

Description

3D® Linear Units are linear actuators for moving loads on the end of arms quickly and accurately.

They incorporate very many operations:

- Guiding
- Cushioning
- Detection
- Stroke adjustment
- Speed adjustment
- Protection
- Adjustable mounting

Guiding

"3D® Pneumatic" linear units have a rectangular slide with 2 stainless steel rods guided by 4 adjustable roller bearings, permanently oiled by felt pads. This guiding system provides outstanding rigidity and enables high work cycle times.

Cushioning

Each end of stroke cushioning is provided with a plastic buffer for absorbing impacts and controlling deceleration.

Detection

Each end of stroke sensing is provided with PNP, NO plug in Inductive Sensors.

Stroke adjustment

The front stop can be adjusted over the entire stroke of the "3D® Pneumatic" linear unit. Each end of stroke is precisely adjustable even when the unit is pressurised.

Speed control

By 90° elbow adjustable flow control valves with push in connections.

Protection

A profiled aluminium cover held by two 1/4 turn screws protects the unit with easy access to all adjustable parts.

Mounting

The aluminium body has a dovetail and tee slot for mounting the unit on other units or machine surface. The front plate at the end of the slide is for mounting other products in the range.

Options

The following are available for increasing "3D® Pneumatic" linear unit options:

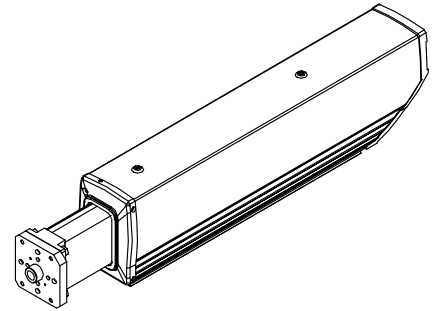
- **NPN NO Inductive Sensors**
- Protection bellows
- **MPS (Mid-Position Stop)** when the slide extends or retracts (with position fine adjustment)
- **Inductive Sensor** intermediate PNP or NPN for information during movement.

Range

"Pneumatic 3D®" Linear Unit

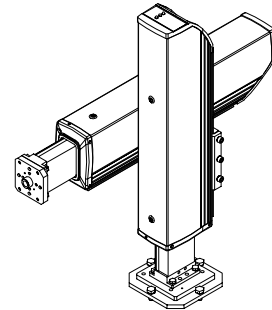
The range consists of 3 sizes with strokes of 25 to 800 mm available.

The unit is mounted by a dovetail. The slide flange is for connecting other units in the 3D® range quickly and accurately using appropriate mounting kits.



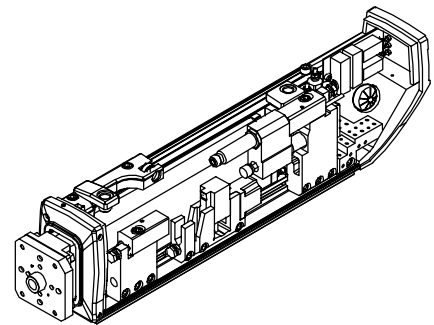
"Pneumatic 3D®" Linear Lift Unit

The "Pneumatic 3D®" Linear Unit can be changed into a lift unit thanks to a single plate fitted to the end of the slide. Connected to another linear unit the dimensions and mass at the end of the arms can be minimised in this way for more accurate positioning and inserting it into small areas.



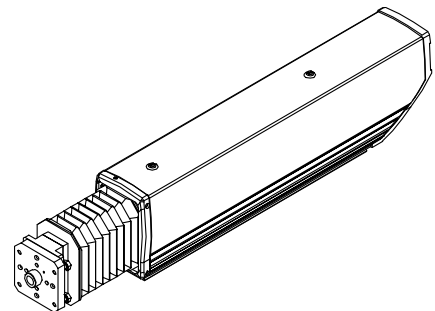
"Pneumatic 3D®" Linear Unit with MPS option

The one way Mid-Position Stop allows the slide to be stopped at different places. Its small size makes it easy to install inside the unit. Up to 4 MPS can be built in standard linear units.



"Pneumatic 3D®" Linear Unit with protection bellows

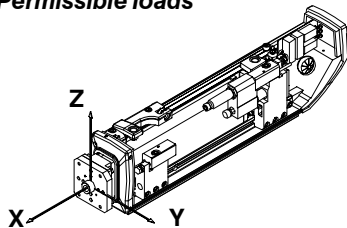
The bellows protects the slide and guide rods from external projections (shavings etc.) and improves the service life of linear units in hostile environments.



General information

Size	1							2						3							
Stroke (mm)	25	50	75	100	150	200	300	50	125	200	300	400	600	50	125	200	300	400	600	800	
Linear unit		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Lift unit	●	●	●	●	Contact us			●	●	●	Contact us			●	●	●	●	Contact us			
Unit with MPS**			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		
Max torque Mx (Nm)				4							6,5						25				
Lateral force Fy (N)	40	40	30	25	20	20	20	70	60	55	45	40	35	185	170	160	130	125	80	70	
Repeatability (mm)	0.03							0.03						0.03							
Operation	Dry air, lubricated or unlubricated																				
Actuator bore (mm)	16							25						40							
Actuator rod diameter (mm)	10							12						18							
Theoretical thrust (N)*																					
Slide extension Fx	120							295						750							
Slide retraction Fx	70							225						600							
ø of supply tubes	2,7 x 4							4 x 6						6 x 8							
Operating pressure (bar)																					
Horizontal position	2 to 8							3 to 8						2 to 8							
Vertical position	5 to 8							4 to 8						2 to 8							
Lift	4 to 8							4 to 8						3 to 8							
Air consumption (dm ³ /cycle)***	0,1	0,1	0,2	0,2	0,3	0,5	0,7	0,3	0,8	1,2	1,8	2,4	3,6	0,8	2	3,2	4,7	6,3	9,4	13	
Flow for max cycle rate (dm ³ /s)***	0,1	0,2	0,3	0,3	0,4	0,5	0,6	0,4	1	1,4	1,7	2	2,4	0,1	2,2	3,1	3,9	4,5	5,5	6,3	
Mass (kg)																					
Linear unit	1,9	2	2,1	2,2	2,4	2,6	3	4,1	4,8	5,5	6,4	7,5	9,5	9,1	10,5	11,9	13,7	15,6	19,3	22,4	
Unit with MPS**	+ 0,25 kg with MPS							+ 0,4 kg with MPS						+ 1 kg with MPS							
Temperature (°C)	0 to 65							0 to 65						0 to 65							

Permissible loads



Size	1							2						3							
Stroke (mm)	25	50	75	100	150	200	300	50	125	200	300	400	600	50	125	200	300	400	600	800	
Horizontal position* (kg)		6	6	5	4	3	3	3	11	9	7	6	6	5	28	26	24	20	16	12	10
Vertical position slide downwards* (kg)				2,5						10					30						
Vertical position slide upwards* (kg)				6						15					38						
Lift * (kg)		4	4	4	3	Contact us		12	11	10	Contact us		30	28	26	24	Contact us				

* At 6 bar pressure.

** MPS: Mid-Position Stop

*** flow (dm³/s) = consumption (dm³) / cycle time (s), (1 cycle = 1 extend + 1 retract)

Technical information

Features	Description						
Slide guiding	By adjustable rollers on steel rods, ground and treated to 60HRC, permanently oiled by felt pads						
End of stroke stops	Front stop adjustable over the entire stroke Front and rearstops adjustable $\pm 2\text{mm}$, ($\pm 3\text{ mm size 3}$)						
Cushioning	Auto compensating hydraulic shock absorbers with urethane impact cap						
Detection	Inductive sensors, three wire plug in straight connectors (mini "inline" plug) M8PNPNO Voltage 10-30 VDC Max switching current 200 mA						
Indication of detection	By LED*** at the rear of the unit						
Electrical connection	To terminals at the rear of the unit (spring loaded junction blocks)						
Provision of additional wiring on the terminal block	<table border="0"> <tr> <td>Size 1</td> <td>Sizes 2 and 3</td> </tr> <tr> <td>2 MPS**</td> <td>4 MPS**</td> </tr> <tr> <td>1 intermediate sensor*</td> <td>2 intermediate sensors*</td> </tr> </table>	Size 1	Sizes 2 and 3	2 MPS**	4 MPS**	1 intermediate sensor*	2 intermediate sensors*
Size 1	Sizes 2 and 3						
2 MPS**	4 MPS**						
1 intermediate sensor*	2 intermediate sensors*						
Pneumatic connection	Flow control valves (banjo) with push in connection						
Protection	By wiper seal on the slide and cover held by two 1/4 turn screws						
Lubrication	By oilers accessible from the outside of the unit						
Mounting the unit	Dovetail						
Fixing the accessories on the front flange	CHC screw Centring by cylindrical sleeve and plastic pin The accessories can be oriented at intervals of 90° Interchangeability with the second generation possible (with appropriate mounting kit)						
Fixing other accessories to the unit	In the centre T slot on the dovetail						

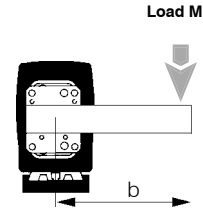
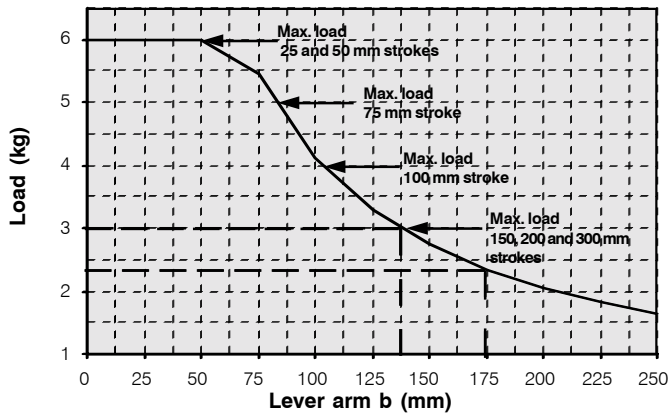
* DPI: Inductive sensor

** MPS: Mid-Position Stop

***LED: Light Emitting Diode

Linear units size 1 – curves

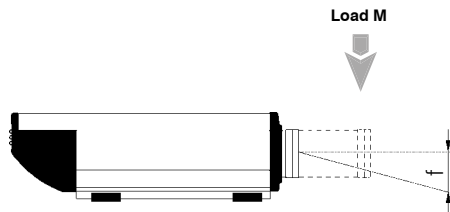
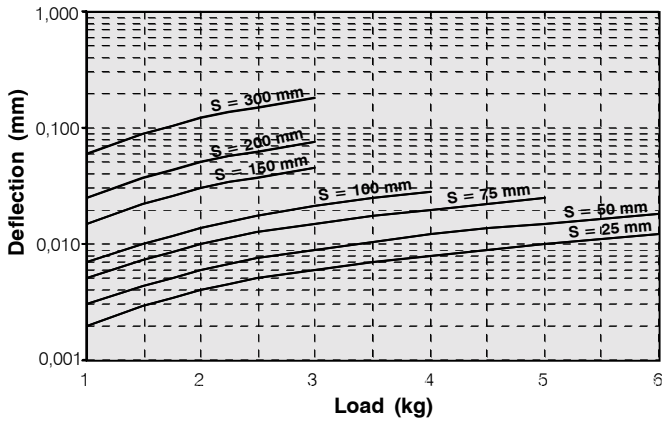
Permissible loads



Examples:
150mm unit stroke
if $b = 175$ mm, $M = 2,3$ kg

Max load of 150mm unit stroke: 3 kg
With $M = 3$ kg, b Maxi = 138 mm

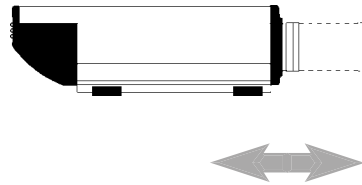
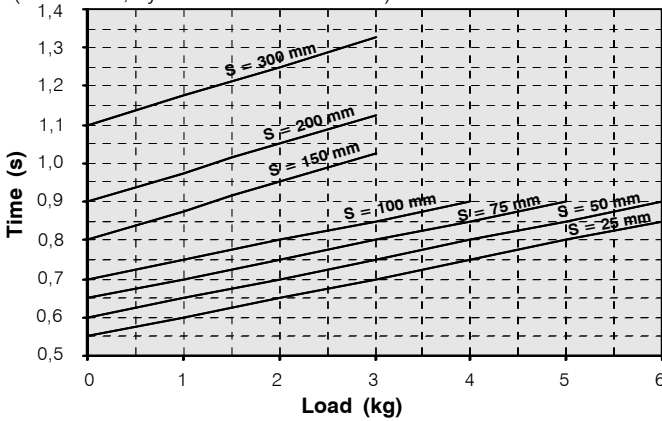
Deflection (f) of the slide under a load



Mounting: 2 dovetail plates

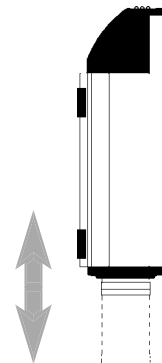
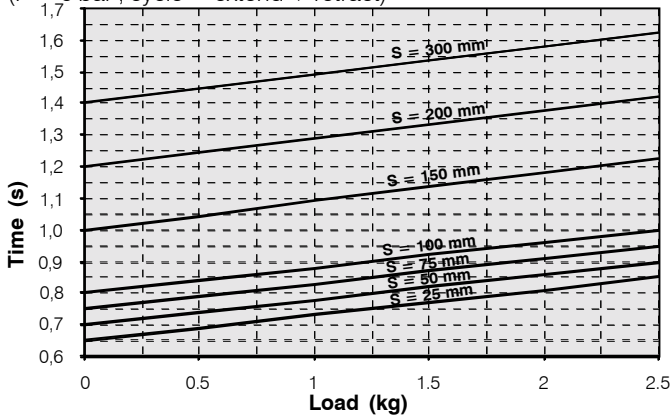
Cycle time, horizontal position

($P = 6$ bar ; cycle = extend + retract)



Cycle time, vertical position – slide downwards

($P = 6$ bar ; cycle = extend + retract)

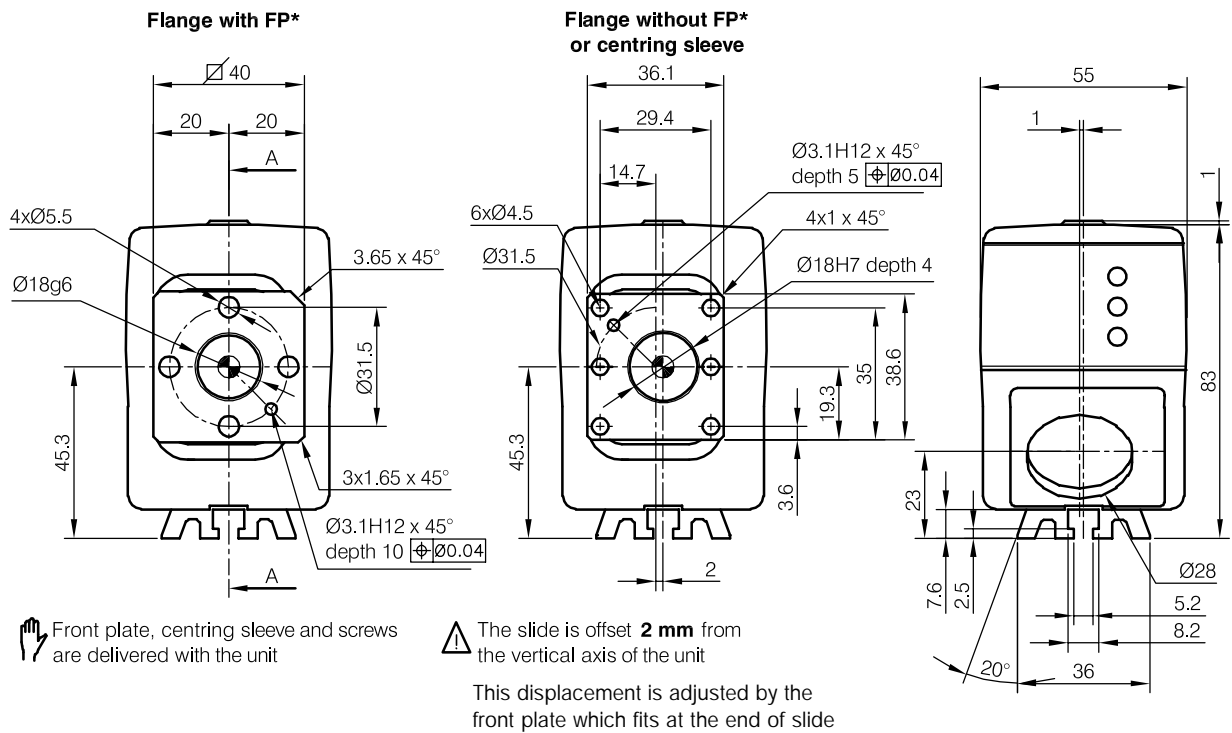
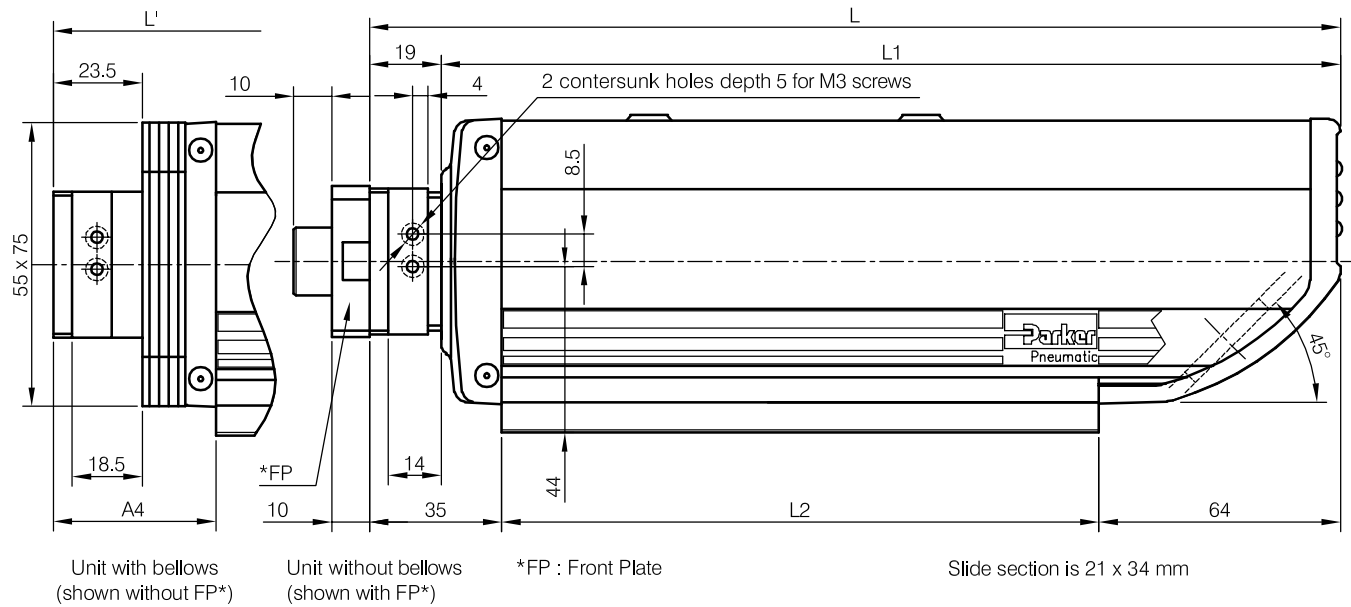


"Pneumatic 3D®" Linear Units

3L•CN

Size 1

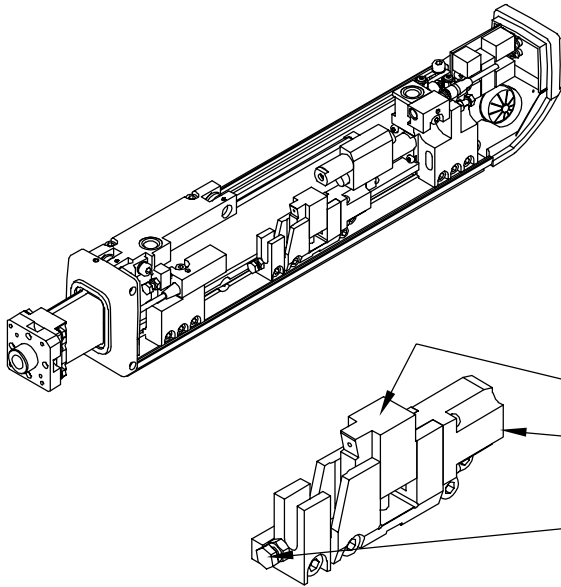
Dimensions (mm)



FP*	Stroke	L	L1	L2	L'	A4
A-A: 	25	307	288	208	319	47
	50	332	313	233	348	51
	75	357	338	258	376	54
	100	382	363	283	405	58
	150	432	413	333	463	66
	200	482	463	383	520	73
	300	582	563	483	635	88

Linear units size 1 with variable Mid-Position Stop (MPS)

Technical features



A Variable Mid-Position Stop (MPS) provides a mechanical stop at a point along the nominal stroke of the unit.

MPS can be fitted anywhere to give a stop when the slide is extending or retracting.

A unit can be fitted with one MPS which operates when the slide is extending and another when it is retracting (max 2).

The MPS is integrated in the unit. It is fixed in a T-slot and its position is adjustable with a ± 2 mm fine adjustment.

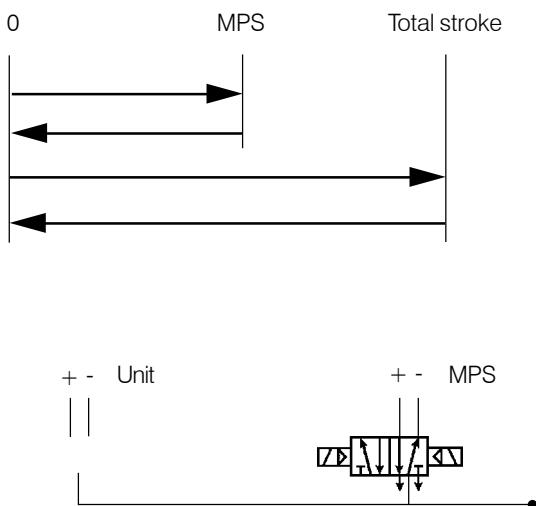
The MPS is made up of:
 1 double acting cylinder which controls the stop
 1 block of 3 inductive sensors with three LEDs (stop extending, stop retracting, slide on position)
 1 fine adjustment which can be removed to increase the adjustment ranges of the MPS.

These MPS can easily be added to the basic unit without the need for modification.

Adding an MPS to a standard unit:
 Part No. of the MPS: 3L1TG

Pneumatic circuitry

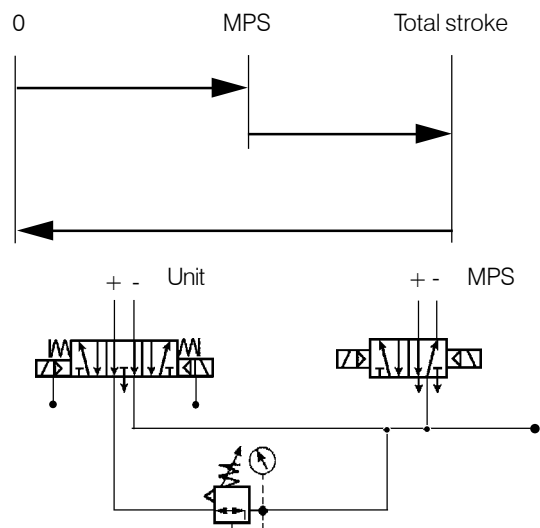
Type of cycle



2 valves 5/2 (eg ref. 19124M*)

* State operating voltage

Type of cycle



One 5/3 open centre supply valve with external pilot supply (eg ref. 19124MY*)

One 5/2 valve (eg. Ref. 19124M*)

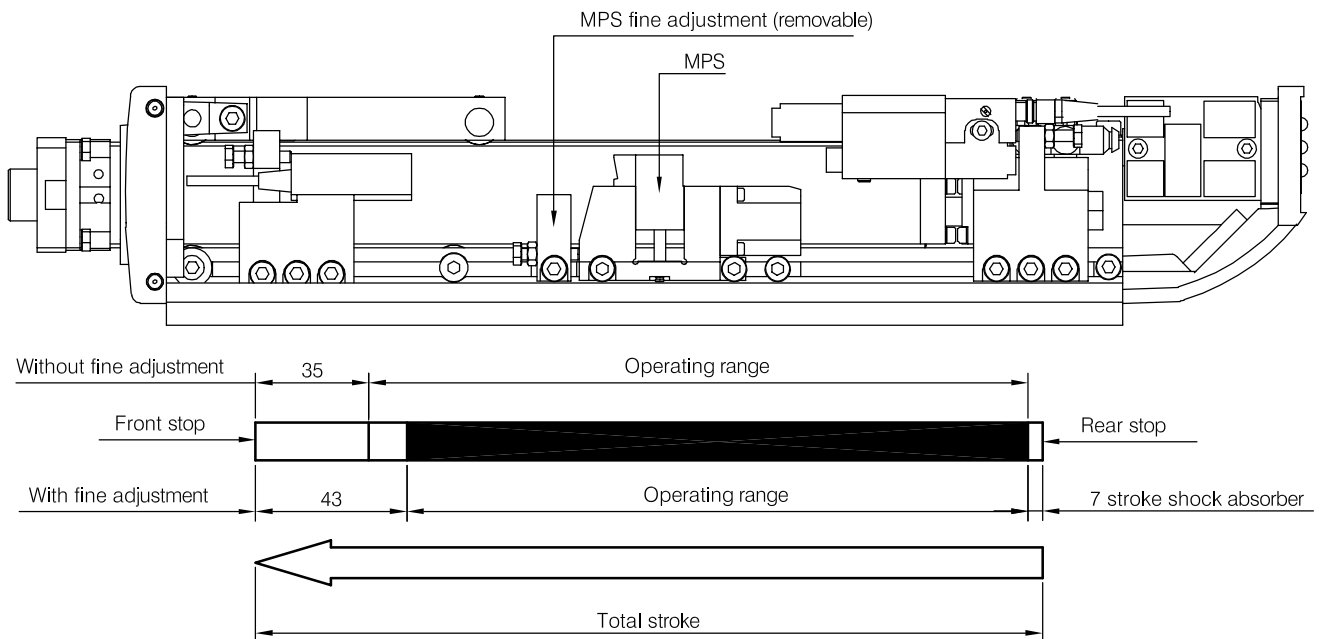
One pressure regulator (eg: ref. P3D-RA11BPG)

! To avoid pressure surges, it is essential **to supply the two chambers with pressure** before releasing the variable mid-position stop.

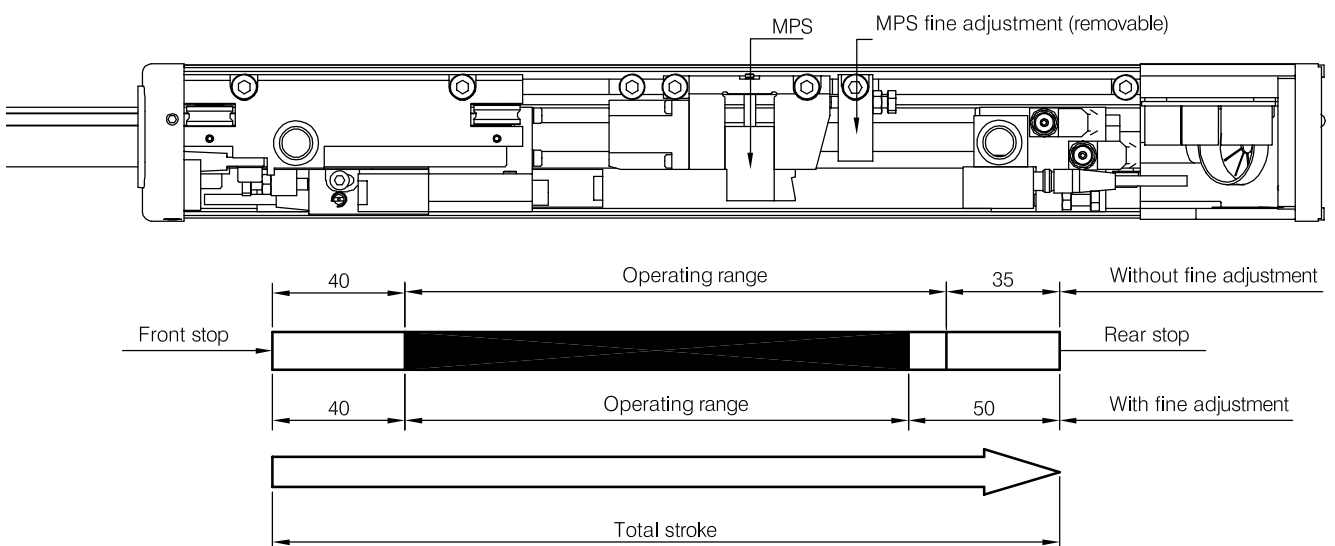
Linear Unit size 1 with variable mid-position stop (MPS)

Technical features

MPS on slide extension (mounted on lower slot of body)



MPS on slide retraction (mounted on upper slot of body)




Min stroke between 2 MPS: 101 mm with fine adjustment
83 mm without fine adjustment

Linear units with one or two MPS are delivered with pneumatic connections (\varnothing 2.7 x 4 tubes)

Linear Lift Units size 1

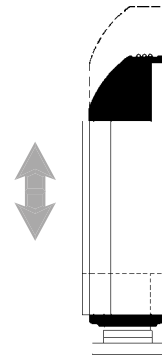
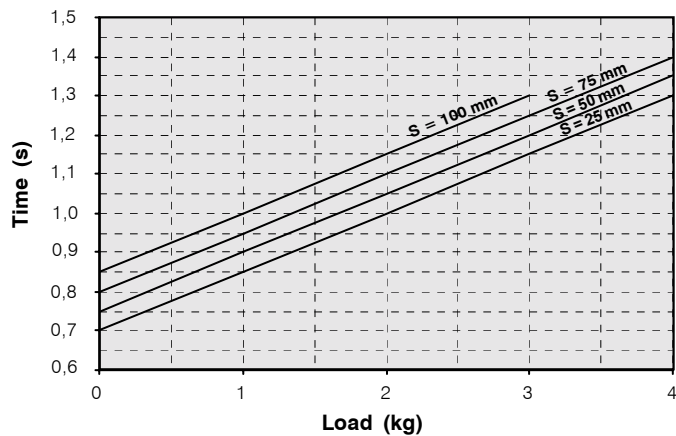
The "Pneumatic 3D[®]" Linear Unit can be changed into a lift unit thanks to a single plate fitted to the end of the slide. Connected to another linear unit the dimensions and mass at the end of the arms can be minimised in this way for more accurate positioning and inserting it into small areas.

General information

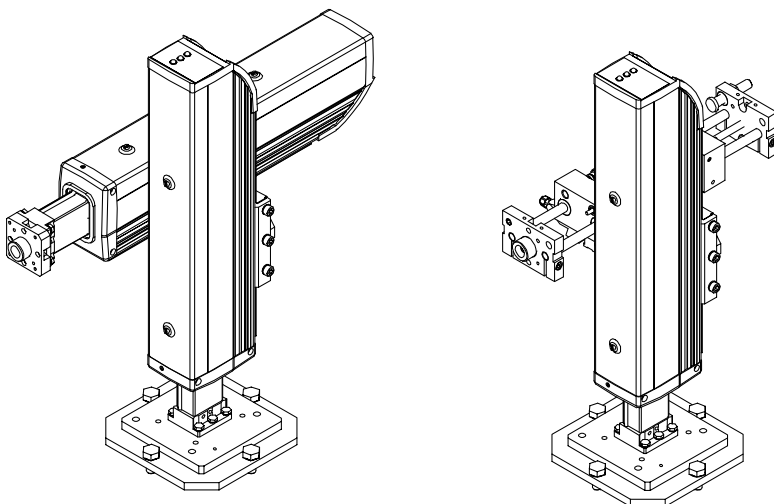
Size	1						
Stroke (mm)	25	50	75	100	150	200	300
Lift unit	●	●	●	●	Contact us		
Permissible loads							
Lift position* (kg)	4	4	4	3	Contact us		

Cycle time

(P = 6 bar ; cycle = extend + retract)

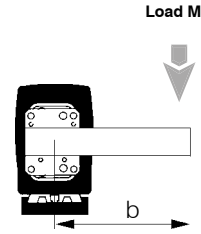
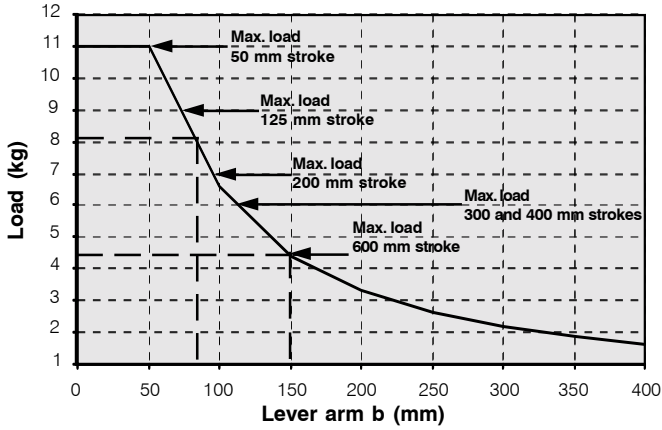


Linear unit or short stroke unit on lift unit



Linear units size 2 – curves

Permissible loads

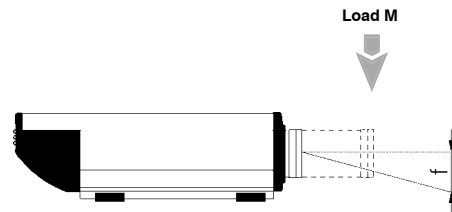
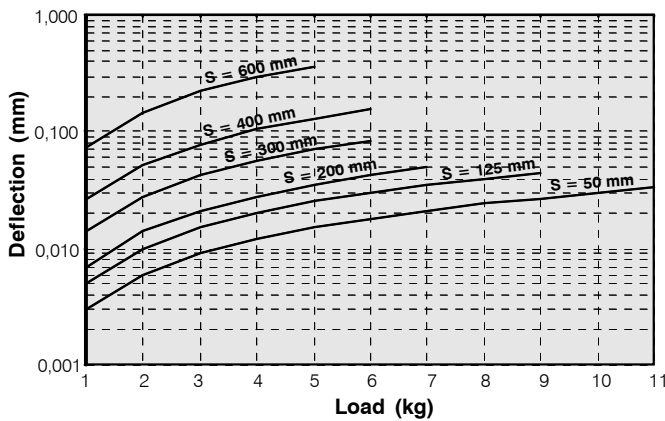


Examples:

200 mm unit stroke
if $b = 150$ mm, $M = 4,4$ kg

Max load of 200mm unit stroke: 8 kg
with $M = 8$ kg, $b_{\text{Maxi}} = 80$ mm

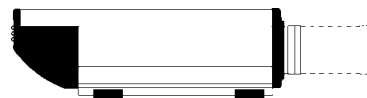
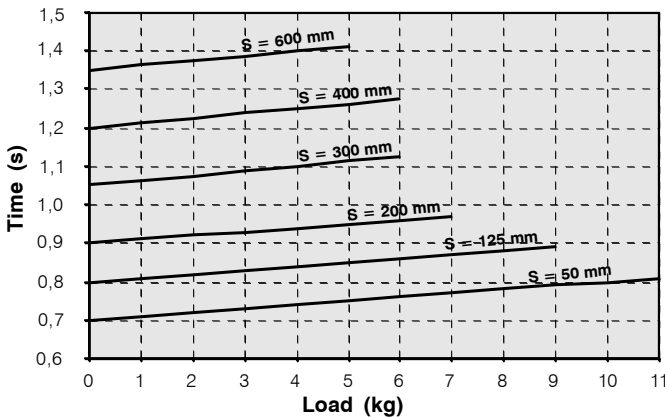
Deflection (f) of the slide under a load



Mounting: 2 dovetail plates

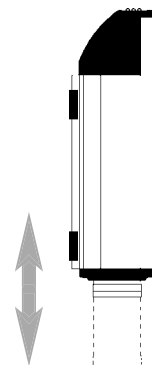
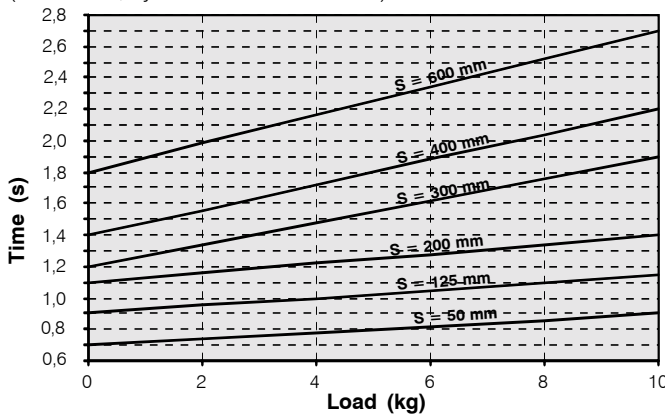
Cycle time, horizontal position

($P = 6$ bar ; cycle = extend + retract)



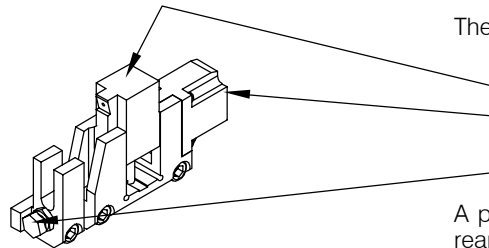
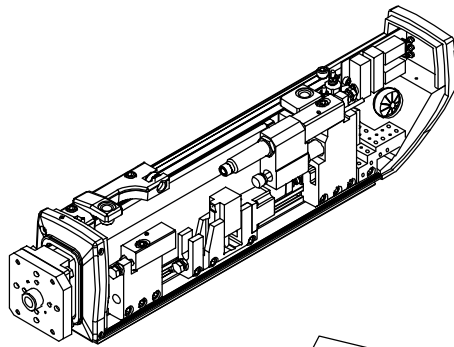
Cycle time, vertical position – slide downwards

($P = 6$ bar ; cycle = extend + retract)



Linear units size 2 with variable Mid-Position Stop (MPS)

Technical features



A Variable Mid-Position Stop (MPS) provides a mechanical stop at a point along the nominal stroke of the unit.

MPS can be fitted anywhere to give a stop when the slide is extending or retracting.

A unit can be fitted with one or two MPSs which operate when the slide is extending and one or two when it is retracting (max 4).

The MPS is integrated in the unit. It is fixed in a T-slot and its position is adjustable with a ± 2 mm fine adjustment.

The MPS is made up of:
 1 double acting cylinder which controls the stop
 1 block of 3 inductive sensors with three LEDs (stop extending, stop retracting, slide on position)
 1 fine adjustment which can be removed to increase the adjustment ranges of the MPS.

A pneumatic connection box for the MPSs is added in the rear connection box of the unit. (for $\varnothing 4$ mm tubing, four MPSs can be connected).

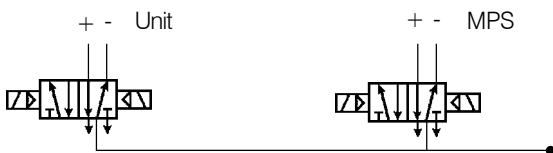
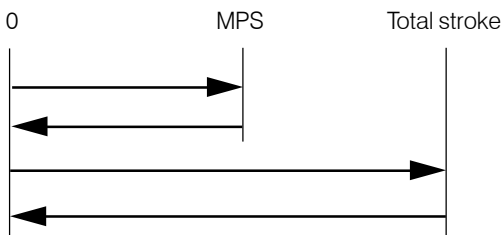
These MPSs can easily be added to the basic unit without the need for modification.

A linear unit with a stroke of 50 mm cannot be fitted with a variable MPS.

Adding an MPS to a 2 position unit :
 Part No. of the MPS: 3L2TG
 Part No. of the pneumatic connection box: 9133000

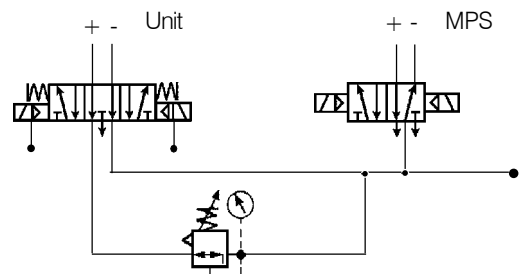
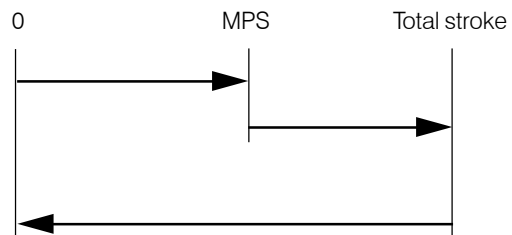
Pneumatic circuitry

Type of cycle



2 valves 5/2 (eg ref. 19124M*)

Type of cycle



One 5/3 open centre supply valve with external pilot supply (eg ref. 19124MY*)

One 5/2 valve (eg. Ref. 19124M*)

One pressure regulator (eg: ref. P3D-RA11BPG)

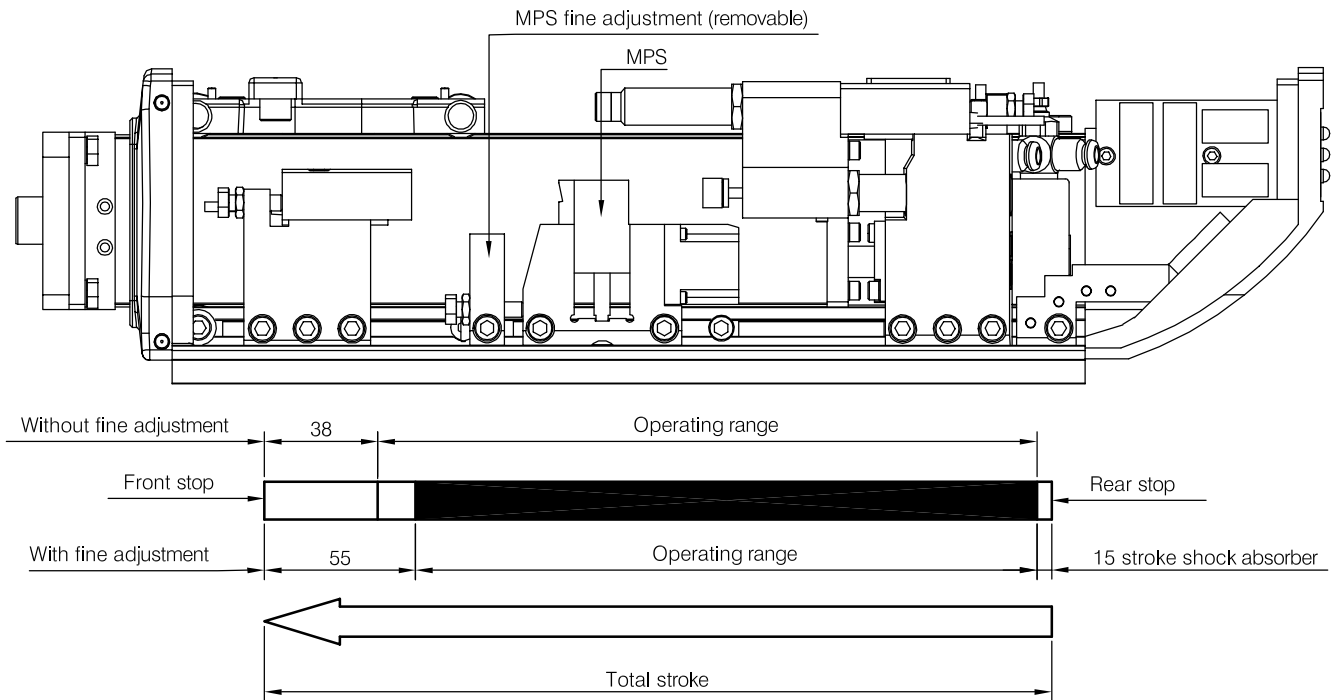
⚠ To avoid pressure surges, it is essential to **supply the two chambers with pressure** before releasing the variable mid-position stop.

* State operating voltage

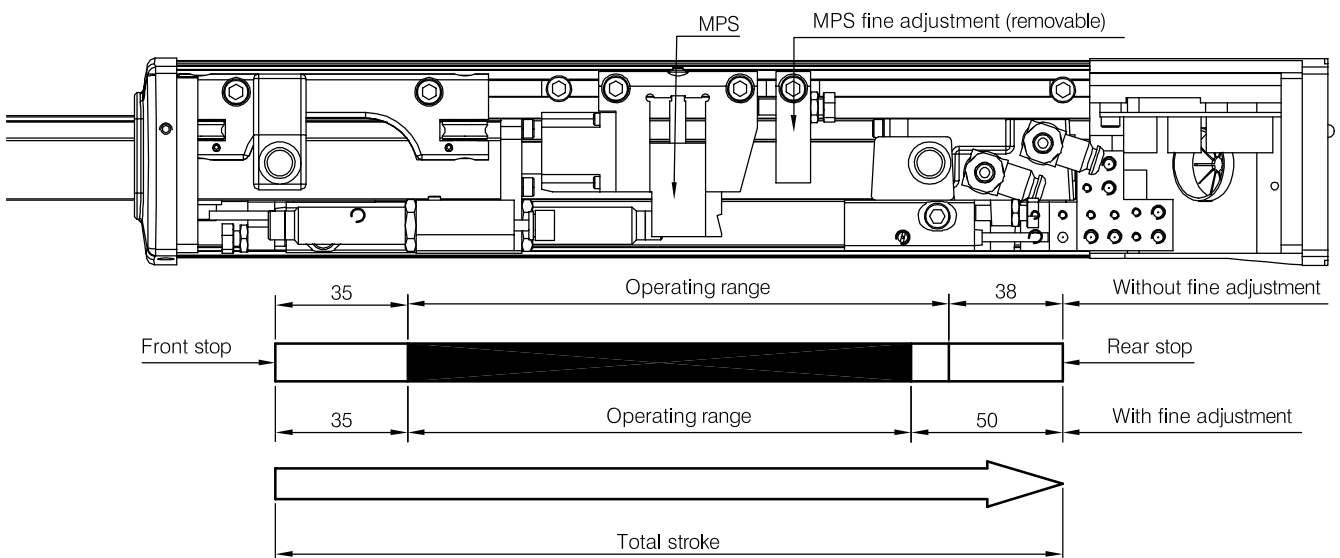
Linear Unit size 2 with variable mid-position stop (MPS)

Technical features

MPS on slide extension (mounted on lower slot of body)



MPS on slide retraction (mounted on upper slot of body)



Min stroke between 2 MPS: 112 mm with fine adjustment
38 mm without fine adjustment


Linear units with one or two MPS are delivered with a pneumatic connection box fixed to the rear of the unit (Ø 2.7 x 4 tubes)

Linear Lift Units size 2

The "Pneumatic 3D[®]" Linear Unit can be changed into a lift unit thanks to a single plate fitted to the end of the slide.

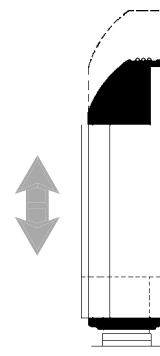
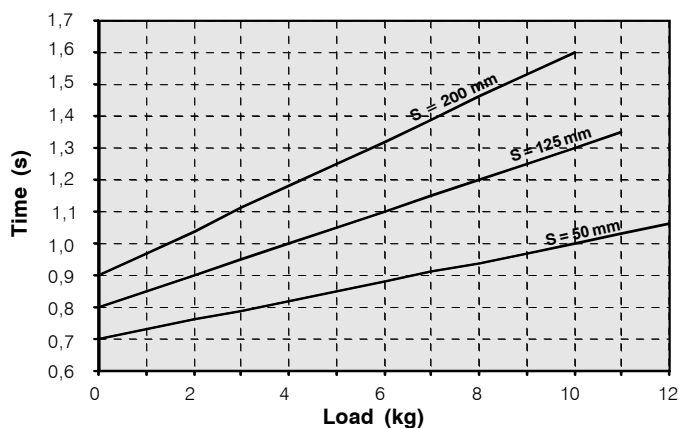
Connected to another linear unit the dimensions and mass at the end of the arms can be minimised in this way for more accurate positioning and inserting it into small areas.

General information

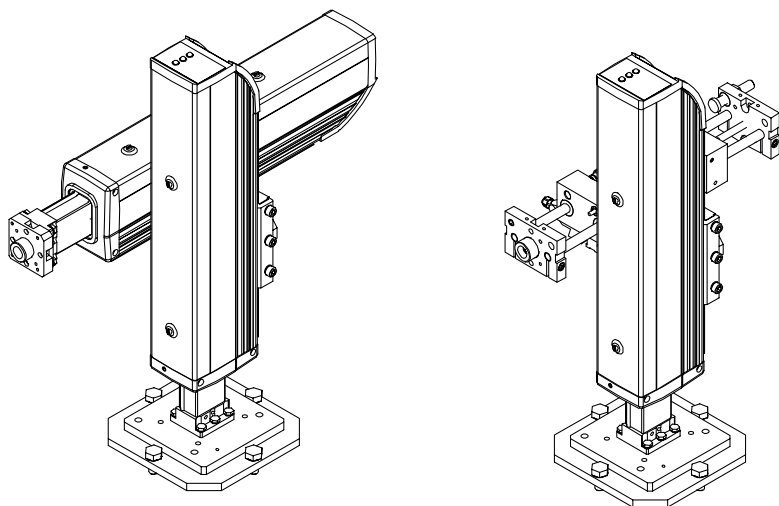
Size	2					
Stroke (mm)	50	125	200	300	400	600
Lift unit	●	●	●			Contact us
Permissible loads						
Lift position* (kg)	12	11	10			Contact us

Cycle time

(P = 6 bar ; cycle = extend + retract)

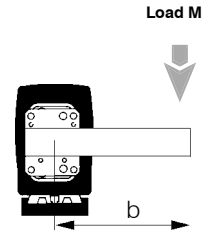
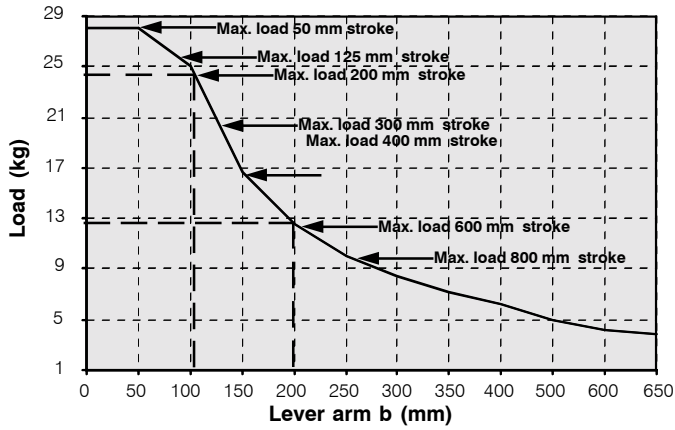


Linear unit or short stroke unit on lift unit



Linear units size 3 – curves

Permissible loads

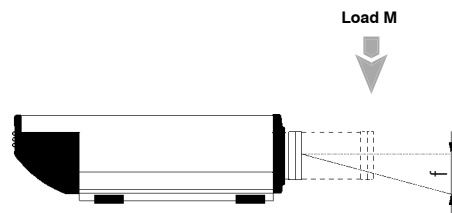
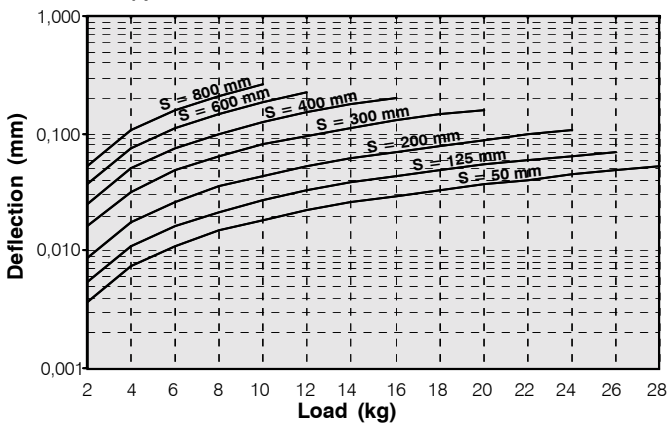


Examples:

200 mm unit stroke
if $b = 200$ mm, $M = 12,8$ kg

Max load of 200mm unit stroke: 24 kg
with $M = 24$ kg, $b_{\text{Maxi}} = 104$ mm

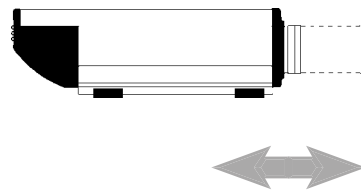
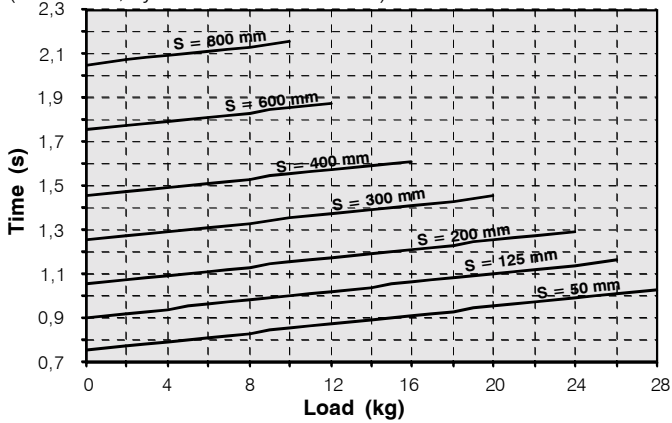
Deflection (f) of the slide under a load



Mounting: 2 dovetail plates

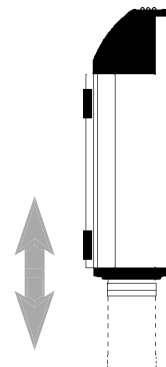
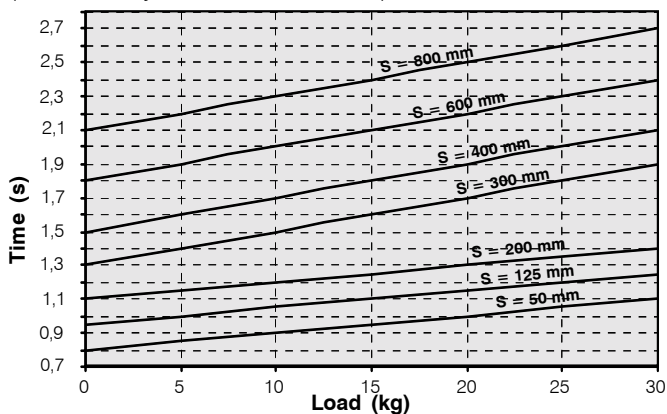
Cycle time, horizontal position

($P = 6$ bar ; cycle = extend + retract)



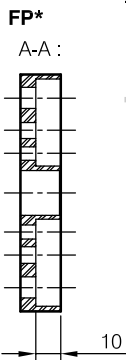
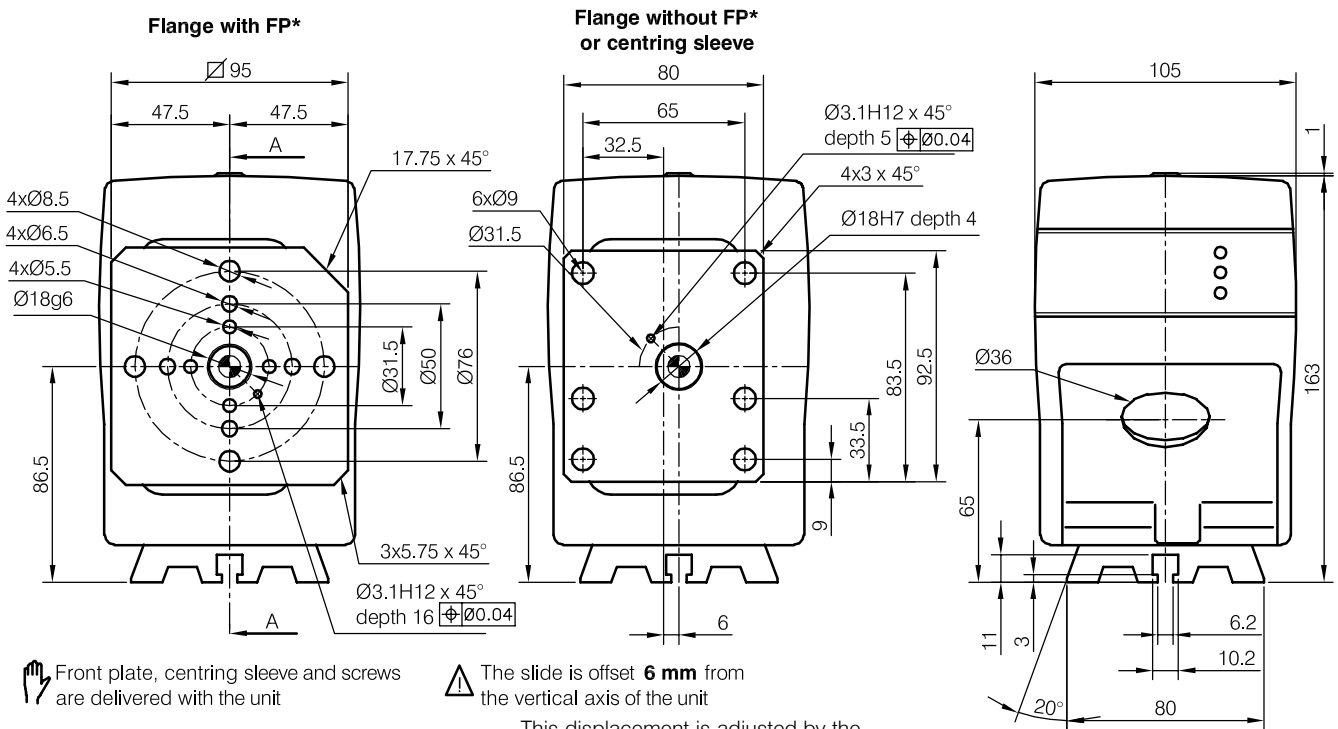
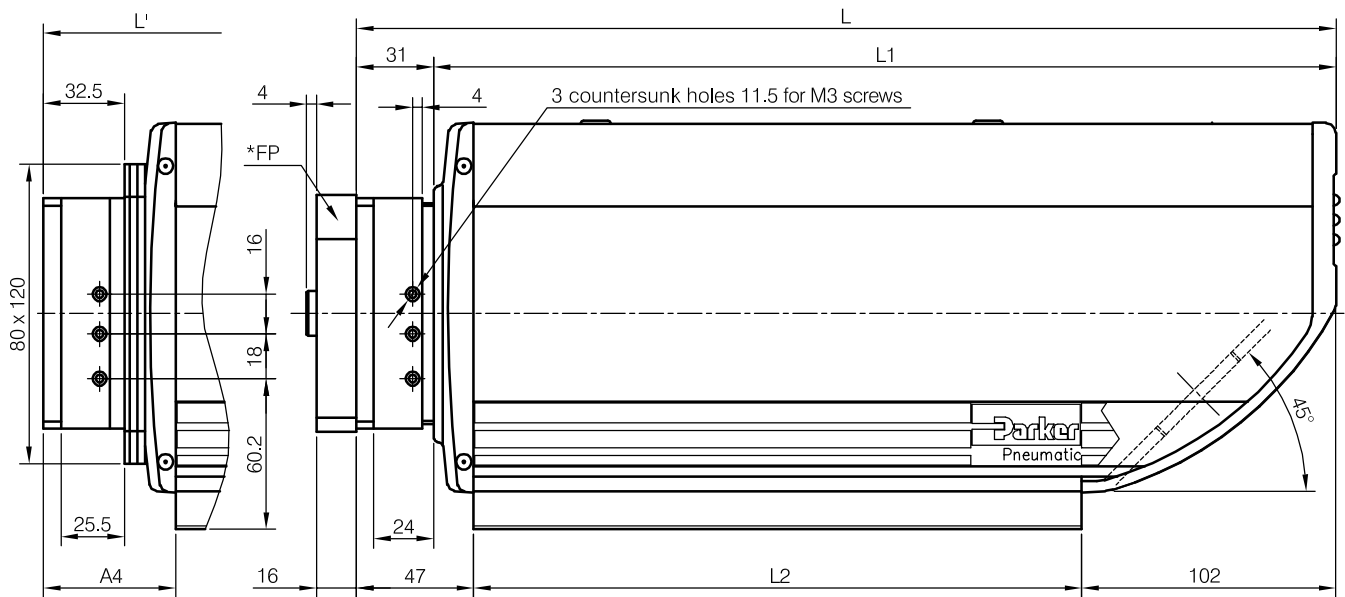
Cycle time, vertical position – slide downwards

($P = 6$ bar ; cycle = extend + retract)



Size 3

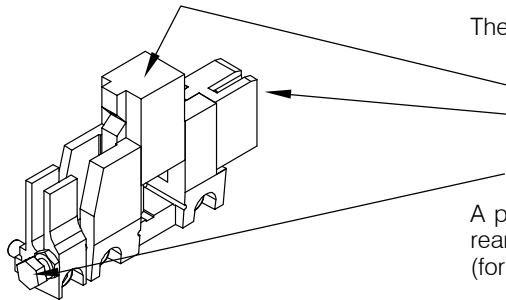
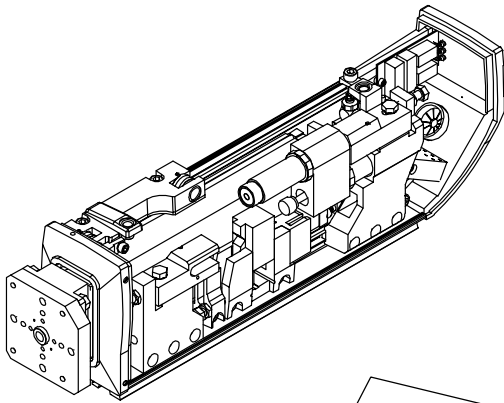
Dimensions (mm)



Stroke	L	L1	L2	L'	A4
50	468	437	319	481	60
125	543	512	394	568	72
200	618	587	469	654	83
300	748	717	599	801	98
400	848	817	899	914	113
600	1078	1047	929	1174	143
800	1278	1247	1129	1404	173

Linear units size 3 with variable Mid-Position Stop (MPS)

Technical features



A Variable Mid-Position Stop (MPS) provides a mechanical stop at a point along the nominal stroke of the unit.

MPS can be fitted anywhere to give a stop when the slide is extending or retracting.

A unit can be fitted with one or two MPS which operate when the slide is extending and one or two when it is retracting (max 4).

The MPS is integrated in the unit. It is fixed in a T-slot and its position is adjustable with a ± 2 mm fine adjustment.

The MPS is made up of:
 1 double acting cylinder which controls the stop
 1 block of 3 inductive sensors with three LEDs (stop extending, stop retracting, slide on position)
 1 fine adjustment which can be removed to increase the adjustment ranges of the MPS.

A pneumatic connection box for the MPSs is added in the rear connection box of the unit. (for \varnothing 4 mm tubing, four MPSs can be connected).

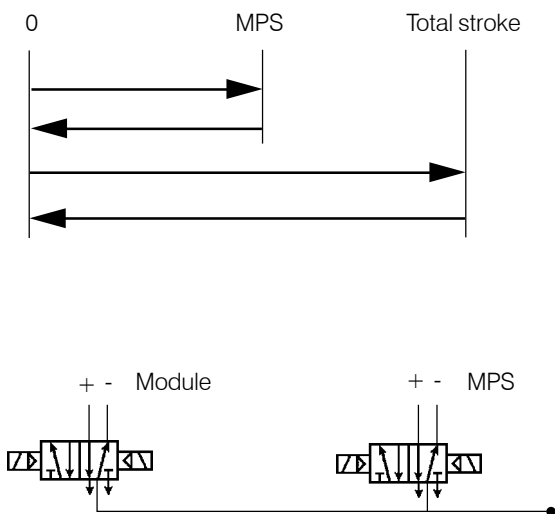
These MPS can easily be added to the basic unit without the need for modification.

A linear unit with a stroke of 50 mm cannot be fitted with a variable MPS.

Adding an MPS to a 2 position unit :
 Part No. of the MPS: 3L3TG
 Part No. of the pneumatic connection box: 9133004

Pneumatic circuitry

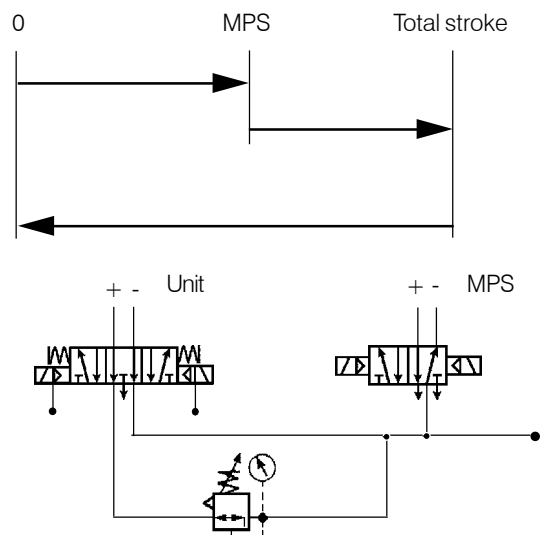
Type of cycle



2 valves 5/2 (eg ref. 19124M*)

* State operating voltage

Type of cycle



One 5/3 open centre supply valve with external pilot supply (eg ref. 19124MY*)

One 5/2 valve (eg. Ref. 19124M*)

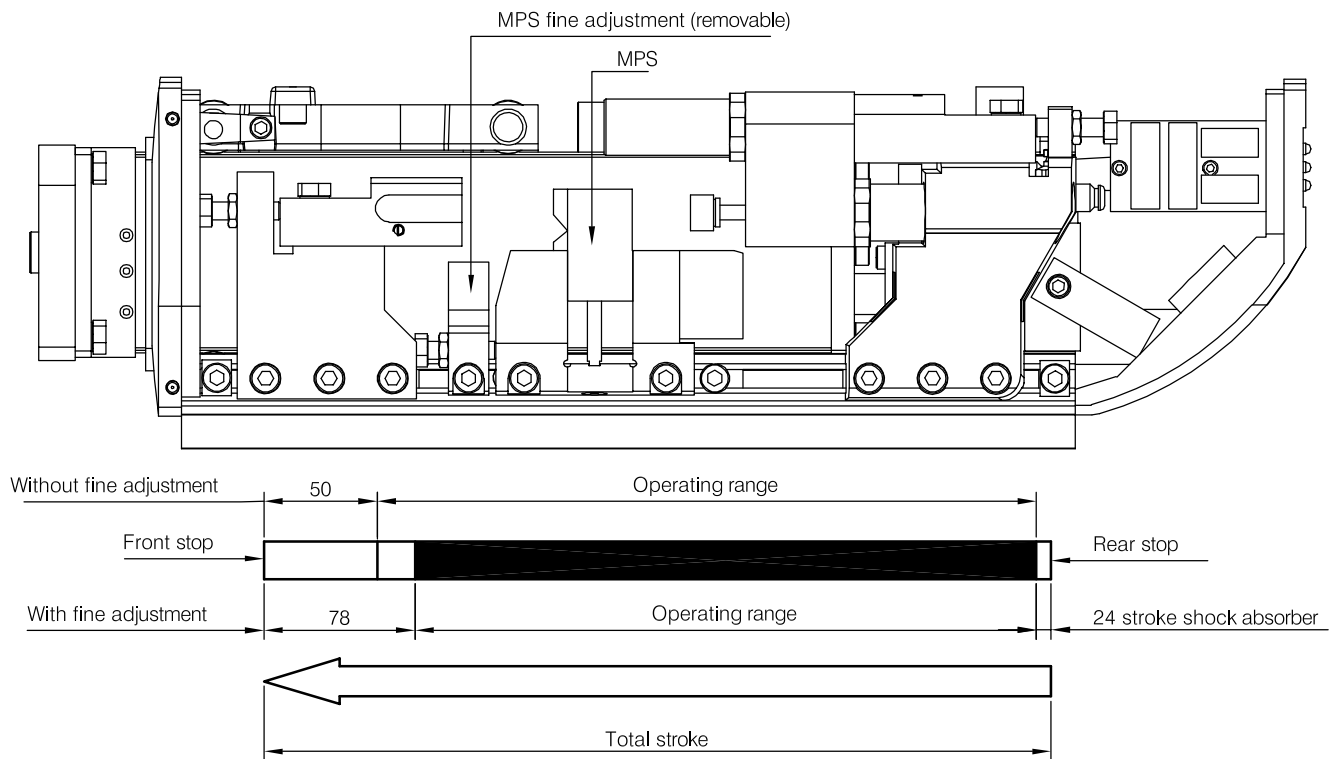
One pressure regulator (eg: ref. P3D-RA11BPG)

⚠ To avoid pressure surges, it is essential **to supply the two chambers with pressure** before releasing the variable mid-position stop.

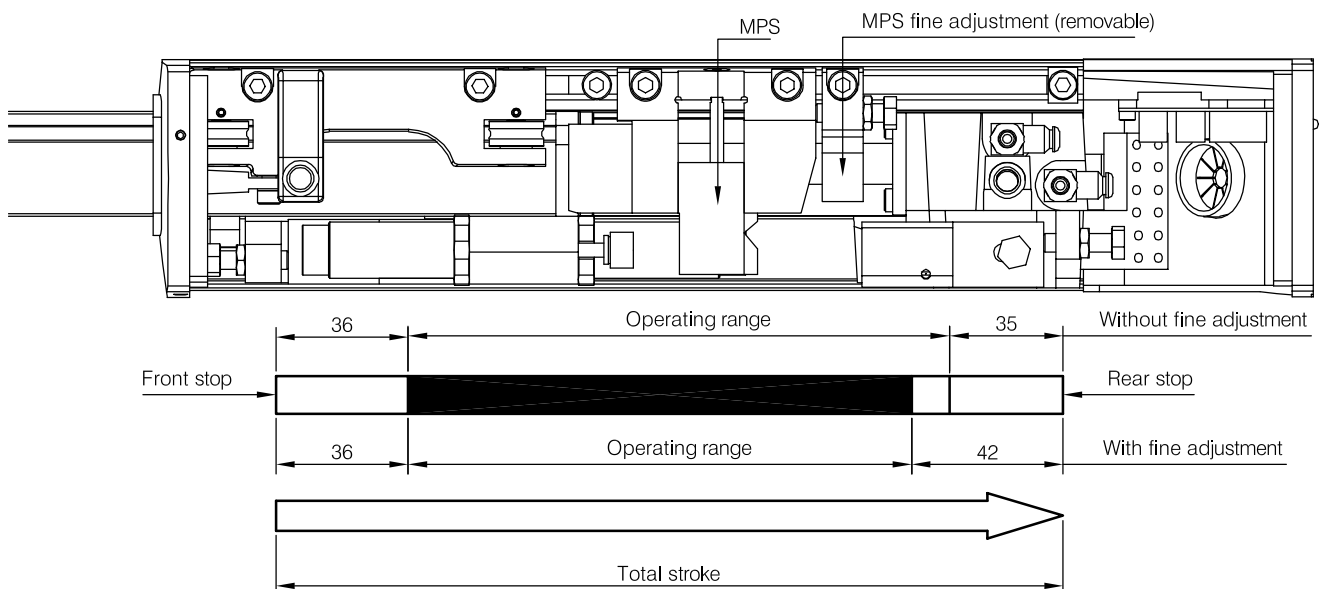
Linear Unit size 3 with variable mid-position stop (MPS)

Technical features

MPS on slide extension (mounted on lower slot of body)



MPS on slide retraction (mounted on upper slot of body)



Min stroke between 2 MPS: 148 mm with fine adjustment
128 mm without fine adjustment


Linear units with one or two MPS are delivered with a pneumatic connection box fixed to the rear of the unit (Ø 2.7 x 4 tubes).

Linear Lift Units size 3

The "Pneumatic 3D[®]" Linear Unit can be changed into a lift unit thanks to a single plate fitted to the end of the slide.

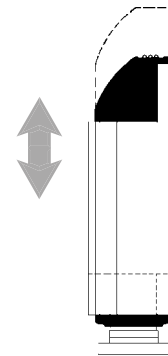
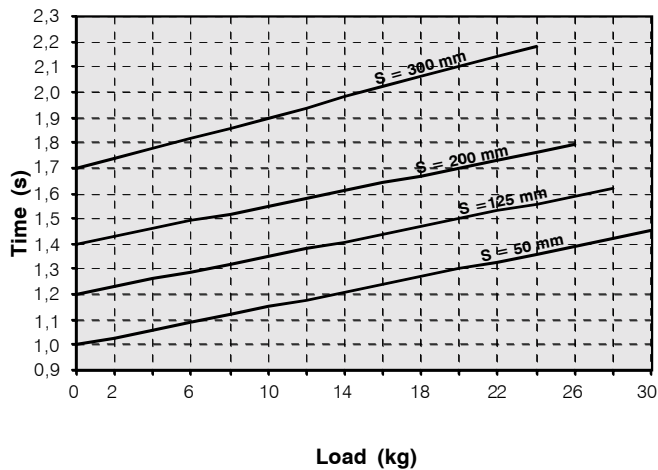
Connected to another linear unit the dimensions and mass at the end of the arms can be minimised in this way for more accurate positioning and inserting it into small areas.

General information

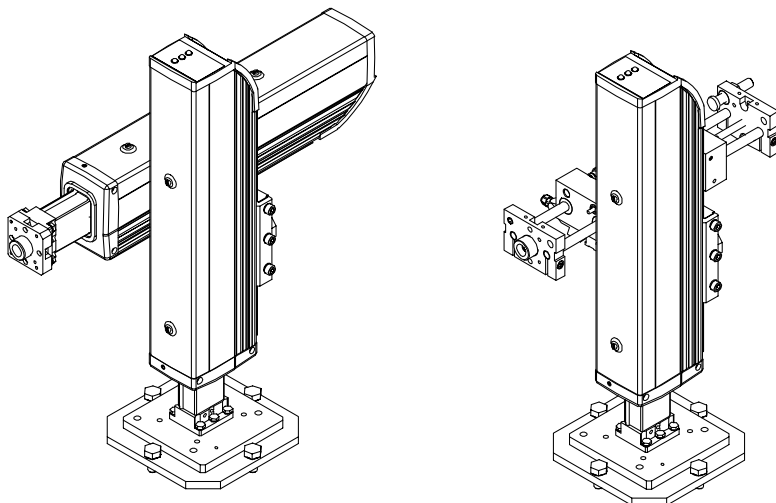
Size	3						
Stroke (mm)	50	125	200	300	400	600	800
Lift unit	●	●	●	●			Contact us
Permissible loads							
Lift position* (kg)							

Cycle time

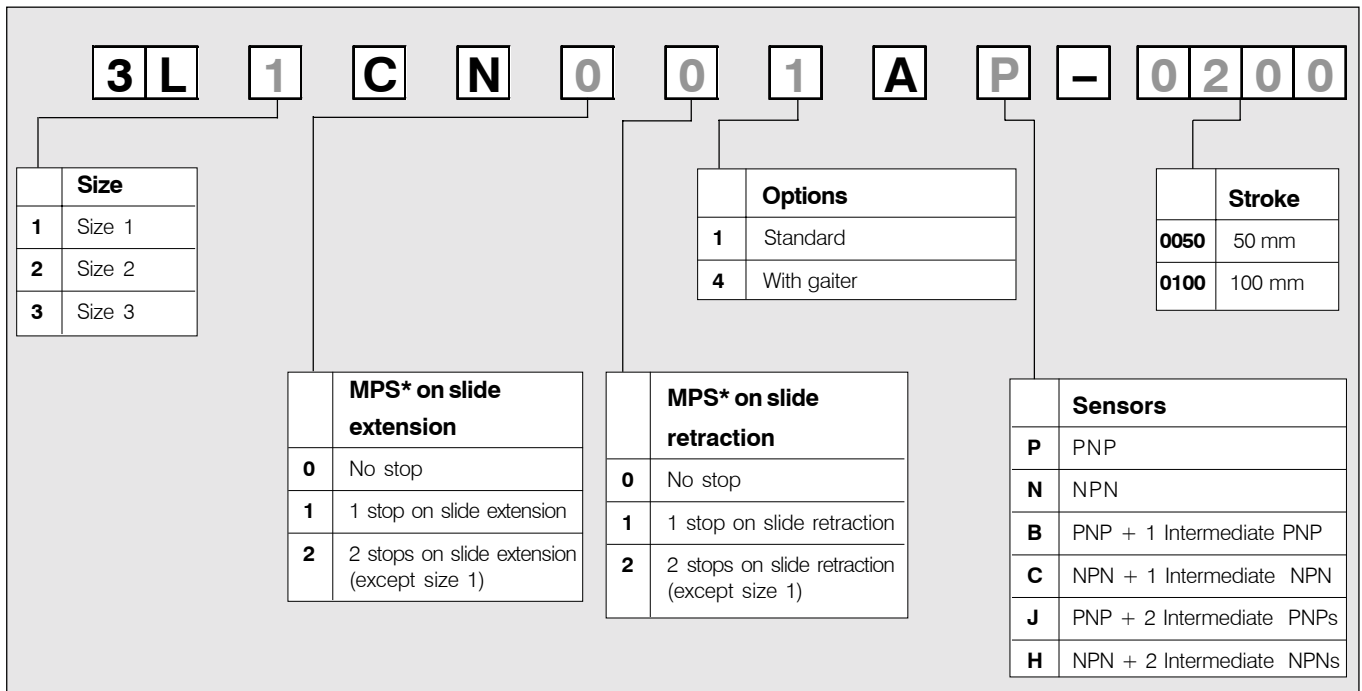
(P = 6 bar ; cycle = extend + retract)



Linear unit or short stroke unit on lift unit



Order code



* Variable Mid-Position Stop

Standard stroke options

Size	1						2				3									
Stroke (mm)	25	50	75	100	150	200	300	50	125	200	300	400	600	50	125	200	300	400	600	800
Linear unit		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lift unit	●	●	●	●	Contact us			●	●	●	Contact us			●	●	●	●	Contact us		
Unit with MPS**			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	