Linear Tables

MOVITEC pneumatic Linear Tables are manufactured in the following configurations:

– **TPP** type in size 150, 200, 250, 300 and 400 with cylinder drive and linear rail guides (standard)
– **TPL** type in size 150, 200, 250, 300 and 400 with cylinder drive and long carriage linear rail guides
– **TPH** type in size 200, 250, 300 and 400 with cylinder drive and heavy load linear rail guides
– **TPR** type in size 150, 200, 250, 300 and 400 with cylinder drive and linear roller guides

Drive

The driving system is provided by a pneumatic cylinder.

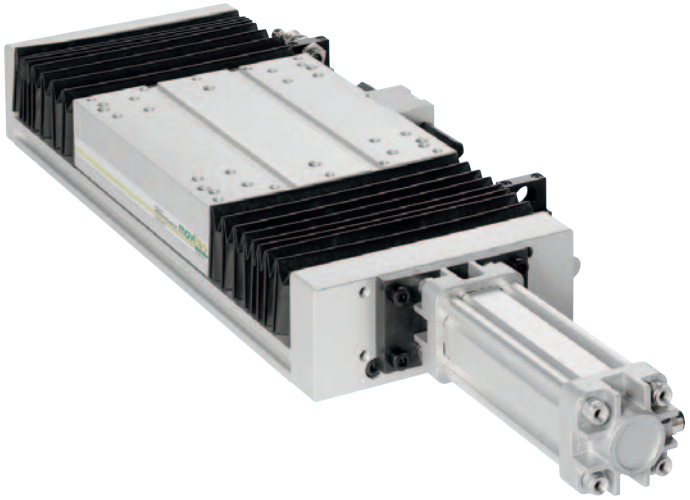
Guiding system

The following guiding systems are available for the TP type:

– **TPP** with linear rail guides (standard)
– **TPL** with long carriage linear rail guides
– **TPH** with heavy load linear rail guides
– **TPR** with linear roller guides

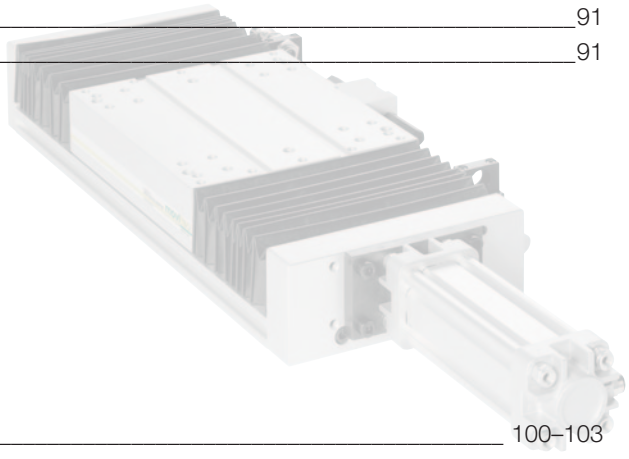
Application

Pneumatic Linear Tables have been developed especially for the automotive and the manufacturing industry. They can be easily combined together or with any other MOVITEC linear system to build multi axis systems.



Product	Linear Tables TP type	TPP	TPL	TPH	TPR
Drive	**P** – Pneumatic cylinder	•	•	•	•
Guide	**P** – Linear rail guides (standard)	•	–	–	–
	L – Long carriage linear rail guides	–	•	–	–
	H – Heavy load linear rail guides	–	–	•	–
	R – Linear roller guides	–	–	–	•
Size	150	•	•	–	•
	200	•	•	•	•
	250	•	•	•	•
	300	•	•	•	•
	400	•	•	•	•
Material	**A** – Aluminium	•	•	•	•
	C – Steel	•	•	•	•
Stroke	[mm]	50–600			
Protection	**S** – Expansion bellows	•	•	•	•
Options	Extra drillings	•	•	•	•
	Lubrication	•	•	•	•
	Limit switches	•	•	•	•
	Damper	•	•	•	•
	Fixing systems	•	•	•	•
	Safety systems	•	•	•	•
	Measuring systems	•	•	•	•

Content TP type



Order code TP type

Example T P P 150 A 0350 S

Product
T = Linear Table

Drive
P = pneumatic cylinder

Guiding system
P = linear rail guides (standard)
L = long carriage linear rail guides
H = heavy load linear rail guides
R = linear roller guides

SIze
150 = profile width 150 mm
200 = profile width 200 mm
250 = profile width 250 mm
300 = profile width 300 mm
400 = profile width 400 mm

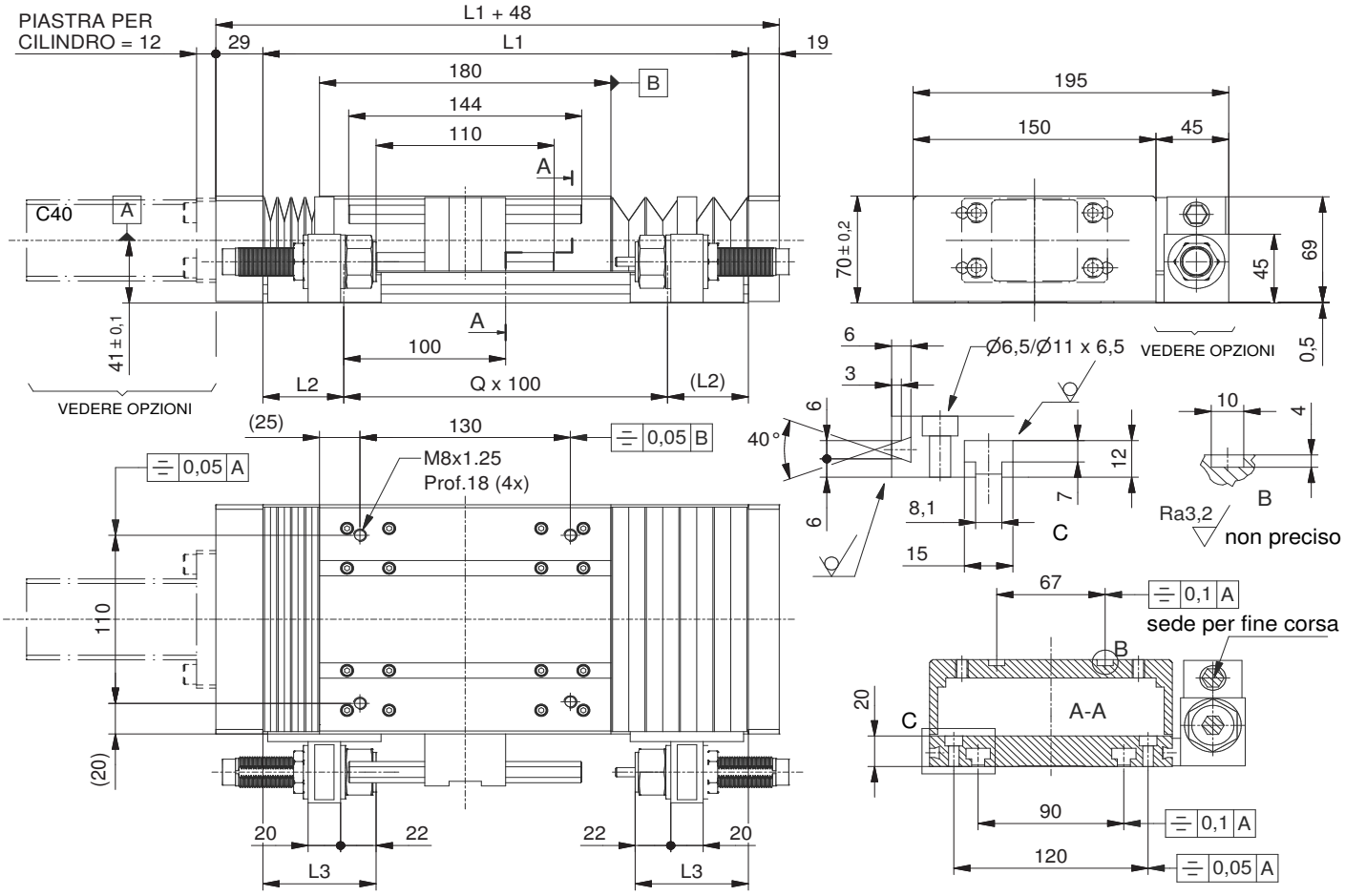
Material
A = aluminium (standard)
C = steel

Stroke [mm]; 0050–0600 (other strokes on request)

Protection
S = expansion bellows (standard; on request equipped with slats in stainless steel)

TP 150 A S · Dimensions / Technical Data

Linear Tables with pneumatic cylinder (TP), size 150, made of aluminium (A)* and with expansion bellows (S)



Dimensions					Entire product (without cylinder)		Carriage (fixed base plate)		Base plate (fixed carriage)	
Stroke s [mm] **	L_1 [mm]	L_2 [mm]	L_3 [mm]	Q [-]	Weight m_t [kg]	Gravity center z_G [mm]	Weight m_c [kg]	Gravity center z_G [mm]	Weight m_b [kg]	Gravity center z_G [mm]
50	300	50	70	2	7.0	33			4.0	22
100	360	30	75	3	7.5	32			4.5	22
150	420	60	80	3	8.1	31			5.1	21
200	480	40	85	4	8.6	30			5.6	21
250	540	70	90	4	9.2	29			6.2	21
300	600	50	95	5	9.7	29	3.0	23	6.7	21
350	660	30	100	6	10.3	28			7.3	20
400	720	60	105	6	10.8	28			7.8	20
450	790	45	115	7	11.4	27			8.4	20
500	850	75	120	7	11.9	27			8.9	20
					$m_t = 0.011 \cdot s + 6.44$		$m_c = 3.0$ kg		$m_b = m_t - m_c$	
Total weight with cylinder C40					$m_t = 0.014 \cdot s + 7.21$					
Total weight with cylinder C50					$m_t = 0.016 \cdot s + 7.65$					

* on request also available in steel (C)

** other strokes on request

For the TP 150 the following pneumatic cylinders are available. Please contact us for drive optimization.

Cylinder ISO 6431 VDMA 24562	Type of force · Advancing x^+ · Retracting x^-	Operating pressure [bar] 4	6	8 Cylinder force [N] 1)	Lead accuracy [mm/300 mm]	Operating temperature [°C]	Air consumption 2) (p = 6 bar and t = 0.5 s) min stroke = 50 Q_{min} [nl/min]	 max stroke = 500 Q_{max} [nl/min]
C40	Advancing force	503	754	1005	± 0.5	–30° / +80°	52.8	528.0
	Retracting force	422	633	844			44.3	443.0
C50	Advancing force	785	1178	1571	± 0.5	–30° / +80°	82.5	825.0
	Retracting force	660	990	1320			69.3	693.0

1) **Cylinder force**

Advancing force (x^+) and retracting force (x^-) can be calculated as follows:

Advancing force (x^+) $F_{x^+} = p \cdot \pi \cdot D^2 / 4$ [N]

Retracting force (x^-) $F_{x^-} = p \cdot \pi \cdot (D^2 - d^2) / 4$ [N]

2) **Air consumption**

Air consumption depends on pressure, operating time and stroke and influences the operating cost.

Average air consumption can be calculated as follows:

$Q = 150 \cdot 10^{-7} \cdot \pi \cdot (D^2 - d^2) \cdot s \cdot (p + p_0) / (p_0 \cdot t)$ [nl/min]

Cylinder weight

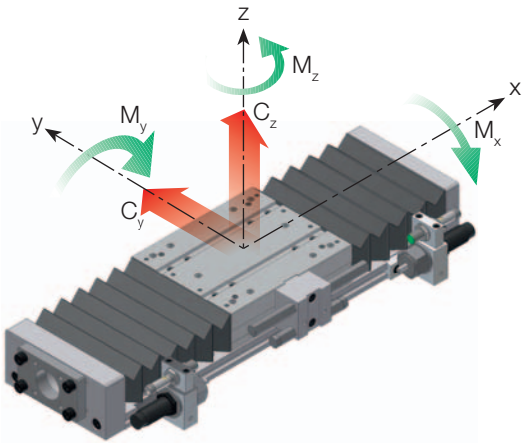
C40: $m = 3{,}24 \cdot 10^{-3} \cdot s + 0{,}77$ [kg]

C50: $m = 4{,}75 \cdot 10^{-3} \cdot s + 1{,}21$ [kg]

Legend:

D = nominal cylinder diameter [m]
d = piston rod diameter [m]
s = stroke [m]
t = stroke time [s]
p = operating pressure [N/m^2]
p_0 = conversion = 1 bar = 10^5 N/m^2
F = force [N]
Q = air consumption [nl/min]
m = weight [kg]

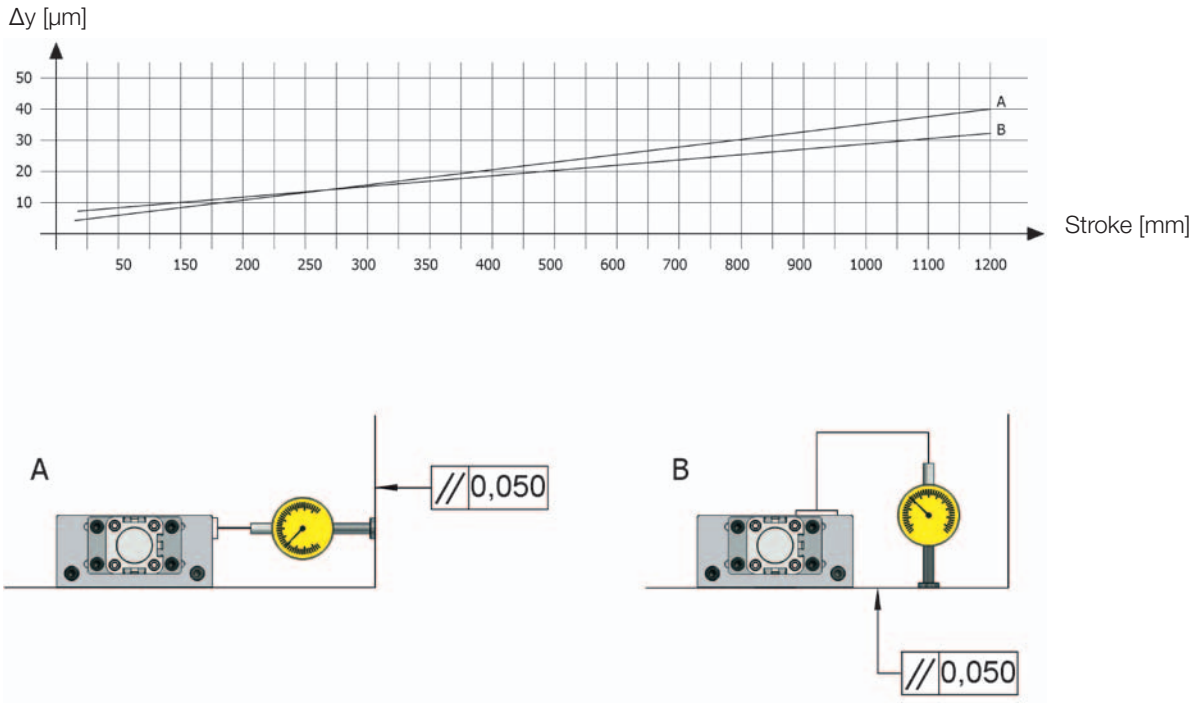
Load Rates and Torque



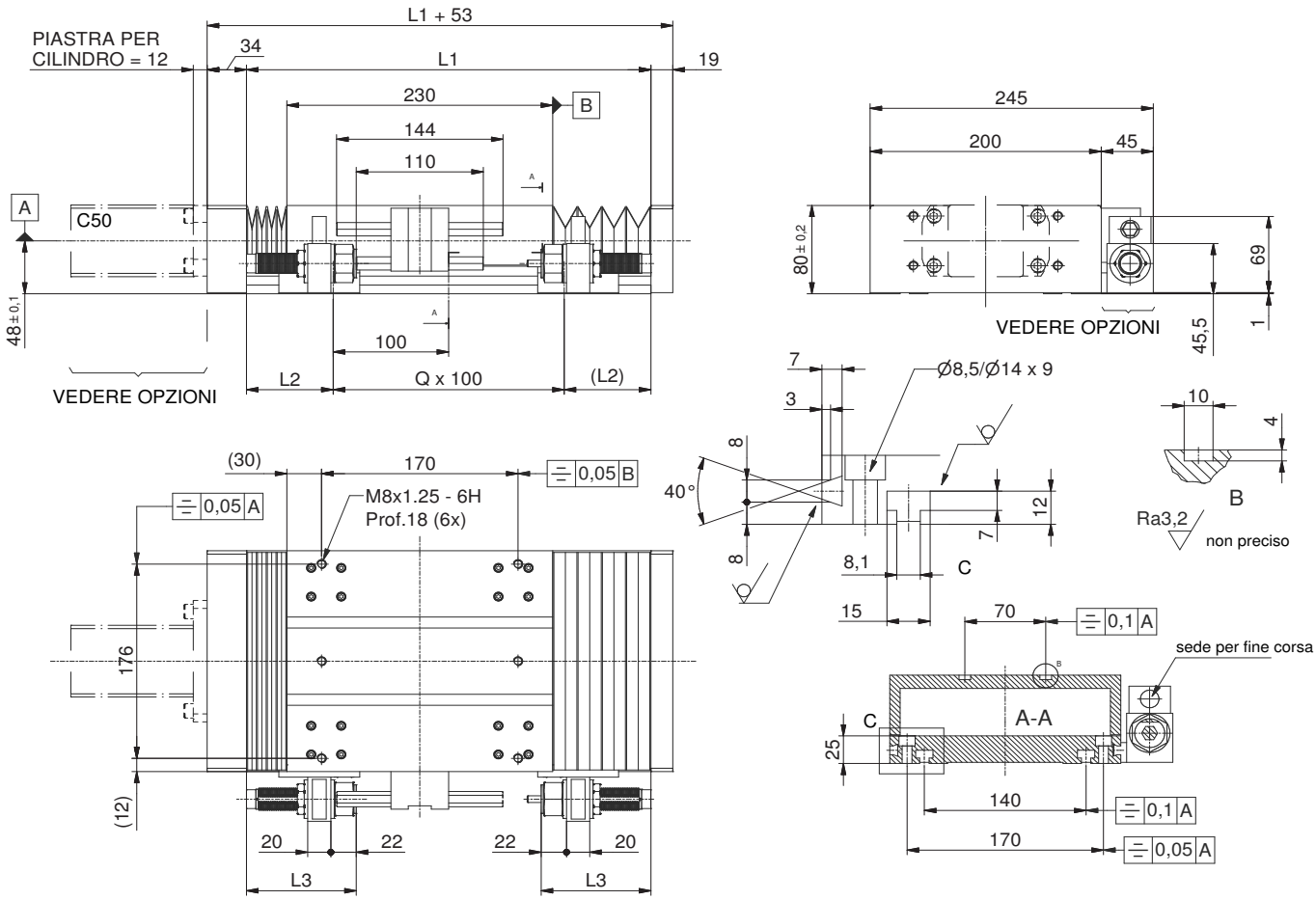
Guiding System	Safety factor s	Load rates [N] C_y dyn.	C_y stat.	C_z- dyn.	C_z- stat.	C_z+ dyn.	C_z+ stat.	Torque [Nm] M_x dyn.	M_x stat.	M_y dyn.	M_y stat.	M_z dyn.	M_z stat.
TP**P** – linear rail guides	10	1910	2348	3056	3756	3056	3756	143	175	184	226	138	170
	5	3820	4695	6112	7512	6112	7512	285	350	367	451	276	339
TP**L** – long carriage linear rail guides	10	2335	3125	3736	5000	3736	5000	174	233	191	255	143	192
	5	4670	6250	7472	10000	7472	10000	348	465	382	510	286	383
TP**R** – linear roller guides	10	2875	5000	4600	8000	4600	8000	214	372	276	480	207	360
	5	5750	10000	9200	16000	9200	16000	428	744	552	960	414	720

values valid for standard carriage length = 180 mm

Accuracy



Linear Tables with pneumatic cylinder (TP), size 200, made of aluminium (A)* and with expansion bellows (S)



Dimensions					Entire product (without cylinder)		Carriage (fixed base plate)		Base plate (fixed carriage)	
Stroke s [mm] **	L_1 [mm]	L_2 [mm]	L_3 [mm]	Q [-]	Weight m_t [kg]	Gravity center z_G [mm]	Weight m_c [kg]	Gravity center z_G [mm]	Weight m_b [kg]	Gravity center z_G [mm]
50	350	75	95	2	14.0	39			8.1	28
100	410	55	100	3	15.1	38			9.2	28
150	470	35	105	4	16.1	37			10.2	28
200	530	65	110	4	17.2	37			11.3	27
250	590	45	115	5	18.2	36			12.3	27
300	650	75	120	5	19.2	35	5.9	25	13.3	27
350	710	55	125	6	20.3	34			14.4	27
400	770	35	130	7	21.3	34			15.4	27
450	830	65	135	7	22.4	34			16.5	27
500	890	45	140	8	23.4	33			17.5	26
					$m_t = 0.021 \cdot s + 12.975$		$m_c = 5.9$ kg		$m_b = m_t - m_c$	
				Total weight with cylinder C50	$m_t = 0.026 \cdot s + 14.185$					
				Total weight with cylinder C63	$m_t = 0.027 \cdot s + 14.715$					

* on request also available in steel (C)

** other strokes on request

For the TP 200 the following pneumatic cylinders are available. Please contact us for drive optimization.

Cylinder ISO 6431 VDMA 24562	Type of force · Advancing x^+ · Retracting x^-	Operating pressure [bar] 4 6 8 Cylinder force [N] [1]			Lead accuracy [mm/300 mm]	Operating temperature [°C]	Air consumption [2] (p = 6 bar and t = 0.5 s) min stroke = 50 Q_{min} [nl/min]	 max stroke = 500 Q_{max} [nl/min]
C50	Advancing force	785	1178	1571	± 0.5	–30° / +80°	82.5	825.0
	Retracting force	660	990	1320			69.3	693.0
C63	Advancing force	1247	1870	2494	± 0.5	–30° / +80°	130.9	1309.0
	Retracting force	1121	1682	2243			117.7	1177.0

[1] **Cylinder force**

Advancing force (x^+) and retracting force (x^-) can be calculated as follows:

Advancing force (x^+) $F_{x^+} = p \cdot \pi \cdot D^2 / 4$ [N]

Retracting force (x^-) $F_{x^-} = p \cdot \pi \cdot (D^2 - d^2) / 4$ [N]

[2] **Air consumption**

Air consumption depends on pressure, operating time and stroke and influences the operating cost.

Average air consumption can be calculated as follows:

$Q = 150 \cdot 10^{-7} \cdot \pi \cdot (D^2 - d^2) \cdot s \cdot (p + p_0) / (p_0 \cdot t)$ [nl/min]

Cylinder weight

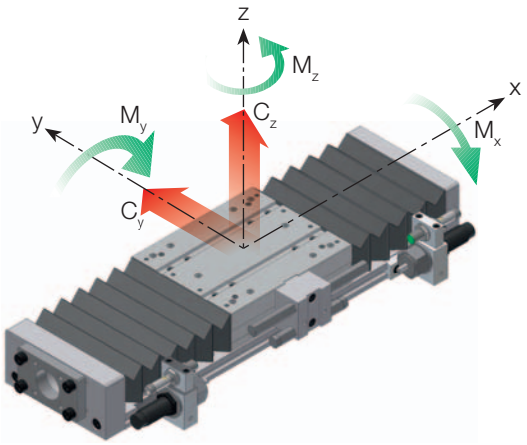
C40: $m = 3{,}24 \cdot 10^{-3} \cdot s + 0{,}77$ [kg]

C50: $m = 4{,}75 \cdot 10^{-3} \cdot s + 1{,}21$ [kg]

Legend:

- D = nominal cylinder diameter [m]
- d = piston rod diameter [m]
- s = stroke [m]
- t = stroke time [s]
- p = operating pressure [N/m^2]
- p_0 = conversion = 1 bar = 10^5 N/m^2
- F = force [N]
- Q = air consumption [nl/min]
- m = weight [kg]

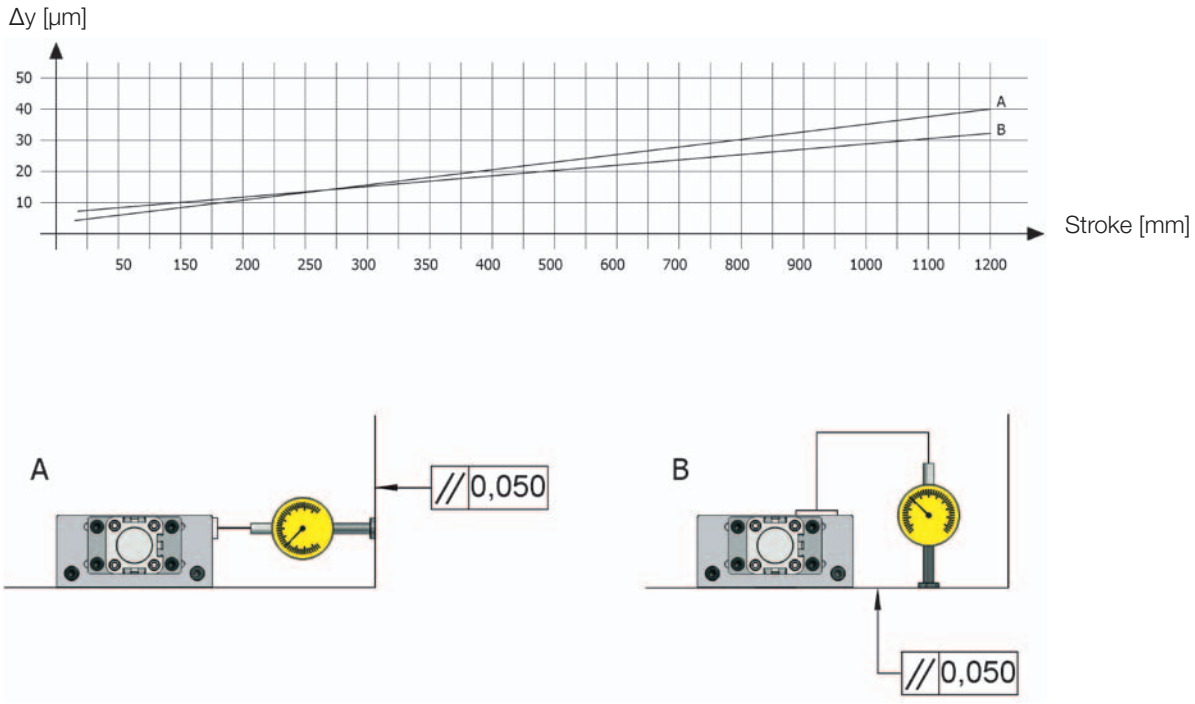
Load Rates and Torque



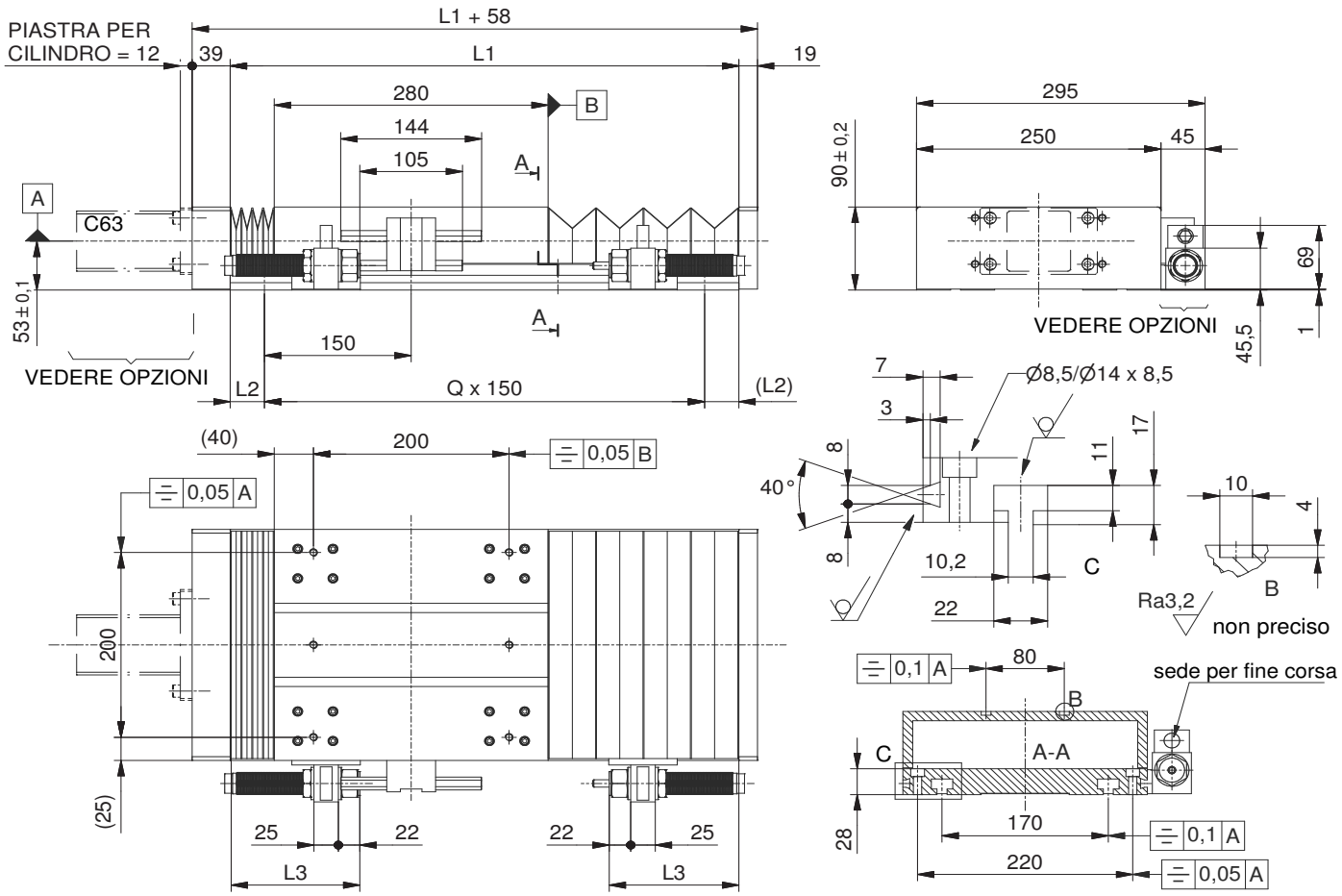
Guiding System	Safety factor s	Load rates [N] C_y dyn.	C_y stat.	C_z- dyn.	C_z- stat.	C_z+ dyn.	C_z+ stat.	Torque [Nm] M_x dyn.	M_x stat.	M_y dyn.	M_y stat.	M_z dyn.	M_z stat.
TP**P** – linear rail guides	10	2900	3350	4640	5360	4640	5360	332	383	376	434	282	326
	5	5800	6700	9280	10720	9280	10720	664	766	752	868	564	652
TP**L** – long carriage linear rail guides	10	2335	3125	3736	5000	3736	5000	268	358	273	365	205	274
	5	4670	6250	7472	10000	7472	10000	535	715	546	730	410	548
TP**H** – heavy load linear rail guides	10	4525	5275	7240	8440	7240	8440	486	566	551	642	413	482
	5	9050	10550	14480	16880	14480	16880	971	1131	1101	1283	826	963
TP**R** – linear roller guides	10	2875	5000	4600	8000	4600	8000	329	572	373	648	280	486
	5	5750	10000	9200	16000	9200	16000	658	1144	746	1296	559	972

values valid for standard carriage length = 230 mm

Accuracy



Linear Tables with pneumatic cylinder (TP), size 250, made of aluminium (A)* and with expansion bellows (S)



Dimensions					Entire product (without cylinder)		Carriage (fixed base plate)		Base plate (fixed carriage)	
Stroke s [mm] **	L_1 [mm]	L_2 [mm]	L_3 [mm]	Q [-]	Weight m_t [kg]	Gravity center z_G [mm]	Weight m_c [kg]	Gravity center z_G [mm]	Weight m_b [kg]	Gravity center z_G [mm]
50	400	50	122.5	2	21.2	44			11.6	31
100	460	80	127.5	2	22.5	44			12.9	31
150	520	35	132.5	3	23.8	43			14.2	30
200	580	65	137.5	3	25.0	42			15.4	30
250	640	95	142.5	3	26.3	42			16.7	30
300	700	50	147.5	4	27.6	41	9.6	27	18.0	29
350	760	80	152.5	4	28.9	40			19.3	29
400	820	35	157.5	5	30.1	40			20.5	29
450	890	70	167.5	5	31.4	39			21.8	28
500	950	100	172.5	5	32.7	39			23.1	28
					$m_t = 0.0254 \cdot s + 19.968$		$m_c = 9.6$ kg		$m_b = m_t - m_c$	
			Total weight with cylinder C63		$m_t = 0.031 \cdot s + 21.71$					
			Total weight with cylinder C80		$m_t = 0.034 \cdot s + 22.71$					

* on request also available in steel (C)

** other strokes on request

For the TP 250 the following pneumatic cylinders are available. Please contact us for drive optimization.

Cylinder ISO 6431 VDMA 24562	Type of force · Advancing x^+ · Retracting x^-	Operating pressure [bar] 4 6 8 Cylinder force [N] 1)			Lead accuracy [mm/300 mm]	Operating temperature [°C]	Air consumption 2) (p = 6 bar and t = 0.5 s) min stroke = 50 Q_{min} [nl/min]	 max stroke = 500 Q_{max} [nl/min]
C63	Advancing force	1247	1870	2494	± 0,5	–30° / +80°	130.9	1309.0
	Retracting force	1121	1682	2243			117.7	1177.0
C80	Advancing force	2011	3016	4021	± 0,5	–30° / +80°	211.1	2111.0
	Retracting force	1814	2721	3629			190.5	1905.0

1) **Cylinder force**

Advancing force (x^+) and retracting force (x^-) can be calculated as follows:

Advancing force (x^+) $F_{x^+} = p \cdot \pi \cdot D^2 / 4$ [N]

Retracting force (x^-) $F_{x^-} = p \cdot \pi \cdot (D^2 - d^2) / 4$ [N]

2) **Air consumption**

Air consumption depends on pressure, operating time and stroke and influences the operating cost.

Average air consumption can be calculated as follows:

$Q = 150 \cdot 10^{-7} \cdot \pi \cdot (D^2 - d^2) \cdot s \cdot (p + p_0) / (p_0 \cdot t)$ [nl/min]

Cylinder weight

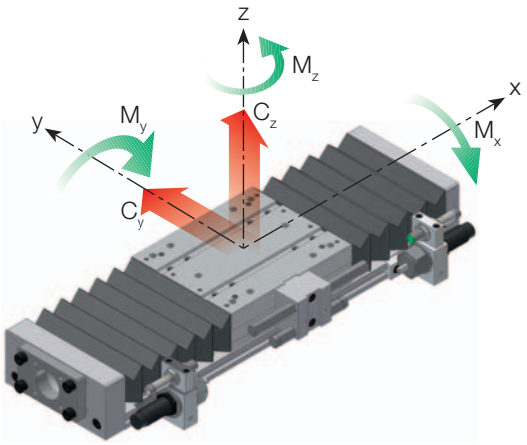
C40: $m = 3{,}24 \cdot 10^{-3} \cdot s + 0{,}77$ [kg]

C50: $m = 4{,}75 \cdot 10^{-3} \cdot s + 1{,}21$ [kg]

Legend:

- D = nominal cylinder diameter [m]
- d = piston rod diameter [m]
- s = stroke [m]
- t = stroke time [s]
- p = operating pressure [N/m^2]
- p_0 = conversion = 1 bar = 10^5 N/m^2
- F = force [N]
- Q = air consumption [nl/min]
- m = weight [kg]

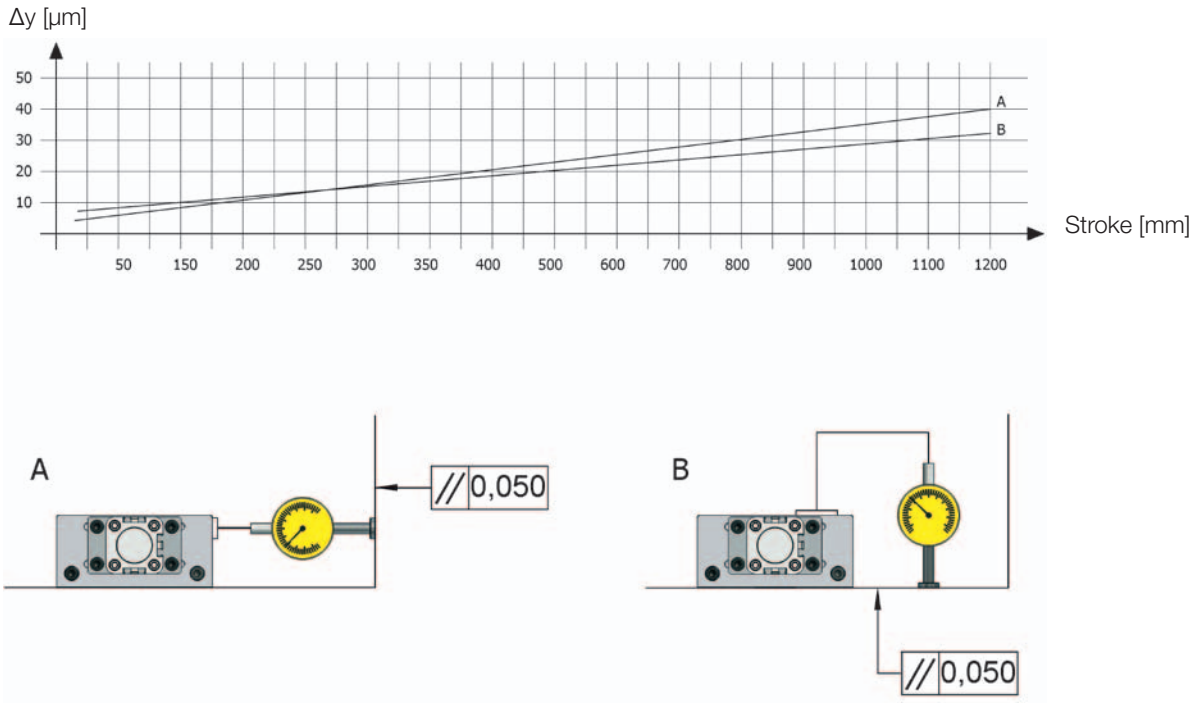
Load Rates and Torque



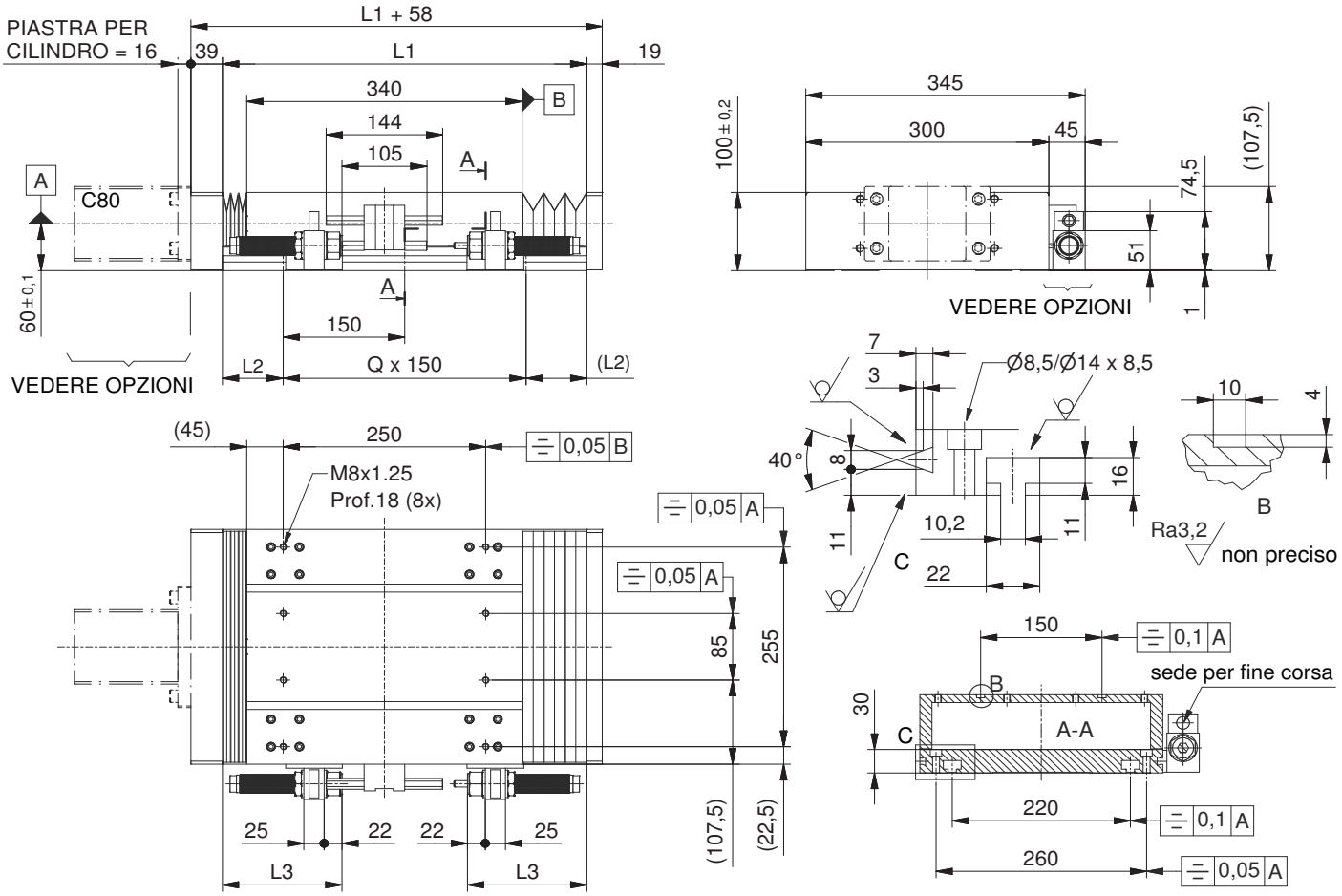
Guiding System	Safety factor s	Load rates [N] C_y dyn.	stat.	C_z- dyn.	stat.	C_z+ dyn.	stat.	Torque [Nm] M_x dyn.	stat.	M_y dyn.	stat.	M_z dyn.	stat.
TP**P** – linear rail guides	10	4525	5275	7240	8440	7240	8440	637	743	710	827	532	620
	5	9050	10550	14480	16880	14480	16880	1274	1486	1420	1654	1064	1240
TP**L** – long carriage linear rail guides	10	6026	7925	9640	12680	9640	12680	849	1116	801	1053	601	790
	5	12052	15850	19280	25360	19280	25360	1698	2232	1602	2106	1202	1580
TP**H** – heavy load linear rail guides	10	6300	7200	10080	11520	10080	11520	872	997	913	1043	685	782
	5	12600	14400	20160	23040	20160	23040	1744	1994	1826	2086	1370	1564
TP**R** – linear roller guides	10	5850	10675	9360	17080	9360	17080	824	1504	918	1674	688	1256
	5	11700	21350	18720	34160	18720	34160	1648	3008	1836	3348	1376	2512

values valid for standard carriage length = 280 mm

Accuracy



Linear Tables with pneumatic cylinder (TP), size 300, made of aluminium (A)* and with expansion bellows (S)



Dimensions					Entire product (without cylinder)		Carriage (fixed base plate)		Base plate (fixed carriage)	
Stroke s [mm] **	L_1 [mm]	L_2 [mm]	L_3 [mm]	Q [-]	Weight m_t [kg]	Gravity center z_G [mm]	Weight m_c [kg]	Gravity center z_G [mm]	Weight m_b [kg]	Gravity center z_G [mm]
50	450	75	147.5	2	34.3	48			18.0	34
100	530	40	162.5	3	36.1	48			19.8	34
150	580	65	162.5	3	38.0	48			21.7	34
200	640	95	167.5	3	39.8	47			23.5	33
250	680	40	162.5	4	41.7	47			25.4	33
300	750	75	172.5	4	43.5	46	16.3	31	27.2	32
350	810	105	177.5	4	45.4	46			29.1	32
400	870	60	182.5	5	47.2	45			30.9	32
450	920	85	182.5	5	49.1	45			32.8	32
500	980	40	187.5	6	50.9	44			34.6	32
					$m_t = 0.037 \cdot s + 32.429$		$m_c = 16.3$ kg		$m_b = m_t - m_c$	
				Total weight with cylinder C80	$m_t = 0.046 \cdot s + 35.17$					
				Total weight with cylinder C100	$m_t = 0.047 \cdot s + 36.21$					

* on request also available in steel (C)

** other strokes on request

For the TP 300 the following pneumatic cylinders are available. Please contact us for drive optimization.

Cylinder ISO 6431 VDMA 24562	Type of force · Advancing x^+ · Retracting x^-	Operating pressure [bar] 4 6 8 Cylinder force [N] 1)			Lead accuracy [mm/300 mm]	Operating temperature [°C]	Air consumption 2) (p = 6 bar and t = 0.5 s) min stroke = 50 Q_{min} [nl/min]	 max stroke = 500 Q_{max} [nl/min]
C80	Advancing force	2011	3016	4021	± 0,5	–30° / +80°	211.1	2111.0
	Retracting force	1814	2721	3629			190.5	1905.0
C100	Advancing force	3142	4712	6283	± 0,5	–30° / +80°	329.9	3299.0
	Retracting force	2945	4418	5891			309.3	3093.0

1) **Cylinder force**

Advancing force (x^+) and retracting force (x^-) can be calculated as follows:

Advancing force (x^+) $F_{x^+} = p \cdot \pi \cdot D^2 / 4$ [N]

Retracting force (x^-) $F_{x^-} = p \cdot \pi \cdot (D^2 - d^2) / 4$ [N]

2) **Air consumption**

Air consumption depends on pressure, operating time and stroke and influences the operating cost.

Average air consumption can be calculated as follows:

$Q = 150 \cdot 10^{-7} \cdot \pi \cdot (D^2 - d^2) \cdot s \cdot (p + p_0) / (p_0 \cdot t)$ [nl/min]

Cylinder weight

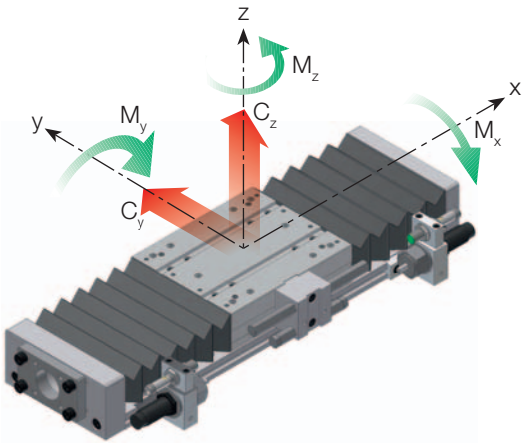
C40: $m = 3{,}24 \cdot 10^{-3} \cdot s + 0{,}77$ [kg]

C50: $m = 4{,}75 \cdot 10^{-3} \cdot s + 1{,}21$ [kg]

Legend:

- D = nominal cylinder diameter [m]
- d = piston rod diameter [m]
- s = stroke [m]
- t = stroke time [s]
- p = operating pressure [N/m^2]
- p_0 = conversion = 1 bar = 10^5 N/m^2
- F = force [N]
- Q = air consumption [nl/min]
- m = weight [kg]

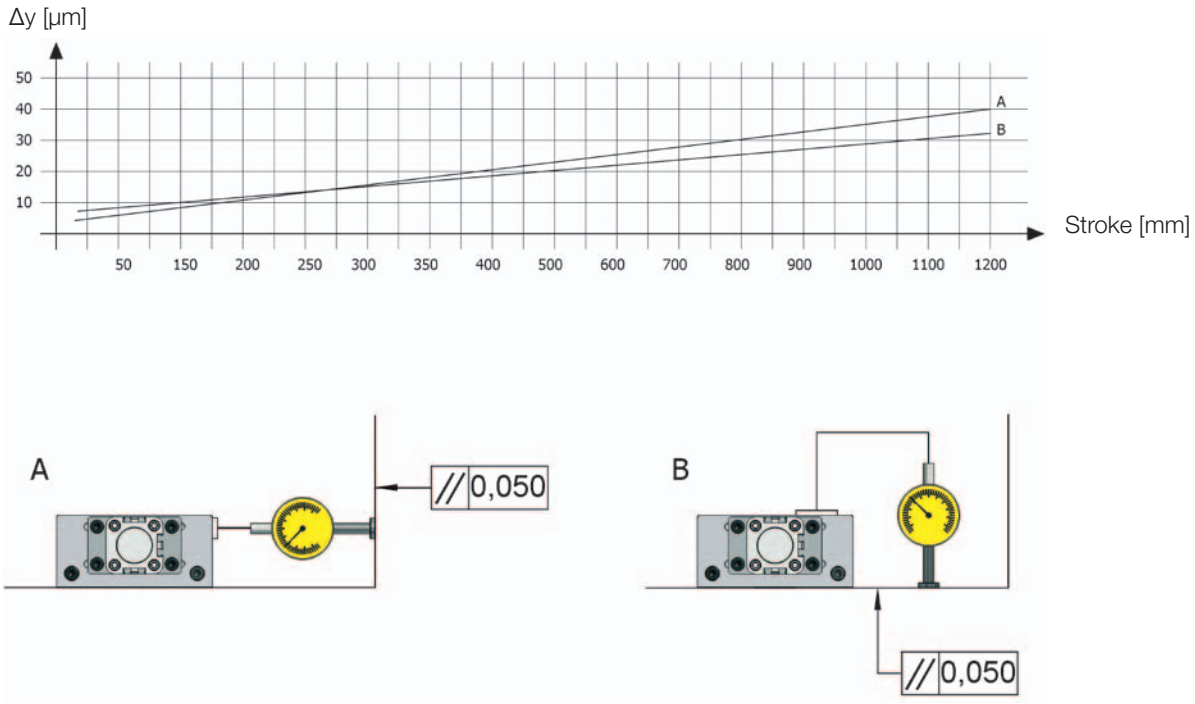
Load Rates and Torque



Guiding System	Safety factor s	Load rates [N] C_y dyn.	C_y stat.	C_z- dyn.	C_z- stat.	C_z+ dyn.	C_z+ stat.	Torque [Nm] M_x dyn.	M_x stat.	M_y dyn.	M_y stat.	M_z dyn.	M_z stat.
TP**P** – linear rail guides	10	6300	7200	10080	11520	10080	11520	1109	1267	1235	1411	926	1058
	5	12600	14400	20160	23040	20160	23040	2218	2534	2470	2822	1852	2116
TP**L** – long carriage linear rail guides	10	7700	9575	12320	15320	12320	15320	1356	1686	1356	1686	1017	1264
	5	15400	19150	24640	30640	24640	30640	2712	3372	2712	3372	2034	2528
TP**H** – heavy load linear rail guides	10	8850	10175	14160	16280	14160	16280	1523	1751	1601	1840	1201	1380
	5	17700	20350	28320	32560	28320	32560	3046	3502	3202	3680	2402	2760
TP**R** – linear roller guides	10	8025	14075	12840	22520	12840	22520	1413	2478	1573	2759	1180	2070
	5	16050	28150	25680	45040	25680	45040	2826	4956	3146	5518	2360	4140

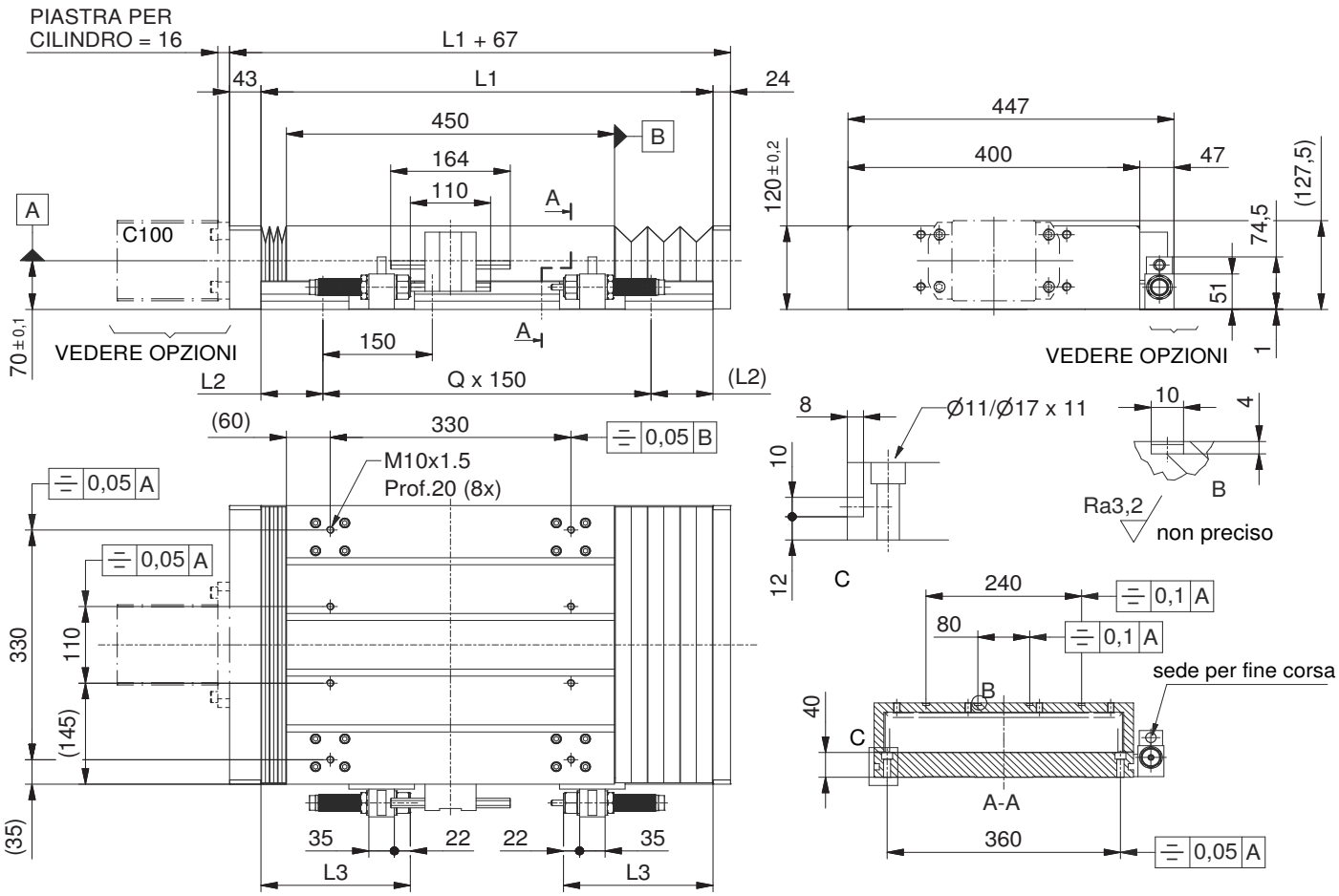
values valid for standard carriage length = 340 mm

Accuracy



TP 400 A S · Dimensions / Technical Data

Linear Tables with pneumatic cylinder (TP), size 400, made of aluminium (A)* and with expansion bellows (S)



Dimensions					Entire product (without cylinder)		Carriage (fixed base plate)		Base plate (fixed carriage)	
Stroke s [mm] **	L_1 [mm]	L_2 [mm]	L_3 [mm]	Q [-]	Weight m_t [kg]	Gravity center z_G [mm]	Weight m_c [kg]	Gravity center z_G [mm]	Weight m_b [kg]	Gravity center z_G [mm]
100	620	85	205	3	81.1	60			48.1	41
150	690	45	217	4	84.7	60			51.7	41
200	760	80	225	4	88.2	59			55.2	40
250	820	110	230	4	91.8	59			58.8	40
300	880	65	237	5	95.4	57			62.4	39
350	950	100	247	5	98.9	57	33.0	35	65.9	39
400	1010	55	250	6	102.5	56			69.5	39
450	1090	95	267	6	106.0	55			73.0	38
500	1130	40	248	7	109.6	54			76.6	38
600	1260	105	277	7	116.7	53			83.7	38
					$m_t = 1.1 \cdot (0.0646 \cdot s + 67.31)$		$m_c = 33.0$ kg		$m_b = m_t - m_c$	
Total weight with cylinder C100					$m_t = 1.1 \cdot (0.075 \cdot s + 71.1)$					
Total weight with cylinder C125					$m_t = 1.1 \cdot (0.079 \cdot s + 73.9)$					

* on request also available in steel (C) ** other strokes on request

For the TP 400 the following pneumatic cylinders are available. Please contact us for drive optimization.

Cylinder ISO 6431 VDMA 24562	Type of force · Advancing x^+ · Retracting x^-	Operating pressure [bar] 4 6 8 Cylinder force [N] 1)			Lead accuracy [mm/300 mm]	Operating temperature [°C]	Air consumption 2) (p = 6 bar and t = 0.5 s) min stroke = 50 Q_{min} [nl/min]	 max stroke = 500 Q_{max} [nl/min]
C100	Advancing force	3142	4712	6283	± 0,5	–30° / +80°	211.1	2111.0
	Retracting force	2945	4418	5891			190.5	1905.0
C125	Advancing force	4909	7363	9818	± 0,5	–30° / +80°	515.4	5154.0
	Retracting force	4712	7069	9425			494.8	4948.0

1) **Cylinder force**

Advancing force (x^+) and retracting force (x^-) can be calculated as follows:

Advancing force (x^+) $F_{x^+} = p \cdot \pi \cdot D^2 / 4$ [N]

Retracting force (x^-) $F_{x^-} = p \cdot \pi \cdot (D^2 - d^2) / 4$ [N]

2) **Air consumption**

Air consumption depends on pressure, operating time and stroke and influences the operating cost.

Average air consumption can be calculated as follows:

$Q = 150 \cdot 10^{-7} \cdot \pi \cdot (D^2 - d^2) \cdot s \cdot (p + p_0) / (p_0 \cdot t)$ [nl/min]

Cylinder weight

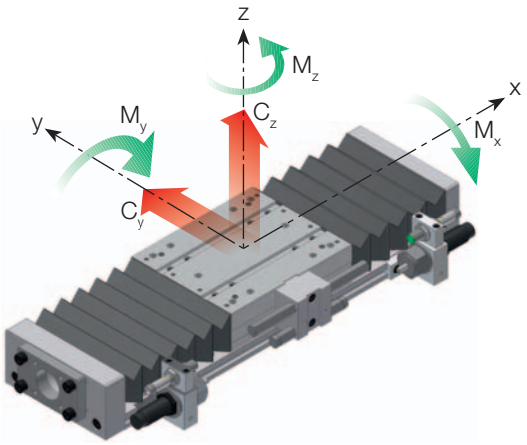
C40: $m = 3{,}24 \cdot 10^{-3} \cdot s + 0{,}77$ [kg]

C50: $m = 4{,}75 \cdot 10^{-3} \cdot s + 1{,}21$ [kg]

Legend:

- D = nominal cylinder diameter [m]
- d = piston rod diameter [m]
- s = stroke [m]
- t = stroke time [s]
- p = operating pressure [N/m^2]
- p_0 = conversion = 1 bar = 10^5 N/m^2
- F = force [N]
- Q = air consumption [nl/min]
- m = weight [kg]

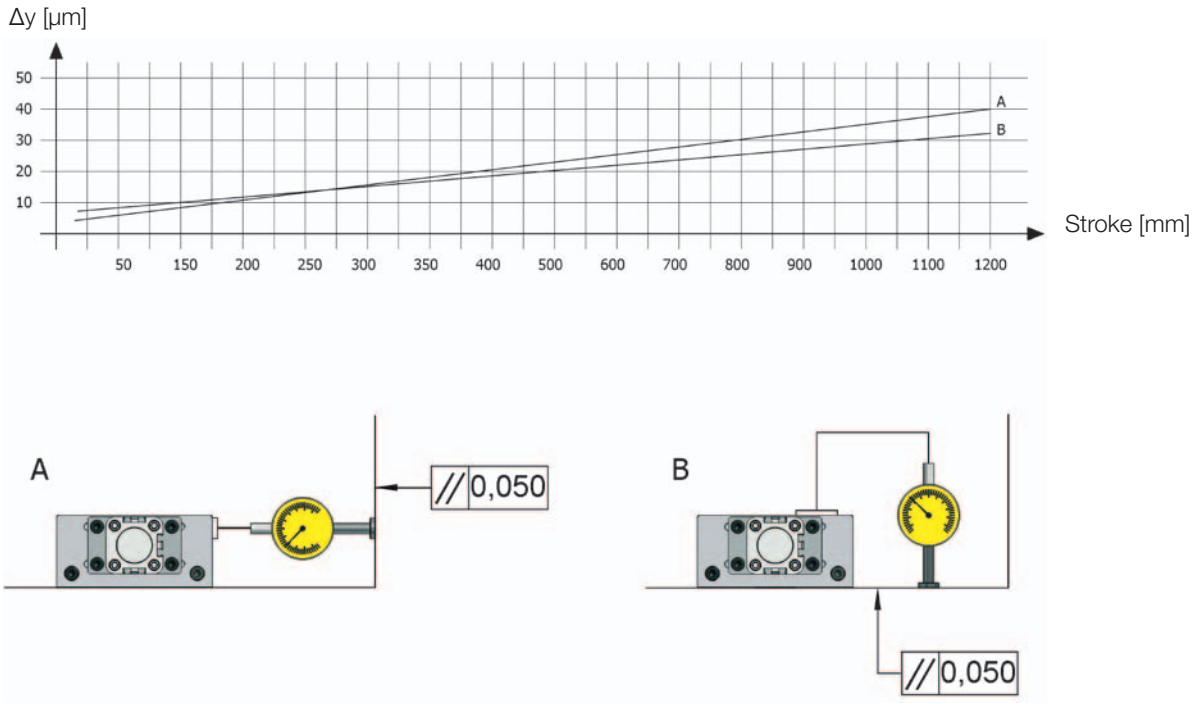
Load Rates and Torque



Guiding System	Safety factor s	Load rates [N] C_y dyn.	C_y stat.	C_z- dyn.	C_z- stat.	C_z+ dyn.	C_z+ stat.	Torque [Nm] M_x dyn.	M_x stat.	M_y dyn.	M_y stat.	M_z dyn.	M_z stat.
TP**P** – linear rail guides	10	8850	10175	14160	16280	14160	16280	2195	2523	2336	2686	1752	2015
	5	17700	20350	28320	32560	28320	32560	4390	5046	4672	5372	3504	4030
TP**L** – long carriage linear rail guides	10	10675	13300	17080	21280	17080	21280	2648	3299	2648	3299	1986	2474
	5	21350	26600	34160	42560	34160	42560	5296	6598	5296	6598	3972	4948
TP**H** – heavy load linear rail guides	10	12175	13425	19480	21480	19480	21480	2971	3276	3117	3437	2338	2578
	5	24350	26850	38960	42960	38960	42960	5942	6552	6234	6874	4676	5156
TP**R** – linear roller guides	10	10850	18600	17360	29760	17360	29760	2691	4613	2865	4911	2149	3683
	5	21700	37200	34720	59520	34720	59520	5382	9226	5730	9822	4298	7366

values valid for standard carriage length = 450 mm

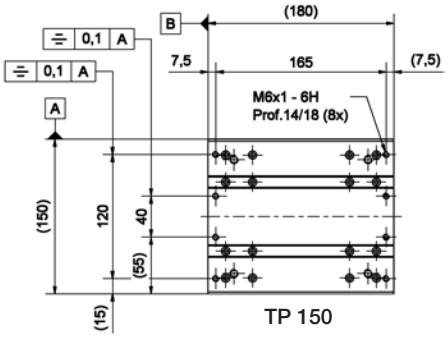
Accuracy



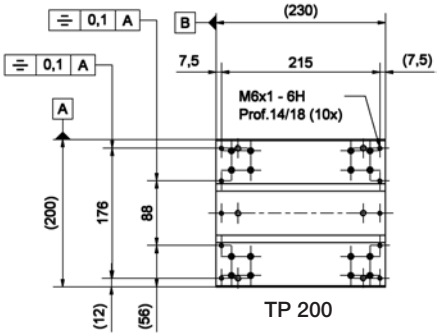
Extra holes on carriage

Carriages of the TP type can be delivered with additional tapping holes on top for X-Y mounting or fixing of other accessories.
For special executions please contact our technical department.

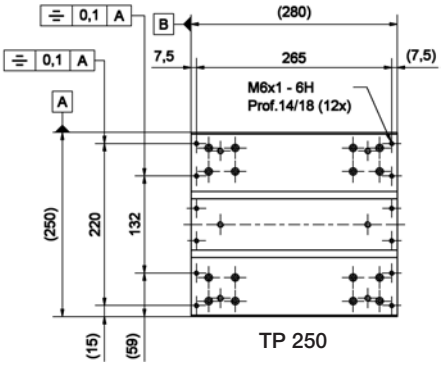
TP size	Tapping hole M x L [mm]
150	M6 x 14
200	M6 x 14
250	M6 x 14
300	M8 x 18
400	M10 x 22



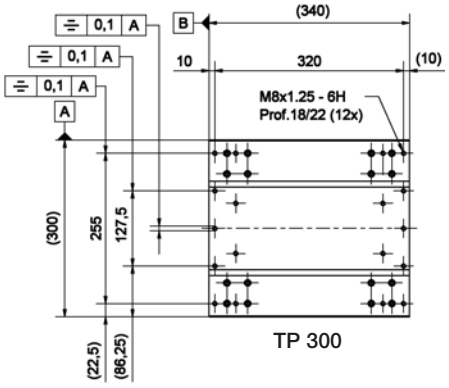
TP 150



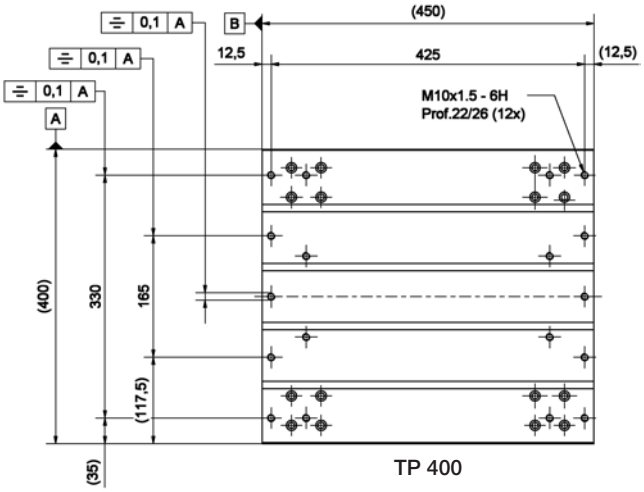
TP 200



TP 250



TP 300

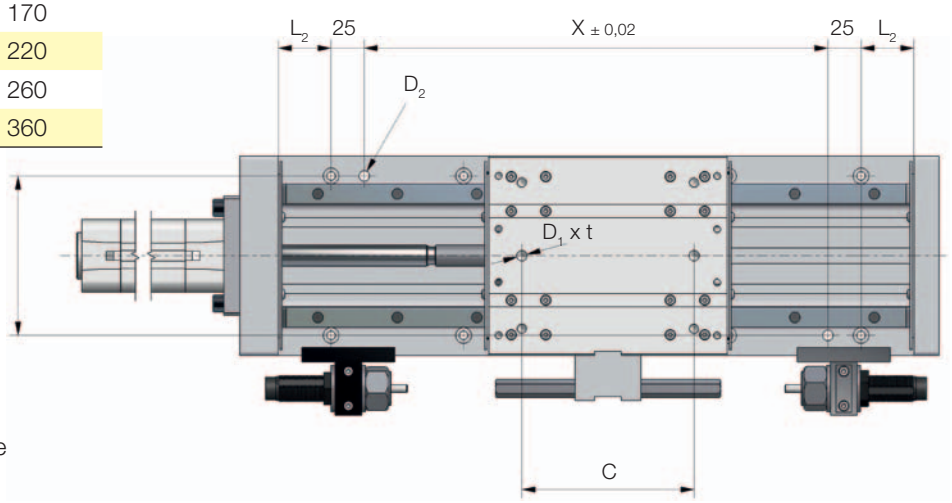


TP 400

Positioning holes

For accurate X-Y mounting or the fixing of accessories the TP Linear Tables are available with additional drill holes on the top of the carriage and on the base plate.

TP size	Carriage		Base plate	
	D_1 x t [mm]	C ± 0,02 [mm]	D_2 [mm]	E ± 0,02 [mm]
150	8 h7 x 15	130	8 h7	120
200	8 h7 x 15	120	8 h7	170
250	8 h7 x 15	150	8 h7	220
300	8 h7 x 15	250	8 h7	260
400	8 h7 x 15	280	8 h7	360

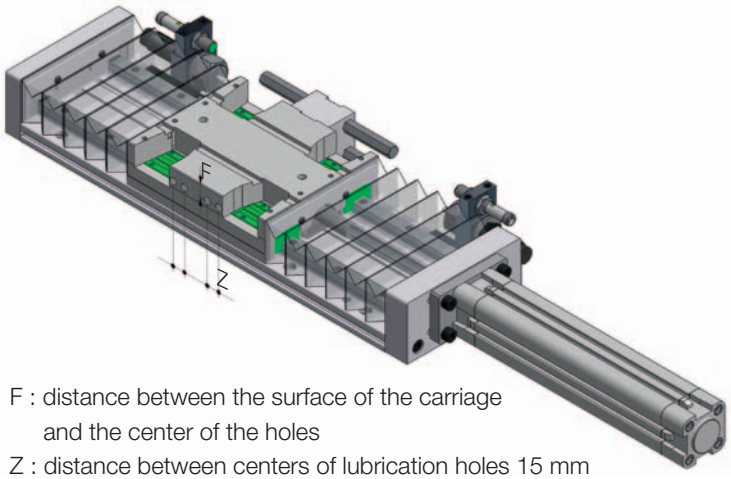


L_2 : see dimensins of corresponding TP size

Lubrication

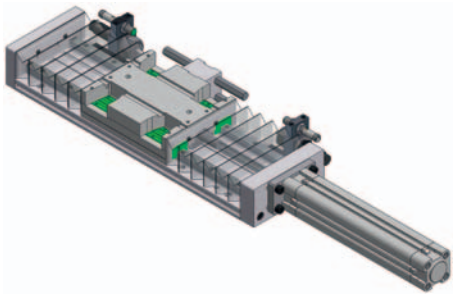
Lubrication holes are provided standard on the left hand side of the carriage. On request it is possible to have them on the right hand side.

TV size	F [mm]	Lubrication hole Ø	Quantity
150	15	1/8”	4x
200	15	1/8”	4x
250	15	1/8”	4x
300	15	1/8”	4x
400	20	1/8”	4x



F : distance between the surface of the carriage and the center of the holes
Z : distance between centers of lubrication holes 15 mm

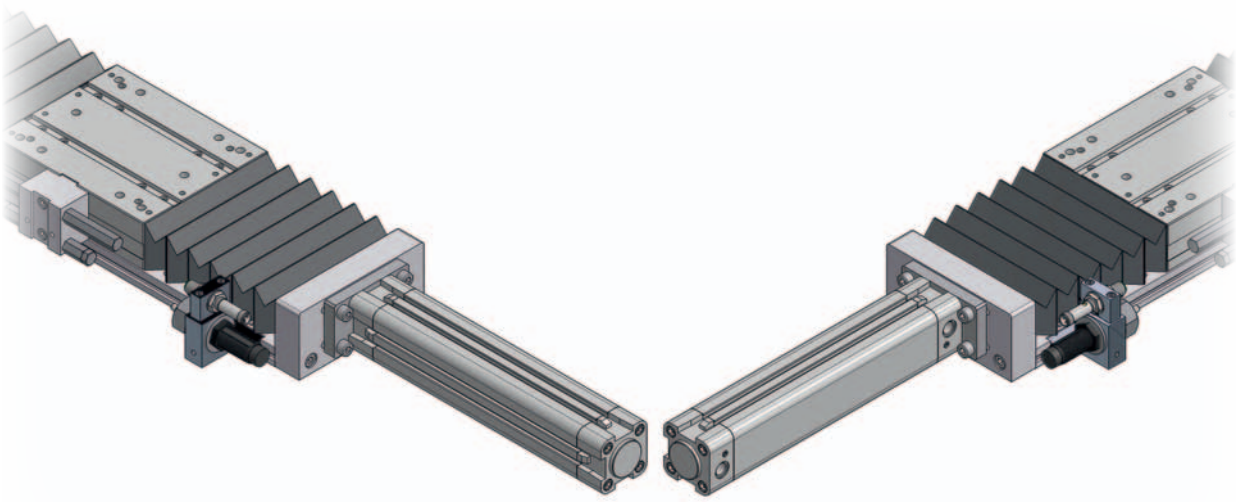
Ord. code	Description
L4S	4 lub. holes on the **right** hand side
L4D	4 lub. holes on the **left** hand side



Linear Tables without lubrication holes but with “self-lubricating” linear rail guides (KK0).

Limit switches

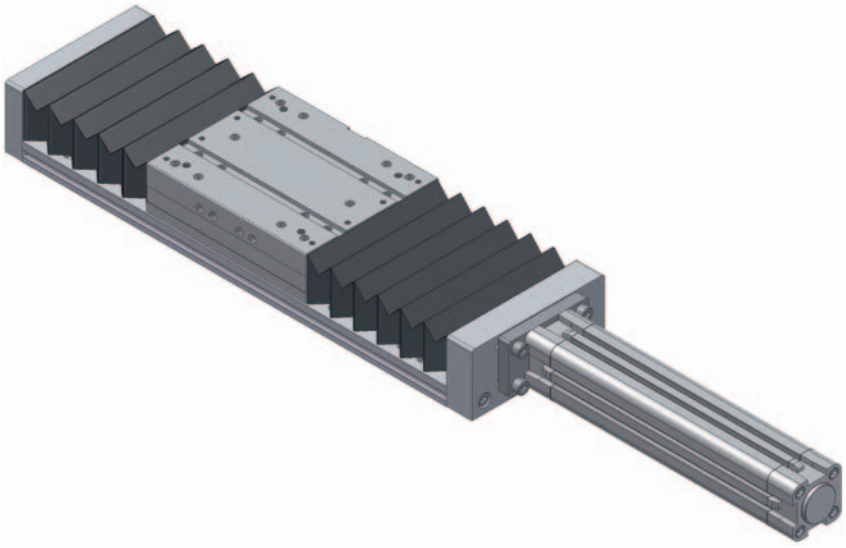
The round limit switches are integrated into the buffers. These are mounted standard on the right hand side (left hand side on request).



Config. without pin connector		Inductive limit switches
Order code for limit switches on the		
right side (DX)	left side (SX)	
FC2	FC4	2x PNP-NC
FE2	FE4	1x PNP-NO

Configuration without limit switches and buffers

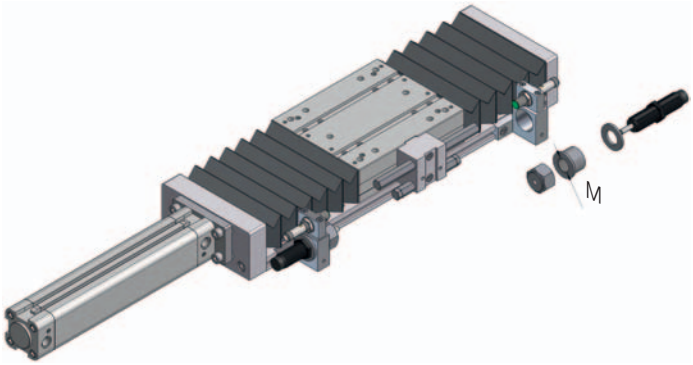
TP Linear Tables are also available in a basic configuration without limit switches and buffers.



Buffer

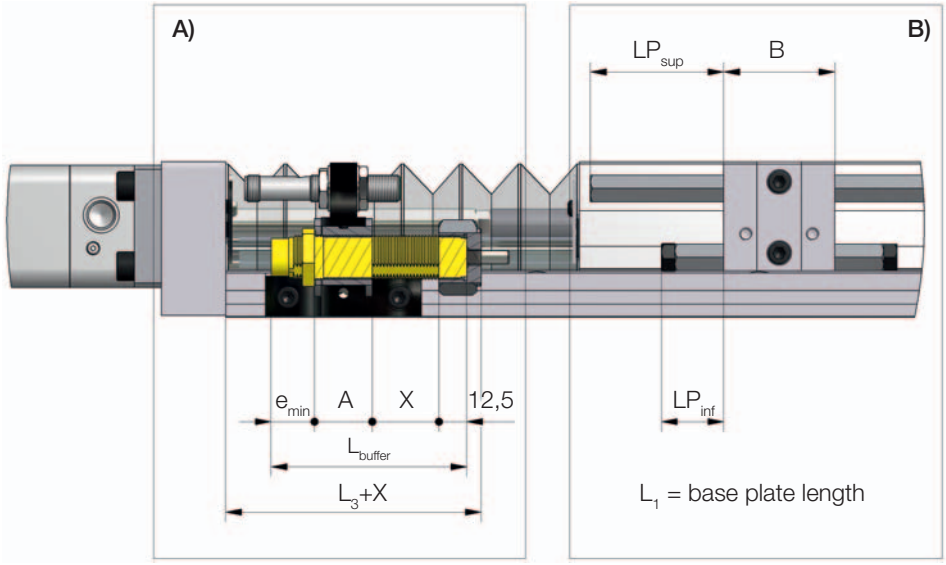
The following buffer sets are available:

TP size	Order code KD2010	KD2015	KD2515	KD2520	KD2715
150	•	•	–	–	–
200	•	•	–	–	–
250	•	•	•	•	–
300	•	•	•	•	–
400	•	•	•	•	•
M	M20x1	M20x1.5	M25x1.5	M25x2	M27x1.2



Stroke reduction

L_3 means the theoretical stroke length of Pneumatic Linear Tables in the dimesnsion tables. This stroke lenght can be reduced on customers needs. Please follow the underneath instructions to reduce the stroke on one or both sides:



A) Adjustment of a limit stop:

Size TP	Support A [mm]
150	20
200	20
250	25
300	25
400	35

Calcualtion of stroke reduction:
$X = L_{damper} - (12{,}5 + A + e_{min})$ [mm]

X = stroke reduction
e_{min} = minimal distance (depends on type of limit stop)

B) Adjustment of carriage support:

Size TP	Support B [mm]
150	50
200	50
250	50
300	50
400	70

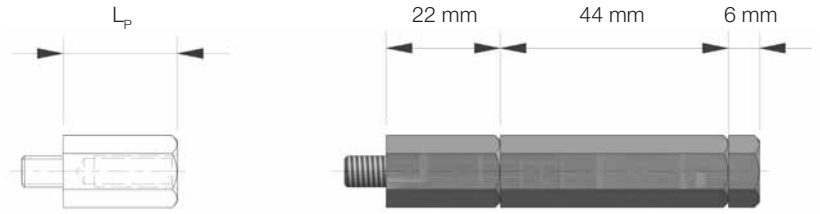
Calcualtion of stroke reduction on the right or the left hand side:
Stroke = $(L_1/2) - (L_3 + X) - (B/2 + LP_{inf})$ [mm]

Calculation of the reduced final stroke:
Total stroke = $L_1 - 2 \cdot (L_3 + X) - (B + (2 \cdot LP_{inf}))$ [mm]

Stroke reduction (continuation)

Order code	Spacer block L_P [mm]
LP06	6*
LP22	22
LP44	44
LP60	60
LP90	90

* only hardened on buffer side



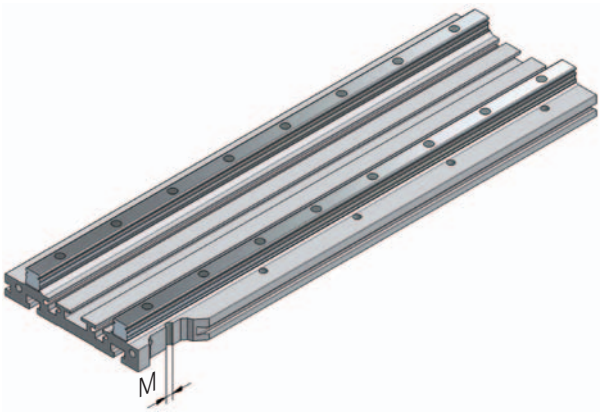
Assembly example for the combination of different spacer blocks

Fixing systems

– Base plates with tapping holes

In standard configuration spot-faced holes are drilled on the base plate.
On request tapping holes are available:

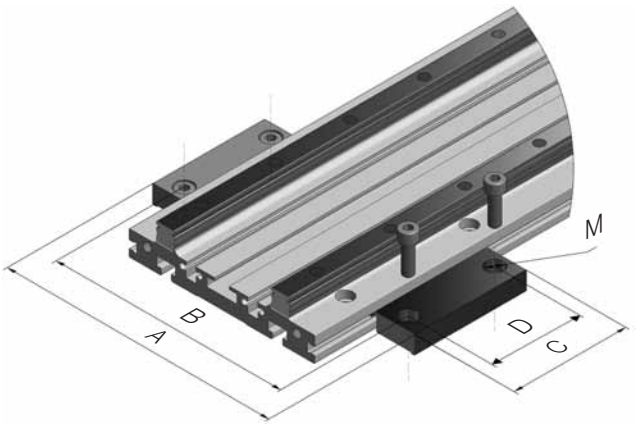
TP size	M [mm]
150	M8
200	M10
250	M10
300	M10
400	M12



– Steel brackets

The profile can be fixed with steel brackets, supplied in pairs.

TP size	Order code	A [mm]	B [mm]	C [mm]	D [mm]	M [mm]
150	ST 150-01	198	165	60	40	M6
200	ST 200-01	256	220	80	60	M8
250	ST 200-01	306	270	80	60	M8
300	ST 300-01	366	320	80	60	M8
400	ST 400-01	484	425	100	80	M10

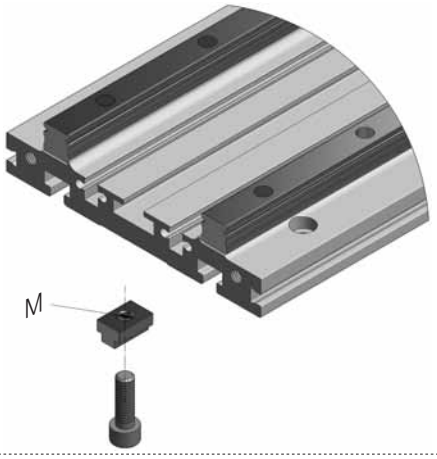


Fixing systems (continuation)

– "Lower" T-nuts

Steel T-nuts are available to match the groove width on the lower surface of each TP size base plate.

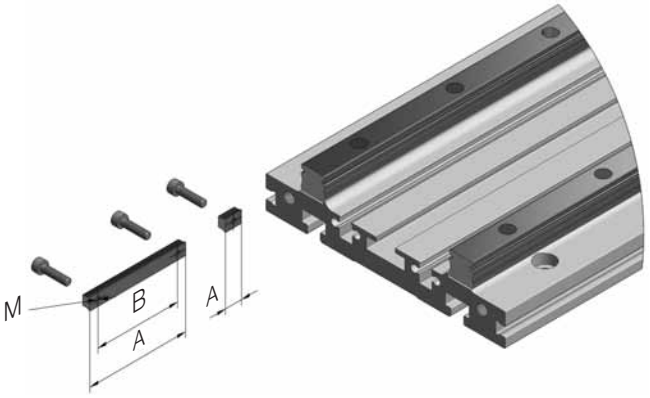
TP size	Order code	M [mm]
150	I 200-01	M6
200	I 200-01	M6
250	I 250-01	M8
300	I 250-01	M8



– "Lateral" T-nuts

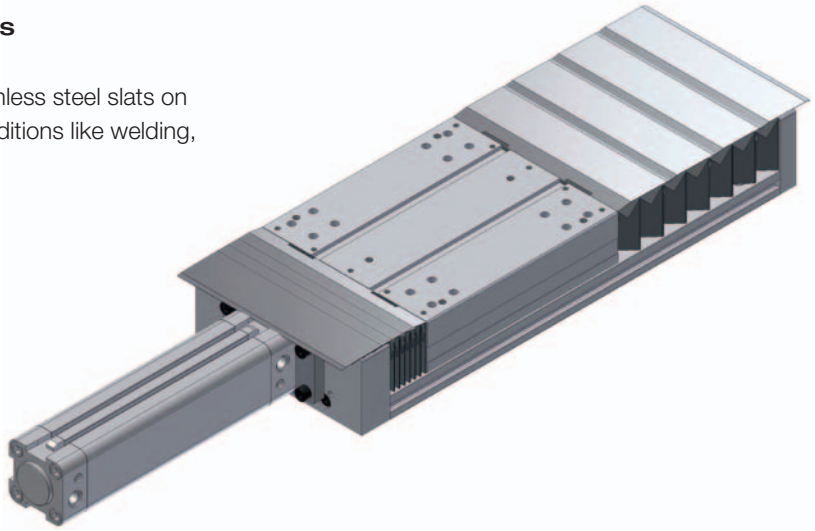
For the mounting of external components like trailing cables, limit switches or measuring systems there are steel T-nuts available. They match the width of the lateral grooves in the base plate of each TP size and are suitable in short or long version.

TP size	Order code	A [mm]	M [mm]	B [mm]
150	IL 150-01	10	M4	—
150	IL 150-02	60	M4	50
200	IL 200-01	10	M4	—
200	IL 200-02	60	M4	50
250	IL 200-01	10	M4	—
250	IL 200-02	60	M4	50
300	IL 200-01	10	M4	—
300	IL 200-02	60	M4	50



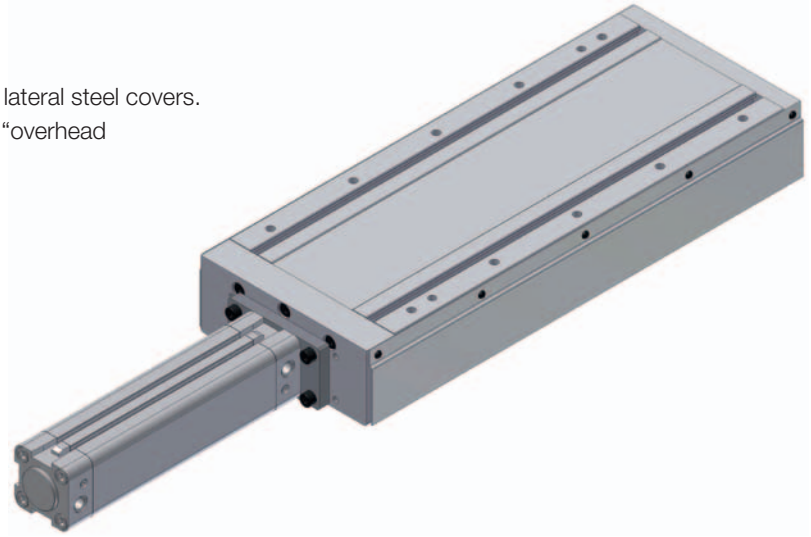
Expansion bellows with stainless steel slats

On all TV Linear Tables it is possible to fit protective stainless steel slats on the standard expansion bellows for special working conditions like welding, grounding, machine tooling, etc.



Lateral steel covers

All Linear Tables TP can be protected on both sides with lateral steel covers. These are recommended with strong dirt conditions and “overhead mounting”.



Cylinder mount

Cylinder mount with flange according to ISO VDMA 6431.

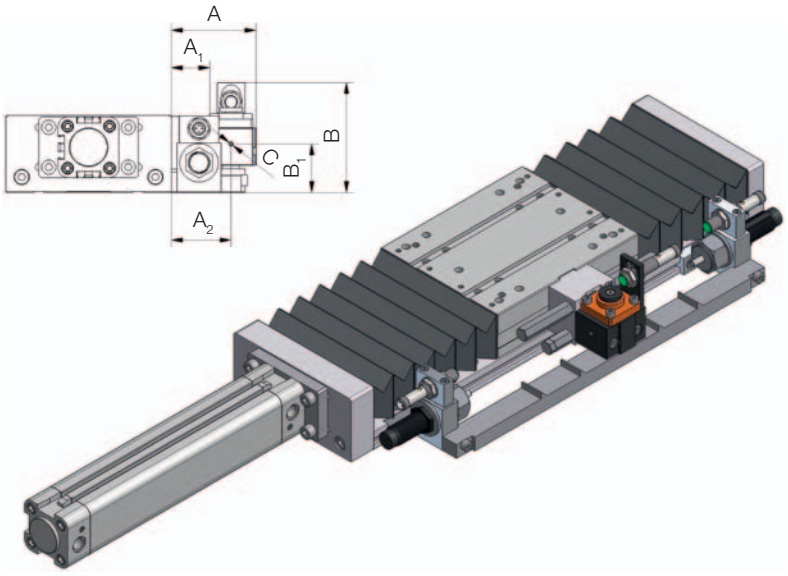
TP size	Order code	Cylinder size [mm]	Flange thickness [mm]	A [mm]	ø B H8 [mm]	C tapping holes	D [mm]
150	C040	40	12	38	35	M6x10	3.5
150	C050	50	12	46.5	40	M6x10	3.5
200	C050	50	12	46.5	40	M6x10	5.5
200	C063	63	12	56.5	45	M8x12	5.5
250	C063	63	12	56.5	45	M8x12	10.5
250	C080	80	16	72	45	M10x15	10.5
300	C080	80	16	72	45	M10x15	7.5
300	C100	100	16	89	55	M10x15	15.0
400	C100	100	16	89	55	M10x15	7.5
400	C125	125	16	110	60	M12x16	18.0

Safety systems

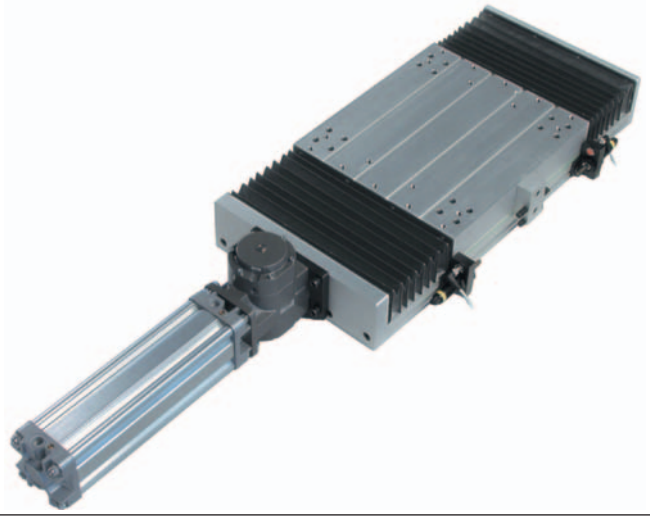
Vertical mounted Pneumatic Linear Tables may be equipped with two different types of safety systems:

– Electropneumatic safety stop, laterally mounted:

TP size	A [mm]	A_1 [mm]	A_2 [mm]	B_1 [mm]	B_2 [mm]	C [mm]
150	74	34	54	99.5	44	M5
200	74	34	54	104	48.5	M5
250	85	34	58	117.5	58	M5
300	85	34	58	116	48	M5
400	92	38	64	140	63	M5



– Rod blocking device (electromechanical)



Assembly examples

TP Linear Tables can be combined to multi axes systems, but also easily assembled with any other MOVITEC products.
For examples see TV type, page 59.

Complete, customer specific solutions

MOVITEC linear systems are the ideal components for customer-specific solutions. Thanks to their modular construction, very economic, application-oriented linear systems can be implemented in the shortest time.