MANIPULATION

Guided compact cylinder
Series 6100
Series 6101

Twin-rod slide unit
Series 6200

Push/pull-twin rod slide unit
Series 6210

Pneumatic grippers
Series 6301 - Angular grippers - standard version
Series 6302 - 180° angular grippers
Series 6303 - Angular gripper, rack & pinion style
Series 6310 - Parallel style grippers- standard version
Series 6311 - Wide opening
Series 6312 - 3 fingers parallel style (air chuck)

Rotary actuators
Series 6400 - Double rack rotary actuators with turn table
Series 6410 - Single rack rotary actuators

Vane type rotary actuators
Series 6420

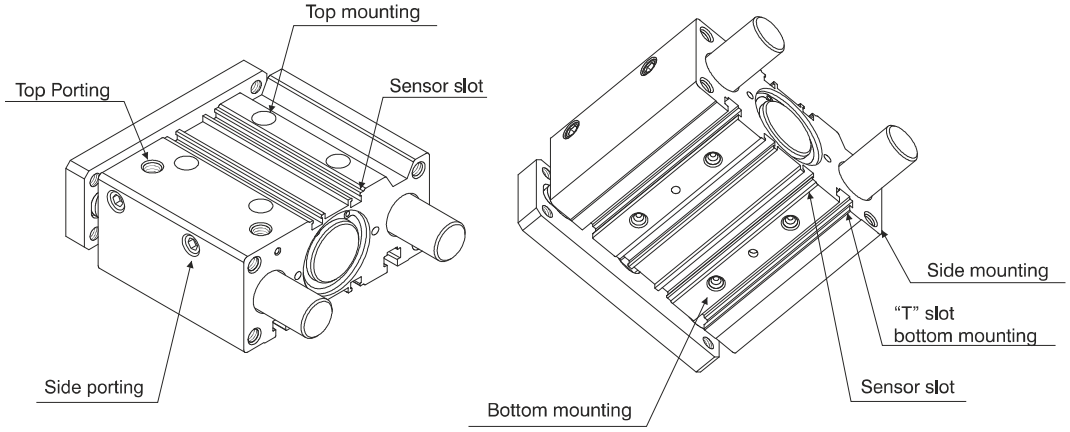
Arbitrary mount cylinders
Series 6500

Slide cylinders
Series 6600

Guide cylinders
Series 6700

Dampers
Series 6900

Specifications may be subject to change without prior notice



These guided compact cylinders, characterised by reduced overall dimensions, can be used for the compression, conveyance and manipulation of objects in many industrial sectors; similarly they can also be used in pushing, lifting and stopping applications.

These cylinders are available in sizes 32mm to 63 mm diameter, and comprise a single compact cylinder with integral guide rods, making it a true guide cylinder designed with installation flexibility and space saving in mind.

The rod guide is available in two styles:
Self-lubricating bronze bushes - useful for absorbing lateral loads and forces, especially as a stopper.
Bearing bushes - guaranteeing high precision and uniform movement with low friction characteristics, useful with mis-aligned loads.
Guided compact cylinders are ideal for use in applications requiring a combination of reduced dimensions and anti-rotation features. Mounting can be achieved on three sides through holes or "T" slots.

Adjustable mounting holes in the front plate ensure safe and accurate assembly. Pneumatic connections can be made to either lateral or top ports (lateral ports plugged on standard units).
When sensors are required, there are special slots in the barrel extrusion where 1580 series miniaturised sensors are easily fitted.

Ordering code

6100.Ø.stroke. _ .

- **12**
- **16**
- **20**
- **25**
- **32**
- **40**
- **50**
- **63**

Side supply ports closed
L = Top supply ports closed

B = Control unit with bronze bush
C = Control unit with bearing bush

Construction characteristics

Body	oxidated aluminium
Guide rods	C43 chromed steel (control unit with bronze bush) tempered and chromed steel (control unit with bearing bush)
Piston	aluminium
Piston rod	stainless steel (for bores Ø12, Ø16, Ø20, Ø25) C43 chromed steel (for bores Ø32, Ø40, Ø50, Ø63)
Rods bushing	bronze or bearing bushing
End plate	oxidated aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	PUR (NBR 12-16)
Wipers	PUR
Plate	nickel plated steel

Technical characteristics

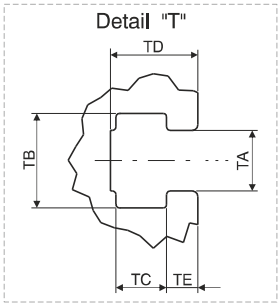
Function	double acting
Fluid	filtered and preferably lubricated air or not (If lubricated the lubrication must be continuous)
Working pressure	max. 10 bar
Working temperature	-5°C - +70°C
Cushioning	elastic bumper on both ends

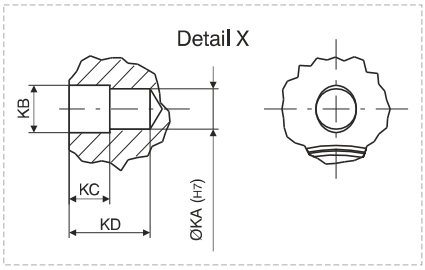
Standard strokes

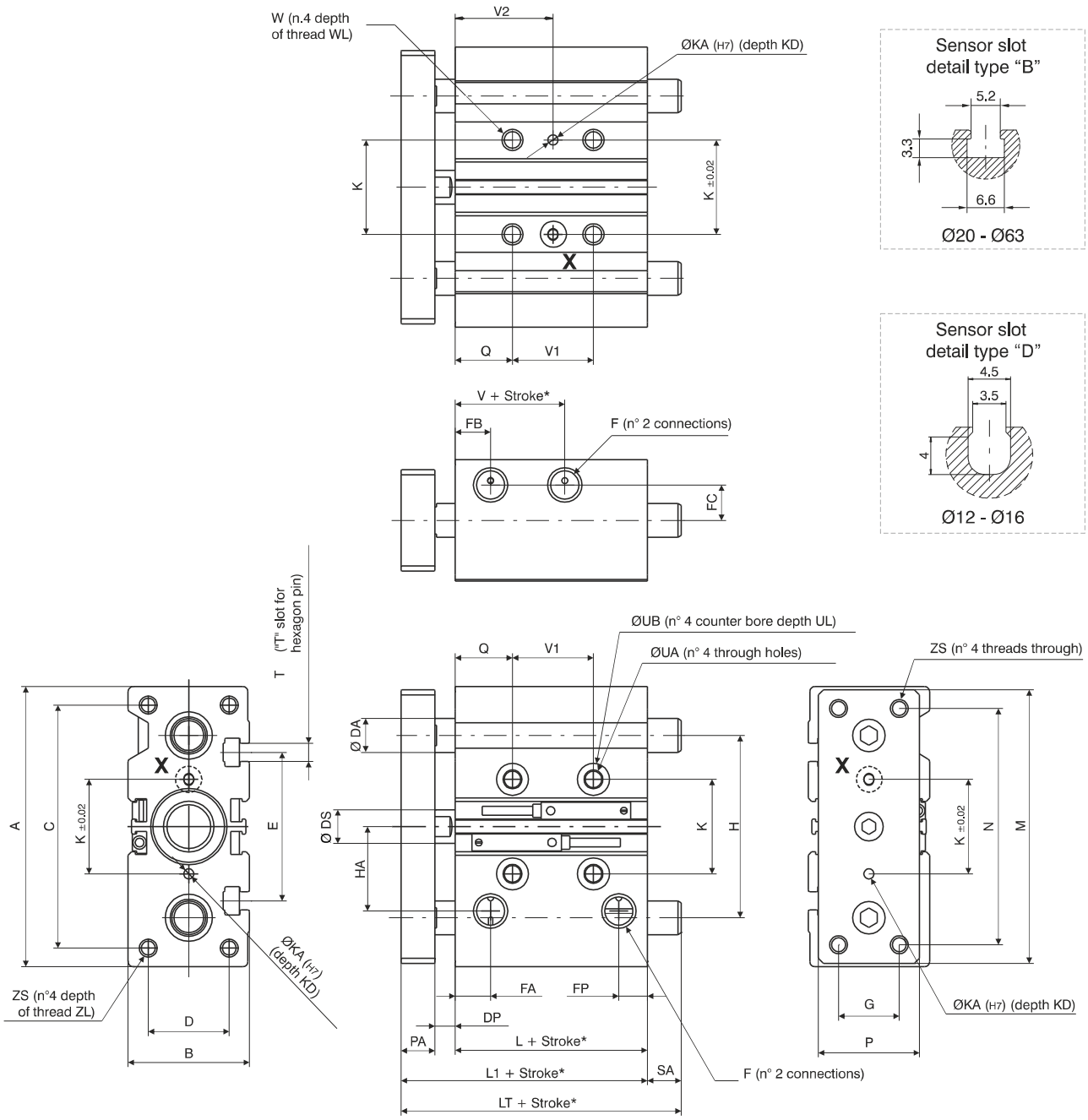
	Stroke											
Bore	**10**	**20**	**25**	**30**	**40**	**50**	**75**	**100**	**125**	**150**	**175**	**200**
Ø12	●	●		●	●	●	●	●				
Ø16	●	●		●	●	●	●	●				
Ø20		●		●	●	●	●	●	●	●	●	●
Ø25		●		●	●	●	●	●	●	●	●	●
Ø32			●			●	●	●	●	●	●	●
Ø40			●			●	●	●	●	●	●	●
Ø50			●			●	●	●	●	●	●	●
Ø63			●			●	●	●	●	●	●	●

Intermediate strokes can be obtained using spacers with defined length (5, 10, 15, 20 mm).
Example: It is possible to obtain a **6100.32.45.B** cylinder from a **6100.32.50.B** cylinder by inserting a spacer with length of 5 mm.
The intermediate strokes manufactured without the use of spacers are considered special executions.

Specifications may be subject to change without prior notice







*Dimensions only refer to the "standard stroke"

Table of dimensions

Bore	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
A	58	64	83	93	112	120	148	162
B	26	30	36	42	48	54	64	78
C	40	56	72	82	98	106	130	142
D	18	22	24	30	34	40	46	58
DA (Control unit with bronze bushes)	8	10	12	16	20	20	25	25
DA (Control unit with bearing bushes)	6	8	10	14	16	16	20	20
DP	2	2	5.5	5.5	9.5	10	13	13
DS	6	8	10	12	16	16	20	20
E	/	/	44	50	63	72	92	110
F	M5	M5	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
FA	11	11	11	12	13	13	13	14
FB	11	11	11	12	13	13	13	14
FC	8.5	10	10.5	13.5	15	18	21.5	28
FP	15	17	9	10.5	9.5	11	11	12.5
G	14	16	18	26	30	30	40	50
H	41.5	46	54	64	78	86	110	124
HA	19.5	23	25	28.5	34	38	47	55
K	23	24	28	34	42	50	66	80
KA	/	/	3	4	4	4	5	5
KB	/	/	3.5	4.5	4.5	4.5	6	6
KC	/	/	3	3	3	3	4	4
KD	/	/	6	6	6	6	8	8
L	29	31	38	38.5	38.5	44	44	49
L1	39	43	53.5	54	60	66	72	77
LT (Control unit with bronze bushes, stroke ≤50)	39	43	53.5	54	97	97	106.5	106.5
LT (Control unit with bronze bushes, 50< stroke ≤200)	57	64	84.5	85	102	102	118	118
LT (Control unit with bearing bushes, stroke ≤30)	39	43	47	49				
LT (Control unit with bearing bushes, 30< stroke ≤100)	53	64	72	77				
LT (Control unit with bearing bushes, 100< stroke ≤200)	/	/	102	102				
LT (Control unit with bearing bushes, stroke <50)					/		/	
LT (Control unit with bearing bushes, 50≤ stroke ≤100)					87		92	
LT (Control unit with bearing bushes, 100< stroke ≤200)					117		127	
M	56	62	81	91	110	118	146	158
N	48	52	70	78	96	104	130	130
PA	8	10	10	10	12	12	15	15
P	22	25	30	38	44	44	60	70
Q	5	5	17.5	17.5	21.5	22	24	24
SA (Control unit with bronze bushes, stroke ≤50)	/	/	/	/	37	31	34.5	29.5
SA (Control unit with bronze bushes, 50< stroke ≤200)	18	21	31	31	42	36	46	41
SA (Control unit with bearing bushes, stroke ≤30)	/	/	/	/				
SA (Control unit with bearing bushes, 30< stroke ≤100)	14	21	18.5	23				
SA (Control unit with bearing bushes, 100< stroke ≤200)	/	/	49	48				
SA (Control unit with bearing bushes, stroke <50)					/	/	/	/
SA (Control unit with bearing bushes, 50≤ stroke ≤100)					27	21	20	15
SA (Control unit with bearing bushes, 100< stroke ≤200)					57	51	55	50
T	/	/	M5	M5	M6	M6	M8	M10
TA	/	/	5.4	5.4	6,5	6.5	8,5	11
TB	/	/	8.4	8.4	10.5	10.5	13.5	17.8
TC	/	/	4.5	4.5	5.5	5.5	7.5	10
TD	/	/	7.8	8.2	9.5	11	13.5	18.5
TE	/	/	2.8	3	3.5	4	4.5	7
UA	4.3	4.3	5.6	5.6	6.6	6.6	8.6	8.6
UB	8	8	9.5	9.5	11	11	14	14
UL	4.5	4.5	5.5	5,5	7.5	7.5	9	9
V	14	14	13	13	7.5	13	9	14
V1 (stroke ≤30)	4+stroke		24	24				
V1 (30< stroke ≤100)			44	44				
V1 (100< stroke ≤200)			120	120				
V1 (stroke ≤25)			/	/	24	24	24	28
V1 (25< stroke ≤100)			/	/	48	48	48	52
V1 (100< stroke ≤200)			/	/	124	124	124	128
V2 (stroke ≤30)	/	/	29.5	29.5				
V2 (30< stroke ≤100)	/	/	39.5	39.5				
V2 (100< stroke ≤200)	/	/	77.5	77.5				
V2 (stroke ≤25)					33.5	34	36	38
V2 (25< stroke ≤100)					45.5	46	48	50
V2 (100< stroke ≤200)					83.5	84	86	88
W	M5	M5	M6x1	M6x1	M8x1.25	M8x1.25	M10x1.5	M10x1.5
WL	10	10	12	12	16	16	20	20
Z	M4	M5	M5x0.8	M6x1	M8x1.25	M8x1.25	M10x1.5	M10x1.5
ZL	9	11	13	15	20	20	22	22
ZS	M4	M5	M5x0.8	M6x1	M8x1.25	M8x1.25	M10x1.5	M10x1.5

Specifications may be subject to change without prior notice

	Stroke							
	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
Stroke	**Control unit with bronze bushes**							**Weight (gr)**
10	240	330						
20	280	380	670	950				
25					1690	1950	3360	4180
30	310	430	750	1050				
40	350	480	830	1160				
50	390	530	910	1270	2070	2370	4000	4940
75	500	680	1170	1650	2470	2830	4730	5780
100	590	800	1370	1920	2850	3250	5370	6540
125			1570	2190	3240	3680	6010	7290
150			1760	2470	3620	4100	6650	8050
175			1960	2740	4000	4530	7290	8800
200			2160	3010	4380	4950	7930	9560
Stroke	Moving parts							
10	100	155						
20	108	170	330	520				
25					1070	1140	2150	2500
30	116	185	350	560				
40	124	200	380	600				
50	132	215	400	640	1230	1300	2400	2750
75	152	250	520	840	1420	1490	2750	3090
100	172	285	580	950	1580	1650	3000	3350
125			640	1050	1740	1810	3260	3600
150			700	1150	1910	1980	3510	3860
175			760	1250	2070	2140	3760	4110
200			820	1350	2230	2300	4020	4360
Stroke	**Control unit with bearing bushes**							
10	240	340						
20	270	390	700	980				
25					1540	1790	3110	3930
30	300	430	770	1070				
40	350	510	890	1250				
50	390	560	970	1340	1850	2150	3660	4590
75	470	670	1140	1570	2300	2640	4410	5460
100	560	790	1310	1810	2620	3000	4960	6120
125			1520	2080	2990	3420	5600	6880
150			1690	2310	3310	3780	6150	7540
175			1870	2540	3620	4140	6700	8210
200			2040	2770	3940	4500	7250	8870
Stroke	Moving parts							
10	95	145						
20	100	153	310	490				
25					820	890	1770	2110
30	105	161	330	520				
40	110	169	370	580				
50	120	177	390	610	940	1010	1950	2300
75	145	197	440	690	1110	1180	2240	2590
100	170	217	480	760	1230	1300	2430	2770
125			560	880	1410	1480	2710	3050
150			600	950	1530	1600	2890	3240
175			650	1020	1650	1720	3080	3420
200			700	1100	1770	1830	3270	3610

Working pressure																**Cylinder theoretic force (N)**
2 bar	23	17	40	30	63	47	98	76	161	121	251	211	393	330	623	561
3 bar	34	26	60	45	94	71	147	113	241	181	377	317	589	495	935	841
4 bar	45	34	80	60	126	94	196	151	322	241	503	422	785	660	1247	1121
5 bar	57	43	101	76	157	118	246	189	402	302	629	528	982	825	1559	1402
6 bar	68	51	121	91	188	142	295	227	482	362	754	634	1178	989	1870	1682
7 bar	79	60	141	106	220	165	344	265	563	422	880	739	1374	1154	2182	1962
8 bar	90	68	161	121	251	189	393	302	643	482	1006	845	1570	1319	2494	2242
9 bar	102	77	181	136	283	212	442	340	724	543	1131	950	1767	1484	2805	2523
10 bar	113	85	201	151	314	236	491	378	804	603	1257	1056	1963	1649	3117	2803
Piston area	out	in	out	in	out	in	out	in	out	in	out	in	out	in	out	in
(mm^2)	113	85	201	151	314	236	491	378	804	603	1257	1056	1963	1649	3117	2803

								Maximum permissible Momentum
J	0.08	0.09	0.11	0.18	0.29	0.52	0.91	1.54

How to calculate the Momentum: $\mathbf{Ec} = \frac{1}{2}\ \mathbf{m}\ \mathbf{V}^2$ (J)

m = Total moving mass: weight of driven object added to weight of cylinder moving parts (kg)

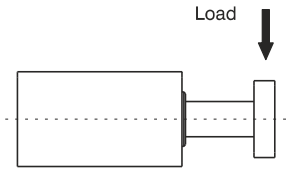
V = max. speed: equal to average speed + 40% (m/sec)

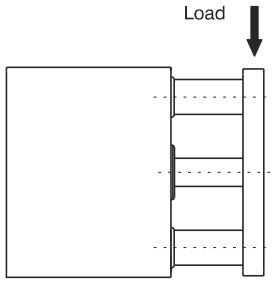
5

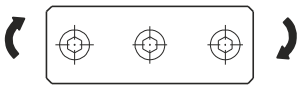
Permissible lateral load (applied on overall plate)

		Bore							
		Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
Version	**Stroke**	**Permissible lateral load (N)***							
Control unit with bronze bushes	10	30	48						
	20	23	37	49	69				
	25					203	203	296	296
	30	19	30	43	60				
	40	16	25	38	54				
	50	14	20	35	49	164	164	245	245
	75	12	18	87	116	182	182	273	273
	100	10	15	75	100	159	159	241	241
	125			66	88	142	142	216	216
	150			59	79	127	127	195	195
	175			54	71	116	116	179	179
	200			49	65	106	106	164	164
Control unit with bearing bushes	10	20	35			191	190	208	206
	20	15	28	58	69				
	25					191	190	208	206
	30	13	22	48	68				
	40	11	18	101	132				
	50	10	16	90	118	157	157	173	171
	75	8	14	70	93	164	163	223	221
	100	6	11	58	77	144	144	199	196
	125			62	80	203	203	264	262
	150			54	70	186	185	242	240
	175			48	62	171	171	224	221
	200			43	55	158	158	207	205
Version	**Stroke**	**Recommended torque moments (Nm)**							
Control unit with bronze bushes	10	0.40	0.70						
	20	0.35	0.65	1.1	1.8				
	25					6.4	7.0	13.0	14.7
	30	0.28	0.48	0.9	1.6				
	40	0.25	0.45	0.8	1.4				
	50	0.21	0.39	0.8	1.3	5.1	5.7	10.8	12.1
	75	0.42	0.68	1.9	3.0	5.7	6.3	12.0	13.5
	100	0.40	0.60	1.6	2.6	5.0	5.5	10.6	11.9
	125			1.4	2.3	4.4	4.9	9.5	10.7
	150			1.3	2.0	4.0	4.4	8.6	9.7
	175			1.2	1.8	3.6	4.0	7.9	8.9
	200			1.1	1.7	3.3	3.7	7.2	8.2
Control unit with bearing bushes	10	0.62	0.70						
	20	0.41	0.65	1.3	2.1				
	25					6.0	6.6	9.2	10.2
	30	0.33	0.48	1.0	1.8				
	40	0.30	0.45	2.2	3.4				
	50	0.48	0.39	1.9	3.0	4.9	5.4	7.6	8.5
	75	0.38	0.68	1.5	2.4	5.1	5.6	9.8	11.0
	100	0.32	0.60	1.3	2.0	4.5	5.0	8.7	9.7
	125			1.3	2.1	6.3	7.0	11.6	13.0
	150			1.2	1.8	5.8	6.4	10.7	11.9
	175			1.0	1.6	5.3	5.9	9.8	11.0
	200			0.9	1.4	4.9	5.4	9.1	10.2

*(Applied on overall plate)

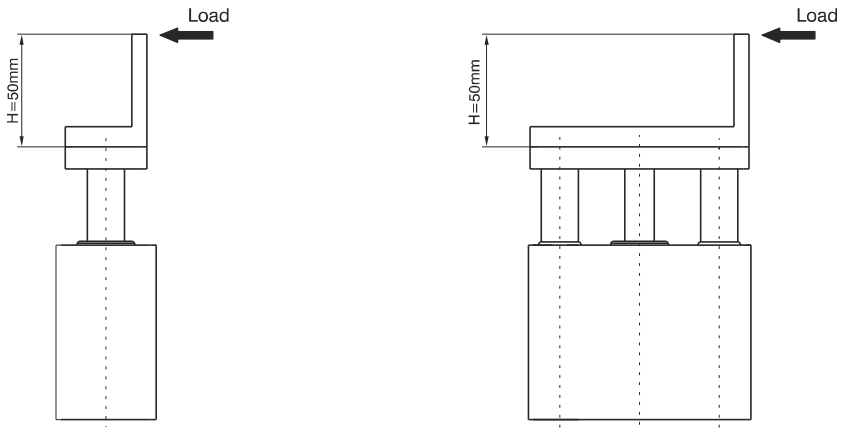






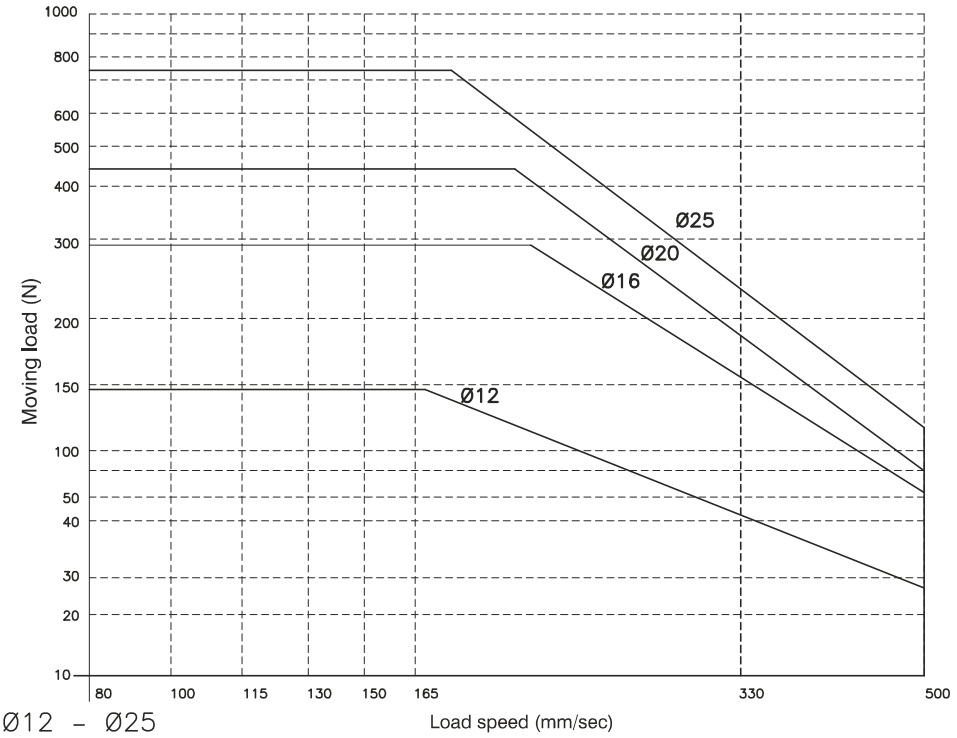
Specifications may be subject to change without prior notice

Stopper device applications



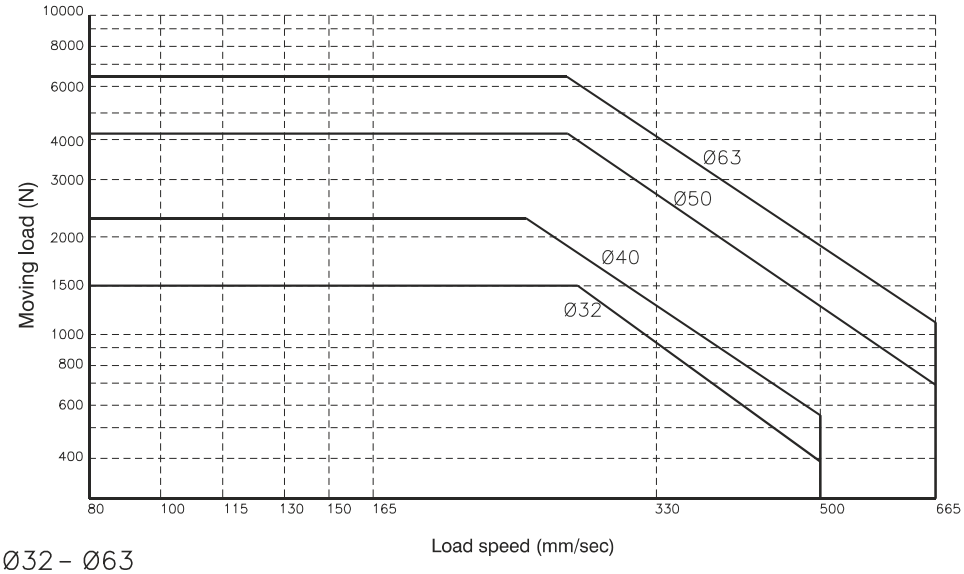
ATTENTION: if H>50 mm use larger bore

Control unit with bronze bushes



Ø12 – Ø25

ATTENTION: use with stroke ≤ 30 mm

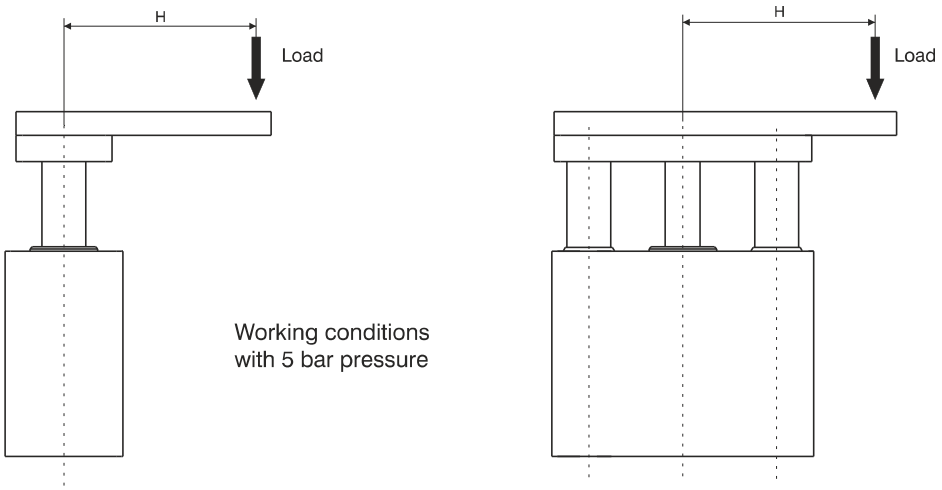


Ø32 – Ø63

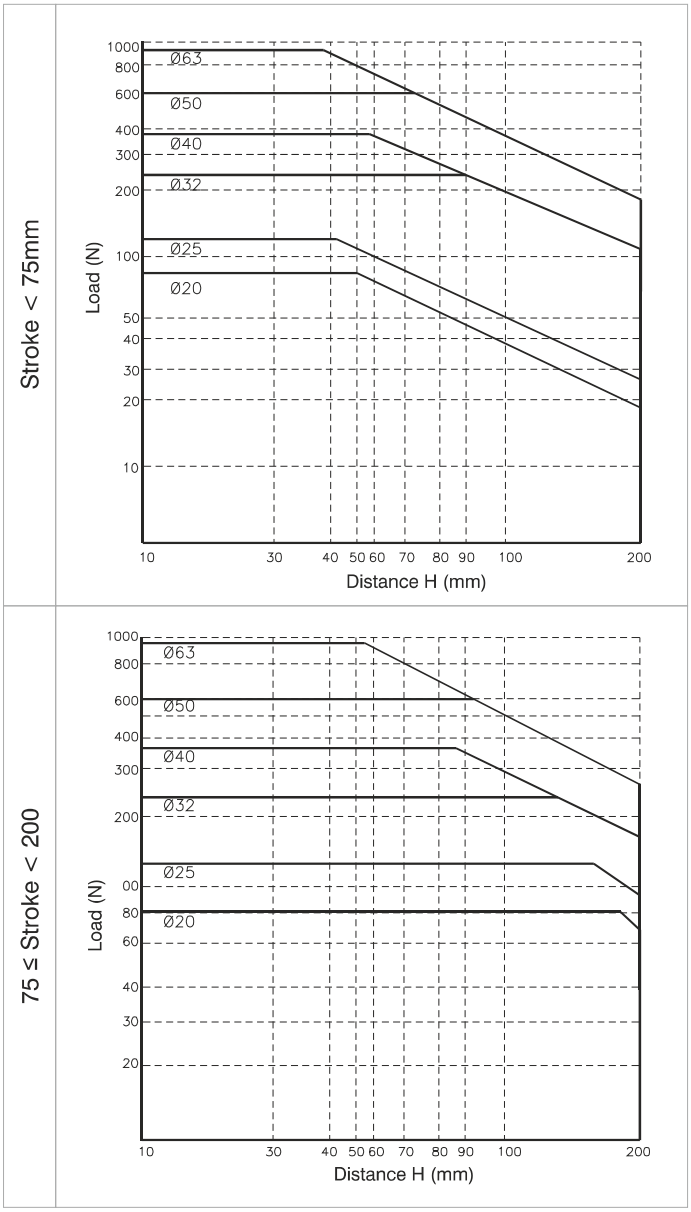
ATTENTION: use with stroke ≤ 50 mm

5

Handling applications

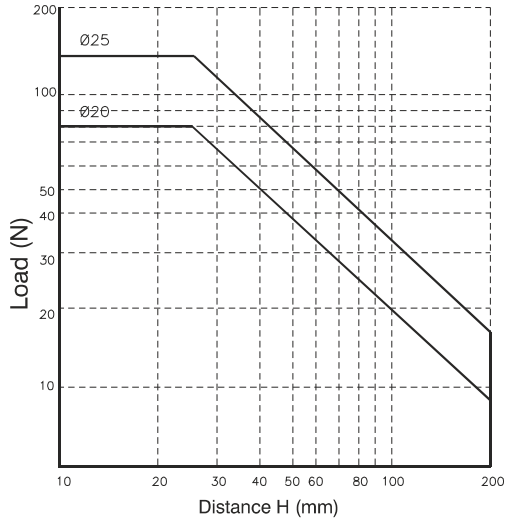
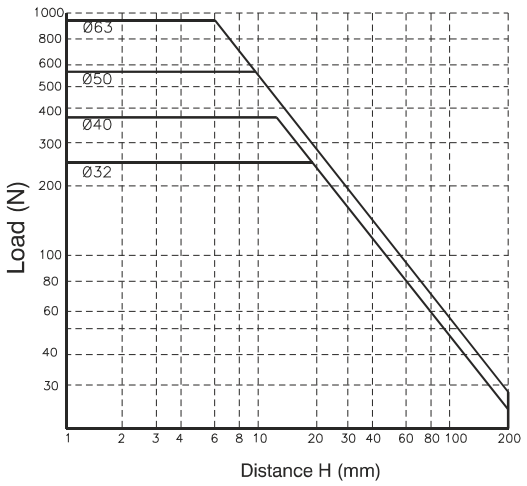
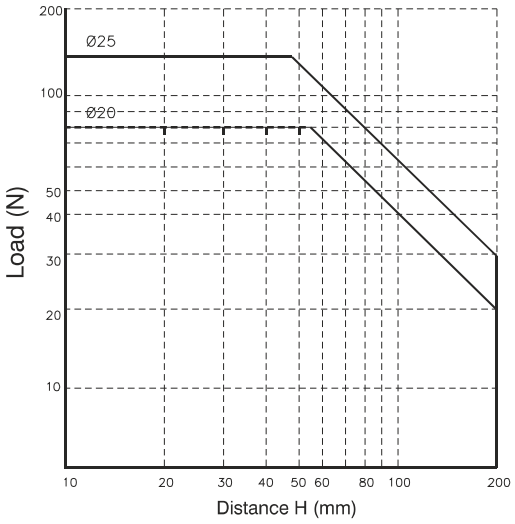
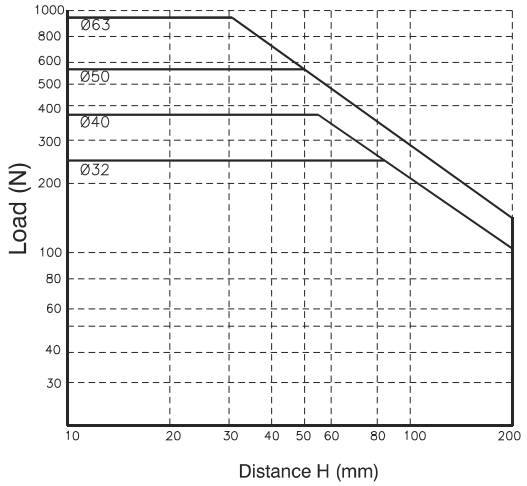
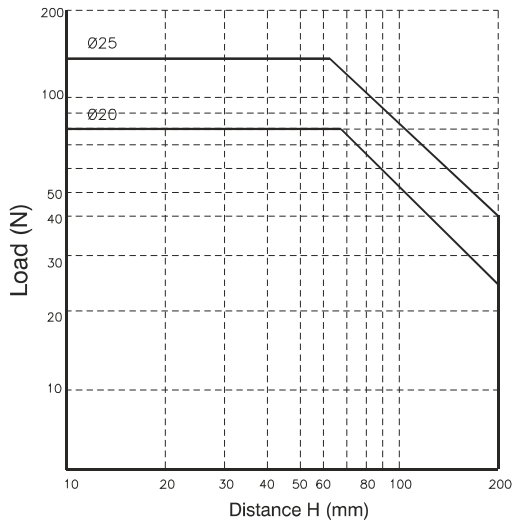
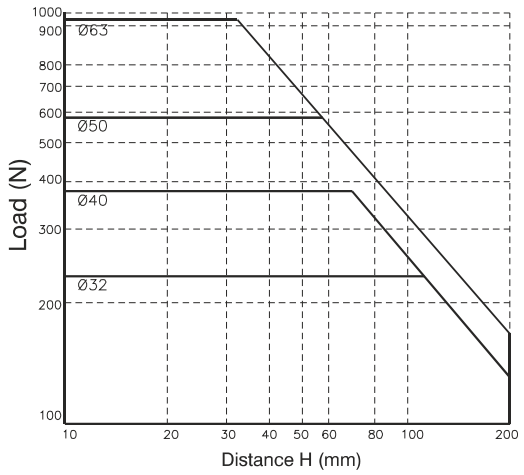


Control unit with bronze bushes



Handling applications

Control unit with bearing bushes

	Ø20 – Ø25		Ø32 - Ø63
Stroke < 40 mm		Stroke < 75 mm	
40 < Stroke < 125 mm		75 < Stroke < 125 mm	
125 ≤ Stroke < 200 mm		125 ≤ Stroke < 200 mm	

Ordering code

6101.80.stroke. B .

Side supply ports closed
L = Top supply ports closed

Construction characteristics

Body	oxidised aluminium
Rods	C43 chromed steel
Piston	aluminium
Piston rod	C43 chromed steel
Piston rod bushing	sintered bronze
Rod bushing	teflon coated bush
End cover / End plate	aluminium
Piston seal	NBR oil-resistant rubber
Piston rod seal	PUR
Plate	anodised aluminium

Technical characteristics

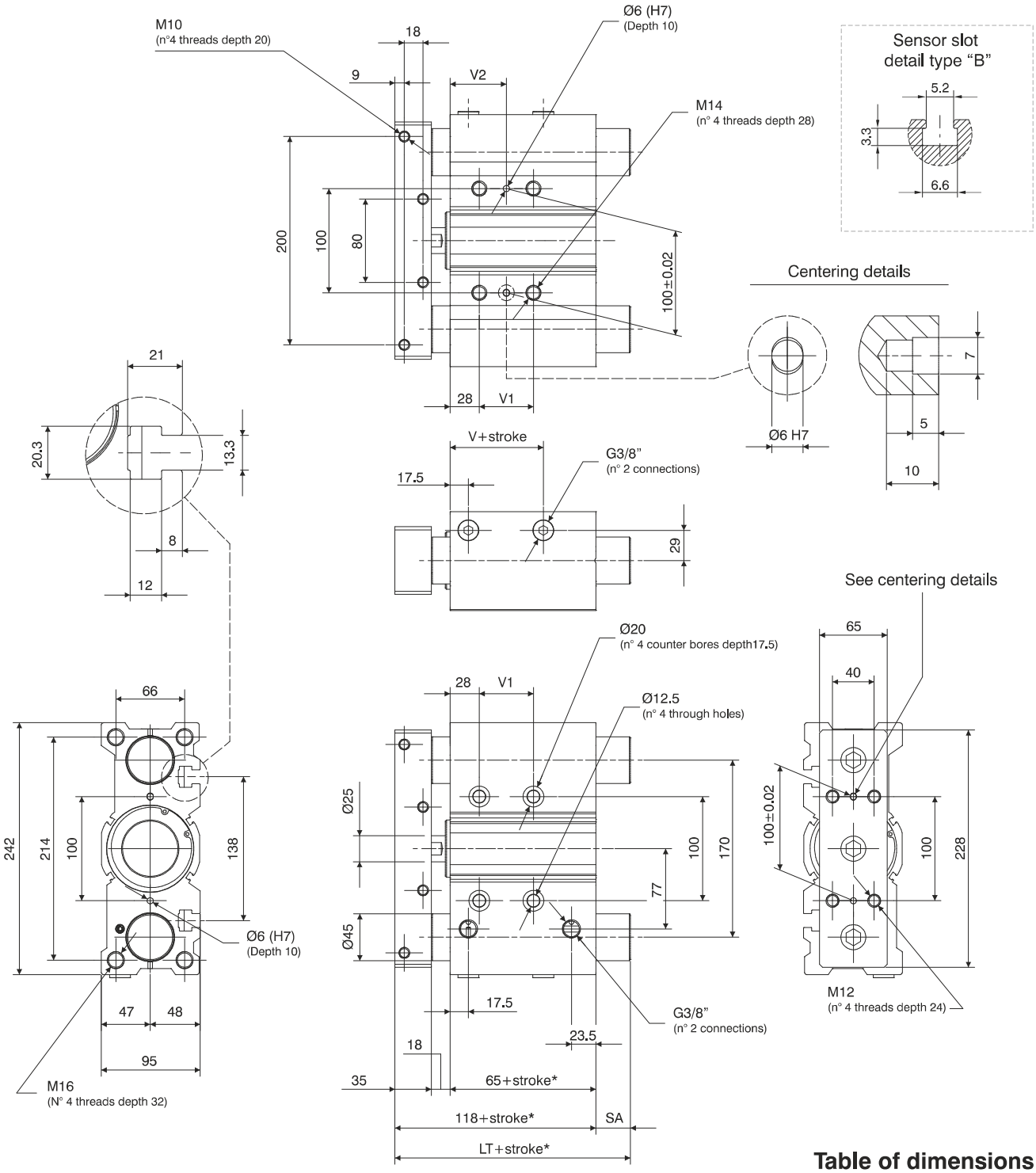
Function	double acting
Fluid	filtered and preferably lubricated air or not (If lubricated the lubrication must be continuous)
Max. pressure	max. 10 bar
Working temperature	-5°C - +70°C
Cushioning	elastic bumper on both ends

Standard strokes

	Stroke							
Bore	25	50	75	100	125	150	175	200
Ø80	●	●	●	●	●	●	●	●

Intermediate strokes can be obtained by adding specific spacers (5, 10, 15, 20mm)
Example: It is possible to obtain a **6101.80.45.B** cylinder from a **6101.80.50.B** cylinder by adding a 5mm spacer (the overall dimension will remain as per the 50mm stroke). The Intermediate strokes manufactured without the use of spacers are considered special executions.

Specifications may be subject to change without prior notice



*Dimensions only refer to the "standard stroke"

Table of dimensions

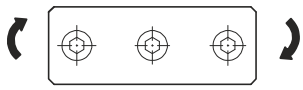
	25	LT	118
stroke	50		118
	> 50		151
		V	14.5
	25	V1	28
	50		52
stroke	75		52
	100		52
	>100		128
	25	V2	42
	50		54
stroke	75		54
	100		54
	>100		92
	25	SA	0
stroke	50		
	> 50		33

Cylinder theoretic force (N)

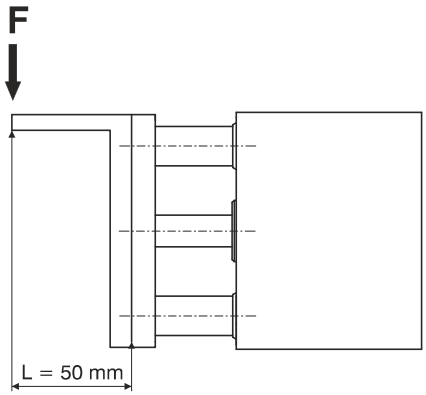
Working pressure		
2 bar	1005	907
3 bar	1508	1361
4 bar	2011	1814
5 bar	2513	2268
6 bar	3016	2721
7 bar	3519	3175
8 bar	4021	3629
9 bar	4524	4082
10 bar	5027	4536
Effective area	out	in
(mm^2)	5027	4536

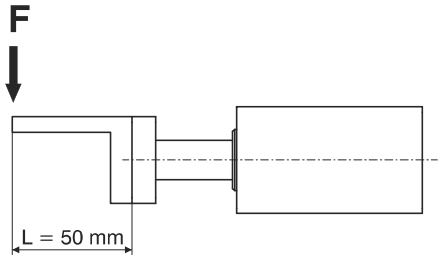
Recommended torque moments

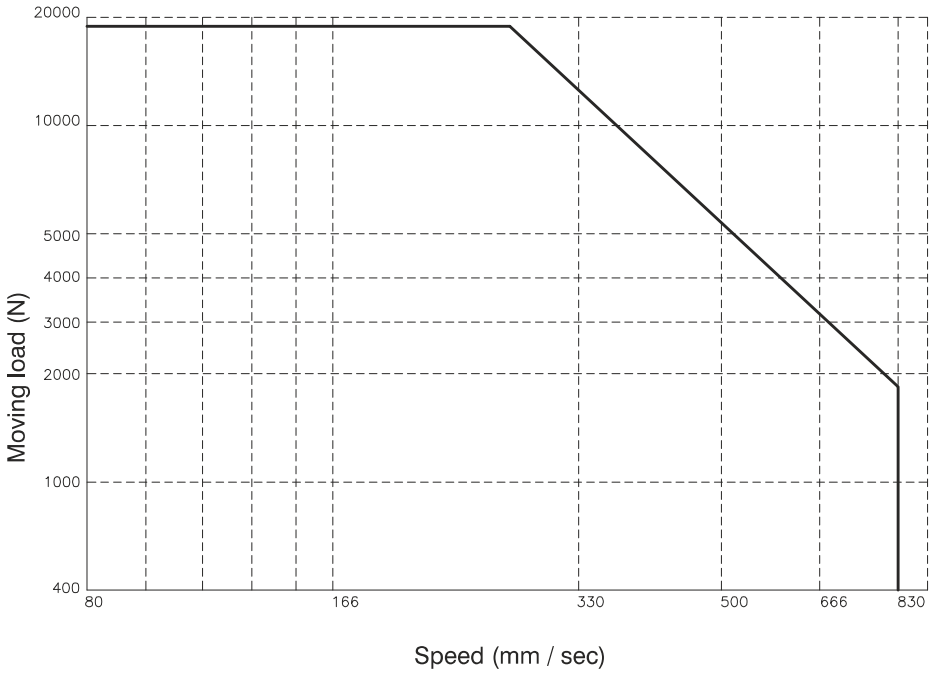
Stroke	N/m
25	49
50	41
75	51
100	45
125	41
150	38
175	35
200	32



"Stopper" device applications



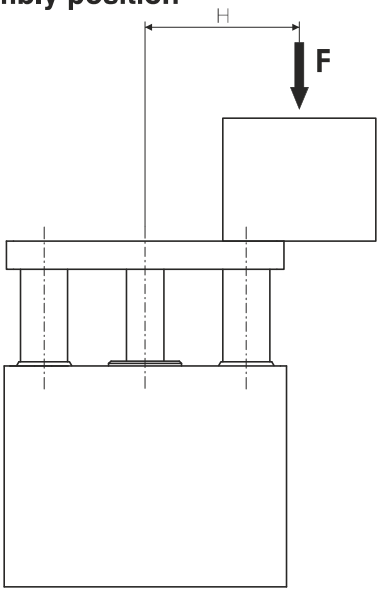




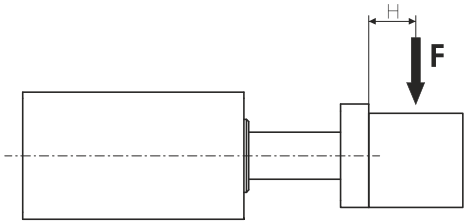
ATTENTION : max stroke 50 mm

Handling applications

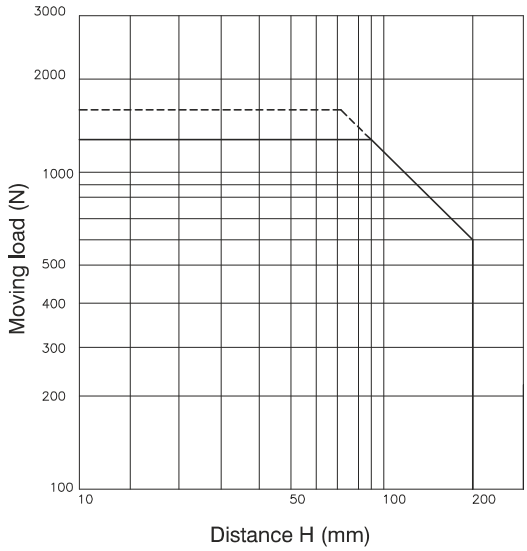
VERTICAL assembly position



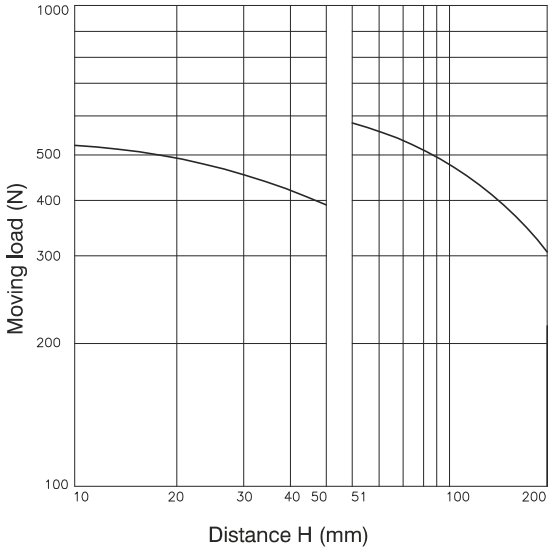
HORIZONTAL assembly position



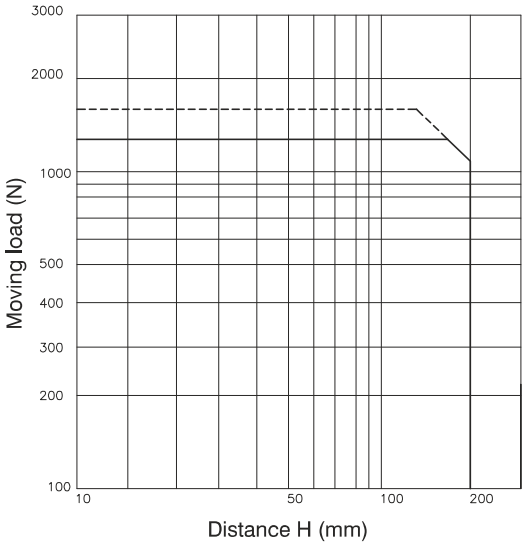
STROKE ≤ 50 mm / V = 200 mm/s



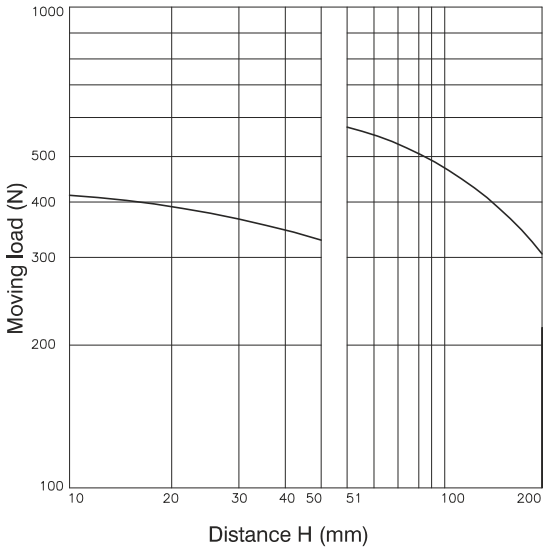
H= 50 mm / V = 200 mm/s



STROKE > 50 mm / V = 200 mm/s



H= 100 mm / V = 200 mm/s



——— Working pressure : 4 bar
- - - - - Working pressure : 5 bar

5