machines
- Injection molding machines
- Plastic bottle manufacturers
- High-speed, repetitious applications requiring exceptional durability and performance

W-PET 0,25-1110

W-PET 0,5x13-XXXX

DIMENSIONS

	Stroke	max. Energy absorption	GW	A	B	C	øD	øF (AP2)	L	SW1	SW2
	mm (inch)	Nm/Hub (lbs/Stroke)		mm (inch)							
W-PET 0,25-1110	6,4 (1.46)	25 (221.27)	M 14 x 1	84,4 (1.46)	78 (1.22)	2,5 (0.1)	4 (0.12)	-	5 (0.24)	17 (0.33)	13 (0.33)
W-PET 0,5x13-330	13 (0.51)	50 (442.54)	M 20 x 1,5	97 (3.82)	75 (2.95)	2,5 (0.1)	6 (0.24)	10 (0.39)	6 (0.24)	18 (0.71)	24 (0.94)
W-PET 0,5x13-380	13 (0.51)	50 (442.54)	M 20 x 1,5	110 (4.33)	88 (3.46)	2,5 (0.1)	6 (0.24)	10 (0.39)	6 (0.24)	18 (0.71)	24 (0.94)
W-PET 0,5x13-1730	13 (0.51)	50 (442.54)	M 20 x 1,5	97 (3.82)	75 (2.95)	2,5 (0.1)	6 (0.24)	10 (0.39)	6 (0.24)	18 (0.71)	24 (0.94)

Type 1 W-PET 1,0-XXXX

Type 2 W-PET 1,0-XXXX

DIMENSIONS

	Type	Stroke	max. Energy absorption	GW	A	B	C	øD	E	HB(E)	øF (AP2)	SW	SW1	M	L
		mm (inch)	Nm/Hub (lbs/Stroke)		mm (inch)										
W-PET 1,0-230	1	19 (0.75)	100 (885.08)	M 27 x 3	121 (4.76)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	-	-	23 (0.91)	13 (0.51)	-
W-PET 1,0-240	1	19 (0.75)	100 (885.08)	M 27 x 3	127 (5)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	-	-	23 (0.91)	13 (0.51)	-
W-PET 1,0-920	1	19 (0.75)	100 (885.08)	M 27 x 3	121 (4.76)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	-	-	23 (0.91)	13 (0.51)	-
W-PET 1,0-1240	1	25 (0.98)	100 (885.08)	M 27 x 3	127 (5)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	-	-	23 (0.91)	13 (0.51)	-
W-PET 1,0-1310	1	25 (0.98)	100 (885.08)	M 27 x 3	127 (5)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	-	30 (1.18)	23 (0.91)	13 (0.51)	8 (0.31)
W-PET 1,0-1350	1	25 (0.98)	100 (885.08)	M 27 x 3	133 (5.24)	102 (4.02)	3,5 (0.14)	6 (0.24)	31 (1.22)	25 (0.98)	-	30 (1.18)	23 (0.91)	13 (0.51)	8 (0.31)
W-PET 1,0-1530	1	25 (0.98)	100 (885.08)	M 27 x 3	127 (5)	102 (4.02)	3,5 (0.14)	6 (0.24)	31 (1.22)	25 (0.98)	-	30 (1.18)	23 (0.91)	13 (0.51)	8 (0.31)
W-PET 1,0-140	2	25 (0.98)	100 (885.08)	M 27 x 3	139 (5.47)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	17 (0.67)	-	23 (0.91)	13 (0.51)	-
W-PET 1,0-260	2	25 (0.98)	100 (885.08)	M 25 x 1,5	139 (5.47)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	17 (0.67)	-	23 (0.91)	13 (0.51)	-
W-PET 1,0-330	2	25 (0.98)	100 (885.08)	M 27 x 3	139 (5.47)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	17 (0.67)	30 (1.18)	23 (0.91)	13 (0.51)	8 (0.31)
W-PET 1,0-710	2	25 (0.98)	100 (885.08)	M 27 x 3	139 (5.47)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	17 (0.67)	-	23 (0.91)	13 (0.51)	-
W-PET 1,0-1710	2	25 (0.98)	100 (885.08)	M 27 x 3	139 (5.47)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	17 (0.67)	30 (1.18)	23 (0.91)	13 (0.51)	8 (0.31)
W-PET 1,0-1720	2	25 (0.98)	100 (885.08)	M 27 x 3	139 (5.47)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	17 (0.67)	30 (1.18)	23 (0.91)	13 (0.51)	8 (0.31)
W-PET 1,0-2270	2	19 (0.75)	100 (885.08)	M 25 x 1,5	133 (5.24)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	-	17 (0.67)	-	-	13 (0.51)	-

Type 1 W-PET 1,0-XXXX

Type 2 W-PET 1,0-XXXX

DIMENSIONS

	Type	Stroke	max. Energy absorption	GW	A	B	C	øD	øE	øF (AP2)	F	SW	L	SW1	M
		mm (inch)	Nm/Hub (lbs/Stroke)							mm (inch)					
W-PET 1,0-120	1	25 (0.98)	100 (885.08)	M27x3	135 (5.31)	102 (4.02)	3,5 (0.14)	6 (0.24)	12 (0.47)	17 (0.67)	139 (5.47)	30 (1.18)	8 (0.31)	23 (0.91)	13 (0.51)
W-PET 1,0-1120	1	25 (0.98)	100 (885.08)	M27x3	135 (5.31)	102 (4.02)	3,5 (0.14)	6 (0.24)	12 (0.47)	17 (0.67)	139 (5.47)	30 (1.18)	8 (0.31)	23 (0.91)	13 (0.51)
W-PET 1,0-1360	2	25 (0.98)	100 (885.08)	M27x3	135 (5.31)	102 (4.02)	3,5 (0.14)	6 (0.24)	12 (0.47)	-	17 (0.67)	30 (1.18)	8 (0.31)	23 (0.91)	13 (0.51)

Type 1 W-PET 1,0-XXXX

Type 2 W-PET 1,0-XXXX

DIMENSIONS

	Type	Stroke	max. Energy absorption	GW	A	B	C	øD	øE	øF	L	SW3	SW2	SW1	M
		mm (inch)	Nm/Hub (lbs/Stroke)							mm (inch)					
W-PET 1,0-350	1	23,7 (0.93)	100 (885.08)	M27x3	139 (5.47)	115 (4.53)	34,6 (1.36)	6 (0.24)	36,5 (1.44)	17 (0.67)	8 (0.31)	30 (1.18)	32 (1.26)	23 (0.91)	13 (0.51)
W-PET 1,0-3240	2	25 (0.98)	100 (885.08)	M27x1,5	137 (5.39)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	16 (0.63)	-	-	-	23 (0.91)	13 (0.51)
W-PET 1,0-3260	2	25 (0.98)	100 (885.08)	1-12 UNF	137 (5.39)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	16 (0.63)	-	-	-	23 (0.91)	13 (0.51)
W-PET 1,0-3280	2	25 (0.98)	100 (885.08)	M25x1,5	137 (5.39)	102 (4.02)	3,5 (0.14)	6 (0.24)	-	16 (0.63)	-	-	-	23 (0.91)	13 (0.51)

W-PET 1,0-2240

W-PET 1,0-870

DIMENSIONS

	Stroke	max. Energy absorption	GW	A	B	C	øD	øF	K	SW1	M	L	SW2
	mm (inch)	Nm/Hub (lbs/Stroke)						mm (inch)					
W-PET 1,0-2240	25 (0.98)	100 (885.08)	M 27 x 3	147 (5.79)	102 (4.02)	3,5 (0.14)	6 (0.24)	17 (0.67)	8 (0.31)	-	-	-	-
W-PET 1,0-870	15 (0.59)	100 (885.08)	M 27 x 3	161 (6.34)	146 (5.75)	3,5 (0.14)	8 (0.31)	-		23 (0.91)	19 (0.75)	8 (0.31)	30 (1.18)

W-PET 1,0-1370

W-PET 1,0-940

DIMENSIONS

	Stroke	max. Energy absorption	GW	A	B	C	øD	øE	SW1	M
	mm (inch)	Nm/Hub (lbs/Stroke)					mm (inch)			
W-PET 1,0x1370	23,9 (0.94)	100 (885.08)	M 27 x 3	127 (5)	103 (4.06)	63,6 (2.5)	6 (0.24)	41,5 (1.63)	23 (0.91)	13 (0.51)
W-PET 1,0-940	19 (0.75)	100 (885.08)	M 27 x 3	130 (5.12)	105 (4.13)	3,5 (0.14)	6 (0.24)	-	-	-

ACCESSORIES

	1 Lock nut	Stop cap AP2	Stop cap (Steel / AS)	Stop limit nut	2 Lock nuts	Stop cap AP2 (supplied loose)
W-PET 0,25-1110	X					
W-PET 0,5x13-330	X	X				
W-PET 0,5x13-380	X	X				
W-PET 0,5x13-1730	X	X				
W-PET 1,0-1310	X					
W-PET 1,0-1350	X					
W-PET 1,0-1530	X					
W-PET 1,0-140		X				
W-PET 1,0-260		X				
W-PET 1,0-330	X	X				
W-PET 1,0-350	X	X		X		
W-PET 1,0-710		X				
W-PET 1,0-1360	X		X			
W-PET 1,0-1710	X	X				
W-PET 1,0-1720	X	X				
W-PET 1,0-2270		X				
W-PET 1,0-3240			X			
W-PET 1,0-3260			X			
W-PET 1,0-3280			X			
W-PET 1,0-2240		X				
W-PET 1,0x1370				X		
W-PET 1,0-120					X	X
W-PET 1,0-1120					X	X
W-PET 1,0-870					X	

Heavy-Duty Shock Absorbers

LDS / HLS

ONLINE
Calculation +
2D / 3D CAD Download

www.weforma.com

A FALLING MASS

Example

m = 1000 kg
H = 1,5 m
S = 0,4 m
X = 1/h
n = 1

Formulae & Calculation

$W_k = m \cdot g \cdot H = 14.715$ Nm
$W_A = m \cdot g \cdot S = 3.924$ Nm
$W_{kg} = W_k + W_A = 18.639$ Nm
$W_{kg/h} = W_{kg} \cdot X = 18.639$ Nm/h

Selection

LDS-40-400-XXXX

B LOAD AGAINST SOLID STOP

Example

m = 40.000 kg
v = 2,5 m/s
F = 6.000 N
S = 0,2 m
X = 5/h
n = 2

Formulae & Calculation

$W_k = \frac{m \cdot v^2}{2} = 125.000$ Nm

with propelling force

$W_A = F \cdot S = 1.200$ Nm
$W_{kg} = (W_k + W_A) : n = 63.100$ Nm
$W_{kg/h} = W_{kg} \cdot X = 315.500$ Nm/h
$v_e = v$

Selection

HLS-100-200-XXXX

J LOAD AGAINST SOLID STOP WITH SHOCK ABSORBERS

Example

m = 10.000 kg
v = 2,6 m/s
F = 4.000 N
X = 10/h
S = 0,4 m

Formulae & Calculation

$W_k = \frac{m \cdot v^2}{2} : 2 = 16.900$ Nm

with propelling force

$W_A = F \cdot S = 1.600$ Nm
$W_{kg} = W_k + W_A = 18.500$ Nm

$W_{kg/h} = W_{kg} \cdot X = 185.000$ Nm/h
$v_e = v / 2 = 1,3$ m/s

Selection

LDS-40-400-XXXX

K LOAD AGAINST LOAD WITH ONE SHOCK ABSORBER

Example

m1 = 5.000 kg
v1 = 1,6 m/s
m2 = 6.000 kg
v2 = 2,0 m/s
X = 6/h
S = 0,5 m

Formulae & Calculation

$W_k = \frac{(m1 \cdot m2) \cdot (v1 + v2)^2}{2\,(m1 + m2)} = 17.672$ Nm

with propelling force

$W_A = F \cdot S$
$W_{kg} = W_k + W_A$

$W_{kg/h} = W_{kg} \cdot X = 106.032$ Nm/h
$v_e = v1 + v2 = 3,6$ m/s

Selection

LDS-32-500-XXXX

L LOAD AGAINST LOAD WITH SHOCK ABSORBERS

Example

m1 = 15.000 kg
v1 = 1,9 m/s
m2 = 16.000 kg
v2 = 1,8 m/s
X = 12/h
S = 0,4 m

Formulae & Calculation

$$W_k = \frac{(m1 \cdot m2) \cdot (v1 + v2)^2}{4\,(m1 + m2)} = 26.490 \text{ Nm}$$

with propelling force

$$W_A = F \cdot S$$

$$W_{kg} = W_k + W_A$$

$$W_{kg/h} = W_{kg} \cdot X = 317.880 \text{ Nm/h}$$

$$v_e = (v\,1 + v2) / 2 = 1{,}85 \text{ m/s}$$

Selection

LDS-50-400-XXXX

F LOAD ON INCLINE

Example

m = 21.000 kg
H = 0,5 m
α = 22°
S = 0,6
X = 1/h

Formulae & Calculation

$$W_k = m \cdot g \cdot H = 103.005 \text{ Nm}$$

$$W_A = m \cdot g \cdot \sin\alpha \cdot S = 46.303 \text{ Nm}$$

$$W_{kg} = W_k + W_A = 149.308 \text{ Nm}$$

$$W_{kg/h} = W_{kg} \cdot X = 149.308 \text{ Nm/h}$$

$$v = v_e = \sqrt{2 \cdot g \cdot H}$$

Selection

HLS-100-600-XXXX

! For a utilizaltion per stroke >80 % the approval of Weforma is necessary!
at 1/h: number of strokes per year required

Online calculation (imperial / metric) at www.weforma.com

FORMULAE

COUNTERFORCE

$$F_G = \frac{W_{kg} \cdot 1{,}2^*}{S}$$

DECELERATION TIME

$$t = \frac{2 \cdot S}{v_e} \cdot 1{,}2^*$$

DECELERATION RATE

$$a = \frac{v^2}{2 \cdot S} \cdot 1{,}2^*$$

STROKE

$$S = \frac{v^2}{2 \cdot a} \cdot 1{,}2^*$$

*Calculation for optimum setting. Allow a safety margin!

LEGEND

W_k	(Nm)	Kinetic energy
W_A	(Nm)	Propelling force energy
W_{kg}	(Nm)	Total energy / $W_k + W_A$
$W_{kg/h}$	(Nm/h)	Total energy per hour
m	(kg)	Mass
me	(kg)	Effective mass

v	(m/s)	Impact speed
v_e	(m/s)	Effective speed
X	(1/h)	Number of strokes per hour
S	(m)	Stroke
F	(N)	Propelling force
H	(m)	Height

g	(m/s²)	Accerelation due to gravity (9,81 m/s²)
α	(°)	Angle
a	(m/s²)	Acceleration/Deceleration
t	(s)	Deceleration time
F_G	(N)	Counter force

LDS 25 - 160

Energy absorption

max. 800.000 Nm / Stroke
max. 7080640 in-lbs / Stroke

Stroke

50 - 1800 mm
1.97 - 70.87 in

HLS 40 - 160

Energy absorption

max. 335.000 Nm / Stroke
max. 2965018 in-lbs / Stroke

Stroke

50 - 1200 mm
1.97 - 47.24 in

FEATURES

Extended Life Time
Piston rod: hardened / hard chrome-plated
Special seals + oils

Surface protection
Housing zinc plated / painted

Deceleration
Customer specific

Temperature
-20ºC - +80ºC / opt.: -40ºC - +100ºC
-4ºF - +176ºF / opt.: -40ºF - +212ºF

RoHS compliant
Directive 2002/95/EC

Applications LDS
Automated storage systems,
Stacker cranes,
Cranes

Applications HLS
Cranes
Swivel bridges

Operating Principle

LDS

LDS models are filled with hydraulic oil and nitrogen. This construction allows the reset of the piston with a low force.

When the piston rod is pushed into the cylinder, the piston displaces the oil through different sized holes which are progressively closed off.

As a result the speed of the piston rod proportionally decreases to the stroke covered. The displaced oil from the volume of the piston rod is compensated by an accumulator of nitrogen, which is above the oil.
During the stroke the pressure in the nitrogen is increased. When the mass is released the piston rod is returned by the pressure of the nitrogen.

HLS

HLS models have two chambers filled with hydraulic oil and nitrogen. The piston rod is used as an accumulator.

Under impact the piston rod is pushed into the cylinder displacing the oil through the orifices into the pressure tube, moving the seperator piston towards the steel cap and compressing the nitrogen.

When the mass is released the pressure of the nitrogen sets back the piston rod.

LDS 25

LDS 32

LDS 40

FH

FV

FB

LDS 25 / DIMENSIONS

	øPiston	Stroke	Energy/Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	FV / FH kg (lbs)	FB kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-25-050	25 (0.98)	50 (1.97)	1250 (11063.5)	30000 (6744.27)	2,5	2,5	2,4 (5.29)	3,8 (8.38)	240 (9.45)	158 (6.22)	178 (7.01)	240 (9.45)	158 (6.22)	178 (7.01)
LDS-25-100	25 (0.98)	100 (3.94)	2500 (22127)	30000 (6744.27)	2,5	2	3,1 (6.83)	4,5 (9.92)	340 (13.39)	208 (8.19)	228 (8.98)	340 (13.39)	215 (8.46)	235 (9.25)
LDS-25-150	25 (0.98)	150 (5.91)	3750 (33190.5)	30000 (6744.27)	2,5	2	4,1 (9.04)	5,5 (12.13)	440 (17.32)	258 (10.16)	278 (10.94)	440 (17.32)	275 (10.83)	295 (11.61)
LDS-25-200	25 (0.98)	200 (7.87)	5000 (44254)	30000 (6744.27)	2,5	2	5,4 (11.91)	6,8 (14.99)	540 (21.26)	308 (12.13)	328 (12.91)	540 (21.26)	335 (13.19)	355 (13.98)
LDS-25-250	25 (0.98)	250 (9.84)	6250 (55317.5)	26000 (5845.03)	2	1	6,8 (14.99)	8,2 (18.08)	678 (26.69)	396 (15.59)	416 (16.38)	678 (26.69)	396 (15.59)	416 (16.38)
LDS-25-300	25 (0.98)	300 (11.81)	7300 (64610.84)	22000 (4945.8)	2	1	8,5 (18.74)	9,9 (21.83)	788 (31.02)	456 (17.95)	476 (18.74)	788 (31.02)	456 (17.95)	476 (18.74)

LDS 32 / DIMENSIONS

	øPiston	Stroke	Energy/ Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-32-050	32 (1.26)	50 (1.97)	2000 (17700)	50000 (11240)	2,5	2,5	6 (13.23)	8 (17.64)	314 (12.36)	216 (8.5)	246 (9.69)	314 (12.36)	216 (8.5)	246 (9.69)
LDS-32-100	32 (1.26)	100 (3.94)	4000 (35400)	50000 (11240)	2,5	2	8 (17.64)	10 (22.05)	414 (16.3)	266 (10.47)	296 (11.65)	464 (18.27)	316 (12.44)	346 (13.62)
LDS-32-150	32 (1.26)	150 (5.91)	6000 (53100)	50000 (11240)	2,5	2	9 (19.84)	11 (24.25)	514 (20.24)	316 (12.44)	346 (13.62)	564 (22.2)	346 (13.62)	376 (14.8)
LDS-32-200	32 (1.26)	200 (7.87)	8000 (70800)	50000 (11240)	2,5	2	11 (24.25)	13 (28.66)	614 (24.17)	366 (14.41)	396 (15.59)	664 (26.14)	416 (16.38)	446 (17.56)
LDS-32-250	32 (1.26)	250 (9.84)	10000 (88500)	50000 (11240)	2	1	12 (26.46)	14 (30.87)	714 (28.11)	416 (16.38)	446 (17.56)	814 (32.05)	516 (20.31)	546 (21.5)
LDS-32-300	32 (1.26)	300 (11.81)	12000 (106200)	50000 (11240)	2	1	14 (30.87)	16 (35.27)	814 (32.05)	466 (18.35)	496 (19.53)	914 (35.98)	566 (22.28)	596 (23.46)
LDS-32-350	32 (1.26)	350 (13.78)	14000 (123900)	50000 (11240)	1,5	1	16 (35.27)	18 (39.68)	914 (35.98)	516 (20.31)	546 (21.5)	1024 (40.31)	626 (24.65)	656 (25.83)
LDS-32-400	32 (1.26)	400 (15.75)	16000 (1416120)	50000 (11240)	1,5	0,5	18 (39.68)	20 (44.09)	1014 (39.92)	566 (22.28)	596 (23.46)	1194 (47.01)	746 (29.37)	776 (30.55)
LDS-32-450	32 (1.26)	450 (17.72)	18000 (159310)	50000 (11240)	1	0,5	20 (44.09)	22 (48.5)	1126 (44.33)	626 (24.65)	656 (25.83)	1306 (51.42)	806 (31.73)	836 (32.91)
LDS-32-500	32 (1.26)	500 (19.69)	20000 (177016)	50000 (11240)	1	0,5	22 (48.5)	24 (52.91)	1236 (48.66)	686 (27.01)	716 (28.19)	1386 (54.57)	836 (32.91)	866 (34.09)
LDS-32-550	32 (1.26)	550 (21.65)	22000 (194720)	50000 (11240)	1	0,5	24 (52.91)	26 (57.32)	1346 (52.99)	746 (29.37)	776 (30.55)	1516 (59.69)	916 (36.06)	946 (37.24)
LDS-32-600	32 (1.26)	600 (23.62)	24000 (212420)	50000 (11240)	1	0,5	26 (57.32)	28 (61.73)	1456 (57.32)	806 (31.73)	836 (32.91)	1646 (64.8)	996 (39.21)	1026 (40.39)

LDS 40 / DIMENSIONS

	øPiston	Stroke	Energy/ Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-40-050	40 (1.57)	50 (1.97)	3000 (26550)	80000 (17985)	2,5	2,5	10 (22.05)	12 (26.46)	298 (11.73)	206 (8.11)	236 (9.29)	298 (11.73)	206 (8.11)	236 (9.29)
LDS-40-100	40 (1.57)	100 (3.94)	6000 (53100)	80000 (17985)	2,5	2	12 (26.46)	13 (28.66)	398 (15.67)	256 (10.08)	286 (11.26)	448 (17.64)	306 (12.05)	336 (13.23)
LDS-40-150	40 (1.57)	150 (5.91)	9000 (79660)	80000 (17985)	2,5	2	13 (28.66)	15 (33.07)	498 (19.61)	306 (12.05)	336 (13.23)	548 (21.57)	356 (14.02)	386 (15.2)
LDS-40-200	40 (1.57)	200 (7.87)	12000 (106210)	80000 (17985)	2,5	2	15 (33.07)	17 (37.48)	598 (23.54)	356 (14.02)	386 (15.2)	648 (25.51)	406 (15.98)	436 (17.17)
LDS-40-250	40 (1.57)	250 (9.84)	16000 (141610)	80000 (17985)	2,5	1	16 (35.27)	18 (39.68)	698 (27.48)	406 (15.98)	436 (17.17)	798 (31.42)	506 (19.92)	536 (21.1)
LDS-40-300	40 (1.57)	300 (11.81)	19000 (168165)	80000 (17985)	2,5	1	18 (39.68)	20 (44.09)	798 (31.42)	456 (17.95)	486 (19.13)	908 (35.75)	566 (22.28)	596 (23.46)
LDS-40-350	40 (1.57)	350 (13.78)	22000 (194720)	80000 (17985)	2	1	19 (41.89)	21 (46.3)	898 (35.35)	506 (19.92)	536 (21.1)	998 (39.29)	606 (23.86)	636 (25.04)
LDS-40-400	40 (1.57)	400 (15.75)	25000 (221270)	80000 (17985)	2	0,5	21 (46.3)	23 (50.71)	1008 (39.69)	566 (22.28)	596 (23.46)	1128 (44.41)	686 (27.01)	716 (28.19)
LDS-40-450	40 (1.57)	450 (17.72)	28000 (247825)	80000 (17985)	1,5	0,5	23 (50.71)	25 (55.12)	1118 (44.02)	626 (24.65)	656 (25.83)	1298 (51.1)	806 (31.73)	836 (32.91)
LDS-40-500	40 (1.57)	500 (19.69)	32000 (283230)	80000 (17985)	1,5	0,5	25 (55.12)	27 (59.53)	1228 (48.35)	686 (27.01)	716 (28.19)	1348 (53.07)	806 (31.73)	836 (32.91)
LDS-40-550	40 (1.57)	550 (21.65)	35000 (309780)	80000 (17985)	1,5	0,5	26 (57.32)	29 (63.94)	1338 (52.68)	746 (29.37)	776 (30.55)	1458 (57.4)	866 (34.09)	896 (35.28)
LDS-40-600	40 (1.57)	600 (23.62)	38000 (336330)	80000 (17985)	1	0,5	28 (61.73)	30 (66.14)	1448 (57.01)	806 (31.73)	836 (32.91)	1568 (61.73)	926 (36.46)	956 (37.64)
LDS-40-650	40 (1.57)	650 (25.59)	41000 (362885)	80000 (17985)	1	0,5	30 (66.14)	32 (70.55)	1558 (61.34)	866 (34.09)	896 (35.28)	1738 (68.43)	1046 (41.18)	1076 (42.36)
LDS-40-700	40 (1.57)	700 (27.56)	44000 (389435)	80000 (17985)	1	0,5	33 (72.75)	35 (77.16)	1668 (65.67)	926 (36.46)	956 (37.64)	1848 (72.76)	1106 (43.54)	1136 (44.72)
LDS-40-750	40 (1.57)	750 (29.53)	48000 (424840)	80000 (17985)	1	0,5	35 (77.16)	37 (81.57)	1778 (70)	986 (38.82)	1016 (40)	1978 (77.87)	1166 (45.91)	1196 (47.09)
LDS-40-800	40 (1.57)	800 (31.5)	51000 (451390)	80000 (17985)	1	0,5	36 (79.37)	38 (83.78)	1888 (74.33)	1046 (41.18)	1076 (42.36)	2068 (81.42)	1226 (48.27)	1256 (49.45)
LDS-40-850	40 (1.57)	850 (33.46)	50000 (442540)	70000 (15740)	1	0,5	38 (83.78)	40 (88.19)	1998 (78.66)	1106 (43.54)	1136 (44.72)	2178 (85.75)	1286 (50.63)	1316 (51.81)
LDS-40-900	40 (1.57)	900 (35.43)	50000 (442540)	70000 (15740)	1	0,5	40 (88.19)	42 (92.6)	2108 (82.99)	1166 (45.91)	1196 (47.09)	2283 (89.88)	1341 (52.8)	1371 (53.98)
LDS-40-950	40 (1.57)	950 (37.4)	49000 (433690)	60000 (13500)	1	0,5	42 (92.6)	44 (97.01)	2218 (87.32)	1226 (48.27)	1256 (49.45)	2403 (94.61)	1411 (55.55)	1441 (46.73)
LDS-40-1000	40 (1.57)	1000 (39.37)	48000 (424840)	60000 (13500)	1	0,5	44 (97.01)	46 (101.41)	2328 (91.65)	1286 (50.63)	1316 (51.81)	2568 (101.1)	1526 (60.08)	1556 (61.26)
LDS-40-1200	40 (1.57)	1200 (47.24)	43000 (380585)	45000 (10120)	1	0,5	46 (101.41)	48 (105.82)	2768 (108.98)	1526 (60.08)	1556 (61.26)	2993 (117.73)	1751 (68.94)	1781 (70.12)

LDS 50

LDS 75

LDS 80

LDS 50 / DIMENSIONS

	øPiston	Stroke	Energy/Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-50-050	50 (1.97)	50 (1.97)	4000 (35405)	120000 (26980)	2,5	2,5	10 (22.05)	12 (26.46)	310 (12.2)	218 (8.58)	248 (9.76)	310 (12.2)	218 (8.58)	248 (9.76)
LDS-50-100	50 (1.97)	100 (3.94)	9000 (79660)	120000 (26980)	2,5	2	12 (26.46)	13 (28.66)	409 (16.1)	267 (10.51)	297 (11.69)	459 (18.07)	267 (10.51)	287 (11.3)
LDS-50-150	50 (1.97)	150 (5.91)	14000 (123915)	120000 (26980)	2,5	2	13 (28.66)	15 (33.07)	509 (20.04)	317 (12.48)	347 (13.66)	544 (21.42)	352 (13.86)	382 (15.04)
LDS-50-200	50 (1.97)	200 (7.87)	19000 (168165)	120000 (26980)	2,5	2	15 (33.07)	17 (37.48)	609 (23.98)	367 (14.45)	397 (15.63)	659 (25.94)	417 (16.42)	447 (17.6)
LDS-50-250	50 (1.97)	250 (9.84)	24000 (212420)	120000 (26980)	2,5	1	16 (35.27)	18 (39.68)	709 (27.91)	417 (16.42)	447 (17.6)	809 (31.85)	517 (20.35)	547 (21.54)
LDS-50-300	50 (1.97)	300 (11.81)	28000 (247825)	120000 (26980)	2,5	1	18 (39.68)	20 (44.09)	809 (31.85)	467 (18.39)	497 (19.57)	909 (35.79)	567 (22.32)	597 (23.5)
LDS-50-350	50 (1.97)	350 (13.78)	33000 (292080)	120000 (26980)	2	1	19 (41.89)	21 (46.3)	909 (35.79)	517 (20.35)	547 (21.54)	1019 (40.12)	627 (24.69)	657 (25.87)
LDS-50-400	50 (1.97)	400 (15.75)	38000 (336330)	120000 (26980)	2	0,5	21 (46.3)	23 (50.71)	1009 (39.72)	567 (22.32)	597 (23.5)	1129 (44.45)	687 (27.05)	717 (28.23)
LDS-50-450	50 (1.97)	450 (17.72)	43000 (380585)	120000 (26980)	1,5	0,5	23 (50.71)	25 (55.12)	1119 (44.06)	627 (24.69)	657 (25.87)	1299 (51.14)	807 (31.77)	837 (32.95)
LDS-50-500	50 (1.97)	500 (16.69)	48000 (424840)	120000 (26980)	1,5	0,5	25 (55.12)	27 (59.53)	1229 (48.39)	687 (27.05)	717 (28.23)	1409 (55.47)	867 (34.13)	897 (35.31)
LDS-50-550	50 (1.97)	550 (21.65)	52000 (460245)	120000 (26980)	1,5	0,5	26 (57.32)	29 (63.94)	1339 (52.72)	747 (29.41)	777 (30.59)	1519 (59.8)	927 (36.5)	957 (37.68)
LDS-50-600	50 (1.97)	600 (23.62)	57000 (504500)	120000 (26980)	1	0,5	28 (61.73)	30 (66.14)	1449 (57.05)	807 (31.77)	837 (32.95)	1629 (64.13)	987 (38.86)	1017 (40.04)
LDS-50-650	50 (1.97)	650 (25.59)	62000 (548750)	120000 (26980)	1	0,5	30 (66.14)	32 (70.55)	1559 (61.38)	867 (34.13)	897 (35.31)	1739 (68.46)	1047 (41.22)	1077 (42.4)
LDS-50-700	50 (1.97)	700 (27.56)	67000 (593005)	120000 (26980)	1	0,5	33 (72.75)	35 (77.16)	1669 (65.71)	927 (36.5)	957 (37.68)	1849 (72.8)	1107 (43.58)	1137 (44.76)
LDS-50-750	50 (1.97)	750 (29.53)	72000 (637260)	120000 (26980)	1	0,5	35 (77.16)	37 (81.57)	1779 (70.04)	987 (38.86)	1017 (40.04)	1959 (77.13)	1167 (45.94)	1197 (47.13)
LDS-50-800	50 (1.97)	800 (31.5)	76000 (672665)	120000 (26980)	1	0,5	36 (79.37)	38 (83.78)	1889 (74.37)	1047 (41.22)	1077 (42.4)	2129 (83.82)	1287 (50.67)	1317 (51.85)
LDS-50-850	50 (1.97)	850 (33.46)	74000 (654960)	100000 (22500)	1	0,5	38 (83.78)	40 (88.19)	1999 (78.7)	1107 (43.58)	1137 (44.76)	2319 (91.3)	1427 (56.18)	1457 (57.36)
LDS-50-900	50 (1.97)	900 (35.43)	72000 (637260)	100000 (22500)	1	0,5	40 (88.78)	42 (92.6)	2109 (83.03)	1167 (45.94)	1197 (47.13)	2369 (93.27)	1427 (56.18)	1457 (57.36)
LDS-50-950	50 (1.97)	950 (37.4)	72000 (637260)	90000 (20240)	1	0,5	42 (92.6)	44 (97.01)	2219 (87.36)	1227 (48.31)	1257 (49.49)	2518 (99.13)	1527 (60.12)	1557 (61.3)
LDS-50-1000	50 (1.97)	1000 (39.37)	72000 (637260)	90000 (20240)	1	0,5	44 (97.01)	46 (101.41)	2329 (91.69)	1287 (50.67)	1317 (51.85)	2569 (101.14)	1527 (60.12)	1557 (61.3)
LDS-50-1100	50 (1.97)	1100 (43.31)	68000 (601855)	80000 (17990)	1	0,5	45 (99.21)	47 (103.62)	2569 (101.14)	1427 (56.18)	1457 (57.36)	2819 (110.98)	1677 (66.02)	1707 (67.2)
LDS-50-1200	50 (1.97)	1200 (47.24)	64000 (566455)	67000 (15070)	1	0,5	46 (101.41)	48 (105.82)	2769 (109.02)	1527 (60.12)	1557 (61.3)	3169 (124.76)	1927 (75.87)	1957 (77.05)

LDS 75 / DIMENSIONS

	øPiston	Stroke	Energy/ Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-75-050	75 (2.95)	50 (1.97)	9600 (84970)	240000 (53960)	2	2	23 (50.71)	29 (63.94)	318 (12.52)	226 (8.9)	258 (10.16)	318 (12.52)	226 (8.9)	258 (10.16)
LDS-75-075	75 (2.95)	75 (2.95)	14400 (127450)	240000 (53960)	2	1,5	25 (55.12)	31 (68.34)	365 (14.37)	247 (9.72)	279 (10.98)	365 (14.37)	247 (9.72)	279 (10.96)
LDS-75-100	75 (2.95)	100 (3.94)	19200 (169935)	240000 (53960)	2	1,5	26 (57.32)	32 (70.55)	418 (16.46)	276 (10.87)	308 (12.13)	418 (16.46)	276 (10.87)	308 (12.13)
LDS-75-125	75 (2.95)	125 (4.92)	24000 (212420)	240000 (53960)	2	1,5	27 (59.53)	33 (72.75)	468 (18.43)	301 (11.85)	333 (13.11)	468 (18.43)	301 (11.85)	333 (13.11)
LDS-75-150	75 (2.95)	150 (5.91)	28800 (254905)	240000 (53960)	2	1,5	29 (63.94)	35 (77.16)	540 (21.26)	348 (13.7)	380 (14.96)	540 (21.26)	348 (13.7)	380 (14.96)
LDS-75-200	75 (2.95)	200 (7.87)	38400 (339875)	240000 (53960)	1,5	1	31 (68.34)	37 (81.57)	618 (24.33)	376 (14.8)	408 (16.06)	718 (28.27)	476 (18.74)	508 (20)
LDS-75-250	75 (2.95)	250 (9.84)	48000 (424840)	240000 (53960)	1,5	0,5	34 (74.96)	40 (88.19)	718 (28.27)	426 (16.77)	458 (18.03)	868 (34.17)	576 (22.68)	608 (23.94)
LDS-75-300	75 (2.95)	300 (11.81)	57600 (509810)	240000 (53960)	1,5	0,5	37 (81.57)	43 (94.8)	818 (32.2)	476 (18.74)	508 (20)	918 (36.14)	576 (22.68)	608 (23.94)
LDS-75-350	75 (2.95)	350 (13.78)	67200 (594775)	240000 (53960)	1,5	0,5	40 (88.19)	46 (101.41)	969 (38.15)	576 (22.68)	608 (23.94)	1071 (42.17)	678 (26.69)	710 (27.95)
LDS-75-400	75 (2.95)	400 (15.75)	76800 (679745)	240000 (53960)	1,5	0,5	43 (94.8)	49 (108.03)	1070 (42.13)	627 (24.69)	659 (25.94)	1172 (46.14)	729 (28.7)	761 (29.96)
LDS-75-450	75 (2.95)	450 (17.72)	86400 (764710)	240000 (53960)	1,5	0,5	45 (99.21)	51 (112.44)	1171 (46.1)	678 (26.69)	710 (27.95)	1323 (52.09)	830 (32.68)	862 (33.94)
LDS-75-500	75 (2.95)	500 (19.69)	94000 (831975)	235000 (52830)	1,5	0,5	50 (110.23)	56 (123.46)	1272 (50.08)	729 (28.7)	761 (29.96)	1475 (58.07)	932 (36.69)	964 (37.95)
LDS-75-600	75 (2.95)	600 (23.62)	112800 (998370)	235000 (52830)	1	0,5	56 (123.46)	62 (136.69)	1472 (57.95)	830 (32.68)	862 (33.94)	1675 (65.94)	1033 (40.67)	1065 (41.93)
LDS-75-700	75 (2.95)	700 (27.56)	136900 (1211675)	230000 (51700)	1	0,5	62 (136.69)	68 (149.92)	1675 (65.94)	932 (36.69)	964 (37.95)	1925 (75.79)	1182 (46.54)	1214 (47.8)
LDS-75-800	75 (2.95)	800 (31.5)	134000 (1186010)	195000 (43840)	1	0,5	67 (147.71)	73 (160.94)	1876 (73.86)	1033 (40.67)	1065 (41.93)	2025 (79.72)	1182 (46.54)	1214 (47.8)
LDS-75-900	75 (2.95)	900 (35.43)	134000 (1186010)	185000 (41590)	1	0,5	73 (160.94)	79 (174.17)	2125 (86.66)	1182 (46.54)	1214 (47.8)	2425 (95.47)	1482 (58.35)	1514 (59.61)
LDS-75-1000	75 (2.95)	1000 (39.37)	134000 (1186010)	170000 (38220)	1	0,5	79 (174.17)	85 (187.4)	2324 (91.5)	1282 (50.47)	1314 (51.73)	2604 (102.52)	1562 (61.5)	1594 (62.76)
LDS-75-1100	75 (2.95)	1100 (43.31)	134000 (1186010)	160000 (35970)	1	0,5	85 (187.4)	91 (200.62)	2525 (99.41)	1382 (54.41)	1414 (55.67)	2875 (113.19)	1732 (68.19)	1764 (69.45)
LDS-75-1200	75 (2.95)	1200 (47.24)	134000 (1186010)	150000 (33720)	1	0,5	91 (200.62)	97 (213.85)	2724 (104.24)	1482 (58.35)	1514 (59.61)	3140 (123.62)	1898 (74.72)	1930 (75.98)
LDS-75-1400	75 (2.95)	1400 (55.12)	134000 (1186010)	140000 (31480)	0,8	0,3	102 (224.88)	107 (235.9)	3275 (128.94)	1832 (72.13)	1864 (73.39)	3625 (142.72)	2182 (85.91)	2214 (87.17)
LDS-75-1500	75 (2.95)	1500 (59.06)	130000 (1150610)	140000 (31480)	0,8	0,3	105 (231.49)	110 (242.51)	3491 (137.44)	1948 (76.69)	1980 (77.95)	3875 (152.56)	2332 (91.81)	2364 (93.07)
LDS-75-1600	75 (2.95)	1600 (62.99)	120000 (1062100)	140000 (31480)	0,6	0,2	120 (264.56)	125 (275.58)	3725 (146.65)	2082 (81.97)	2114 (83.23)	4075 (160.43)	2432 (95.75)	2464 (97.01)
LDS-75-1800	75 (2.95)	1800 (70.87)	120000 (1062100)	140000 (31480)	0,5	0,2	140 (308.65)	145 (319.68)	4175 (164.37)	2332 (91.81)	2364 (93.07)	4575 (180.12)	2732 (107.56)	2764 (108.82)

LDS 80 / DIMENSIONS

	øPiston	Stroke	Energy/ Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-80-050	80 (3.15)	50 (1.97)	11800 (104440)	280000 (62950)	2	2	26 (57.32)	32 (70.55)	418 (16.46)	325 (12.8)	375 (14.76)	418 (16.46)	325 (12.8)	375 (14.76)
LDS-80-100	80 (3.15)	100 (3.94)	24200 (214190)	280000 (62950)	2	1,5	29 (63.94)	35 (77.16)	543 (21.38)	400 (15.75)	450 (17.72)	543 (21.38)	400 (15.75)	450 (17.72)
LDS-80-150	80 (3.15)	150 (5.91)	36300 (321285)	280000 (62950)	2	1,5	32 (70.55)	38 (83.78)	643 (25.31)	450 (17.72)	500 (19.69)	643 (25.31)	450 (17.72)	500 (19.69)
LDS-80-200	80 (3.15)	200 (7.87)	48500 (429265)	280000 (62950)	1,5	0,5	34 (74.96)	40 (88.19)	768 (30.24)	525 (20.67)	575 (22.64)	768 (30.24)	525 (20.67)	575 (22.64)
LDS-80-250	80 (3.15)	250 (9.84)	61500 (544325)	280000 (62950)	1,5	0,5	37 (81.57)	42 (92.62)	868 (34.17)	575 (22.64)	625 (24.61)	868 (34.17)	575 (22.64)	625 (24.61)
LDS-80-300	80 (3.15)	300 (11.81)	73800 (653190)	280000 (62950)	1,5	0,5	41 (90.39)	47 (103.62)	993 (39.09)	650 (25.59)	700 (27.56)	993 (39.09)	650 (25.59)	700 (27.56)
LDS-80-400	80 (3.15)	400 (15.75)	98000 (867380)	280000 (62950)	1,5	0,5	46 (101.41)	52 (114.64)	1193 (46.97)	750 (29.53)	800 (31.5)	1193 (46.97)	750 (29.53)	800 (31.5)
LDS-80-500	80 (3.15)	500 (19.69)	122300 (1082455)	275000 (61830)	1,5	0,5	54 (119.05)	60 (132.28)	1418 (55.83)	875 (34.45)	925 (36.42)	1418 (55.83)	875 (34.45)	925 (36.42)
LDS-80-600	80 (3.15)	600 (23.62)	147400 (1304610)	275000 (61830)	1	0,5	61 (134.48)	67 (147.71)	1618 (63.7)	975 (38.39)	1025 (40.35)	1618 (63.7)	975 (38.39)	1025 (40.35)
LDS-80-700	80 (3.15)	700 (27.56)	171000 (1513490)	260000 (58450)	1	0,5	65 (143.3)	71 (156.53)	1843 (72.56)	1100 (43.31)	1150 (45.28)	1843 (72.56)	1100 (43.31)	1150 (45.28)
LDS-80-800	80 (3.15)	800 (31.5)	198000 (1752460)	245000 (55080)	1	0,5	71 (156.53)	77 (169.76)	2043 (80.43)	1200 (47.24)	1250 (49.21)	2043 (80.43)	1200 (47.24)	1250 (49.21)
LDS-80-900	80 (3.15)	900 (35.43)	210000 (1858670)	225000 (50590)	1	0,5	76 (167.55)	82 (180.78)	2293 (90.28)	1350 (53.15)	1400 (55.12)	2293 (90.28)	1350 (53.15)	1400 (55.12)
LDS-80-1000	80 (3.15)	1000 (39.37)	210000 (1858670)	225000 (50590)	1	0,5	84 (185.19)	90 (198.42)	2493 (98.15)	1450 (57.09)	1500 (59.06)	2493 (98.15)	1450 (57.09)	1500 (59.06)
LDS-80-1200	80 (3.15)	1200 (47.24)	200000 (1770160)	190000 (42720)	1	0,3	98 (216.06)	103 (227.08)	2893 (113.9)	1650 (64.96)	1700 (66.93)	2893 (113.9)	1650 (64.96)	1700 (66.93)
LDS-80-1400	80 (3.15)	1400 (55.12)	190000 (1681655)	150000 (33720)	0,8	0,3	118 (260.15)	125 (275.58)	3393 (133.58)	1950 (76.77)	2000 (78.74)	3393 (133.58)	1950 (76.77)	2000 (78.74)
LDS-80-1600	80 (3.15)	1600 (62.99)	190000 (1681655)	150000 (33720)	0,6	0,2	140 (308.65)	150 (330.7)	3893 (153.27)	2250 (88.58)	2300 (90.55)	3893 (153.27)	2250 (88.58)	2300 (90.55)
LDS-80-1800	80 (3.15)	1800 (70.87)	190000 (1681655)	150000 (33720)	0,5	0,2	175 (385.82)	185 (407.86)	4293 (169.02)	2450 (96.46)	2500 (98.43)	4293 (169.02)	2450 (96.46)	2500 (98.43)

LDS 100

LDS 125

LDS 160

LDS 100 / DIMENSIONS

	øPiston	Stroke	Energy/ Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-100-050	100 (3.94)	50 (1.97)	15500 (137190)	360000 (80930)	2	2	55 (121.26)	90 (198.42)	425 (16.73)	313 (12.32)	363 (14.29)	425 (16.73)	313 (12.32)	363 (14.29)
LDS-100-100	100 (3.94)	100 (3.94)	31000 (274375)	360000 (80930)	2	1,5	60 (132.28)	95 (209.44)	525 (20.67)	363 (14.29)	413 (16.26)	535 (21.06)	373 (14.69)	423 (16.65)
LDS-100-150	100 (3.94)	150 (5.91)	46500 (411565)	360000 (80930)	2	1,5	65 (143.3)	100 (220.47)	625 (24.61)	413 (16.26)	463 (18.23)	645 (25.39)	433 (17.05)	483 (19.02)
LDS-100-200	100 (3.94)	200 (7.87)	62000 (548750)	360000 (80930)	1,5	1	70 (154.33)	105 (231.49)	725 (28.54)	463 (18.23)	513 (20.2)	755 (29.72)	493 (19.41)	543 (21.38)
LDS-100-250	100 (3.94)	250 (9.84)	77500 (685940)	360000 (80930)	1,5	0,5	75 (165.35)	110 (242.51)	825 (32.48)	513 (20.2)	563 (22.17)	865 (34.06)	553 (21.77)	603 (23.74)
LDS-100-300	100 (3.94)	300 (11.81)	93000 (823125)	360000 (80930)	1,5	0,5	85 (187.4)	120 (264.56)	1000 (39.37)	643 (25.31)	693 (27.28)	1000 (39.37)	643 (25.31)	693 (27.28)
LDS-100-400	100 (3.94)	400 (15.75)	124000 (1097500)	360000 (80930)	1,5	0,5	95 (209.44)	130 (286.61)	1200 (47.24)	743 (29.25)	793 (31.22)	1200 (47.24)	743 (29.25)	793 (31.22)
LDS-100-500	100 (3.94)	500 (16.69)	155000 (1371875)	360000 (80930)	1,5	0,5	105 (231.49)	140 (308.65)	1405 (55.31)	848 (33.39)	898 (35.35)	1405 (55.31)	848 (33.39)	898 (35.35)
LDS-100-600	100 (3.94)	600 (23.62)	186000 (1646250)	360000 (80930)	1,5	0,5	115 (253.54)	150 (330.7)	1605 (63.19)	948 (37.32)	998 (39.29)	1635 (64.37)	978 (38.5)	1028 (40.47)
LDS-100-700	100 (3.94)	700 (27.56)	217000 (1920625)	360000 (80930)	1	0,5	125 (275.58)	160 (352.75)	1805 (71.06)	1048 (41.26)	1098 (43.23)	1845 (72.64)	1088 (42.83)	1138 (44.8)
LDS-100-800	100 (3.94)	800 (31.5)	248000 (2195000)	360000 (80930)	1	0,5	135 (297.63)	170 (374.79)	2015 (79.33)	1153 (45.39)	1203 (47.36)	2065 (81.3)	1203 (47.36)	1253 (49.33)
LDS-100-900	100 (3.94)	900 (35.43)	279000 (2469480)	360000 (80930)	1	0,5	145 (319.68)	180 (396.84)	2215 (87.2)	1253 (49.33)	1303 (51.3)	2285 (89.96)	1323 (52.09)	1373 (54.06)
LDS-100-1000	100 (3.94)	1000 (39.37)	250000 (2212700)	300000 (67445)	1	0,5	155 (341.72)	190 (418.89)	2415 (95.08)	1353 (53.27)	1403 (55.24)	2515 (99.02)	1453 (57.2)	1503 (59.17)
LDS-100-1200	100 (3.94)	1200 (47.24)	212000 (1876370)	212000 (47660)	1	0,5	165 (363.77)	210 (462.98)	2815 (110.83)	1553 (61.14)	1603 (63.11)	2965 (116.73)	1703 (67.05)	1753 (69.02)

LDS 125 / DIMENSIONS

	øPiston	Stroke	Energy/ Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-125-050	125 (4.92)	50 (1.97)	23000 (203570)	552000 (124100)	2	2	85 (187.4)	127 (279.99)	462 (18.19)	295 (11.61)	355 (13.98)	462 (18.19)	295 (11.61)	355 (13.98)
LDS-125-100	125 (4.92)	100 (3.94)	46000 (407140)	552000 (124100)	2	1,5	90 (198.42)	132 (291.02)	562 (22.13)	345 (13.58)	405 (15.94)	562 (22.13)	345 (13.58)	405 (15.94)
LDS-125-150	125 (4.92)	150 (5.91)	69000 (610710)	552000 (124100)	2	1,5	99 (218.26)	141 (310.86)	662 (26.06)	395 (15.55)	455 (17.91)	662 (26.06)	395 (15.55)	455 (17.91)
LDS-125-200	125 (4.92)	200 (7.87)	92000 (814275)	552000 (124100)	1,5	1	105 (231.49)	147 (324.09)	762 (30)	445 (17.52)	505 (19.88)	788 (31.02)	471 (18.54)	531 (20.91)
LDS-125-250	125 (4.92)	250 (9.84)	115000 (1017845)	552000 (124100)	1,5	0,5	115 (253.54)	157 (346.13)	872 (34.33)	505 (19.88)	565 (22.24)	898 (35.35)	531 (20.91)	591 (23.27)
LDS-125-300	125 (4.92)	300 (11.81)	138000 (1221410)	552000 (124100)	1,5	0,5	120 (264.56)	162 (357.15)	984 (38.74)	567 (22.32)	627 (24.69)	1020 (40.16)	603 (23.74)	663 (26.1)
LDS-125-400	125 (4.92)	400 (15.75)	185000 (1637400)	552000 (124100)	1,5	0,5	135 (297.63)	177 (390.22)	1227 (48.31)	710 (27.95)	770 (30.31)	1278 (50.31)	761 (29.96)	#WERT!
LDS-125-500	125 (4.92)	500 (19.69)	231000 (2044535)	552000 (124100)	1,5	0,5	165 (363.77)	207 (456.36)	1475 (58.07)	858 (33.78)	918 (36.14)	1537 (60.51)	920 (36.22)	980 (38.58)
LDS-125-600	125 (4.92)	600 (23.62)	277000 (2451675)	552000 (124100)	1,5	0,5	180 (396.84)	222 (489.43)	1723 (67.83)	1006 (39.61)	1066 (41.97)	1783 (70.2)	1066 (41.97)	1126 (44.33)
LDS-125-700	125 (4.92)	700 (27.56)	325000 (2876510)	552000 (124100)	1	0,5	190 (418.89)	232 (511.48)	1970 (77.56)	1153 (45.39)	1213 (47.46)	2050 (80.71)	1233 (48.54)	1293 (50.91)
LDS-125-800	125 (4.92)	800 (31.5)	370000 (3274800)	552000 (124100)	1	0,5	205 (451.96)	247 (544.55)	2219 (87.36)	1302 (51.26)	1362 (53.62)	2321 (91.38)	1404 (55.28)	1464 (57.64)
LDS-125-900	125 (4.92)	900 (35.43)	415000 (3673085)	552000 (124100)	1	0,5	215 (474)	257 (566.6)	2467 (97.13)	1450 (57.09)	1510 (59.45)	2574 (101.34)	1557 (61.3)	1617 (63.66)
LDS-125-1000	125 (4.92)	1000 (39.37)	460000 (4071370)	552000 (124100)	1	0,5	230 (507.07)	272 (599.67)	2715 (106.89)	1598 (62.94)	1658 (65.28)	2837 (111.69)	1720 (67.72)	1780 (70.08)
LDS-125-1200	125 (4.92)	1200 (47.24)	410000 (3628828)	410000 (92200)	1	0,5	250 (551.17)	292 (643.76)	3211 (126.42)	1894 (74.57)	1954 (76.93)	3368 (132.6)	2051 (80.75)	2111 (83.11)

LDS 160 / DIMENSIONS

	øPiston	Stroke	Energy/ Stroke	max. Counterforce	max. Angular Tolerance		Weight		Mounting: horizontal			Mounting: vertical		
	mm (inch)	mm (inch)	Nm (in lbs)	N (lbs)	Emergency	Constant load	kg (lbs)	FV / FH kg (lbs)	A mm (inch)	B mm (inch)	D mm (inch)	A mm (inch)	B mm (inch)	D mm (inch)
LDS-160-050	160 (6.3)	50 (1.97)	37500 (331905)	900000 (202330)	2	2	160 (352.75)	215 (474)	512 (20.16)	340 (13.39)	410 (16.14)	512 (20.16)	340 (13.39)	410 (16.14)
LDS-160-100	160 (6.3)	100 (3.94)	75000 (663810)	900000 (202330)	2	1,5	170 (374.79)	225 (496.05)	612 (24.09)	390 (15.35)	460 (18.11)	612 (24.09)	390 (15.35)	460 (18.11)
LDS-160-150	160 (6.3)	150 (5.91)	112000 (991290)	900000 (202330)	2	1,5	185 (407.86)	240 (529.12)	712 (28.03)	440 (17.32)	510 (20.08)	712 (28.03)	440 (17.32)	510 (20.08)
LDS-160-200	160 (6.3)	200 (7.87)	150000 (1327620)	900000 (202330)	1,5	1	195 (429.91)	250 (551.17)	812 (31.97)	490 (19.29)	560 (22.05)	812 (31.97)	490 (19.29)	560 (22.05)
LDS-160-250	160 (6.3)	250 (9.84)	190000 (1681655)	900000 (202330)	1,5	0,5	205 (451.96)	260 (573.21)	902 (35.51)	530 (20.87)	600 (23.62)	902 (35.51)	530 (20.87)	600 (23.65)
LDS-160-300	160 (6.3)	300 (11.81)	220000 (1947180)	900000 (202330)	1,5	0,5	215 (474)	270 (595.26)	1007 (39.65)	585 (23.03)	655 (25.79)	1007 (39.65)	585 (23.03)	655 (25.79)
LDS-160-400	160 (6.3)	400 (15.75)	300000 (2655240)	900000 (202330)	1,5	0,5	235 (518.1)	290 (639.35)	1217 (47.91)	695 (27.36)	765 (30.12)	1227 (48.31)	705 (27.76)	775 (30.51)
LDS-160-500	160 (6.3)	500 (19.69)	380000 (3363305)	900000 (202330)	1,5	0,5	260 (573.21)	315 (694.47)	1457 (57.36)	835 (32.87)	905 (35.63)	1467 (57.76)	845 (33.27)	1005 (39.57)
LDS-160-600	160 (6.3)	600 (23.62)	455000 (4027115)	900000 (202330)	1,5	0,5	310 (683.44)	365 (804.7)	1697 (66.81)	975 (38.39)	1045 (41.14)	1707 (67.2)	985 (38.78)	1055 (41.54)
LDS-160-700	160 (6.3)	700 (27.56)	530000 (4690925)	900000 (202330)	1	0,5	330 (727.54)	385 (848.79)	1937 (76.26)	1115 (43.9)	1185 (46.65)	1957 (77.05)	1135 (44.69)	1205 (47.44)
LDS-160-800	160 (6.3)	800 (31.5)	605000 (5354735)	900000 (202330)	1	0,5	360 (793.68)	415 (914.93)	2177 (85.71)	1255 (49.41)	1325 (52.17)	2197 (86.5)	1275 (50.2)	1345 (52.95)
LDS-160-900	160 (6.3)	900 (35.43)	680000 (6018545)	900000 (202330)	1	0,5	390 (859.82)	445 (981.07)	2417 (95.16)	1395 (54.92)	1465 (57.68)	2437 (95.94)	1425 (56.1)	1495 (58.86)
LDS-160-1000	160 (6.3)	1000 (39.37)	795000 (7036390)	900000 (202330)	1	0,5	420 (925.96)	475 (1047.21)	2657 (104.61)	1535 (60.43)	1605 (63.19)	2697 (106.18)	1575 (62.01)	1645 (64.76)
LDS-160-1200	160 (6.3)	1200 (47.24)	800000 (7080640)	800000 (179850)	1	0,5	450 (992.1)	505 (1113.35)	3137 (123.5)	1815 (71.46)	1885 (74.21)	3187 (125.47)	1865 (73.43)	1935 (76.18)

PROXIMITY SWITCH

SECURITY CHAIN

For safety reasons we recommend the use of a security chain when the installation height of the LDS / HLS heavy-duty shock absorber is 2 m or above.

STOP CAP

	D	F	ø E1
	mm (inch)		
LDS 25	30 (1.18)	16 (0.63)	21 (0.83)
LDS 32	39,5 (1.56)	18 (0.71)	31 (1.22)
LDS 40	59 (2.32)	25 (0.98)	49 (1.93)
LDS 50	59 (2.32)	25 (0.98)	49 (1.93)
LDS 75	80 (3.15)	25 (0.98)	66 (2.6)
LDS 80	80 (3.15)	25 (0.98)	66 (2.6)
LDS 100	98 (3.86)	17 (0.67)	80 (3.15)
LDS 125	125 (4.92)	42 (1.65)	100 (3.94)
LDS 160	160 (6.3)	50 (1.97)	120 (4.72)

ENLARGED STOP CAP

Application: Shock absorber against Shock absorber

	ø E1
LDS 25	39,5 (1.56)
LDS 32	79 (3.11)
LDS 40	70 (2.76)
LDS 50	80 (3.15)

	ø E1
LDS 75	100 (3.94)
LDS 80	100 (3.94)
LDS 100	125 (4.92)

METAL WIPER

(Stroke: -10 mm)

Clevis Mounting

From series LDS-80
Female rod clevis mounted on both sides!

DIMENSIONS

	Stroke	A	F	G	H	J	øK	L	M	P
	mm (inch)									
LDS-32-050	50 (1.97)	398 (15.67)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-100	100 (3.94)	498 (19.61)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-150	150 (5.91)	598 (23.54)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-200	200 (7.87)	698 (27.48)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-250	250 (9.84)	798 (31.42)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-32-300	300 (11.81)	898 (35.35)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-050	50 (1.97)	382 (15.04)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-100	100 (3.94)	482 (18.98)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-150	150 (5.91)	582 (22.91)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-200	200 (7.87)	682 (26.85)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-250	250 (9.84)	782 (30.79)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-40-300	300 (11.81)	882 (34.72)	38,1 (1.5)	16,3 (0.64)	35 (1.38)	38,1 (1.5)	20 (0.79)	38 (1.5)	25 (0.98)	38 (1.5)
LDS-50-050	50 (1.97)	398 (15.67)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-100	100 (3.94)	497 (19.57)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-150	150 (5.91)	597 (23.5)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-200	200 (7.87)	697 (27.44)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-250	250 (9.84)	797 (31.38)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-50-300	300 (11.81)	897 (35.31)	55 (2.17)	25 (0.98)	34 (1.34)	40 (1.57)	20 (0.79)	40 (1.57)	25 (0.98)	40 (1.57)
LDS-75-050	50 (1.97)	432 (17.01)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-075	75 (2.95)	483 (19.02)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-100	100 (3.94)	520 (20.47)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-125	125 (4.92)	585 (23.03)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-150	150 (5.91)	642 (25.28)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-200	200 (7.87)	736 (28.98)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-250	250 (9.84)	838 (32.99)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-75-300	300 (11.81)	940 (37.01)	90 (3.54)	38 (1.5)	32 (1.26)	60 (2.36)	25 (0.98)	45 (1.77)	38 (1.5)	60 (2.36)
LDS-80-050	50 (1.97)	551 (21.69)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-100	100 (3.94)	676 (26.61)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-150	150 (5.91)	776 (30.55)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-200	200 (7.87)	901 (35.47)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-250	250 (9.84)	1001 (39.41)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-80-300	300 (11.81)	1126 (44.33)	90 (3.54)	38 (1.5)	50 (1.97)	60 (2.36)	30 (1.18)	50 (1.97)	-	-
LDS-100-050	50 (1.97)	570 (22.44)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-100	100 (3.94)	672 (26.46)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-150	150 (5.91)	772 (30.39)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-200	200 (7.87)	875 (34.45)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-250	250 (9.84)	976 (38.43)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-100-300	300 (11.81)	1143 (45)	140 (5.51)	65 (2.56)	50 (1.97)	100 (3.94)	50 (1.97)	70 (2.76)	-	-
LDS-125-050	50 (1.97)	640 (25.2)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-100	100 (3.94)	751 (29.57)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-150	150 (5.91)	853 (33.58)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-200	200 (7.87)	955 (37.6)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-250	250 (9.84)	1055 (41.54)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-
LDS-125-300	300 (11.81)	1157 (45.55)	150 (5.91)	70 (2.76)	70 (2.76)	100 (3.94)	60 (2.36)	80 (3.15)	-	-

We reserve the right to make changes without further notice!

Protection Bellow

	LDS 25	LDS 32 / 40	LDS 50 / 75	LDS 80 / 100 / 125	LDS 160
ØG	30 (1,18)	55 (2,17)	70 (2,76)	125 (4,92)	160 (6,3)
ØF	80 (3,15)	120 (4,72)	130 (5,12)	190 (7,48)	220 (8,66)

LDS 25

Stroke	A
mm	mm
50 (1,97)	313 (12,32)
100 (3,94)	413 (16,26)
150 (5,91)	513 (20,2)
200 (7,87)	613 (24,13)

LDS 32

Stroke	A
mm	mm
50 (1,97)	380 (14,96)
100 (3,94)	480 (18,9)
150 (5,91)	580 (22,83)
200 (7,87)	680 (26,77)
250 (9,84)	780 (30,71)
300 (11,81)	935 (36,81)
350 (13,78)	1035 (40,75)
400 (15,75)	1135 (44,69)
450 (17,72)	1245 (49,02)
500 (19,69)	1355 (53,35)
550 (21,65)	1465 (57,68)
600 (23,62)	1575 (62,01)

LDS 40

Stroke	A
mm	mm
50 (1,97)	370 (14,57)
100 (3,94)	470 (18,5)
150 (5,91)	570 (22,44)
200 (7,87)	670 (26,38)
250 (9,84)	770 (30,31)
300 (11,81)	925 (36,42)
350 (13,78)	1025 (40,35)
400 (15,75)	1135 (44,69)
450 (17,72)	1245 (49,02)
500 (19,69)	1355 (53,35)
550 (21,65)	1465 (57,68)
600 (23,62)	1575 (62,01)
650 (25,59)	1750 (68,9)
700 (27,56)	1860 (73,23)
750 (29,53)	1970 (77,56)
800 (31,5)	2080 (81,89)
850 (33,46)	2190 (86,22)
900 (35,43)	2300 (90,55)
950 (37,4)	2410 (94,88)
1000 (39,37)	2520 (99,21)
1200 (47,24)	2960 (116,54)

LDS 50

Stroke	A
mm	mm
50 (1,97)	382 (15,04)
100 (3,94)	481 (18,94)
150 (5,91)	581 (22,87)
200 (7,87)	681 (26,81)
250 (9,84)	781 (30,75)
300 (11,81)	936 (36,85)
350 (13,78)	1036 (40,79)
400 (15,75)	1136 (44,72)
450 (17,72)	1246 (49,06)
500 (19,69)	1356 (53,39)
550 (21,65)	1466 (57,72)
600 (23,62)	1576 (62,05)
650 (25,59)	1751 (68,94)
700 (27,56)	1861 (73,27)
750 (29,53)	1971 (77,6)
800 (31,5)	2081 (81,93)
850 (33,46)	2191 (86,26)
900 (35,43)	2301 (90,59)
950 (37,4)	2411 (94,92)
1000 (39,37)	2521 (99,25)

LDS 75

Stroke	A
mm	mm
50 (1,97)	390 (15,35)
75 (2,95)	436 (17,17)
100 (3,94)	490 (19,29)
125 (4,92)	540 (21,26)
150 (5,91)	612 (24,09)
200 (7,87)	690 (27,17)
250 (9,84)	790 (31,1)
300 (11,81)	945 (37,2)
350 (13,78)	1095 (43,11)
400 (15,75)	1196 (47,09)
450 (17,72)	1297 (51,06)
500 (19,69)	1398 (55,04)
600 (23,62)	1599 (62,95)
700 (27,56)	1866 (73,46)
800 (31,5)	2067 (81,38)
900 (35,43)	2316 (91,18)
1000 (39,37)	2516 (99,06)

LDS 80

Stroke	A
mm	mm
50 (1,97)	484 (19,06)
100 (3,94)	609 (23,98)
150 (5,91)	709 (27,91)
200 (7,87)	834 (32,83)
250 (9,84)	934 (36,77)
300 (11,81)	1104 (43,46)
400 (15,75)	1304 (51,34)
500 (19,69)	1529 (60,2)
600 (23,62)	1729 (68,07)
700 (27,56)	2004 (78,9)
800 (31,5)	2204 (86,77)
900 (35,43)	2454 (96,61)
1000 (39,37)	2654 (104,49)

LDS 100

Stroke	A
mm	mm
50 (1,97)	492 (19,37)
100 (3,94)	592 (23,31)
150 (5,91)	692 (27,24)
200 (7,87)	792 (31,18)
250 (9,84)	892 (35,12)
300 (11,81)	1112 (43,78)
400 (15,75)	1312 (51,65)
500 (19,69)	1517 (59,72)
600 (23,62)	1717 (67,6)
700 (27,56)	1967 (77,44)
800 (31,5)	2177 (85,71)
900 (35,43)	2377 (93,58)
1000 (39,37)	2577 (101,46)

LDS 125

Stroke	A
mm	mm
50 (1,97)	529 (20,83)
100 (3,94)	629 (24,76)
150 (5,91)	729 (28,7)
200 (7,87)	829 (32,64)
250 (9,84)	939 (36,97)
300 (11,81)	1096 (43,15)
400 (15,75)	1339 (52,72)
500 (19,69)	1587 (62,48)
600 (23,62)	1835 (72,24)
700 (27,56)	2132 (83,94)
800 (31,5)	2381 (93,74)
900 (35,43)	2629 (103,5)
1000 (39,37)	2877 (113,27)

LDS 160

Stroke	A
mm	mm
50 (1,97)	587 (23,11)
100 (3,94)	687 (27,05)
150 (5,91)	787 (30,98)
200 (7,87)	887 (34,92)
250 (9,84)	1055 (41,54)
300 (11,81)	1160 (45,67)
400 (15,75)	1370 (53,94)
500 (19,69)	1610 (63,39)
600 (23,62)	1850 (72,83)
700 (27,56)	2090 (82,28)
800 (31,5)	2408 (94,8)
900 (35,43)	2648 (104,25)
1000 (39,37)	2888 (113,7)
1200 (47,24)	3368 (132,6)

Double-Acting Heavy-Duty Shock Absorbers

FEATURES

- Customer-specific modification to suit application scenario
- Strokes: 50 - 1000 mm
- Energy absorption: up to 400.000 Nm / stroke

For the selection the following information is required:

- Mass (kg)
- Speed (m/s)
- Propelling force (N)
- Drive power (kW)
- Number of strokes / h
- At 1/h: number of strokes per year
- Temperature (°C)
- Stroke (mm)
- Dimensions according to the drawing

Surface protection

FEATURES

1) Indoor applications (without humidity)
- Piston rod: chrome plated, hardened (LDS)
- Piston rod: chrome plated (HLS)
- Housing: zinc plated
- Seal bushing from high strength aluminium

2) Outdoor
- Piston rod: nickel (30 µm) and hardchrome (20 µm) plated
- Housing and seal bushing painted conforming to DIN EN ISO 12944-2-C5-I

Cleaning agents!
- Before using cleaning agents please consult Weforma

Packaging
- Wooden boxes; depending on national regulations according to ISPM 15

RFV

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	A	C
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	RFV kg (lbs)	mm (inch)	mm (inch)
HLS-40-050	50 (1.97)	3800 (33633)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	2,5	6 (13.23)	300 (11.81)	150 (5.91)
HLS-40-100	100 (3.94)	7500 (66381)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	2,0	8 (17.64)	450 (17.72)	200 (7.87)
HLS-40-150	150 (5.91)	11000 (97358)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	2,0	9 (19.85)	600 (23.62)	250 (9.84)
HLS-40-200	200 (7.87)	14700 (130106)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	1,0	11 (24.26)	750 (29.53)	300 (11.81)
HLS-40-250	250 (9.84)	18300 (161969)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	1,0	12 (26.46)	900 (35.43)	350 (13.78)
HLS-40-300	300 (11.81)	22000 (194717)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	1,0	13 (28.67)	1050 (41.34)	400 (15.75)
HLS-40-350	350 (13.78)	25500 (225694)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	0,6	14 (30.87)	1200 (47.24)	450 (17.72)
HLS-40-400	400 (15.75)	28500 (252246)	80000 (17984.8)	1100 (247.29)	3600 (809.32)	0,6	16 (35.28)	1350 (53.15)	500 (19.69)

Protection Bellow

Rear flange recommended only for shock absorbers up to 300 mm stroke!

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	D	E	A2*
	mm (inch)	Nm (lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	FB kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-63-050	50 (1.97)	7500 (66381)	180000 (40465.62)	1500 (337.21)	14000 (3147.33)	2,5	13,5 (29.76)	15,5 (34.17)	329 (12.95)	229 (9.02)	261 (10.28)	84 (3.31)	335 (13.19)
HLS-63-100	100 (3.94)	15000 (132762)	180000 (40465.62)	1500 (337.21)	14000 (3147.33)	2,5	14 (30.87)	17 (37.48)	440 (17.32)	290 (11.42)	322 (12.68)	134 (5.28)	466 (18.35)
HLS-63-150	150 (5.91)	22500 (199143)	180000 (40465.62)	1500 (337.21)	18000 (4046.56)	2,5	15,5 (34.17)	18,5 (40.79)	585 (23.03)	385 (15.16)	417 (16.42)	184 (7.24)	611 (24.06)
HLS-63-200	200 (7.87)	30000 (265524)	180000 (40465.62)	1500 (337.21)	19000 (4271.37)	2,5	17 (37.48)	20 (44.09)	720 (28.35)	470 (18.5)	502 (19.76)	234 (9.21)	746 (29.37)
HLS-63-250	250 (9.84)	37500 (331905)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	2,5	19,5 (42.99)	22 (48.5)	865 (34.06)	565 (22.24)	597 (23.5)	284 (11.18)	891 (35.08)
HLS-63-300	300 (11.81)	45000 (398286)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	2,5	22 (48.5)	25 (55.12)	1000 (39.37)	650 (25.59)	682 (26.85)	334 (13.15)	1081 (42.56)
HLS-63-350	350 (13.78)	52500 (464667)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	2,5	24 (52.91)	27 (59.53)	1145 (45.08)	745 (29.33)	777 (30.59)	384 (15.12)	1226 (48.27)
HLS-63-400	400 (15.75)	60000 (531048)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	1,5	27,5 (60.63)	30,5 (67.24)	1280 (50.39)	830 (32.68)	862 (33.94)	434 (17.09)	1361 (53.58)
HLS-63-500	500 (19.69)	75000 (663810)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	1,5	30 (66.14)	33 (72.75)	1560 (61.42)	1010 (39.76)	1042 (41.02)	534 (21.02)	1641 (64.61)
HLS-63-600	600 (23.62)	90000 (796572)	180000 (40465.62)	1500 (337.21)	21000 (4720.99)	1,5	32,5 (71.65)	35,5 (78.27)	1840 (72.44)	1190 (46.85)	1222 (48.11)	634 (24.96)	1921 (75.63)

* Version with protection bellow: Stroke -20 mm!

HLS 70

FH

FV

Protection Bellow

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	A	B	D	E	A2*
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-70-050	50 (1.97)	10000 (88508)	250000 (56202.25)	1500 (337.21)	14000 (3147.33)	2,5 (2.5)	13,5 (29.76)	329 (12.95)	229 (9.02)	261 (10.28)	84 (3.31)	355 (13.98)
HLS-70-100	100 (3.94)	20000 (177016)	250000 (56202.25)	1500 (337.21)	14000 (3147.33)	2,5 (2.5)	14 (30.87)	440 (17.32)	290 (11.42)	322 (12.68)	134 (5.28)	466 (18.35)
HLS-70-150	150 (5.91)	30000 (265524)	250000 (56202.25)	1500 (337.21)	18000 (4046.56)	2,5 (2.5)	15,5 (34.17)	585 (23.03)	385 (15.16)	417 (16.42)	184 (7.24)	611 (24.06)
HLS-70-200	200 (7.87)	40000 (354032)	250000 (56202.25)	1500 (337.21)	19000 (4271.37)	2,5 (2.5)	17 (37.48)	720 (28.35)	470 (18.5)	502 (19.76)	234 (9.21)	746 (29.37)

* Version with protection bellow: Stroke -20 mm!

Protection Bellow

Rear flange recommended only for shock absorbers up to 300 mm stroke!

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	C	D	E
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-75-050	50 (1.97)	15000 (132762)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2,5 (2.5)	20 (44.09)	26 (57.32)	363 (14.29)	283 (11.14)	153 (6.02)	174 (6.85)	239 (9.41)
HLS-75-100	100 (3.94)	30000 (265524)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2,5 (2.5)	24 (52.91)	30 (66.14)	493 (19.41)	363 (14.29)	213 (8.39)	254 (10)	319 (12.56)
HLS-75-150	150 (5.91)	45000 (398286)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2,5 (2.5)	29 (63.94)	35 (77.16)	623 (24.53)	443 (17.44)	273 (10.75)	334 (13.15)	399 (15.71)
HLS-75-200	200 (7.87)	60000 (531048)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2,5 (2.5)	34 (74.96)	40 (88.19)	838 (32.99)	608 (23.94)	359 (14.13)	474 (18.66)	539 (21.22)
HLS-75-300	300 (11.81)	90000 (796572)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2,5 (2.5)	44 (97.01)	50 (110.23)	1154 (45.43)	824 (32.44)	577 (22.72)	572 (22.52)	637 (25.08)
HLS-75-400	400 (15.75)	120000 (1062096)	350000 (78683.15)	4000 (899.24)	35000 (7868.32)	2,5 (2.5)	54 (119.05)	60 (132.28)	1468 (57.8)	1038 (40.87)	677 (26.65)	786 (30.94)	851 (33.5)
HLS-75-500	500 (19.69)	130000 (1150604)	300000 (67442.7)	4000 (899.24)	35000 (7868.32)	2 (2.5)	60 (132.28)	66 (145.51)	1719 (67.68)	1189 (46.81)	777 (30.59)	938 (36.93)	1002 (39.45)
HLS-75-600	600 (23.62)	150000 (1327620)	300000 (67442.7)	4000 (899.24)	35000 (7868.32)	1,5 (2.5)	67 (147.71)	73 (160.94)	1974 (77.72)	1344 (52.91)	877 (34.53)	1092 (42.99)	1157 (45.55)
HLS-75-700	700 (27.56)	160000 (1416128)	250000 (56202.25)	4000 (899.24)	35000 (7868.32)	1,5 (2.5)	75 (165.35)	81 (178.58)	2269 (89.33)	1539 (60.59)	977 (38.46)	1288 (50.71)	1352 (53.23)
HLS-75-800	800 (31.5)	170000 (1504636)	250000 (56202.25)	4000 (899.24)	35000 (7868.32)	1,5 (2.5)	84 (185.19)	90 (198.42)	2563 (100.91)	1733 (68.23)	1077 (42.4)	1482 (58.35)	1546 (60.87)
HLS-75-1000	1000 (39.37)	190000 (1681652)	230000 (51706.07)	4000 (899.24)	35000 (7868.32)	1,5 (2.5)	96 (211.65)	102 (224.88)	3063 (120.59)	2033 (80.04)	1277 (50.28)	1781 (70.12)	1846 (72.68)
HLS-75-1200	1200 (47.24)	200000 (1770160)	210000 (47209.89)	4000 (899.24)	35000 (7868.32)	1,5 (2.5)	112 (246.92)	118 (260.15)	3634 (143.07)	2404 (94.65)	1477 (58.15)	2152 (84.72)	2217 (87.28)

HLS 90

Protection Bellow

Rear flange recommended only for shock absorbers up to 300 mm stroke!

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	C
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV kg (lbs)	FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)
HLS-90-250	250 (9.84)	100000 (885075)	500000 (112405)	4000 (899.24)	37000 (8317.97)	2,5	58 (127.89)	55 (121.28)	875 (34.45)	478 (18.82)	527 (20.75)
HLS-90-300	300 (11.81)	120000 (1062090)	500000 (112405)	4000 (899.24)	37000 (8317.97)	2,5	62 (136.71)	59 (130.1)	1006 (39.61)	559 (22.01)	577 (22.72)
HLS-90-400	400 (15.75)	160000 (1416120)	500000 (112405)	4000 (899.24)	37000 (8317.97)	1,5	71 (156.56)	68 (149.94)	1277 (50.28)	730 (28.74)	677 (26.65)

Rear flange recommended only for shock absorbers up to 300 mm stroke!

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	Weight	A	B	D	E	A2*
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
HLS-100-050	50 (1.97)	19000 (168165.2)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2,5 (2.5)	37,5 (82.67)	45 (99.21)	405 (15.94)	305 (12.01)	355 (13.98)	75 (2.95)	432 (17.01)
HLS-100-100	100 (3.94)	39000 (345181.2)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2,5 (2.5)	40 (88.19)	47,5 (104.72)	505 (19.88)	355 (13.98)	405 (15.94)	125 (4.92)	532 (20.94)
HLS-100-150	150 (5.91)	55000 (486794)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2,5 (2.5)	43 (94.8)	50,5 (111.34)	605 (23.82)	405 (15.94)	455 (17.91)	175 (6.89)	632 (24.88)
HLS-100-200	200 (7.87)	76000 (672660.8)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2,5 (2.5)	49 (108.03)	56,5 (124.56)	740 (29.13)	490 (19.29)	540 (21.26)	225 (8.86)	767 (30.2)
HLS-100-250	250 (9.84)	95000 (840826)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2,5 (2.5)	56 (123.46)	63,5 (140)	875 (34.45)	575 (22.64)	625 (24.61)	275 (10.83)	902 (35.51)
HLS-100-300	300 (11.81)	115000 (1017842)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2,5 (2.5)	62 (136.69)	69,5 (153.22)	1010 (39.76)	660 (25.98)	710 (27.95)	325 (12.8)	1092 (42.99)
HLS-100-350	350 (13.78)	135000 (1194858)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	2,5 (2.5)	67 (147.71)	74,5 (164.25)	1145 (45.08)	745 (29.33)	795 (31.3)	375 (14.76)	1227 (48.31)
HLS-100-400	400 (15.75)	155000 (1371874)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	1,5 (2.5)	74 (163.14)	81,5 (179.68)	1280 (50.39)	830 (32.68)	880 (34.65)	425 (16.73)	1362 (53.62)
HLS-100-450	450 (17.72)	170000 (1504636)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	1,5 (2.5)	79 (174.17)	86,5 (190.7)	1415 (55.71)	915 (36.02)	965 (37.99)	475 (18.7)	1497 (58.94)
HLS-100-500	500 (19.69)	190000 (1681652)	455000 (102288.1)	3800 (854.27)	40000 (8992.36)	1,5 (2.5)	85 (187.4)	92,5 (203.93)	1550 (61.02)	1000 (39.37)	1050 (41.34)	525 (20.67)	1632 (64.25)
HLS-100-600	600 (23.62)	230000 (2035684)	455000 (102288.1)	3800 (854.27)	46000 (10341.21)	1,5 (2.5)	92,5 (203.93)	100 (220.47)	1820 (71.65)	1170 (46.06)	1220 (48.03)	625 (24.61)	1902 (74.88)

FV

FH

Protection Bellow

Rear flange recommended only for shock absorbers up to 300 mm stroke!

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	A	B	C
	mm (inch)	Nm (in lbs)	N (lbs)	min. N (min. lbs)	max. N (max. lbs)	°	FV / FH kg (lbs)	mm (inch)	mm (inch)	mm (inch)
HLS-110-114	114 (4.49)	90000 (796572)	900000 (202328.1)	3800 (854.27)	40000 (20232.81)	2,5 (2.5)	45 (99.21)	529 (20.83)	365 (14.37)	235 (9.25)
HLS-110-250	250 (9.84)	100000 (885080)	500000 (112404.5)	3800 (854.27)	40000 (22480.9)	2,5 (2.5)	60 (132.28)	875 (34.45)	575 (22.64)	528 (20.79)
HLS-110-300	300 (11.81)	120000 (1062096)	500000 (112404.5)	3800 (854.27)	40000 (26977.08)	2,5 (2.5)	65 (143.3)	1010 (39.76)	660 (25.98)	577 (22.72)
HLS-110-400	400 (15.75)	220000 (1947176)	700000 (157366.3)	3800 (854.27)	40000 (49457.98)	1,5 (1.5)	80 (176.37)	1280 (50.39)	830 (32.68)	728 (28.66)
HLS-110-500	500 (19.69)	280000 (2478224)	700000 (157366.3)	3800 (854.27)	40000 (62946.52)	1,5 (1.5)	90 (198.42)	1550 (61.02)	1000 (39.37)	828 (32.6)
HLS-110-600	600 (23.62)	335000 (2965018)	700000 (157366.3)	3800 (854.27)	46000 (75311.02)	1,5 (1.5)	97 (213.85)	1820 (71.65)	1170 (46.06)	928 (36.54)

RFH

FH

FV

Rear flange recommended only for shock absorbers up to 300 mm stroke!

DIMENSIONS

	Stroke	Energy/Stroke	max. Counterforce	Piston return force		max. Angular Tolerance	Weight	A	B	C
	mm	Nm	N	min. N	max. N	°	FV / FH kg	mm	mm	mm
HLS-160-200	200 (7.87)	162000 (1433829.6)	950000 (213568.55)	15000 (3372.14)	70000 (36419.06)	2	145 (319.68)	800 (31.5)	548 (21.57)	400 (15.75)
HLS-160-400	400 (15.75)	324000 (2867659.2)	950000 (213568.55)	15000 (3372.14)	70000 (72838.12)	1,5	205 (451.96)	1400 (55.12)	948 (37.32)	600 (23.62)
HLS-160-600	600 (23.62)	486000 (4301488.8)	950000 (213568.55)	15000 (3372.14)	70000 (109257.17)	1	265 (584.23)	2000 (78.74)	1348 (53.07)	800 (31.5)
HLS-160-800	800 (31.5)	648000 (5735318.4)	950000 (213568.55)	15000 (3372.14)	70000 (145676.23)	1	325 (716.51)	2600 (102.36)	1748 (68.82)	1000 (39.37)

WES

Damping medium	High-viscosity elastomer
Energy absorption	Max. 1.000.000 Nm
	Max. 8850800 in lbs
Surface protection	Pressure tube zinc plated / Housing painted
Deceleration	Progressive, customer specific
Temperature	-10ºC - +60ºC (14ºF - +140ºF)
RoHS compliant	Directive 2002/95/EG
Applications	Sluices, Flight simulators, Metal industry

Operating Principle

Shock absorbers and springs of series WES have been developed based on the principle of the hydrostatic compression of visco-elastic fluids. Two characteristics are taken advantage of: compressibility and viscosity - this means that in a product the dual function of a shock absorber and a spring can be used or each function can be used separately.

Shock absorber:
The weight is cushioned by the fluid friction in the throttling port of the piston head and/or in the annular clearance between piston and reservoir.

Spring:
The spring effect is generated by the compressibility of the visco-elastic fluid, which can amount to up to 15% on volume.

Resetting of the piston rod is effected by the slackening of the compressed visco-elastic fluid.

A FALLING MASS

Example

m = 5000 kg
H = 0,2 m
S_k = 0,105 m
X = 5/h
n = 1

Formulae & Calculation

$W_k = m \cdot g \cdot H = 9{,}81$ kNm

$W_A = m \cdot g \cdot S_k = 5{,}16$ kNm

$W_{kg} = W_k + W_A = 14{,}97$ kNm

$W_{kg/h} = W_{kg} \cdot X = 74{,}85$ kNm/h

WES-1 / WES-5

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}(0{,}03\,V_e + 0{,}24)}} + 1{,}36 - 1{,}17 \right) = 70 \text{ mm}$$

WES-6 / WES-8

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}(0{,}027\,V_e + 0{,}22)}} + 1{,}83 - 1{,}35 \right)$$

$$F_{Ge} = \left[\left(\frac{F_{Gmax} - F_{Gmin}}{S_k} \right) x\, S_e + F_{Gmin} \right] (0{,}1\,V_e + 0{,}8) = 261 \text{ kN}$$

Selection

WES-5-25-105

B LOAD AGAINST SOLID STOP WITHOUT PROPELLING FORCE

C1 LOAD AGAINST SOLID STOP WITH PROPELLING FORCE

Example

m = 200 kg
v = 1,5 m/s
F = 2.000 N
S_k = 0,022 m
X = 10/h
n = 1

Formulae & Calculation

$$W_k = \frac{m \cdot v^2}{2} = 0{,}225 \text{ kNm}$$

with propelling force

$W_A = F \cdot S_k = 0{,}044$ kNm

$W_{kg} = (W_k + W_A) : n = 0{,}27$ kNm

$W_{kg/h} = W_{kg} \cdot X = 2{,}7$ kNm/h

$v_e = v$

WES-1 / WES-5

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}(0{,}03\,V_e + 0{,}24)}} + 1{,}36 - 1{,}17 \right) = 16 \text{ mm}$$

WES-6 / WES-8

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}(0{,}027\,V_e + 0{,}22)}} + 1{,}83 - 1{,}35 \right)$$

$$F_{Ge} = \left[\left(\frac{F_{Gmax} - F_{Gmin}}{S_k} \right) x\, S_e + F_{Gmin} \right] (0{,}1\,V_e + 0{,}8) = 22{,}1 \text{ kN}$$

Selection

WES-1-35

J LOAD AGAINST SOLID STOP WITH SHOCK ABSORBERS

Example

m = 10.000 kg
v = 2,6 m/s
F = 4.000 N
X = 2/h
S_k = 0,2 m

Formulae & Calculation

$$W_k = \frac{m \cdot v^2}{2} : 2 = 16{,}9 \text{ kNm}$$

with propelling force

$W_A = F \cdot S_k = 0{,}8$ kNm

$W_{kg} = W_k + W_A = 17{,}7$ kNm

$W_{kg/h} = W_{kg} \cdot X = 35{,}4$ kNm/h

$v_e = v / 2 = 1{,}3$ m/s

WES-1 / WES-5

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}(0{,}03\,V_e + 0{,}24)}} + 1{,}36 - 1{,}17 \right)$$

WES-6 / WES-8

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}(0{,}027\,V_e + 0{,}22)}} + 1{,}83 - 1{,}35 \right) = 159 \text{ mm}$$

$$F_{Ge} = \left[\left(\frac{F_{Gmax} - F_{Gmin}}{S_k} \right) x\, S_e + F_{Gmin} \right] (0{,}1\,V_e + 0{,}8) = 129 \text{ kN}$$

Selection

WES-6-25-200

K LOAD AGAINST LOAD WITH ONE SHOCK ABSORBER

Example

m1 = 20.000 kg
v1 = 1,7 m/s
m2 = 30.000 kg
v2 = 1,7 m/s
F = 20.000 N
X = 2/h
S_k = 0,4 m

Formulae & Calculation

$$W_k = \frac{(m1 \cdot m2) \cdot (v1 + v2)^2}{2\,(m1 + m2)} = 69{,}4 \text{ kNm}$$

with propelling force

$$W_A = F \cdot S_k = 8 \text{ kNm}$$

$$W_{kg} = W_k + W_A = 77{,}4 \text{ kNm}$$

$$W_{kg/h} = W_{kg} \cdot X = 154{,}8 \text{ Nm/h}$$

$$v_e = v1 + v2 = 3{,}4 \text{ m/s}$$

WES-1 / WES-5

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}\,(0{,}03\,V_e + 0{,}24)}} + 1{,}36 - 1{,}17 \right)$$

WES-6 / WES-8

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}\,(0{,}027\,V_e + 0{,}22)}} + 1{,}83 - 1{,}35 \right) = 291 \text{ mm}$$

$$F_{Ge} = \left[\left(\frac{F_{Gmax} - F_{Gmin}}{S_k} \right) x\, S_e + F_{Gmin} \right] (0{,}1\,V_e + 0{,}8) = 316 \text{ kN}$$

Selection

WES-8-100-400

L LOAD AGAINST LOAD WITH SHOCK ABSORBERS

Example

m1 = 5.000 kg
v1 = 1,2 m/s
m2 = 10.000 kg
v2 = 1,5 m/s
X = 2/h
S_k = 0,2 m

Formulae & Calculation

$$W_k = \frac{(m1 \cdot m2) \cdot (v1 + v2)^2}{4\,(m1 + m2)} = 6{,}1 \text{ kNm}$$

with propelling force

$$W_A = F \cdot S_k$$

$$W_{kg} = W_k + W_A$$

$$W_{kg/h} = W_{kg} \cdot X = 12{,}2 \text{ kNm/h}$$

$$v_e = (v1 + v2) / 2 = 1{,}35 \text{ m/s}$$

WES-1 / WES-5

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}\,(0{,}03\,V_e + 0{,}24)}} + 1{,}36 - 1{,}17 \right)$$

WES-6 / WES-8

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}\,(0{,}027\,V_e + 0{,}22)}} + 1{,}83 - 1{,}35 \right) = 120 \text{ mm}$$

$$F_{Ge} = \left[\left(\frac{F_{Gmax} - F_{Gmin}}{S_k} \right) x\, S_e + F_{Gmin} \right] (0{,}1\,V_e + 0{,}8) = 59 \text{ kN}$$

Selection

WES-6-12-200

F LOAD ON INCLINE

Example

m = 35.000 kg
H = 0,3 m
α = 10°
S_k = 0,5
X = 2/h
n = 1

Formulae & Calculation

$$W_k = m \cdot g \cdot H = 103 \text{ kNm}$$

$$W_A = m \cdot g \cdot \sin\alpha \cdot S_k = 29{,}8 \text{ kNm}$$

$$W_{kg} = W_k + W_A = 132{,}8 \text{ kNm}$$

$$W_{kg/h} = W_{kg} \cdot X = 265{,}6 \text{ kNm/h}$$

$$v = v_e = \sqrt{2 \cdot g \cdot H}$$

WES-1 / WES-5

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}\,(0{,}03\,V_e + 0{,}24)}} + 1{,}36 - 1{,}17 \right)$$

WES-6 / WES-8

$$S_e = S_k \left(\sqrt{\frac{W_{kg}}{W_{kk}\,(0{,}027\,V_e + 0{,}22)}} + 1{,}83 - 1{,}35 \right) = 435 \text{ mm}$$

$$F_{Ge} = \left[\left(\frac{F_{Gmax} - F_{Gmin}}{S_k} \right) x\, S_e + F_{Gmin} \right] (0{,}1\,V_e + 0{,}8) = 371 \text{ kN}$$

Selection

WES-8-150-500

Online calculation (imperial / metric) at www.weforma.com

Pre-stressed elasto-fluid spring

$F = F0 + KS$

Pre-stressed elasto-fluid damper and spring

$F = F0 + KS + CV^x$
$x: 0,1 < x < 0,2$

Shock absorber without resetting

$F = CV^x$
$x: 0,1 < x < 0,4$

F0	Static prestrain
K	Static rigidity
S	Stroke
C: kN $(m/s)^x$	Velocity coefficient
V	Velocity
X	0.1 to 0.4

LEGEND

W_k	(kNm)	Kinetic energy
W_A	(kNm)	Propelling force energy
W_{kg}	(kNm)	Total energy / $W_k + W_A$
$W_{kg/h}$	(kNm/h)	Total energy per hour
W_{kk}	(kNm/h)	Energy absorption according to catalogue
m	(kg)	Mass
me	(kg)	Effective mass

v	(m/s)	Impact speed
v_e	(m/s)	Effective speed
X	(1/h)	Number of strokes per hour
S_k	(mm)	Stroke
S_e	(mm)	Effective stroke
F	(N)	Propelling force
H	(m)	Height

g	(m/s^2)	Accerelation due to gravity (9,81 m/s^2)
α	(°)	Angle
a	(m/s^2)	Acceleration/Deceleration
t	(s)	Deceleration time
$F_{G\,min}$	(kN)	Min counterforce according to catalogue
$F_{G\,max}$	(N)	Max counterforce according to catalogue
F_{Ge}	(N)	Effective counterforce

WES with Flange: F

WES with lock nuts: Standard

DIMENSIONS

	L1	L2	L3	L4	L5	L6	R1	Ø D1	D2	Ø D3	Ø D4	Ø D5	Ø D6	Ø D7
	mm (inch)													
WES-1-25	75 (2.95)	53 (2.09)	52 (2.05)	10 (0.39)	7 (0.28)	43 (1.69)	-	19 (0.75)	M25x1,5	20 (0.79)	38 (1.5)	57 (2.24)	41 (1.61)	7 (0.28)
WES-1-35	120 (4.72)	98 (3.86)	96 (3.78)	12 (0.47)	8 (0.31)	86 (3.39)	-	25 (0.98)	M35x1,5	32 (1.26)	52 (2.05)	80 (3.15)	60 (2.36)	9 (0.35)
WES-1-40	120 (4.72)	98 (3.86)	96 (3.78)	12 (0.47)	9 (0.35)	-	-	25 (0.98)	M40x1,5	32 (1.26)	56 (2.2)	-	-	-
WES-1-50-1	175 (6.89)	140 (5.51)	138 (5.43)	12 (0.47)	11 (0.43)	128 (5.04)	-	38 (1.5)	M50x1,5	45 (1.77)	70 (2.76)	90 (3.54)	70 (2.76)	9 (0.35)
WES-1-50-2	175 (6.89)	140 (5.51)	138 (5.43)	12 (0.47)	11 (0.43)	128 (5.04)	-	38 (1.5)	M50x1,5	45 (1.77)	70 (2.76)	106 (4.17)	85 (3.35)	11 (0.43)
WES-1-60	175 (6.89)	140 (5.51)	138 (5.43)	12 (0.47)	11 (0.43)	-	-	38 (1.5)	M60x2	45 (1.77)	81 (3.19)	-	-	-
WES-1-75	213 (8.39)	168 (6.61)	158 (6.22)	10 (0.39)	13 (0.51)	158 (6.22)	130 (5.12)	60 (2.36)	M75x2	72 (2.83)	98 (3.86)	122 (4.8)	100 (3.94)	11 (0.43)
WES-1-90	270 (10.63)	210 (8.27)	130 (5.12)	12 (0.47)	16 (0.63)	130 (5.12)	150 (5.91)	74,5 (2.93)	M90x2	90 (3.54)	120 (4.72)	150 (5.91)	120 (4.72)	13 (0.51)
WES-1-110	337 (13.27)	257 (10.12)	145 (5.71)	14 (0.55)	19 (0.75)	145 (5.71)	350 (13.78)	90 (3.54)	M110x2	110 (4.33)	145 (5.71)	175 (6.89)	143 (5.63)	18 (0.71)

PERFORMANCE

	Thread	Stroke (HB)	Energy absorption		Counterforce		V
		mm (inch)	kNm (lbf ft)	kNm / h (lbf ft / h)	FG min kN (FG min lbf)	FG max kN (FG max lbf)	max m/s (max ft/s)
WES-1-25	M 25x1,5	12 (0.47)	0,1 (74)	2,5 (1844)	6 (1349)	11 (2473)	2 (6.56)
WES-1-35	M 35x1,5	22 (0.87)	0,43 (317)	10,75 (7929)	14 (3147)	27 (6070)	4 (13.12)
WES-1-40	M 40x1,5	22 (0.87)	0,43 (317)	10,75 (7929)	14 (3147)	27 (6070)	5 (16.4)
WES-1-50-1 / WES-1-50-2	M 50x1,5	35 (1.38)	1,5 (1106)	37,5 (27659)	28 (6295)	60 (13489)	5 (16.4)
WES-1-60	M 60x2	35 (1.38)	1,5 (1106)	37,5 (27659)	28 (6295)	60 (13489)	5 (16.4)
WES-1-75	M 75x2	45 (1.77)	3,4 (2508)	85 (62693)	45 (10116)	100 (22481)	5 (16.4)
WES-1-90	M 90x2	60 (2.36)	7 (5163)	175 (129073)	90 (20233)	150 (33721)	5 (16.4)
WES-1-110	M 110x2	80 (3.15)	14 (10326)	350 (258147)	130 (29225)	230 (51706)	5 (16.4)

DIMENSIONS

	A	B	C	D	E	F	G	Ø H	Ø J	Ø K	Ø N
	mm (inch)										
WES-5-25-105	415 (16.34)	295 (11.61)	140 (5.51)	20 (0.79)	15 (0.59)	135 (5.31)	105 (4.13)	116 (4.57)	87 (3.43)	120 (4.72)	14 (0.55)
WES-5-50-120	500 (19.69)	350 (13.78)	175 (6.89)	25 (0.98)	30 (1.18)	155 (6.1)	125 (4.92)	142 (5.59)	115 (4.53)	138 (5.43)	15 (0.59)
WES-5-75-140	520 (20.47)	345 (13.58)	205 (8.07)	30 (1.18)	35 (1.38)	175 (6.89)	140 (5.51)	160 (6.3)	132 (5.2)	158 (6.22)	18 (0.71)
WES-5-100-160	585 (23.03)	385 (15.16)	235 (9.25)	35 (1.38)	40 (1.57)	215 (8.46)	170 (6.69)	180 (7.09)	153 (6.02)	185 (7.28)	22 (0.87)
WES-5-100-180	670 (26.38)	445 (17.52)	265 (10.43)	40 (1.57)	45 (1.77)	250 (9.84)	195 (7.68)	215 (8.46)	182 (7.17)	220 (8.66)	26 (1.02)

PERFORMANCE

	Stroke (HB)	Energy absorption		Counterforce		V	Weight
	mm (inch)	kNm (lbf ft)	kNm / h (lbf ft / h)	FG min kN (FG min lbf)	FG max kN (FG max lbf)	max m/s (max ft/s)	kg
WES-5-25-105	105 (4.13)	25 (18439)	475 (350342)	167 (37543)	310 (69691)	2 (6.56)	25 (55)
WES-5-50-120	120 (4.72)	50 (36878)	950 (700684)	310 (69691)	450 (101164)	4 (13.12)	40 (88)
WES-5-75-140	140 (5.51)	75 (55317)	1425 (1051026)	400 (89924)	700 (157366)	5 (16.4)	45 (99)
WES-5-100-160	160 (6.3)	100 (73756)	1900 (1401368)	470 (105660)	820 (184343)	5 (16.4)	73 (161)
WES-5-100-180	180 (7.09)	150 (110634)	2850 (2102052)	640 (143878)	1100 (247290)	5 (16.4)	117 (258)

WES-6

DIMENSIONS

	A	B	C	D	E	F	G	H	Ø J	Ø K	Ø L	Ø M	N
	mm (inch)												
WES-6-6-150	410 (16.14)	231 (9.09)	179 (7.05)	19 (0.75)	0 (0)	10 (0.39)	90 (3.54)	70 (2.76)	50 (1.97)	90 (3.54)	38 (1.5)	50 (1.97)	9 (0.35)
WES-6-12-150	480 (18.9)	285 (11.22)	195 (7.68)	18 (0.71)	15 (0.59)	12 (0.47)	110 (4.33)	85 (3.35)	75 (2.95)	90 (3.54)	57 (2.24)	80 (3.15)	11 (0.43)
WES-6-12-200	530 (20.87)	285 (11.22)	245 (9.65)	18 (0.71)	15 (0.59)	12 (0.47)	110 (4.33)	85 (3.35)	75 (2.95)	90 (3.54)	57 (2.24)	80 (3.15)	11 (0.43)
WES-6-25-200	620 (24.41)	370 (14.57)	250 (9.84)	20 (0.79)	18 (0.71)	12 (0.47)	135 (5.31)	105 (4.13)	90 (3.54)	110 (4.33)	72 (2.83)	100 (3.94)	14 (0.55)
WES-6-25-270	690 (27.17)	370 (14.57)	320 (12.6)	20 (0.79)	18 (0.71)	12 (0.47)	175 (6.89)	105 (4.13)	90 (3.54)	110 (4.33)	72 (2.83)	100 (3.94)	14 (0.55)
WES-6-50-275	855 (33.66)	520 (20.47)	335 (13.19)	25 (0.98)	20 (0.79)	15 (0.59)	175 (6.89)	140 (5.51)	110 (4.33)	150 (5.91)	87 (3.43)	120 (4.72)	18 (0.71)
WES-6-50-400	980 (38.58)	520 (20.47)	460 (18.11)	25 (0.98)	20 (0.79)	15 (0.59)	175 (6.89)	140 (5.51)	110 (4.33)	150 (5.91)	87 (3.43)	120 (4.72)	18 (0.71)
WES-6-100-400	1370 (53.94)	910 (35.83)	460 (18.11)	25 (0.98)	20 (0.79)	15 (0.59)	175 (6.89)	140 (5.51)	110 (4.33)	150 (5.91)	87 (3.43)	120 (4.72)	18 (0.71)
WES-6-100-600	1570 (61.81)	910 (35.83)	660 (25.98)	25 (0.98)	20 (0.79)	15 (0.59)	175 (6.89)	140 (5.51)	110 (4.33)	150 (5.91)	87 (3.43)	120 (4.72)	18 (0.71)
WES-6-150-800	2640 (103.94)	1780 (70.08)	860 (33.86)	25 (0.98)	20 (0.79)	15 (0.59)	175 (6.89)	140 (5.51)	110 (4.33)	150 (5.91)	87 (3.43)	120 (4.72)	18 (0.71)

PERFORMANCE

	Stroke (HB)	Energy absorption		Counterforce		V	Weight
	mm (inch)	kNm (lbf ft)	kNm / h (lbf ft / h)	FG min kN (FG min lbf)	FG max kN (FG max lbf)	max m/s (max ft/s)	kg (lbs)
WES-6-6-150	150 (5.91)	6 (4425)	60 (44254)	25 (5620)	50 (11240)	3 (9.84)	4,2 (9)
WES-6-12-150	150 (5.91)	12 (8851)	120 (88507)	66 (14837)	100 (22481)	3 (9.84)	11 (24)
WES-6-12-200	200 (7.87)	12 (8851)	120 (88507)	42 (9442)	78 (17535)	3 (9.84)	11 (24)
WES-6-25-200	200 (7.87)	25 (18439)	250 (184391)	95 (21357)	150 (33721)	3 (9.84)	20 (44)
WES-6-25-270	270 (10.63)	25 (18439)	250 (184391)	66 (14837)	112 (25179)	3 (9.84)	25 (55)
WES-6-50-275	275 (10.83)	50 (36878)	500 (368781)	118 (26527)	230 (51706)	3 (9.84)	40 (88)
WES-6-50-400	400 (15.75)	50 (36878)	500 (368781)	75 (16861)	150 (33721)	3 (9.84)	40 (88)
WES-6-100-400	400 (15.75)	100 (73756)	1000 (737562)	175 (39342)	320 (71939)	3 (9.84)	65 (143)
WES-6-100-600	600 (23.62)	100 (73756)	1000 (737562)	85 (19109)	230 (51706)	3 (9.84)	65 (143)
WES-6-150-800	800 (31,50)	150 (110634)	1500 (1106343)	80 (17985)	250 (56202)	3 (9.84)	115 (254)

DIMENSIONS

	A	B	C	D	E	F	G	H	Ø J	Ø K	Ø L	Ø M	N
	mm (inch)												
WES-8-100-400	1120 (44.09)	660 (25.98)	460 (18.11)	25 (0.98)	20 (0.79)	15 (0.59)	175 (6.89)	140 (5.51)	130 (5.12)	150 (5.91)	110 (4.33)	140 (5.51)	18 (0.71)
WES-8-150-500	1350 (53.15)	775 (30.51)	575 (22.64)	30 (1.18)	25 (0.98)	20 (0.79)	215 (8.46)	170 (6.69)	140 (5.51)	185 (7.28)	120 (4.72)	150 (5.91)	22 (0.87)
WES-8-220-400	1258 (49.53)	783 (30.83)	475 (18.7)	30 (1.18)	25 (0.98)	20 (0.79)	215 (8.46)	170 (6.69)	140 (5.51)	185 (7.28)	120 (4.72)	150 (5.91)	22 (0.87)
WES-8-250-650	1750 (68.9)	1025 (40.35)	725 (28.54)	30 (1.18)	25 (0.98)	20 (0.79)	215 (8.46)	170 (6.69)	155 (6.1)	185 (7.28)	135 (5.31)	170 (6.69)	22 (0.87)
WES-8-400-850	2185 (86.02)	1250 (49.21)	935 (36.81)	35 (1.38)	25 (0.98)	25 (0.98)	265 (10.43)	210 (8.27)	175 (6.89)	235 (9.25)	150 (5.91)	190 (7.48)	27 (1.06)
WES-8-600-1050	2555 (100.59)	1420 (55.91)	1135 (44.69)	35 (1.38)	25 (0.98)	25 (0.98)	265 (10.43)	210 (8.27)	200 (7.87)	235 (9.25)	175 (6.89)	215 (8.46)	27 (1.06)
WES-8-800-1200	2935 (115.55)	1630 (64.17)	1305 (51.38)	40 (1.57)	35 (1.38)	30 (1.18)	300 (11.81)	240 (9.45)	220 (8.66)	270 (10.63)	190 (7.48)	235 (9.25)	30 (1.18)
WES-8-1000-1300	3225 (126.97)	1820 (71.65)	1405 (55.31)	40 (1.57)	35 (1.38)	30 (1.18)	300 (11.81)	240 (9.45)	230 (9.06)	270 (10.63)	205 (8.07)	248 (9.76)	30 (1.18)

PERFORMANCE

	Stroke (HB)	Energy absorption		Counterforce		V	Weight
	mm (inch)	kNm (lbf ft)	kNm / h (lbf ft / h)	FG min kN (FG min lbf)	FG max kN (FG max lbf)	max m/s (max ft/s)	kg (lbs)
WES-8-100-400	400 (15.75)	100 (73756)	1000 (737562)	190 (42714)	310 (69691)	3 (9.84)	63 (139)
WES-8-150-500	500 (19.69)	150 (110634)	1500 (1106343)	200 (44962)	380 (85427)	3 (9.84)	90 (198)
WES-8-220-400	400 (15.75)	220 (162264)	2200 (1622637)	380 (85427)	685 (153994)	3 (9.84)	100 (220)
WES-8-250-650	650 (25.59)	250 (184391)	2500 (1843905)	270 (60698)	490 (110156)	3 (9.84)	135 (298)
WES-8-400-850	850 (33.46)	400 (295025)	4000 (2950240)	330 (74187)	600 (134885)	3 (9.84)	218 (481)
WES-8-600-1050	1050 (41.34)	600 (442537)	6000 (4425360)	370 (83179)	740 (166359)	3 (9.84)	295 (650)
WES-8-800-1200	1200 (47.24)	800 (590050)	8000 (5900480)	430 (96668)	860 (193336)	3 (9.84)	420 (926)
WES-8-1000-1300	1300 (51.18)	1000 (737562)	10000 (7375600)	500 (112404)	1000 (224809)	3 (9.84)	470 (1036)

WES-F

- Very small construction size
- Good reproducibility of characteristics
- Simple assembly
- No adjustment

OPERATING PRINCIPLE

Elasto-Fluid springs of production series WES-F take advantage of the compressibility of the pre-stressed Elasto-Fluid.

If an Elasto-Fluid spring is loaded with an axial force F, the piston rod and/or the piston penetrates into the pre-stressed Elasto-Fluid. This further increases the pressure. If force F is reduced, the Elasto-Fluid relaxes and returns the piston / piston rod to the starting position.

This technique is used among other things in the rolling mills of cold and hot steel mills. The upper roller inc. attachments is borne by 2 and/ or 4 Elasto-Fluid springs of production series WES-F. With the help of hydraulics, the upper roller can be lowered to the desired roll gap. The Elasto-Fluid springs retract accordingly and hold the upper roller in position. If the upper roller is unburdened, the Elasto-Fluid relaxes and returns the roller to the starting position.

As an additional function, the Elasto-Fluid springs can serve as pistons and be used for roller bending. Elasto-Fluid springs of production series WES-F are based on standard designs, modified and adapted to meet customer requirements.

STROKE CALCULATION

S = A - Dmin + Reserve (reserve)

S = Dmax - Dmin + W + Reserve (reserve)

RETURN FORCE CALCULATION

F_R = F/n x 1,1

S	(mm)	Stroke
A	(mm)	Axis center distance
F	(kN)	Weight of the total upper roll construction
W	(mm)	Roll gap
n		Numbers of springs per roll stand
F_R	(kN)	Return force per sping
D_{max}	(mm)	Roll fully extended
D_{min}	(mm)	Roll total compressed

Information required from the customer

A	Housing bottom		Example
A1	Standard filling port		A1
	Connection thread	N	
	Depth	O	
A2	Filling port + Tapped bores		
A3	Filling port + Tapping		

B	Housing design		
B1	Housing (standard)		
B2	Housing with connection		B2
	Connection height	L3	210
	Connection diameter	ØH	62

C	Housing front design		
C1	Standard		C1
C2	Seals for hydraulic connection		
	Connectin heigth	L5	
	Connection diameter	ØK	

D	Piston rod design		
D1	Standard		D1
D2	Additional use as hydraulic cylinder	ØR	
D3	Additional use as hydraulic cylinder		

E	Surface protection for the housing		
E1	No protection (standard)		E1
E2	Zinc plated		
E3	Hard chrome plated		

Final Design Data - for confirmation by Weforma

	Dimensions		Example
	Total length (mm)	L1	350
	Housing length (mm)	L2	320
	Housing diameter (mm)	ØG	70
TD	Technical data		
	Return force (kN)	FR	15
	Max. Counterforce (FG kN)	FG	23
	Stroke (mm)	S	30

WES-G

Damping medium	Elasto-Fluid
High extension force	up to 6400 N up to 1438 lbs
Extended Life Time	Housing: zinc plated Piston rod: stainless steel
RoHS compliant	Directive 2002/95/EG
Applications	Heavy flaps, covers and lids Extension to gas spring WM-G28

DIMENSIONS

	GW	A	A1	B	C	C1	ØD	ØE	ØF
		mm (inch)							
WES-G28-20-K0G0	M6	132 (5.2)	-	-	7 (0.28)	-	28 (1.1)	6 (0.24)	-
WES-G28-40-K0G0	M6	197 (7.76)	-	-	7 (0.28)	-	28 (1.1)	6 (0.24)	-
WES-G28-60-K0G0	M6	262 (10.31)	-	-	7 (0.28)	-	28 (1.1)	6 (0.24)	-
WES-G28-80-K0G0	M6	327 (12.87)	-	-	7 (0.28)	-	28 (1.1)	6 (0.24)	-
WES-G28-20-K1G1	-	-	155,5 (6.12)	10 (0.39)	-	19 (0.75)	28 (1.1)	6 (0.24)	8,1 (0.32)
WES-G28-40-K1G1	-	-	220,5 (8.68)	10 (0.39)	-	19 (0.75)	28 (1.1)	6 (0.24)	8,1 (0.32)
WES-G28-60-K1G1	-	-	285,5 (11.24)	10 (0.39)	-	19 (0.75)	28 (1.1)	6 (0.24)	8,1 (0.32)
WES-G28-80-K1G1	-	-	350,5 (13.8)	10 (0.39)	-	19 (0.75)	28 (1.1)	6 (0.24)	8,1 (0.32)

PERFORMANCE

	Stroke	Force		Initial force	Progression
	mm	N min	N max	max. N	
WES-G28-20	20 (0.79)	2200 (494.58)	6400 (1438.78)	3600 (809.32)	100 - 400 %
WES-G28-40	40 (1.57)	2200 (494.58)	6400 (1438.78)	3600 (809.32)	100 - 400 %
WES-G28-60	60 (2.36)	2200 (494.58)	6400 (1438.78)	3600 (809.32)	100 - 400 %
WES-G28-80	80 (3.15)	2200 (494.58)	6400 (1438.78)	3600 (809.32)	100 - 400 %

KEEP HANDS ON GRAB BAR
KEEP HANDS ON GRAB BAR

Shock Absorbers for Elevators and Inclined Lifts

Overrun Buffers for Elevators ▪ Page 206

ADS-26-SR / ADS-50-SR

Surface protection	Housing painted, Piston rod chrome plated
EC-Type Examination	Directive: 95/16/EC; EN 81-20/50
Security	Limit switch DIN EN 50047 (IP66)
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC
Applications	Passenger and load elevators

CERTIFICATE OF CONFORMITY

OPERATING PRINCIPLE

ADS shock absorbers for elevators are closed hydraulic components which operate on the basis of oil displacement.

When the piston rod is pushed into the cylinder, the piston displaces the oil through different sized holes which are progressively closed off.

As a result the speed of the piston rod proportionally decreases to the stroke covered. The displaced oil from the volume of the piston rod is compensated by an accumulator of nitrogen, which is above the oil. During the stroke the pressure in the nitrogen is increased. When the mass is released the piston rod is returned by the pressure of the nitrogen / return spring. A plastic stop cap reduces the impact noise. The ADS-50 shock absorbers are filled by a valve with nitrogen at 5 bar.

An oil sight glass allows easy visual check of the oil level.

For monitoring of the extended piston rod a limit switch according DIN-EN 50047 is built in. Depending on the type of ADS the limit switch is pushed in by the protection tube (ADS-SR) or by the contact pin (ADS-ST).

ADS-26-SR

ADS-50-SR

DIMENSIONS

	A	B	Ø D	Ø E
	mm (inch)			
ADS-26-080-SR	286 (11.26)	90 (3.54)	18 (0.71)	70 (2.76)
ADS-26-175-SR	502 (19.76)	90 (3.54)	18 (0.71)	70 (2.76)
ADS-50-080-SR	316 (12.44)	140 (5.51)	36 (1.42)	130 (5.12)
ADS-50-120-SR	396 (15.59)	140 (5.51)	36 (1.42)	130 (5.12)
ADS-50-175-SR	506 (19.92)	140 (5.51)	36 (1.42)	130 (5.12)
ADS-50-225-SR	615 (24.21)	140 (5.51)	36 (1.42)	130 (5.12)
ADS-50-275-SR	724 (28.5)	140 (5.51)	36 (1.42)	130 (5.12)
ADS-50-425-SR	1050 (41.34)	140 (5.51)	36 (1.42)	130 (5.12)

PERFORMANCE

	Stroke	Mass		Nominal Speed	Weight
	mm (inch)	min. kg (lbs)	max kg (lbs)	standard m/s (ft/s)	kg (lbs)
ADS-26-080-SR	80 (3.15)	300 (662)	1200 (2646)	1 (3.28)	3,2 (7)
ADS-26-175-SR	175 (6.89)	300 (662)	2100 (4631)	1,6 (5.25)	5,9 (13)
ADS-50-080-SR	80 (3.15)	450 (992)	2800 (6174)	1 (3.28)	12 (26)
ADS-50-120-SR	120 (4.72)	450 (992)	2800 (6174)	1,3 (4.27)	14 (31)
ADS-50-175-SR	175 (6.89)	450 (992)	3800 (8379)	1,6 (5.25)	16 (35)
ADS-50-225-SR	225 (8.86)	450 (992)	3800 (8379)	1,8 (5.91)	18 (40)
ADS-50-275-SR	275 (10.83)	450 (992)	4000 (8820)	2 (6.56)	20,5 (45)
ADS-50-425-SR	425 (16.73)	450 (992)	4500 (9923)	2,5 (8.2)	27,5 (61)

ADS-26-ST / ADS-50-ST

Surface protection	Housing painted, Piston rod chrome plated
EC-Type Examination	Directive: 95/16/EC; EN 81-20/50
Security	Limit switch DIN EN 50047 (IP66)
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC
Applications	Passenger and load elevators

CERTIFICATE OF CONFORMITY

OPERATING PRINCIPLE

ADS shock absorbers for elevators are closed hydraulic components which operate on the basis of oil displacement.

When the piston rod is pushed into the cylinder, the piston displaces the oil through different sized holes which are progressively closed off.

As a result the speed of the piston rod proportionally decreases to the stroke covered. The displaced oil from the volume of the piston rod is compensated by an accumulator of nitrogen, which is above the oil. During the stroke the pressure in the nitrogen is increased. When the mass is released the piston rod is returned by the pressure of the nitrogen / return spring. A plastic stop cap reduces the impact noise. The ADS-50 shock absorbers are filled by a valve with nitrogen at 5 bar.

An oil sight glass allows easy visual check of the oil level.

For monitoring of the extended piston rod a limit switch according DIN-EN 50047 is built in. Depending on the type of ADS the limit switch is pushed in by the protection tube (ADS-SR) or by the contact pin (ADS-ST).

ADS-26-ST

ADS-50-ST

DIMENSIONS

	A	B	Ø D
	mm (inch)	mm (inch)	mm (inch)
ADS-26-080-ST	286 (11.26)	90 (3.54)	18 (0.71)
ADS-26-175-ST	502 (19.76)	90 (3.54)	18 (0.71)
ADS-50-080-ST	308 (12.13)	140 (5.51)	36 (1.42)
ADS-50-120-ST	388 (15.28)	140 (5.51)	36 (1.42)
ADS-50-175-ST	497 (19.57)	140 (5.51)	36 (1.42)
ADS-50-225-ST	607 (23.9)	140 (5.51)	36 (1.42)
ADS-50-275-ST	716 (28.19)	140 (5.51)	36 (1.42)
ADS-50-425-ST	1042 (41.02)	140 (5.51)	36 (1.42)

PERFORMANCE

	Stroke	Mass		Nominal Speed	Weight
	mm (inch)	min. kg (lbs)	max kg (lbs)	standard m/s (ft/s)	kg (lbs)
ADS-26-080-ST	80 (3.15)	300 (662)	1200 (2646)	1 (3.28)	3,4 (7)
ADS-26-175-ST	175 (6.89)	300 (662)	2100 (4631)	1,6 (5.25)	6,2 (14)
ADS-50-080-ST	80 (3.15)	450 (992)	2800 (6174)	1 (3.28)	12 (26)
ADS-50-120-ST	120 (4.72)	450 (992)	2800 (6174)	1,3 (4.27)	14 (31)
ADS-50-175-ST	175 (6.89)	450 (992)	3800 (8379)	1,6 (5.25)	16 (35)
ADS-50-225-ST	225 (8.86)	450 (992)	3800 (8379)	1,8 (5.91)	18 (40)
ADS-50-275-ST	275 (10.83)	450 (992)	4000 (8820)	2 (6.56)	20,5 (45)
ADS-50-425-ST	425 (16.73)	450 (992)	4500 (9923)	2,5 (8.2)	27,5 (61)

SAD

Applications
Inclined lifts, cable cars

Closed system
No external tank required

Surface Protection
Housing: zinc plated / Piston rod: chrome plated

Security
Limit switch according DIN EN 50047

Temperature
-30ºC - +50ºC (-22ºF - 122ºF)

TÜV EC type-examination
DIN EN 81-22

RoHS - conform
Directive 2002/95/EC

TÜV-A-AT-1-17-0497-EUPU-1

TÜV AUSTRIA

EU-Baumusterprüfbescheinigung

Certificate of EU-Type Examination

α°: 15 - 75

α°: 0 - 10

DIMENSIONS

A	B	D	E	F	G	H	J	K	L	M
mm (inch)										
1187 (46.73)	930 (36.61)	70 (2.76)	49 (1.93)	40 (1.57)	20 (0.79)	207 (8.15)	122 (4.8)	170 (6.69)	125 (4.92)	22 (0.87)

PERFORMANCE

Stroke	Mountain station CB		Valley station CT		max. Impact speed	Mass (kg) at inclination angle (°)		
mm (inch)	mm (inch)	α°	mm (inch)	α°	m/s (ft/s)	α°	min. kg (min. lbs)	max. kg (max. lbs)
200 (7.87)	465 (18.31)	0	465 (18.31)	0	1,3 (4.27)	0	1574 (3471)	15740 (34707)
	465 (18.31)	5	465 (18.31)	5		5	1309 (2886)	13091 (28866)
	465 (18.31)	10	465 (18.31)	10		10	1122 (2474)	11217 (24733)
	525 (20.67)	15	385 (15.16)	15		15	983 (2168)	9831 (21677)
	525 (20.67)	20	385 (15.16)	20		20	877 (1934)	8773 (19344)
	325 (12.8)	25	185 (7.28)	25		25	794 (1751)	7944 (17517)
	325 (12.8)	30	185 (7.28)	30		30	728 (1605)	7284 (16061)
	325 (12.8)	35	185 (7.28)	35		35	675 (1488)	6750 (14884)
	325 (12.8)	40	185 (7.28)	40		40	631 (1391)	6315 (13925)
	325 (12.8)	45	185 (7.28)	45		45	596 (1314)	5958 (13137)
	325 (12.8)	50	185 (7.28)	50		50	566 (1248)	5664 (12489)
	325 (12.8)	55	185 (7.28)	55		55	542 (1195)	5424 (11960)
	325 (12.8)	60	185 (7.28)	60		60	523 (1153)	5228 (11528)
	325 (12.8)	65	185 (7.28)	65		65	507 (1118)	5070 (11179)
	325 (12.8)	70	185 (7.28)	70		70	495 (1091)	4947 (10908)
	325 (12.8)	75	185 (7.28)	75		75	485 (1069)	4854 (10703)

SAS-50-550

Mountain station

Valley station

α°: 15 - 75

α°: 0 - 10

DIMENSIONS

A	B	D	E	F	G	H	J	K	L	M
mm (inch)										
1867 (73.5)	1260 (49.61)	70 (2.76)	49 (1.93)	40 (1.57)	20 (0.79)	207 (8.15)	122 (4.8)	170 (6.69)	125 (4.92)	22 (0.87)

PERFORMANCE

Stroke	Mountain station CB		Valley station CT		max. Impact speed	Mass (kg) at inclination angle (°)		
mm (inch)	mm (inch)	α°	mm (inch)	α°	m/s (ft/s)	α°	min. kg (min. lbs)	max. kg (max. lbs)
550 (21.65)	630 (24.8)	0	630 (24.8)	0	2,3 (7.55)	0	1376 (3034)	13762 (30345)
	630 (24.8)	5	630 (24.8)	5		5	1168 (2576)	11684 (25763)
	630 (24.8)	10	630 (24.8)	10		10	1016 (2240)	10162 (22407)
	525 (20.67)	15	385 (15.16)	15		15	901 (1987)	9007 (19860)
	525 (20.67)	20	385 (15.16)	20		20	811 (1788)	8106 (17874)
	349 (13.74)	25	209 (8.23)	25		25	739 (1629)	7391 (16297)
	349 (13.74)	30	209 (8.23)	30		30	681 (1502)	6813 (15023)
	349 (13.74)	35	209 (8.23)	35		35	634 (1398)	6342 (13984)
	349 (13.74)	40	209 (8.23)	40		40	595 (1312)	5954 (13129)
	349 (13.74)	45	209 (8.23)	45		45	563 (1241)	5635 (12425)
	349 (13.74)	50	209 (8.23)	50		50	537 (1184)	5370 (11841)
	349 (13.74)	55	209 (8.23)	55		55	515 (1136)	5152 (11360)
	349 (13.74)	60	209 (8.23)	60		60	497 (1096)	4974 (10968)
	349 (13.74)	65	209 (8.23)	65		65	483 (1065)	4831 (10652)
	349 (13.74)	70	209 (8.23)	70		70	472 (1041)	4718 (10403)
	349 (13.74)	75	209 (8.23)	75		75	463 (1021)	4633 (10216)

α°: 15 - 75

α°: 0 - 10

DIMENSIONS

A	B	D	E	F	G	H	J	K	L	M
mm (inch)										
2867 (112.87)	1860 (73.23)	70 (2.76)	49 (1.93)	40 (1.57)	20 (0.79)	207 (8.15)	122 (4.8)	170 (6.69)	125 (4.92)	22 (0.87)

PERFORMANCE

Stroke	Mountain station CB		Valley station CT		max. Impact speed	Mass (kg) at inclination angle (°)		
mm (inch)	mm (inch)	α°	mm (inch)	α°	m/s (ft/s)	α°	min. kg (min. lbs)	max. kg (max. lbs)
950 (37.40)	930 (36.61)	0	930 (36.61)	0	3,0 (9.84)	0	1120 (2470)	11200 (24696)
	930 (36.61)	5	930 (36.61)	5		5	949 (2093)	9488 (20921)
	930 (36.61)	10	930 (36.61)	10		10	824 (1817)	8238 (18165)
	635 (25)	15	495 (19.49)	15		15	729 (1607)	7292 (16079)
	635 (25)	20	495 (19.49)	20		20	656 (1446)	6556 (14456)
	459 (18.07)	25	319 (12.56)	25		25	597 (1316)	5973 (13170)
	459 (18.07)	30	319 (12.56)	30		30	550 (1213)	5502 (12132)
	459 (18.07)	35	319 (12.56)	35		35	512 (1129)	5119 (11287)
	459 (18.07)	40	319 (12.56)	40		40	480 (1058)	4804 (10593)
	459 (18.07)	45	319 (12.56)	45		45	454 (1001)	4545 (10022)
	459 (18.07)	50	319 (12.56)	50		50	433 (955)	4330 (9548)
	459 (18.07)	55	319 (12.56)	55		55	415 (915)	4154 (9160)
	459 (18.07)	60	319 (12.56)	60		60	401 (884)	4009 (8840)
	459 (18.07)	65	319 (12.56)	65		65	389 (858)	3893 (8584)
	459 (18.07)	70	319 (12.56)	70		70	380 (838)	3802 (8383)
	459 (18.07)	75	319 (12.56)	75		75	373 (822)	3733 (8231)

Deceleration Cylinders
Speed Controls

WM-Z 0,1 - 1,0 / WM-ZL

WM-Z 0,1 - 0,4

Flexibility relating to stroke, deceleration characteristic
Self-adjusting within performance range

Surface protection	Housing: Zinc Plated Piston rod: stainless steel
Mounting	Any position Recommandation: Vertical with the piston rod down
Extended Life Time	Special Seals + Oils
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC

WM-Z / ZG 0,6 - 1,0

Flexibility relating to stroke, deceleration characteristic

Surface protection	Housing: zinc plated
Mounting	WM-Z: vertical +/- 30° WM-ZG: any position Recommandation: vertical with the piston rod down
Extended Life Time	Special Seals + Oils
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC

WM-ZL

Without free travel	Mounting any position
Deceleration	Adjustable, optional: non adjustable Push, Pull , Push + Pull
Surface protection	Housing: zinc plated
Extended Life Time	Special Seals + Oils
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC

DIMENSIONS

	Stroke	Max. compression force	v max* -2	v max* -4	v max* -6	A	B	C	øD	øE	GW	Weight
	mm (inch)	N (lbs)	m/s (ft/s)	m/s (ft/s)	m/s (ft/s)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		kg (lbs)
WM-Z 0,1-10	10 (0.39)	25 (5.62)	0,4 (25)	0,25 (1.31)	0,1 (0.82)	37 (0.33)	27 (1.46)	3 (1.06)	5 (0.12)	1,5 (0.2)	M1,4	0,004 (0.01)
WM-Z 0,1-20	20 (0.79)	25 (5.62)	0,4 (25)	0,25 (1.31)	0,1 (0.82)	57 (0.33)	37 (2.24)	3 (1.46)	5 (0.12)	1,5 (0.2)	M1,4	0,005 (0.01)
WM-Z 0,1-30	30 (1.18)	25 (5.62)	0,4 (25)	0,25 (1.31)	0,1 (0.82)	77 (0.33)	47 (3.03)	3 (1.85)	5 (0.12)	1,5 (0.2)	M1,4	0,006 (0.01)
WM-Z 0,1-40	40 (1.57)	25 (5.62)	0,4 (25)	0,25 (1.31)	0,1 (0.82)	97 (0.33)	57 (3.82)	3 (2.24)	5 (0.12)	1,5 (0.2)	M1,4	0,007 (0.02)
WM-Z 0,2-10	10 (0.39)	60 (13.49)	0,4 (60)	0,25 (1.31)	0,1 (0.82)	41 (0.33)	31 (1.61)	3,5 (1.22)	6 (0.14)	2 (0.24)	M2	0,004 (0.01)
WM-Z 0,2-20	20 (0.79)	60 (13.49)	0,4 (60)	0,25 (1.31)	0,1 (0.82)	61 (0.33)	41 (2.4)	3,5 (1.61)	6 (0.14)	2 (0.24)	M2	0,006 (0.01)
WM-Z 0,2-30	30 (1.18)	60 (13.49)	0,4 (60)	0,25 (1.31)	0,1 (0.82)	81 (0.33)	51 (3.19)	3,5 (2.01)	6 (0.14)	2 (0.24)	M2	0,008 (0.02)
WM-Z 0,2-40	40 (1.57)	60 (13.49)	0,4 (60)	0,25 (1.31)	0,1 (0.82)	101 (0.33)	61 (3.98)	3,5 (2.4)	6 (0.14)	2 (0.24)	M2	0,01 (0.02)
WM-Z 0,4-10	10 (0.39)	115 (25.85)	0,4 (115)	0,25 (1.31)	0,1 (0.82)	41 (0.33)	31 (1.61)	3,5 (1.22)	8 (0.14)	2 (0.31)	M2	0,006 (0.01)
WM-Z 0,4-20	20 (0.79)	115 (25.85)	0,4 (115)	0,25 (1.31)	0,1 (0.82)	61 (0.33)	41 (2.4)	3,5 (1.61)	8 (0.14)	2 (0.31)	M2	0,008 (0.02)
WM-Z 0,4-30	30 (1.18)	115 (25.85)	0,4 (115)	0,25 (1.31)	0,1 (0.82)	81 (0.33)	51 (3.19)	3,5 (2.01)	8 (0.14)	2 (0.31)	M2	0,01 (0.02)
WM-Z 0,4-40	40 (1.57)	115 (25.85)	0,4 (115)	0,25 (1.31)	0,1 (0.82)	101 (0.33)	61 (3.98)	3,5 (2.4)	8 (0.14)	2 (0.31)	M2	0,012 (0.03)

*Max. compression force at max. speed

1

4

Ordering Information

WM-Z 0,2-20-6-K3G1-C

WM	Weforma
Z	Deceleration cylinder (Standard)
0,2	Size
20	Stroke
-6	Hardeness Level
K3	Piston rod mounting: female rod clevis
G1	Housing mounting: male rod clevis
C	Type of deceleration: C=push and pull

3

		GW	D	øE	F	G	H	I	J	SW
			mm (inch)							
1	WM-Z 0,1	M1,4	5 (0.2)	3 (0.12)	3 (0.12)	1,6 (0.06)	2,4 (0.09)	1,5 (0.06)	-	-
	WM-Z 0,2	M2	6 (0.24)	4 (0.16)	4 (0.16)	2,1 (0.08)	3 (0.12)	2 (0.08)	-	-
	WM-Z 0,4	M2	6 (0.24)	4 (0.16)	4 (0.16)	2,1 (0.08)	3 (0.12)	2 (0.08)	-	-
3	WM-Z 0,1	M1,4	7,5 (0.3)	1,5 (0.06)	3,5 (0.14)	4,4 (0.17)	2,5 (0.1)	9 (0.35)	-	-
	WM-Z 0,2	M2	8 (0.31)	2 (0.08)	4 (0.16)	5,4 (0.21)	3,1 (0.12)	10 (0.39)	-	-
	WM-Z 0,4	M2	8 (0.31)	2 (0.08)	4 (0.16)	5,4 (0.21)	3,1 (0.12)	10 (0.39)	-	-
4	WM-Z 0,1	M1,4	-	-	-	-	-	-	-	-
	WM-Z 0,2	M2	16 (0.63)	4,5 (0.18)	4,5 (0.18)	4,5 (0.18)	3,6 (0.14)	2 (0.08)	3,8 (0.15)	4 (0.16)
	WM-Z 0,4	M2	16 (0.63)	4,5 (0.18)	4,5 (0.18)	4,5 (0.18)	3,6 (0.14)	2 (0.08)	3,8 (0.15)	4 (0.16)

20% of the stroke without deceleration for the standard models (WM-Z).
Design ZG without return stroke with volume compensation of piston rod through floating piston. Return force, see table
Installation position: any position

PERFORMANCE

	Stroke	Max. compression force	Standard version		Version		Return force					Weight	Weight
			A	B	A	B		C	ø D	ø E	GW	(Z)	(ZG)
	mm (inch)	N (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	max. N (lbs)	mm (inch)	mm (inch)	mm (inch)		kg (lbs)	kg (lbs
WM-Z 0,6-10	10 (0.39)	150 (33.72)	51 (2.01)	41 (1.61)	70 (2.76)	60 (2.36)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,025 (0.06)	0,03 (0.07)
WM-Z 0,6-20	20 (0.79)	150 (33.72)	71 (2.8)	51 (2.01)	90 (3.54)	70 (2.76)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,03 (0.07)	0,035 (0.08)
WM-Z 0,6-30	30 (1.18)	150 (33.72)	91 (3.58)	61 (2.4)	110 (4.33)	80 (3.15)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,035 (0.08)	0,04 (0.09)
WM-Z 0,6-40	40 (1.57)	150 (33.72)	113 (4.45)	73 (2.87)	132 (5.2)	92 (3.62)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,041 (0.09)	0,046 (0.1)
WM-Z 0,6-50	50 (1.97)	150 (33.72)	135 (5.31)	85 (3.35)	155 (6.1)	105 (4.13)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,047 (0.1)	0,052 (0.11)
WM-Z 0,6-60	60 (2.36)	150 (33.72)	156 (6.14)	96 (3.78)	177 (6.97)	117 (4.61)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,053 (0.12)	0,058 (0.13)
WM-Z 0,6-70	70 (2.76)	150 (33.72)	178 (7.01)	108 (4.25)	200 (7.87)	130 (5.12)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,058 (0.13)	0,063 (0.14)
WM-Z 0,6-80	80 (3.15)	150 (33.72)	200 (7.87)	120 (4.72)	223 (8.78)	143 (5.63)	25 (5.62)	5 (0.2)	10 (0.39)	3 (0.12)	M 3,5	0,064 (0.14)	0,069 (0.15)
WM-Z 0,8-10	10 (0.39)	200 (44.96)	55 (2.17)	45 (1.77)	65 (2.56)	55 (2.17)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,03 (0.07)	0,035 (0.08)
WM-Z 0,8-20	20 (0.79)	200 (44.96)	75 (2.95)	55 (2.17)	88 (3.46)	68 (2.68)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,035 (0.08)	0,04 (0.09)
WM-Z 0,8-30	30 (1.18)	200 (44.96)	95 (3.74)	65 (2.56)	111 (4.37)	81 (3.19)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,04 (0.09)	0,045 (0.1)
WM-Z 0,8-40	40 (1.57)	200 (44.96)	115 (4.53)	75 (2.95)	134 (5.28)	94 (3.7)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,046 (0.1)	0,051 (0.11)
WM-Z 0,8-50	50 (1.97)	200 (44.96)	135 (5.31)	85 (3.35)	158 (6.22)	108 (4.25)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,052 (0.11)	0,057 (0.13)
WM-Z 0,8-60	60 (2.36)	200 (44.96)	155 (6.1)	95 (3.74)	181 (7.13)	121 (4.76)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,058 (0.13)	0,063 (0.14)
WM-Z 0,8-70	70 (2.76)	200 (44.96)	175 (6.89)	105 (4.13)	204 (8.03)	134 (5.28)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,063 (0.14)	0,068 (0.15)
WM-Z 0,8-80	80 (3.15)	200 (44.96)	195 (7.68)	115 (4.53)	227 (8.94)	147 (5.79)	25 (5.62)	5 (0.2)	12 (0.47)	4 (0.16)	M 3,5	0,069 (0.15)	0,074 (0.16)
WM-Z 1-050	50 (1.97)	1500 (337.21)	160 (6.3)	110 (4.33)	210 (8.27)	160 (6.3)	50 (11.24)	8 (0.31)	15 (0.59)	6 (0.24)	M 5	0,1 (0.22)	0,13 (0.29)
WM-Z 1-100	100 (3.94)	1500 (337.21)	260 (10.24)	160 (6.3)	310 (12.2)	210 (8.27)	50 (11.24)	8 (0.31)	15 (0.59)	6 (0.24)	M 5	0,133 (0.29)	0,165 (0.36)
WM-Z 1-150	150 (5.91)	1500 (337.21)	360 (14.17)	210 (8.27)	420 (16.54)	270 (10.63)	50 (11.24)	8 (0.31)	15 (0.59)	6 (0.24)	M 5	0,171 (0.38)	0,2 (0.44)
WM-Z 1-200	200 (7.87)	1500 (337.21)	470 (18.5)	270 (10.63)	520 (20.47)	320 (12.6)	50 (11.24)	8 (0.31)	15 (0.59)	6 (0.24)	M 5	0,232 (0.51)	0,27 (0.6)

20% of the stroke without deceleration for the standard models (WM-Z).
Design ZG without return stroke with volume compensation of piston rod through floating piston. Return force, see table
Installation position: any position

PERFORMANCE

	Stroke	Max. compression force	Standard version		Version		Return force					Weight	Weight
			A	B	A	B		C	ø D	ø E	GW	(Z)	(ZG)
	mm (inch)	N (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	max. N (max. lbs)	mm (inch)	mm (inch)	mm (inch)		kg (lbs)	kg (lbs)
WM-Z 2-050	50 (1.97)	3100 (696.91)	160 (6.3)	110 (4.33)	240 (9.45)	190 (7.48)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	0,3 (0.66)	0,5 (1.1)
WM-Z 2-100	100 (3.94)	3100 (696.91)	260 (10.24)	160 (6.3)	340 (13.39)	240 (9.45)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	0,4 (0.88)	0,6 (1.32)
WM-Z 2-150	150 (5.91)	3100 (696.91)	360 (14.17)	210 (8.27)	440 (17.32)	290 (11.42)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	0,5 (1.1)	0,7 (1.54)
WM-Z 2-200	200 (7.87)	3100 (696.91)	460 (18.11)	260 (10.24)	540 (21.26)	340 (13.39)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	0,6 (1.32)	0,8 (1.76)
WM-Z 2-250	250 (9.84)	3100 (696.91)	560 (22.05)	310 (12.2)	640 (25.2)	390 (15.35)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	0,7 (1.54)	0,9 (1.98)
WM-Z 2-300	300 (11.81)	2800 (629.47)	660 (25.98)	360 (14.17)	740 (29.13)	440 (17.32)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	0,8 (1.76)	1 (2.2)
WM-Z 2-350	350 (13.78)	2300 (517.06)	760 (29.92)	410 (16.14)	840 (33.07)	490 (19.29)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	0,9 (1.98)	1 (2.2)
WM-Z 2-400	400 (15.75)	1800 (404.66)	860 (33.86)	460 (18.11)	940 (37.01)	540 (21.26)	100 (22.48)	10 (0.39)	28 (1.1)	8 (0.31)	M 8	1 (2.2)	1,2 (2.65)
WM-Z 3-100	100 (3.94)	10000 (2248.09)	275 (10.83)	175 (6.89)	355 (13.98)	255 (10.04)	200 (44.96)	10 (0.39)	35 (1.38)	14 (0.55)	M 10	0,8 (1.76)	1,4 (3.09)
WM-Z 3-200	200 (7.87)	10000 (2248.09)	475 (18.7)	275 (10.83)	555 (21.85)	355 (13.98)	200 (44.96)	10 (0.39)	35 (1.38)	14 (0.55)	M 10	1,1 (2.43)	1,7 (3.75)
WM-Z 3-300	300 (11.81)	10000 (2248.09)	675 (26.57)	375 (14.76)	755 (29.72)	455 (17.91)	200 (44.96)	10 (0.39)	35 (1.38)	14 (0.55)	M 10	1,4 (3.09)	2 (4.41)
WM-Z 3-400	400 (15.75)	10000 (2248.09)	875 (34.45)	475 (18.7)	955 (37.6)	555 (21.85)	200 (44.96)	10 (0.39)	35 (1.38)	14 (0.55)	M 10	1,7 (3.75)	2,2 (4.85)
WM-Z 3-500	500 (19.69)	8500 (1910.88)	1075 (42.32)	575 (22.64)	1155 (45.47)	655 (25.79)	200 (44.96)	10 (0.39)	35 (1.38)	14 (0.55)	M 10	2 (4.41)	2,3 (5.07)
WM-Z 5-100	100 (3.94)	24000 (5395.42)	320 (12.6)	220 (8.66)	420 (16.54)	320 (12.6)	250 (56.2)	25 (0.98)	50 (1.97)	18 (0.71)	M 16	2,4 (5.29)	3,1 (6.83)
WM-Z 5-200	200 (7.87)	24000 (5395.42)	520 (20.47)	320 (12.6)	620 (24.41)	420 (16.54)	250 (56.2)	25 (0.98)	50 (1.97)	18 (0.71)	M 16	3,2 (7.05)	4 (8.82)
WM-Z 5-300	300 (11.81)	24000 (5395.42)	720 (28.35)	420 (16.54)	820 (32.28)	520 (20.47)	250 (56.2)	25 (0.98)	50 (1.97)	18 (0.71)	M 16	4 (8.82)	4,7 (10.36)
WM-Z 5-400	400 (15.75)	24000 (5395.42)	920 (36.22)	520 (20.47)	1020 (40.16)	620 (24.41)	250 (56.2)	25 (0.98)	50 (1.97)	18 (0.71)	M 16	4,7 (10.36)	5,5 (12.13)
WM-Z 5-500	500 (19.69)	22000 (4945.8)	1120 (44.09)	620 (24.41)	1220 (48.03)	720 (28.35)	250 (56.2)	25 (0.98)	50 (1.97)	18 (0.71)	M 16	5,5 (12.13)	6,2 (13.67)
WM-Z 7-100	100 (3.94)	52000 (11690.07)	320 (12.6)	220 (8.66)	470 (18.5)	370 (14.57)	300 (67.44)	35 (1.38)	70 (2.76)	28 (1.1)	M 24x2	4,5 (9.92)	6,6 (14.55)
WM-Z 7-200	200 (7.87)	52000 (11690.07)	520 (20.47)	320 (12.6)	670 (26.38)	470 (18.5)	300 (67.44)	35 (1.38)	70 (2.76)	28 (1.1)	M 24x2	5,8 (12.79)	7,9 (17.42)
WM-Z 7-300	300 (11.81)	52000 (11690.07)	720 (28.35)	420 (16.54)	870 (34.25)	570 (22.44)	300 (67.44)	35 (1.38)	70 (2.76)	28 (1.1)	M 24x2	7,1 (15.65)	9,2 (20.28)
WM-Z 7-400	400 (15.75)	52000 (11690.07)	920 (36.22)	520 (20.47)	1070 (42.13)	670 (26.38)	300 (67.44)	35 (1.38)	70 (2.76)	28 (1.1)	M 24x2	8,4 (18.52)	10,4 (22.93)
WM-Z 7-500	500 (19.69)	50000 (11240.45)	1120 (44.09)	620 (24.41)	1270 (50)	770 (30.31)	300 (67.44)	35 (1.38)	70 (2.76)	28 (1.1)	M 24x2	9,6 (21.16)	11,7 (25.79)

1 Male rod clevis

2 Angle joint

	Force
WM-Z 0,6 / 0,8	250 N
WM-Z 1	500 N
WM-Z 2	1.230 N
WM-Z 3	1.900 N
WM-Z 5	3.200 N

3 Female rod clevis (DIN 71752)

4 Spherical end bearing
(DIN 648, Series K / Series E on enquiry)

5 Clevis flange
only use in combination with spherical end bearing (4)

DIMENSIONS

		GW	D	ØE	F	G	H	I	J	SW	K	L	M	N	O	P
			mm (inch)													
1	WM-Z 0,6	M 3,5	12 (0.47)	8 (0.31)	8 (0.31)	4,1 (0.16)	4 (0.16)	4 (0.16)	-	-	-	-	-	-	-	-
	WM-Z 0,8	M 3,5	12 (0.47)	8 (0.31)	8 (0.31)	4,1 (0.16)	4 (0.16)	4 (0.16)	-	-	-	-	-	-	-	-
	WM-Z 1	M 5	16 (0.63)	12 (0.47)	12 (0.47)	6,1 (0.24)	8 (0.31)	6 (0.24)	-	-	-	-	-	-	-	-
	WM-Z 2	M 8	19 (0.75)	14 (0.55)	12 (0.47)	8,1 (0.32)	10 (0.39)	7 (0.28)	-	-	-	-	-	-	-	-
	WM-Z 3	M 10	27 (1.06)	18 (0.71)	12 (0.47)	8,1 (0.32)	10 (0.39)	9 (0.35)	-	-	-	-	-	-	-	-
2	WM-Z 0,6	M 3,5	22 (0.87)	8 (0.31)	9 (0.35)	10,2 (0.4)	13 (0.51)	18 (0.71)	-	7 (0.28)	-	-	-	-	-	-
	WM-Z 0,8	M 3,5	22 (0.87)	8 (0.31)	9 (0.35)	10,2 (0.4)	13 (0.51)	18 (0.71)	-	7 (0.28)	-	-	-	-	-	-
	WM-Z 1	M 5	22 (0.87)	8 (0.31)	9 (0.35)	10 (0.39)	13 (0.51)	18 (0.71)	-	7 (0.28)	-	-	-	-	-	-
	WM-Z 2	M 8	30 (1.18)	13 (0.51)	13 (0.51)	16 (0.63)	20 (0.79)	18 (0.71)	-	11 (0.43)	-	-	-	-	-	-
	WM-Z 3	M 10	35 (1.38)	16 (0.63)	16 (0.63)	19 (0.75)	24 (0.94)	18 (0.71)	-	13 (0.51)	-	-	-	-	-	-
	WM-Z 5	M 16	45 (1.77)	22 (0.87)	20 (0.79)	28 (1.1)	30 (1.18)	18 (0.71)	-	16 (0.63)	-	-	-	-	-	-
3	WM-Z 0,6	M 3,5	16 (0.63)	4 (0.16)	8 (0.31)	8 (0.31)	4 (0.16)	21 (0.83)	-	-	-	-	-	-	-	-
	WM-Z 0,8	M 3,5	16 (0.63)	4 (0.16)	8 (0.31)	8 (0.31)	4 (0.16)	21 (0.83)	-	-	-	-	-	-	-	-
	WM-Z 1	M 5	20 (0.79)	5 (0.2)	9 (0.35)	10 (0.39)	5 (0.2)	26 (1.02)	-	-	-	-	-	-	-	-
	WM-Z 2	M 8	32 (1.26)	8 (0.31)	16 (0.63)	16 (0.63)	8 (0.31)	42 (1.65)	-	-	-	-	-	-	-	-
	WM-Z 3	M 10	40 (1.57)	10 (0.39)	20 (0.79)	20 (0.79)	10 (0.39)	52 (2.05)	-	-	-	-	-	-	-	-
	WM-Z 5	M 16	64 (2.52)	16 (0.63)	32 (1.26)	32 (1.26)	16 (0.63)	83 (3.27)	-	-	-	-	-	-	-	-
	WM-Z 7	M 24 x 2	100 (3.94)	25 (0.98)	50 (1.97)	50 (1.97)	25 (0.98)	132 (5.2)	-	-	-	-	-	-	-	-
4	WM-Z 0,6	M 3,5	21 (0.83)	6,5 (0.26)	7 (0.28)	6 (0.24)	4,5 (0.18)	3 (0.12)	5 (0.2)	5,5 (0.22)	-	-	-	-	-	-
	WM-Z 0,8	M 3,5	21 (0.83)	6,5 (0.26)	7 (0.28)	6 (0.24)	4,5 (0.18)	3 (0.12)	5 (0.2)	5,5 (0.22)	-	-	-	-	-	-
	WM-Z 1	M 5	27 (1.06)	11 (0.43)	9 (0.35)	8 (0.31)	6 (0.24)	5 (0.2)	9 (0.35)	9 (0.35)	-	-	-	-	-	-
	WM-Z 2	M 8	36 (1.42)	16 (0.63)	12 (0.47)	12 (0.47)	9 (0.35)	8 (0.31)	12,5 (0.49)	13 (0.51)	-	-	-	-	-	-
	WM-Z 3	M 10	43 (1.69)	19 (0.75)	14 (0.55)	14 (0.55)	10,5 (0.41)	10 (0.39)	15 (0.59)	17 (0.67)	-	-	-	-	-	-
	WM-Z 5	M 16	64 (2.52)	27 (1.06)	21 (0.83)	21 (0.83)	15 (0.59)	16 (0.63)	20 (0.79)	22 (0.87)	-	-	-	-	-	-
	WM-Z 7	M 24 x 2	94 (3.7)	42 (1.65)	30 (1.18)	31 (1.22)	22 (0.87)	25 (0.98)	33,5 (1.32)	36 (1.42)	-	-	-	-	-	-
5	WM-Z 3	M 10	28 (1.1)	10 (0.39)	20 (0.79)	50 (1.97)	20 (0.79)	40 (1.57)	8,5 (0.33)	-	60 (2.36)	40 (1.57)	26 (1.02)	46 (1.81)	10 (0.39)	8 (0.31)
	WM-Z 5	M 16	38 (1.5)	16 (0.63)	28 (1.1)	60 (2.36)	26 (1.02)	55 (2.17)	11 (0.43)	-	75 (2.95)	55 (2.17)	30 (1.18)	55 (2.17)	15 (0.59)	10 (0.39)
	WM-Z 7	M 24 x 2	45 (1.77)	25 (0.98)	33 (1.3)	70 (2.76)	32 (1.26)	65 (2.56)	13 (0.51)	-	90 (3.54)	65 (2.56)	40 (1.57)	70 (2.76)	20 (0.79)	12 (0.47)

PERFORMANCE

	Stroke	Max. compres-sion force	Max. compression force (clevis mounting)	A	B	C	ø D	ø E	L	GW1	GW2	Weight
	mm (inch)	N (lbs)	N (lbs)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	GW	GW	kg (lbs)
WM-ZL 2-050	50 (1.97)	3100 (696.91)	3100 (696.91)	295 (11.61)	219 (8.62)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	0,7 (1.54)
WM-ZL 2-075	75 (2.95)	3100 (696.91)	3100 (696.91)	370 (14.57)	269 (10.59)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	0,8 (1.76)
WM-ZL 2-100	100 (3.94)	3100 (696.91)	3100 (696.91)	445 (17.52)	319 (12.56)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	0,9 (1.98)
WM-ZL 2-150	150 (5.91)	3100 (696.91)	3100 (696.91)	595 (23.43)	419 (16.5)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	1,2 (2.65)
WM-ZL 2-200	200 (7.87)	3100 (696.91)	3100 (696.91)	745 (29.33)	519 (20.43)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	1,5 (3.31)
WM-ZL 2-250	250 (9.84)	3100 (696.91)	3100 (696.91)	895 (35.24)	619 (24.37)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	1,7 (3.75)
WM-ZL 2-300	300 (11.81)	2800 (629.47)	3100 (696.91)	1035 (40.75)	719 (28.31)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	1,9 (4.19)
WM-ZL 2-350	350 (13.78)	2300 (517.06)	3100 (696.91)	1195 (47.05)	819 (32.24)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	2,2 (4.85)
WM-ZL 2-400	400 (15.75)	1800 (404.66)	3100 (696.91)	1345 (52.95)	919 (36.18)	10 (0.39)	28 (1.1)	8 (0.31)	16 (0.63)	M8	M20x1,5	2,5 (5.51)
WM-ZL 3-100	100 (3.94)	10000 (2248.09)	10000 (2248.09)	485 (19.09)	350 (13.78)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	2,3 (5.07)
WM-ZL-3-150	150 (5.91)	10000 (2248.09)	10000 (2248.09)	635 (25)	450 (17.72)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	2,6 (5.73)
WM-ZL 3-200	200 (7.87)	10000 (2248.09)	10000 (2248.09)	785 (30.91)	550 (21.65)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	3 (6.61)
WM-ZL 3-300	300 (11.81)	10000 (2248.09)	10000 (2248.09)	1085 (42.72)	750 (29.53)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	3,6 (7.94)
WM-ZL 3-400	400 (15.75)	10000 (2248.09)	10000 (2248.09)	1385 (54.53)	950 (37.4)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	4,2 (9.26)
WM-ZL 3-500	500 (19.69)	8500 (1910.88)	10000 (2248.09)	1685 (66.34)	1150 (45.28)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	5 (11.02)
WM-ZL 3-600	600 (23.62)	7200 (1618.62)	9000 (2023.28)	1985 (78.15)	1350 (53.15)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	5,9 (13.01)
WM-ZL 3-700	700 (27.56)	5000 (1124.05)	7000 (1573.66)	2285 (89.96)	1550 (61.02)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	6,8 (14.99)
WM-ZL 3-800	800 (31.5)	4000 (899.24)	5500 (1236.45)	2585 (101.77)	1750 (68.9)	10 (0.39)	35 (1.38)	14 (0.55)	25 (0.98)	M10	M25x1,5	7,4 (16.31)

Accessories Pages 106

WM-ZD / ZDK / ZE

Surface protection	Housing zinc plated
Extended life time	Special Seals + Oils
	Piston rod: hard-chrome plated
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC

WM-ZE

WM-ZE-M

Adjustment

OPERATING PRINCIPLE

WM-ZE 1. 2. with spring return

WM-ZE-M 1. 2. The piston rod is pulled out by a magnet

PERFORMANCE

	Stroke mm (inch)	Energy absorption Nm/HB (in lbs/HB)	Return spring force N (lbs)	Impact Speed m/s (ft/s)	A mm (inch)	B mm (inch)	Weight g (lbs)
WM-ZE 2-050	50 (1.97)	150 (1327.62)	35 (7.87)	0,1 - 4 (0,33 - 13,1)	201 (7.91)	125 (4.92)	0,5 (1.1)
WM-ZE 2-070	70 (2.76)	200 (1770.16)	35 (7.87)	0,1 - 4 (0,33 - 13,1)	271 (10.67)	175 (6.89)	0,6 (1.32)
WM-ZE 2-100	100 (3.94)	250 (2212.7)	40 (8.99)	0,1 - 4 (0,33 - 13,1)	351 (13.82)	225 (8.86)	0,7 (1.54)
WM-ZE 2-120	120 (4.72)	300 (2655.24)	40 (8.99)	0,1 - 4 (0,33 - 13,1)	371 (14.61)	225 (8.86)	0,7 (1.54)
WM-ZE-M 2-050	50 (1.97)	150 (1327.62)	35 (7.87)	0,1 - 4 (0,33 - 13,1)	215 (8.46)	125 (4.92)	0,5 (1.1)
WM-ZE-M 2-070	70 (2.76)	200 (1770.16)	35 (7.87)	0,1 - 4 (0,33 - 13,1)	285 (11.22)	175 (6.89)	0,6 (1.32)
WM-ZE-M 2-100	100 (3.94)	250 (2212.7)	40 (8.99)	0,1 - 4 (0,33 - 13,1)	365 (14.37)	225 (8.86)	0,7 (1.54)
WM-ZE-M 2-120	120 (4.72)	300 (2655.24)	40 (8.99)	0,1 - 4 (0,33 - 13,1)	385 (15.16)	225 (8.86)	0,7 (1.54)

WM-ZDK 2

WM-ZDK 3

OPERATING PRINCIPLE

Adjustment

WM-ZDK

1.

2.

Double-acting without spring return
As one piston rod travels in, the opposite rod travels out

PERFORMANCE

	Stroke	Energy absorption	Return spring force	Impact Speed	A	B	Weight
	mm (inch)	Nm/HB (in lbs/HB)	N (lbs)	m/s (ft/s)	mm (inch)	mm (inch)	g (lbs)
WM-ZDK 2-120	120 (4.72)	250 (2212.7)	0 (0)	0,1 - 4 (0.33 - 13.1)	410 (16.14)	237 (9.33)	0,7 (1.54)
WM-ZDK 3-060	60 (2.36)	1000 (8850.8)	0 (0)	0,1 - 4 (0.33 - 13.1)	260 (10.24)	149 (5.87)	0,85 (1.87)

WM-ZD

Adjustment

OPERATING PRINCIPLE

WM-ZD

1.

2.

Double-acting with spring return
As one piston rod travels in, the opposite rod remains out

PERFORMANCE

	Stroke	Energy absorption	Return spring force	Impact Speed	A	B	Weight
	mm (inch)	Nm/HB (in lbs/HB)	N (lbs)	m/s (ft/s)	mm (inch)	mm (inch)	g (lbs)
WM-ZD 2-050	50 (1.97)	150 (1327.62)	35 (7.87)	0,1 - 4 (0.33 - 13.1)	342 (13.46)	190 (7.48)	0,6 (1.32)
WM-ZD 2-070	70 (2.76)	200 (1770.16)	35 (7.87)	0,1 - 4 (0.33 - 13.1)	382 (15.04)	190 (7.48)	0,7 (1.54)
WM-ZD 2-100	100 (3.94)	250 (2212.7)	40 (8.99)	0,1 - 4 (0.33 - 13.1)	492 (19.37)	240 (9.45)	0,8 (1.76)
WM-ZD 2-120	120 (4.72)	250 (2212.7)	40 (8.99)	0,1 - 4 (0.33 - 13.1)	532 (20.94)	240 (9.45)	0,8 (1.76)

WV-M

Speed rates: 0,015 - 40 m/min

ProSurf	Long-life surface protection (p. 9)
Adjustment	Variable
Extended Life Time	Special Seals + Oils
	Piston rod: hardened stainless steel
Integrated End Stop	
Flats	
RoHS compliant	Directive 2002/95/EC

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

DIMENSIONS

	GW	A	B	C	Ø D	ØE (A)	ØE (AP)	ØE (AS)	F (A)	F (AP)	F (AS)	K	L	SW	SW 1
		mm (inch)													
WV-M 0,25	M 14x1	96 (3.78)	82 (3.23)	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 (0.16)	5 (0.2)	13 (0.51)	17 (0.67)
WV-M 0,35	M 16x1	96 (3.78)	82 (3.23)	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 (0.16)	6 (0.24)	14 (0.55)	19 (0.75)
WV-M 0,5x19	M 20x1	113 (4.45)	94 (3.7)	2,5 (0.1)	6 (0.24)	12 (0.47)	12 (0.47)	17 (0.67)	123 (4.84)	125 (4.92)	123 (4.84)	6 (0.24)	6 (0.24)	18 (0.71)	24 (0.94)
WV-M 1,0	M 24x1,5	141 (5.55)	114 (4.49)	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)	6 (0.24)	8 (0.31)	23 (0.91)	30 (1.18)
WV-M 1,0x40	M 24x1,5	178 (7.01)	136 (5.35)	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)	6 (0.24)	8 (0.31)	23 (0.91)	30 (1.18)
WV-M 0,25UC	9/16-18	96 (3.78)	82 (3.23)	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 (0.16)	5 (0.2)	13 (0.51)	17 (0.67)
WV-M 0,5x19U	3/4-16	113 (4.45)	94 (3.7)	2,5 (0.1)	6 (0.24)	12 (0.47)	12 (0.47)	17 (0.67)	123 (4.84)	125 (4.92)	123 (4.84)	6 (0.24)	6 (0.24)	18 (0.71)	24 (0.94)
WV-M 1,0U	1 - 12	141 (5.55)	114 (4.49)	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)	6 (0.24)	8 (0.31)	23 (0.91)	30 (1.18)
WV-M 1,0x40U	1-12	178 (7.01)	136 (5.35)	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)	6 (0.24)	8 (0.31)	23 (0.91)	30 (1.18)

PERFORMANCE

	Stroke	Speed force		Speed rates m / min (inch / min)				Return spring force		Weight
	mm (inch)	min. N (min. lbs)	max. N (max. lbs)	min. -1	max. -1	min. -2	max. -2	min. N (min. lbs)	max. N (max. lbs)	kg (lbs)
WV-M 0,25	14 (0.55)	20 (4.5)	500 (112.4)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	13 (2.92)	23 (5.17)	0,05 (0.11)
WV-M 0,35	14 (0.55)	20 (4.5)	700 (157.37)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	13 (2.92)	23 (5.17)	0,07 (0.15)
WV-M 0,5x19	19 (0.75)	25 (5.62)	1800 (404.66)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	12 (2.7)	23 (5.17)	0,14 (0.31)
WV-M 1,0	25 (0.98)	70 (15.74)	3600 (809.31)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	15 (3.37)	31 (6.97)	0,29 (0.64)
WV-M 1,0x40	40 (1.57)	80 (17.98)	3600 (809.31)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	11 (2.47)	20 (4.5)	0,39 (0.86)
WV-M 0,25UC	14 (0.55)	20 (4.5)	500 (112.4)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	13 (2.92)	23 (5.17)	0,05 (0.11)
WV-M 0,5x19U	19 (0.75)	25 (5.62)	1800 (404.66)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	12 (2.7)	23 (5.17)	0,14 (0.31)
WV-M 1,0U	25 (0.98)	70 (15.74)	3600 (809.31)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	15 (3.37)	31 (6.97)	0,29 (0.64)
WV-M 1,0x40U	40 (1.57)	80 (17.98)	3600 (809.31)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	11 (2.47)	20 (4.5)	0,39 (0.86)

WV-M 1,25

High feed force: 10.000 N
Speed rates: 0,015 - 40 m/min

Adjustment	Variable
Extended Life Time	Special Seals + Oils
	Piston rod: hardened stainless steel
	Housing: black finish
Integrated end stop	
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC

DIMENSIONS

	Thread	A	B	C	D	E
		mm (inch)				
WV-M 1,25x1	M33x1,5	231 (9.09)	198 (7.8)	25 (0.98)	5 (0.2)	163 (6.42)
WV-M 1,25x2	M33x1,5	281 (11.06)	223 (8.78)	50 (1.97)	5 (0.2)	188 (7.4)
WV-M 1,25x3	M33x1,5	331 (13.03)	248 (9.76)	75 (2.95)	5 (0.2)	213 (8.39)

PERFORMANCE

	Stroke	Speed force		Speed rates m / min (inch / min)				Return spring force		Weight
	mm (inch)	min. N (min. lbs)	max. N (max. lbs)	min. -1	max. -1	min. -2	max. -2	min. N (min. lbs)	max. N (max. lbs)	kg (lbs)
WV-M 1,25x1	25 (0.98)	100 (22.48)	10000 (2248.09)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	35 (7.87)	100 (22.48)	0,95 (2.09)
WV-M 1,25x2	50 (1.97)	100 (22.48)	10000 (2248.09)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	35 (7.87)	100 (22.48)	1,05 (2.31)
WV-M 1,25x3	75 (2.95)	100 (22.48)	10000 (2248.09)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	35 (7.87)	100 (22.48)	1,15 (2.54)

ACCESSOIRES

Lock nut

Code: S23012H

Square flange

Code: S23014H

Stop limit nut

Code: S23018H

GW	ø A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	ø F (mm)	G (mm)	ø H (mm)	ø I (mm)	J (mm)
M 33 x 1,5	38 (1.5)	6,5 (0.26)	45 (1.77)	32 (1.26)	12 (0.47)	6,6 (0.26)	60 (2.36)	38 (1.5)	33 (1.3)	35 (1.38)

WM-V

Speed rates: 0,015 - 40 m/min

Adjustment	Variable
Extended Life Time	Special Seals + Oils
	Piston rod: hardened stainless steel
	Housing: black finish
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/EC

DIMENSIONS

	A	B	C	D	øE (A)	F (A)	øE (AP)	F (AP)	øE (AS)	F (AS)	G	T	H	J
	mm (inch)													
WM-V 10	161 (6.34)	128 (5.04)	21 (0.83)	21,5 (0.85)	16 (0.63)	166 (6.54)	21 (0.83)	168 (6.61)	16 (0.63)	166 (6.54)	25,4 (1)	32 (1.26)	40 (1.57)	93 (3.66)
WM-V 20	202 (7.95)	157 (6.18)	33 (1.3)	19,1 (0.75)	16 (0.63)	207 (8.15)	21 (0.83)	209 (8.23)	16 (0.63)	207 (8.15)	25,4 (1)	32 (1.26)	40 (1.57)	122 (4.8)
WM-V 30	278 (10.94)	208 (8.19)	58 (2.28)	14,6 (0.57)	16 (0.63)	283 (11.14)	21 (0.83)	285 (11.22)	16 (0.63)	283 (11.14)	25,4 (1)	32 (1.26)	40 (1.57)	173 (6.81)
WM-V 40	351 (13.82)	256 (10.08)	83 (3.27)	14,6 (0.57)	16 (0.63)	356 (14.02)	21 (0.83)	358 (14.09)	16 (0.63)	356 (14.02)	25,4 (1)	50 (1.97)	40 (1.57)	221 (8.7)
WM-V 50	417 (16.42)	298 (11.73)	106 (4.17)	14,6 (0.57)	16 (0.63)	422 (16.61)	21 (0.83)	424 (16.69)	16 (0.63)	422 (16.61)	25,4 (1)	50 (1.97)	40 (1.57)	263 (10.35)
WM-V 60	524 (20.63)	381 (15)	131 (5.16)	14,6 (0.57)	16 (0.63)	529 (20.83)	21 (0.83)	531 (20.91)	16 (0.63)	529 (20.83)	25,4 (1)	50 (1.97)	40 (1.57)	-
WM-V 70	584 (22.99)	415 (16.34)	156 (6.14)	14,6 (0.57)	16 (0.63)	589 (23.19)	21 (0.83)	591 (23.27)	16 (0.63)	589 (23.19)	25,4 (1)	50 (1.97)	40 (1.57)	-

PERFORMANCE

	Stroke	Speed force		Speed rates m / min (inch / min)				Return spring force		Weight
	mm (inch)	min. N (min. lbs)	max. N (max. lbs)	min. -1	max. -1	min. -2	max. -2	min. N (min. lbs)	max. N (max. lbs)	kg (lbs)
WM-V 10	13 (0.51)	25 (5.62)	3700 (831.79)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	12 (2.7)	28 (6.29)	0,35 (0.77)
WM-V 20	25 (0.98)	25 (5.62)	3700 (831.79)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	12 (2.7)	28 (6.29)	0,45 (0.99)
WM-V 30	50 (1.97)	35 (7.87)	3700 (831.79)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	15 (3.37)	32 (7.19)	0,5 (1.1)
WM-V 40	75 (2.95)	45 (10.12)	3700 (831.79)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	15 (3.37)	32 (7.19)	0,65 (1.43)
WM-V 50	100 (3.94)	45 (10.12)	3700 (831.79)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	15 (3.37)	32 (7.19)	0,8 (1.76)
WM-V 60	125 (4.92)	45 (10.12)	3700 (831.79)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	16 (3.6)	40 (8.99)	0,97 (2.14)
WM-V 70	150 (5.91)	45 (10.12)	3700 (831.79)	12 (472.44)	40 (1574.8)	0,015 (0.59)	15 (590.55)	16 (3.6)	40 (8.99)	1,05 (2.31)

WM-VD 32

Precise adjustment in Push- and Pull direction
Continuous adjustment over the entire stroke

Deceleration	Double-acting
Surface protection	Housing: anodised aluminium
Extended life time	Piston rod: hard-chrome plated
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/E

Accessories Pages 115

PERFORMANCE

	Stroke	Pull	Push	Pull - Push	Speed rates	A1	A2	B	C	D	Weight
	mm (inch)	N max. (lbs max.)	N max. (lbs max.)	N min. (lbs min.)	m/min (ft./min)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	g (lbs)
WM-VD 32 - 050	50 (1.97)	2000 (449.62)	2000 (449.62)	40 (8.99)	0,015 - 40 (0.05 - 132)	225 (8.86)	250 (9.84)	175 (6.89)	190 (7.48)	140 (5.51)	370 (0.82)
WM-VD 32 - 075	75 (2.95)	2000 (449.62)	2000 (449.62)	40 (8.99)	0,015 - 40 (0.05 - 132)	275 (10.83)	300 (11.81)	200 (7.87)	235 (9.25)	165 (6.5)	420 (0.93)
WM-VD 32 - 100	100 (3.94)	2000 (449.62)	1700 (382.18)	40 (8.99)	0,015 - 40 (0.05 - 132)	325 (12.8)	350 (13.78)	225 (8.86)	290 (11.42)	190 (7.48)	470 (1.04)
WM-VD 32 - 150	150 (5.91)	2000 (449.62)	1400 (314.73)	40 (8.99)	0,015 - 40 (0.05 - 132)	425 (16.73)	450 (17.72)	275 (10.83)	390 (15.35)	240 (9.45)	570 (1.26)
WM-VD 32 - 200	200 (7.87)	2000 (449.62)	1000 (224.81)	40 (8.99)	0,015 - 40 (0.05 - 132)	525 (20.67)	550 (21.65)	325 (12.8)	490 (19.29)	290 (11.42)	670 (1.48)
WM-VD 32 - 250	250 (9.84)	2000 (449.62)	600 (134.89)	40 (8.99)	0,015 - 40 (0.05 - 132)	625 (24.61)	650 (25.59)	375 (14.76)	590 (23.23)	340 (13.39)	770 (1.7)

Ordering Information

WM-VD 32-100-K2G4-C

WM	Weforma
VD	Speed control, double-acting
32	Size
100	Stroke
K2	Piston rod - Angle joint
G4	Housing - Spherical end bearing
C	Type of deceleration: A=push, B=pull, C=push and pull

WM-VD 36

Precise adjustment in Push- and Pull direction
Continuous adjustment over the entire stroke

Deceleration	Double-acting
Surface protection	Housing: anodised aluminium
Extended life time	Piston rod: hard-chrome plated
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/E

Ordering Information

WM-VD 36-100-K2G4-C

WM	Weforma	**K2**	Piston rod - Angle joint
VD	Speed control, double-acting	**G4**	Housing - Spherical end bearing
36	Size	**C**	Type of deceleration: A=push, B=pull, C=push and pull
100	Stroke		

Accessories Pages 115

PERFORMANCE

	Stroke	Pull	Push	Pull - Push	Speed rates	A	B	C	D	Weight
	mm (inch)	N max. (lbs max.)	N max. (lbs max.)	N min. (lbs min.)	m/min (ft/min)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	g (lbs)
WM-VD 36 - 050	50 (1.97)	4000 (899.24)	4000 (899.24)	60 (13.49)	0,015 - 40 (0.05 - 132)	250 (9.84)	200 (7.87)	240 (9.45)	190 (7.48)	420 (0.93)
WM-VD 36 - 100	100 (3.94)	4000 (899.24)	3500 (786.84)	60 (13.49)	0,015 - 40 (0.05 - 132)	350 (13.78)	250 (9.84)	340 (13.39)	240 (9.45)	470 (1.04)
WM-VD 36 - 150	150 (5.91)	4000 (899.24)	2000 (449.62)	60 (13.49)	0,015 - 40 (0.05 - 132)	450 (17.72)	300 (11.81)	440 (17.32)	290 (11.42)	520 (1.15)
WM-VD 36 - 200	200 (7.87)	4000 (899.24)	1800 (404.66)	60 (13.49)	0,015 - 40 (0.05 - 132)	550 (21.65)	350 (13.78)	540 (21.26)	340 (13.39)	570 (1.26)
WM-VD 36 - 250	250 (9.84)	4000 (899.24)	1500 (337.22)	60 (13.49)	0,015 - 40 (0.05 - 132)	650 (25.59)	400 (15.75)	640 (25.2)	390 (15.35)	650 (1.43)

WM-VD 50 / 70 / 85 / 100

Precise adjustment in Push- and Pull direction
Continuous adjustment over the entire stroke

Deceleration	Double-acting
Surface protection	Housing: zinc plated steel
Extended life time	Piston rod: hard-chrome plated
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/E

Ordering Information

WM-VD 70-100-E1-K1G3-C

WM	Weforma	**C**	Type of deceleration: A=push, B=pull, C=push and pull
VD	Speed control, double-acting	**E1 / E2**	E1 = Adjusting screw standard, E2 = Larger adjustment screw
70	Size	**K1**	Piston rod - Male rod clevis
100	Stroke	**G3**	Housing - Female rod clevis

E1

Mounting **G0**

Mounting **K0**

1 mm end stop required in both stroke directions

E2 larger adjustment screw

Accessories Pages 115

PERFORMANCE

	Stroke	Pull	Push	A	B	ØC	ØD	ØE	F	G	ØH	J	Weight
	mm (inch)	N max.	N max.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	kg (lbs)
WM-VD 50-050	50 (1.97)	11000 (2472.91)	11000 (2472.91)	196 (7.72)	146 (5.75)	60 (2.36)	50 (1.97)	14 (0.55)	M10	12 (0.47)	22 (0.87)	37,5 (1.48)	2,2 (5)
WM-VD 50-100	100 (3.94)	11000 (2472.91)	11000 (2472.91)	296 (11.65)	196 (7.72)	60 (2.36)	50 (1.97)	14 (0.55)	M10	12 (0.47)	22 (0.87)	37,5 (1.48)	2,6 (6)
WM-VD 50-150	150 (5.91)	11000 (2472.91)	11000 (2472.91)	396 (15.59)	246 (9.69)	60 (2.36)	50 (1.97)	14 (0.55)	M10	12 (0.47)	22 (0.87)	37,5 (1.48)	3,1 (7)
WM-VD 50-200	200 (7.87)	11000 (2472.91)	11000 (2472.91)	496 (19.53)	296 (11.65)	60 (2.36)	50 (1.97)	14 (0.55)	M10	12 (0.47)	22 (0.87)	37,5 (1.48)	3,5 (8)
WM-VD 50-250	250 (9.84)	11000 (2472.91)	11000 (2472.91)	596 (23.46)	346 (13.62)	60 (2.36)	50 (1.97)	14 (0.55)	M10	12 (0.47)	22 (0.87)	37,5 (1.48)	4 (9)
WM-VD 50-300	300 (11.81)	11000 (2472.91)	11000 (2472.91)	696 (27.4)	396 (15.59)	60 (2.36)	50 (1.97)	14 (0.55)	M10	12 (0.47)	22 (0.87)	37,5 (1.48)	4,4 (10)
WM-VD 70-100	100 (3.94)	18000 (4046.58)	18000 (4046.58)	314 (12.36)	214 (8.43)	80 (3.15)	70 (2.76)	18 (0.71)	M14x1,5	20 (0.79)	30 (1.18)	48 (1.89)	4,9 (11)
WM-VD 70-150	150 (5.91)	18000 (4046.58)	18000 (4046.58)	414 (16.3)	264 (10.39)	80 (3.15)	70 (2.76)	18 (0.71)	M14x1,5	20 (0.79)	30 (1.18)	48 (1.89)	5,2 (11)
WM-VD 70-200	200 (7.87)	18000 (4046.58)	18000 (4046.58)	514 (20.24)	314 (12.36)	80 (3.15)	70 (2.76)	18 (0.71)	M14x1,5	20 (0.79)	30 (1.18)	48 (1.89)	5,8 (13)
WM-VD 70-300	300 (11.81)	18000 (4046.58)	18000 (4046.58)	714 (28.11)	414 (16.3)	80 (3.15)	70 (2.76)	18 (0.71)	M14x1,5	20 (0.79)	30 (1.18)	48 (1.89)	7 (15)
WM-VD 70-400	400 (15.75)	18000 (4046.58)	15000 (3372.15)	914 (35.98)	514 (20.24)	80 (3.15)	70 (2.76)	18 (0.71)	M14x1,5	20 (0.79)	30 (1.18)	48 (1.89)	8,2 (18)
WM-VD 70-500	500 (19.69)	18000 (4046.58)	12000 (2697.72)	1114 (43.86)	614 (24.17)	80 (3.15)	70 (2.76)	18 (0.71)	M14x1,5	20 (0.79)	30 (1.18)	48 (1.89)	9,4 (21)

WM-VD 50 / 70 / 85 / 100

Precise adjustment in Push- and Pull direction
Continuous adjustment over the entire stroke

Deceleration	Double-acting
Surface protection	Housing: zinc plated steel
Extended life time	Piston rod: hard-chrome plated
Temperature	-20°C - +80°C (-4°F - +176°F)
RoHS compliant	Directive 2002/95/E

E1

1 mm end stop required in both stroke directions

E2 larger adjustment screw

PERFORMANCE

Accessories Pages 115

	Stroke	Pull	Push	A	B	ØC	ØD	ØE	F	G	ØH	J	Weight
	mm (inch)	N max.	N max.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	kg (lbs)
WM-VD 85-100	100 (3.94)	50000 (11240.5)	50000 (11240.5)	361 (14.21)	261 (10.28)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	9,2 (20)
WM-VD 85-150	150 (5.91)	50000 (11240.5)	40000 (8992.4)	461 (18.15)	311 (12.24)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	10,4 (23)
WM-VD 85-200	200 (7.87)	50000 (11240.5)	30000 (6744.3)	561 (22.09)	361 (14.21)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	11,5 (25)
WM-VD 85-250	250 (9.84)	50000 (11240.5)	20000 (4496.2)	661 (26.02)	411 (16.18)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	12,6 (28)
WM-VD 85-300	300 (11.81)	50000 (11240.5)	15000 (3372.15)	761 (29.96)	461 (18.15)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	13,7 (30)
WM-VD 85-400	400 (15.75)	50000 (11240.5)	10000 (2248.1)	961 (37.83)	561 (22.09)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	15,7 (35)
WM-VD 85-500	500 (19.69)	50000 (11240.5)	9000 (2023.29)	1161 (45.71)	661 (26.02)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	18,2 (40)
WM-VD 85-600	600 (23.62)	50000 (11240.5)	7000 (1573.67)	1361 (53.58)	761 (29.96)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	20,5 (45)
WM-VD 85-700	700 (27.56)	50000 (11240.5)	4000 (899.24)	1561 (61.46)	861 (33.9)	95 (3.74)	85 (3.35)	28 (1.1)	M24x2	35 (1.38)	30 (1.18)	54,4 (2.14)	22,7 (50)
WM-VD 110-100	100 (3.94)	90000 (20232.9)	90000 (20232.9)	410 (16.14)	310 (12.2)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	19,5 (43)
WM-VD 110-150	150 (5.91)	90000 (20232.9)	80000 (17984.8)	510 (20.08)	360 (14.17)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	21,3 (47)
WM-VD 110-200	200 (7.87)	90000 (20232.9)	75000 (16860.75)	610 (24.02)	410 (16.14)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	23,2 (51)
WM-VD 110-250	250 (9.84)	90000 (20232.9)	70000 (15736.7)	710 (27.95)	460 (18.11)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	25,1 (55)
WM-VD 110-300	300 (11.81)	90000 (20232.9)	50000 (11240.5)	810 (31.89)	510 (20.08)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	27 (60)
WM-VD 110-400	400 (15.75)	90000 (20232.9)	40000 (8992.4)	1010 (39.76)	610 (24.02)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	30,8 (68)
WM-VD 110-500	500 (19.69)	90000 (20232.9)	30000 (6744.3)	1210 (47.64)	710 (27.95)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	34,5 (76)
WM-VD 110-600	600 (23.62)	90000 (20232.9)	20000 (4496.2)	1410 (55.51)	810 (31.89)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	38,3 (84)
WM-VD 110-700	700 (27.56)	90000 (20232.9)	15000 (3372.15)	1610 (63.39)	910 (35.83)	120 (4.72)	110 (4.33)	32 (1.26)	M30x2	40 (1.57)	50 (1.97)	67 (2.64)	42 (93)

1 Male rod clevis

2 Angle joint (DIN 71802)

	Force	
WM-VD 32 / 36	1.230 N	276.52 lbs
WM-VD 50	1.900 N	427.14 lbs
WM-VD 70	3.200 N	719.39 lbs

3 Female rod clevis (DIN 71752)

WM-VD 32 / 36	M8
WM-VD 50	M10
WM-VD 70	M14x1,5
WM-VD 80 / 85	M24x2

3 Female rod clevis (DIN 71752)

WM-VD 110	M30x2

4 Spherical end bearing
(DIN 648, Series K, Series E on enquiry)

	Force	
WM-VD 32 / 36	7.000 N	1573.67 lbs
WM-VD 50	10.400 N	2338.02 lbs
WM-VD 70	22.400 N	5035.74 lbs
WM-VD 85	45.400 N	10206.37 lbs
WM-VD 110	55.000 N	12364.55 lbs

5 Clevis flange

only use in combination with spherical end bearing (4)

DIMENSIONS

		GW* / GW1	D	ØE	F	G	H	I	SW
			mm (inch)						
1	WM-VD 32 / 36	M8	19 (0.75)	14 (0.55)	12 (0.47)	8,1 (0.32)	10 (0.39)	7 (0.28)	-
	WM-VD 50	M10	27 (1.06)	18 (0.71)	12 (0.47)	8,1 (0.32)	10 (0.39)	9 (0.35)	-
	WM-VD 70	M14x1,5	40 (1.57)	25 (0.98)	21 (0.83)	14,1 (0.56)	14 (0.55)	12,5 (0.49)	-
	WM-VD 80 / 85	M24x2	60 (2.36)	40 (1.57)	35 (1.38)	25 (0.98)	25 (0.98)	20 (0.79)	-
	WM-VD 110	M30x2	80 (3.15)	55 (2.17)	45 (1.77)	30 (1.18)	37 (1.46)	27,5 (1.08)	-
2	WM-VD 32 / 36	M8	30 (1.18)	13 (0.51)	13 (0.51)	16 (0.63)	20 (0.79)	-	11 (0.43)
	WM-VD 50	M10	35 (1.38)	16 (0.63)	16 (0.63)	19 (0.75)	24 (0.94)	-	13 (0.51)
	WM-VD 70	M14x1,5	45 (1.77)	22 (0.87)	20 (0.79)	28 (1.1)	30 (1.18)	-	16 (0.63)
3	WM-VD 32 / 36	M8	32 (1.26)	8 (0.31)	16 (0.63)	16 (0.63)	8 (0.31)	42 (1.65)	-
	WM-VD 50	M10	40 (1.57)	10 (0.39)	20 (0.79)	20 (0.79)	10 (0.39)	52 (2.05)	-
	WM-VD 70	M14x1,5	56 (2.2)	14 (0.55)	27 (1.06)	27 (1.06)	14 (0.55)	72 (2.83)	-
	WM-VD 80 / 85	M24x2	100 (3.94)	25 (0.98)	50 (1.97)	50 (1.97)	25 (0.98)	132 (5.2)	-
	WM-VD 110	M30x2	120 (4.72)	30 (1.18)	60 (2.36)	60 (2.36)	30 (1.18)	160 (6.3)	-

		GW*	D	ØE	F	G	H	I	J	SW
			mm (inch)							
4	WM-VD 32 / 36	M8	36 (1.42)	16 (0.63)	12 (0.47)	12 (0.47)	9 (0.35)	8 (0.31)	12,5 (0.49)	13 (0.51)
	WM-VD 50	M10	43 (1.69)	19 (0.75)	14 (0.55)	14 (0.55)	10,5 (0.41)	10 (0.39)	15 (0.59)	17 (0.67)
	WM-VD 70	M14x1,5	57 (2.24)	26 (1.02)	18 (0.71)	19 (0.75)	13 (0.51)	14 (0.55)	20 (0.79)	22 (0.87)
	WM-VD 80 / 85	M24x2	94 (3.7)	42 (1.65)	30 (1.18)	31 (1.22)	22 (0.87)	25 (0.98)	33,5 (1.32)	36 (1.42)
	WM-VD 110	M30x2	110 (4.33)	55 (2.17)	35,5 (1.4)	37 (1.46)	25 (0.98)	30 (1.18)	40 (1.57)	41 (1.61)
5	WM-VD 50	M10	28 (1.1)	10 (0.39)	20 (0.79)	50 (1.97)	20 (0.79)	40 (1.57)	8,5 (0.33)	-
	WM-VD 70	M14x1,5	28 (1.1)	14 (0.55)	20 (0.79)	44 (1.73)	20 (0.79)	40 (1.57)	8,5 (0.33)	-
	WM-VD 80 / 85	M24x2	45 (1.77)	25 (0.98)	33 (1.3)	70 (2.76)	32 (1.26)	65 (2.56)	13 (0.51)	-

		GW*	K	L	M	N	O	P
			mm (inch)					
5	WM-VD 50	M10	60 (2.36)	40 (1.57)	26 (1.02)	46 (1.81)	10 (0.39)	8 (0.31)
	WM-VD 70	M14x1,5	60 (2.36)	40 (1.57)	26 (1.02)	46 (1.81)	10 (0.39)	8 (0.31)
	WM-VD 80 / 85	M24x2	90 (3.54)	65 (2.56)	40 (1.57)	70 (2.76)	20 (0.79)	12 (0.47)

Rotary Dampers

ONLINE
Calculation +
2D / 3D CAD Download

www.weforma.com

WRD 0607 - 1207

Controlled damping of rotary movements

High torques	**up to 700 Nm**
Damping	**Both sides, clockwise and counter-clockwise**
Adjustable	from WRD 2515
Fixed setting	up to WRD 2010
Material	Aluminium, steel
Temperature range	-10°C - +60°C (14°F - +140°F)
RoHS compliant	Directive 2002/95/EC
Applications	Damping of rotary movement in flaps, covers and lids

CALCULATION

Example	Formula & Calculation	Selection
m = 50,0 kg L = 0,30 m	M = g x m x L/2 = 73,58 Nm	**WRD-H 6030R**
F = 200,0 N L = 0,10 m	M = F x L = 20 Nm	**WRD-H 4025R**

LEGEND

m	(kg)	Mass
L	(m)	Lenght
F	(N)	Force

M	(Nm)	Torque
g	(m/s^2)	Accerelation due to gravity (9,81 m/s^2)

Online calculation (imperial / metric) at www.weforma.com

TORQUE

Clockwise	Anti-clockwise	Clockwise and anticlockwise	Torque Nm (in lbs)	Opening angle °	Weight g (oz)
WRD-H 0607-R	WRD-H 0607-L	WRD-H 0607-C	0,08 (0.71)	180	4 (0.14)
WRD-H 0805-R	WRD-H 0805-L	WRD-H 0805-C	0,2 (1.77)	180	5 (0.1/)
WRD-H 1208-R	WRD-H 1208-L	WRD-H 1208-C	1,1 (9.74)	180	14 (0.49)
WRD-H 1610-R	WRD-H 1610-L	WRD-H 1610-C	2,6 (23.01)	180	24 (0.85)
WRD-H 2010-R	WRD-H 2010-L	WRD-H 2010-C	3,5 (30.98)	180	29 (1.02)
WRD-H 2515-R	WRD-H 2515-L	WRD-H 2515-C	10 (88.5)	180	81 (2.86)
WRD-H 3015-R	WRD-H 3015-L	WRD-H 3015-C	14 (123.9)	180	109 (3.84)
WRD-H 4025-R	WRD-H 4025-L	WRD-H 4025-C	40 (354.0)	180	354 (12.49)
WRD-H 6030-R	WRD-H 6030-L	WRD-H 6030-C	110 (973.6)	180	759 (26.78)
WRD-H 7550-R	WRD-H 7550-L	WRD-H 7550-C	250 (2213)	180	4665 (164.55)
WRD-H 9565-R	WRD-H 9565-L	WRD-H 9565-C	500 (4425)	180	10155 (358.21)
WRD-H 12070-R	WRD-H 12070-L	WRD-H 12070-C	700 (6196)	180	18560 (654.68)

Idle: At the beginning of the deceleration max. 5°

WRD-H 0607 / 0805 / 1208 / 1610 / 2010

R (CW)*	L (CCW)*	C*	M* (Nm / in lbs)	Reverse running	Material
WRD-H 0607-R	WRD-H 0607-L	WRD-H 0607-C	0,08 (0.71)	0,03 (0,27)	Aluminum / Steel
WRD-H 0805-R	WRD-H 0805-L	WRD-H 0805-C	0,2 (1.77)	0,08 (0,71)	
WRD-H 1208-R	WRD-H 1208-L	WRD-H 1208-C	1,1 (9.74)	0,25 (2,21)	
WRD-H 1610-R	WRD-H 1610-L	WRD-H 1610-C	2,6 (23.01)	0,2 (1,77)	
WRD-H 2010-R	WRD-H 2010-L	WRD-H 2010-C	3,5 (30.98)	0,5 (4,43)	

	ØA	ØB	C	D	E	F	SW	SW1
WRD-H 0607	9 (0.35)	3 f7 (0.12)	18,7 (0.74)	13,0 (0.51)	4 (0.16)	2 (0.08)	2,6 (0.10)	8 (0.31)
WRD-H 0805	12 (0.47)	4 f7 (0.16)	17,2 (0.68)	11,5 (0.45)	5 (0.2)	3 (0.12)	3 (0.12)	11 (0.43)
WRD-H 1208	18 (0.71)	5 f7 (0.2)	21 (0.83)	15,5 (0.61)	5 (0.2)	3 (0.12)	4 (0.16)	15 (0.59)
WRD-H 1610	21 (0.83)	6 f7 (0.24)	26 (1.02)	19 (0.75)	10 (0.39)	6 (0.24)	4 (0.16)	18 (0.71)
WRD-H 2010	24 (0.94)	6 f7 (0.24)	25 (0.98)	18 (0.71)	10 (0.39)	6 (0.24)	4 (0.16)	22 (0.87)

WRD-H 2515 / 3015 / 4025 / 6030

R (CW)*	L (CCW)*	C*	M* max (Nm / in lbs)	M* min (Nm / in lbs)	Reverse running	Material
WRD-H 2515-R	WRD-H 2515-L	WRD-H 2515-C	10 (88.5)	1,5 (13.28)	0,8 (7.08)	Aluminum / Steel
WRD-H 3015-R	WRD-H 3015-L	WRD-H 3015-C	14 (123.9)	2 (17.7)	0,7 (6.2)	
WRD-H 4025-R	WRD-H 4025-L	WRD-H 4025-C	40 (354.0)	12,5 (110.63)	2,5 (22.13)	
WRD-H 6030-R	WRD-H 6030-L	WRD-H 6030-C	110 (973.6)	25 (221.27)	7,5 (66.38)	

	ØA	ØB	C	D	E	ØF	G	ØH	SW	I
WRD-H 2515	32 (1.26)	7 f7 (0.28)	39,8 (1.57)	30 (1.18)	9 (0.35)	47 (1.85)	40 (1.57)	4,1 (0.16)	5 (0.2)	5 (0.2)
WRD-H 3015	38 (1.5)	8 f7 (0.31)	39 (1.54)	29 (1.14)	9 (0.35)	56 (2.2)	47,5 (1.87)	5,1 (0.2)	6 (0.24)	5 (0.2)
WRD-H 4025	55 (2.17)	10 f7 (0.39)	59 (2.32)	45 (1.77)	14 (0.55)	77 (3.03)	66 (2.6)	6,6 (0.26)	8 (0.31)	10 (0.39)
WRD-H 6030	75 (2.95)	20 f7 (0.79)	73 (2.87)	53 (2.09)	16,6 (0.65)	97 (3.82)	86 (3.39)	6,6 (0.26)	17 (0.67)	5 (0.2)

* **R (CW):** Clockwise / **L (CCW):** Anti-clockwise / **C**: Clockwise and anti-clockwise / **M:** Torque

WRD-H 7550 / 9565 / 12070

R (CW)*	L (CCW)*	C*	M* max (Nm / in lbs)	M* min (Nm / in lbs)	M* Reverse Running L/R (Nm / in lbs)	Material*
WRD-H 7550-R	WRD-H 7550-L	WRD-H 7550-C	250 (2213)	65 (575)	30 (266)	Steel
WRD-H 9565-R	WRD-H 9565-L	WRD-H 9565-C	500 (4425)	140 (1239)	110 (974)	
WRD-H 12070-R	WRD-H 12070-L	WRD-H 12070-C	700 (6196)	270 (2390)	250 (2213)	

	ØA	ØB	ØC	D	E	F	G	H	J	T	ØK	ØL
WRD-H 7550	90 (3.54)	25 f7 (0.98)	130 (5.12)	100 (3.94)	10 (0.39)	25 (0.98)	140 (5.51)	6,4 (0.25)	8 (0.31)	4 (0.16)	8,2 (0.32)	110 (4.33)
WRD-H 9565	120 (4.72)	30 f7 (1.18)	155 (6.1)	125 (4.92)	15 (0.59)	32 (1.26)	175 (6.89)	9 (0.35)	10 (0.39)	4 (0.16)	8,2 (0.32)	137,5 (5.41)
WRD-H 12070	148 (5.83)	35 f7 (1.38)	188 (7.4)	155 (6.1)	15 (0.59)	45 (1.77)	215 (8.46)	10 (0.39)	10 (0.39)	5 (0.2)	10,5 (0.41)	168 (6.61)

FEATHER KEY*

	M	N	P
WRD-H 7550	25 (0.98)	8 (0.31)	7 (0.28)
WRD-H 9565	32 (1.26)	10 (0.39)	8 (0.31)
WRD-H 12070	45 (1.77)	10 (0.39)	8 (0.31)

optional

* **R (CW):** Clockwise
L (CCW): Anti-clockwise
C: Clockwise and anti-clockwise
M: Torque
Material

WRD-H-VA

Material	**Housing Stainless steel V2A / DIN 1.4305 / AISI 303**
Piston rod	**DIN 1.4125 / AISI 440C**

Corrosion resistance in wet environments

Temperature	-10°C - +60°C (14°F - +140°F)
Special oils	Food-grade according to USDA-H1
Applications	Food industry, Outside machinery, Medical technology

Clockwise	Counter-clockwise	Clockwise and counter-clockwise	Torque Nm (in lbs)	Weight kg (lbs)
WRD-H 0607-R-VA	WRD-H 0607-L-VA	WRD-H 0607-C-VA	0,08 (0.71)	0,007 (0.015)
WRD-H 0805-R-VA	WRD-H 0805-L-VA	WRD-H 0805-C-VA	0,2 (1.77)	0,009 (0.02)
WRD-H 1208-R-VA	WRD-H 1208-L-VA	WRD-H 1208-C-VA	1,1 (9.74)	0,025 (0.055)
WRD-H 1610-R-VA	WRD-H 1610-L-VA	WRD-H 1610-C-VA	2,6 (23.01)	0,041 (0.09)
WRD-H 2010-R-VA	WRD-H 2010-L-VA	WRD-H 2010-C-VA	3,5 (30.98)	0,049 (0.108)
WRD-H 2515-R-VA	WRD-H 2515-L-VA	WRD-H 2515-C-VA	10 (88.5)	0,19 (0.419)
WRD-H 3015-R-VA	WRD-H 3015-L-VA	WRD-H 3015-C-VA	14 (123.9)	0,257 (0.57)
WRD-H 4025-R-VA	WRD-H 4025-L-VA	WRD-H 4025-C-VA	40 (354.0)	0,863 (1.9)
WRD-H 6030-R-VA	WRD-H 6030-L-VA	WRD-H 6030-C-VA	110 (973.6)	1,58 (3.48)
WRD-H 7550-R-VA	WRD-H 7550-L-VA	WRD-H 7550-C-VA	250 (2213)	4,67 (10.3)
WRD-H 9565-R-VA	WRD-H 9565-L-VA	WRD-H 9565-C-VA	500 (4425)	10,22 (22.54)
WRD-H 12070-R-VA	WRD-H 12070-L-VA	WRD-H 12070-C-VA	700 (6196)	18,61 (41.04)

Idle: At the beginning of the deceleration max. 5°

WRD-HK 3515 / 5550 / 10060

Controlled damping of continuous rotary movements

High torques	**up to 110 Nm**
Damping	**clockwise or counter-clockwise, adjustable**
Material	Aluminium, Steel
Temperature	-10°C - +60°C (14°F - +140°F)
RoHS compliant	Directive 2002/95/EC

WRD-HK 10060

R (CW)*	L (CCW)*	M* max. (Nm)	M* min. (Nm)	M* Reverse Running L/R	Rotational speed	Material	Weight kg (lbs)
WRD-HK 3515-R	WRD-HK 3515-L	8 (71)	1 (9)	0,5 - 1,0 (4 - 9)	30 U/min (rpm) max.	Aluminum / Steel	0,27 (1)
WRD-HK 5550-R	WRD-HK 5550-L	40 (354)	5 (44)	1,0 - 3,0 (9 - 27)			1,95 (4)
WRD-HK 10060-R	WRD-HK 10060-L	110 (974)	10 (89)	5,0 - 7,0 (44 - 62)			7,4 (16)

	ØA	ØB	C	D	E	F	G	ØH	J	K	SW
	mm (inch)										
WRD-HK 3515	45 (1.77)	10 f7 (0.39)	60 (2.36)	45 (1.77)	10 (0.39)	47 (1.85)	38 (1.5)	5,5 (0.22)	2,5 (0.1)	10 (0.39)	8 (0.31)
WRD-HK 5550	90 (3.54)	20 f7 (0.79)	105 (4.13)	80 (3.15)	16,5 (0.65)	90 (3.54)	74 (2.91)	8,5 (0.33)	8 (0.31)	12 (0.47)	17 (0.67)
WRD-HK 10060	150 (5.91)	30 f7 (1.81)	160 (6.3)	110 (4.33)	-	150 (5.91)	126 (4.96)	13 (0.51)	10 (0.39)	20 (0.79)	-

* **R (CW):** Clockwise
L (CCW): Counter-clockwise
M: Torque

WRD

Material	**Plastic and aluminium di cast**
Torques	**up to 9 Nm**
Damping	right-turning and left-turning fixed setting (WRD 22 / 23 adjustable)
Temperature	-5°C - +50°C (23°C - +122°C)
RoHS compliant	Directive 2002/95/EC
Applications	Damping of rotational movements of flaps, hoods and lids

TORQUE

Clockwise	Counter-clockwise	Torque Nm (in lbs)	Opening angle °	Weight g (oz)
WRD 16 - R25	WRD 16 - L25	2,45 (21.68)	110	60 (2.15)
WRD 16 - R40	WRD 16 - L40	3,92 (34.70)		
WRD 18 - R10	WRD 18 - L10	0,98 (8.67)	110	10 (0.35)
WRD 18 - R15	WRD 18 - L15	1,47 (13.01)		
WRD 18 - R20	WRD 18 - L20	1,96 (17.35)		
WRD 19 - R15	WRD 19 - L10	1,47 (13.01)	110	30 (1.06)
WRD 19 - R20	WRD 19 - L20	1,96 (17.35)		
WRD 19 - R25	WRD 19 - L25	2,45 (21.68)		
WRD 19 - R30	WRD 19 - L30	2,94 (26.02)		
WRD 20 - R20	WRD 20 - L20	1,96 (17.35)	110	12 (0.42)
WRD 20 - R25	WRD 20 - L25	2,45 (21.68)		
WRD 20 - R30	WRD 20 - L30	2,94 (26.02)		
WRD 20 - R35	WRD 20 - L35	3,43 (30.36)		
WRD 22 - R13	WRD 22 - L13	0,49 - 1,27 (4.34 - 11.24)	110	30 (1.06)
WRD 22 - R20	WRD 22 - L20	0,98 - 1,96 (8.67 - 17.35)		
WRD 23 - R13	WRD 23 - L13	0,49 - 1,27 (4.34 - 11.24)		
WRD 23 - R20	WRD 23 - L20	0,98 - 1,96 (8.67 - 17.35)		
WRD 40 - R50	WRD 40 - L50	4,9 (43.37)	110	200 (7.06)
WRD 40 - R70	WRD 40 - L70	6,86 (60.72)		
WRD 40 - R90	WRD 40 - L90	8,82 (78.15)		
WRD 60 - R10	WRD 60 - L10	0,98 (8.67)	110	60 (2.15)
WRD 60 - R15	WRD 60 - L15	1,47 (13.01)		
WRD 60 - R20	WRD 60 - L20	1,96 (17.35)		
WRD 73 - R10	WRD 73 - L10	0,10 (0.89)	110	2 (0.07)
WRD 73 - R20	WRD 73 - L20	0,20 (1.77)		
WRD 73 - R30	WRD 73 - L30	0,29 (2.57)		
WRD 100 - R15	WRD 100 - L15	1,5 (13.28)	110	22 (0.78)
WRD 100 - R20	WRD 100 - L20	2,0 (17.70)		
WRD 100 - R25	WRD 100 - L25	2,5 (22.13)		
WRD 100 - R30	WRD 100 - L30	3,0 (26.55)		
WRD 34 - R15	WRD 34 - L15	0,15 (1.33)	180	20 (0.71)
WRD 34 - R30	WRD 34 - L30	0,29 (2.57)		
WRD 34 - R60	WRD 34 - L60	0,59 (5.22)		

Clockwise	Counter-clockwise	Torque Nm (in lbs)	Opening angle °	Weight g (oz)
WRD 58 - R30	WRD 58 - L30	0,3 (2.66)	continously	40 (1.41)
WRD 58 - R50	WRD 58 - L50	0,5 (4.43)		
WRD 58 - R80	WRD 58 - L80	0,8 (7.08)		
WRD 62 - R3	WRD 62 - L3	0,03 (0.27)	continously	16 (0.56)
WRD 62 - R6	WRD 62 - L6	0,06 (0.53)		
WRD 62 - R9	WRD 62 - L9	0,09 (0.80)		
WRD 62 - R15	WRD 62 - L15	0,15 (1.33)		
WRD 62 - R20	WRD 62 - L20	0,20 (1.17)		
WRD 62 - R25	WRD 62 - L25	0,25 (2.21)		
WRD 88 - R40	WRD 88 - L40	0,04 (0.35)	continously	8 (0.28)
WRD 101 - C25		0,0025 (0.02)	continously	0,4 (0.01)
WRD 101 - C40		0,004 (0.04)		0,6 (0.02)
WRD 470-R1	WRD 470-L1	1 (8.85)	continously	50 (1.76)
WRD 470-R2	WRD 470-L2	2 (17.7)		
WRD 470-C2		2 (17.7)	continously	50 (1.76)
WRD 470-C3		3 (26.55)		
WRD 470-C4		4 (35.4)		
WRD 570-R3	WRD 570-L3	3 (26.55)	continously	77 (2.72)
WRD 570-R4	WRD 570-L4	4 (35.4)		
WRD 570-R5	WRD 570-L5	5 (44.25)		
WRD 570-R6	WRD 570-L6	6 (53.1)		
WRD 570-R7	WRD 570-L7	7 (61.96)		
WRD 570-R8	WRD 570-L8	8 (70.81)		
WRD 570-C3		3 (26.55)	continously	77 (2.72)
WRD 570-C4		4 (35.4)		
WRD 570-C5		5 (44.25)		
WRD 570-C6		6 (53.1)		
WRD 570-C7		7 (61.96)		
WRD 570-C8		8 (70.81)		

WRD 16

R (CW)*	L (CCW)*	M* (Nm / in lbs)	Material*
WRD 16 - R25	WRD 16 - L25	2,45 (21.68)	Alu die cast
WRD 16 - R40	WRD 16 - L40	3,92 (34.70)	

A	B	C	D	E	F	G
7 (0.28)	40 (1.57)	10 (0.39)	8 (0.31)	16,2 (0.64)	7 (0.28)	9 (0.35)

WRD 18 / 19

R (CW)*	L (CCW)*	M* (Nm / in lbs)	Material*
WRD 18 - R10	WRD 18 - L10	0,98 (8.67)	Plastic
WRD 18 - R15	WRD 18 - L15	1,47 (13.01)	
WRD 18 - R20	WRD 18 - L20	1,96 (17.35)	
WRD 19 - R15	WRD 19 - L15	1,47 (13.01)	Alu die cast
WRD 19 - R20	WRD 19 - L20	1,96 (17.35)	
WRD 19 - R25	WRD 19 - L25	2,45 (21.68)	
WRD 19 - R30	WRD 19 - L30	2,94 (26.02)	

A	B	C	D	E	F	G
45 / 43 (1.77/1.69)	20 / 18 (0.79/0.71)	5 (0.2)	15 (0.59)	18 (0.71)	12/8 (0.47/0.31)	8 (0.31)

WRD 20

R (CW)*	L (CCW)*	M* (Nm / in lbs)	Material*
WRD 20 - R20	WRD 20 - L20	1,96 (17.35)	Plastic
WRD 20 - R25	WRD 20 - L25	2,45 (21.68)	
WRD 20 - R30	WRD 20 - L30	2,94 (26.02)	
WRD 20 - R35	WRD 20 - L35	3,43 (30.36)	

A	B	C	D	E	F	G	H
45 (1.77)	15 (0.59)	22 (0.87)	3 (0.12)	$8_{-0,2}$ ($0.31_{0,01}$)	16 (0.63)	$20_{-0,2}$ ($0.79_{0,01}$)	$12_{-0,2}$ ($0.47_{0,01}$)

WRD 22

R (CW)*	L (CCW)*	M* (Nm / in lbs)	Material*
WRD 22 - R13	WRD 22 - L13	0,49 - 1,27 (4.34 - 11.24)	Plastic
WRD 22 - R20	WRD 22 - L20	0,98 - 1,96 (8.67 - 17.35)	

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
60 (2.36)	20 (0.79)	7,5 (0.3)	18 (0.71)	25 (0.98)	18 (0.71)	14 (0.55)	8 (0.31)	3 (0.12)	11,5 (0.45)	15 (0.59)	10 (0.39)	22 (0.87)	R5 (R0,2)	2x Ø6xØ10 (2x Ø0.24xØ0.39)

WRD 23

R (CW)*	L (CCW)*	M* (Nm / in lbs)	Material*
WRD 23 - R13	WRD 23 - L13	0,49 - 1,27 (4.34 - 11.24)	Plastic
WRD 23 - R20	WRD 23 - L20	0,98 - 1,96 (8.67 - 17.35)	

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
60 (2.36)	20 (0.79)	7,5 (0.3)	18 (0.71)	25 (0.98)	18 (0.71)	14 (0.55)	8 (0.31)	3 (0.12)	11,5 (0.45)	15 (0.59)	10 (0.39)	22 (0.87)	R5 (R0,2)	2x Ø6xØ10 (2x Ø0.24xØ0.39)

Bracket

WRD 22 / 23
Code: R2223

Example

* **R (CW):** Clockwise
L (CCW): Anti-clockwise
M: Torque
Material

WRD 40

R (CW)*	L (CCW)*	M* (Nm / in lbs)	Material*
WRD 40 - R50	WRD 40 - L50	4,90 (43.37)	Alu die cast
WRD 40 - R70	WRD 40 - L70	6,86 (60.72)	
WRD 40 - R90	WRD 40 - L90	8,83 (78.15)	

A	B	C	D	E	F	G	H	J	K	L
43,5 (1.71)	28,5 (1.12)	15 (0.59)	8 (0.31)	40 (1.57)	12,5 (0.49)	12 (0.47)	71 (2.8)	56 (2.2)	8 (0.31)	7,5 (0.3)

WRD 60

R (CW)*	L (CCW)*	M* (Nm)	Material*
WRD 60 - R10	WRD 60 - L10	0,98	Alu die cast
WRD 60 - R15	WRD 60 - L15	1,47	
WRD 60 - R20	WRD 60 - L20	1,96	

A	B	C	D	E	F	G	H	J	K	L	M
20,8 (0.82)	10,9 (0.43)	8,9 (0.35)	1 (0.04)	25 (0.98)	0,9 (0.04)	1,5 (0.06)	43,4 (1.71)	26,8 (1.06)	34 (1.34)	8 (0.31)	10 (0.39)

WRD 73

R (CW)*	L (CCW)*	M* (Nm)	Material*
WRD 73 - R10	WRD 73 - L10	0,10	Plastic
WRD 73 - R20	WRD 73 - L20	0,20	
WRD 73 - R30	WRD 73 - L30	0,29	

A	B	C	D	E
32 (1.26)	22 (0.87)	5 (0.2)	11 (0.43)	7 (0.28)

WRD 100

R (CW)*	L (CCW)*	M* (Nm)	Material*
WRD 100 - R15	WRD 100 - L15	1,5	Plastic / Alu die cast
WRD 100 - R20	WRD 100 - L20	2,0	
WRD 100 - R25	WRD 100 - L25	2,5	
WRD 100 - R30	WRD 100 - L30	3,0	

A	B	C	D	E	F	G	H	J
50 (1.97)	31 (1.22)	15 (0.59)	12 (0.47)	4 (0.16)	10 (0.39)	16 (0.63)	7 (0.28)	6 (0.24)

WRD 34

R (CW)*	L (CCW)*	M* (Nm / in lbs)	Material*
WRD 34 - R15	WRD 34 - L15	0,15 (1.33)	Plastic / Alu die cast
WRD 34 - R30	WRD 34 - L30	0,29 (2.57)	
WRD 34 - R60	WRD 34 - L60	0,59 (5.22)	

A	B	C	D	E	F	G	H	J	K	L	M
32 (1.26)	16 (0.63)	4 (0.16)	7 (0.28)	5 (0.2)	5 (0.2)	$6_{-0,1}$ ($0.24_{-0,004}$)	22 (0.87)	34 (1.34)	4,2 (0.17)	11 (0.43)	R4 (R0,16)

WRD 58

R (CW)*	L (CCW)*	M* (Nm)	Material
WRD 58 - R30	WRD 58 - L30	0,30	Plastic / Alu die cast
WRD 58 - R50	WRD 58 - L50	0,50	
WRD 58 - R80	WRD 58 - L80	0,80	

A	B	C	D	E	F	G	H	J	K
38 (1.5)	16,5 (0.65)	10 (0.39)	34 (1.34)	20 (0.79)	31 (1.22)	3 (0.12)	44 (1.73)	4,2 (0.17)	R5 (R0,2)

Standard spur gear	
Modul	1
Number of gear teeth	18
Deceleration characteristics:	continously

WRD 62

R (CW)*	L (CCW)*	M* (Nm)	Material
WRD 62 - R3	WRD 62 - L3	0,03	Plastic / Alu die cast
WRD 62 - R6	WRD 62 - L6	0,06	
WRD 62 - R9	WRD 62 - L9	0,09	
WRD 62 - R15	WRD 62 - L15	0,15	
WRD 62 - R20	WRD 62 - L20	0,20	
WRD 62 - R25	WRD 62 - L25	0,25	

A	B	C	D	E	F	G	H	J	K	L
20 (0.79)	8,5 (0.33)	5 (0.2)	4 (0.16)	28 (1.1)	17,6 (0.69)	25 (0.98)	2 (0.08)	36 (1.42)	3,1 (0.12)	R3,5 (R0.14)

Standard spur gear	
Modul	1
Number of gear teeth	15
Deceleration characteristics:	continously

* **R (CW):** Clockwise
L (CCW): Counter-clockwise
M: Torque

WRD 88

R (CW)*	L (CCW)*	M* (Nm)	Material*
WRD 88 - R40	WRD 88 - L40	0,04	Plastic / Alu die cast

A	B	C	D	E	F	G	H	J	K	L	M
21 (0.83)	12,5 (0.49)	8,5 (0.33)	7,5 (0.3)	3 (0.12)	15 (0.59)	4,5 (0.18)	10,4 (0.41)	30 (1.18)	22 (0.87)	3,2 (0.13)	R4,5 (R0.18)

Standard spur gear	
Modul	**0,8**
Number of gear teeth	**11**
Deceleration characteristics:	continously

WRD 101

C*	M* (Nm)	Material*	Deceleration characteristics
WRD 101 - C25	0,0025	Plastic	continously
WRD 101 - C40	0,004		

A	B	C	D	E	F	G
15 (0.59)	10 (0.39)	6 (0.24)	2,5 (0.1)	3,5 (0.14)	2,5 (0.1)	3,5 (0.14)

* **R (CW):** Clockwise
L (CCW): Counter-clockwise
C: Clockwise and counter-clockwise
M: Torque

WRD 470-L/R

Damping: Clockwise or counter-clockwise

R (CW)*	L (CCW)*	M* (Nm)	Material
WRD 470-R1	WRD 470-L1	1,0 ±0,3	Steel zinc plated / Plastic
WRD 470-R2	WRD 470-L2	2,0 ±0,3	

***R (CW):** Clockwise / **L (CCW):** Counter-clockwise / **M:** Torque

A	B	C	D	E	F	G	H	J	K	L
65 (2.56)	56 (2.2)	R4,5 (R0,18)	4,5 (0.18)	47 (1.85)	42,8 (1.69)	6 (0.24)	10,3 (0.41)	1,6 (0.06)	1 (0.04)	9 (0.35)

Rotational speed max.	**50 U/min (rpm)**
Cycle rate (1 cycle: 360° left + 360° right)	**12 / min**
Do not use the rotary dampers as supports - an external guidance is required	

WRD 470-C

Damping: Both directions

C*	M* (Nm)	Material
WRD 470-C2	2,0 ±0,3	Steel zinc plated / Plastic
WRD 470-C3	3,0 ±0,3	
WRD 470-C4	4,0 ±0,3	

* **C**: Both directions / **M:** Torque

A	B	C	D	E	F	G	H	J	K	L	M
65 (2.56)	56 (2.2)	8 (0.31)	R4,5 (R0,18)	4,5 (0.18)	R0,5 (R0,02)	47 (1.85)	42,8 (1.69)	10,3 (0.41)	1,6 (0.06)	8 (0.31)	1,5 (0.06)

Rotational speed max.	**50 U/min (rpm)**
Cycle rate (1 cycle: 360° left + 360° right)	**12 / min**
Do not use the rotary dampers as supports - an external guidance is required	

WRD 570-L/R

Damping: Clockwise or counter-clockwise

R (CW)*	L (CCW)*	M* (Nm)	Material
WRD 570-R3	WRD 570-L3	3,0 ±0,3	Steel zinc plated / Plastic
WRD 570-R4	WRD 570-L4	4,0 ±0,5	
WRD 570-R5	WRD 570-L5	5,0 ±0,5	
WRD 570-R6	WRD 570-L6	6,0 ±0,5	
WRD 570-R7	WRD 570-L7	7,0 ±0,5	
WRD 570-R8	WRD 570-L8	8,0 ±0,5	

* **R (CW):** Clockwise / **L (CCW):** Counter-clockwise / **M:** Torque

A	B	C	D	E	F	G	H	J	K	L
79 (3.11)	68 (2.68)	5,5 (0.22)	R5,5 (R0,22)	57 (2.24)	52,4 (2.06)	10 (0.39)	13,8 (0.54)	1,6 (0.06)	1 (0.04)	11 (0.43)

Rotational speed max.	**50 U/min (rpm)**
Cycle rate (1 cycle: 360° left + 360° right)	**12 / min**
Do not use the rotary dampers as supports - an external guidance is required	

WRD 570-C

Damping: Both directions

C*	M* (Nm)	Material
WRD 570-C3	3,0 ±0,3	Steel zinc plated / Plastic
WRD 570-C4	4,0 ±0,5	
WRD 570-C5	5,0 ±0,5	
WRD 570-C6	6,0 ±0,5	
WRD 570-C7	7,0 ±0,5	
WRD 570-C8	8,0 ±0,5	

* **C**: Both directions / **M:** Torque

A	B	C	D	E	F	G	H	J	K	L	M
79 (3.11)	68 (2.68)	10 (0.39)	R5,5 (R0,22)	5,5 (0.22)	R0,5 (R0,02)	57 (2.24)	52,4 (2.06)	11,2 (0.44)	1,6 (0.06)	9 (0.35)	1 (0.04)

Rotational speed max.	**50 U/min (rpm)**
Cycle rate (1 cycle: 360° left + 360° right)	**12 / min**
Do not use the rotary dampers as supports - an external guidance is required	

Gas Springs

ONLINE
Calculation +
2D / 3D CAD Download

www.weforma.com

WM-G

- **High corrosion resistance**
  - Housing: powder coated (WM-G 8: brass)
  - Piston rod: ceramic coated (WM-G 8 - 40)
  - Piston rod hard chrome-plated (WM-G 70)
- **Minimal friction coefficient to achieve the lowest extension forces**
- **Integrated grease chamber and sliding bearing**

- Lower breakaway force
- Installation position: any
- Maintenance-free and ready for installation
- Temperature: -30°C – +80°C (-22°F – +176°F), optional: -45°C – +200°C (-49°F – +392°F)
- RoHS compliant Directive 2002/95/EC
- Extension force must be stated on ordering.

FORCE DIAGRAM

The theoretical extension force is the result of the filling pressure multiplied by the cross-sectional area of the piston rod. Weforma gas springs are filled to a pressure determined in accordance with the customer's requirements (extension force F_1). The extension force always refers to the value F_1, measured at 20°C ± 2°C and with a downwards facing piston rod.

F_1 = extension force with extended piston rod
F_2 = extension force with compressed piston rod
F_3 = insertion force with extended piston rod
F_4 = insertion force with compressed piston rod
F_R = frictional force

PROGRESSION

Linear force increase during extension or compression, measured by the nominal force over the entire stroke. The listed values can be influenced.

	Progression approx. %		Progression approx. %		Progression approx. %		Progression approx. %
WM-G-8	28	WM-G-15	27	WM-G-28	52	WM-GZ-19	20
WM-G-10	20	WM-G-19	33	WM-G-40	45	WM-GZ-28	65
WM-G-12	21	WM-G-22	39	WM-G-70	25		

SELECTION

For the selection and/or order the following information is required:

S	Centre of gravity
G	Weight of the lid in N (ca. Kp x 10)
b	Lever arm of a force (correlates to approx. 85% of the required stroke)
X	Number of springs (as a rule 2 pieces, one spring each side of the lid)
L	Radius

Note
In general the permitted extended force tolerances are +40N - 20N or ± 5-7%.
The force of a gas spring is physically dependant on temperature. It varies by approx. 3.3% (basis +20°C) per 10°C.

ORDERING INFORMATION

WM-G-19-100-K2G4-XXXXX-XXXX

WM-G	Gas Springs
WM-GZ	Gas traction springs
WM-GVA	Stainless Steel Gas Springs
19	19mm diameter
100	Stroke
K0G0	Thread
K2	Piston rod - Angle joint
G4	Housing - Spherical end bearing
Code	Code is assigned by Weforma

Ordering Information: Page 134

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		Force with compressed piston rod	A	B1	B2	B3	B4	B5	B6	B7	C1	C2	ø E	GW
	mm (inch)		N min. (lbs)	N max. (lbs)	N max. (lbs)	mm (inch)											
WM-G-8-20	8 (0.31)	20 (0.79)	10 (2.25)	100 (22.48)	128 (28.78)	72 (2.83)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-8-30	8 (0.31)	30 (1.18)	10 (2.25)	100 (22.48)	128 (28.78)	92 (3.62)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-8-40	8 (0.31)	40 (1.57)	10 (2.25)	100 (22.48)	128 (28.78)	112 (4.41)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-8-50	8 (0.31)	50 (1.97)	10 (2.25)	100 (22.48)	128 (28.78)	132 (5.2)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-8-60	8 (0.31)	60 (2.36)	10 (2.25)	100 (22.48)	128 (28.78)	152 (5.98)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-8-80	8 (0.31)	80 (3.15)	10 (2.25)	100 (22.48)	128 (28.78)	192 (7.56)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-10-20	10 (0.39)	20 (0.79)	10 (2.25)	100 (22.48)	120 (26.98)	72 (2.83)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-10-30	10 (0.39)	30 (1.18)	10 (2.25)	100 (22.48)	120 (26.98)	92 (3.62)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-10-40	10 (0.39)	40 (1.57)	10 (2.25)	100 (22.48)	120 (26.98)	112 (4.41)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-10-50	10 (0.39)	50 (1.97)	10 (2.25)	100 (22.48)	120 (26.98)	132 (5.2)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-10-60	10 (0.39)	60 (2.36)	10 (2.25)	100 (22.48)	120 (26.98)	152 (5.98)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-10-80	10 (0.39)	80 (3.15)	10 (2.25)	100 (22.48)	120 (26.98)	192 (7.56)	11 (0.43)	18 (0.71)	16 (0.63)	21 (0.83)	18 (0.71)	-	-	4 (0.16)	4 (0.16)	3 (0.12)	M3
WM-G-12-20	12 (0.47)	20 (0.79)	10 (2.25)	180 (40.47)	218 (49.01)	72 (2.83)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-30	12 (0.47)	30 (1.18)	10 (2.25)	180 (40.47)	218 (49.01)	92 (3.62)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-40	12 (0.47)	40 (1.57)	10 (2.25)	180 (40.47)	218 (49.01)	112 (4.41)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-50	12 (0.47)	50 (1.97)	10 (2.25)	180 (40.47)	218 (49.01)	132 (5.2)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-60	12 (0.47)	60 (2.36)	10 (2.25)	180 (40.47)	218 (49.01)	152 (5.98)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-80	12 (0.47)	80 (3.15)	10 (2.25)	180 (40.47)	218 (49.01)	192 (7.56)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-100	12 (0.47)	100 (3.94)	10 (2.25)	180 (40.47)	218 (49.01)	232 (9.13)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-120	12 (0.47)	120 (4.72)	10 (2.25)	180 (40.47)	218 (49.01)	272 (10.71)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-12-150	12 (0.47)	150 (5.91)	10 (2.25)	180 (40.47)	218 (49.01)	332 (13.07)	12 (0.47)	18 (0.71)	16 (0.63)	12 (0.47)	18 (0.71)	5 (0.2)	-	5 (0.2)	5 (0.2)	4 (0.16)	M4
WM-G-15-20	15 (0.59)	20 (0.79)	20 (4.5)	400 (89.92)	508 (114.2)	67 (2.64)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-40	15 (0.59)	40 (1.57)	20 (4.5)	400 (89.92)	508 (114.2)	107 (4.21)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-50	15 (0.59)	50 (1.97)	20 (4.5)	400 (89.92)	508 (114.2)	127 (5)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-60	15 (0.59)	60 (2.36)	20 (4.5)	400 (89.92)	508 (114.2)	147 (5.79)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-80	15 (0.59)	80 (3.15)	20 (4.5)	400 (89.92)	508 (114.2)	187 (7.36)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-100	15 (0.59)	100 (3.94)	20 (4.5)	400 (89.92)	508 (114.2)	227 (8.94)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-120	15 (0.59)	120 (4.72)	20 (4.5)	400 (89.92)	508 (114.2)	267 (10.51)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-150	15 (0.59)	150 (5.91)	20 (4.5)	400 (89.92)	508 (114.2)	327 (12.87)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-G-15-200	15 (0.59)	200 (7.87)	20 (4.5)	400 (89.92)	508 (114.2)	427 (16.81)	16 (0.63)	22 (0.87)	20 (0.79)	30 (1.18)	22 (0.87)	5 (0.2)	28 (1.1)	5 (0.2)	5 (0.2)	6 (0.24)	M5

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		Force with compressed piston rod	A	B1	B2	B3	B4	B5	B6	B7	C1	C2	ø E	GW
	mm (inch)		N min. (lbs)	N max. (lbs)	N max. (lbs)	mm (inch)											
WM-G-19-50	19 (0.75)	50 (1.97)	50 (11.24)	700 (157.37)	931 (209.3)	164 (6.46)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-G-19-100	19 (0.75)	100 (3.94)	50 (11.24)	700 (157.37)	931 (209.3)	264 (10.39)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-G-19-150	19 (0.75)	150 (5.91)	50 (11.24)	700 (157.37)	931 (209.3)	364 (14.33)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-G-19-200	19 (0.75)	200 (7.87)	50 (11.24)	700 (157.37)	931 (209.3)	464 (18.27)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-G-19-250	19 (0.75)	250 (9.84)	50 (11.24)	700 (157.37)	931 (209.3)	564 (22.2)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-G-19-300	19 (0.75)	300 (11.81)	50 (11.24)	700 (157.37)	931 (209.3)	664 (26.14)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-G-22-50	22 (0.87)	50 (1.97)	80 (17.98)	1300 (292.25)	1807 (406.23)	164 (6.46)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-100	22 (0.87)	100 (3.94)	80 (17.98)	1300 (292.25)	1807 (406.23)	264 (10.39)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-150	22 (0.87)	150 (5.91)	80 (17.98)	1300 (292.25)	1807 (406.23)	364 (14.33)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-200	22 (0.87)	200 (7.87)	80 (17.98)	1300 (292.25)	1807 (406.23)	464 (18.27)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-250	22 (0.87)	250 (9.84)	80 (17.98)	1300 (292.25)	1807 (406.23)	564 (22.2)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-300	22 (0.87)	300 (11.81)	80 (17.98)	1300 (292.25)	1807 (406.23)	664 (26.14)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-350	22 (0.87)	350 (13.78)	80 (17.98)	1300 (292.25)	1807 (406.23)	764 (30.08)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-400	22 (0.87)	400 (15.75)	80 (17.98)	1300 (292.25)	1807 (406.23)	864 (34.02)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-450	22 (0.87)	450 (17.72)	80 (17.98)	1300 (292.25)	1807 (406.23)	964 (37.95)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-500	22 (0.87)	500 (19.69)	80 (17.98)	1300 (292.25)	1807 (406.23)	1064 (41.89)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-550	22 (0.87)	550 (21.65)	80 (17.98)	1300 (292.25)	1807 (406.23)	1164 (45.83)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-600	22 (0.87)	600 (23.62)	80 (17.98)	1300 (292.25)	1807 (406.23)	1264 (49.76)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-650	22 (0.87)	650 (25.59)	80 (17.98)	1300 (292.25)	1807 (406.23)	1364 (53.7)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-22-700	22 (0.87)	700 (27.56)	80 (17.98)	1300 (292.25)	1807 (406.23)	1464 (57.64)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	31 (1.22)	9 (0.35)	8 (0.31)	10 (0.39)	M8
WM-G-28-100	28 (1.1)	100 (3.94)	150 (33.72)	2500 (562.03)	3800 (854.28)	262 (10.31)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-150	28 (1.1)	150 (5.91)	150 (33.72)	2500 (562.03)	3800 (854.28)	362 (14.25)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-200	28 (1.1)	200 (7.87)	150 (33.72)	2500 (562.03)	3800 (854.28)	462 (18.19)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-250	28 (1.1)	250 (9.84)	150 (33.72)	2500 (562.03)	3800 (854.28)	562 (22.13)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-300	28 (1.1)	300 (11.81)	150 (33.72)	2500 (562.03)	3800 (854.28)	662 (26.06)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-350	28 (1.1)	350 (13.78)	150 (33.72)	2500 (562.03)	3800 (854.28)	762 (30)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-400	28 (1.1)	400 (15.75)	150 (33.72)	2500 (562.03)	3800 (854.28)	862 (33.94)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-450	28 (1.1)	450 (17.72)	150 (33.72)	2500 (562.03)	3800 (854.28)	962 (37.87)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-500	28 (1.1)	500 (19.69)	150 (33.72)	2500 (562.03)	3800 (854.28)	1062 (41.81)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-550	28 (1.1)	550 (21.65)	150 (33.72)	2500 (562.03)	3800 (854.28)	1162 (45.75)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-600	28 (1.1)	600 (23.62)	150 (33.72)	2500 (562.03)	3800 (854.28)	1262 (49.69)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-650	28 (1.1)	650 (25.59)	150 (33.72)	2500 (562.03)	3800 (854.28)	1362 (53.62)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-700	28 (1.1)	700 (27.56)	150 (33.72)	2500 (562.03)	3800 (854.28)	1462 (57.56)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-G-28-750	28 (1.1)	750 (29.53)	150 (33.72)	2500 (562.03)	3800 (854.28)	1562 (61.5)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	13 (0.51)	-	9 (0.35)	13 (0.51)	14 (0.55)	M10

1 Male rod clevis

2 Angle joint

3 Female rod clevis

4 Spherical end bearing

5 Ball joint housing

6 Release screw
only G

7 Ball joints

8 Protection tube

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		Force with compressed piston rod	A	B1	B2	B3	B4	B6	B7	C1	C2	ø E	GW
	mm (inch)		N min. (lbs)	N max. (lbs)	N max. (lbs)	mm (inch)										
WM-G-40-100	40 (1.57)	100 (3.94)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	317 (12.48)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-150	40 (1.57)	150 (5.91)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	417 (16.42)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-200	40 (1.57)	200 (7.87)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	517 (20.35)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-300	40 (1.57)	300 (11.81)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	717 (28.23)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-400	40 (1.57)	400 (15.75)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	917 (36.1)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-500	40 (1.57)	500 (19.69)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	1117 (43.98)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-600	40 (1.57)	600 (23.62)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	1317 (51.85)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-800	40 (1.57)	800 (31.5)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	1717 (67.6)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-40-1000	40 (1.57)	1000 (39.37)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	2117 (83.35)	40 (1.57)	45 (1.77)	56 (2.2)	57 (2.24)	15 (0.59)	-	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-G-70-100	70 (2.76)	100 (3.94)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	320 (12.6)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0
WM-G-70-200	70 (2.76)	200 (7.87)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	520 (20.47)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0
WM-G-70-300	70 (2.76)	300 (11.81)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	720 (28.35)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0
WM-G-70-400	70 (2.76)	400 (15.75)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	920 (36.22)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0
WM-G-70-500	70 (2.76)	500 (19.69)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	1120 (44.09)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0
WM-G-70-600	70 (2.76)	600 (23.62)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	1320 (51.97)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0
WM-G-70-700	70 (2.76)	700 (27.56)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	1520 (59.84)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0
WM-G-70-800	70 (2.76)	800 (31.5)	2000 (449,62)	12000 (2697,72)	15000 (3372,15)	1720 (67.72)	-	-	100 (3.94)	94 (3.7)	-	-	35 (1.38)	35 (1.38)	30 (1.18)	M24x2,0

Ordering Information: Page 134

WM - GVA

Material	**Housing, Piston rod high-quality stainless steel (V4A, AISI No. 316L)**
Installation position	Recommendation: piston rod downwards
Filling medium	Nitrogen oil
Temperature	-30°C – +80°C (-22°F – +176°F)
RoHS compliant	Directive 2002/95/EC
Applications	**Food industry, Chemicals, Seawater**

FORCE DIAGRAM

The theoretical extension force is the result of the filling pressure multiplied by the cross-sectional area of the piston rod. Weforma gas springs are filled to a pressure determined in accordance with the customer's requirements (extension force F_1). The extension force always refers to the value F_1, measured at 20°C ± 2°C and with a downwards facing piston rod.

F_1 = extension force with extended piston rod
F_2 = extension force with compressed piston rod
F_3 = insertion force with extended piston rod
F_4 = insertion force with compressed piston rod
F_R = frictional force

PROGRESSION

Linear force increase during extension or compression, measured by the nominal force over the entire stroke. The listed values can be influenced.

	Progression approx. %		Progression approx. %		Progression approx. %		Progression approx. %
WM-G-8	28	WM-G-15	27	WM-G-28	52	WM-GZ-19	20
WM-G-10	20	WM-G-19	33	WM-G-40	45	WM-GZ-28	65
WM-G-12	21	WM-G-22	39	WM-G-70	25		

SELECTION

For the selection and/or order the following information is required:

S	Centre of gravity
G	Weight of the lid in N (ca. Kp x 10)
b	Lever arm of a force (correlates to approx. 85% of the required stroke)
X	Number of springs (as a rule 2 pieces, one spring each side of the lid)
L	Radius

Note
In general the permitted extended force tolerances are +40N - 20N or ± 5-7%.
The force of a gas spring is physically dependant on temperature. It varies by approx. 3.3% (basis +20°C) per 10°C.

ORDERING INFORMATION

WM-G-19-100-K2G4-XXXXX-XXXX

WM-G	Gas Springs
WM-GZ	Gas traction springs
WM-GVA	Stainless Steel Gas Springs
19	19mm diameter
100	Stroke
K0G0	Thread
K2	Piston rod - Angle joint
G4	Housing - Spherical end bearing
Code	Code is assigned by Weforma

1 Male rod clevis

2 Angle joint

3 Female rod clevis

4 Spherical end bearing

5 Ball joint housing

6 only G Release screw

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		Force with compressed piston rod*	A	B1	B2	B3	B4	B5	B6	C1	C2	ø E	GW
	mm (inch)		N min. (lbs)	N max. (lbs)	N max. (lbs)	mm (inch)										
WM-GVA-15-20	15 (0.59)	20 (0.79)	40 (8.99)	400 (89.92)	508 (114.2)	74 (2.91)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-15-40	15 (0.59)	40 (1.57)	40 (8.99)	400 (89.92)	508 (114.2)	114 (4.49)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-15-50	15 (0.59)	50 (1.97)	40 (8.99)	400 (89.92)	508 (114.2)	134 (5.28)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-15-60	15 (0.59)	60 (2.36)	40 (8.99)	400 (89.92)	508 (114.2)	154 (6.06)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-15-80	15 (0.59)	80 (3.15)	40 (8.99)	400 (89.92)	508 (114.2)	194 (7.64)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-15-100	15 (0.59)	100 (3.94)	40 (8.99)	400 (89.92)	508 (114.2)	234 (9.21)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-15-120	15 (0.59)	120 (4.72)	40 (8.99)	400 (89.92)	508 (114.2)	274 (10.79)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-15-150	15 (0.59)	150 (5.91)	40 (8.99)	400 (89.92)	508 (114.2)	334 (13.15)	16 (0.63)	-	-	-	-	5 (0.2)	5 (0.2)	5 (0.2)	6 (0.24)	M5
WM-GVA-19-50	19 (0.75)	50 (1.97)	50 (11.24)	700 (157.37)	931 (209.3)	164 (6.46)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-GVA-19-100	19 (0.75)	100 (3.94)	50 (11.24)	700 (157.37)	931 (209.3)	264 (10.39)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-GVA-19-150	19 (0.75)	150 (5.91)	50 (11.24)	700 (157.37)	931 (209.3)	364 (14.33)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-GVA-19-200	19 (0.75)	200 (7.87)	50 (11.24)	700 (157.37)	931 (209.3)	464 (18.27)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-GVA-19-250	19 (0.75)	250 (9.84)	50 (11.24)	700 (157.37)	931 (209.3)	564 (22.2)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-GVA-19-300	19 (0.75)	300 (11.81)	50 (11.24)	700 (157.37)	931 (209.3)	664 (26.14)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	8 (0.31)	9 (0.35)	8 (0.31)	8 (0.31)	M8
WM-GVA-22-50	22 (0.87)	50 (1.97)	100 (22.48)	1200 (269.77)	1807 (406.23)	164 (6.46)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-100	22 (0.87)	100 (3.94)	100 (22.48)	1200 (269.77)	1807 (406.23)	264 (10.39)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-150	22 (0.87)	150 (5.91)	100 (22.48)	1200 (269.77)	1807 (406.23)	364 (14.33)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-200	22 (0.87)	200 (7.87)	100 (22.48)	1200 (269.77)	1807 (406.23)	464 (18.27)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-250	22 (0.87)	250 (9.84)	100 (22.48)	1200 (269.77)	1807 (406.23)	564 (22.2)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-300	22 (0.87)	300 (11.81)	100 (22.48)	1200 (269.77)	1807 (406.23)	664 (26.14)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-350	22 (0.87)	350 (13.78)	100 (22.48)	1200 (269.77)	1807 (406.23)	764 (30.08)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-400	22 (0.87)	400 (15.75)	100 (22.48)	1200 (269.77)	1807 (406.23)	864 (34.02)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-450	22 (0.87)	450 (17.72)	100 (22.48)	1200 (269.77)	1807 (406.23)	964 (37.95)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-500	22 (0.87)	500 (19.69)	100 (22.48)	1200 (269.77)	1807 (406.23)	1064 (41.89)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-550	22 (0.87)	550 (21.65)	100 (22.48)	1200 (269.77)	1807 (406.23)	1164 (45.83)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-600	22 (0.87)	600 (23.62)	100 (22.48)	1200 (269.77)	1807 (406.23)	1264 (49.76)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-650	22 (0.87)	650 (25.59)	100 (22.48)	1200 (269.77)	1807 (406.23)	1364 (53.7)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8
WM-GVA-22-700	22 (0.87)	700 (27.56)	100 (22.48)	1200 (269.77)	1807 (406.23)	1464 (57.64)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	10 (0.39)	9 (0.35)	9 (0.35)	10 (0.39)	M8

WM-GVA

1 Male rod clevis

2 Angle joint

3 Female rod clevis

4 Spherical end bearing

6 Release screw
only G

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		Force with compressed piston rod*	A	B1	B2	B3	B4	B6	C1	C2	ø E	GW
	mm (inch)		N min. (lbs)	N max. (lbs)	N max. (lbs)	mm (inch)									
WM-GVA-28-100	28 (1.1)	100 (3.94)	150 (33,72)	2500 (562,03)	3800 (854,28)	262 (10.31)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-150	28 (1.1)	150 (5.91)	150 (33,72)	2500 (562,03)	3800 (854,28)	362 (14.25)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-200	28 (1.1)	200 (7.87)	150 (33,72)	2500 (562,03)	3800 (854,28)	462 (18.19)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-250	28 (1.1)	250 (9.84)	150 (33,72)	2500 (562,03)	3800 (854,28)	562 (22.13)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-300	28 (1.1)	300 (11.81)	150 (33,72)	2500 (562,03)	3800 (854,28)	662 (26.06)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-350	28 (1.1)	350 (13.78)	150 (33,72)	2500 (562,03)	3800 (854,28)	762 (30)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-400	28 (1.1)	400 (15.75)	150 (33,72)	2500 (562,03)	3800 (854,28)	862 (33.94)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-450	28 (1.1)	450 (17.72)	150 (33,72)	2500 (562,03)	3800 (854,28)	962 (37.87)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-500	28 (1.1)	500 (19.69)	150 (33,72)	2500 (562,03)	3800 (854,28)	1062 (41.81)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-550	28 (1.1)	550 (21.65)	150 (33,72)	2500 (562,03)	3800 (854,28)	1162 (45.75)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-600	28 (1.1)	600 (23.62)	150 (33,72)	2500 (562,03)	3800 (854,28)	1262 (49.69)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-28-650	28 (1.1)	650 (25.59)	150 (33,72)	2500 (562,03)	3800 (854,28)	1362 (53.62)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	13 (0.51)	9 (0.35)	13 (0.51)	14 (0.55)	M10
WM-GVA-40-100	40 (1.57)	100 (3.94)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	317 (12.48)	40 (1.57)	45 (1.77)	-	-	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-GVA-40-150	40 (1.57)	150 (5.91)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	417 (16.42)	40 (1.57)	45 (1.77)	-	-	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-GVA-40-200	40 (1.57)	200 (7.87)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	517 (20.35)	40 (1.57)	45 (1.77)	-	-	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-GVA-40-300	40 (1.57)	300 (11.81)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	717 (28.23)	40 (1.57)	45 (1.77)	-	-	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-GVA-40-400	40 (1.57)	400 (15.75)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	917 (36.1)	40 (1.57)	45 (1.77)	-	-	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-GVA-40-500	40 (1.57)	500 (19.69)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	1117 (43.98)	40 (1.57)	45 (1.77)	-	-	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5
WM-GVA-40-600	40 (1.57)	600 (23.62)	500 (112,41)	5000 (1124,05)	7250 (1629,87)	1317 (51.85)	40 (1.57)	45 (1.77)	-	-	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	M14x1,5

1 Male rod clevis

SW	Ø	L1	L3	d	Code	max. N (lbs)
mm (inch)						
3 (0.12)	6,2 (0.24)	16 (0.63)	9 (0.35)	M5	1-M5-VA	490 (110.16)
10 (0.39)	8,2 (0.32)	20 (0.79)	20 (0.79)	M8	1-M8-VA	1560 (350.7)
12 (0.47)	8,2 (0.32)	25 (0.98)	12 (0.47)	M10	1-M10-VA	3800 (854.28)
14 (0.55)	14,2 (0.56)	40 (1.57)	20 (0.79)	M14x1,5	1-M14-VA	7000 (1573.67)

2 Angle joint

AØ	L	b	c	d	e	f	Code	max. N (lbs)
mm (inch)			mm (inch)		mm (inch)			
13 (0.51)	30 (1.18)	M8	14,5 (0.57)	M8	16,5 (0.65)	13 (0.51)	2-M8-VA	1140 (256.28)
16 (0.63)	35 (1.38)	M10	15,5 (0.61)	M10	20 (0.79)	16 (0.63)	2-M10-VA	1750 (393.42)
19 (0.75)	45 (1.77)	M14x1,5	20 (0.79)	M14x1,5	28 (1.1)	20 (0.79)	2-M14-VA	3200 (719.39)

3 Female rod clevis

A	ØB	b	g	L1	L2	d	Code	max. N (lbs)
mm (inch)								
16 (0.63)	8 (0.31)	8 (0.31)	16 (0.63)	42 (1.65)	32 (1.26)	M8	3-M8-VA	1560 (350.7)
20 (0.79)	10 (0.39)	10 (0.39)	20 (0.79)	52 (2.05)	40 (1.57)	M10	3-M10-VA	3800 (854.28)

4 Spherical end bearing

b1	d1	d3	L	L3	h	Code	max. N
mm (inch)			mm (inch)				
8 (0.31)	8 (0.31)	M8	16 (0.63)	12 (0.47)	36 (1.42)	4-M8-VA	1560 (350.7)
9 (0.35)	10 (0.39)	M10	20 (0.79)	13 (0.51)	43 (1.69)	4-M10-VA	3800 (854.28)

5 Ball joint housing

A	L	b	c	Code	max. N (lbs)
mm (inch)			mm (inch)		
10 (0.39)	19 (0.75)	M8	10 (0.39)	5-M8-2-VA	1140 (256.28)
13 (0.51)	30 (1.18)	M8	14 (0.55)	5-M8-VA	1140 (256.28)

20-VA (for 1-M8-VA, 4-M8-VA)

21-VA (für / for 1-M8-VA, 4-M8-VA)

25-VA (für / for 1-M8-VA, 1-M10-VA, 4-M8-VA)

WM - GZ

- **High corrosion resistance**
  - Housing: powder coated
  - Piston rod: ceramic coated
- **Minimal friction coefficient to achieve the lowest extension forces**
- **Integrated grease chamber and sliding bearing**

- Lower breakaway force
- Installation position: any
- Maintenance-free and ready for installation
- Temperature: -30°C – +80°C (-22°F – +176°F), optional: -45°C – +200°C (-49°F – +392°F)
- RoHS compliant Directive 2002/95/EC
- Pull-in force must be stated on ordering.

FORCE DIAGRAM

The theoretical extension force is the result of the filling pressure multiplied by the cross-sectional area of the piston rod. Weforma gas springs are filled to a pressure determined in accordance with the customer's requirements (extension force F_1). The extension force always refers to the value F_1, measured at 20°C ± 2°C and with a downwards facing piston rod.

F_1 = extension force with extended piston rod
F_2 = extension force with compressed piston rod
F_3 = insertion force with extended piston rod
F_4 = insertion force with compressed piston rod
F_R = frictional force

PROGRESSION

Linear force increase during extension or compression, measured by the nominal force over the entire stroke. The listed values can be influenced.

	Progression approx. %
WM-GZ-19	20
WM-GZ-28	65

SELECTION

For the selection and/or order the following information is required:

S	Centre of gravity
G	Weight of the lid in N (ca. Kp x 10)
b	Lever arm of a force (correlates to approx. 85% of the required stroke)
X	Number of springs (as a rule 2 pieces, one spring each side of the lid)
L	Radius

Note
In general the permitted extended force tolerances are +40N - 20N or ± 5-7%.
The force of a gas spring is physically dependant on temperature. It varies by approx. 3.3% (basis +20°C) per 10°C.

ORDERING INFORMATION

WM-G-19-100-K2G4-XXXXX-XXXX

WM-G	Gas Springs
WM-GZ	Gas traction springs
WM-GVA	Stainless Steel Gas Springs
19	19mm diameter
100	Stroke
K0G0	Thread
K2	Piston rod - Angle joint
G4	Housing - Spherical end bearing
Code	Code is assigned by Weforma

1 Male rod clevis

2 Angle joint

3 Female rod clevis

4 Spherical end bearing

5 Ball joint housing

6 only G Release screw

8 Protection tube

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		Force with extended piston rod	A	B1	B2	B3	B4	B5	B6	C1	C2	ø E	GW1	GW2
	mm (inch)		N min. (lbs)	N max. (lbs)	N max. (lbs)	mm (inch)											
WM-GZ-19-30	19 (0.75)	30 (1.18)	30 (6.74)	300 (67.44)	360 (80.93)	112 (4.41)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	5 (0.2)	10 (0.39)	8 (0.31)	6 (0.24)	M8	M8
WM-GZ-19-50	19 (0.75)	50 (1.97)	30 (6.74)	300 (67.44)	360 (80.93)	132 (5.2)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	5 (0.2)	10 (0.39)	8 (0.31)	6 (0.24)	M8	M8
WM-GZ-19-100	19 (0.75)	100 (3.94)	30 (6.74)	300 (67.44)	360 (80.93)	182 (7.17)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	5 (0.2)	10 (0.39)	8 (0.31)	6 (0.24)	M8	M8
WM-GZ-19-150	19 (0.75)	150 (5.91)	30 (6.74)	300 (67.44)	360 (80.93)	232 (9.13)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	5 (0.2)	10 (0.39)	8 (0.31)	6 (0.24)	M8	M8
WM-GZ-19-200	19 (0.75)	200 (7.87)	30 (6.74)	300 (67.44)	360 (80.93)	282 (11.1)	20 (0.79)	30 (1.18)	32 (1.26)	36 (1.42)	30 (1.18)	5 (0.2)	10 (0.39)	8 (0.31)	6 (0.24)	M8	M8
WM-GZ-28-30	28 (1.1)	30 (1.18)	150 (33.72)	1200 (269.77)	1980 (445.12)	130 (5.12)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-50	28 (1.1)	50 (1.97)	150 (33.72)	1200 (269.77)	1980 (445.12)	150 (5.91)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-100	28 (1.1)	100 (3.94)	150 (33.72)	1200 (269.77)	1980 (445.12)	200 (7.87)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-150	28 (1.1)	150 (5.91)	150 (33.72)	1200 (269.77)	1980 (445.12)	250 (9.84)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-200	28 (1.1)	200 (7.87)	150 (33.72)	1200 (269.77)	1980 (445.12)	300 (11.81)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-250	28 (1.1)	250 (9.84)	150 (33.72)	1200 (269.77)	1980 (445.12)	350 (13.78)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-300	28 (1.1)	300 (11.81)	150 (33.72)	1200 (269.77)	1980 (445.12)	400 (15.75)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-350	28 (1.1)	350 (13.78)	150 (33.72)	1200 (269.77)	1980 (445.12)	450 (17.72)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-400	28 (1.1)	400 (15.75)	150 (33.72)	1200 (269.77)	1980 (445.12)	500 (19.69)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-450	28 (1.1)	450 (17.72)	150 (33.72)	1200 (269.77)	1980 (445.12)	550 (21.65)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-500	28 (1.1)	500 (19.69)	150 (33.72)	1200 (269.77)	1980 (445.12)	600 (23.62)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-550	28 (1.1)	550 (21.65)	150 (33.72)	1200 (269.77)	1980 (445.12)	650 (25.59)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-600	28 (1.1)	600 (23.62)	150 (33.72)	1200 (269.77)	1980 (445.12)	700 (27.56)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10
WM-GZ-28-650	28 (1.1)	650 (25.59)	150 (33.72)	1200 (269.77)	1980 (445.12)	750 (29.53)	25 (0.98)	35 (1.38)	40 (1.57)	43 (1.69)	35 (1.38)	12 (0.47)	9 (0.35)	9 (0.35)	10 (0.39)	M10	M10

M3

1-M3 Male rod clevis

2-M3 Angle joint

3-M3 Female rod clevis

4-M3 Spherical end bearing

5-M3 Ball joint housing

M4

1-M4 Male rod clevis

2-M4 Angle joint

3-M4 Female rod clevis

4-M4 Spherical end bearing

5-M4 Ball joint housing

6-M4 Release screw

M5

1-M5 Male rod clevis

2-M5 Angle joint

3-M5 Female rod clevis

4-M5 Spherical end bearing

5-M5 Ball joint housing

7-M5 Ball joints

6-15-M5 Release screw

26 (for 1-M5, 4-M5)

29 (for 1-M5, 4-M5)

M8

1-M8 Male rod clevis

2-M8 Angle joint

3-M8 Female rod clevis

4-M8 Spherical end bearing

5-M8 Ball joint housing

max. 1200 N

7-M8 Ball joints

max. 1200 N

6-22-M8 Release screw

5-2-M8 Ball joint housing

max. 1200 N

20 (for 1-M8, 4-M8)

21 (for 1-M8, 4-M8)

22 (for 1-M8, 4-M8)

23 (for 5-2-M8)

24 (for 5-2-M8)

25 (for 1-M8, 4-M8)

M10

1-M10 Male rod clevis

2-M10 Angle joint

3-M10 Female rod clevis

4-M10 Spherical end bearing

6-28-M10 Release screw

5-M10 Ball joint housing

25 (for 1-M10)

M14x1,5

1-M14 Male rod clevis

max. 10000 N

2-M14 Angle joint

max. 3200 N

3-M14 Female rod clevis

max. 10000 N

4-M14 Spherical end bearing

max. 10000 N

6-40-M14 Release screw

M24x2

3-M24 Female rod clevis

4-M24 Spherical end bearing

max. 50000 N

Gas spring Refilling Kit

The gas spring refilling kit allows to fill or adjust gas springs on site. The kit contains all necessary filling bells and release screws for our product range. The refilling kit is equipped for 200 bar nitrogen bottles with thread W24,32x1/14"
Nitrogen is not included.

Gas Spring Release Kit

Gas spring release kit for controlled discharge of nitrogen in gas springs. The kit contains all necessary release screws and a pressure gauge to control the remaining pressure in the gas spring.

Gas Spring Filling Station

Gas spring filling station to fill gas springs (except WM-G-70).
All necessary filling adapters are included.
Nitrogen is not included.

WM - GB

- **High corrosion resistance**
  - Housing: powder coated
  - Piston rod: ceramic coated
- **Freely lockable over the complete stroke**
- **Minimal friction coefficient to achieve the lowest extension forces**

- Integrated grease chamber and sliding bearing
- Lower breakaway force
- Installation position: any
- Maintenance-free and ready for installation
- Temperature: -30°C – +80°C (-22°F – +176°F), optional: -45°C – +200°C (-49°F – +392°F)
- RoHS compliant Directive 2002/95/EC
- Extension force must be stated on ordering.

Type 1

- Blockable in both directions
- Spring travel possible in spite of being blocked
- Comfortable shock absorption
- Application: seat height adjustment

Type 2

- Fixed blocking when load is placed on the pull
- Blocking under pressure remains fixed until the force of the filling pressure on the separating piston is exceeded.
- Application: adjustable inclinations

Type 3

- Functional application as in type 2
- Oil and gas are reversed
- Application: adjusting

Type 4

- Combination of type 2 and type 3
- Fixed blocking in both directions
- Application: rocker mechanisms, medical couches

WM-GB Type 1

Ordering Information: Page 154

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		Progression	A	E	C1	C2	GW1	GW2
	mm (inch)		N min. (lbs)	N max. (lbs)	%	mm (inch)					
WM-GB-22-050-1	22 (0.87)	50 (1.97)	40 (8.99)	700 (157.37)	23	175 (6.89)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-22-100-1	22 (0.87)	100 (3.94)	40 (8.99)	700 (157.37)	23	275 (10.83)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-22-150-1	22 (0.87)	150 (5.91)	40 (8.99)	700 (157.37)	23	375 (14.76)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-22-200-1	22 (0.87)	200 (7.87)	40 (8.99)	700 (157.37)	23	475 (18.7)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-22-250-1	22 (0.87)	250 (9.84)	40 (8.99)	700 (157.37)	23	575 (22.64)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-22-300-1	22 (0.87)	300 (11.81)	40 (8.99)	700 (157.37)	23	675 (26.57)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-22K-050-1	22 (0.87)	50 (1.97)	50 (11.24)	1300 (292.25)	39	181 (7.13)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-22K-100-1	22 (0.87)	100 (3.94)	50 (11.24)	1300 (292.25)	39	281 (11.06)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-22K-150-1	22 (0.87)	150 (5.91)	50 (11.24)	1300 (292.25)	39	381 (15)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-22K-200-1	22 (0.87)	200 (7.87)	50 (11.24)	1300 (292.25)	39	481 (18.94)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-22K-250-1	22 (0.87)	250 (9.84)	50 (11.24)	1300 (292.25)	39	581 (22.87)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-22K-300-1	22 (0.87)	300 (11.81)	50 (11.24)	1300 (292.25)	39	681 (26.81)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-28-050-1	28 (1.1)	50 (1.97)	40 (8.99)	700 (157.37)	13	187 (7.36)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-28-100-1	28 (1.1)	100 (3.94)	40 (8.99)	700 (157.37)	13	287 (11.3)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-28-150-1	28 (1.1)	150 (5.91)	40 (8.99)	700 (157.37)	13	387 (15.24)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-28-200-1	28 (1.1)	200 (7.87)	40 (8.99)	700 (157.37)	13	487 (19.17)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-28-250-1	28 (1.1)	250 (9.84)	40 (8.99)	700 (157.37)	13	587 (23.11)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-28-300-1	28 (1.1)	300 (11.81)	40 (8.99)	700 (157.37)	13	687 (27.05)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M8
WM-GB-28K-050-1	28 (1.1)	50 (1.97)	50 (11.24)	1300 (292.25)	21	194 (7.64)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-28K-100-1	28 (1.1)	100 (3.94)	50 (11.24)	1300 (292.25)	21	294 (11.57)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-28K-150-1	28 (1.1)	150 (5.91)	50 (11.24)	1300 (292.25)	21	394 (15.51)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-28K-200-1	28 (1.1)	200 (7.87)	50 (11.24)	1300 (292.25)	21	494 (19.45)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-28K-250-1	28 (1.1)	250 (9.84)	50 (11.24)	1300 (292.25)	21	594 (23.39)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-28K-300-1	28 (1.1)	300 (11.81)	50 (11.24)	1300 (292.25)	21	694 (27.32)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M10
WM-GB-40-050-1	40 (1.57)	50 (1.97)	150 (33.72)	2600 (584.51)	18	201 (7.91)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M14x1,5
WM-GB-40-100-1	40 (1.57)	100 (3.94)	150 (33.72)	2600 (584.51)	18	301 (11.85)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M14x1,5
WM-GB-40-150-1	40 (1.57)	150 (5.91)	150 (33.72)	2600 (584.51)	18	401 (15.79)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M14x1,5
WM-GB-40-200-1	40 (1.57)	200 (7.87)	150 (33.72)	2600 (584.51)	18	501 (19.72)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M14x1,5
WM-GB-40-300-1	40 (1.57)	300 (11.81)	150 (33.72)	2600 (584.51)	18	701 (27.6)	14 (0.55)	20 (0.79)	20 (0.79)	M 14x1,5	M14x1,5
WM-GB-40-400-1	40 (1.57)	400 (15.75)	150 (33.72)	2600 (584.51)	18	901 (35.47)	14 (0.55)	20 (0.79)	20 (0.79)	M 14x1,5	M14x1,5
WM-GB-40-500-1	40 (1.57)	500 (19.69)	150 (33.72)	2600 (584.51)	18	1101 (43.35)	14 (0.55)	20 (0.79)	20 (0.79)	M 14x1,5	M14x1,5
WM-GB-40-600-1	40 (1.57)	600 (23.62)	150 (33.72)	2600 (584.51)	18	1301 (51.22)	14 (0.55)	20 (0.79)	20 (0.79)	M 14x1,5	M14x1,5
WM-GB-40-700-1	40 (1.57)	700 (27.56)	150 (33.72)	2600 (584.51)	18	1501 (59.09)	14 (0.55)	20 (0.79)	20 (0.79)	M 14x1,5	M14x1,5

WM-GB Type 2

Ordering Information: Page 154

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		A1 Progression 35%	A2 Progression 50%	A3 Progression 100%	E	C1	C2	GW1	GW2	Locking force push*	Locking force pull
	mm (inch)		N min. (lbs)	N max. (lbs)	mm (inch)								N max. (lbs)	
WM-GB-22-050-2	22 (0.87)	50 (1.97)	40 (8.99)	700 (157.37)	194 (7.64)	187 (7.36)	178 (7.01)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	3920 (881.26)	-
WM-GB-22-100-2	22 (0.87)	100 (3.94)	40 (8.99)	700 (157.37)	320 (12.6)	305 (12.01)	287 (11.3)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	3920 (881.26)	-
WM-GB-22-150-2	22 (0.87)	150 (5.91)	40 (8.99)	700 (157.37)	446 (17.56)	424 (16.69)	397 (15.63)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	3920 (881.26)	-
WM-GB-22-200-2	22 (0.87)	200 (7.87)	40 (8.99)	700 (157.37)	572 (22.52)	542 (21.34)	506 (19.92)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	3920 (881.26)	-
WM-GB-22-250-2	22 (0.87)	250 (9.84)	40 (8.99)	700 (157.37)	698 (27.48)	661 (26.02)	616 (24.25)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	3920 (881.26)	-
WM-GB-22-300-2	22 (0.87)	300 (11.81)	40 (8.99)	700 (157.37)	824 (32.44)	779 (30.67)	725 (28.54)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	3920 (881.26)	-
WM-GB-22K-050-2	22 (0.87)	50 (1.97)	40 (8.99)	1300 (292.25)	214 (8.43)	202 (7.95)	188 (7.4)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	3920 (881.26)	7000 (1573.67)
WM-GB-22K-100-2	22 (0.87)	100 (3.94)	40 (8.99)	1300 (292.25)	354 (13.94)	331 (13.03)	303 (11.93)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	3920 (881.26)	7000 (1573.67)
WM-GB-22K-150-2	22 (0.87)	150 (5.91)	40 (8.99)	1300 (292.25)	495 (19.49)	460 (18.11)	418 (16.46)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	3920 (881.26)	7000 (1573.67)
WM-GB-22K-200-2	22 (0.87)	200 (7.87)	40 (8.99)	1300 (292.25)	635 (25)	589 (23.19)	533 (20.98)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	3920 (881.26)	7000 (1573.67)
WM-GB-22K-250-2	22 (0.87)	250 (9.84)	40 (8.99)	1300 (292.25)	776 (30.55)	718 (28.27)	648 (25.51)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	3920 (881.26)	7000 (1573.67)
WM-GB-22K-300-2	22 (0.87)	300 (11.81)	40 (8.99)	1300 (292.25)	916 (36.06)	847 (33.35)	763 (30.04)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	3920 (881.26)	7000 (1573.67)
WM-GB-28-050-2	28 (1.1)	50 (1.97)	50 (11.24)	700 (157.37)	189 (7.44)	184 (7.24)	179 (7.05)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	7000 (1573.67)	-
WM-GB-28-100-2	28 (1.1)	100 (3.94)	50 (11.24)	700 (157.37)	305 (12.01)	296 (11.65)	285 (11.22)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	7000 (1573.67)	-
WM-GB-28-150-2	28 (1.1)	150 (5.91)	50 (11.24)	700 (157.37)	422 (16.61)	408 (16.06)	392 (15.43)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	7000 (1573.67)	-
WM-GB-28-200-2	28 (1.1)	200 (7.87)	50 (11.24)	700 (157.37)	538 (21.18)	520 (20.47)	498 (19.61)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	7000 (1573.67)	-
WM-GB-28-250-2	28 (1.1)	250 (9.84)	50 (11.24)	700 (157.37)	655 (25.79)	632 (24.88)	605 (23.82)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	7000 (1573.67)	-
WM-GB-28-300-2	28 (1.1)	300 (11.81)	50 (11.24)	700 (157.37)	771 (30.35)	744 (29.29)	711 (27.99)	8 (0.31)	16 (0.63)	8 (0.31)	M 8x1	M 8	7000 (1573.67)	-
WM-GB-28K-050-2	28 (1.1)	50 (1.97)	50 (11.24)	1300 (292.25)	203 (7.99)	195 (7.68)	187 (7.36)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-100-2	28 (1.1)	100 (3.94)	50 (11.24)	1300 (292.25)	329 (12.95)	313 (12.32)	296 (11.65)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-150-2	28 (1.1)	150 (5.91)	50 (11.24)	1300 (292.25)	455 (17.91)	431 (16.97)	406 (15.98)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-200-2	28 (1.1)	200 (7.87)	50 (11.24)	1300 (292.25)	581 (22.87)	549 (21.61)	515 (20.28)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-250-2	28 (1.1)	250 (9.84)	50 (11.24)	1300 (292.25)	707 (27.83)	667 (26.26)	625 (24.61)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-300-2	28 (1.1)	300 (11.81)	50 (11.24)	1300 (292.25)	833 (32.8)	744 (29.29)	734 (28.9)	10 (0.39)	18 (0.71)	13 (0.51)	M 10x1	M 10	10000 (2248.1)	10000 (2248.1)
WM-GB-40-100-2	40 (1.57)	100 (3.94)	150 (33.72)	2600 (584.51)	342 (13.46)	330 (12.99)	314 (12.36)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-150-2	40 (1.57)	150 (5.91)	150 (33.72)	2600 (584.51)	464 (18.27)	446 (17.56)	422 (16.61)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-200-2	40 (1.57)	200 (7.87)	150 (33.72)	2600 (584.51)	585 (23.03)	561 (22.09)	529 (20.83)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-300-2	40 (1.57)	300 (11.81)	150 (33.72)	2600 (584.51)	828 (32.6)	792 (31.18)	744 (29.29)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-400-2	40 (1.57)	400 (15.75)	150 (33.72)	2600 (584.51)	1071 (42.17)	1023 (40.28)	959 (37.76)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-500-2	40 (1.57)	500 (19.69)	150 (33.72)	2600 (584.51)	1314 (51.73)	1254 (49.37)	1174 (46.22)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-600-2	40 (1.57)	600 (23.62)	150 (33.72)	2600 (584.51)	1557 (61.3)	1485 (58.46)	1389 (54.69)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-700-2	40 (1.57)	700 (27.56)	150 (33.72)	2600 (584.51)	1800 (70.87)	1716 (67.56)	1604 (63.15)	14 (0.55)	20 (0.79)	15 (0.59)	M 14x1,5	M 14x1,5	10000 (2248.1)	10000 (2248.1)

*Data are approximate - depending on the extension force "F1"

WM-GB Type 3

! without valve

Ordering Information: Page 154

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		A1 - Progression 35%	A2 - Progression 50%	A3 - Progression 100%	E	C1	C2	GW1	GW2	Locking force push*	Locking force pull*
	mm (inch)		N min. (lbs)	N max. (lbs)	mm (inch)								N max. (lbs	
WM-GB-22-050-3	22 (0.87)	50 (1.97)	40 (8.99)	700 (157.37)	216 (8.5)	206 (8.11)	196 (7.72)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	-
WM-GB-22-100-3	22 (0.87)	100 (3.94)	40 (8.99)	700 (157.37)	357 (14.06)	338 (13.31)	317 (12.48)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	-
WM-GB-22-150-3	22 (0.87)	150 (5.91)	40 (8.99)	700 (157.37)	499 (19.65)	470 (18.5)	439 (17.28)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	-
WM-GB-22-200-3	22 (0.87)	200 (7.87)	40 (8.99)	700 (157.37)	640 (25.2)	602 (23.7)	560 (22.05)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	-
WM-GB-22K-050-3	22 (0.87)	50 (1.97)	50 (11.24)	1300 (292.25)	254 (10)	239 (9.41)	219 (8.62)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	3380 (759.86)
WM-GB-22K-100-3	22 (0.87)	100 (3.94)	50 (11.24)	1300 (292.25)	427 (16.81)	396 (15.59)	357 (14.06)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	3380 (759.86)
WM-GB-22K-150-3	22 (0.87)	150 (5.91)	50 (11.24)	1300 (292.25)	600 (23.62)	554 (21.81)	495 (19.49)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	3380 (759.86)
WM-GB-22K-200-3	22 (0.87)	200 (7.87)	50 (11.24)	1300 (292.25)	773 (30.43)	711 (27.99)	633 (24.92)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	3380 (759.86)
WM-GB-22K-250-3	22 (0.87)	250 (9.84)	50 (11.24)	1300 (292.25)	946 (37.24)	869 (34.21)	771 (30.35)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	3380 (759.86)
WM-GB-22K-300-3	22 (0.87)	300 (11.81)	50 (11.24)	1300 (292.25)	1119 (44.06)	1026 (40.39)	909 (35.79)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	3380 (759.86)
WM-GB-28-050-3	28 (1.1)	50 (1.97)	50 (11.24)	700 (157.37)	202 (7.95)	196 (7.72)	191 (7.52)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	7000 (1573.67)
WM-GB-28-100-3	28 (1.1)	100 (3.94)	50 (11.24)	700 (157.37)	326 (12.83)	313 (12.32)	303 (11.93)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	7000 (1573.67)
WM-GB-28-150-3	28 (1.1)	150 (5.91)	50 (11.24)	700 (157.37)	450 (17.72)	431 (16.97)	416 (16.38)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	7000 (1573.67)
WM-GB-28-200-3	28 (1.1)	200 (7.87)	50 (11.24)	700 (157.37)	574 (22.6)	548 (21.57)	528 (20.79)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	7000 (1573.67)
WM-GB-28-250-3	28 (1.1)	250 (9.84)	50 (11.24)	700 (157.37)	698 (27.48)	666 (26.22)	641 (25.24)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	7000 (1573.67)
WM-GB-28-300-3	28 (1.1)	300 (11.81)	50 (11.24)	700 (157.37)	822 (32.36)	783 (30.83)	753 (29.65)	8 (0.31)	16 (0.63)	8 (0.31)	M8x1	M8	7000 (1573.67)	7000 (1573.67)
WM-GB-28K-050-3	28 (1.1)	50 (1.97)	50 (11.24)	1300 (292.25)	226 (8.9)	217 (8.54)	206 (8.11)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	7000 (1573.67)
WM-GB-28K-100-3	28 (1.1)	100 (3.94)	50 (11.24)	1300 (292.25)	366 (14.41)	348 (13.7)	327 (12.87)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	7000 (1573.67)
WM-GB-28K-150-3	28 (1.1)	150 (5.91)	50 (11.24)	1300 (292.25)	507 (19.96)	480 (18.9)	448 (17.64)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	7000 (1573.67)
WM-GB-28K-200-3	28 (1.1)	200 (7.87)	50 (11.24)	1300 (292.25)	647 (25.47)	611 (24.06)	569 (22.4)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	7000 (1573.67)
WM-GB-28K-250-3	28 (1.1)	250 (9.84)	50 (11.24)	1300 (292.25)	788 (31.02)	743 (29.25)	690 (27.17)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	7000 (1573.67)
WM-GB-28K-300-3	28 (1.1)	300 (11.81)	50 (11.24)	1300 (292.25)	928 (36.54)	874 (34.41)	811 (31.93)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	7000 (1573.67)
WM-GB-40-050-3	40 (1.57)	50 (1.97)	150 (33.72)	2600 (584.51)	227 (8.94)	220 (8.66)	211 (8.31)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-100-3	40 (1.57)	100 (3.94)	150 (33.72)	2600 (584.51)	361 (14.21)	346 (13.62)	328 (12.91)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-150-3	40 (1.57)	150 (5.91)	150 (33.72)	2600 (584.51)	495 (19.49)	473 (18.62)	446 (17.56)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-200-3	40 (1.57)	200 (7.87)	150 (33.72)	2600 (584.51)	629 (24.76)	599 (23.58)	563 (22.17)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-300-3	40 (1.57)	300 (11.81)	150 (33.72)	2600 (584.51)	897 (35.31)	852 (33.54)	798 (31.42)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-400-3	40 (1.57)	400 (15.75)	150 (33.72)	2600 (584.51)	1165 (45.87)	1105 (43.5)	1033 (40.67)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-500-3	40 (1.57)	500 (19.69)	150 (33.72)	2600 (584.51)	1433 (56.42)	1356 (53.39)	1268 (49.92)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)
WM-GB-40-600-3	40 (1.57)	600 (23.62)	150 (33.72)	2600 (584.51)	1701 (66.97)	1611 (63.43)	1503 (59.17)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	10000 (2248.1)	10000 (2248.1)

*Data are approximate - depending on the extension force "F1"

WM-GB Type 4

DIMENSIONS / PERFORMANCE

	ø D	Stroke	Force		A	E	C1	C2	GW1	GW2	Locking force push*	Locking force pull*
	mm (inch)		N min. (lbs)	N max. (lbs)	mm (inch)						N max (lbs)	
WM-GB-22K-050-4	22 (0.87)	50 (1.97)	50 (11.24)	1300 (292.25)	233 (9.17)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	7000 (1573.67)
WM-GB-22K-100-4	22 (0.87)	100 (3.94)	50 (11.24)	1300 (292.25)	383 (15.08)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	7000 (1573.67)
WM-GB-22K-150-4	22 (0.87)	150 (5.91)	50 (11.24)	1300 (292.25)	533 (20.98)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	7000 (1573.67)
WM-GB-22K-200-4	22 (0.87)	200 (7.87)	50 (11.24)	1300 (292.25)	683 (26.89)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	7000 (1573.67)
WM-GB-22K-250-4	22 (0.87)	250 (9.84)	50 (11.24)	1300 (292.25)	833 (32.8)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	7000 (1573.67)	7000 (1573.67)
WM-GB-28K-50-4	28 (1.1)	50 (1.97)	50 (11.24)	1300 (292.25)	237 (9.33)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-100-4	28 (1.1)	100 (3.94)	50 (11.24)	1300 (292.25)	387 (15.24)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-150-4	28 (1.1)	150 (5.91)	50 (11.24)	1300 (292.25)	537 (21.14)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-200-4	28 (1.1)	200 (7.87)	50 (11.24)	1300 (292.25)	687 (27.05)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	10000 (2248.1)
WM-GB-28K-250-4	28 (1.1)	250 (9.84)	50 (11.24)	1300 (292.25)	837 (32.95)	10 (0.39)	18 (0.71)	13 (0.51)	M10x1	M10	10000 (2248.1)	10000 (2248.1)
WM-GB-40-050-4	40 (1.57)	50 (1.97)	150 (33.72)	2600 (584.51)	239 (9.41)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	12000 (2697.72)	12000 (2697.72)
WM-GB-40-100-4	40 (1.57)	100 (3.94)	150 (33.72)	2600 (584.51)	389 (15.31)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	12000 (2697.72)	12000 (2697.72)
WM-GB-40-150-4	40 (1.57)	150 (5.91)	150 (33.72)	2600 (584.51)	539 (21.22)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	12000 (2697.72)	12000 (2697.72)
WM-GB-40-200-4	40 (1.57)	200 (7.87)	150 (33.72)	2600 (584.51)	689 (27.13)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	12000 (2697.72)	12000 (2697.72)
WM-GB-40-250-4	40 (1.57)	250 (9.84)	150 (33.72)	2600 (584.51)	989 (38.94)	14 (0.55)	20 (0.79)	15 (0.59)	M14x1,5	M14x1,5	12000 (2697.72)	12000 (2697.72)

! Due to the size, there may be a slip of 2mm. If this is not allowed, you have to order the gas spring with **-EL**.

Ordering Information

WM-GB-22-100-2-K0G1-XXXXX-XXXX

WM-GB	Lockable Gas Springs
22	22 mm diameter
100	Stroke
-2	Type

-EL only Type 4	Type 4 without slip
K0G1	Piston rod - only thread Gehäuse - Gelenkauge
Code	Code is assigned by Weforma

Release Systems

Gas Spring Configurator
www.weforma.com (Button: Service/Calculation)

BOWDEN WIRE RELEASE SYSTEM

A

Release head (Standard, Zinc die cast)

AK7

Release head (Horizontal, Zinc die cast)

AK8

B

BO-1000

Bowden wire

C

T1
Push button plastic
with spring

T2
Push button plastic
without spring

T3
Push button alu
with spring

T4
Push button alu
without spring

T5
Push button with long
bushing, aluminium,
without spring

RELEASE SYSTEM WITH LEVER

AK5-D

Release System with Lever
(release dir. towards gas spring)
Release head, Release lever
Flat grip for release lever

AK5-U

Release System with Lever
(release dir. away from gas spring)
Release head, Release lever
Flat grip for release lever

AK6

Variable release lever
Release head, Release lever
Cone grip for release lever

HYDRAULIC RELEASE SYSTEM

Short release system
with / without push button

AK10

TH1

Plastic bushing +
Plastic push button

TH3

Aluminium bushing +
Plastic push button

TH5

Aluminium bushing +
Aluminium push button

Weforma
WVE 8-7

Pallet Stoppers

Pallet Stopper

Electric Pallet Stopper

WPS-E
WPS-ED

Pneumatic deceleration

WPS-A 15
WPS-A 20
WPS-A 60

Hydraulic deceleration

WPS-H200
WPS 500

Pallet Stopper without deceleration

WPS-F 250
WPS-F 400

Pallet Stopper for roller conveyor system

WPS 600

Positioning Cylinder

WPZ

Anti-Bounce Stopper

WPR 20
WPR 22

Escapements

WVE 8-7
WVE 12-15
WVE 32-25
WVE 32-50

http://www.weforma.com/en/deceleration-technology/escapements.html

Working Principle

WPS-E

- **Return via rotary movement, no vertical stroke necessary**
- **Splash-proof according to IP64**
- **Resistant to dust and dirt**

- Energy-efficient compared to compressed air
- Function control possible additionally via an app
- Piston rod hard-coated: insensitive to bonding, e.g., welding
- LED – Diagnostic function

HB = Stroke

CONNECTIONS

- M12x1 connector, five-pin connections
- 2 connectors for actuator sensors (X1, X2)
- Additional 1 analogue path (X3) output 0 - 3 V connector provided by the customer for position detection

DIMENSIONS

	HB	A	B	C	D	E	F	G	øH	I	J	Weight
						mm (inch)						kg / lbs
WPS-E 20	8,5 (0.33)	133 (5.24)	116,5 (4.59)	98 (3.86)	60 (2.36)	36,5 (1.44)	8 (0.31)	25 (0.98)	8,6 (0.34)	46 (1.81)	10 (0.39)	0,67 (1.48)
WPS-E 50	17,5 (0.69)	144 (5.67)	116,5 (4.59)	98 (3.86)	60 (2.36)	36,5 (1.44)	10 (0.39)	36 (1.42)	8,6 (0.34)	46 (1.81)	18 (0.71)	0,67 (1.48)
WPS-E 100	20 (0.79)	149,5 (5.89)	119,5 (4.7)	102 (4.02)	65 (2.56)	39 (1.54)	10 (0.39)	38,5 (1.52)	8,6 (0.34)	50 (1.97)	18 (0.71)	0,88 (1.94)

PERFORMANCE

Speed		6 m/min	9 m/min	12 m/min	18 m/min	24 m/min	30 m/min	36 m/min	50 m/min	Mass (kg / lbs)	Friction	Propelling force
WPS-E 20	Masse Mass Masse Massa Masa (kg / lbs)	0,25 - 15 (0.55 - 33)	0,25 - 10 (0.55 - 22)	0,25 - 9 (0.55 - 20)	0,25 - 7 (0.55 - 15)	0,25 - 6 (0.55 - 13)	0,25 - 4 (0.55 - 19.8)	0,25 - 2 (0.55 - 4.4)	0,25 - 1 (0.55 - 2.2)	0,25 - 15 (0.55 - 33)	0,07 µ	min 3 N (0.67 lbs)
WPS-E 50		3 - 60 (6.6 - 132)	3 - 40 (6.6 - 88)	3 - 35 (6.6 - 77)	3 - 30 (6.6 - 66)	3 - 24 (6.6 - 53)	3 - 18 (6.6 - 39)	3 - 10 (6.6 - 22)	3 - 5 (6.6 - 11)	3 - 60 (6.6 - 132)	0,07 µ	min 6 N (1.35 lbs)
WPS-E 100		3 -100 (6.6 - 220)	3 - 70 (6.6 - 154)	3 - 60 (6.6 - 132)	3 - 50 (6.6 - 110)	3 - 45 (6.6 - 99)	3 - 30 (6.6 - 66)	3 - 20 (6.6 - 44)	3 - 10 (6.6 - 22)	3 -100 (6.6 - 220)	0,07 µ	min 6 N (1.35 lbs)

WPS-A 15

- **Precise deceleration and singulation of pallets**
- **Adjustable pneumatic deceleration with pneumatic piston return**
- **Masses up to 15 kg and speeds up to 50 m/min**

- Housing: aluminium, black anodized, Stop: hard anodized
- Hardened stop
- Sensor for end postion (optional)
- Special version: pallet stopper for clean room Cl. 5 (ISO), Cl. 100 (US), Cl. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

PERFORMANCE

Speed	Mass kg (lbs)
6 m/min	0,25 - 15 (0.55 - 33.07)
9 m/min	0,25 - 10 (0.55 - 22.05)
12 m/min	0,25 - 9 (0.55 - 19.84)
18 m/min	0,25 - 7 (0.55 - 15.43)
24 m/min	0,25 - 6 (0.55 - 13.23)
30 m/min	0,25 - 4 (0.55 - 8.82)
36 m/min	0,25 - 2 (0.55 - 4.41)
50 m/min	0,25 - 1 (0.55 - 2.2)

Values apply to a coefficient of friction of 0.07 µ at a propelling force of at least 3 N (0.67 lbs).

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)
Stroke horizontal	7 mm (0.28 inch)
Stroke vertical	7 mm (0.28 inch)

Accessories Pages 170

WPS-A 20 / WPS-A 60

- **Precise deceleration and singulation of pallets**
- **Adjustable pneumatic deceleration with pneumatic piston return**
- **Masses up to 60 kg and speeds up to 50 m/min**

- Housing: aluminium, black anodized, Stop: hard anodized
- Hardened stop
- Sensor for end postion (optional)
- Special version: pallet stopper for clean room Cl. 5 (ISO), Cl. 100 (US), Cl. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

PERFORMANCE

	WPS-A 20	WPS-A 60
Speed	Mass kg (lbs)	Mass kg (lbs)
6 m/min	2 - 20 (4.41 - 44.1)	3 - 60 (6.61 - 132.28)
9 m/min	2 - 10 (4.41 - 22.05)	3 - 40 (6.61 - 88.18)
12 m/min	2 - 10 (4.41 - 22.05)	3 - 35 (6.61 - 77.16)
18 m/min	2 - 10 (4.41 - 22.05)	3 - 30 (6.61 - 66.14)
24 m/min	2 - 7 (4.41 - 15.43)	3 - 24 (6.61 - 52.91)
30 m/min	2 - 5 (4.41 - 11.02)	3 - 18 (6.61 - 39.68)
36 m/min	1 - 3 (2.20 - 6.61)	3 - 10 (6.61 - 22.05)
50 m/min	0,25 - 1,5 (0.55 - 3.31)	1 - 5 (2.20 - 11.02)

Values apply to a coefficient of friction of 0.07 µ at a propelling force of at least 6 N (1.35 lbs).

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)
Stroke horizontal	21 mm (0.83 inch)
Stroke vertical	8 mm (0.31 inch)

Accessories Pages 171

WPS-H200

- **Precise deceleration and singulation of pallets**
- **Adjustable hydraulic deceleration with pneumatic piston return**
- **Masses up to 200 kg and speeds up to 50 m/min**

- Housing: aluminium, black anodized, Stop: ProSurf
- Hardened stop
- Sensor for end postion (optional)
- Special version: pallet stopper for clean room Cl. 5 (ISO), Cl. 100 (US), Cl. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

PERFORMANCE

Speed	Mass kg (lbs)
6 m/min	5 - 200 (11.02 - 440.92)
9 m/min	5 - 200 (11.02 - 440.92)
12 m/min	5 - 200 (11.02 - 440.92)
18 m/min	5 - 200 (11.02 - 440.92)
24 m/min	5 - 120 (11.02 - 264.55)
30 m/min	5 - 80 (11.02 - 176.37)
36 m/min	5 - 60 (11.02. - 132.28)
50 m/min	5 - 30 (11.02 - 66.14)

Values apply to a coefficient of friction of 0.07 µ at a propelling force of at least 6 N (1.35 lbs).

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)
Stroke horizontal	15 mm (0.59 inch)
Stroke vertical	8 mm (0.31 inch)

Accessories Pages 171

WPS 500

- **Precise deceleration and singulation of pallets**
- **Adjustable hydraulic deceleration with pneumatic piston return**
- **Masses up to 1.200 kg and speeds up to 40 m/min**

- Housing: aluminium, black anodized, Stop: nickel plated
- Hardened stop
- Sensor for end postion (optional)
- Special version: pallet stopper for clean room Cl. 5 (ISO), Cl. 100 (US), Cl. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

Ordering information proximity switch

Standard version: without preparation for proximity switch (e.g. WPS 500)
"NV" Version: with preparation for proximity switch (e.g. WPS 500-NV)

Accessories Pages 172

PERFORMANCE

Speed	Mass kg (lbs)
6 m/min	7 - 1200 (15.43 - 2645.55)
9 m/min	7 - 1200 (15.43 - 2645.55)
12 m/min	7 - 1200 (15.43 - 2645.55)
18 m/min	7 - 1200 (15.43 - 2645.55)
24 m/min	7 - 1000 (15.43 - 2204.62)
30 m/min	7 - 600 (15.43 - 1322.77)
40 m/min	7 - 300 (15.43 - 661.39)

Values apply to a coefficient of friction of 0.07 µ at a propelling force of at least 35 N (7.87 lbs).

Values apply to a coefficient of friction of 0.1 µ.

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)
Stroke horizontal:	20 mm
Stroke vertical:	15 mm (0.59 inch)
Weight	3,8 kg

WPS 600

- **Design for rolling conveyor systems**
- **Smooth braking through the adjustable hydraulic shock absorbers**
- **Masses up to 1200 kg and speeds up to 30 m/min**

- Precise deceleration and seperation of pallets
- Housing: aluminium, black anodized
- Stop: hardened, nickel-plated
- Single acting
- Proximity switch for detecting lower and upper position (optional)
- Special version: pallet stopper for clean room Cl. 5 (ISO), Cl. 100 (US), Cl. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

Accessories Pages 172

PERFORMANCE

Speed	Mass kg (lbs)	Speed	Mass kg (lbs)
6 m/min	50 - 1200 (110.23 - 2645.55)	18 m/min	50 - 800 (110.23 - 1763.7)
9 m/min	50 - 1000 (110.23 - 2204.62)	24 m/min	30 - 400 (66.14 - 881.85)
12 m/min	50 - 1000 (110.23 - 2204.62)	30 m/min	30 - 250 (66.14 - 551.16)

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)
Weight	7,4 kg (16.31 lbs)

WPS-F 250

- **Precise deceleration and seperation of pallets**
- **Masses up to 450 kg and speeds up to 40 m/min**

- Single acting: via return spring
- Double acting (optional): pneumatic return
- Housing: aluminium, black anodized
- Hardened stop, (Plastic stop for low masses, optional)
- Sensor for end postion (optional)
- Special models: pallet stopper for clean room Cl. 5 (ISO), Cl. 100 (US), Cl. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

Ordering information proximity switch

Standard version: without preparation for proximity switch (e.g. WPS-F 250-9)
"NV" Version: with preparation for proximity switch (e.g. WPS-F 250-9-NV)

DIMENSIONS

	Stroke vertical	A	B	C	ØD	E	ØF	G	H	J	L	Weight
	mm (inch)											kg
WPS-F 250-9	9 (0.35)	78 (3.07)	38,5 (1.52)	32,9 (1.3)	8,2 (0.32)	5,2 (0.2)	10,15 (0.4)	6,5 (0.26)	5 (0.2)	5,2 (0.2)	1,5 (0.06)	0,55 (1.21)
WPS-F 250-15	15 (0.59)	92 (3.62)	38,5 (1.52)	41,8 (1.65)	8,2 (0.32)	5,2 (0.2)	10,15 (0.4)	6,5 (0.26)	5 (0.2)	5,2 (0.2)	1,5 (0.06)	0,65 (1.43)
WPS-F 250-25	25 (0.98)	108 (4.25)	50 (1.97)	51,8 (2.04)	8,2 (0.32)	5,2 (0.2)	10,15 (0.4)	6,5 (0.26)	5 (0.2)	5,2 (0.2)	1,5 (0.06)	0,8 (1.76)

PERFORMANCE

Speed	Mass kg (lbs)	Speed	Mass kg (lbs)
6 m/min	450 (992.08)	24 m/min	130 (286.6)
9 m/min	350 (771.62)	30 m/min	70 (154.32)
12 m/min	280 (617.29)	40 m/min	50 (110.23)
18 m/min	230 (507.06)		

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)

Accessories Pages 173

WPS-F 400

- **Precise deceleration and seperation of pallets**
- **Masses up to 850 kg and speeds up to 40 m/min**

- Single acting: via return spring
- Double acting (optional): pneumatic return
- Housing: aluminium, black anodized
- Hardened stop
- Sensor for end postion (optional)
- Special version: pallet stopper for clean room Cl. 5 (ISO), Cl. 100 (US), Cl. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

Ordering information proximity switch

Standard version: without preparation for proximity switch (e.g. WPS-F 400-10)
"NV" Version: with preparation for proximity switch (e.g. WPS-F 400-10-NV)

DIMENSIONS

	Stroke vertical	A	B	C	D	G	H	J	L	Weight
	mm (inch)									kg
WPS-F 400-10	10 (0.39)	80 (3.15)	38,5 (1.52)	33,5 (1.32)	34,5 (1.36)	6,5 (0.26)	5 (0.2)	5,2 (0.2)	1,5 (0.06)	1,1 (2.436)
WPS-F 400-20	20 (0.79)	95 (3.74)	45 (1.77)	39,5 (1.56)	42 (1.65)	6,5 (0.26)	5 (0.2)	5,2 (0.2)	1,5 (0.06)	1,3 (2.88)

PERFORMANCE

Speed	Mass kg (lbs)	Speed	Mass kg (lbs)
6 m/min	850 (1873.93)	24 m/min	500 (1102.31)
9 m/min	850 (1873.93)	30 m/min	300 (661.39)
12 m/min	850 (1873.93)	40 m/min	220 (485.02)
18 m/min	850 (1873.93)		

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)

Accessories Pages 173

WPR

- **Anti-bounce stopper eliminate the bounce back from pallet stoppers without damping (WPS-F) and the return of the workpiece carrier when the transfer system is shutdown**

- Housing: aluminium, black anodized
- Stop plate: hardened stainless steel
- Easy mounting at profile groove of the transfer system
- Set back: WPR 20 - return spring / WPR 22 - pneumatic
- Sensor for end position WPR 22 (optional)
- RoHS compliant Directive 2002/95/EC

WPR 20

WPR 22

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)
Weight	WPR 20: 355 g (0.78 lbs), WPR 22: 500 g (1.1 lbs)

Ordering information proximity switch

Standard version: without preparation for proximity switch (e.g. WPR-22)
"NV" Version: with preparation for proximity switch (e.g. WPR-22-NV)

Accessories Pages 174

WPZ

- **Exact positioning and lifting of pallets**
- **Interchangeable positioning bolts for different pallet systems**

- Sensor for end postion (optional)
- Special version: Positioning cylinder for clean room CL. 5 (ISO), CL. 100 (US), CL. 3 (VDI)
- RoHS compliant Directive 2002/95/EC

PISTON FORCES

Working pressure (bar / psi)	4	5	6	7	8
retract (WPZ 32 / 40)	200 N (44.96 lbs) / 380 N (85.43 lbs)	250 N (56.2 lbs) / 475 N (106.78lbs)	295 N (66.32 lbs) / 656 N (147.47 lbs)	345 N (77.56 lbs) / 660 N (148.37 lbs)	395 N (88.8 lbs) / 755 N (169.73 bls)
extend (WPZ 32 / 40)	320 N (71.94 lbs) / 505 N (113.53 lbs)	400 N (89.92 lbs) / 630 N (141.63 lbs)	485 N (109.03 lbs) / 755 N (169.73 lbs)	565 N (127.02 lbs) / 880 N (197.83 lbs)	645 N (145 lbs) / 1010 N (227.06 lbs)

SPECIFICATIONS

Working Pressure	4 - 8 bar (58.02 - 116.03 psi)
Air connection	G1/8
Compressed Air	treated
Tube Diameter	6 - 8 mm (0.24 - 0.31 inch)
Weight	WPZ 32: 0,9 kg (1.98 lbs), WPZ40: 1,0 kg (2.2 lbs)

Accessories Pages 175

Ordering information proximity switch

Standard version: without preparation for proximity switch (e.g. WPZ-32)
"NV" Version: with preparation for proximity switch (e.g. WPZ-32-NV)

Ordering Information

Pallet stopper **WITHOUT** preparation for proximity switch
(ATTENTION: not retrofittable)

Available Models:

WPS-A 20
WPS-A-60
WPS 500
WPS-F 250
WPS-F 400
WPS 20
WPS 22
WPZ 32
WPZ 40

Pallet stopper **WITH** preparation for proximity switch (-NV)
(pallet stopper contains magnetic piston)

Available Models:

WPS-A 20-NV
WPS-A-60-NV
WPS 500-NV
WPS-F 250-NV
WPS-F 400-NV
WPS 22-NV
WPZ 32-NV
WPZ 40-NV

WPS-A 15

1	PSB-A15	Fastening set
6	N 20	Sensor with plug, inductiv
7	KS60	Cable with angle plug, Ø12mm
8.1	N 31	Sensor, inductiv, with plug
8.2	N 30	Sensor with cable 2,5 m, inductiv
9	KS50	Cable with plug Ø8mm
10	PSA15-15	Sensor bracket WPS-A 15
11	PSA15-16	Sensor bracket WPS-A 15
14	VWl1/8-6	Stud elbow G1/8 Ø6mm Tube
15	VGR1/8-6	Male stud G1/8 Ø6mm Schlauch •Tube
16	VWS1/8-6	Single banjo G1/8 Ø6mm Tube
17	VDR1/8-6	Flow control regulator G1/8 Ø6mm Tube
18	VWL1/8-6	Stud elbo, extended G1/8 Ø6mm Tube

WPS-A 20 / 60

1	PSB-A60	Fastening set
2	N 10	Sensor, electric reed switch, 2,5 m cable
3	N 11	Sensor, electric reed switch, 5 m cable
4	N 15	Sensor with plug, electric reed switch, Ø 8mm, 0,3 m cable
5	N 16	Sensor with knurled nut, Ø 8mm electric reed switch, 0,3 m cable
6	N 20	Sensor with plug, inductiv
7	KS60	Cable with angle plug, Ø12mm
8.1	N 31	Sensor, inductiv, with plug
8.2	N 30	Sensor with cable 2,5 m, inductiv
9	KS50	m, Ø mm ▪ Cable with plug m, Ø mm
10	PSA60-15	Sensor bracket WPS-A 20 / 60
11	PSA60-16	Sensor bracket WPS-A 20 / 60
14	VWI1/8-6	Stud elbow G1/8 Ø6mm Tube
15	VGR1/8-6	Male stud G1/8 Ø6mm Tube
16	VWS1/8-6	Single banjo G1/8 Ø6mm Tube
17	VDR1/8-6	Flow control regulator G1/8 Ø6mm Tube
18	VWL1/8-6	Stud elbo, extended G1/8 Ø6mm Tube

WPS-H 200

1	PSB-H200	Fastening set
2	N 10	Sensor, electric reed switch, 2,5 m cable
3	N 11	Sensor, electric reed switch, 5 m cable
4	N 15	Sensor with plug, electric reed switch, Ø 8mm, 0,3 m cable
5	N 16	Sensor with knurled nut, Ø 8mm electric reed switch, 0,3 m cable
6	N 20	Sensor with plug M12x1, inductiv
7	KS60	Cable with angle plug, Ø12mm
8.1	N 31	Sensor, inductiv, with plug
8.2	N 30	Sensor with cable 2,5 m, inductiv
9	KS50	Cable with plug Ø8mm
10	PSH2000-15	Sensor bracket WPS-H 200
11	PSH200-16	Sensor bracket WPS-H 200
14	VWI1/8-6	Stud elbow G1/8 Ø6mm Tube
15	VGR1/8-6	Male stud G1/8 Ø6mm Tube
16	VWS1/8-6	Winkelschwenkanschluß ▪ Single banjo G1/8 Ø6mm Schlauch ▪Tube
17	VDR1/8-6	Flow control regulator G1/8 Ø6mm Tube
18	VWL1/8-6	Stud elbo, extended G1/8 Ø6mm Tube

WPS 500

1	PSB 500	Fastening set
2	N 10	Sensor, electric reed switch, 2,5 m cable
3	N 11	Sensor, electric reed switch, 5 m cable
4	N 15	Sensor with plug, electric reed switch, Ø 8mm, 0,3 m cable
5	N 16	Sensor with knurled nut, Ø 8mm electric reed switch, 0,3 m cable
6	N 20	Sensor, inductiv
7	KS 60	Kabel mit Stecker, Ø 8mm ▪ Cable with plug, Ø 8mm
8	KS 25	Cable with plug 2,5 m, Ø 8mm
9	KS 50	Cable with plug 5 m, Ø 8mm
10	PS500-15	Position sensing WPS-500, top and bottom
11	PS500-1	Stop plate, steel, hardened (for replacement)
12	PS514	Mounting flange
14	VWI1/8-6	G1/8-6 Stud elbow
14	VWI1/8-8	G1/8-8 Stud elbow
15	VGR1/8-6	G1/8-6 Male stud
15	VGR1/8-8	G1/8-8 Male stud
16	VWS1/8-6	G1/8-6 Single banjo
16	VWS1/8-8	G1/8-8 Single banjo
17	VDR1/8-6	G1/8-6 Flow control regulator
17	VDR1/8-8	G1/8-8 Flow control regulator
18	VWL1/8-6	G1/8-6Stud elbo, extended
18	VWL1/8-8	G1/8-8 Stud elbo, extended

WPS 600

6	N 20	Sensor, inductiv
7	KS 60	Cable with plug, Ø 8mm
14	VWIM5-6	M5-6 Stud elbow
15	VGRM5-6	M5-6 Male stud
16	VWSM5-6	M5-6 Single banjo
17	VDRM5-6	M5-6 Flow control regulator
18	VWLM5-6	M5-6 Stud elbo, extended

WPS-F 250

1	PSFB 250	Fastening set
2	N 10	Sensor, electric reed switch, 2,5 m cable
3	N 11	Sensor, electric reed switch, 5 m cable
4	N 15	Sensor with plug, electric reed switch, Ø 8mm, 0,3 m cable
5	N 16	Sensor with knurled nut, Ø 8mm electric reed switch, 0,3 m cable
6	N 20	Sensor, inductiv
7	KS 60	Cable with plug, Ø 8mm
8	KS 25	Cable with plug 2,5 m, Ø 8mm
9	KS 50	Cable with plug 5 m, Ø 8mm
10	F 250-14	Mounting flange for sensor
11	F250-9-15	Position sensing WPS-F250-9, top and bottom
12	F250-15-15	Position sensing WPS-F250-15, top and bottom
13	F250-25-15	Position sensing WPS-F250-25, top and bottom
14	VWIM5-6	M5-6 Stud elbow
15	VGRM5-6	M5-6 Male stud
16	VWSM5-6	M5-6 Single banjo
17	VDRM5-6	M5-6 Flow control regulator
18	VWLM5-6	M5-6 Stud elbo, extended

WPS-F 400

1	PSFB 400	Fastening set
2	N 10	Sensor, electric reed switch, 2,5 m cable
3	N 11	Sensor, electric reed switch, 5 m cable
4	N 15	Sensor with plug, electric reed switch, Ø 8mm, 0,3 m cable
5	N 16	Sensor with knurled nut, Ø 8mm electric reed switch, 0,3 m cable
6	N 20	Sensor, inductiv
7	KS 60	Cable with plug, Ø 8mm
8	KS 25	Cable with plug 2,5 m, Ø 8mm
9	KS 50	Cable with plug 5 m, Ø 8mm
10	F 400-14	Mounting flange for sensor
11	F400-10-15	Position sensing WPS-F400-10, top and bottom
12	F400-20-15	Position sensing WPS-F400-20, top and bottom
14	VWIM5-6	M5-6 Stud elbow
15	VGRM5-6	M5-6 Male stud
16	VWSM5-6	M5-6 Single banjo
17	VDRM5-6	M5-6 Flow control regulator
18	VWLM5-6	M5-6 Stud elbo, extended

WPR 20

1	PRB 20-1	Fastening set
2	PRB 20-2	Fastening set PRB 20-5
3	PRB 20-5	Adapter für Bosch TS4
4	PRB 20-6	Positioning bolts
5	PRB20-TS4	Fastening set: PRB20-2, PRB20-5, PRB20-6

WPR 22

1	PRB 20-1	Fastening set
2	PRB 20-2	Fastening set PRB 20-5
3	N 10	Sensor, electric reed switch, 2,5 m cable
4	N 11	Sensor, electric reed switch, 5 m cable
5	N 15	Sensor with plug, electric reed switch, Ø 8mm, 0,3 m cable
6	N 16	Sensor with knurled nut, Ø 8mm electric reed switch, 0,3 m cable
7	N 20	Sensor, inductiv
8	KS 60	Cable with plug, Ø 8mm
9	KS 25	Cable with plug 2,5 m, Ø 8mm
10	KS 50	Cable with plug 5 m, Ø 8mm
11	PR-22-15	Position sensing WPR-22, top and bottom
12	PRB 20-5	Adapter for Bosch TS4
13	PRB 20-6	Positioning bolts
19	PRB20-TS4	Fastening set: PRB20-2, PRB20-5, PRB20-6
14	VWIM5-6	M5-6 Stud elbow
15	VGRM5-6	M5-6 Male stud
16	VWSM5-6	M5-6 Single banjo
17	VDRM5-6	M5-6 Flow control regulator
18	VWLM5-6	M5-6 Stud elbo, extended

WPZ 32 / 40

1	PZB32	Fastening set WPZ 32
2	PZB40	Fastening set WPZ 40
3	N 10	Sensor, electric reed switch, 2,5 m cable
4	N 11	Sensor, electric reed switch, 5 m cable
5	N 15	Sensor with plug, electric reed switch, Ø 8mm, 0,3 m cable
6	N 16	Sensor with knurled nut, Ø 8mm electric reed switch, 0,3 m cable
7	KS 25	Cable with plug 2,5 m, Ø 8mm
8	KS 50	Cable with plug 5 m, Ø 8mm
9	PB10	Positionierbolzen PB10
10	PB11	Positionierbolzen PB11
11	PB12	Positionierbolzen PB12
12	PB13	Positionierbolzen PB13
14	VWI1/8-6	G1/8-6 Stud elbow
14	VWI1/8-8	G1/8-8 Stud elbow
15	VGR1/8-6	G1/8-6 Male stud
15	VGR1/8-8	G1/8-8 Male stud
16	VWS1/8-6	G1/8-6 Single banjo
16	VWS1/8-8	G1/8-8 Single banjo
17	VDR1/8-6	G1/8-6 Flow control regulator
17	VDR1/8-8	G1/8-8 Flow control regulator
18	VWL1/8-6	G1/8-6 Stud elbo, extended
18	VWL1/8-8	G1/8-8 Stud elbo, extended

Air Springs

ONLINE
Calculation +
2D / 3D CAD Download

www.weforma.com

Single-Convolution Air Springs
WBE

Double-Convolution Air Springs
WBZ

Triple-Convolution Air Springs
WBD

Air Springs with Aluminium Connection Plates
WBE / WBZ / WBD

Air Springs with Threaded Studs
WBE-G / WBZ-G / WBD-G

Special Versions
INOX / ECO / HP

Rolling Lobes
WSR

		Actuation	Vibration isolation
1.	Operation pressure	x	x
2.	Required stroke	x	
3.	Mass to be lifted **(kg)**	x	
4.	Number of air springs **(n)**	x	x
5.	Min. height for construction **(H min; mm)**	x	
6.	Smallest diameter for construction **(D; mm)**	x	x

		Actuation	Vibration isolation
7.	Temperature **(T)**	x	x
8.	Mass to be supported **(m; kg)**		x
9.	Smallest height for construction **(H; mm)**		x
10.	Exciting frequency or rate of revolutions **(ferr.;HZ) / (cps / min; 1 Hz=1/s; 1/min=1/60s)**		x
11.	Desired degree of isolation **(Ig; %)**		x

A ACTUATION

p = 6 bar	1. p ≤ p max.		1. 6 bar < 8 bar
S min = 200 mm	2. S ≥ S min		2. 215 mm > 200 mm
m = 2000 kg	3. $F_t \geq F$	$F = \frac{kg \times g}{n}$	3. 35000 N > 4905 N
n = 4			
H min = 100 mm	5. H min ≤ H		5. 75 mm < 100 mm
D = 400 mm	6. D ≥ E		6. 400 mm > 300 mm
T = 30 °C	7. T		7. -40 °C < 30 °C < 70 °C

WBZ 500

B VIBRATION ISOLATION

p = 6 bar	1. p ≤ p max.		1. 6 bar < 8 bar
m = 2000	3. $F_t \geq F$	$F = \frac{kg \times g}{n}$	2. 5200 N > 4905 N
n = 4			
H = 90 mm	9. H ≥ H min		9. 100 mm > 50 mm
D = 300 mm	6. D ≥ E		6. 300 mm > 180 mm
ferr. = 10 Hz	10. $f_o \leq \frac{f_{err}}{1{,}44}$		10. 2,9 < 6,94 Hz
Ig = 90 %	11. It≥Ig≤100%	$It = 1 - \frac{1}{\left(\frac{f_{err}}{f_0}\right)^2 - 1}$	11. 90,9% > 90% < 100%
T = 20 °C	7. T		7. -40 °C < 30 °C < 70 °C

WBE 200

LEGEND

m (kg)	Mass
S (m)	Stoke
S min (m)	minimum stroke
n	Number of air springs
p (bar)	Operation pressure
E (mm)	Smallest diameter for the air spring

D (mm)	Smallest diameter for the construction
H (mm)	Smallest height for construction
H min (mm)	Smallest height for the air spring (without stroke)
F (N)	Calculated load per air spring
Ft (N)	Maximum load per air spring

ferr (Hz)	Smallest exciting frequency
fo (Hz)	Natural frequency
It (%)	Calculated degree of isolation
Ig (%) optimal: 70 - 99 %	Desired degree of isolation
g (m/s²)	9,81 m/s²

BENEFITS

1

2

FEATURES

- Compact design (1)
- Lateral misalignment: Weforma - air springs can be used with a misalignment of up to 30 mm
- Tilt capability (2)
- Dual function - combining vibration isolation with height adjustment
- Insulating properties irrespective of load
- Easy installation
- Maintenance free
- No friction (no stick-slip-effect)
- CrVI-free according to 2002/95/EG
- RoHS compliant Directive 2002/95/EC

ORDERING INFORMATION

WBZ 500-E2

WBZ - Double convolution air spring
500 - Size
E2 - Air connection G 1/4

WBE

DIMENSIONS

** E1 - F1 / E2 - F2

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	D	F1**	F2**	E1**	E2**	Weight	Volume in litre	
		mm / inch (max.)	mm (inch)										kg	Hmin	Hmax
WBE 100	1	60 (2.36)	160 (6.3)	50 (1.97)	90 (3.54)	145 (5.71)	20 (0.79)	M8	-	-	G1/8	-	0,9 (1.98)	0,2	0,6
WBE 150	2	45 (1.77)	165 (6.5)	51 (2.01)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	-	G1/4	-	1,2 (2.65)	0,2	0,6
WBE 200	2	64 (2.52)	180 (7.09)	51 (2.01)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	-	G1/4	-	1,2 (2.65)	0,5	1,1
WBE 250	2	95 (3.74)	225 (8.86)	51 (2.01)	114 (4.49)	210 (8.27)	44,5 (1.75)	M8	-	-	G1/4	-	1,4 (3.09)	1,0	2,2
WBE 300	2	85 (3.35)	230 (9.06)	50 (1.97)	141 (5.55)	215 (8.46)	70 (2.76)	M8	-	-	G3/4	G1/4	2 (4.41)	0,9	2,1
WBE 310	2	100 (3.94)	245 (9.65)	51 (2.01)	141 (5.55)	231 (9.09)	70 (2.76)	M8	-	-	G3/4	G1/4	1,9 (4.19)	0,9	2,4
WBE 320	2	120 (4.72)	250 (9.84)	51 (2.01)	141 (5.55)	235 (9.25)	70 (2.76)	M8	-	-	G3/4	G1/4	1,9 (4.19)	1,2	3,2
WBE 400	3	90 (3.54)	265 (10.43)	51 (2.01)	161 (6.34)	250 (9.84)	89 (3.5)	M8	38,1 (1.5)	44,5 (1.75)	G3/4	G1/4	2,3 (5.07)	1,0	3,1
WBE 410*	3	60 (2.36)	265 (10.43)	80 (3.15)	161 (6.34)	250 (9.84)	89 (3.5)	M8	44,5 (1.75)	-	G1/4	-	2,6 (5.73)	0,9	3,0
WBE 500	3	100 (3.94)	340 (13.39)	51 (2.01)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	66 (2.6)	73 (2.87)	G1	G1/4	4,1 (9.04)	3,3	7,7
WBE 510*	3	50 (1.97)	340 (13.39)	100 (3.94)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	73,2 (2.88)	-	G1/4	-	4,3 (9.48)	3,7	7,6
WBE 530	3	130 (5.12)	360 (14.17)	51 (2.01)	228 (8.98)	343 (13.5)	157,5 (6.2)	M8	73 (2.87)	66 (2.6)	G1/4	G3/4	4,3 (9.48)	2,7	8,5
WBE 600	4	125 (4.92)	400 (15.75)	51 (2.01)	287 (11.3)	385 (15.16)	158,8 (6.25)	M8	158,8 (6.25)	158,8 (6.25)	G1	G1/4	5,9 (13.01)	3,3	10,8
WBE 700	4	135 (5.31)	420 (16.54)	51 (2.01)	287 (11.3)	405 (15.94)	158,8 (6.25)	M8	158,8 (6.25)	158,8 (6.25)	G1	G1/4	6,1 (13.45)	3,6	13,0
WBE 730	5	121 (4.76)	490 (19.29)	66 (2.6)	384 (15.12)	452 (17.8)	228,5 (9)	M12	-	-	G3/4	-	22,7 (50.05)	8,4	16,3
WBE 750	5	110 (4.33)	570 (22.44)	67 (2.64)	451 (17.76)	530 (20.87)	305 (12.01)	M12	-	-	G3/4	-	28,6 (63.06)	11,2	21,1

* with Rubber buffer

Operating pressure	0 - 8 bar (0 - 116.03 psi)	Temperature	-40°C - +50°C (+70°C) -40°F - 122°F (+158°F)	Compressed air	oiled / oilfree
Lateral misaligment	max. 10 mm (0.39 in)	Tilt capability	max. 20°	Return force	120 - 300 N (26.98 - 67.44 lbs)

1

2

3

4

5

ACTUATION

	Heigth	Load kN (1000*lbs)			Heigth	Load kN (1000*lbs)			Heigth	Load kN (1000*lbs)		
	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBE 100	60 (2.36)	1,8 (0.4)	3,5 (0.79)	5,2 (1.17)	80 (3.15)	1,4 (0.31)	2,8 (0.63)	4,2 (0.94)	100 (3.94)	0,8 (0.18)	1,6 (0.36)	2,5 (0.56)
WBE 150	60 (2.36)	2 (0.45)	4 (0.9)	6 (1.35)	70 (2.76)	1,8 (0.4)	3,4 (0.76)	5,1 (1.15)	80 (3.15)	1,5 (0.34)	2,7 (0.61)	4 (0.9)
WBE 200	60 (2.36)	2,8 (0.63)	4,8 (1.08)	8,2 (1.84)	90 (3.54)	1,5 (0.34)	3,6 (0.81)	5,6 (1.26)	100 (3.94)	1,2 (0.27)	3,1 (0.7)	4,8 (1.08)
WBE 250	70 (2.76)	3,3 (0.74)	6,6 (1.48)	10,2 (2.29)	100 (3.94)	2,6 (0.58)	5,2 (1.17)	8 (1.8)	120 (4.72)	1,8 (0.4)	3,7 (0.83)	5,8 (1.3)
WBE 300	60 (2.36)	4,1 (0.92)	8,2 (1.84)	13 (2.92)	90 (3.54)	3,3 (0.74)	6,8 (1.53)	10,8 (2.43)	120 (4.72)	1,9 (0.43)	4,3 (0.97)	6,9 (1.55)
WBE 310	60 (2.36)	4,7 (1.06)	9,4 (2.11)	14,4 (3.24)	90 (3.54)	4 (0.9)	8 (1.8)	12,2 (2.74)	120 (4.72)	2,8 (0.63)	5,6 (1.26)	8,4 (1.89)
WBE 320	70 (2.76)	4,6 (1.03)	9,2 (2.07)	13,7 (3.08)	110 (4.33)	3,9 (0.88)	7,8 (1.75)	11,8 (2.65)	150 (5.91)	2,5 (0.56)	5,1 (1.15)	7,9 (1.78)
WBE 400	60 (2.36)	5,5 (1.24)	11,3 (2.54)	17,1 (3.84)	90 (3.54)	4,6 (1.03)	9,4 (2.11)	14,6 (3.28)	120 (4.72)	3,1 (0.7)	6,2 (1.39)	10,4 (2.34)
WBE 410	60 (2.36)	5,5 (1.24)	11 (2.47)	17 (3.82)	90 (3.54)	4,6 (1.03)	9,4 (2.11)	14,6 (3.28)	120 (4.72)	3,1 (0.7)	6,2 (1.39)	10,4 (2.34)
WBE 500	60 (2.36)	10,5 (2.36)	21,6 (4.86)	32,6 (7.33)	90 (3.54)	9,5 (2.14)	19,2 (4.32)	29,1 (6.54)	120 (4.72)	8 (1.8)	15,7 (3.53)	23,8 (5.35)
WBE 510	60 (2.36)	10,5 (2.36)	22 (4.95)	32 (7.19)	90 (3.54)	9,5 (2.14)	19 (4.27)	29 (6.52)	120 (4.72)	7,5 (1.69)	15,7 (3.53)	23,8 (5.35)
WBE 530	70 (2.76)	11,4 (2.56)	23 (5.17)	34,9 (7.85)	110 (4.33)	9,9 (2.23)	19,8 (4.45)	30 (6.74)	150 (5.91)	6,7 (1.51)	13,3 (2.99)	20,3 (4.56)
WBE 600	70 (2.76)	17 (3.82)	32 (7.19)	48,8 (10.97)	110 (4.33)	13,8 (3.1)	27,4 (6.16)	41,7 (9.37)	150 (5.91)	9 (2.02)	19 (4.27)	30 (6.74)
WBE 700	80 (3.15)	17 (3.82)	33,4 (7.51)	50,3 (11.31)	140 (5.51)	13,3 (2.99)	26,8 (6.02)	40,6 (9.13)	160 (6.3)	11,4 (2.56)	23 (5.17)	35 (7.87)
WBE 730	80 (3.15)	23,3 (5.24)	46,9 (10.54)	70,9 (15.94)	120 (4.72)	20 (4.5)	40,3 (9.06)	61,3 (13.78)	160 (6.3)	13,1 (2.95)	26,9 (6.05)	42,3 (9.51)
WBE 750	80 (3.15)	34,5 (7.76)	69,1 (15.53)	104 (23.38)	120 (4.72)	29,9 (6.72)	59,9 (13.47)	90,6 (20.37)	140 (5.51)	25,9 (5.82)	52,3 (11.76)	79,6 (17.89)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency HZ			Natural frequency U/min			Height min.	Height opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	mm (inch)
WBE 100	1,1 (0.25)	2,3 (0.52)	3,4 (0.76)	3,5	3,3	3,3	210	198	198	70 (2.76)	90 (3.54)
WBE 150	1,5 (0.34)	3 (0.67)	4,6 (1.03)	3,9	3,8	3,7	234	228	222	65 (2.56)	75 (2.95)
WBE 200	1,6 (0.36)	3,7 (0.83)	5,7 (1.28)	3,1	2,9	2,8	186	174	168	70 (2.76)	90 (3.54)
WBE 250	2 (0.45)	4,3 (0.97)	6,5 (1.46)	2,8	2,7	2,7	168	162	162	100 (3.94)	110 (4.33)
WBE 300	2,5 (0.56)	5,4 (1.21)	8,5 (1.91)	3,0	2,7	2,6	180	162	156	90 (3.54)	110 (4.33)
WBE 310	3,2 (0.72)	6,6 (1.48)	9,9 (2.23)	2,7	2,7	2,6	162	162	156	100 (3.94)	115 (4.53)
WBE 320	2,8 (0.63)	5,8 (1.3)	8,9 (2)	2,6	2,5	2,4	156	150	144	125 (4.92)	140 (5.51)
WBE 400	3,7 (0.83)	7,5 (1.69)	11,9 (2.68)	2,8	2,6	2,6	168	156	150	90 (3.54)	110 (4.33)
WBE 410	3,7 (0.83)	7,5 (1.69)	11,9 (2.68)	2,8	2,6	2,6	168	156	150	90 (3.54)	110 (4.33)
WBE 500	7 (1.57)	14,2 (3.19)	21,8 (4.9)	2,6	2,4	2,3	156	144	138	100 (3.94)	130 (5.12)
WBE 510	2 (0.45)	14,2 (3.19)	21,8 (4.9)	2,8	2,4	2,3	156	144	138	100 (3.94)	130 (5.12)
WBE 530	7,7 (1.73)	15,5 (3.48)	23,4 (5.26)	2,6	2,3	2,3	156	144	138	120 (4.72)	140 (5.51)
WBE 600	10 (2.25)	20,1 (4.52)	31,6 (7.1)	2,5	2,5	2,4	150	144	144	110 (4.33)	145 (5.71)
WBE 700	12,4 (2.79)	24,9 (5.6)	37,9 (8.52)	2,3	2,1	2,0	138	132	126	120 (4.72)	150 (5.91)
WBE 730	19,1 (4.29)	38,3 (8.61)	57,5 (12.93)	2,3	2,2	2,1	138	132	126	115 (4.53)	130 (5.12)
WBE 750	27,8 (6.25)	55,7 (12.52)	83,9 (18.86)	2,2	2,2	2,1	132	132	126	111 (4.37)	131 (5.16)

WBZ

DIMENSIONS

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	D	F1**	F2**	E1**	E2**	Weight	Volume in litre	
		mm / inch (max.)	mm (inch)										kg	Hmin	Hmax
WBZ 100	1	100 (3.94)	160 (6.3)	70 (2.76)	90 (3.54)	145 (5.71)	20 (0.79)	M8	-	-	G1/8	-	1,1 (2.43)	0,4	1,2
WBZ 200	2	128 (5.04)	180 (7.09)	75 (2.95)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	-	G1/4	-	1,5 (3.31)	0,6	1,9
WBZ 250	2	155 (6.1)	215 (8.46)	72 (2.83)	141 (5.55)	203 (7.99)	70 (2.76)	M8	-	-	G3/4	G1/4	2,1 (4.63)	1,1	3,4
WBZ 300	2	155 (6.1)	230 (9.06)	75 (2.95)	141 (5.55)	215 (8.46)	70 (2.76)	M8	-	-	G3/4	G1/4	2,4 (5.29)	1,1	3,8
WBZ 320	2	193 (7.6)	235 (9.25)	77 (3.03)	141 (5.55)	218 (8.58)	70 (2.76)	M8	-	-	G3/4	-	2,3 (5.07)	1,6	5,0
WBZ 400	3	200 (7.87)	265 (10.43)	75 (2.95)	161 (6.34)	250 (9.84)	89 (3.5)	M8	38,1 (1.5)	44,5 (1.75)	G3/4	G1/4	3 (6.62)	1,9	6,2
WBZ 430	3	248 (9.76)	275 (10.83)	77 (3.03)	161 (6.34)	260 (10.24)	89 (3.5)	M8	38,1 (1.5)	44,5 (1.75)	G3/4	G1/4	3,5 (7.72)	4,0	9,8
WBZ 500	3	230 (9.06)	340 (13.39)	75 (2.95)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	66 (2.6)	73 (2.87)	G1	G1/4	4,8 (10.58)	4,0	14,2
WBZ 520	3	283 (11.14)	355 (13.98)	77 (3.03)	228 (8.98)	340 (13.39)	157,5 (6.2)	M8	66 (2.6)	73 (2.87)	G1	G1/4	5,1 (11.25)	3,7	15,0
WBZ 600	4	233 (9.17)	400 (15.75)	77 (3.03)	287 (11.3)	385 (15.16)	158,8 (6.25)	M8	158,8 (6.25)	158,8 (6.25)	G1	G1/4	6,9 (15.21)	5,4	22,8
WBZ 630	4	283 (11.14)	415 (16.34)	77 (3.03)	287 (11.3)	400 (15.75)	158,8 (6.25)	M8	158,8 (6.25)	158,8 (6.25)	G1	G1/4	7,3 (16.1)	5,8	25,6
WBZ 640	4	313 (12.32)	420 (16.54)	77 (3.03)	287 (11.3)	405 (15.94)	158,8 (6.25)	M8	158,8 (6.25)	158,8 (6.25)	G1	G 1/4	7,7 (16.98)	7,0	30,3
WBZ 700	5	315 (12.4)	550 (21.65)	90 (3.54)	380 (14.96)	500 (19.69)	354 (13.94)	M8	-	-	-	-	14,4 (31.75)	12,0	48,0
WBZ 730	6	225 (8.86)	510 (20.08)	99 (3.9)	384 (15.12)	462 (18.19)	228,5 (9)	M12	-	-	G3/4	-	24,1 (53.14)	11,1	25,0
WBZ 750	6	246 (9.69)	575 (22.64)	96 (3.78)	451 (17.76)	525 (20.67)	305 (12.01)	M12	-	-	G3/4	-	30,5 (67.25)	15,8	39,8
WBZ 800	5	400 (15.75)	650 (25.59)	100 (3.94)	430 (16.93)	610 (24.02)	395 (15.55)	M16	-	-	-	-	16,7 (36.82)	22,0	92,0
WBZ 900	5	400 (15.75)	750 (29.53)	100 (3.94)	530 (20.87)	710 (27.95)	495 (19.49)	M16	-	-	-	-	18,2 (40.13)	32,0	127,0

Operating pressure	0 - 8 bar (0 - 116.03 psi)	Temperature	-40°C - +50°C (+70°C) -40°F - 122°F (+158°F)	Compressed air	oiled / oilfree
Lateral misaligment	max. 20 mm (0.79 in)	Tilt capability	max. 25°	Return force	120 - 300 N (26.98 - 67.44 lbs)

ACTUATION

	Heigth	Load kN (1000*lbs)			Heigth	Load kN (1000*lbs)			Heigth	Load kN (1000*lbs)		
	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBZ 100	80 (3.15)	1,8 (0.4)	3,5 (0.79)	5,4 (1.21)	120 (4.72)	1,4 (0.31)	2,7 (0.61)	4,1 (0.92)	140 (5.51)	1,1 (0.25)	2,2 (0.49)	3,3 (0.74)
WBZ 200	80 (3.15)	2,8 (0.63)	5,7 (1.28)	8,5 (1.91)	140 (5.51)	1,9 (0.43)	3,9 (0.88)	5,8 (1.3)	180 (7.09)	1,1 (0.25)	2,3 (0.52)	3,5 (0.79)
WBZ 250	80 (3.15)	4,1 (0.92)	8,1 (1.82)	12,2 (2.74)	140 (5.51)	3 (0.67)	6 (1.35)	9 (2.02)	180 (7.09)	2,1 (0.47)	4,1 (0.92)	6,3 (1.42)
WBZ 300	80 (3.15)	4,5 (1.01)	9,1 (2.05)	13,7 (3.08)	160 (6.3)	3,3 (0.74)	6,5 (1.46)	9,9 (2.23)	200 (7.87)	2,3 (0.52)	4,8 (1.08)	7,3 (1.64)
WBZ 320	80 (3.15)	4,9 (1.1)	9,7 (2.18)	14,7 (3.3)	160 (6.3)	3,9 (0.88)	7,8 (1.75)	11,9 (2.68)	200 (7.87)	3,2 (0.72)	6,2 (1.39)	9,6 (2.16)
WBZ 400	80 (3.15)	6,9 (1.55)	13,4 (3.01)	19,7 (4.43)	170 (6.69)	4,8 (1.08)	9,4 (2.11)	14,2 (3.19)	230 (9.06)	2,7 (0.61)	5,6 (1.26)	8,8 (1.98)
WBZ 430	110 (4.33)	6,2 (1.39)	12,3 (2.77)	18,7 (4.2)	170 (6.69)	5,5 (1.24)	11 (2.47)	16,6 (3.73)	290 (11.42)	2,7 (0.61)	5,6 (1.26)	9 (2.02)
WBZ 500	100 (3.94)	11,2 (2.52)	22,1 (4.97)	34,1 (7.67)	160 (6.3)	9,7 (2.18)	19,4 (4.36)	29,5 (6.63)	240 (9.45)	6,7 (1.51)	13,3 (2.99)	20,6 (4.63)
WBZ 520	100 (3.94)	12,2 (2.74)	24,4 (5.49)	36,3 (8.16)	220 (8.66)	9,7 (2.18)	19,4 (4.36)	29,4 (6.61)	320 (12.6)	4,4 (0.99)	10,8 (2.43)	17 (3.82)
WBZ 600	100 (3.94)	16,2 (3.64)	32,3 (7.26)	48,7 (10.95)	200 (7.87)	13,1 (2.95)	26,4 (5.93)	39,8 (8.95)	240 (9.45)	11 (2.47)	22,1 (4.97)	33,5 (7.53)
WBZ 630	100 (3.94)	18,6 (4.18)	36,8 (8.27)	52,4 (11.78)	220 (8.66)	14 (3.15)	28 (6.29)	42 (9.44)	300 (11.81)	8,6 (1.93)	17,7 (3.98)	27,7 (6.23)
WBZ 640	120 (4.72)	17,5 (3.93)	34,8 (7.82)	52,9 (11.89)	240 (9.45)	14 (3.15)	28 (6.29)	43,3 (9.73)	320 (12.6)	10 (2.25)	20,4 (4.59)	32 (7.19)
WBZ 700	90 (3.54)	30 (6.74)	60 (13.49)	90 (20.23)	210 (8.27)	24 (5.4)	50 (11.24)	75 (16.86)	330 (12.99)	15,6 (3.51)	31,3 (7.04)	47 (10.57)
WBZ 730	100 (3.94)	25,1 (5.64)	50,1 (11.26)	75,2 (16.91)	160 (6.3)	23,1 (5.19)	46,4 (10.43)	70 (15.74)	220 (8.66)	19,6 (4.41)	39,4 (8.86)	59,9 (13.47)
WBZ 750	120 (4.72)	35,3 (7.94)	70,5 (15.85)	105,7 (23.76)	210 (8.27)	30 (6.74)	60 (13.49)	91 (20.46)	270 (10.63)	23,4 (5.26)	47,7 (10.72)	73,4 (16.5)
WBZ 800	150 (5.91)	39,6 (8.9)	79,3 (17.83)	119,3 (26.82)	350 (13.78)	29 (6.52)	58,6 (13.17)	88,5 (19.9)	450 (17.72)	18,7 (4.2)	37,8 (8.5)	58,8 (13.22)
WBZ 900	100 (3.94)	60,7 (13.65)	123 (27.65)	186 (41.81)	300 (11.81)	49,3 (11.08)	102 (22.93)	155 (34.85)	500 (19.69)	26 (5.85)	53 (11.91)	84 (18.88)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency						Height	
				HZ			U/min			min.	opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	mm (inch)
WBZ 100	0,7 (0.16)	1,5 (0.34)	2,4 (0.54)	2,8	2,8	2,7	168	168	162	150 (5.91)	160 (6.3)
WBZ 200	1,3 (0.29)	2,5 (0.56)	3,8 (0.85)	2,5	2,5	2,4	150	144	144	160 (6.3)	175 (6.89)
WBZ 250	2,2 (0.49)	4,5 (1.01)	6,8 (1.53)	2,3	2,2	2,2	138	132	126	155 (6.1)	175 (6.89)
WBZ 300	2,4 (0.54)	5,2 (1.17)	8 (1.8)	2,2	2,0	2,0	132	120	120	175 (6.89)	190 (7.48)
WBZ 320	3,1 (0.7)	6,2 (1.39)	9,4 (2.11)	1,9	1,8	1,8	114	108	108	190 (7.48)	205 (8.07)
WBZ 400	3,4 (0.76)	7,1 (1.6)	10,7 (2.41)	2,0	1,9	1,9	120	114	114	195 (7.68)	210 (8.27)
WBZ 430	4 (0.9)	8,1 (1.82)	12,3 (2.77)	1,8	1,8	1,7	108	108	102	230 (9.06)	254 (10)
WBZ 500	6,7 (1.51)	13,3 (2.99)	20,6 (4.63)	2,1	1,9	1,8	126	108	108	220 (8.66)	240 (9.45)
WBZ 600	10,1 (2.27)	20,7 (4.65)	31,5 (7.08)	1,9	1,8	1,8	114	108	108	225 (8.86)	250 (9.84)
WBZ 630	11,5 (2.59)	23,4 (5.26)	35,9 (8.07)	1,6	1,6	1,5	96	96	90	245 (9.65)	260 (10.24)
WBZ 640	12,5 (2.81)	25,1 (5.64)	38,2 (8.59)	1,5	1,5	1,4	90	90	84	265 (10.43)	285 (11.22)
WBZ 730	18 (4.05)	36,3 (8.16)	45,7 (10.27)	1,7	1,6	1,6	102	96	96	220 (8.66)	240 (9.45)
WBZ 750	26,5 (5.96)	53,6 (12.05)	80,9 (18.19)	1,6	1,6	1,5	96	96	90	226 (8.9)	246 (9.69)

WBD

DIMENSIONS

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	D	F1**	F2**	E1**	E2**	Weight	Volume in litre	
		mm / inch (max.)	mm (inch)										kg (lbs)	Hmin	Hmax
WBD 500	1	320 (12.6)	345 (13.58)	110 (4.33)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	66 (2.6)	73 (2.87)	G 1	G 1/4	5,9 (13.01)	5,0	26,0
WBD 600	2	325 (12.8)	410 (16.14)	110 (4.33)	287 (11.3)	384 (15.12)	158,8 (6.25)	M8	158,8 (6.25)	158,8 (6.25)	G 1	G 1/4	8 (17.64)	5,5	33,1
WBD 700	2	395 (15.55)	430 (16.93)	115 (4.53)	287 (11.3)	405 (15.94)	158,8 (6.25)	M8	158,8 (6.25)	158,8 (6.25)	G 1	G 1/4	9,3 (20.51)	9,6	37,3
WBD 730	3	336 (13.23)	510 (20.08)	126 (4.96)	384 (15.12)	462 (18.19)	228,5 (9)	M12	-	-	G 3/4	-	25,5 (56.23)	15,9	39,0
WBD 750	3	356 (14.02)	570 (22.44)	126 (4.96)	451 (17.76)	521 (20.51)	305 (12.01)	M12	-	-	G 3/4	-	33 (72.77)	24,4	54,5

Operating pressure	0 - 8 bar (0 - 116.03 psi)	Temperature	-40°C - +50°C (+70°C) -40°F - 122°F (+158°F)	Compressed air	oiled / oilfree
Lateral misaligment	max. 30 mm (1.18 in)	Tilt capability	max. 30°	Return force	400 - 500 N (89.92 - 122.41 lbs)

ACTUATION

	Heigth mm (inch)	Load (kN) 2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	Heigth mm (inch)	Load (kN) 2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	Heigth mm (inch)	Load (kN) 2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBD 500	140 (5.51)	11,3 (2.54)	22,4 (5.04)	33,6 (7.55)	260 (10.24)	9,1 (2.05)	18,2 (4.09)	27,6 (6.2)	380 (14.96)	5,9 (1.33)	11,9 (2.68)	18,4 (4.14)
WBD 600	160 (6.3)	16,3 (3.66)	32,3 (7.26)	49,1 (11.04)	280 (11.02)	13,3 (2.99)	26,7 (6)	40,8 (9.17)	360 (14.17)	10 (2.25)	20,8 (4.68)	32 (7.19)
WBD 700	140 (5.51)	18,2 (4.09)	36,3 (8.16)	54,5 (12.25)	300 (11.81)	14,2 (3.19)	28,4 (6.38)	43,4 (9.76)	380 (14.96)	11,8 (2.65)	23,8 (5.35)	36,4 (8.18)
WBD 730	160 (6.3)	24,7 (5.55)	49,2 (11.06)	73,6 (16.55)	280 (11.02)	21 (4.72)	41,8 (9.4)	62,9 (14.14)	400 (15.75)	13,2 (2.97)	26,6 (5.98)	40,6 (9.13)
WBD 750	190 (7.48)	34,8 (7.82)	69,6 (15.65)	104,6 (23.52)	270 (10.63)	31,5 (7.08)	63 (14.16)	95,3 (21.42)	390 (15.35)	22,3 (5.01)	45,4 (10.21)	70,1 (15.76)

WBE / WBZ / WBD

DIMENSIONS

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	D	E1	Weight	Volume in litre	
		mm / inch (max.)	mm (inch)							kg	Hmin	Hmax
WBE 70	1	20 (0.79)	95 (3.74)	50 (1.97)	78 (3.07)	95 (3.74)	36 (1.42)	M6	G 1/4	0,5 (1.1)	0,1	0,2
WBE 140	2	40 (1.57)	140 (5.51)	45 (1.77)	110 (4.33)	125 (4.92)	93 (3.66)	M6	G 3/8	0,8 (1.76)	0,2	0,5
WBE 210	3	55 (2.17)	190 (7.48)	55 (2.17)	152 (5.98)	175 (6.89)	127 (5)	M8	G 1/2	1,65 (3.64)	0,4	1,0
WBZ 70	1	45 (1.77)	95 (3.74)	65 (2.56)	78 (3.07)	80 (3.15)	36 (1.42)	M6	G 1/4	0,7 (1.54)	0,3	0,6
WBZ 140	2	85 (3.35)	140 (5.51)	65 (2.56)	110 (4.33)	125 (4.92)	93 (3.66)	M6	G 3/8	0,9 (1.98)	0,4	0,8
WBZ 210	3	125 (4.92)	190 (7.48)	75 (2.95)	152 (5.98)	175 (6.89)	127 (5)	M8	G 1/2	2 (4.41)	0,6	2,3
WBD 70	1	60 (2.36)	95 (3.74)	80 (3.15)	78 (3.07)	80 (3.15)	36 (1.42)	M6	G 1/4	1 (2.21)	0,4	0,8
WBD 140	2	100 (3.94)	140 (5.51)	100 (3.94)	110 (4.33)	125 (4.92)	93 (3.66)	M6	G 3/8	1,2 (2.65)	0,6	1,2
WBD 210	3	168 (6.61)	190 (7.48)	102 (4.02)	152 (5.98)	175 (6.89)	127 (5)	M8	G 1/2	2,5 (5.51)	0,8	2,7

Operating pressure	0 - 8 bar (0 - 116.03 psi)	Temperature	-40°C - +50°C (+70°C) -40°F - 122°F (+158°F)	Compressed air	oiled / oilfree
Lateral misaligment	WBE: max. 10 mm (0.39 in) WBZ: max. 20 mm (0.79 in) WBD: max. 30 mm (1.18 in)	Tilt capability	WBE: max. 20° WBZ: max. 25° WBD: max. 30°	Return force	WBE: 120 - 300 N (26.98 - 67.44 lbs) WBZ: 120 - 300 N (26.98 - 67.44 lbs) WBD: 400 - 500 N (89.92 - 112.41 lbs)

ACTUATION

	Heigth mm (inch)	Load (kN) 2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	Heigth mm (inch)	Load (kN) 2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	Heigth mm (inch)	Load (kN) 2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBE 70	55 (2.17)	0,7 (0.16)	1,4 (0.31)	2,1 (0.47)	65 (2.56)	0,5 (0.11)	0,9 (0.2)	1,4 (0.31)	70 (2.76)	0,3 (0.07)	0,7 (0.16)	1,1 (0.25)
WBE 140	50 (1.97)	1,8 (0.4)	3,6 (0.81)	5,5 (1.24)	70 (2.76)	1,1 (0.25)	2,2 (0.49)	3,5 (0.79)	80 (3.15)	0,8 (0.18)	1,6 (0.36)	2,6 (0.58)
WBE 210	60 (2.36)	3,6 (0.81)	7,2 (1.62)	10,9 (2.45)	80 (3.15)	2,5 (0.56)	4,9 (1.1)	7,8 (1.75)	100 (3.94)	1,6 (0.36)	3,2 (0.72)	5,2 (1.17)
WBZ 70	70 (2.76)	1,5 (0.34)	3 (0.67)	4,5 (1.01)	80 (3.15)	1,1 (0.25)	2,2 (0.49)	3,3 (0.74)	100 (3.94)	0,5 (0.11)	1 (0.22)	1,5 (0.34)
WBZ 140	70 (2.76)	2 (0.45)	3,6 (0.81)	5,3 (1.19)	100 (3.94)	1,3 (0.29)	2,4 (0.54)	3,7 (0.83)	140 (5.51)	0,6 (0.13)	1,3 (0.29)	2 (0.45)
WBZ 210	100 (3.94)	3,2 (0.72)	6,3 (1.42)	9,3 (2.09)	140 (5.51)	2,3 (0.52)	4,5 (1.01)	6,8 (1.53)	180 (7.09)	1,6 (0.36)	3,1 (0.7)	4,8 (1.08)
WBD 70	90 (3.54)	0,7 (0.16)	1,23 (0.28)	1,84 (0.41)	110 (4.33)	0,48 (0.11)	0,96 (0.22)	1,46 (0.33)	130 (5.12)	0,35 (0.08)	0,6 (0.13)	0,94 (0.21)
WBD 140	110 (4.33)	1,6 (0.36)	3 (0.67)	5 (1.12)	150 (5.91)	1,2 (0.27)	2,2 (0.49)	3,3 (0.74)	180 (7.09)	0,8 (0.18)	1,6 (0.36)	2,6 (0.58)
WBD 210	125 (4.92)	3,2 (0.72)	6,2 (1.39)	9,1 (2.05)	175 (6.89)	2,3 (0.52)	4,7 (1.06)	7 (1.57)	252 (9.92)	1,7 (0.38)	3,4 (0.76)	5,3 (1.19)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency HZ			Natural frequency U/min			Height min.	Height opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	mm (inch)
WBE 70	0,6 (0.13)	1,2 (0.27)	1,8 (0.4)	4,3	4,2	4,1	258	252	246	55 (2.17)	60 (2.36)
WBE 140	1,1 (0.25)	2,3 (0.52)	3,5 (0.79)	3,8	3,6	3,5	228	216	210	65 (2.56)	70 (2.76)
WBE 210	2 (0.45)	4 (0.9)	6,1 (1.37)	3,3	3,2	3,1	198	192	186	75 (2.95)	90 (3.54)
WBZ 70	0,8 (0.18)	1,6 (0.36)	2,5 (0.56)	3,8	3,6	3,6	228	216	216	75 (2.95)	90 (3.54)
WBZ 140	0,8 (0.18)	1,6 (0.36)	2,5 (0.56)	3,0	2,9	2,7	180	174	168	110 (4.33)	130 (5.12)
WBZ 210	2 (0.45)	4 (0.9)	6 (1.35)	2,3	2,2	2,1	138	132	126	150 (5.91)	160 (6.3)

WBE

WBZ

WBD

WBE-G / WBZ-G / WBD-G

DIMENSIONS

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	F	G	E	Weight	Volume in litre	
		mm / inch (max.)				mm (inch)					kg (lbs)	Hmin	Hmax
WBE-G210	1	55 (2.17)	180 (7.09)	50 (1.97)	154 (6.06)	168 (6.61)	127 (5)	4xM10	27,3 (1.07)	G 1/2	1,9 (4.19)	0,2	0,6
WBE-G350	1	80 (3.15)	245 (9.65)	50 (1.97)	184 (7.24)	230 (9.06)	155,5 (6.12)	4xM10	29,5 (1.16)	G 1/2	3,4 (7.5)	0,5	7,1
WBE-G450	1	100 (3.94)	295 (11.61)	50 (1.97)	210 (8.27)	280 (11.02)	181 (7.13)	4xM10	27,3 (1.07)	G 1/2	3,8 (8.38)	0,9	7,2
WBE-G550	1	100 (3.94)	345 (13.58)	50 (1.97)	260 (10.24)	330 (12.99)	231,8 (9.13)	4xM10	27,3 (1.07)	G 1/2	4,8 (10.58)	2,7	8,5
WBE-G600	1	135 (5.31)	410 (16.14)	50 (1.97)	311 (12.24)	395 (15.55)	282,6 (11.13)	4xM10	27,3 (1.07)	G 1/2	6,9 (15.21)	3,7	16,0
WBE-G650	2	135 (5.31)	480 (18.9)	51 (2.01)	384 (15.12)	442 (17.4)	350 (13.78)	18xM10	28,5 (1.12)	-	5 (11.03)	3,8	16,6
WBE-G750	2	115 (4.53)	570 (22.44)	51 (2.01)	451 (17.76)	530 (20.87)	419 (16.5)	24xM10	28,5 (1.12)	-	7,3 (16.1)	6,4	32,2
WBE-G850	2	126 (4.96)	620 (24.41)	51 (2.01)	517 (20.35)	580 (22.83)	482 (18.98)	24xM10	28,5 (1.12)	-	8,7 (19.18)	6,9	34,0
WBE-G950	2	164 (6.46)	760 (29.92)	51 (2.01)	638 (25.12)	715 (28.15)	596 (23.46)	32xM10	28,5 (1.12)	-	11,1 (24.48)	14,1	53,6
WBE-G1050	2	150 (5.91)	1000 (39.37)	64 (2.52)	890 (35.04)	950 (37.4)	830 (32.68)	40xM10	23,5 (0.93)	-	22 (48.51)	32,3	115,0
WBZ-G210	1	125 (4.92)	190 (7.48)	70 (2.76)	153,5 (6.04)	175 (6.89)	127 (5)	4xM10	29 (1.14)	G 1/2	2 (4.41)	0,6	4,8
WBZ-G350	1	175 (6.89)	245 (9.65)	75 (2.95)	184 (7.24)	230 (9.06)	155,5 (6.12)	4xM10	29 (1.14)	G 1/2	3,8 (8.38)	1,3	4,6
WBZ-G450	1	225 (8.86)	300 (11.81)	75 (2.95)	210 (8.27)	270 (10.63)	181 (7.13)	4xM10	29 (1.14)	G 1/2	4,8 (10.58)	1,8	8,2
WBZ-G550	1	225 (8.86)	350 (13.78)	75 (2.95)	260 (10.24)	330 (12.99)	232 (9.13)	4xM10	29 (1.14)	G 1/2	6,5 (14.33)	4,1	14,4
WBZ-G600	1	260 (10.24)	420 (16.54)	80 (3.15)	311 (12.24)	395 (15.55)	282,6 (11.13)	4xM10	29 (1.14)	G 1/2	9,3 (20.51)	7,7	26,5
WBZ-G650	2	226 (8.9)	490 (19.29)	84 (3.31)	384 (15.12)	444 (17.48)	350 (13.78)	18xM10	28,5 (1.12)	-	8,6 (18.96)	8,7	31,4
WBZ-G750	2	245 (9.65)	570 (22.44)	84 (3.31)	451 (17.76)	518 (20.39)	419 (16.5)	24xM10	28,5 (1.12)	-	10,2 (22.49)	11,0	45,2
WBZ-G850	2	250 (9.84)	620 (24.41)	84 (3.31)	517 (20.35)	577 (22.72)	482 (18.98)	24xM10	28,5 (1.12)	-	12 (26.46)	13,5	59,7
WBZ-G900	2	230 (9.06)	710 (27.95)	84 (3.31)	600 (23.62)	660 (25.98)	558 (21.97)	24xM10	28,5 (1.12)	-	14,1 (31.09)	20,9	78,5
WBZ-G950	2	251 (9.88)	760 (29.92)	84 (3.31)	638 (25.12)	709 (27.91)	596 (23.46)	32xM10	28,5 (1.12)	-	15,4 (33.96)	19,6	104,6
WBZ-G1050	2	283 (11.14)	1000 (39.37)	107 (4.21)	890 (35.04)	950 (37.4)	830 (32.68)	40xM10	23,5 (0.93)	-	32,9 (72.54)	17,8	222,6
WBD-G210	1	183 (7.2)	180 (7.09)	95 (3.74)	154 (6.06)	168 (6.61)	127 (5)	4xM10	27,3 (1.07)	G 1/2	2,5 (5.51)	1,8	8,2
WBD-G350	1	250 (9.84)	230 (9.06)	100 (3.94)	184 (7.24)	230 (9.06)	155,6 (6.13)	4xM10	27,3 (1.07)	G 1/2	4,5 (9.92)	2,2	9,0
WBD-G450	1	330 (12.99)	300 (11.81)	100 (3.94)	210 (8.27)	270 (10.63)	181 (7.13)	4xM10	29 (1.14)	G 1/2	5,6 (12.35)	2,6	11,8
WBD-G550	1	330 (12.99)	350 (13.78)	100 (3.94)	260 (10.24)	330 (12.99)	232 (9.13)	4xM10	29 (1.14)	G 1/2	8,1 (17.86)	4,3	19,5
WBD-G590	1	380 (14.96)	420 (16.54)	100 (3.94)	311 (12.24)	395 (15.55)	282,6 (11.13)	4xM10	29 (1.14)	G 1/2	11,5 (25.36)	8,0	32,4
WBD-G600	1	430 (16.93)	480 (18.9)	120 (4.72)	311 (12.24)	430 (16.93)	282,6 (11.13)	4xM10	29 (1.14)	G 1/2	13 (28.67)	19,0	47,3
WBD-G650	2	336 (13.23)	510 (20.08)	114 (4.49)	384 (15.12)	462 (18.19)	350 (13.78)	18xM10	28,5 (1.12)	-	9,3 (20.51)	16,3	43,3
WBD-G750	2	355 (13.98)	570 (22.44)	114 (4.49)	451 (17.76)	521 (20.51)	419 (16.5)	24xM10	28,5 (1.12)	-	12,5 (27.56)	13,9	63,1
WBD-G850	2	355 (13.98)	630 (24.8)	114 (4.49)	517 (20.35)	580 (22.83)	482 (18.98)	24xM10	28,5 (1.12)	-	14,5 (31.97)	19,0	86,0
WBD-G950	2	455 (17.91)	770 (30.31)	115 (4.53)	638 (25.12)	720 (28.35)	596 (23.46)	32xM10	28,5 (1.12)	-	17 (37.49)	35,0	157,0
WBD-G1050	2	440 (17.32)	1000 (39.37)	140 (5.51)	890 (35.04)	950 (37.4)	830 (32.68)	40xM10	23,5 (0.93)	-	44 (97.02)	77,2	307,2

Operating pressure	0 - 8 bar (0 - 116.03 psi)	Temperature	-40°C - +50°C (+70°C) -40°F - 122°F (+158°F)	Compressed air	oiled / oilfree
Lateral misaligment	max. 10 - 30 mm (0.39 - 1.18 in)	Tilt capability	max. 10° - 30°	Return force	- 1800 N (- 404.66 lbs)

ACTUATION

	Heigth	Load (kN)			Heigth	Load (kN)			Heigth	Load (kN)		
	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBE-G210	27,3 (1.07)	3,6 (0.81)	7,2 (1.62)	10,8 (2.43)	90 (3.54)	1,8 (0.4)	3,6 (0.81)	5,4 (1.21)	100 (3.94)	1,2 (0.27)	2,4 (0.54)	3,6 (0.81)
WBE-G350	29,5 (1.16)	8,6 (1.93)	11,6 (2.61)	17,6 (3.96)	100 (3.94)	5,5 (1.24)	7,2 (1.62)	14,1 (3.17)	120 (4.72)	3,4 (0.76)	4,9 (1.1)	7,8 (1.75)
WBE-G450	27,3 (1.07)	9 (2.02)	18 (4.05)	27 (6.07)	100 (3.94)	7 (1.57)	14 (3.15)	21 (4.72)	140 (5.51)	3 (0.67)	6 (1.35)	9 (2.02)
WBE-G550	27,3 (1.07)	13 (2.92)	26 (5.85)	39 (8.77)	100 (3.94)	10 (2.25)	20 (4.5)	30 (6.74)	140 (5.51)	4,4 (0.99)	8,8 (1.98)	13,2 (2.97)
WBE-G600	27,3 (1.07)	17 (3.82)	34 (7.64)	51 (11.47)	110 (4.33)	9 (2.02)	18 (4.05)	27 (6.07)	160 (6.3)	9,6 (2.16)	19,2 (4.32)	28,8 (6.47)
WBE-G650	28,5 (1.12)	25 (5.62)	49,6 (11.15)	75,3 (16.93)	110 (4.33)	20 (4.5)	41,2 (9.26)	62,3 (14.01)	140 (5.51)	16 (3.6)	32,7 (7.35)	49,7 (11.17)
WBE-G750	28,5 (1.12)	34,5 (7.76)	69 (15.51)	103,5 (23.27)	110 (4.33)	28,6 (6.43)	57,6 (12.95)	86,7 (19.49)	140 (5.51)	22,6 (5.08)	45,8 (10.3)	69,5 (15.62)
WBE-G850	28,5 (1.12)	45,2 (10.16)	90,2 (20.28)	135,5 (30.46)	100 (3.94)	40 (8.99)	80,2 (18.03)	121 (27.2)	140 (5.51)	32,1 (7.22)	64,4 (14.48)	98 (22.03)
WBE-G950	28,5 (1.12)	80 (17.98)	156,9 (35.27)	225,6 (50.72)	120 (4.72)	70 (15.74)	135 (30.35)	196,3 (44.13)	180 (7.09)	47 (10.57)	91,9 (20.66)	189,6 (42.62)
WBE-G1050	23,5 (0.93)	127 (28.55)	254,9 (57.3)	380,9 (85.63)	120 (4.72)	118 (26.53)	231,2 (51.98)	349 (78.46)	180 (7.09)	89 (20.01)	180,1 (40.49)	274,4 (61.69)
WBZ-G210	29 (1.14)	3,2 (0.72)	6,3 (1.42)	9,3 (2.09)	135 (5.31)	2,3 (0.52)	4,5 (1.01)	6,8 (1.53)	175 (6.89)	1,5 (0.34)	3,1 (0.7)	4,8 (1.08)
WBZ-G350	29 (1.14)	8,1 (1.82)	11,6 (2.61)	16,6 (3.73)	150 (5.91)	6 (1.35)	8 (1.8)	17,4 (3.91)	200 (7.87)	4 (0.9)	5,3 (1.19)	8,2 (1.84)
WBZ-G450	29 (1.14)	12,2 (2.74)	17,2 (3.87)	26 (5.85)	200 (7.87)	8,2 (1.84)	10,8 (2.43)	16,6 (3.73)	250 (9.84)	5,6 (1.26)	7,8 (1.75)	12,2 (2.74)
WBZ-G550	29 (1.14)	18 (4.05)	25,9 (5.82)	38,3 (8.61)	200 (7.87)	11,8 (2.65)	19,5 (4.38)	26,7 (6)	250 (9.84)	7,8 (1.75)	12,8 (2.88)	19,9 (4.47)
WBZ-G600	60 (2.36)	20,4 (4.59)	39,9 (8.97)	59,6 (13.4)	200 (7.87)	14,3 (3.21)	28,9 (6.5)	44,4 (9.98)	280 (11.02)	9,1 (2.05)	18,9 (4.25)	-
WBZ-G650	60 (2.36)	25,8 (5.8)	52,2 (11.74)	77,8 (17.49)	160 (6.3)	22,6 (5.08)	46 (10.34)	69,5 (15.62)	220 (8.66)	19,1 (4.29)	38,1 (8.57)	58,1 (13.06)
WBZ-G750	60 (2.36)	34,3 (7.71)	68,4 (15.38)	102,8 (23.11)	180 (7.09)	30,5 (6.86)	61,2 (13.76)	91,8 (20.64)	270 (10.63)	22,7 (5.1)	45,9 (10.32)	69,2 (15.56)
WBZ-G850	60 (2.36)	44,2 (9.94)	88,1 (19.81)	133,5 (30.01)	200 (7.87)	38 (8.54)	76,5 (17.2)	115,7 (26.01)	280 (11.02)	28,1 (6.32)	57,8 (12.99)	86,4 (19.42)
WBZ-G900	60 (2.36)	57,4 (12.9)	114,7 (25.79)	172,4 (38.76)	200 (7.87)	50 (11.24)	100,3 (22.55)	151,3 (34.01)	260 (10.24)	41,8 (9.4)	83,8 (18.84)	127,5 (28.66)
WBZ-G950	70 (2.76)	71,3 (16.03)	137,9 (31)	205,2 (46.13)	200 (7.87)	65,6 (14.75)	128,7 (28.93)	189,2 (42.53)	280 (11.02)	54 (12.14)	105 (23.61)	155,5 (34.96)
WBZ-G1050	70 (2.76)	127,3 (28.62)	255 (57.33)	383 (86.1)	200 (7.87)	117,3 (26.37)	233,5 (52.49)	353,9 (79.56)	280 (11.02)	103,2 (23.2)	205,6 (46.22)	308,1 (69.26)
WBD-G210	60 (2.36)	3,6 (0.81)	7,2 (1.62)	10,8 (2.43)	180 (7.09)	2 (0.45)	4 (0.9)	6 (1.35)	250 (9.84)	1,2 (0.27)	2,4 (0.54)	3,6 (0.81)
WBD-G350	60 (2.36)	8,5 (1.91)	12,7 (2.86)	15 (3.37)	220 (8.66)	3,5 (0.79)	9 (2.02)	12 (2.7)	330 (12.99)	2,5 (0.56)	5 (1.12)	7,5 (1.69)
WBD-G450	80 (3.15)	11,8 (2.65)	15,8 (3.55)	23,7 (5.33)	250 (9.84)	8,5 (1.91)	11,2 (2.52)	17 (3.82)	350 (13.78)	5,4 (1.21)	7,9 (1.78)	11,1 (2.5)
WBD-G550	95 (3.74)	18,5 (4.16)	23,1 (5.19)	37,8 (8.5)	250 (9.84)	14,2 (3.19)	19,3 (4.34)	29,4 (6.61)	350 (13.78)	9,3 (2.09)	12,2 (2.74)	20,5 (4.61)
WBD-G590	100 (3.94)	20,5 (4.61)	40,6 (9.13)	60,2 (13.53)	300 (11.81)	13 (2.92)	26 (5.85)	39,2 (8.81)	400 (15.75)	9,2 (2.07)	18,6 (4.18)	28,4 (6.38)
WBD-G600	100 (3.94)	20,8 (4.68)	41,6 (9.35)	62,5 (14.05)	300 (11.81)	16,2 (3.64)	32,4 (7.28)	48,5 (10.9)	450 (17.72)	10,8 (2.43)	21,6 (4.86)	33 (7.42)
WBD-G650	100 (3.94)	25,6 (5.76)	51,3 (11.53)	76,2 (17.13)	280 (11.02)	20,9 (4.7)	42 (9.44)	63,3 (14.23)	404 (15.91)	12,8 (2.88)	27,3 (6.14)	42,1 (9.46)
WBD-G750	80 (3.15)	36,3 (8.16)	72,1 (16.21)	107,4 (24.14)	270 (10.63)	31,5 (7.08)	62,2 (13.98)	93,5 (21.02)	390 (15.35)	23,7 (5.33)	45,5 (10.23)	68,5 (15.4)
WBD-G850	100 (3.94)	45 (10.12)	90,4 (20.32)	135 (30.35)	270 (10.63)	39,9 (8.97)	78,7 (17.69)	118 (26.53)	390 (15.35)	30,2 (6.79)	61,8 (13.89)	93,3 (20.97)
WBD-G950	120 (4.72)	73,3 (16.48)	142 (31.92)	210 (47.21)	320 (12.6)	63,3 (14.23)	123 (27.65)	183 (41.14)	480 (18.9)	43,7 (9.82)	85 (19.11)	126 (28.33)
WBD-G1050	120 (4.72)	128,8 (28.96)	257,7 (57.93)	382,9 (86.08)	120 (4.72)	113,3 (25.47)	227,1 (51.05)	342,5 (77)	120 (4.72)	98,7 (22.19)	198,4 (44.6)	302,2 (67.94)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency						Height	
				HZ			U/min			min.	opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	mm (inch)
WBE-G210	2,5 (0.56)	4,9 (1.1)	7,4 (1.66)	4,2	3,9	3,9	252	234	234	70 (2.76)	80 (3.15)
WBE-G350	5,5 (1.24)	9,2 (2.07)	11,1 (2.5)	3,0	3,0	7,9	180	168	168	75 (2.95)	100 (3.94)
WBE-G450	7 (1.57)	14 (3.15)	21 (4.72)	2,9	2,8	2,8	174	168	168	75 (2.95)	95 (3.74)
WBE-G550	10 (2.25)	20 (4.5)	30 (6.74)	2,9	2,8	2,8	174	168	168	75 (2.95)	95 (3.74)
WBE-G600	15 (3.37)	30 (6.74)	45 (10.12)	2,6	2,5	2,5	156	150	150	85 (3.35)	105 (4.13)
WBE-G650	19,1 (4.29)	38,8 (8.72)	58,7 (13.2)	2,3	2,2	2,2	138	132	132	110 (4.33)	125 (4.92)
WBE-G750	26 (5.85)	57 (12.81)	79 (17.76)	2,3	2,2	2,2	138	132	132	105 (4.13)	125 (4.92)
WBE-G850	32,1 (7.22)	70,6 (15.87)	110 (24.73)	2,2	2,2	2,1	132	126	126	110 (4.33)	125 (4.92)
WBE-G950	59 (13.26)	116,9 (26.28)	173,2 (38.94)	2,0	2,0	1,9	120	114	108	130 (5.12)	150 (5.91)
WBE-G1050	108 (24.28)	217 (48.78)	328 (73.74)	2,0	2,0	1,9	120	114	114	120 (4.72)	140 (5.51)
WBZ-G210	3 (0.67)	4 (0.9)	6 (1.35)	2,3	2,2	2,1	138	132	126	145 (5.71)	155 (6.1)
WBZ-G350	4 (0.9)	5,3 (1.19)	8,2 (1.84)	2,1	2,2	2,1	126	120	10	180 (7.09)	200 (7.87)
WBZ-G450	7,1 (1.6)	9,5 (2.14)	14,5 (3.26)	1,9	1,8	1,7	114	108	102	200 (7.87)	220 (8.66)
WBZ-G550	10,3 (2.32)	16,3 (3.66)	24,5 (5.51)	2,0	1,8	1,7	120	108	108	200 (7.87)	220 (8.66)
WBZ-G600	11,5 (2.59)	23,3 (5.24)	35,3 (7.94)	1,7	1,7	1,6	102	102	96	230 (9.06)	250 (9.84)
WBZ-G650	18,3 (4.11)	35,2 (7.91)	54,6 (12.27)	1,7	1,7	1,6	102	96	96	220 (8.66)	240 (9.45)
WBZ-G750	26 (5.85)	51,4 (11.56)	77,8 (17.49)	1,6	1,6	1,5	96	90	90	220 (8.66)	240 (9.45)
WBZ-G850	34,4 (7.73)	69,4 (15.6)	102,8 (23.11)	1,6	1,6	1,5	96	90	90	220 (8.66)	240 (9.45)
WBZ-G900	46,1 (10.36)	90,5 (20.35)	137,6 (30.93)	1,6	1,6	1,5	96	90	90	220 (8.66)	240 (9.45)
WBZ-G950	56,8 (12.77)	113,3 (25.47)	166 (37.32)	1,5	1,5	1,5	90	90	84	245 (9.65)	265 (10.43)
WBZ-G1050	104,9 (23.58)	204,9 (46.06)	312,3 (70.21)	1,4	1,4	1,3	84	78	78	260 (10.24)	280 (11.02)

WBE-G

WBZ-G

WBD-G

WBE-VA / WBZ-VA / WBD-VA

- Highly resistant to media, e.g. to acids, chemicals and cleaning products
- Corrosion resistant
- Wear-resistant (even at high temperatures and high mechanical stress)

Applications:

- Offshore
- Pharmaceutical and processing industry
- Chemical industry
- Cellulose and paper industry
- Food industry

DIMENSIONS

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	D	F1	E1	Weight	Volume in litre	
		mm / inch (max.)	mm (inch)								kg	Hmin	Hmax
WBE 100-VA	1	60 (2.36)	160 (6.3)	50 (1.97)	90 (3.54)	145 (5.71)	20 (0.79)	M8	-	G1/8	0,9 (1.98)	0,2	0,6
WBE 150-VA	2	45 (1.77)	165 (6.5)	51 (2.01)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	G1/4	1,2 (2.65)	0,2	0,6
WBE 200-VA	2	64 (2.52)	180 (7.09)	51 (2.01)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	G1/4	1,2 (2.65)	0,5	1,1
WBE 300-VA	2	85 (3.35)	230 (9.06)	50 (1.97)	141 (5.55)	215 (8.46)	70 (2.76)	M8	-	G3/4	2 (4.41)	0,9	2,1
WBE 320-VA	2	120 (4.72)	250 (9.84)	51 (2.01)	141 (5.55)	235 (9.25)	70 (2.76)	M8	-	G3/4	1,9 (4.19)	1,2	3,2
WBE 400-VA	3	90 (3.54)	265 (10.43)	51 (2.01)	161 (6.34)	250 (9.84)	89 (3.5)	M8	38,1 (1.5)	G3/4	2,3 (5.07)	1,0	3,1
WBE 500-VA	3	100 (3.94)	340 (13.39)	51 (2.01)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	73 (2.87)	G3/4	4,1 (9.04)	3,3	7,7
WBE 600-VA	4	125 (4.92)	400 (15.75)	51 (2.01)	287 (11.3)	385 (15.16)	158,8 (6.25)	M8	158,8 (6.25)	G3/4	5,9 (13.01)	3,3	10,8
WBE 700-VA	4	135 (5.31)	420 (16.54)	51 (2.01)	287 (11.3)	405 (15.94)	158,8 (6.25)	M8	158,8 (6.25)	G3/4	6,1 (13.45)	3,6	13,0
WBZ 100-VA	1	100 (3.94)	160 (6.3)	70 (2.76)	90 (3.54)	145 (5.71)	20 (0.79)	M8	-	G1/8	1,1 (2.43)	0,4	1,2
WBZ 200-VA	2	128 (5.04)	180 (7.09)	75 (2.95)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	G1/4	1,5 (3.31)	0,6	1,9
WBZ 320-VA	2	193 (7.6)	235 (9.25)	77 (3.03)	141 (5.55)	218 (8.58)	70 (2.76)	M8	-	G3/4	2,3 (5.07)	1,6	5,0
WBZ 430-VA	3	248 (9.76)	275 (10.83)	77 (3.03)	161 (6.34)	260 (10.24)	89 (3.5)	M8	38,1 (1.5)	G3/4	3,5 (7.72)	4,0	9,8
WBZ 500-VA	3	230 (9.06)	340 (13.39)	75 (2.95)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	66 (2.6)	G1	4,8 (10.58)	4,0	14,2
WBZ 520-VA	3	283 (11.14)	355 (13.98)	77 (3.03)	228 (8.98)	340 (13.39)	157,5 (6.2)	M8	73 (2.87)	G3/4	5,1 (11.25)	5,0	15,0
WBZ 630-VA	2	320 (12.6)	415 (16.34)	77 (3.03)	287 (11.3)	400 (15.75)	158,8 (6.25)	M8	158,8 (6.25)	G3/4	7,3 (16.1)	5,8	25,6
WBD 500-VA	3	280 (11.02)	345 (13.58)	110 (4.33)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	73 (2.87)	G3/4	5,9 (13.01)	5,0	26,0
WBD 600-VA	4	325 (12.8)	410 (16.14)	110 (4.33)	287 (11.3)	384 (15.12)	158,8 (6.25)	M8	158,8 (6.25)	G3/4	8 (17.64)	5,5	33,1
WBD 700-VA	4	395 (15.55)	430 (16.93)	115 (4.53)	287 (11.3)	405 (15.94)	158,8 (6.25)	M8	158,8 (6.25)	G3/4	9,3 (20.51)	9,6	37,3

WBE

WBZ

WBD

** E1 - F1 / E2 - F2

ACTUATION

	Heigth	Load (kN)			Heigth	Load (kN)			Heigth	Load (kN)		
	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBE 100-VA	60 (2.36)	1,8 (0.4)	3,5 (0.79)	5,2 (1.17)	80 (3.15)	1,4 (0.31)	2,8 (0.63)	4,2 (0.94)	100 (3.94)	0,8 (0.18)	1,6 (0.36)	2,5 (0.56)
WBE 150-VA	60 (2.36)	2 (0.45)	4 (0.9)	6 (1.35)	70 (2.76)	1,8 (0.4)	3,4 (0.76)	5,1 (1.15)	80 (3.15)	1,5 (0.34)	2,7 (0.61)	4 (0.9)
WBE 200-VA	60 (2.36)	2,8 (0.63)	4,8 (1.08)	8,2 (1.84)	90 (3.54)	1,5 (0.34)	3,6 (0.81)	5,6 (1.26)	100 (3.94)	1,2 (0.27)	3,1 (0.7)	4,8 (1.08)
WBE 300-VA	60 (2.36)	4,1 (0.92)	8,2 (1.84)	13 (2.92)	90 (3.54)	3,3 (0.74)	6,8 (1.53)	10,8 (2.43)	120 (4.72)	1,9 (0.43)	4,3 (0.97)	6,9 (1.55)
WBE 320-VA	70 (2.76)	4,6 (1.03)	9,2 (2.07)	13,7 (3.08)	110 (4.33)	3,9 (0.88)	7,8 (1.75)	11,8 (2.65)	150 (5.91)	2,5 (0.56)	5,1 (1.15)	7,9 (1.78)
WBE 400-VA	60 (2.36)	5,5 (1.24)	11,3 (2.54)	17,1 (3.84)	90 (3.54)	4,6 (1.03)	9,4 (2.11)	14,6 (3.28)	120 (4.72)	3,1 (0.7)	6,2 (1.39)	10,4 (2.34)
WBE 500-VA	60 (2.36)	10,5 (2.36)	21,6 (4.86)	32,6 (7.33)	90 (3.54)	9,5 (2.14)	19,2 (4.32)	29,1 (6.54)	120 (4.72)	8 (1.8)	15,7 (3.53)	23,8 (5.35)
WBE 600-VA	70 (2.76)	17 (3.82)	32 (7.19)	48,8 (10.97)	110 (4.33)	13,8 (3.1)	27,4 (6.16)	41,7 (9.37)	150 (5.91)	9 (2.02)	19 (4.27)	30 (6.74)
WBE 700-VA	80 (3.15)	17 (3.82)	33,4 (7.51)	50,3 (11.31)	140 (5.51)	13,3 (2.99)	26,8 (6.02)	40,6 (9.13)	160 (6.3)	11,4 (2.56)	23 (5.17)	35 (7.87)
WBZ 100-VA	80 (3.15)	1,8 (0.4)	3,5 (0.79)	5,4 (1.21)	120 (4.72)	1,4 (0.31)	2,7 (0.61)	4,1 (0.92)	140 (5.51)	1,1 (0.25)	2,2 (0.49)	3,3 (0.74)
WBZ 200-VA	80 (3.15)	2,8 (0.63)	5,7 (1.28)	8,5 (1.91)	140 (5.51)	1,9 (0.43)	3,9 (0.88)	5,8 (1.3)	180 (7.09)	1,1 (0.25)	2,3 (0.52)	3,5 (0.79)
WBZ 320-VA	80 (3.15)	4,9 (1.1)	9,7 (2.18)	14,7 (3.3)	160 (6.3)	3,9 (0.88)	7,8 (1.75)	11,9 (2.68)	200 (7.87)	3,2 (0.72)	6,2 (1.39)	9,6 (2.16)
WBZ 430-VA	110 (4.33)	6,2 (1.39)	12,3 (2.77)	18,7 (4.2)	170 (6.69)	5,5 (1.24)	11 (2.47)	16,6 (3.73)	290 (11.42)	2,7 (0.61)	5,6 (1.26)	9 (2.02)
WBZ 500-VA	100 (3.94)	11,2 (2.52)	22,1 (4.97)	34,1 (7.67)	160 (6.3)	9,7 (2.18)	9,4 (2.11)	29,5 (6.63)	240 (9.45)	6,7 (1.51)	13,3 (2.99)	20,6 (4.63)
WBZ 520-VA	100 (3.94)	12,2 (2.74)	24,4 (5.49)	36,3 (8.16)	220 (8.66)	9,7 (2.18)	19,4 (4.36)	29,4 (6.61)	320 (12.6)	4,4 (0.99)	10,8 (2.43)	17 (3.82)
WBZ 630-VA	100 (3.94)	18,6 (4.18)	36,8 (8.27)	52,4 (11.78)	220 (8.66)	14 (3.15)	28 (6.29)	42 (9.44)	300 (11.81)	8,6 (1.93)	17,7 (3.98)	27,7 (6.23)
WBD 500-VA	140 (5.51)	11,3 (2.54)	22,4 (5.04)	33,6 (7.55)	260 (10.24)	9,1 (2.05)	18,2 (4.09)	27,6 (6.2)	380 (14.96)	5,9 (1.33)	11,9 (2.68)	18,4 (4.14)
WBD 600-VA	160 (6.3)	16,3 (3.66)	32,3 (7.26)	49,1 (11.04)	280 (11.02)	13,3 (2.99)	26,7 (6)	40,8 (9.17)	360 (14.17)	10 (2.25)	20,8 (4.68)	32 (7.19)
WBD 700-VA	140 (5.51)	18,2 (4.09)	36,3 (8.16)	54,5 (12.25)	300 (11.81)	14,2 (3.19)	28,4 (6.38)	43,4 (9.76)	380 (14.96)	11,8 (2.65)	23,8 (5.35)	36,4 (8.18)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency						Height	
				HZ			U/min			min.	opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	mm (inch)
WBE 100-VA	1,1 (0.25)	2,3 (0.52)	3,4 (0.76)	3,5	3,3	3,3	210	198	198	70 (2.76)	90 (3.54)
WBE 150-VA	1,5 (0.34)	3 (0.67)	4,6 (1.03)	3,9	3,8	3,7	234	228	222	65 (2.56)	75 (2.95)
WBE 200-VA	1,6 (0.36)	3,9 (0.88)	5,7 (1.28)	3,1	2,9	2,8	186	174	168	70 (2.76)	90 (3.54)
WBE 300-VA	2,5 (0.56)	5,4 (1.21)	8,5 (1.91)	3,0	2,7	2,6	180	162	156	90 (3.54)	110 (4.33)
WBE 320-VA	2,8 (0.63)	5,8 (1.3)	8,9 (2)	2,6	2,5	2,4	156	150	144	125 (4.92)	140 (5.51)
WBE 400-VA	3,7 (0.83)	7,5 (1.69)	11,9 (2.68)	2,8	2,6	2,6	168	156	150	90 (3.54)	110 (4.33)
WBE 500-VA	7 (1.57)	14,2 (3.19)	21,8 (4.9)	2,6	2,4	2,3	156	144	138	100 (3.94)	130 (5.12)
WBE 600-VA	10 (2.25)	20,1 (4.52)	31,6 (7.1)	2,5	2,5	2,4	150	144	144	110 (4.33)	145 (5.71)
WBE 700-VA	12,4 (2.79)	24,9 (5.6)	37,9 (8.52)	2,3	2,1	2,0	138	132	126	120 (4.72)	150 (5.91)
WBZ 100-VA	0,7 (0.16)	1,5 (0.34)	2,4 (0.54)	2,8	2,8	2,7	168	168	162	150 (5.91)	160 (6.3)
WBZ 200-VA	1,3 (0.29)	2,5 (0.56)	3,8 (0.85)	2,5	2,5	2,4	150	144	144	160 (6.3)	175 (6.89)
WBZ 320-VA	3,1 (0.7)	6,2 (1.39)	9,4 (2.11)	1,9	1,8	1,8	114	108	108	190 (7.48)	205 (8.07)
WBZ 430-VA	4 (0.9)	8,1 (1.82)	12,3 (2.77)	1,8	1,8	1,7	108	108	102	230 (9.06)	254 (10)
WBZ 500-VA	6,7 (1.51)	13,3 (2.99)	20,6 (4.63)	2,1	1,9	1,8	126	108	108	220 (8.66)	240 (9.45)
WBZ 600-VA	10,1 (2.27)	20,7 (4.65)	31,5 (7.08)	1,9	1,8	1,8	114	108	108	225 (8.86)	250 (9.84)

ECO

Temperature: 50°C - 115°C (122°F - 239°F)
(limited duration 130°C / 266°F)

- Resistant to mineral oils
- Bellow made of synthetic rubber

DIMENSIONS

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	D	F	E	Weight	Volume in litre	
		mm / inch (max.)			mm (inch)						kg (lbs)	Hmin	Hmax
WBE 150-ECO	2	41 (1.61)	165 (6.5)	54 (2.13)	108 (4.25)	150 (5.91)	44,5 (1.75)	M8	-	G1/4	1,4 (3.09)	0,2	0,6
WBE 200-ECO	2	61 (2.4)	180 (7.09)	54 (2.13)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	G1/4	1,2 (2.65)	0,5	1,1
WBE 250-ECO	2	77 (3.03)	225 (8.86)	54 (2.13)	114 (4.49)	210 (8.27)	44,5 (1.75)	M8	-	G1/4	1,4 (3.09)	1,0	2,2
WBE 300-ECO	2	82 (3.23)	230 (9.06)	53 (2.09)	141 (5.55)	215 (8.46)	70 (2.76)	M8	-	G3/4	2 (4.41)	0,7	2,1
WBE 320-ECO	2	117 (4.61)	250 (9.84)	54 (2.13)	141 (5.55)	235 (9.25)	70 (2.76)	M8	-	G3/4	1,9 (4.19)	1,2	3,2
WBE 400-ECO	3	87 (3.43)	265 (10.43)	54 (2.13)	161 (6.34)	250 (9.84)	89 (3.5)	M8	38,1 (1.5)	G3/4	2,3 (5.07)	1,0	3,1
WBE 500-ECO	3	96 (3.78)	340 (13.39)	54 (2.13)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	66 (2.6)	G3/4	4,1 (9.04)	3,3	7,7
WBE 600-ECO	4	121 (4.76)	400 (15.75)	54 (2.13)	287 (11.3)	385 (15.16)	158,8 (6.25)	M8	158,8 (6.25)	G3/4	5,9 (13.01)	3,3	10,8
WBZ 200-ECO	2	125 (4.92)	180 (7.09)	78 (3.07)	108 (4.25)	165 (6.5)	44,5 (1.75)	M8	-	G1/4	1,5 (3.31)	0,6	1,9
WBZ 320-ECO	2	190 (7.48)	235 (9.25)	80 (3.15)	141 (5.55)	218 (8.58)	70 (2.76)	M8	-	G3/4	2,3 (5.07)	1,6	5,0
WBZ 430-ECO	3	248 (9.76)	275 (10.83)	77 (3.03)	161 (6.34)	260 (10.24)	89 (3.5)	M8	38,1 (1.5)	G3/4	3,5 (7.72)	4,0	9,8
WBZ 500-ECO	3	230 (9.06)	340 (13.39)	75 (2.95)	228 (8.98)	325 (12.8)	157,5 (6.2)	M8	66 (2.6)	G3/4	4,8 (10.58)	4,0	14,2
WBZ 520-ECO	3	283 (11.14)	355 (13.98)	77 (3.03)	228 (8.98)	340 (13.39)	157,5 (6.2)	M8	66 (2.6)	G3/4	5,1 (11.25)	3,7	15,0
WBZ 630-ECO	4	233 (9.17)	400 (15.75)	77 (3.03)	287 (11.3)	385 (15.16)	158,8 (6.25)	M8	158,8 (6.25)	G3/4	6,9 (15.21)	5,4	22,8

On enquiry: WBZ-G 350 / WBZ-G 650

WBE

WBZ

** E1 - F1 / E2 - F2

ACTUATION

	Heigth	Load (kN)			Heigth	Load (kN)			Heigth	Load (kN)		
	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBE 150-ECO	60 (2.36)	2 (0.45)	4 (0.9)	6 (1.35)	70 (2.76)	1,8 (0.4)	3,4 (0.76)	5,1 (1.15)	80 (3.15)	1,5 (0.34)	2,7 (0.61)	4 (0.9)
WBE 200-ECO	60 (2.36)	2,8 (0.63)	4,8 (1.08)	7,2 (1.62)	90 (3.54)	1,5 (0.34)	3,6 (0.81)	5,6 (1.26)	100 (3.94)	1,2 (0.27)	3,1 (0.7)	4,8 (1.08)
WBE 250-ECO	70 (2.76)	3,3 (0.74)	6,6 (1.48)	10,2 (2.29)	100 (3.94)	2,6 (0.58)	5,2 (1.17)	8 (1.8)	120 (4.72)	1,8 (0.4)	3,7 (0.83)	5,8 (1.3)
WBE 300-ECO	60 (2.36)	4,1 (0.92)	9,2 (2.07)	13 (2.92)	90 (3.54)	3,3 (0.74)	6,8 (1.53)	10,8 (2.43)	120 (4.72)	1,9 (0.43)	4,3 (0.97)	6,9 (1.55)
WBE 320-ECO	70 (2.76)	4,6 (1.03)	9,2 (2.07)	13,7 (3.08)	110 (4.33)	3,9 (0.88)	7,8 (1.75)	11,8 (2.65)	150 (5.91)	2,5 (0.56)	5,1 (1.15)	7,9 (1.78)
WBE 400-ECO	60 (2.36)	5,5 (1.24)	11,3 (2.54)	17,1 (3.84)	90 (3.54)	4,6 (1.03)	9,4 (2.11)	14,6 (3.28)	120 (4.72)	3,1 (0.7)	6,2 (1.39)	10,4 (2.34)
WBE 500-ECO	60 (2.36)	10,5 (2.36)	21,6 (4.86)	32,6 (7.33)	90 (3.54)	9,5 (2.14)	19,2 (4.32)	29,1 (6.54)	120 (4.72)	8 (1.8)	15,7 (3.53)	23,8 (5.35)
WBE 600-ECO	70 (2.76)	17 (3.82)	32 (7.19)	48,8 (10.97)	110 (4.33)	13,8 (3.1)	27,4 (6.16)	41,7 (9.37)	150 (5.91)	9 (2.02)	19 (4.27)	30 (6.74)
WBZ 200-ECO	80 (3.15)	2,8 (0.63)	5,7 (1.28)	8,5 (1.91)	140 (5.51)	1,9 (0.43)	3,9 (0.88)	5,8 (1.3)	180 (7.09)	1,1 (0.25)	2,3 (0.52)	3,5 (0.79)
WBZ 320-ECO	80 (3.15)	4,9 (1.1)	9,7 (2.18)	14,7 (3.3)	160 (6.3)	3,9 (0.88)	7,8 (1.75)	11,9 (2.68)	200 (7.87)	3,2 (0.72)	6,2 (1.39)	9,6 (2.16)
WBZ 430-ECO	110 (4.33)	6,2 (1.39)	12,3 (2.77)	18,7 (4.2)	170 (6.69)	5,5 (1.24)	11 (2.47)	16,6 (3.73)	290 (11.42)	2,7 (0.61)	5,6 (1.26)	9 (2.02)
WBZ 500-ECO	100 (3.94)	11,2 (2.52)	22,1 (4.97)	34,1 (7.67)	160 (6.3)	9,7 (2.18)	19,4 (4.36)	29,5 (6.63)	240 (9.45)	6,7 (1.51)	13,3 (2.99)	20,6 (4.63)
WBZ 520-ECO	100 (3.94)	12,2 (2.74)	24,4 (5.49)	36,3 (8.16)	220 (8.66)	9,7 (2.18)	19,4 (4.36)	29,4 (6.61)	320 (12.6)	4,4 (0.99)	10,8 (2.43)	17 (3.82)
WBZ 630-ECO	100 (3.94)	16,2 (3.64)	32,3 (7.26)	48,7 (10.95)	200 (7.87)	13,1 (2.95)	26,4 (5.93)	39,8 (8.95)	240 (9.45)	11 (2.47)	22,1 (4.97)	33,5 (7.53)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency						Height	
				HZ			U/min			min.	opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	mm (inch)
WBE 150-ECO	1,5 (0.34)	3 (0.67)	4,6 (1.03)	3,9	3,8	3,7	234	228	222	65 (2.56)	75 (2.95)
WBE 200-ECO	1,6 (0.36)	3,7 (0.83)	5,7 (1.28)	3,1	2,9	2,8	186	174	168	70 (2.76)	90 (3.54)
WBE 250-ECO	2 (0.45)	4,3 (0.97)	6,5 (1.46)	2,8	2,7	2,7	168	162	162	100 (3.94)	110 (4.33)
WBE 300-ECO	2,5 (0.56)	5,4 (1.21)	8,5 (1.91)	3,0	2,7	2,6	180	162	156	90 (3.54)	110 (4.33)
WBE 320-ECO	2,8 (0.63)	5,8 (1.3)	8,9 (2)	2,6	2,5	2,4	156	150	144	125 (4.92)	140 (5.51)
WBE 400-ECO	3,7 (0.83)	7,5 (1.69)	11,9 (2.68)	2,8	2,6	2,6	168	156	150	90 (3.54)	110 (4.33)
WBE 500-ECO	7 (1.57)	14,2 (3.19)	21,8 (4.9)	2,6	2,4	2,3	156	144	138	100 (3.94)	130 (5.12)
WBE 600-ECO	10 (2.25)	20,1 (4.52)	31,6 (7.1)	2,5	2,5	2,4	150	144	144	110 (4.33)	145 (5.71)
WBZ 200-ECO	1,3 (0.29)	2,5 (0.56)	3,8 (0.85)	2,5	2,5	2,4	150	144	144	160 (6.3)	175 (6.89)
WBZ 320-ECO	3,1 (0.7)	6,2 (1.39)	9,4 (2.11)	1,9	1,8	1,8	114	108	108	190 (7.48)	205 (8.07)
WBZ 430-ECO	4 (0.9)	8,1 (1.82)	12,3 (2.77)	1,8	1,8	1,7	108	108	102	230 (9.06)	254 (10)
WBZ 500-ECO	6,7 (1.51)	13,3 (2.99)	20,6 (4.63)	2,1	1,9	1,8	126	108	108	220 (8.66)	240 (9.45)
WBZ 630-ECO	10,1 (2.27)	20,7 (4.65)	31,5 (7.08)	1,9	1,8	1,8	114	108	108	225 (8.86)	250 (9.84)

ECO

Temperature: 50°C - 115°C (122°F - 239°F)
(limited duration 130°C / 266°F)

- Resistant to mineral oils
- Bellow made of synthetic rubber

DIMENSIONS

	Connection	Stroke	min. Diameter	min. Height	ø A	ø B	C	F	G	E	Weight	Volume in litre	
		mm / inch (max.)	mm (inch)								kg	Hmin	Hmax
WBE-G450-ECO	1	100 (3,94)	295 (11,61)	50 (1,97)	210 (8,27)	280 (11,02)	181 (7,13)	4xM10	27,3 (1,07)	G 1/2	3,8 (8,38)	0,9	7,2
WBE-G550-ECO	1	100 (3,94)	345 (13,58)	50 (1,97)	260 (10,24)	330 (12,99)	231,8 (9,13)	4xM10	27,3 (1,07)	G 1/2	4,8 (10,58)	2,7	8,5
WBE-G600-ECO	1	135 (5,31)	410 (16,14)	50 (1,97)	311 (12,24)	395 (15,55)	282,6 (11,13)	4xM10	27,3 (1,07)	G 1/2	6,9 (15,21)	3,7	16,0
WBZ-G450-ECO	1	225 (8,86)	300 (11,81)	75 (2,95)	210 (8,27)	270 (10,63)	181 (7,13)	4xM10	29 (1,14)	G 1/2	4,8 (10,58)	1,8	8,2
WBZ-G550-ECO	1	225 (8,86)	350 (13,78)	75 (2,95)	260 (10,24)	330 (12,99)	232 (9,13)	4xM10	29 (1,14)	G 1/2	6,5 (14,33)	4,1	14,4
WBZ-G600-ECO	1	260 (10,24)	420 (16,54)	80 (3,15)	311 (12,24)	395 (15,55)	282,6 (11,13)	4xM10	29 (1,14)	G 1/2	9,3 (20,51)	7,7	26,5
WBD-G450-ECO	1	330 (12,99)	300 (11,81)	100 (3,94)	210 (8,27)	270 (10,63)	181 (7,13)	4xM10	29 (1,14)	G 1/2	5,6 (12,35)	2,6	11,8
WBD-G550-ECO	1	330 (12,99)	350 (13,78)	100 (3,94)	260 (10,24)	330 (12,99)	232 (9,13)	4xM10	29 (1,14)	G 1/2	8,1 (17,86)	4,3	19,5
WBD-G590-ECO	1	380 (14,96)	420 (16,54)	100 (3,94)	311 (12,24)	395 (15,55)	282,6 (11,13)	4xM10	29 (1,14)	G 1/2	11,5 (25,36)	8,0	32,4
WBD-G600-ECO	1	430 (16,93)	480 (18,9)	120 (4,72)	311 (12,24)	430 (16,93)	282,6 (11,13)	4xM10	29 (1,14)		13 (28,67)	19,0	47,3

Operating pressure	0 - 8 bar (0 - 116.03 psi)	Temperature	+50°C - +115°C (+130°C) +122°F - +239°F (+266°F)	Compressed air	oiled / oilfree
Lateral misaligment	max. 10 - 30 mm (0.39 - 1.18 in)	Tilt capability	max. 10° - 30°	Return force	- 1800 N (404.66 lbs)

ACTUATION

	Heigth	Load (kN)			Heigth	Load (kN)			Heigth	Load (kN)		
	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WBE-G450-ECO	60 (2,36)	9 (2,02)	18 (4,05)	27 (6,07)	100 (3,94)	7 (1,57)	14 (3,15)	21 (4,72)	140 (5,51)	3 (0,67)	6 (1,35)	9 (2,02)
WBE-G550-ECO	60 (2,36)	13 (2,92)	26 (5,85)	39 (8,77)	100 (3,94)	10 (2,25)	20 (4,5)	30 (6,74)	140 (5,51)	4,4 (0,99)	8,8 (1,98)	13,2 (2,97)
WBE-G600-ECO	60 (2,36)	17 (3,82)	34 (7,64)	51 (11,47)	110 (4,33)	9 (2,02)	18 (4,05)	27 (6,07)	160 (6,3)	9,6 (2,16)	19,2 (4,32)	28,8 (6,47)
WBZ-G450-ECO	100 (3,94)	12,2 (2,74)	17,2 (3,87)	26 (5,85)	200 (7,87)	8,2 (1,84)	10,8 (2,43)	16,6 (3,73)	250 (9,84)	5,6 (1,26)	7,8 (1,75)	12,2 (2,74)
WBZ-G550-ECO	100 (3,94)	18 (4,05)	25,9 (5,82)	38,3 (8,61)	200 (7,87)	11,8 (2,65)	19,5 (4,38)	26,7 (6)	250 (9,84)	7,8 (1,75)	12,8 (2,88)	19,9 (4,47)
WBZ-G600-ECO	80 (3,15)	20,4 (4,59)	39,9 (8,97)	59,6 (13,4)	200 (7,87)	14,3 (3,21)	28,9 (6,5)	44,4 (9,98)	280 (11,02)	9,1 (2,05)	18,9 (4,25)	-
WBD-G450-ECO	150 (5,91)	11,8 (2,65)	15,8 (3,55)	23,7 (5,33)	250 (9,84)	8,5 (1,91)	11,2 (2,52)	17 (3,82)	350 (13,78)	5,4 (1,21)	7,9 (1,78)	11,1 (2,5)
WBD-G550-ECO	150 (5,91)	18,5 (4,16)	23,1 (5,19)	37,8 (8,5)	250 (9,84)	14,2 (3,19)	19,3 (4,34)	29,4 (6,61)	350 (13,78)	9,3 (2,09)	12,2 (2,74)	20,5 (4,61)
WBD-G590-ECO	100 (3,94)	20,5 (4,61)	40,6 (9,13)	60,2 (13,53)	300 (11,81)	13 (2,92)	26 (5,85)	39,2 (8,81)	400 (15,75)	9,2 (2,07)	18,6 (4,18)	28,4 (6,38)
WBD-G600-ECO	150 (5,91)	20,8 (4,68)	41,6 (9,35)	62,5 (14,05)	300 (11,81)	16,2 (3,64)	32,4 (7,28)	48,5 (10,9)	450 (17,72)	10,8 (2,43)	21,6 (4,86)	33 (7,42)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency						Height	
				HZ			U/min			min.	opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	mm (inch)
WBE-G450-ECO	7 (1,57)	14 (3,15)	21 (4,72)	2,9	2,8	2,8	174	168	168	75 (2,95)	95 (3,74)
WBE-G550-ECO	10 (2,25)	20 (4,5)	30 (6,74)	2,9	2,8	2,8	174	168	168	75 (2,95)	95 (3,74)
WBE-G600-ECO	15 (3,37)	30 (6,74)	45 (10,12)	2,6	2,5	2,5	156	150	150	85 (3,35)	105 (4,13)
WBZ-G450-ECO	7,1 (1,6)	9,5 (2,14)	14,5 (3,26)	1,9	1,8	1,7	114	108	102	200 (7,87)	220 (8,66)
WBZ-G550-ECO	10,3 (2,32)	16,3 (3,66)	24,5 (5,51)	2,0	1,8	1,7	120	108	108	200 (7,87)	220 (8,66)
WBZ-G600-ECO	11,5 (2,59)	23,3 (5,24)	35,3 (7,94)	1,7	1,7	1,6	102	102	96	230 (9,06)	250 (9,84)

WBE-G

WBZ-G

WBD-G

WSR

Operating pressure	**1 - 8 bar**
Temperature	-30°C - max. +70°C (-22°F - max. +158°F) (+90°C / +194°F limited duration)
Compressed air	oiled / oilfree
Lateral misaligment	max. 10 mm
Tilt capability	max. 15°
Return force	350 - 950 N

WSR 50

DIMENSIONS

	Stroke	min. Diameter	min. Height	ø A	ø B	C	D	E	F	G	I	Weight	Volume in litre	
	mm (inch)											kg (lbs)	Hmin	Hmax
WSR 20	33 (1.3)	70 (2.76)	30 (1.18)	34 (1.34)	60 (2.36)	34 (1.34)	M16	G1/8	25 (0.98)	25 (0.98)	M8	0,07 (0.15)	0,05	0,08
WSR 30	46 (1.81)	100 (3.94)	38 (1.5)	76 (2.99)	88 (3.46)	56 (2.2)	M16	G1/8	25 (0.98)	25 (0.98)	M8	0,2 (0.44)	0,1	0,2
WSR 40	72 (2.83)	100 (3.94)	38 (1.5)	76 (2.99)	88 (3.46)	56 (2.2)	M16	G1/8	25 (0.98)	25 (0.98)	M8	0,23 (0.51)	0,12	0,34
WSR 50	95 (3.74)	120 (4.72)	65 (2.56)	-	100 (3.94)	61 (2.4)	M16	G1/8	25 (0.98)	25 (0.98)	-	0,35 (0.77)	-	-
WSR 100	110 (4.33)	100 (3.94)	95 (3.74)	76,5 (3.01)	80 (3.15)	50 (1.97)	M30 x 1,5	G3/8	16 (0.63)	18 (0.71)	M8	0,4 (0.88)	0,2	0,5
WSR 200	105 (4.13)	115 (4.53)	95 (3.74)	86,5 (3.41)	97 (3.82)	60,5 (2.38)	M30 x 1,5	G3/8	16 (0.63)	18 (0.71)	M8	0,5 (1.1)	0,3	0,7
WSR 300	105 (4.13)	140 (5.51)	95 (3.74)	106,5 (4.19)	123 (4.84)	80,1 (3.15)	M30 x 1,5	G3/8	16 (0.63)	18 (0.71)	M8	0,6 (1.32)	0,3	1,1
WSR 400	105 (4.13)	170 (6.69)	95 (3.74)	126,5 (4.98)	151 (5.94)	89 (3.5)	M30 x 1,5	G3/8	16 (0.63)	18 (0.71)	M8	0,7 (1.54)	0,6	1,6
WSR 500	105 (4.13)	190 (7.48)	95 (3.74)	148 (5.83)	173 (6.81)	114 (4.49)	M30 x 1,5	G3/8	16 (0.63)	18 (0.71)	M8	1 (2.21)	1,0	2,4
WSR 520	135 (5.31)	190 (7.48)	95 (3.74)	148 (5.83)	175 (6.89)	114 (4.49)	M30x 1,5	G3/8	16 (0.63)	18 (0.71)	M8	1,1 (2.43)	1,0	3,0

ACTUATION

	Heigth	Load (kN)			Heigth	Load (kN)			Heigth	Load (kN)		
	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)
WSR 20	35 (1.38)	0,4 (0.09)	0,7 (0.16)	1 (0.22)	45 (1.77)	0,3 (0.07)	0,6 (0.13)	0,9 (0.2)	55 (2.17)	0,3 (0.07)	0,4 (0.09)	0,6 (0.13)
WSR 30	40 (1.57)	0,8 (0.18)	1,5 (0.34)	2,3 (0.52)	50 (1.97)	0,8 (0.18)	1,5 (0.34)	2,3 (0.52)	70 (2.76)	0,8 (0.18)	1,3 (0.29)	2 (0.45)
WSR 40	45 (1.77)	1,4 (0.31)	2,2 (0.49)	3 (0.67)	65 (2.56)	0,8 (0.18)	1,4 (0.31)	2,2 (0.49)	95 (3.74)	0,7 (0.16)	1,3 (0.29)	1,9 (0.43)
WSR 50	70 (2.76)	0,8 (0.18)	1,6 (0.36)	2,4 (0.54)	110 (4.33)	0,8 (0.18)	1,5 (0.34)	2,3 (0.52)	150 (5.91)	0,6 (0.13)	1,2 (0.27)	1,7 (0.38)
WSR 100	100 (3.94)	0,6 (0.13)	1,1 (0.25)	1,9 (0.43)	160 (6.3)	0,6 (0.13)	1,1 (0.25)	1,7 (0.38)	190 (7.48)	0,6 (0.13)	1,2 (0.27)	1,8 (0.4)
WSR 200	100 (3.94)	0,8 (0.18)	1,6 (0.36)	2,5 (0.56)	160 (6.3)	0,8 (0.18)	1,6 (0.36)	2,5 (0.56)	190 (7.48)	0,8 (0.18)	1,6 (0.36)	2,4 (0.54)
WSR 300	100 (3.94)	1,4 (0.31)	2,8 (0.63)	4,2 (0.94)	160 (6.3)	1,4 (0.31)	2,8 (0.63)	4,2 (0.94)	180 (7.09)	1,4 (0.31)	2,8 (0.63)	4,3 (0.97)
WSR 400	100 (3.94)	1,8 (0.4)	3,8 (0.85)	5,8 (1.3)	145 (5.71)	1,8 (0.4)	3,8 (0.85)	5,8 (1.3)	175 (6.89)	1,8 (0.4)	3,6 (0.81)	5,5 (1.24)
WSR 500	100 (3.94)	2,6 (0.58)	5,4 (1.21)	8,2 (1.84)	145 (5.71)	2,6 (0.58)	5,3 (1.19)	8,1 (1.82)	175 (6.89)	2,7 (0.61)	5,4 (1.21)	8 (1.8)
WSR 520	110 (4.33)	2,8 (0.63)	5,5 (1.24)	8,4 (1.89)	170 (6.69)	2,7 (0.61)	5,4 (1.21)	8,3 (1.87)	210 (8.27)	2,3 (0.52)	4,6 (1.03)	6,8 (1.53)

VIBRATION ISOLATION

	Force (kN) at recomm. design height (1000*lbs)			Natural frequency HZ			Natural frequency U/min			Height opt.
	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	2 bar (29.01 psi)	4 bar (58.02 psi)	6 bar (87.02 psi)	mm (inch)
WSR 20	0,3 (0.07)	0,6 (0.13)	0,9 (0.2)	3,4	3,3	3,2	204	198	192	45 (1.77)
WSR 30	0,8 (0.18)	1,4 (0.31)	2,1 (0.47)	2,7	2,7	2,6	162	162	156	60 (2.36)
WSR 40	0,8 (0.18)	1,4 (0.31)	1,8 (0.4)	2,6	2,6	2,4	156	156	144	75 (2.95)
WSR 100	0,6 (0.13)	1,1 (0.25)	1,7 (0.38)	2,3	2,1	2,0	138	126	120	150 (5.91)
WSR 200	0,8 (0.18)	1,6 (0.36)	2,5 (0.56)	2,1	1,9	1,9	126	114	108	150 (5.91)
WSR 300	1,4 (0.31)	2,8 (0.63)	4,2 (0.94)	2,2	2	1,9	132	120	108	150 (5.91)
WSR 400	1,8 (0.4)	3,7 (0.83)	5,7 (1.28)	2	1,9	1,8	120	108	108	150 (5.91)
WSR 500	2,6 (0.58)	5,3 (1.19)	8,1 (1.82)	2,3	2,2	2,1	138	132	126	140 (5.51)
WSR 520	2,8 (0.63)	5,5 (1.24)	8,4 (1.89)	2,0	1,9	1,9	120	114	114	150 (5.91)

PUR Buffer

ONLINE
Calculation +
2D / 3D CAD Download

www.weforma.com

WMB

Material	PUR, micro-cellular Base: steel, zinc plated
Load	2 - 225 Nm
Temperature	-30°C - max. +80°C (-22°F - max. +176°F)
Impcat speed	max. 5 m/s
Long life time	Resistant to oil, grease, ozone, UV radiation, weathering and splash water
Applications	End stop of machines, Crane systems

DIMENSIONS

	max. Deflection	Energy absorption		øA	øB	C	D	E	F
		Constant load	Emergency						
	mm (inch)	Nm (in lbs)	Nm (in lbs)	mm (inch)					
WMB-10-10-6	8 (0.31)	2 (18)	3 (27)	10 (0.39)	11 (0.43)	M3	3 (0.12)	15,5 (0.61)	3 (0.12)
WMB-20-20-6	16 (0.63)	10 (89)	16 (142)	20 (0.79)	23 (0.91)	M6	6 (0.24)	28,5 (1.12)	3 (0.12)
WMB-20-20-6-M5	16 (0.63)	10 (89)	16 (142)	20 (0.79)	23 (0.91)	M5	5 (0.2)	27,5 (1.08)	3 (0.12)
WMB-30-30-6	24 (0.94)	45 (398)	85 (752)	30 (1.18)	33 (1.3)	M6	6 (0.24)	38,5 (1.52)	3 (0.12)
WMB-40-40-6	32 (1.26)	85 (752)	135 (1195)	40 (1.57)	45 (1.77)	M8	8 (0.31)	50,5 (1.99)	3 (0.12)
WMB-50-50-6	40 (1.57)	170 (1505)	225 (1991)	50 (1.97)	55 (2.17)	M12	12 (0.47)	66,5 (2.62)	5 (0.2)

INSTALLATION

The entire diameter of the base must lie flat on the counterpart.
Recommendation: secure screw-in thread with a screw-locking adhesive.

WEF

Material	PUR, celled
Load	8.000 - 130.000 N
Tilting angle	max. 15°
Temperature	-30°C - max. +80°C (-22°F - max. +176°F)
Options	softer and harder version
Applications	End stop of machines, Support of equipment, Vibration isolation

ORDERING INFORMATION

M = Nut — **B = Thread bolts**

WEF 50-41-3-M — **WEF 50-41-3-B**

M = Nut

B = Thread bolts

DIMENSIONS

	Version	max. Deflection	max. dyn. Load	Natural frequency	max. static Load	øA	B	øC	F	L	GW
		mm (inch)	kN	Hz	kN	mm (inch)					
WEF 50-41-3	1	14 (0.55)	8 (1.8)	4,2	0,98 (0.22)	50 (1.97)	41 (1.61)	60 (2.36)	9 (0.35)	30 (1.18)	M 8
WEF 50-51-3	1	18 (0.71)	8 (1.8)	3,7	0,98 (0.22)	50 (1.97)	51 (2.01)	60 (2.36)	9 (0.35)	30 (1.18)	M 8
WEF 50-61-3	1	21 (0.83)	8 (1.8)	3,5	0,98 (0.22)	50 (1.97)	61 (2.4)	60 (2.36)	9 (0.35)	30 (1.18)	M 8
WEF 50-66-3	2	23 (0.91)	8 (1.8)	3,3	0,98 (0.22)	50 (1.97)	66 (2.6)	60 (2.36)	9 (0.35)	30 (1.18)	M 8
WEF 50-76-3	2	27 (1.06)	8 (1.8)	3	0,98 (0.22)	50 (1.97)	76 (2.99)	60 (2.36)	9 (0.35)	30 (1.18)	M 8
WEF 63-51-3	1	18 (0.71)	12 (2.7)	3,7	1,56 (0.35)	63 (2.48)	51 (2.01)	80 (3.15)	10 (0.39)	30 (1.18)	M 8
WEF 63-64-3	1	22 (0.87)	12 (2.7)	3,4	1,56 (0.35)	63 (2.48)	64 (2.52)	80 (3.15)	10 (0.39)	30 (1.18)	M 8
WEF 63-76-3	1	26 (1.02)	12 (2.7)	3,1	1,56 (0.35)	63 (2.48)	76 (2.99)	80 (3.15)	10 (0.39)	30 (1.18)	M 8
WEF 63-84-3	2	29 (1.14)	12 (2.7)	2,9	1,56 (0.35)	63 (2.48)	84 (3.31)	80 (3.15)	10 (0.39)	30 (1.18)	M 8
WEF 63-96-3	2	33 (1.3)	12 (2.7)	2,8	1,56 (0.35)	63 (2.48)	96 (3.78)	80 (3.15)	10 (0.39)	30 (1.18)	M 8
WEF 80-66-3	1	23 (0.91)	20 (4.5)	3,3	2,51 (0.56)	80 (3.15)	66 (2.6)	95 (3.74)	10 (0.39)	30 (1.18)	M 10
WEF 80-81-3	1	28 (1.1)	20 (4.5)	3	2,51 (0.56)	80 (3.15)	81 (3.19)	95 (3.74)	10 (0.39)	30 (1.18)	M 10
WEF 80-96-3	2	33 (1.3)	20 (4.5)	2,8	2,51 (0.56)	80 (3.15)	96 (3.78)	95 (3.74)	10 (0.39)	30 (1.18)	M 10
WEF 80-106-3	3	37 (1.46)	20 (4.5)	2,6	2,51 (0.56)	80 (3.15)	106 (4.17)	95 (3.74)	10 (0.39)	30 (1.18)	M 10
WEF 80-126-3	3	42 (1.65)	20 (4.5)	2,4	2,51 (0.56)	80 (3.15)	126 (4.96)	95 (3.74)	10 (0.39)	30 (1.18)	M 10
WEF 100-81-3	1	28 (1.1)	32 (7.19)	3	3,93 (0.88)	100 (3.94)	81 (3.19)	120 (4.72)	12 (0.47)	30 (1.18)	M 12
WEF 100-101-3	2	35 (1.38)	32 (7.19)	2,7	3,93 (0.88)	100 (3.94)	101 (3.98)	120 (4.72)	12 (0.47)	30 (1.18)	M 12
WEF 100-121-3	2	42 (1.65)	32 (7.19)	2,4	3,93 (0.88)	100 (3.94)	121 (4.76)	120 (4.72)	12 (0.47)	30 (1.18)	M 12
WEF 100-133-3	3	46 (1.81)	32 (7.19)	2,3	3,93 (0.88)	100 (3.94)	133 (5.24)	120 (4.72)	12 (0.47)	30 (1.18)	M 12
WEF 100-151-3	3	53 (2.09)	32 (7.19)	2,2	3,93 (0.88)	100 (3.94)	151 (5.94)	120 (4.72)	12 (0.47)	30 (1.18)	M 12
WEF 112-91-3	2	32 (1.26)	40 (8.99)	2,8	4,93 (1.11)	112 (4.41)	91 (3.58)	135 (5.31)	12 (0.47)	35 (1.38)	M 12
WEF 112-131-3	3	46 (1.81)	40 (8.99)	2,3	4,93 (1.11)	112 (4.41)	131 (5.16)	135 (5.31)	12 (0.47)	35 (1.38)	M 12
WEF 112-151-3	3	52 (2.05)	40 (8.99)	2,2	4,93 (1.11)	112 (4.41)	151 (5.94)	135 (5.31)	12 (0.47)	35 (1.38)	M 12
WEF 112-171-3	3	59 (2.32)	40 (8.99)	2,1	4,93 (1.11)	112 (4.41)	171 (6.73)	135 (5.31)	12 (0.47)	35 (1.38)	M 12
WEF 125-101-3	2	35 (1.38)	50 (11.24)	2,7	6,14 (1.38)	125 (4.92)	101 (3.98)	145 (5.71)	12 (0.47)	35 (1.38)	M 14
WEF 125-125-3	2	44 (1.73)	50 (11.24)	2,4	6,14 (1.38)	125 (4.92)	125 (4.92)	145 (5.71)	12 (0.47)	35 (1.38)	M 14
WEF 125-151-3	3	52 (2.05)	50 (11.24)	2,2	6,14 (1.38)	125 (4.92)	151 (5.94)	145 (5.71)	12 (0.47)	35 (1.38)	M 14
WEF 125-166-3	3	57 (2.24)	50 (11.24)	2,1	6,14 (1.38)	125 (4.92)	166 (6.54)	145 (5.71)	12 (0.47)	35 (1.38)	M 14
WEF 125-191-3	3	67 (2.64)	50 (11.24)	1,9	6,14 (1.38)	125 (4.92)	191 (7.52)	145 (5.71)	12 (0.47)	35 (1.38)	M 14
WEF 140-111-3	2	38 (1.5)	60 (13.49)	2,6	7,7 (1.73)	140 (5.51)	111 (4.37)	165 (6.5)	15 (0.59)	35 (1.38)	M 14
WEF 140-141-3	3	49 (1.93)	60 (13.49)	2,3	7,7 (1.73)	140 (5.51)	141 (5.55)	165 (6.5)	15 (0.59)	35 (1.38)	M 14
WEF 140-166-3	3	57 (2.24)	60 (13.49)	2,1	7,7 (1.73)	140 (5.51)	166 (6.54)	165 (6.5)	15 (0.59)	35 (1.38)	M 14
WEF 140-186-3	3	64 (2.52)	60 (13.49)	2	7,7 (1.73)	140 (5.51)	186 (7.32)	165 (6.5)	15 (0.59)	35 (1.38)	M 14
WEF 140-210-3	3	73 (2.87)	60 (13.49)	1,9	7,7 (1.73)	140 (5.51)	210 (8.27)	165 (6.5)	15 (0.59)	35 (1.38)	M 14
WEF 160-131-3	2	46 (1.81)	80 (17.98)	2,3	10 (2.25)	160 (6.3)	131 (5.16)	185 (7.28)	15 (0.59)	40 (1.57)	M 16
WEF 160-161-3	3	56 (2.2)	80 (17.98)	2,1	10 (2.25)	160 (6.3)	161 (6.34)	185 (7.28)	15 (0.59)	40 (1.57)	M 16
WEF 160-185-3	3	64 (2.52)	80 (17.98)	2	10 (2.25)	160 (6.3)	185 (7.28)	185 (7.28)	15 (0.59)	40 (1.57)	M 16
WEF 160-211-3	3	74 (2.91)	80 (17.98)	1,8	10 (2.25)	160 (6.3)	211 (8.31)	185 (7.28)	15 (0.59)	40 (1.57)	M 16
WEF 160-240-3	3	84 (3.31)	80 (17.98)	1,7	10 (2.25)	160 (6.3)	240 (9.45)	185 (7.28)	15 (0.59)	40 (1.57)	M 16
WEF 200-161-3	2	56 (2.2)	130 (29.23)	2,1	15,7 (3.53)	200 (7.87)	161 (6.34)	230 (9.06)	15 (0.59)	50 (1.97)	M 20
WEF 200-201-3	3	70 (2.76)	130 (29.23)	1,9	15,7 (3.53)	200 (7.87)	201 (7.91)	230 (9.06)	15 (0.59)	50 (1.97)	M 20
WEF 200-236-3	3	86 (3.39)	130 (29.23)	1,7	15,7 (3.53)	200 (7.87)	236 (9.29)	230 (9.06)	15 (0.59)	50 (1.97)	M 20
WEF 200-266-3	3	93 (3.66)	130 (29.23)	1,6	15,7 (3.53)	200 (7.87)	266 (10.47)	230 (9.06)	15 (0.59)	50 (1.97)	M 20

WCB

Material	Microcellular polyurethane elastomer
Mounting	Threaded bolt or base plate
Temperature	-35°C - +80°C (limited duration +100°C) -31°F - +176°F (limited duration +212°F)
Long service life	Resistant to oil, grease, ozone, UV radiation and weathering
Applications	Crane systems, machine building, conveyor technology

Typ 1 x*

Typ 2 x / y*

Typ 3 x*

*x: with nubs

*y: without nubs

DIMENSIONS

	Typ*		A	B	L	GW	Weight
			mm (inch)				kg (lbs)
WCB-070-070-6-B	2	y	70 (2.76)	70 (2.76)	35 (1.38)	M 12	0,25 (0.55)
WCB-080-040-6-B	1	x	80 (3.15)	40 (1.57)	35 (1.38)	M 12	0,21 (0.46)
WCB-080-080-6-B	2	y	80 (3.15)	80 (3.15)	35 (1.38)	M 12	0,31 (0.68)
WCB-080-120-6-B	3	x	80 (3.15)	120 (4.72)	35 (1.38)	M 12	0,42 (0.93)
WCB-100-050-6-B	1	x	100 (3.94)	50 (1.97)	35 (1.38)	M 12	0,31 (0.68)
WCB-100-100-6-B	2	y	100 (3.94)	100 (3.94)	35 (1.38)	M 12	0,52 (1.15)
WCB-100-150-6-B	3	x	100 (3.94)	150 (5.91)	35 (1.38)	M 12	0,73 (1.61)
WCB-125-063-6-B	1	x	125 (4.92)	63 (2.48)	35 (1.38)	M 12	0,51 (1.12)
WCB-125-125-6-B	2	y	125 (4.92)	125 (4.92)	35 (1.38)	M 12	0,92 (2.03)
WCB-125-190-6-B	3	x	125 (4.92)	190 (7.48)	35 (1.38)	M 12	1,32 (2.91)
WCB-160-080-6-B	1	x	160 (6.3)	80 (3.15)	35 (1.38)	M 12	0,95 (2.09)
WCB-160-160-6-B	2	y	160 (6.3)	160 (6.3)	35 (1.38)	M 12	1,8 (3.97)
WCB-160-240-6-B	3	x	160 (6.3)	240 (9.45)	35 (1.38)	M 12	2,66 (5.87)

	Typ*		A	B	L	GW	Weight
			mm (inch)				kg (lbs)
WCB-200-100-6-B	1	x	200 (7.87)	100 (3.94)	35 (1.38)	M 12	1,76 (3.88)
WCB-200-200-6-B	2	y	200 (7.87)	200 (7.87)	35 (1.38)	M 12	3,43 (7.56)
WCB-200-300-6-B	3	x	200 (7.87)	300 (11.81)	35 (1.38)	M 12	5,1 (11.25)
WCB-250-125-6-B	1	x	250 (9.84)	125 (4.92)	80 (3.15)	M 24	5,4 (11.91)
WCB-250-250-6-B	2	x	250 (9.84)	250 (9.84)	80 (3.15)	M 24	8,5 (18.74)
WCB-250-375-6-B	3	x	250 (9.84)	375 (14.76)	80 (3.15)	M 24	11,5 (25.36)
WCB-315-158-6-B	1	x	315 (12.4)	158 (6.22)	80 (3.15)	M 24	8,5 (18.74)
WCB-315-315-6-B	2	x	315 (12.4)	315 (12.4)	80 (3.15)	M 24	14,65 (32.3)
WCB-315-475-6-B	3	x	315 (12.4)	475 (18.7)	80 (3.15)	M 24	20,8 (45.86)
WCB-400-200-6-B	1	x	400 (15.75)	200 (7.87)	80 (3.15)	M 30	16,5 (36.38)
WCB-400-400-6-B	2	x	400 (15.75)	400 (15.75)	80 (3.15)	M 30	29,1 (64.17)
WCB-400-600-6-B	3	x	400 (15.75)	600 (23.62)	80 (3.15)	M 30	41,6 (91.73)

PERFORMANCE

	max. Deflection	V static		V 1 m/s		V 2 m/s		V 3 m/s		V 4 m/s	
	mm (inch)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)
WCB-070-070-6-B	56 (2.2)	0,46 (4)	24 (5.4)	0,59 (5)	26 (5.85)	0,67 (6)	30 (6.74)	0,84 (7)	35 (7.87)	1 (9)	38 (8.54)
WCB-080-040-6-B	32 (1.26)	0,37 (3)	31 (6.97)	0,47 (4)	34 (7.64)	0,54 (5)	41 (9.22)	0,67 (6)	47 (10.57)	0,8 (7)	51 (11.47)
WCB-080-080-6-B	64 (2.52)	0,7 (6)	31 (6.97)	0,89 (8)	34 (7.64)	1,02 (9)	41 (9.22)	1,28 (11)	47 (10.57)	1,52 (13)	51 (11.47)
WCB-080-120-6-B	96 (3.78)	1,08 (10)	31 (6.97)	1,37 (12)	34 (7.64)	1,57 (14)	41 (9.22)	1,96 (17)	47 (10.57)	2,33 (21)	51 (11.47)
WCB-100-050-6-B	40 (1.57)	0,69 (6)	50 (11.24)	0,88 (8)	55 (12.36)	1 (9)	65 (14.61)	1,25 (11)	75 (16.86)	1,5 (13)	80 (17.98)
WCB-100-100-6-B	80 (3.15)	1,42 (13)	50 (11.24)	1,81 (16)	55 (12.36)	2,1 (19)	65 (14.61)	2,6 (23)	75 (16.86)	3,1 (27)	80 (17.98)
WCB-100-150-6-B	120 (4.72)	2,1 (19)	50 (11.24)	2,6 (23)	55 (12.36)	3 (27)	65 (14.61)	3,7 (33)	75 (16.86)	4,5 (40)	80 (17.98)
WCB-125-063-6-B	50 (1.97)	1,33 (12)	65 (14.61)	1,7 (15)	80 (17.98)	2,06 (18)	95 (21.36)	2,42 (21)	110 (24.73)	2,9 (26)	120 (26.98)
WCB-125-125-6-B	100 (3.94)	2,61 (23)	65 (14.61)	3,33 (29)	80 (17.98)	4,04 (36)	95 (21.36)	4,75 (42)	110 (24.73)	5,7 (50)	120 (26.98)
WCB-125-190-6-B	150 (5.91)	3,94 (35)	65 (14.61)	5 (44)	80 (17.98)	6 (53)	95 (21.36)	7,1 (63)	110 (24.73)	8,6 (76)	120 (26.98)
WCB-160-080-6-B	64 (2.52)	2,3 (20)	123 (27.65)	3,1 (27)	147 (33.05)	3,9 (35)	172 (38.67)	4,9 (43)	186 (41.81)	6 (53)	200 (44.96)
WCB-160-160-6-B	128 (5.04)	4,7 (42)	123 (27.65)	6,1 (54)	147 (33.05)	7,8 (69)	172 (38.67)	9,7 (86)	186 (41.81)	11,4 (101)	200 (44.96)
WCB-160-240-6-B	192 (7.56)	7,1 (63)	123 (27.65)	9,14 (81)	147 (33.05)	11,8 (104)	172 (38.67)	14,55 (129)	186 (41.81)	18 (159)	200 (44.96)
WCB-200-100-6-B	80 (3.15)	5,5 (49)	190 (42.71)	7,2 (64)	230 (51.71)	8,8 (78)	270 (60.7)	10,4 (92)	300 (67.44)	12,2 (108)	315 (70.82)
WCB-200-200-6-B	160 (6.3)	10,8 (96)	190 (42.71)	14,2 (126)	230 (51.71)	17,4 (154)	270 (60.7)	20,5 (181)	300 (67.44)	24 (212)	315 (70.82)
WCB-200-300-6-B	240 (9.45)	15,8 (140)	190 (42.71)	20,7 (183)	230 (51.71)	25,3 (224)	270 (60.7)	30 (266)	300 (67.44)	35 (310)	315 (70.82)
WCB-250-125-6-B	100 (3.94)	10,54 (93)	275 (61.82)	13,64 (121)	300 (67.44)	16,74 (148)	350 (78.68)	19,84 (176)	400 (89.92)	23 (204)	490 (110.16)
WCB-250-250-6-B	200 (7.87)	21,13 (187)	275 (61.82)	27,35 (242)	300 (67.44)	33,56 (297)	350 (78.68)	39,79 (352)	400 (89.92)	46 (407)	490 (110.16)
WCB-250-375-6-B	300 (11.81)	31,71 (281)	275 (61.82)	41,03 (363)	300 (67.44)	50,36 (446)	350 (78.68)	59,68 (528)	400 (89.92)	69 (611)	490 (110.16)
WCB-315-158-6-B	126 (4.96)	13,3 (118)	650 (146.13)	17,5 (155)	717 (161.19)	22,5 (199)	728 (163.66)	35 (310)	750 (168.61)	47 (416)	780 (175.35)
WCB-315-315-6-B	252 (9.92)	26,6 (235)	650 (146.13)	35,28 (312)	717 (161.19)	45,36 (401)	728 (163.66)	70,56 (625)	750 (168.61)	93 (823)	780 (175.35)
WCB-315-475-6-B	380 (14.96)	39,84 (353)	650 (146.13)	54,67 (484)	717 (161.19)	69,58 (616)	728 (163.66)	109,34 (968)	750 (168.61)	140 (1239)	780 (175.35)
WCB-400-200-6-B	160 (6.3)	31,13 (276)	1000 (224.81)	39,5 (350)	1100 (247.29)	49,22 (436)	1150 (258.53)	72 (637)	1200 (269.77)	94 (832)	1250 (281.01)
WCB-400-400-6-B	320 (12.6)	50 (443)	1000 (224.81)	80 (708)	1100 (247.29)	90 (797)	1150 (258.53)	140 (1239)	1200 (269.77)	190 (1682)	1250 (281.01)
WCB-400-600-6-B	480 (18.9)	80 (708)	1000 (224.81)	120 (1062)	1100 (247.29)	140 (1239)	1150 (258.53)	220 (1947)	1200 (269.77)	282 (2496)	1250 (281.01)

* Energy absorption
** Force max.

WCB

DIMENSIONS

Plastic Flange	Aluminum Flange	A	B	C	D	ØE	F	Weight	
		mm (inch)						FK kg (lbs)	FA kg (lbs)
WCB-080-040-6-FK	WCB-080-040-6-FA	80 (3.15)	40 (1.57)	110 (4.33)	80 (3.15)	14 (0.55) [13,8 (0.54)]*	10 (0.39)	0,2 (0.44)	0,4 (0.88)
WCB-080-080-6-FK	WCB-080-080-6-FA	80 (3.15)	80 (3.15)	110 (4.33)	80 (3.15)	14 (0.55) [13,8 (0.54)]*	10 (0.39)	0,3 (0.66)	0,5 (1.1)
WCB-080-120-6-FK	WCB-080-120-6-FA	80 (3.15)	120 (4.72)	110 (4.33)	80 (3.15)	14 (0.55) [13,8 (0.54)]*	10 (0.39)	0,4 (0.88)	0,6 (1.32)
WCB-100-050-6-FK	WCB-100-050-6-FA	100 (3.94)	50 (1.97)	125 (4.92)	100 (3.94)	14 (0.55)	10 (0.39)	0,3 (0.66)	0,6 (1.32)
WCB-100-100-6-FK	WCB-100-100-6-FA	100 (3.94)	100 (3.94)	125 (4.92)	100 (3.94)	14 (0.55)	10 (0.39)	0,5 (1.1)	0,8 (1.76)
WCB-100-150-6-FK	WCB-100-150-6-FA	100 (3.94)	150 (5.91)	125 (4.92)	100 (3.94)	14 (0.55)	10 (0.39)	0,7 (1.54)	1 (2.21)
WCB-125-063-6-FK	WCB-125-063-6-FA	125 (4.92)	63 (2.48)	160 (6.3)	125 (4.92)	18 (0.71)	12 (0.47)	0,6 (1.32)	1,2 (2.65)
WCB-125-125-6-FK	WCB-125-125-6-FA	125 (4.92)	125 (4.92)	160 (6.3)	125 (4.92)	18 (0.71)	12 (0.47)	1 (2.21)	1,5 (3.31)
WCB-125-190-6-FK	WCB-125-190-6-FA	125 (4.92)	190 (7.48)	160 (6.3)	125 (4.92)	18 (0.71)	12 (0.47)	1,4 (3.09)	2 (4.41)
WCB-160-080-6-FK	WCB-160-080-6-FA	160 (6.3)	80 (3.15)	200 (7.87)	160 (6.3)	18 (0.71)	12 (0.47)	1,1 (2.43)	1,6 (3.53)
WCB-160-160-6-FK	WCB-160-160-6-FA	160 (6.3)	160 (6.3)	200 (7.87)	160 (6.3)	18 (0.71)	12 (0.47)	2 (4.41)	2,8 (6.17)
WCB-160-240-6-FK	WCB-160-240-6-FA	160 (6.3)	240 (9.45)	200 (7.87)	160 (6.3)	18 (0.71)	12 (0.47)	2,8 (6.17)	3,7 (8.16)
WCB-200-100-6-FK	WCB-200-100-6-FA	200 (7.87)	100 (3.94)	250 (9.84)	200 (7.87)	22 (0.87)	14 (0.55)	2,15 (4.74)	3,6 (7.94)
WCB-200-200-6-FK	WCB-200-200-6-FA	200 (7.87)	200 (7.87)	250 (9.84)	200 (7.87)	22 (0.87)	14 (0.55)	3,8 (8.38)	5,5 (12.13)
WCB-200-300-6-FK	WCB-200-300-6-FA	200 (7.87)	300 (11.81)	250 (9.84)	200 (7.87)	22 (0.87)	14 (0.55)	5,5 (12.13)	7,2 (15.88)

* for aluminum flange

Steel Flange	A	B	C	D	ØE	F	Weight
	mm (inch)						FS kg (lbs)
WCB-250-125-6-FS	250 (9.84)	125 (4.92)	315 (12.4)	250 (9.84)	22 (0.87)	15 (0.59)	4,2 (9.26)
WCB-250-250-6-FS	250 (9.84)	250 (9.84)	315 (12.4)	250 (9.84)	22 (0.87)	15 (0.59)	7,8 (17.2)
WCB-250-375-6-FS	250 (9.84)	375 (14.76)	315 (12.4)	250 (9.84)	22 (0.87)	15 (0.59)	11 (24.26)
WCB-315-158-6-FS	315 (12.4)	158 (6.22)	400 (15.75)	315 (12.4)	22 (0.87)	15 (0.59)	22 (48.51)
WCB-315-315-6-FS	315 (12.4)	315 (12.4)	400 (15.75)	315 (12.4)	22 (0.87)	15 (0.59)	29 (63.95)
WCB-315-475-6-FS	315 (12.4)	475 (18.7)	400 (15.75)	315 (12.4)	22 (0.87)	15 (0.59)	36 (79.38)
WCB-400-200-6-FS	400 (15.75)	200 (7.87)	500 (19.69)	400 (15.75)	26 (1.02)	20 (0.79)	47 (103.64)
WCB-400-400-6-FS	400 (15.75)	400 (15.75)	500 (19.69)	400 (15.75)	26 (1.02)	20 (0.79)	59 (130.1)
WCB-400-600-6-FS	400 (15.75)	600 (23.62)	500 (19.69)	400 (15.75)	26 (1.02)	20 (0.79)	71 (156.56)
WCB-500-250-6-FS	500 (19.69)	250 (9.84)	630 (24.8)	500 (19.69)	26 (1.02)	20 (0.79)	83 (183.02)
WCB-500-500-6-FS	500 (19.69)	500 (19.69)	630 (24.8)	500 (19.69)	26 (1.02)	20 (0.79)	105 (231.53)
WCB-500-750-6-FS	500 (19.69)	750 (29.53)	630 (24.8)	500 (19.69)	26 (1.02)	20 (0.79)	129 (284.45)
WCB-600-300-6-FS	600 (23.62)	300 (11.81)	730 (28.74)	600 (23.62)	26 (1.02)	20 (0.79)	116 (255.78)
WCB-600-600-6-FS	600 (23.62)	600 (23.62)	730 (28.74)	600 (23.62)	26 (1.02)	20 (0.79)	167 (368.24)
WCB-600-900-6-FS	600 (23.62)	900 (35.43)	730 (28.74)	600 (23.62)	26 (1.02)	20 (0.79)	198 (436.59)

PERFORMANCE

	max. Deflection	V static		V 1 m/s		V 2 m/s		V 3 m/s		V 4 m/s	
	mm (inch)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)	kNm* (in lbs*1000)	kN** (lbs*1000)
WCB-080-040-6	32 (1.26)	0,37 (3)	31 (6.97)	0,47 (4)	34 (7.64)	0,54 (5)	41 (9.22)	0,67 (6)	47 (10.57)	0,8 (7)	51 (11.47)
WCB-080-080-6	64 (2.52)	0,7 (6)	31 (6.97)	0,89 (8)	34 (7.64)	1,02 (9)	41 (9.22)	1,28 (11)	47 (10.57)	1,52 (13)	51 (11.47)
WCB-080-120-6	96 (3.78)	1,08 (10)	31 (6.97)	1,37 (12)	34 (7.64)	1,57 (14)	41 (9.22)	1,96 (17)	47 (10.57)	2,33 (21)	51 (11.47)
WCB-100-050-6	40 (1.57)	0,69 (6)	50 (11.24)	0,88 (8)	55 (12.36)	1 (9)	65 (14.61)	1,25 (11)	75 (16.86)	1,5 (13)	80 (17.98)
WCB-100-100-6	80 (3.15)	1,42 (13)	50 (11.24)	1,81 (16)	55 (12.36)	2,1 (19)	65 (14.61)	2,6 (23)	75 (16.86)	3,1 (27)	80 (17.98)
WCB-100-150-6	120 (4.72)	2,1 (19)	50 (11.24)	2,6 (23)	55 (12.36)	3 (27)	65 (14.61)	3,7 (33)	75 (16.86)	4,5 (40)	80 (17.98)
WCB-125-063-6	50 (1.97)	1,33 (12)	65 (14.61)	1,7 (15)	80 (17.98)	2,06 (18)	95 (21.36)	2,42 (21)	110 (24.73)	2,9 (26)	120 (26.98)
WCB-125-125-6	100 (3.94)	2,61 (23)	65 (14.61)	3,33 (29)	80 (17.98)	4,04 (36)	95 (21.36)	4,75 (42)	110 (24.73)	5,7 (50)	120 (26.98)
WCB-125-190-6	150 (5.91)	3,94 (35)	65 (14.61)	5 (44)	80 (17.98)	6 (53)	95 (21.36)	7,1 (63)	110 (24.73)	8,6 (76)	120 (26.98)
WCB-160-080-6	64 (2.52)	2,3 (20)	123 (27.65)	3,1 (27)	147 (33.05)	3,9 (35)	172 (38.67)	4,9 (43)	186 (41.81)	6 (53)	200 (44.96)
WCB-160-160-6	128 (5.04)	4,7 (42)	123 (27.65)	6,1 (54)	147 (33.05)	7,8 (69)	172 (38.67)	9,7 (86)	186 (41.81)	11,4 (101)	200 (44.96)
WCB-160-240-6	192 (7.56)	7,1 (63)	123 (27.65)	9,14 (81)	147 (33.05)	11,8 (104)	172 (38.67)	14,55 (129)	186 (41.81)	18 (159)	200 (44.96)
WCB-200-100-6	80 (3.15)	5,5 (49)	190 (42.71)	7,2 (64)	230 (51.71)	8,8 (78)	270 (60.7)	10,4 (92)	300 (67.44)	12,2 (108)	315 (70.82)
WCB-200-200-6	160 (6.3)	10,8 (96)	190 (42.71)	14,2 (126)	230 (51.71)	17,4 (154)	270 (60.7)	20,5 (181)	300 (67.44)	24 (212)	315 (70.82)
WCB-200-300-6	240 (9.45)	15,8 (140)	190 (42.71)	20,7 (183)	230 (51.71)	25,3 (224)	270 (60.7)	30 (266)	300 (67.44)	35 (310)	315 (70.82)
WCB-250-125-6	100 (3.94)	10,54 (93)	275 (61.82)	13,64 (121)	300 (67.44)	16,74 (148)	350 (78.68)	19,84 (176)	400 (89.92)	23 (204)	490 (110.16)
WCB-250-250-6	200 (7.87)	21,13 (187)	275 (61.82)	27,35 (242)	300 (67.44)	33,56 (297)	350 (78.68)	39,79 (352)	400 (89.92)	46 (407)	490 (110.16)
WCB-250-375-6	300 (11.81)	31,71 (281)	275 (61.82)	41,03 (363)	300 (67.44)	50,36 (446)	350 (78.68)	59,68 (528)	400 (89.92)	69 (611)	490 (110.16)
WCB-315-158-6	126 (4.96)	13,3 (118)	650 (146.13)	17,5 (155)	717 (161.19)	22,5 (199)	728 (163.66)	35 (310)	750 (168.61)	47 (416)	780 (175.35)
WCB-315-315-6	252 (9.92)	26,6 (235)	650 (146.13)	35,28 (312)	717 (161.19)	45,36 (401)	728 (163.66)	70,56 (625)	750 (168.61)	93 (823)	780 (175.35)
WCB-315-475-6	380 (14.96)	39,84 (353)	650 (146.13)	54,67 (484)	717 (161.19)	69,58 (616)	728 (163.66)	109,34 (968)	750 (168.61)	140 (1239)	780 (175.35)
WCB-400-200-6	160 (6.3)	31,13 (276)	1000 (224.81)	39,5 (350)	1100 (247.29)	49,22 (436)	1150 (258.53)	72 (637)	1200 (269.77)	94 (832)	1250 (281.01)
WCB-400-400-6	320 (12.6)	50 (443)	1000 (224.81)	80 (708)	1100 (247.29)	90 (797)	1150 (258.53)	140 (1239)	1200 (269.77)	190 (1682)	1250 (281.01)
WCB-400-600-6	480 (18.9)	80 (708)	1000 (224.81)	120 (1062)	1100 (247.29)	140 (1239)	1150 (258.53)	220 (1947)	1200 (269.77)	282 (2496)	1250 (281.01)
WCB-500-250-6	200 (7.87)	50 (443)	1500 (337.22)	70 (620)	1700 (382.18)	90 (797)	1800 (404.66)	140 (1239)	1900 (427.14)	185 (1637)	1950 (438.38)
WCB-500-500-6	400 (15.75)	100 (885)	1500 (337.22)	154 (1363)	1700 (382.18)	178 (1575)	1800 (404.66)	275 (2434)	1900 (427.14)	370 (3275)	1950 (438.38)
WCB-500-750-6	600 (23.62)	150 (1328)	1500 (337.22)	225 (1991)	1700 (382.18)	275 (2434)	1800 (404.66)	425 (3762)	1900 (427.14)	555 (4912)	1950 (438.38)
WCB-600-300-6	240 (9.45)	87,5 (774)	2500 (562.03)	125 (1106)	2650 (595.75)	150 (1328)	2700 (606.99)	250 (2213)	2750 (618.23)	317 (2806)	2800 (629.47)
WCB-600-600-6	480 (18.9)	175 (1549)	2500 (562.03)	250 (2213)	2650 (595.75)	300 (2655)	2700 (606.99)	500 (4425)	2750 (618.23)	633 (5603)	2800 (629.47)
WCB-600-900-6	720 (28.35)	250 (2213)	2500 (562.03)	400 (3540)	2650 (595.75)	500 (4425)	2700 (606.99)	750 (6638)	2750 (618.23)	950 (8408)	2800 (629.47)

* Energy absorption
** Force max.

WAP

Material	PUR, cellular
EC-Type Examination	Directive: 95/16/EC; EN 81-20/50
Temperature	-30°C - +80°C (-22°F - +176°F)
Applications	Passenger and load elevators

RS

EM

DIMENSIONS

		Size	ø D	H	S
			mm (inch)	mm (inch)	mm (inch) (+/- 0,5)
WAP-80-80-RS	WAP-80-80-EM	D0	80 (3.15)	80 (3.15)	4 (0.16)
WAP-100-80-RS	WAP-100-80-EM	D1	100 (3.94)	80 (3.15)	4 (0.16)
WAP-100-80-RS2	WAP-100-80-EM2	D2	100 (3.94)	80 (3.15)	4 (0.16)
WAP-125-80-RS	WAP-125-80-EM	D3	125 (4.92)	80 (3.15)	4 (0.16)
WAP-140-80-RS	WAP-140-80-EM	D4	140 (5.51)	80 (3.15)	4 (0.16)
WAP-165-80-RS	WAP-165-80-EM	D5	165 (6.5)	80 (3.15)	6 (0.24)
WAP-220-80-RS	WAP-220-80-EM	D6	220 (8.66)	80 (3.15)	6 (0.24)

PERFORMANCE

		Size	Nominal Speed			
			0,63 m/s* (2.07 ft/s)		1 m/s* (3.28 ft/s)	
			m min (kg / lbs)	m max (kg / lbs)	m min (kg / lbs)	m max (kg / lbs)
WAP-80-80-RS	WAP-80-80-EM	D0	180 (396.9)	1200 (2646)	180 (396.9)	600 (1323)
WAP-100-80-RS	WAP-100-80-EM	D1	200 (441)	1500 (3307.5)	220 (485.1)	700 (1543.5)
WAP-100-80-RS2	WAP-100-80-EM2	D2	250 (551.25)	3200 (7056)	330 (727.65)	1250 (2756.25)
WAP-125-80-RS	WAP-125-80-EM	D3	500 (1102.5)	5200 (11466)	600 (1323)	1850 (4079.25)
WAP-140-80-RS	WAP-140-80-EM	D4	320 (705.6)	4000 (8820)	450 (992.25)	1500 (3307.5)
WAP-165-80-RS	WAP-165-80-EM	D5	600 (1323)	7500 (16537.5)	650 (1433.25)	2700 (5953.5)
WAP-220-80-RS	WAP-220-80-EM	D6	950 (2094.75)	9400 (20727)	1500 (3307.5)	5500 (12127.5)

WS-PU / WD-PU

- **Large Load Range**
- **Effective vibration damping/vibration insulation**

- WD-PU: closed cell system, can be used under water
- Dimensions: 2000x500 mm, 100x100 mm, on request
- Can be loaded upon pressure and thrust
- High degree of resistance to hydrolysis
- Application range from -30°C to + 70°C (-22°F to + 158°F) ambient temperature
- Low subsidence
- Effective de-coupling properties
- Can be used to insulate the source or the receiver
- Good resistance to chemicals and oils

PERFORMANCE WS-PU

WS-PU-XX-12,5 (Thickness 12,5 mm) WS-PU-XX-25 (Thickness 25 mm)	10-12,5 10-25	16-12,5 16-25	26-12,5 26-25	40-12,5 40-25	65-12,5 65-25	110-12,5 110-25	170-12,5 170-25	
Colour	red	pink	orange	yellow	bright green	green	dark green	
Static load [N/mm²]	0,010	0,016	0,026	0,040	0,065	0,110	0,170	
Dynamic load [N/mm²]	0,016	0,026	0,040	0,065	0,110	0,170	0,260	
Load peaks [N/mm²]	0,5	0,7	1,0	2,0	2,5	3,0	3,5	
Mechanical loss factor	0,25	0,24	0,22	0,15	0,18	0,12	0,13	DIN 53513
Static E-modulus [N/mm²]	0,048	0,111	0,129	0,316	0,453	0,861	0,931	DIN 53513
Dynamic E-modulus [N/mm²]	0,144	0,328	0,443	0,743	1,06	1,86	2,27	DIN 53513
Resistance to strain at 10% deformation [N/mm²]	0,011	0,018	0,026	0,046	0,073	0,130	0,170	
Residual compression set [%]	< 5	< 5	< 5	< 5	< 5	< 5	< 5	DIN ISO 1856
Tensile strength [N/mm²]	> 0,35	> 0,40	> 0,45	> 0,55	> 0,70	> 0,95	> 1,25	DIN 53455-6-4
Elongation at break [%]	> 400	> 400	> 400	> 400	> 400	> 400	> 400	DIN 53455-6-4
Rebound elasticity [%]	50	50	50	50	50	50	50	DIN EN ISO 8307
Specific volume resistance [Ω·cm]	> 10	> 10	> 10	> 10	> 10	> 10	> 10	DIN IEC 93
Thermal conductivity [W/(m·K)]	0,05	0,05	0,06	0,07	0,07	0,08	0,08	DIN 52612-1

WS-PU-XX-12,5 (Thickness 12,5 mm) WS-PU-XX-25 (Thickness 25 mm)	260-12,5 260-25	400-12,5 400-25	650-12,5 650-25	950-12,5 950-25	1300-12,5 1300-25	1900-12,5 1900-25	
Colour	petrol	blue	dark blue	dark violett	violett	bordeaux red	
Static load [N/mm²]	0,260	0,400	0,650	0,950	1,300	1,900	
Dynamic load [N/mm²]	0,400	0,650	0,950	1,450	2,000	2,800	
Load peaks [N/mm²]	4,0	4,5	5,5	6,0	6,5	7,0	
Mechanical loss factor	0,11	0,10	0,10	0,10	0,09	0,09	DIN 53513
Static E-modulus [N/mm²]	1,64	2,72	4,57	8,16	12,0	20,4	DIN 53513
Dynamic E-modulus [N/mm²]	3,63	5,27	10,4	21,5	35,2	78,2	DIN 53513
Resistance to strain at 10% deformation [N/mm²]	0,270	0,370	0,590	0,930	1,340	1,840	
Residual compression set [%]	< 5	< 6	< 7	< 9	< 9	< 8	DIN ISO 1856
Tensile strength [N/mm²]	> 1,65	> 2,25	> 3,00	> 3,80	> 4,40	> 5,00	DIN 53455-6-4
Elongation at break [%]	> 400	> 400	> 400	> 400	> 400	> 400	DIN 53455-6-4
Rebound elasticity [%]	50	50	50	50	50	50	DIN EN ISO 8307
Specific volume resistance [Ω·cm]	> 10	> 10	> 10	> 10	> 10	> 10	DIN IEC 93
Thermal conductivity [W/(m·K)]	0,08	0,10	0,10	0,11	0,11	0,11	DIN 52612-1

Metal Cushions

ONLINE
Calculation +
2D / 3D CAD Download

www.weforma.com

WG-XX

- **Material**: stainless steel
- Shock-absorbing and vibration-isolation
- Corrosion-resistant against solvents, acids, oils, greases, liquids and dust
- Resistant to age - no permanent deformation, no hardening and no creeping
- Temperature: -90°C to +400°C (-130°F to +752°F)

SELECTION

BASIC CRITERIA REQUIRED FOR SIZING:

1. Mass to be lifted m (kg)
2. Exciting frequency f (Hz)
3. Rate of revolutions (U)
4. Desired degree of isolation Ig (%)
5. Number of metal cushions (n)
6. Temperature

VIBRATION ISOLATION

			Selection **WG-FB 29,2x29,2x19x6,4**
m = 100	$F_t \geq F$	$F = \frac{kg \times g}{n}$	0,75 kN > 0,25 kN
n = 4			
ferr. = 90 Hz	$f_o \leq \frac{f_{err}}{1{,}44}$		15 < 62,5 Hz
Ig = 90 %	It≥Ig≤100%	$It = 1 - \frac{1}{\left(\frac{f_{err}}{f_0}\right)^2 - 1}$	97,1% > 90% < 100%
T = 20 °C	T		-90 °C < 30 °C < +400 °C

WG-RU Circular Type

SPECIFICATIONS

	D mm	H mm	Load N (lbs) (max.)	Natural frequency Hz	Static deflection mm	Weight g (oz)
WG-RU 23,2x15	23,2 (0,91)	15 (0,59)	1250 (281,01)	15 - 20	4,5 (0,18)	11 (0,39)
WG-RU 25x15	25 (0,98)	15 (0,59)	1400 (314,73)	15 - 20	4,5 (0,18)	13 (0,46)
WG-RU 35,2x20	35,2 (1,39)	20 (0,79)	2000 (449,62)	15 - 20	6,2 (0,24)	30 (1,06)
WG-RU 44,2x20	44,2 (1,74)	20 (0,79)	2500 (562,03)	15 - 20	6,5 (0,26)	50 (1,77)
WG-RU 54,3x20	54,3 (2,14)	20 (0,79)	4000 (899,24)	15 - 20	6,5 (0,26)	70 (2,47)

WG-RL Circular type for socket head cap screw fixing

SPECIFICATIONS

	D1 mm	H1 mm	d mm	D2 mm	H2 mm	Load N (lbs) (max.)	Natural frequency Hz	Static deflection mm	Weight g (oz)
WG-RL 20x12,5x5,4	20 (0,79)	12,5 (0,49)	5,4 (0,21)	9,5 (0,37)	5,5 (0,22)	225 (50,58)	15 - 20	2,8 (0,11)	7 (0,25)
WG-RL 20,2x13x6,3	20,2 (0,8)	13 (0,51)	6,3 (0,25)	11 (0,43)	6 (0,24)	300 (67,44)	15 - 20	3 (0,12)	7 (0,25)
WG-RL 25x15,5x6,9	25 (0,98)	15,5 (0,61)	6,9 (0,27)	12 (0,47)	8,5 (0,33)	400 (89,92)	15 - 20	3,5 (0,14)	14 (0,49)
WG-RL 35,5x20x9,9	35,5 (1,4)	20 (0,79)	9,9 (0,39)	16 (0,63)	11 (0,43)	500 (112,41)	15 - 20	6 (0,24)	25 (0,88)
WG-RL 52,5x23x11,2	52,5 (2,07)	23 (0,91)	11,2 (0,44)	18 (0,71)	10 (0,39)	3500 (786,84)	15 - 20	7 (0,28)	70 (2,47)

WG-BU Collar Type

SPECIFICATIONS

	D1 mm	H1 mm	d mm	D2 mm	H2 mm	Load N (lbs) (max.)	Natural frequency Hz	Static deflection mm	Weight g (oz)
WG-BU 17x5,5x8,2	17 (0,67)	5,5 (0,22)	8,2 (0,32)	12,7 (0,5)	3,5 (0,14)	35 (7,87)	30 - 50	0,2 (0,01)	3 (0,11)
WG-BU 21,3x5,5x10,8	21,3 (0,84)	5,5 (0,22)	10,8 (0,43)	15,5 (0,61)	3,5 (0,14)	100 (22,48)	30 - 50	0,6 (0,02)	4 (0,14)
WG-BU 24,5x6,5x13,5	24,5 (0,96)	6,5 (0,26)	13,5 (0,53)	17,8 (0,7)	4,5 (0,18)	150 (33,72)	30 - 50	0,7 (0,03)	6 (0,21)
WG-BU 29,6x7,5x17,8	29,6 (1,17)	7,5 (0,3)	17,8 (0,7)	22,7 (0,89)	5 (0,2)	200 (44,96)	30 - 50	1,6 (0,06)	7 (0,25)
WG-BU 36,6x7,5x21,6	36,6 (1,44)	7,5 (0,3)	21,6 (0,85)	27,8 (1,09)	5 (0,2)	200 (44,96)	30 - 50	1,7 (0,07)	12 (0,42)

WG-RI Ring Type

SPECIFICATIONS

	D mm	H mm	d mm	Load N (lbs) (max.)	Natural frequency Hz	Static deflection mm	Weight g (oz)
WG-RI 14,8x10x8,7	14,8 (0,58)	10 (0,39)	8,7 (0,34)	40 (8,99)	15 - 20	2,1 (0,08)	2 (0,07)
WG-RI 19,8x10x7,7	19,8 (0,78)	10 (0,39)	7,7 (0,3)	350 (78,68)	15 - 20	3,2 (0,13)	5 (0,18)
WG-RI 22x15,5x6,3	22 (0,87)	15,5 (0,61)	6,3 (0,25)	500 (112,41)	15 - 20	5,5 (0,22)	7 (0,25)
WG-RI 23,6x15,5x11,6	23,6 (0,93)	15,5 (0,61)	11,6 (0,46)	600 (134,89)	15 - 20	5,3 (0,21)	8 (0,28)
WG-RI 28,5x15x9,7	28,5 (1,12)	15 (0,59)	9,7 (0,38)	800 (179,85)	15 - 20	5,3 (0,21)	11 (0,39)
WG-RI 34,5x15x9,7	34,5 (1,36)	15 (0,59)	9,7 (0,38)	1000 (224,81)	15 - 20	5,5 (0,22)	18 (0,64)
WG-RI 40x20x11,8	40 (1,57)	20 (0,79)	11,8 (0,46)	1500 (337,22)	15 - 20	6,9 (0,27)	32 (1,13)
WG-RI 42,5x20x21,2	42,5 (1,67)	20 (0,79)	21,2 (0,83)	1500 (337,22)	15 - 20	5,8 (0,23)	32 (1,13)
WG-RI 53,6x20x19,8	53,6 (2,11)	20 (0,79)	19,8 (0,78)	2250 (505,82)	15 - 20	7 (0,28)	52 (1,84)
WG-RI 62,6x20x39,2	62,6 (2,46)	20 (0,79)	39,2 (1,54)	3000 (674,43)	15 - 20	5,8 (0,23)	60 (2,12)

WG-FL Rectangular Type

SPECIFICATIONS

	A mm	B mm	H mm	Load N (lbs) (max.)	Natural frequency Hz	Static deflection mm	Weight g (oz)
WG-FL 27,5x27,5x15,5	27,5 (1,08)	27,5 (1,08)	15,5 (0,61)	5000 (1124,05)	15 - 30	2,5 (0,1)	15 (0,53)
WG-FL 29x29x15,5	29 (1,14)	29 (1,14)	15,5 (0,61)	1500 (337,22)	15 - 30	4,5 (0,18)	17 (0,6)
WG-FL 46x37,5x21,5	46 (1,81)	37,5 (1,48)	21,5 (0,85)	12500 (2810,13)	15 - 30	3,2 (0,13)	60 (2,12)
WG-FL 60,5x31x11	60,5 (2,38)	31 (1,22)	11 (0,43)	2500 (562,03)	15 - 30	4 (0,16)	35 (1,24)

WG-FB Rectangular type for socket head cap screw fixings

SPECIFICATIONS

	A mm	B mm	H1 mm	d mm	D mm	H2 mm	Load N (lbs) (max.)	Natural frequency Hz	Static deflection mm	Weight g (oz)
WG-FB 29,2x29,2x19x6,4	29,2 (1,15)	29,2 (1,15)	19 (0,75)	6,4 (0,25)	11 (0,43)	8,5 (0,33)	750 (168,61)	15 - 20	5,5 (0,22)	22 (0,78)
WG-FB 65x50x25x9	65 (2,56)	50 (1,97)	25 (0,98)	9 (0,35)	20 (0,79)	9 (0,35)	5000 (1124,05)	15 - 20	5,2 (0,2)	200 (7,06)

WG-GI Machine mount type with thread

SPECIFICATIONS

	D1 mm	H mm	D2 mm	GW mm	Load N (lbs) (max.)	Natural frequency Hz	Static deflection mm	Weight g (oz)
WG-GI 28x17,5	28 (1,1)	17,5 (0,69)	23,6 (0,93)	M6	600 (134,89)	15 - 20	4,2 (0,17)	20 (0,71)
WG-GI 40x17	40 (1,57)	17 (0,67)	34,5 (1,36)	M6	1000 (224,81)	15 - 20	4,8 (0,19)	40 (1,41)
WG-GI 45x22	45 (1,77)	22 (0,87)	40 (1,57)	M8	1500 (337,22)	15 - 20	5,6 (0,22)	60 (2,12)
WG-GI 58x22	58 (2,28)	22 (0,87)	53,6 (2,11)	M8	2250 (505,82)	15 - 20	6,3 (0,25)	100 (3,53)

WG-LB Machine mount type with plate

WG-LB 7710 / 7720

WG-LB 7750 / 7760

SPECIFICATIONS

	Load (static) N (lbs) (min. - max.)	Load (dynamic) Push (N)	Load (dynamic) Pull (N)	Natural frequency Hz	Weight g (oz)
WG-LB 7710	50 - 300 (11,24 - 67,44)	1500 (337,22)	1500 (337,22)	15 - 22	180 (6,35)
WG-LB 7720	200 - 2500 (44,96 - 562,03)	12500 (2810,13)	6000 (1348,86)	15 - 22	180 (6,35)
WG-LB 7750	250 - 600 (56,2 - 134,89)	1800 (404,66)	750 (168,61)	8 - 10	350 (12,36)
WG-LB 7760	500 - 1700 (112,41 - 382,18)	5100 (1146,53)	1500 (337,22)	8 - 10	350 (12,36)

WG-MB*

- Resilient elements holder in malleable cast iron
- Resilient element fabricated from stainless steel wire
- Surface protection: painted

WG-VR / WG-VRD*

- Multi-directional damper
- Resilient elements holder and housing in malleable cast iron
- Can be used in tension

WG-MF*

- Top cup and base: iron
- Centre mounting stud – high strength aluminium alloy
- The arrangement and form of the whole resilient elements in the damper allowed the admission of high horizontal forces and tractive powers

WG-FVD*

- Base plate with damping unit and cover plate in steel
- Sealed damping unit with highly viscous damping fluid
- Springs in spring steel

WG-MP*

- Top cup and base: steel
- Resilient element: stainless steel wire
- Mountings with 2 cushions with low resonant frequency.

WG-MD*

- Top cup and base: cast iron
- The arrangement of the whole resilient elements in the damper allowed the admission of high horizontal forces and tractive powers

WG-DL*

- Base plate and cover plate: steel
- Cushion plates: cast iron
- Reduced natural frequency when multiple cushions are stacked
- The arrangement and form of the whole resilient elements in the damper allowed the admission of horizontal forces

WG-AE*

- Strain element and equipment: steel
- Resilient element: stainless steel wire
- Protection: Zink plated

***Technical information can be found at www.weforma.com**

	WG-RU, -RI, - RL, - BU, -FL, FB	WG-MB*	WG-VR*	WG-LB	WG-VRD*	WG-MF*
Machine Tool	•	•	•	•	•	•
Mobile Systems			•	•	•	•
Air Conditioners	•			•		
Compressors	•			•		•
Pumps	•			•		•
Generators			•	•		•
Mills			•		•	•
Exhaust Pipes	•					
Switchboards	•			•		
Transformers	•		•		•	•
Pipelines	•		•		•	•
Presses, Shears		•	•		•	
Fans						
Motors	•			•		•
Natural frequency (Hz)	15 - 40	15 - 40	15 - 30	8-22	15 - 20	15 - 20
Static load(kN)	0,1 - 30	0,5 - 45	0,5 - 70	0,05 - 2,5	0,3 - 9	0,7 - 14
Loading direction	Push	Push	Push, Pull	Push	Push, Pull	Push, Pull, side load
Breakaway securing			•	•	•	•

	WG-FVD*	WG-MP*	WG-MD*	WG-DL*	WG-AE
Machine Tool		•		•	
Switchboards	•				
Transformers		•			•
Pipelines			•	•	
Motors			•		
sensitive Equipment	•				
Air Conditioners	•				
Sieve	•				
Tomography	•				
Textile machinery	•				
Presses	•			•	
Ships: exhaust pipes					•
Natural frequency (Hz)	3 - 4	13-20	18 - 25	9 - 20	9 - 20
Static load(kN)	4 - 32	1,2-70	3,5 - 350	2,5 - 280	10 - 800 kg
Loading direction	Push	Push	Push, Pull, side load	Push	Pull
Breakaway securing			•		•

***Technical information can be found at www.weforma.com**

§ 1 Scope, Form

(1) The present general conditions of sale (AVB) are applicable to all our business relationships with our customers ("Buyers"). The AVB apply only if the Buyer is an entrepreneur (§ 14 German Civil Code (BGB)), a legal entity under public law or a special asset under public law.

(2) The AVB especially apply for contracts on the sale and/or the delivery of movable things ("goods"), without considering whether we produce the goods ourselves or purchase them from suppliers (§§ 433, 651 BGB). Unless otherwise agreed, the AVB valid at the time of ordering by the Buyer or in any case, in the version communicated to him most recently in text form as a framework agreement applies even for similar future contracts , without us having to refer to it again in each and every case.

(3) Our AVB apply exclusively. Differing, contradictory or supplementary general terms and conditions of the Buyer are a part of the contract only when, and to the extent that we have expressly consented to their applicability. This requirement of consent applies in any case, for example, even if we unconditionally make the delivery while knowing the AGB (General Terms and Conditions) of the Buyer.

(4) Individual agreements with the Buyer made in isolated cases (including collateral agreements, additions and changes) always have precedence over this AVB. For the content of such agreements, subject to counterevidence, a written contract or our written confirmation is decisive.

(5) Legally relevant declarations and notifications of the Buyer in relation to the contract (e.g. deadline, notice of defects, cancellation or reduction), should be submitted in writing, i.e. in written or text form (e.g. letter, email, fax). Legal formalities and other proofs, especially in the event of doubts about the legitimation of the declaring party remain unchanged.

(6) References to the validity of legal provisions only have clarifying significance. Therefore, the legal provisions apply even without such a clarification, provided they are not directly amended or expressly excluded in this AVB.

§ 2 Conclusion of Contract

(1) Our offers are subject to change and non-binding. This also applies if we have let the Buyer have catalogues, technical documentations (e.g. drawings, plans, computations, calculations, references to DIN standards), other product descriptions or documents – even in electronic format, to which we reserve property rights and copyrights.

(2) The ordering of goods by the Buyer applies as a binding contractual offer. Unless stipulated otherwise in the purchase order, we are authorised to accept this contractual offer within 2 weeks after our receipt of it.

(3) The acceptance can be declared either in writing (e.g. by order confirmation) or by delivery of the goods to the Buyer.

§ 3 Deadline of Delivery and Delay in Delivery

(1) The deadline of delivery is individually agreed or given by us at the time of accepting the purchase order. If this is not the case, the delivery deadline is approx. 4 weeks from conclusion of contract.

(2) If we cannot meet the binding delivery deadlines for reasons for which we are not responsible (non-availability of service), we will immediately inform the Buyer in this regard and simultaneously communicate the new expected delivery deadline. If the service is not available even within the new delivery deadline, we are authorised to withdraw fully or partially from the contract; we shall immediately reimburse the Buyer for any consideration already provided. In this sense the non-availability of the service, in particular, the late delivery to us by our supplier, if we have concluded a congruent covering transaction, is a situation that neither we nor our suppliers are to blame for or we are not obligated for purchasing in individual cases.

(3) The onset of our delay in delivery is determined in accordance with the legal provisions. In any case, however, a reminder by the Buyer is required. If we fall into delivery delay, then the Buyer can demand a lump-sum compensation of his loss due to delay. The lump-sum compensations amounts to 0.5% of the net price (delivery value) per completed calendar week of delay, to a maximum total of 5% of the delivery value of the delayed supplied good. We reserve the right to prove that the Buyer suffered no loss at all or only a significantly lower loss than the present lump-sums.

(4) The rights of the Buyer as per § 8 of this AVB and our legal rights, especially in an exclusion of the service obligation (e.g. due to impossibility or unreasonableness of the service and/or retrospective fulfilment), remain unchanged.

§ 4 Delivery, Transfer of Risk, Approval, Default of Acceptance

(1) The delivery is ex stock, which is also the place of fulfilment for the delivery and any retrospective fulfilment. At the request and costs of the Buyer, the goods are also sent to another destination (sales shipment). Unless otherwise agreed, we are authorised to decide the type of shipment (particularly, transportation company, dispatch route, packaging) on our own.

(2) The risk of accidental loss and accidental deterioration of the goods passes over at the latest with the handover to the Buyer. For sales shipment, however, the risk of accidental loss and the accidental deterioration of the goods and the risk of delay already passes over with the dispatch of the goods to the freight forwarder, carrier or the person or institution otherwise decided for the execution of the shipment. As long as an approval procedure is agreed, it is authoritative for the transfer of risk. The legal provisions of the law on work contracts shall also apply analogously in other respects for an agreed approval. If the Buyer is in default of the acceptance, the handover or approval is deemed as given.

(3) If the Buyer is in default of acceptance, he refrains from cooperation or delays our delivery for other reasons for which the Buyer is responsible, then we are entitled to demand compensation for the loss resulting from it, including additional expenditures (e.g. storage costs). We calculate lump sum compensation in the amount of EUR 75.- per calendar day for this, beginning with the delivery deadline or – in the absence of a delivery deadline – with the communication of readiness of the goods for dispatch.

The proof of a greater loss and our legal claims (especially reimbursement of additional expenditures, reasonable compensation, and notice of cancellation) remain unchanged; but the lump sum should be credited against the further monetary claims. The Buyer is allowed to prove that we suffered no loss or only a significantly lower loss than the present lump-sums.

§ 5 Prices and Terms of Payment

(1) Unless otherwise agreed in individual cases, our respective latest prices at the time of conclusion of contract, and in fact ex stock plus statutory value added tax are applicable.

(2) In case of sales shipment (§ 4 Para 1), the Buyer bears the transport costs ex stock and where applicable, the costs of transport insurance requested by the Buyer. As long as we do not charge the actual transportation costs incurred in the individual case, a lump-sum transport cost is (exclusive of transport insurance), amounting to EUR ... applies as agreed. Any customs duties, fees, taxes and other public charges are borne by the Buyer.

(3) The purchase price is due and must be paid within 14 days from invoicing and delivery or approval of the goods. Nevertheless, we are entitled at any time, even in the scope of an ongoing business relationship to execute a delivery fully or partly only against advanced payment. We will declare a corresponding reservation at the latest with the order confirmation.

(4) If the aforementioned payment period lapses, the Buyer is in default. Interest should be paid on the purchase price during the delay at the applicable statutory default interest rate. We reserve the right to assert claim of further default damage. Our claim to the commercial interest on maturity (§ 353 German Commercial Code (HGB)) with respect to the businessmen remains unaffected.

(5) The Buyer is entitled to the rights to offsetting or retention only inasmuch as his claim is legally established or indisputable. In case of defects in the shipment, the Buyer's reciprocal rights, especially as per § 7 Para 6 Clause 2 of this AVB remain unaffected.

(6) If it is perceived after the conclusion of the contract (e.g. by an application for opening insolvency proceedings), that our claim to the purchase price is at risk due to lack of payment capacity of the Buyer, then we are entitled to rescind from the contract (§ 321 BGB) under the legal provisions for refusal of payment and – where applicable, after setting a deadline. In contracts for the manufacture of non-substitutable goods (custom-made products), we can declare the rescission immediately; the legal regulations on the dispensability of the setting of deadline remain unchanged.

§ 6 Retention of Title

(1) Until complete payment of all our present and future claims is made from the purchase contract and an ongoing business relationship (secured claims), we are entitled to the ownership of the sold goods.

(2) The goods under the retention of title may neither be pledged nor transferred as security to third parties before the full payment of the secured claims. The Buyer has to notify us immediately in writing if an order for opening insolvency proceedings is placed or if third parties access (e.g. seizures) the goods belonging to us.

(3) In case of the Buyer's behaviour contrary to the contract, especially in case of non-payment of the due purchase price, we are authorised under the legal provisions to withdraw from the contract or/and to demand the surrender of goods on the grounds of retention of title. The demand for surrender does not concurrently include the declaration of the rescission; rather, we shall be entitled to demand only the surrender of goods and to reserve our right to rescission. If the Buyer does not pay the purchase price due, we may assert this right only if we have unsuccessfully set the Buyer a reasonable term for payment before, or such a setting of a term is unnecessary under the legal provisions.

(4) The Buyer is authorised up to the withdrawal as per (c) below to re-sell and/or process the goods subject to retention of title in the orderly course of business. In this case, the following provisions also apply.

(a) The retention of title extends to cover the full value of the products emerging from processing, mixing or combination of our goods, where we are considered as manufacturer. If the ownership right of a third party remains in existence during the processing, mixing or combination with their goods, we shall gain co-ownership in the ratio of the invoice values of the processed, mixed or combined goods. Otherwise the same rules apply for the resulting product as to the goods delivered under the retention of title.

(b) The claims against third parties arising from the resale of goods or the products are already now assigned to us as security by the Buyers in total or rather in the amount of our potential share of co-ownership as per the preceding paragraph. We shall accept the assignment. The Buyer's obligations named in Para 2 also apply in consideration of the assigned claims.

(c) The Buyer remains authorised to collect the claim alongside us. We commit to not collect the claim as long as the Buyer complies with his payment obligations to us, there is no lack in his payment capacity and we do not assert the claim to retention of title by exercising a right as per Para 3. However, if that is the case, we can demand that the Buyer discloses to us the assigned claims and their debtor, gives us all the details required for the collection, turns over the associated documents and communicates the assignment to the debtor (third party). Otherwise, we are entitled in this case to revoke the authority of the Buyer to further disposal and processing of the goods subject to retention of title.

(d) If the realisable value of the securities exceeds our claims by more than 10%, upon the request of the customer, we shall release the securities by our choice.

§ 7 Buyer's Claims for Defects

(1) The legal provisions apply for the rights of the Buyer in case of defects in goods and title (including incorrect and short deliveries as well as improper installation or insufficient installation instructions), unless specified otherwise below. In all cases, the legal special regulations remain unchanged upon final delivery of the unprocessed goods to a consumer, even if he has processed it further (Supplier regress as per §§ 478 BGB). Claims from supplier regress are excluded if the defective goods were further processed by the Buyer or another entrepreneur, e.g. by integrations in another product.

(2) The basis of our warranty for defects is primarily the agreement made about the quality of the goods. All product descriptions that are objects of individual contract or were made public by us (particularly in catalogues or on our internet homepage) are considered as agreement on the quality of goods.

(3) If the quality was not agreed, it must be assessed according to the statutory regulations whether there is a defect or not (§ 434 Para 1 Clauses 2 and 3 BGB). We nevertheless do not take any responsibility for the public statements of the manufacturer or other third parties (e.g. advertising statements).

(4) The Buyer's claims for defect require that he has complied with his legal duties of inspection and notification of defects (§§ 377, 381 HGB). If a defect is apparent at the time of delivery, inspection or at a later point in time, we should be immediately notified about it in writing. In any case, apparent defects must be notified in writing within 5 working days from delivery and the defects not visible in the inspection within the same period starting from their discovery. If the Buyer neglects the proper inspection and/or notification of defects, our liability for the defects that are not notified, or not notified on time or not notified properly is excluded under the legal provisions.

(5) If the delivered object is defective, we can first choose whether we shall provide retrospective fulfilment by remedying the defect (rectification) or by delivery of a good that is free of defect (replacement). Our right to refuse retrospective

fulfilment under the statutory conditions remains unaffected.

(6) We are authorised to make the retrospective fulfilment dependent on the payment of the due purchase price by the Buyer. The Buyer is however authorised to withhold a part of the purchase price in proportion to the defect.

(7) The Buyer has to give us the time and opportunity required for the owed retrospective fulfilment, in particular, to hand over the rejected goods for purposes of tests. In case of replacement, the Buyer has to return to us the defective objects under the legal provisions. The retrospective fulfilment includes neither dismantling of the defective object nor the reinstallation, if we were not originally obligated for installation.

(8) We shall reimburse the expenses required for the testing and retrospective fulfilment, especially transport, road, work and material costs as well as possible dismantling and installation costs according to the statutory regulations if a defect is actually present. Otherwise, we can demand to have the costs arising from the unjustified request for the rectification of defects (especially testing and transportation costs) reimbursed from the Buyer, unless, the absence of defectiveness was not identifiable for the customer.

(9) In urgent cases, e.g. when operational safety is endangered or to avert excessive damages, the Buyer has the right to rectify the defect himself and to demand reimbursement from us for the objectively required expenses for it. We must be notified promptly, if possible before the repair, with respect to such a rectification by the buyer. The buyer's right to rectify does not exist if we would be authorised to refuse corresponding retrospective fulfilment under the legal provisions.

(10) If the retrospective fulfilment has failed or a reasonable term set by the Buyer for the retrospective fulfilment has expired without success or it is dispensable under the legal provisions, the Buyer can withdraw from the purchase contract or reduce the purchase price. However, there the right to withdraw does not exist in case of an insignificant defect.

(11) Claims of the Buyer to damages or reimbursement of fruitless expenses exist even in case of defects only according to § 8 and are otherwise excluded.

§ 8 Miscellaneous Liabilities

(1) Insofar as not derived otherwise from this AVB including the following provisions, we shall be liable according to the legal provisions in case of breach of contractual and non-contractual duties.

(2) We are liable for compensation – irrespective of their legal grounds – within the scope of the fault-based liability in case of intention and gross negligence. In case of minor negligence, we are liable subject to a milder liability criterion under the legal provisions (e.g. for diligence in our own matters) only

a) for damages from the loss of life, bodily injury or damage to the health,

b) for damages from the significant breach of an essential contractual duty (obligations whose fulfilment is a prerequisite for the execution of the contract in the first place and whose compliance is regularly trusted or may be trusted by the contract partner); but in this case, our liability is limited only to the compensation of the typically foreseeable damage.

(3) The limitations of liability arising from Para 2 also apply for breaches of duty by or in favour of persons whose fault must be represented by us under the legal provisions. They do not apply if we have maliciously concealed a defect or have taken over a guarantee for the procurement of the goods and for the claims of the Buyer under the Product liability law.

(4) On account of a breach of duty that is not attributable to a defect, the Buyer can withdraw or give notice only if we are responsible for the breach of duty. A free right to termination by the Buyer (particularly as per §§ 651, 649 BGB) is excluded. Apart from that, the statutory conditions and legal consequences apply.

§ 9 Statute of Limitation

(1) Notwithstanding § 438 Para 1 no. 3 BGB, the general statute of limitation for claims from defects in goods and title is one year from delivery. Provided an approval process is agreed, the statute of limitation begins with the approval.

(2) However, if the goods are a building or an object that has been used as a building in accordance with its customary manner of use and its defect has caused the defectiveness (building material), the statute of limitations is 5 years from the delivery as per the statutory regulations (§ 438 Para 1 no. 2 BGB). Other special statutory regulations of statute of limit (especially § 438 Para 1 no. 1, Para 3, §§ 444, 445 b BGB) also remain unaffected.

(3) The present statutes of limitations of the purchase right also apply for contractual and non-contractual claims of damages of the Buyer that are based on a defect in the goods, unless the application of the regular legal statute of limitation (§§ 195, 199 BGB) would lead to a shorter statute of limitation in individual cases. Claims of damages of the Buyer as per § 8 Para 2 clause 1 and clause 2(a) and according to Product liability law nevertheless lapse only after the legal statute of limitations.

§ 10 Applicable Law and Place of Jurisdiction

(1) The law of the Federal Republic of Germany excluding the uniform international law, especially of UN purchase right applies for this AVB and the contractual relationship between us and the Buyer.

(2) If the Buyer is a merchant within the meaning of the German commercial code, a legal entity under the public law or a special asset under the public law, the exclusive – and even international – jurisdiction for all disputes arising directly or indirectly from the contractual relationship is our business location in Stolberg. The corresponding applies if the Buyer is an entrepreneur within the meaning of § 14 BGB. We are however also authorised in all cases to bring an action at the place of fulfilment of the delivery obligation as per this AVB or an overriding individual or at the general place of jurisdiction of the Buyer. Overriding legal provisions, especially to exclusive authorities, remain unaffected.

§ 11 Privacy Statement with respect to the Processing/Collection of Customer's Personal Data

(1) Information about the collection of customer's personal data

a) In the following section, we inform you about the collection of customer's personal data. Personal data is all information that can be related to you personally e.g. name, address, email address etc.

b) The Responsible Party as per Article 4 Para 7 EU General Data Protection Regulation (GDPR) is

Weforma Dämpfungstechnik GmbH,
legally represented by the Executive Directors
Armin Schmidt and Thomas Schmidt
Werther Straße 44 in 52224 Stolberg
Telephone: +49-(0)2402 - 9892-0
Fax: +49-(0)2402 - 9892-20
info@weforma.com
www.weforma.com
Amtsgericht / County Court: Aachen HRB 11532

You can contact our data protection officer under IITR Datenschutz GmbH, Marienplatz 2, 80331 München, Tel. 089/18917360, E-Mail: email@iitr.de or at our postal address with the addition "The Data Protection Officer".

c) For the purpose of fulfilling the contract or the execution of pre-contractual actions, which happen upon your request, we process / collect especially the following personal data that is disclosed by you and/or has become known to us:

- Your name or your company name including the name of the natural persons dealing for you
- Your contact data, i.e. your business address and where applicable, your telephone numbers, fax numbers and email addresses
- Your bank details
- All the data about your payment history and handling of complaints that is required for the execution/fulfilment of the contract.

d) The legal foundation for the processing of personal data is Article 6 Para 1 clause 1 b) GDPR.

e) Categories of recipients of personal data are

aa) The Responsible Party, Weforma Dämpfungstechnik GmbH

bb) Order Processor, e.g. external service provider such as the tax consultant appointed by us with the financial accounting

cc) Persons, who are allowed under the direct responsibility of the Responsible Party (i.e. Weforma Dämpfungstechnik GmbH) or an Order Processor to process the personal data (e.g. employees of our service department)

dd) Subcontractors and/or payment service providers where applicable

ee) Public bodies and officials where applicable

(2) Duration of the storage of personal data

We shall limit the storage periods for your personal data to the minimum mandatory time. We have introduced a deletion approach for this purpose, in which the time limits for the regular review and deletion of your personal data are scheduled to ensure that your personal data is not stored longer than necessary. The following time limits are decisive according to it:

- For the execution of the contractual relationship relevant data records/documents:

Maximum storage of up to legal termination time of the contractual relationship + safety margin of three years (till the expiry of the regular three year statute of limitation as per §§ 195, 199 BGB)

- Data records/documents that can be relevant for the annual financial statement of our company, e.g. documents of financial accounting:

Maximum storage up to the expiry of ten years, § 257 Para 1 no. 1 and Para 4 HGB, § 147 Regulation of Tax (AO)

- Data records/documents that can be relevant for tax, e.g. emails of employees that are deemed as commercial letters:

Maximum storage up to the expiry of six years, § 147 Para 3 clause 1 AO

- Data records/documents, e.g. about your payment history and handling of complaints, for which there is no retention period:

Maximum storage of up to till the expiry of the regular three year statute of limitation as per §§ 195, 199 BGB + safety margin of three months, unless the data records/documents are needed beyond that time for the execution of the contractual relationships.

(3) Your Rights

a) You have the following rights towards us regarding the personal data concerning you:

- Right to Information (Article 15 of GDPR, § 34 Federal Data Protection Act, (BDSG)),
- Right to Correction and Deletion (Article 16 and 17 of GDPR, § 35 BDSG),
- Right to Restriction of Processing (Article 18 of GDPR),
- Right to Objection against the Processing (Article 21 of GDPR, § 36 BDSG),
- Right to Data Portability

b) In addition, you have the right, to file complaints with a regulatory authority about the processing of your personal data in our company.

(4) You are legally and/or contractually obliged, to make available your personal data processed for the purposes of execution/fulfilment of contractual behaviour. Possible consequences of not providing the data would be termination of the contractual relationship.

Weforma Dämpfungstechnik GmbH
06.08.2018

Measurement Conversions

LENGTH

cm	mm	inch	feet
1	10	0.394	0.0328
0,1	1	0.0394	0.00328
2,54	25,4	1	0,083
30,48	304,8	12	1

inch = mm ÷ 25,4
mm = inch x 25,4

WEIGTH

g	kg	oz	lb
1	0,001	0.0353	0.0022
1000	1	35.27	2.205
28,4	0,0284	1	0.0625
453,6	0,454	16	1

lb = kg x 2,205
kg = lbf ÷ 2,205

FORCE

N	kgf	lbf
1	0,10197	0.225
9,807	1	2.205
4,448	0,454	1

lb = kg x 2,205
kg = lbf ÷ 2,205

N = kgf x 9,807
kgf = N ÷ 9,807

TORQUE

N x m	kgf x cm	lbs x in
1	10,197	8.85
0,0981	1	0.868
0,113	1,152	1

lbs x in = kgf x cm x 0,868
kgf x cm = lbs x in ÷ 0,868

N x m = kgf x cm x 0,0981
kgf x cm = N x m ÷ 0,0981

SPEED

m/s	ft/s
1	3.280
0,305	1

TEMPERATURE

°C	°F
0	32
-17,77	0

°C = (°F - 32) x 5 ÷ 9
°F = °C ÷ 5 x 9 + 32

Weforma

Weforma Dämpfungstechnik GmbH

Werther Str. 44
DE - 52224 Stolberg
Tel.: +49 2402 98 92 0
Fax: +49 2402 98 92 20
info@weforma.com
www.weforma.com