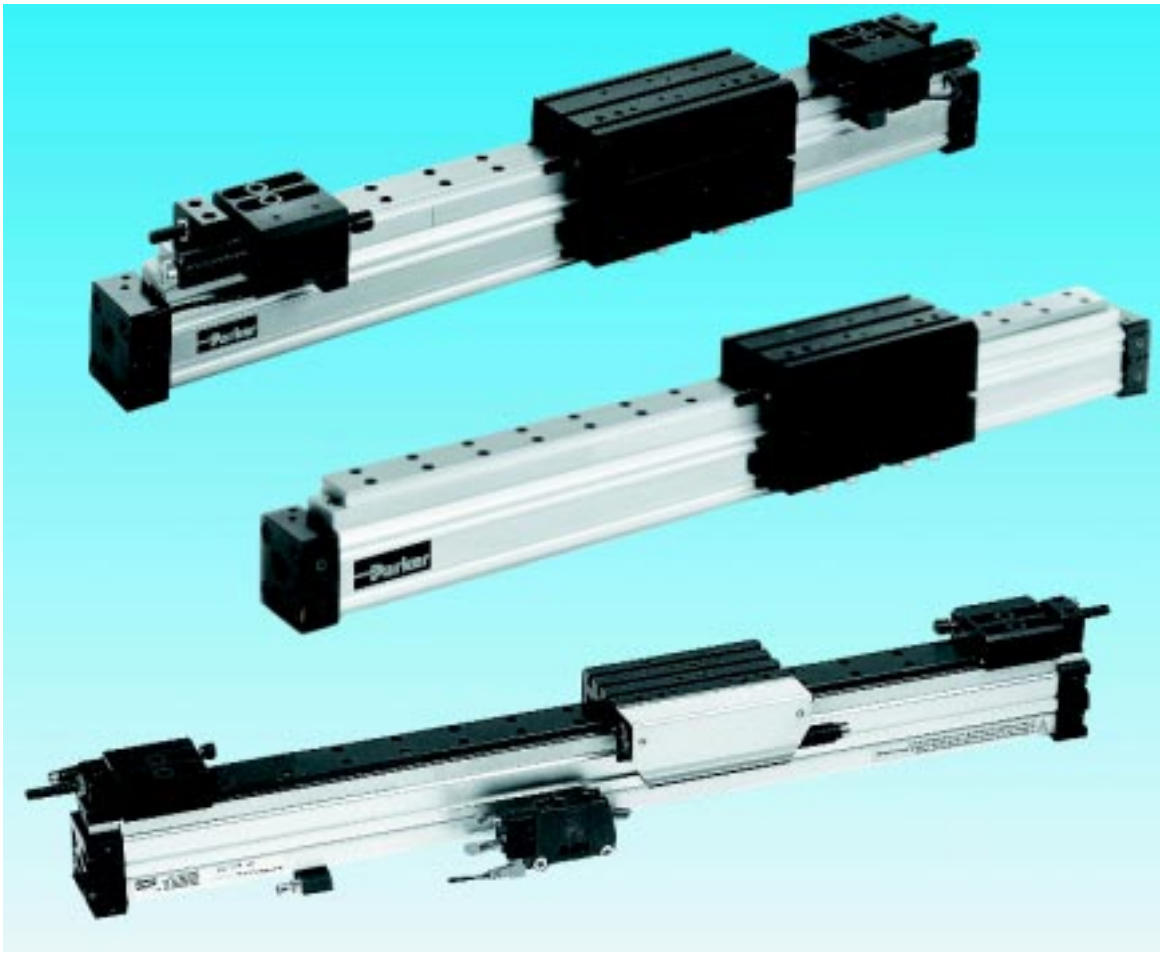
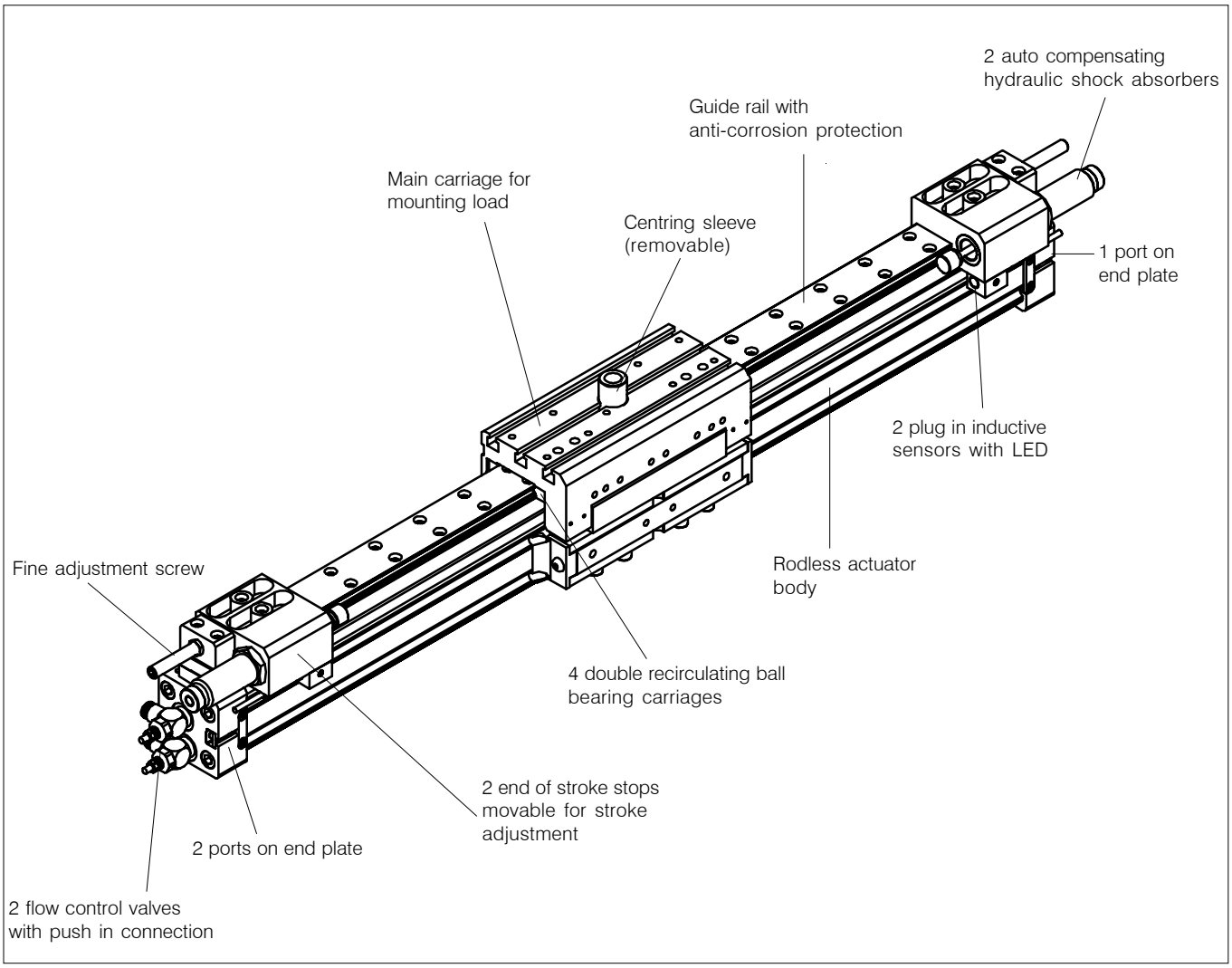




Description

"3D® Pneumatic" Carrier Units are linear actuators for moving heavy loads quickly and accurately with very long stroke options.
They incorporate very many operations:

- Guiding
- Cushioning
- Detection
- End of stroke adjustment
- Speed adjustment

Guiding

The carriage, guided by 4 double circulating ball bearings on ground and treated rail, provides outstanding rigidity and accuracy in moving heavy loads.
These fast modular carrier units provide cost effective solutions for industry's needs.

Cushioning

Each end of stroke is provided with an auto compensating hydraulic shock absorber for absorbing impacts and controlling deceleration.

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

End of stroke adjustment

Adjustment over the entire stroke of the "3D® Pneumatic" carrier unit is possible by step movement of the end stops. 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.

Options

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

- NPN NO Inductive Sensors

- MPS (Mid-Position Stop) two way for one or more positive carriage stops along the nominal stroke of the carrier unit (with fine position adjustment)

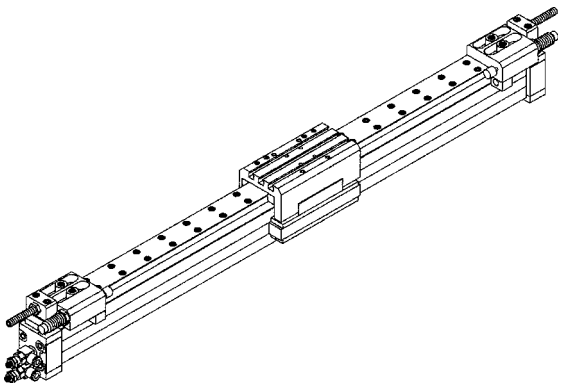
- Brake for stopping the carriage in the event of the compressed air supply being cut off.

- ***Inductive Sensor*** intermediate PNP or NPN for information during movement.

Range

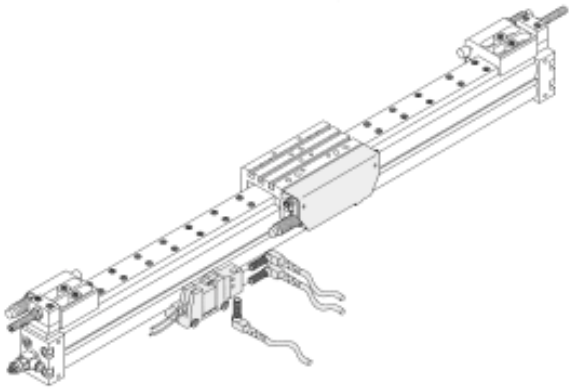
"Pneumatic 3D®" Carrier Unit

The range consists of 3 sizes with standard strokes of 100 to 5010 mm available.
The moving carriage enables other units in the 3D® range to be quickly and accurately connected using mounting kits.



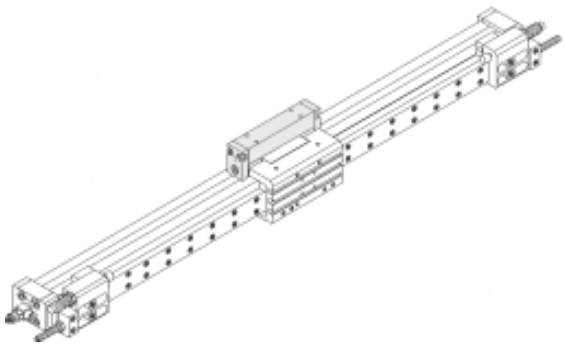
"Pneumatic 3D®" Carrier Unit with MPS option

The two way variable Mid-Position Stop allows the carriage to be accurately stopped at different places.
One or more MPS can be built in the "Pneumatic 3D®" Carrier Unit.



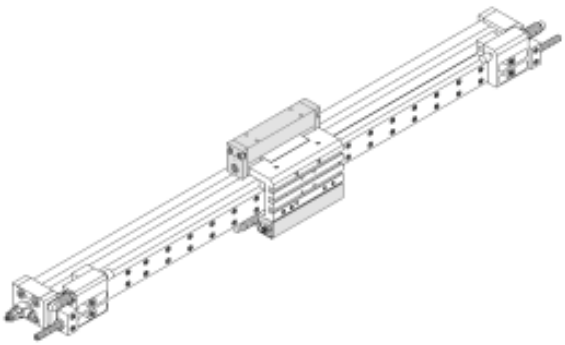
"Pneumatic 3D®" Carrier Unit with brake option

This option is for locking the movement in the event of the compressed air supply being cut off, mainly when the carrier unit is used in the vertical position.



"Pneumatic 3D®" Carrier Unit with MPS and brake options

The two options can be combined on the same "Pneumatic 3D®" Carrier Unit



General information

Size		1	2	3
Stroke (mm)**		100 to 3020	100 to 4020	150 to 5010
(standard stroke, see page 52)		40 mm step	40 mm step	60 mm step
Maximum load (kg)				
	horizontal position	40	60	100
	vertical position	15	25	40
Repeatability (mm)		0.03	0.03	0.03
Operation		Dry air, lubricated or non lu	air, lubricated or non lu	air, lubricated or non lu
Ø actuator bore (mm)		25	32	40
Theoretical thrust (N)*		294	482	753
Ø connection opening (mm)		4 x 6	6 x 8	6 x 8
Operating pressure (bar)		2 to 8	2 to 8	2 to 8
Mass (kg)				
	0 stroke	3,53	5,35	9,40
	extra./mm of stroke	0,0062	0,0073	0,0126
Temperature (°C)		0 to 65	0 to 65	0 to 65

* At 6 bar pressure
** For longer strokes, consult us

Permissible loads

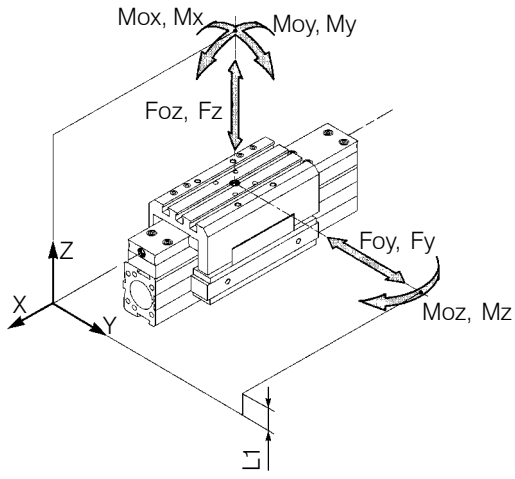
Static Values
(for the guiding system)

Size	1	2	3
Foy (N)	24600	24600	60000
Foz (N)	21200	21200	52000
Mox (Nm)	430	430	1284
Moy (Nm)	550	930	1200
Moz (Nm)	600	1060	1350

Dynamic values
(for 7500 km guiding service life)

Size	1	2	3
Fy (N)	400	600	1000
Fz (N)	400	600	1000
Mx (Nm)	40	40	130
My (Nm)	80	125	145
Mz (Nm)	80	125	145

- These values are not cumulative
- Subject to operating under normal conditions
Consult us for more information



Size	L1
1	21
2	26
3	32

L1: the distance between the rail centre and face of carriage body

Technical information

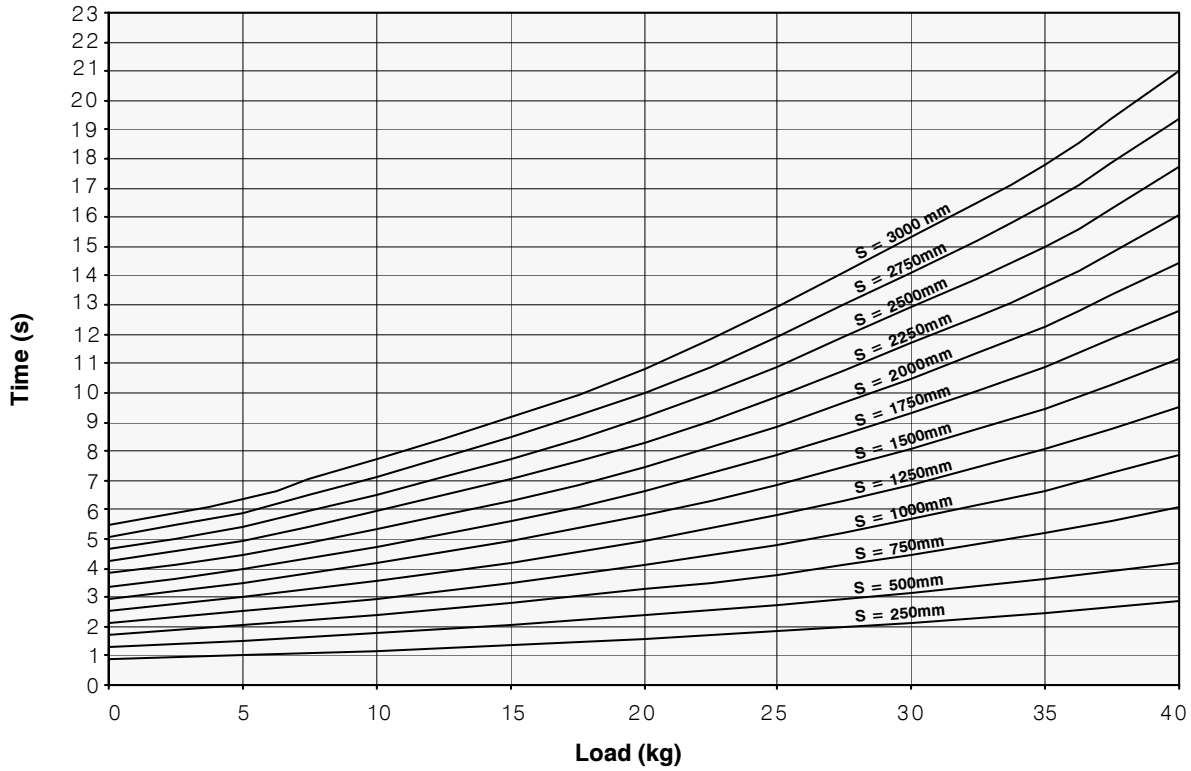
Features

Type of guide rail	4 double recirculating ball bearing cartridges, with scrapers treated rail, corrosion proof treated
End of stroke stops	Adjustable stops over entire stroke length, at 40 mm (size 1 and 2), 60 mm (size 3) 40 mm pressure adjustable (size 1 and 2), 60 mm (size 3)
Cushioning	Self-compensating hyraulic shock absorbers with urethane stop
Detection	3 wire inductive sensors with plug in straight connectors M8 PNP NO Voltage 10-30 VDC Max switching current 200 mA
Detection indication	LED on the sensors
Pneumatic connection	Plug in adjustable flow control valves on each end plate or on the same side
Rail lubrication	By grease nipple accessible at the ends of the carriages
Carrier fixing	By bolt holes on 2 ends
Intermediate support	By dovetail slot on body
Fixing other units or accessories on the carriage	Dowel pin to carriage or rectangular nut and screw in T-slots Centring with cylindrical sleeve and plastic cotter pin Possible accessory adjustment at 90° intervals

Cycle time size 1

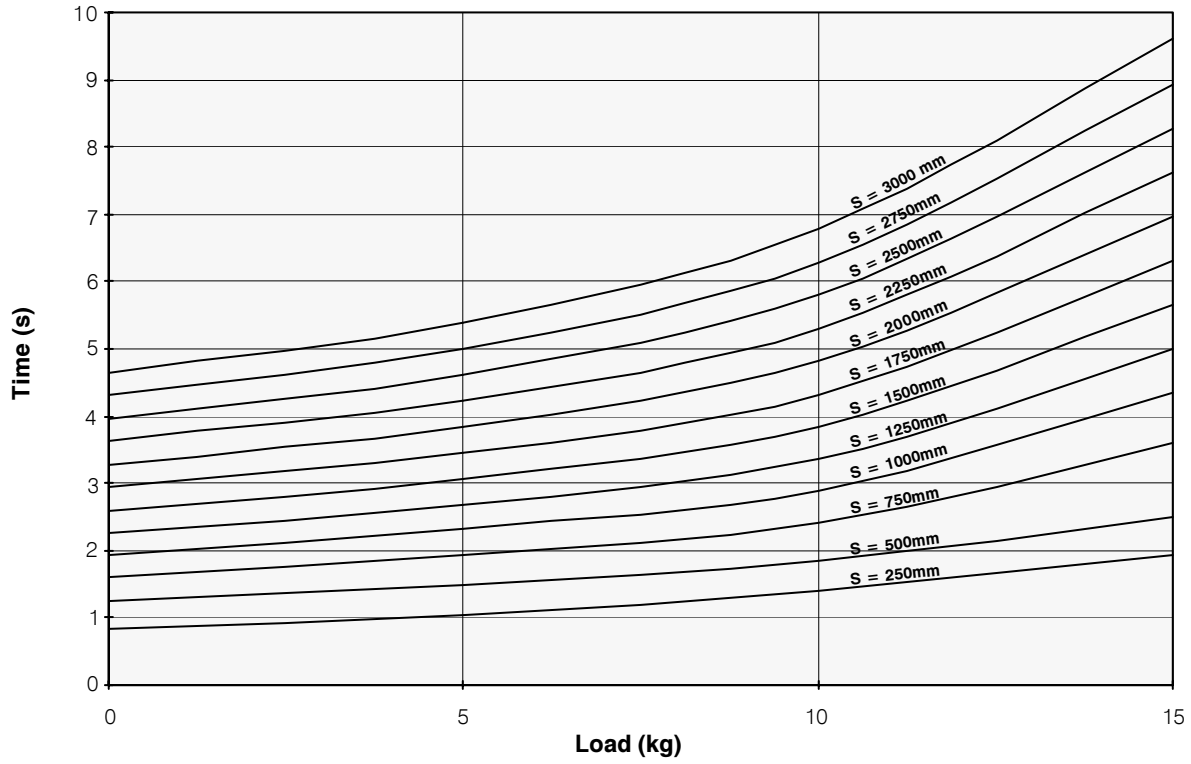
Horizontal position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



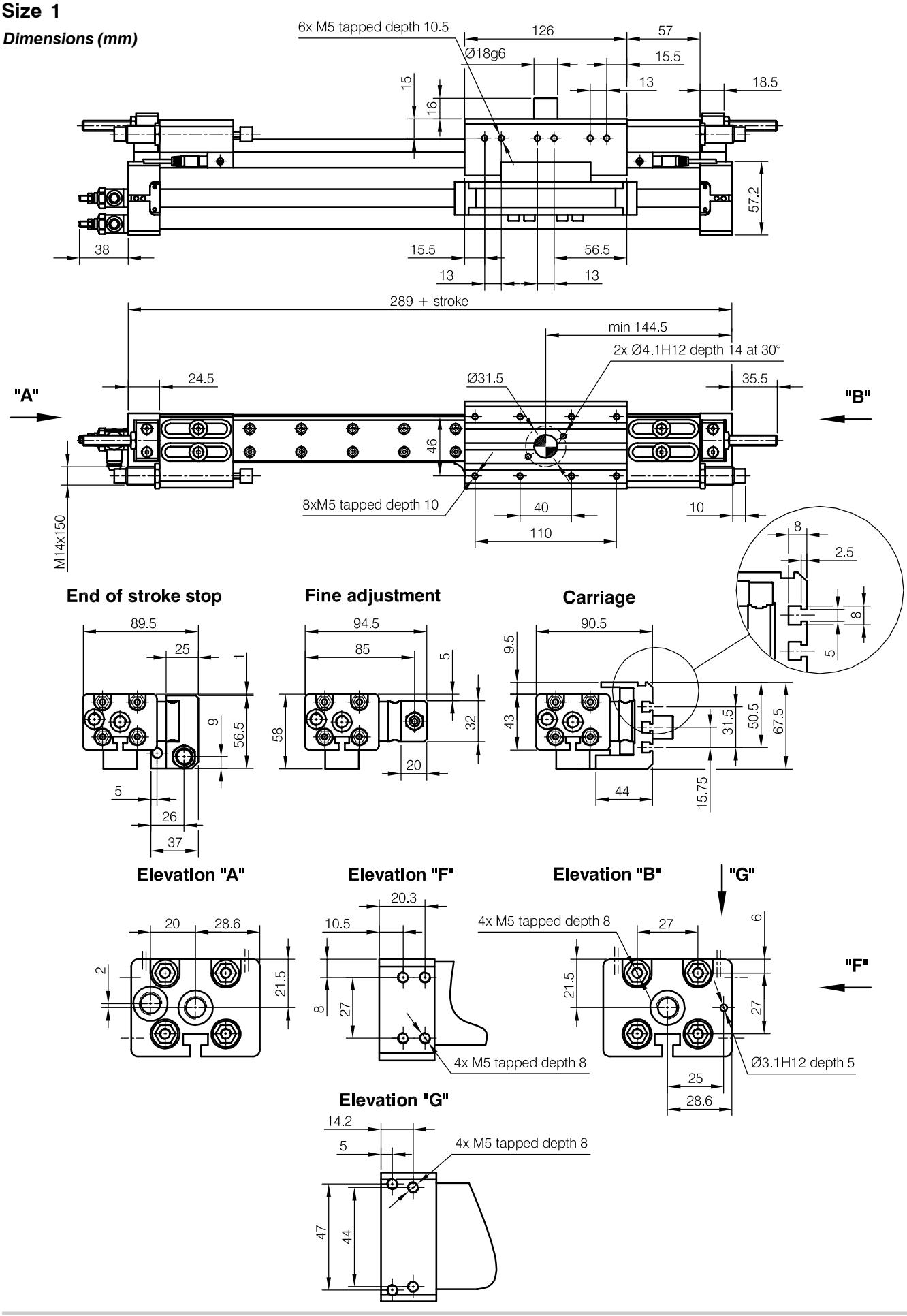
Vertical position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



Size 1

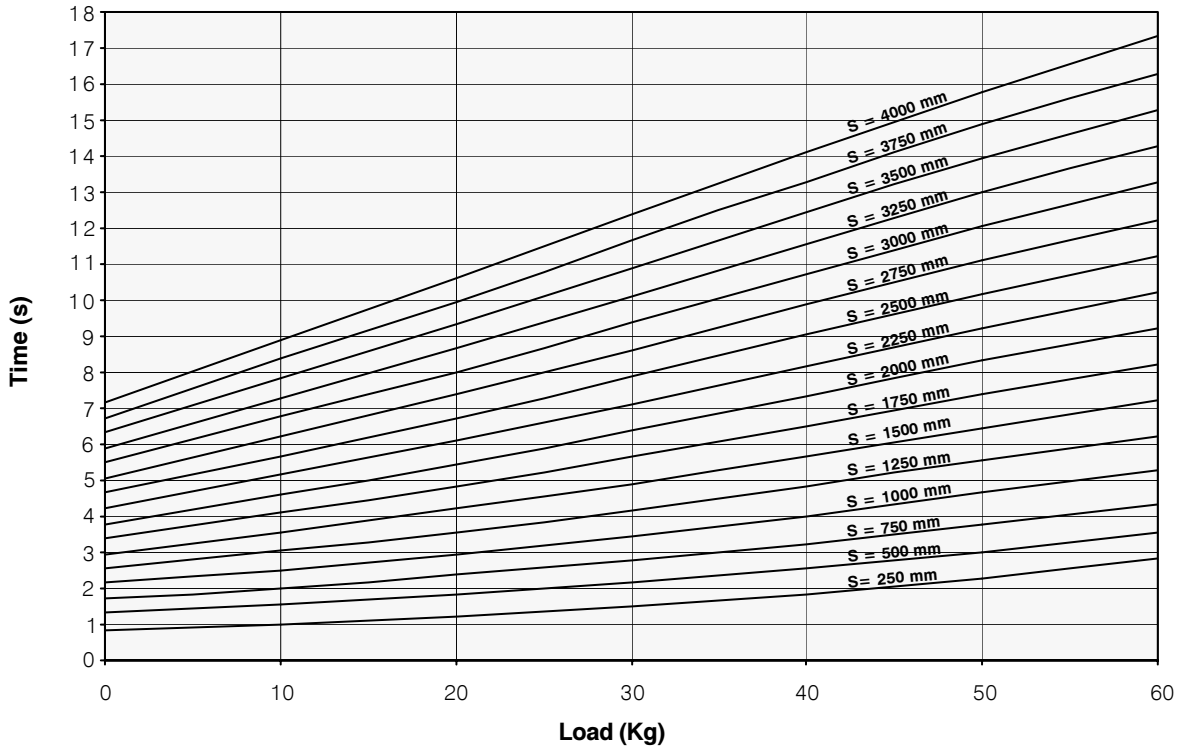
Dimensions (mm)



Cycle time size 2

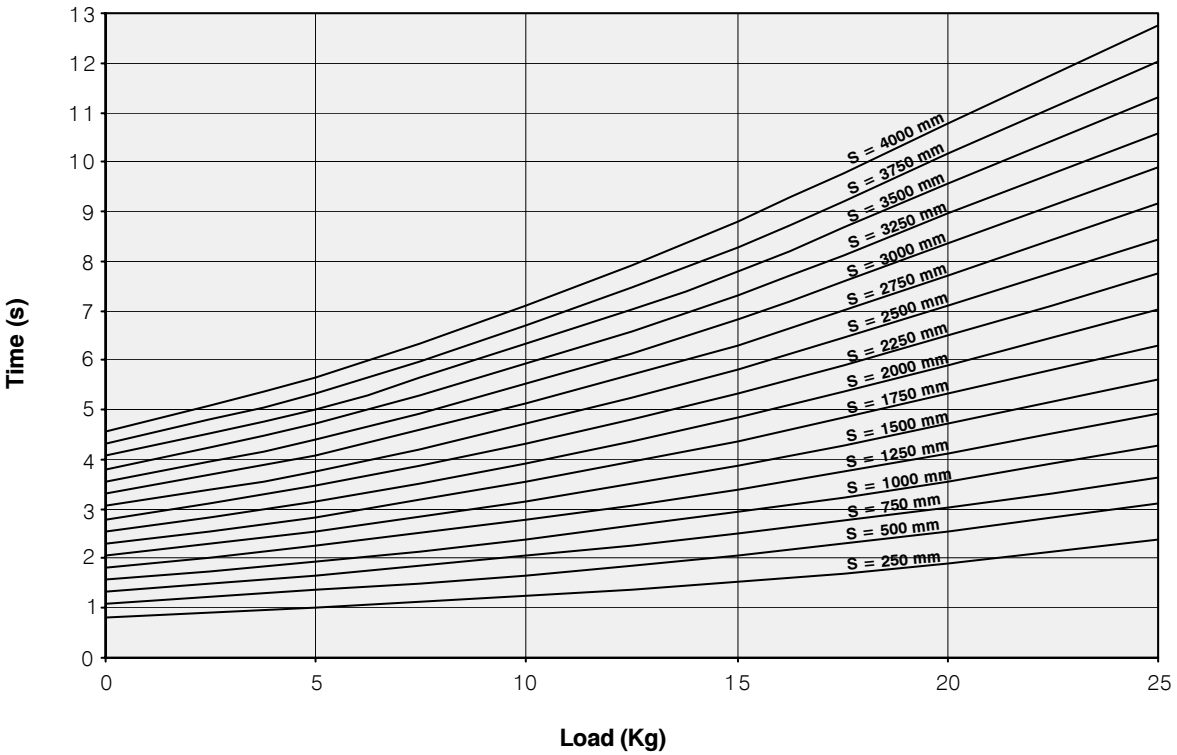
Horizontal position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



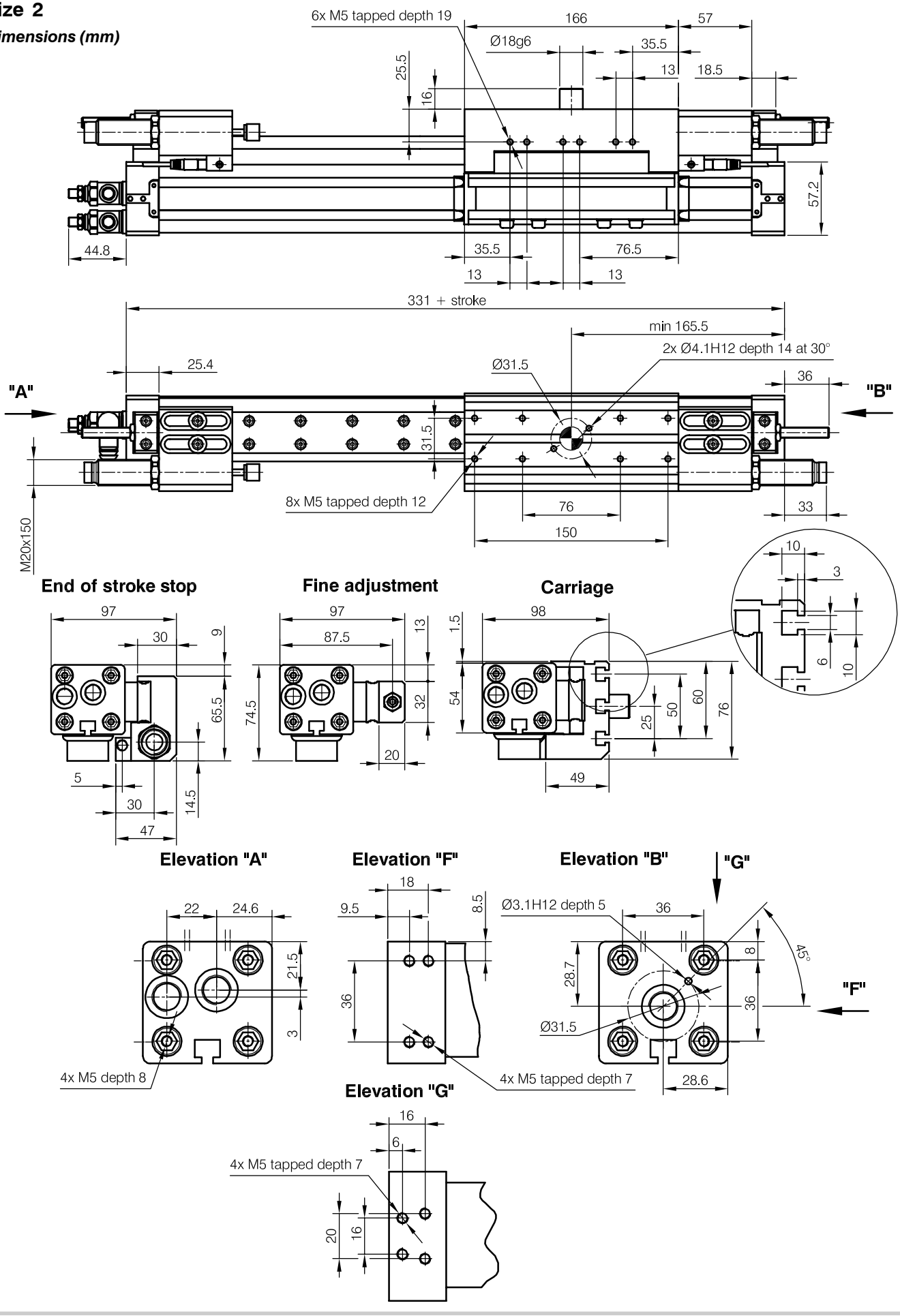
Vertical position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



Size 2

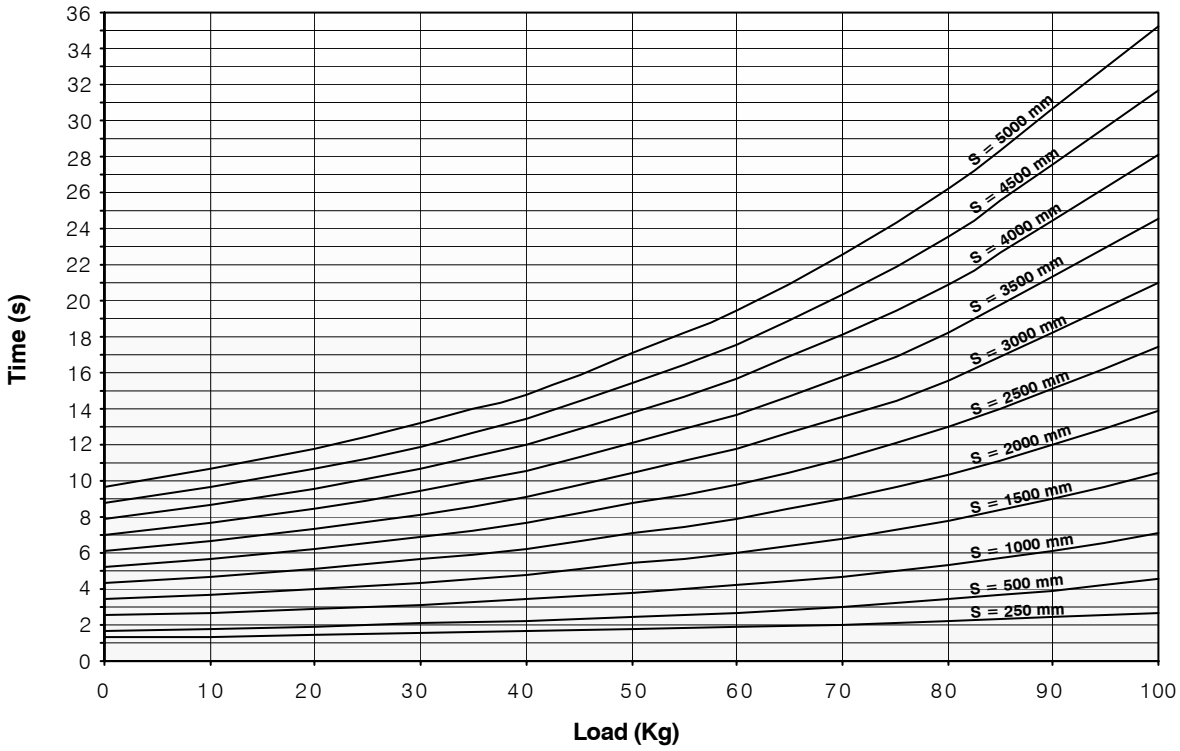
Dimensions (mm)

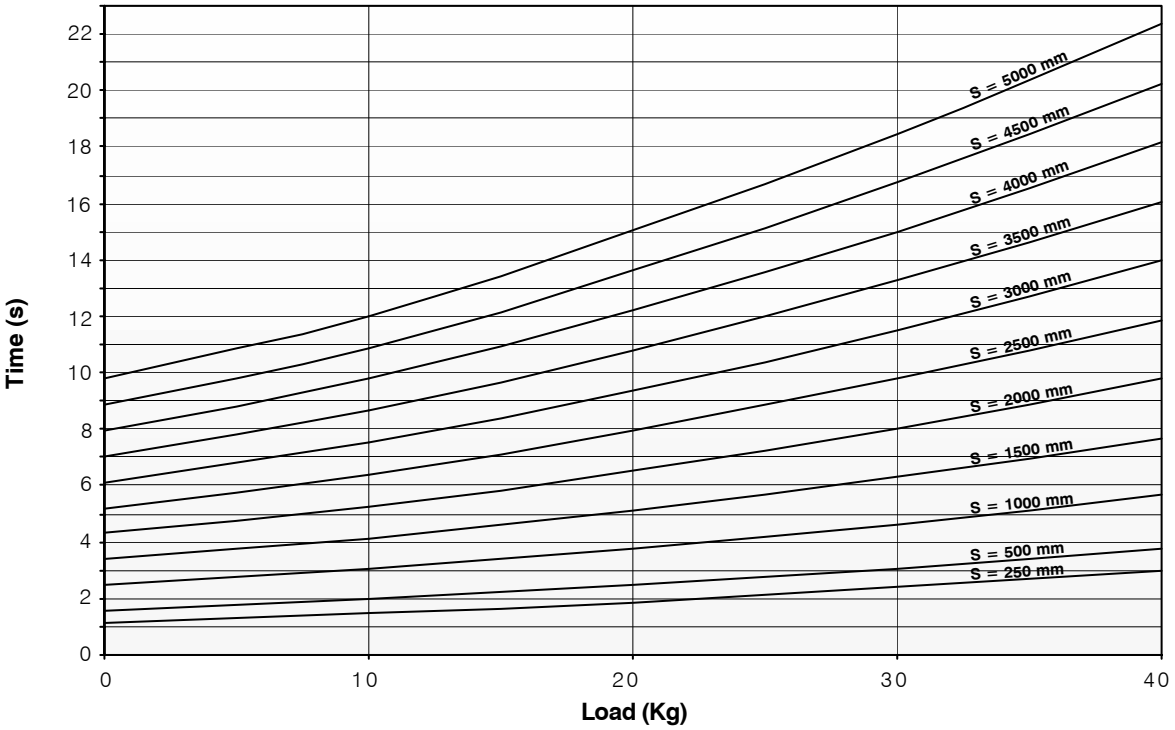


Cycle time size 3

Horizontal position

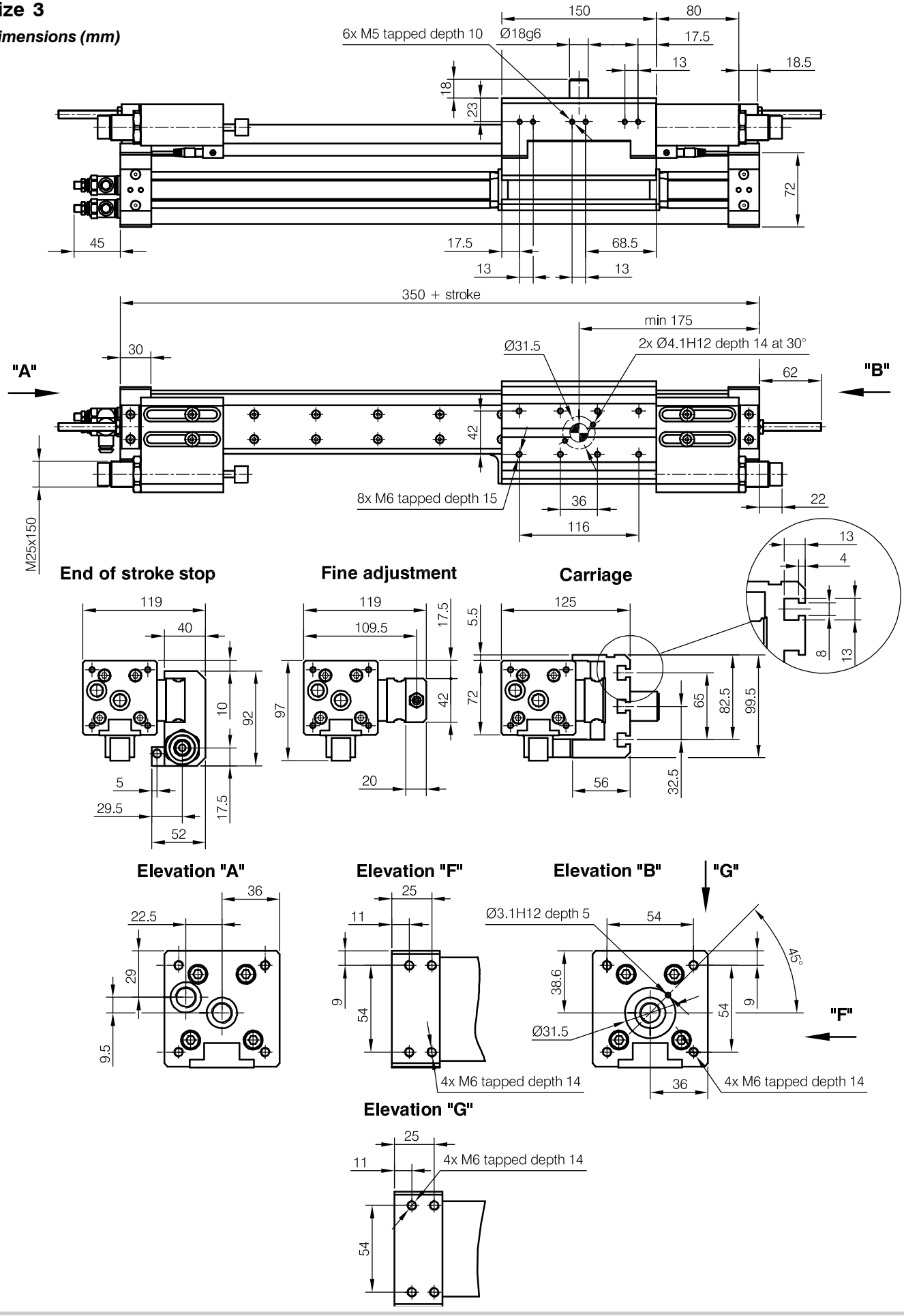
(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)





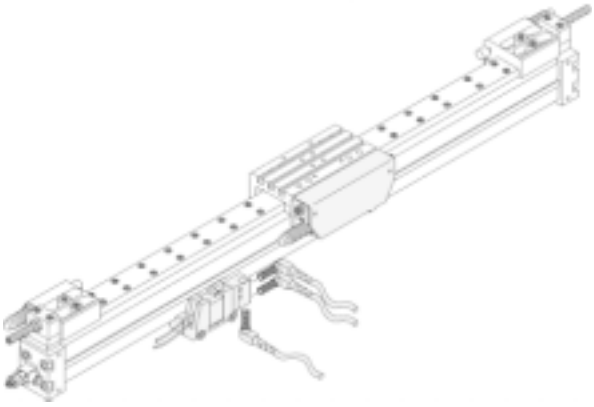
Size 3

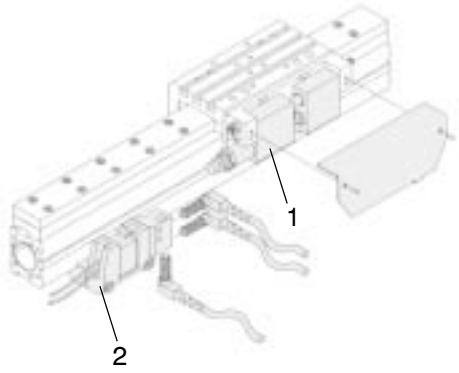
Dimensions (mm)



"Pneumatic 3D" Carrier Units with Variable Mid-Position Stop (MPS)

Technical information





The MPS is for:

- mechanical stops along the stroke of the "Pneumatic 3D®" Carrier Unit
- stopping the carriage in both directions at the same point (adjusting the same stop point with the adjustment screw)

The MPS is made up of two parts:

- the top part built in the carrier unit carriage (1)
- the bottom part fixed on the carrier unit body (2).

A hydraulic shock absorber is for vibration free fast deceleration.

The MPS is built in the carrier unit. ± 2mm fine adjustment reduces adjustment time and provides stopping accuracy.

The MPS provides carriage stop positions with 0.03 mm repeatability.

Other MPSs can easily be fitted on a carrier unit with an MPS by only adding the bottom part (2) as many times as required (see page 49 for minimum distance between two stops).

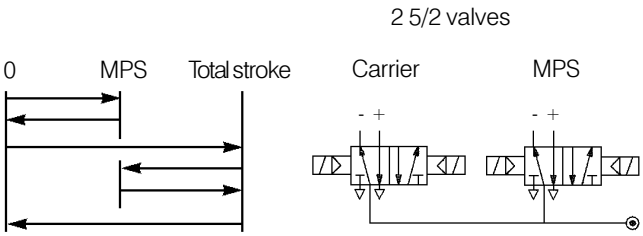
A cover, making the unit aesthetic and safe, protects the MPS.

The range includes an MPS by carrier size.

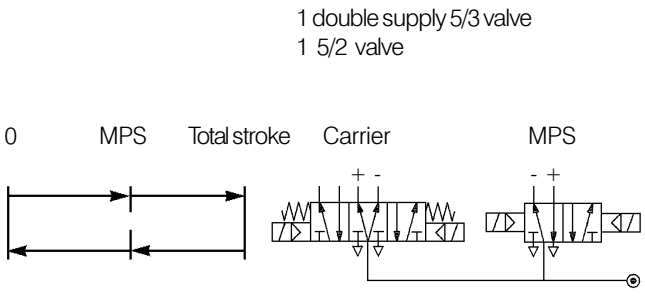
The MPS consists of:

- a double acting piston controlling the extendable stop (polyurethane pipe supply on push in connections)
- three inductive sensors with connections which provide information on the status of the stop and carriage stop on the MPS (stop extending, stop retracting, carriage stop position).

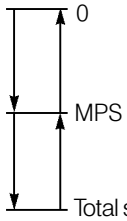
Reversing direction after each intermediate stop
(carrier unit vertical or horizontal):



No direction reverse after each intermediate stop
(carrier unit horizontal):

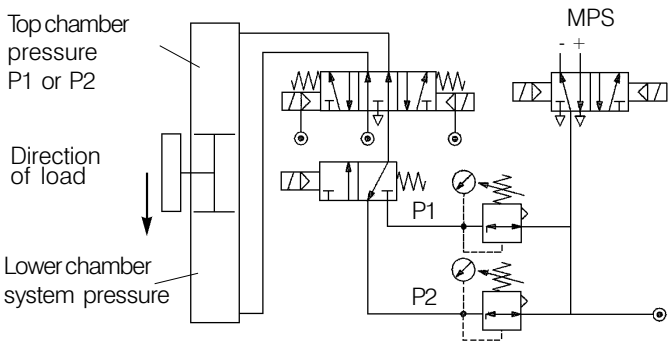


No direction reverse after each intermediate stop
(carrier unit vertical):



1 5/3 valve, pressure centre **with external pilot supply**
1 5/2 valve
1 3/2 NF valve
2 controls

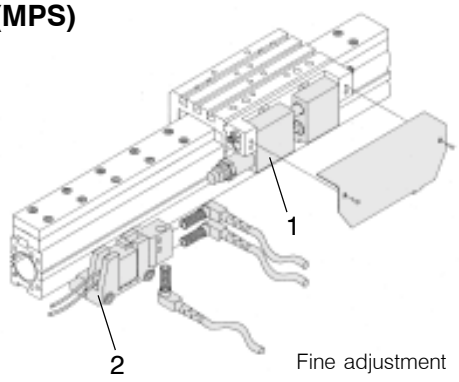
Several compensating pressures are required to retract the MPS in the vertical position with different loads and stopping directions.

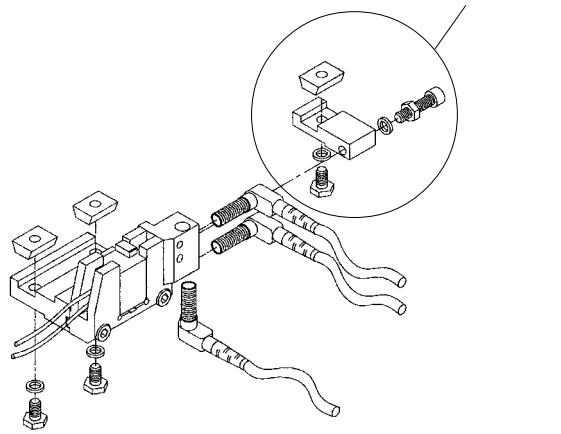


"Pneumatic 3D®" Carrier Units with Variable Mid-Position Stop (MPS)

Technical information

Size	Connections per tube Ø mm	Mass kg	Part No. Carrier + MPS
1	2,7 x 4	1,5	see
2	2,7 x 4	2,4	part No.
3	2,7 x 4	2,6	page 52





Order code

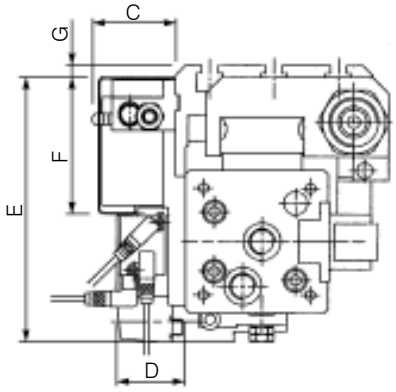
(Additional MPS: bottom part reference 2)

3	F	1	K	E

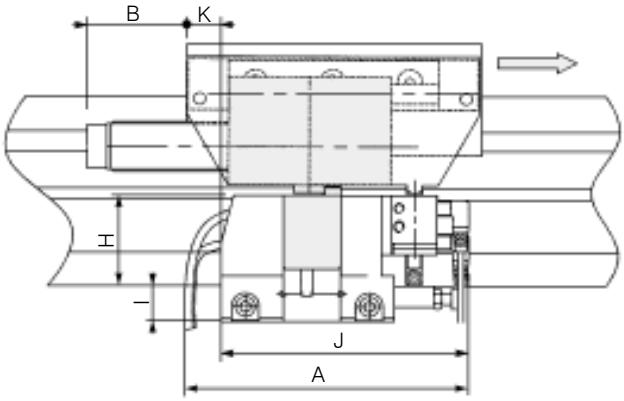
	Size
1	Size 1
2	Size 2
3	Size 3

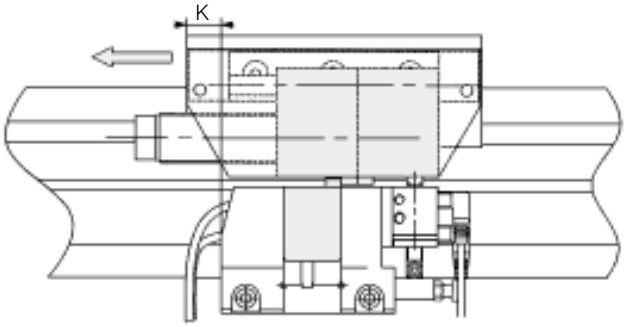
	Sensors
E	PNP
F	NPN

Dimensions (mm)



Carriage shown in the stop position on the MPS



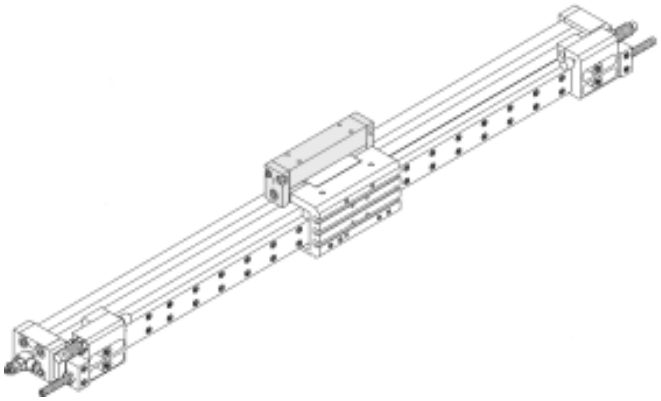


Size	A	B	C	D	E	F	G	H	I	J	K
1	115	32,5	27,5	33	100	53,5	0,5	30,5	15	24	100
2	145	43	37,5	31	115,5	50,5	0,5	44	20	26	125
3	145	49,5	41,5	34,5	134	69	6	46	18	19	125

A: minimum distance between two MPSs

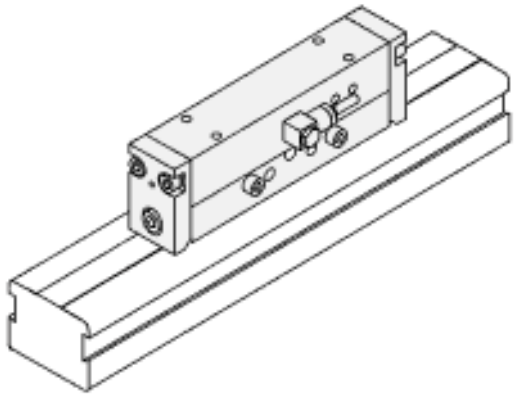
"Pneumatic 3D®" Carrier Unit with passive brake

Technical information



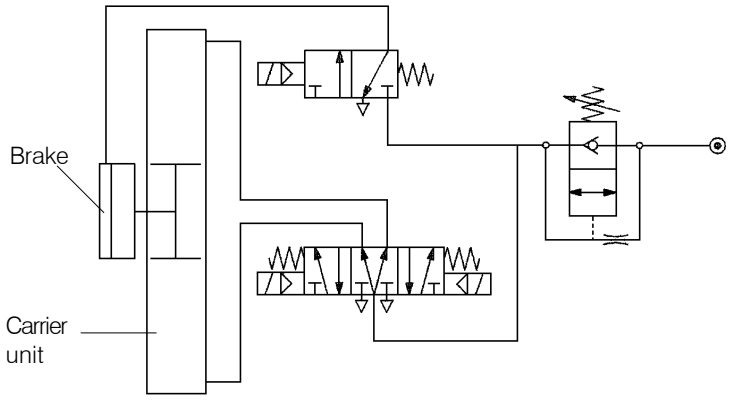
- The brake consists of a main body in a single part in which the braking system is integrated.
- The brake is for:

  - stopping the carriage immediately in the event of the compressed air supply being cut off
- The range includes one brake by carrier size.
- The brake is mounted on only one side of the carrier unit and enables multiple combinations with other options like the MPS and mounting accessories.
- Brake operating pressure 5 to 8 bar.



⚠ Caution: The brake must only be used with balancing the 2 chambers of the piston (pressurized or not).
The unit shall be restarted with all required precautions (gradual pressurizing)

Pneumatic circuitry



- 1 5/3 valve, pressure centre
- 1 3/2 NC valve
- 1 soft start valve

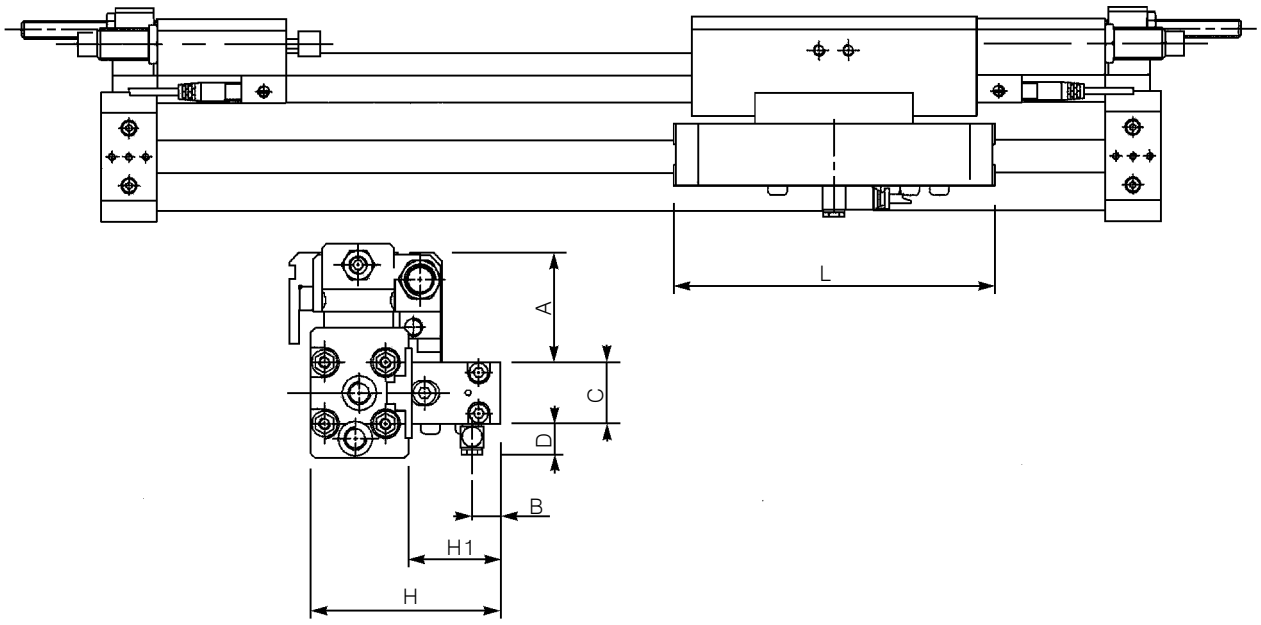
"Pneumatic 3D®" Carrier Unit with passive brake

Technical information

Size	Connections per tube Ø	Mass	Static holding force	Part No. Carrier + Brake
	mm	kg	N	
1	2,7 x 4	0,85	240	see part No. page 52
2	2,7 x 4	1,1	400	
3	2,7 x 4	1	630	

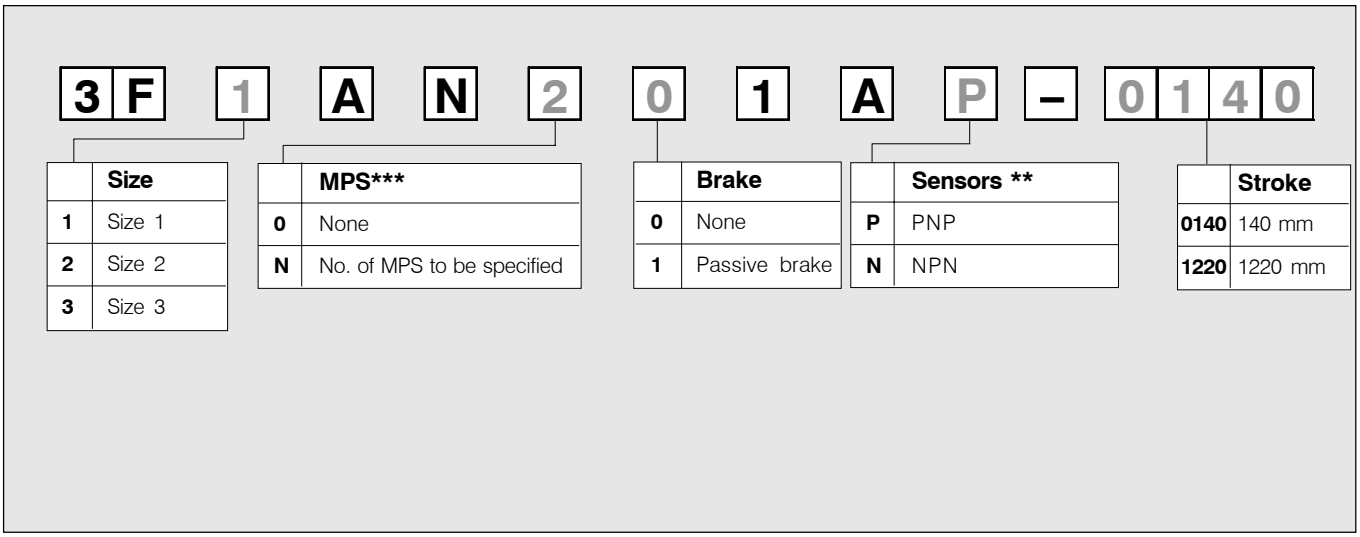
⚠ It is strongly recommended that a quick exhaust valve near the supply port be used to get better brake reaction times.

Dimensions (mm)



Size	A	B	C	D	H1	H	L
1	48,5	12,5	27	13,5	41	84	142,5
2	53,5	13,5	32	13,5	47	101	184,5
3	73	17	32	13,5	49	121	172,5

Order code



** Inductive sensors with straight connectors and 5m cable.
*** Variable Mid-Position Stop.
MPS and brake options can be combined.

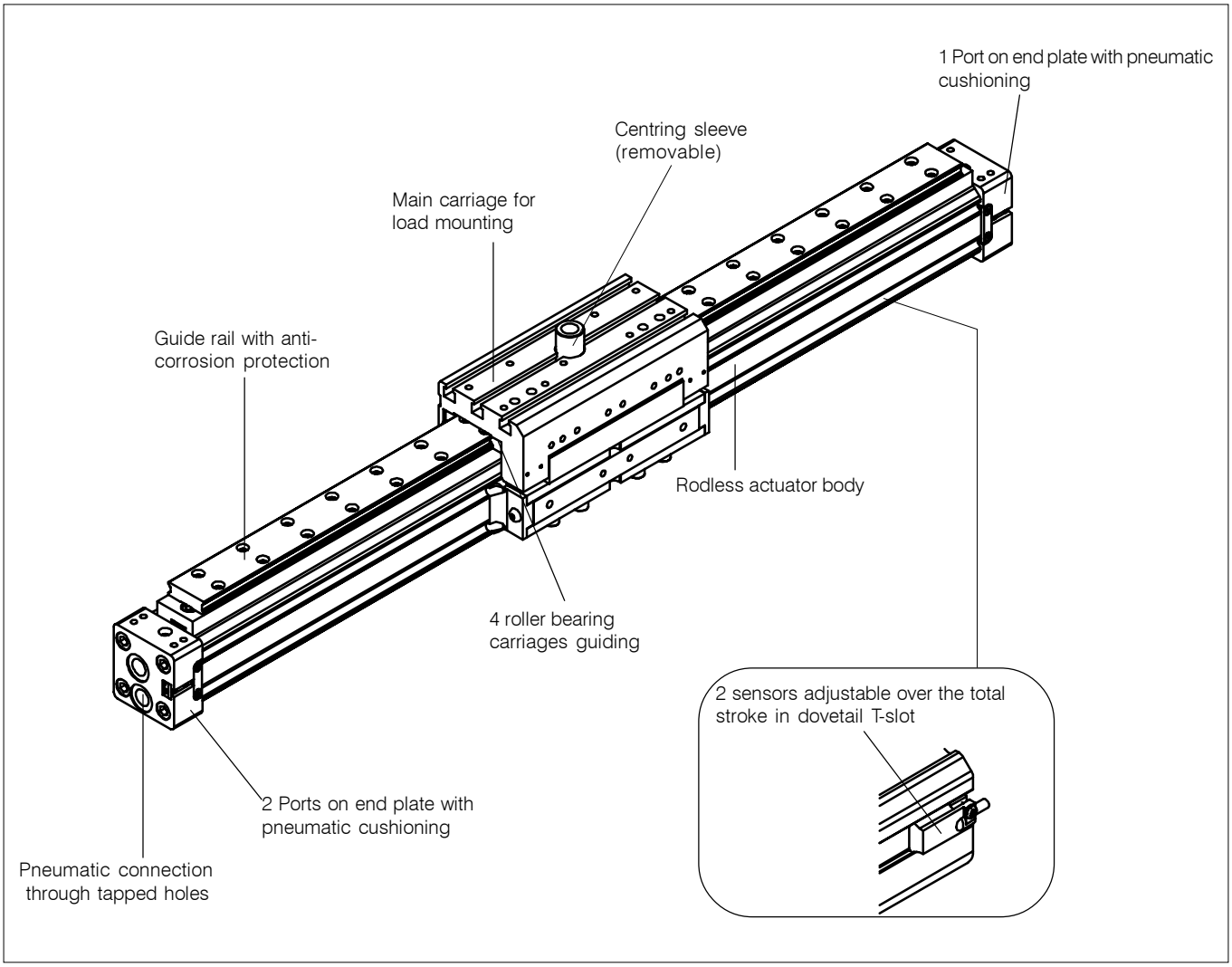
Additional intermediate sensor

The carrier unit can be fitted with one or more additional sensors.
They should be ordered separately (part nos. on page 68).

Standard stroke options

Part No.	Size	Standard stroke options in mm
3F1AN001AP-XXXX*	1	100 140 180 220 260 300 340 380 420 460 500 540 580 620 660 700 740 780 820 860 900 940 980 1020 1060 1100 1140 1180 1220 1260 1300 1340 1380 1420 1460 1500 1540 1580 1620 1660 1700 1740 1780 1820 1860 1900 1940 1980 2020 2060 2100 2140 2180 2220 2260 2300 2340 2380 2420 2460 2500 2540 2580 2620 2660 2700 2740 2780 2820 2860 2900 2940 2980 3020
3F2AN001AP-XXXX*	2	100 140 180 220 260 300 340 380 420 460 500 540 580 620 660 700 740 780 820 860 900 940 980 1020 1060 1100 1140 1180 1220 1260 1300 1340 1380 1420 1460 1500 1540 1580 1620 1660 1700 1740 1780 1820 1860 1900 1940 1980 2020 2060 2100 2140 2180 2220 2260 2300 2340 2380 2420 2460 2500 2540 2580 2620 2660 2700 2740 2780 2820 2860 2900 2940 2980 3020 3060 3100 3140 3180 3220 3260 3300 3340 3380 3420 3460 3500 3540 3580 3620 3660 3700 3740 3780 3820 3860 3900 3940 3980 4020
3F3AN001AP-XXXX*	3	150 210 270 330 390 450 510 570 630 690 750 810 870 930 990 1050 1110 1170 1230 1290 1350 1410 1470 1530 1590 1650 1710 1770 1830 1890 1950 2010 2070 2130 2190 2250 2310 2370 2430 2490 2550 2610 2670 2730 2790 2850 2910 2970 3030 3090 3150 3210 3270 3330 3390 3450 3510 3570 3630 3690 3750 3810 3870 3930 3990 4050 4110 4170 4230 4290 4350 4410 4470 4530 4590 4650 4710 4770 4830 4890 4950 5010

* Show the stroke in 4 digits (e.g.: 0140 stroke 140mm)



Description

Simple Carrier Units are linear actuators for moving heavy loads quickly and accurately with very long stroke options. They incorporate the following operations:

- Guiding
- Cushioning
- Detection

Guiding

The carriage, guided by 4 double circulating ball bearings on ground and treated rail, provides outstanding rigidity and accuracy in moving heavy loads.
These fast modular carrier units provide cost effective solutions for industry's needs.

Cushioning

Each end of stroke is provided with an adjustable pneumatic cushioning for controlling deceleration.

Detection

All simple carrier units are fitted with magnetic pistons. Magnetic or magneto-inductive sensors can be mounted in a dovetail slot.

Options

The following are available for increasing simple carrier unit options:

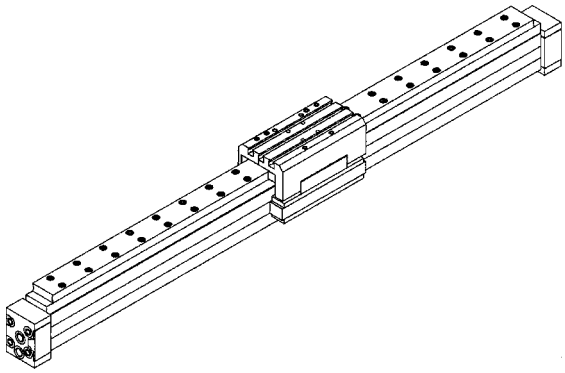
- ***MPS (Mid-Position Stop)*** two way for one or more positive carriage stops along the nominal stroke of the carrier unit (with fine position adjustment)

- ***Brake*** for stopping the carriage in the event of the compressed air supply being cut off.

Range

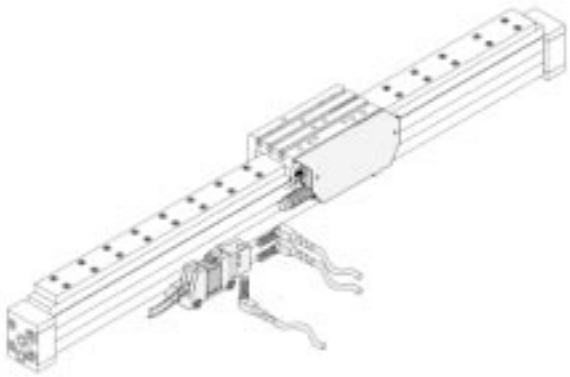
Simple Carrier Unit

The range consists of 3 sizes with standard strokes of 100 to 5000 mm available.
The moving carriage enables other units in the 3D® range to be quickly and accurately connected using mounting kits.



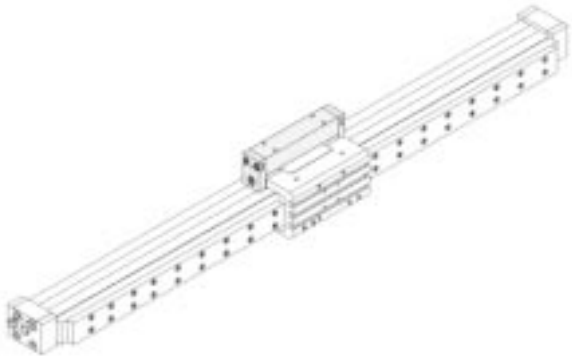
Simple Carrier Unit with MPS option

The two way variable Mid-Position Stop allows the carriage to be accurately stopped at different places.
One or more MPS can be built in the Simple Carrier Unit.



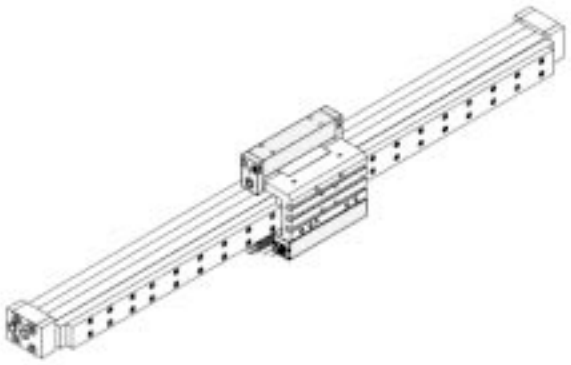
Simple Carrier Unit with brake option

This option is for locking the movement in the event of the compressed air supply being cut off, mainly when the carrier unit is used in the vertical position.



Simple Carrier Unit with MPS and brake options

The two options can be combined on the same Simple Carrier Unit.



General information

Size		1	2	3
Stroke (mm)**		0 to 3000	0 to 4000	0 to 5000
Maximum load (kg)				
	horizontal position	20	30	50
	vertical position	10	20	30
Repeatability (mm)		0.03	0.03	0.03
Operation		Dry air, lubricated, unlubrica	air, lubricated, unlubrica	air, lubricated, unlubrica
Ø piston bore (mm)		25	32	40
Theoretical thrust (N)*		294	482	753
Ø of supply ports (G)		1/8"	1/4"	1/4"
Operating pressure (bar)		2 to 8	2 to 8	2 to 8
Mass (kg)				
	0 stroke	3,53	5,35	9,40
	extra./mm of stroke	0,0062	0,0073	0,0126
Temperature (°C)		0 to 65	0 to 65	0 to 65

* At 6 bar pressure
** For longer strokes, consult us.

Permissible loads

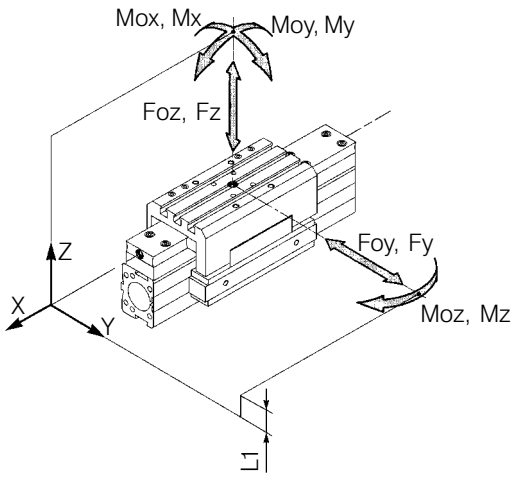
Static Values
(for the guiding system)

Size	1	2	3
Foy (N)	24600	24600	60000
Foz (N)	21200	21200	52000
Mox (Nm)	430	430	1284
Moy (Nm)	550	930	1200
Moz (Nm)	600	1060	1350

Dynamic values
(for 7500 km guiding service life)

Size	1	2	3
Fy (N)	400	600	1000
Fz (N)	400	600	1000
Mx (Nm)	40	40	130
My (Nm)	80	125	145
Mz (Nm)	80	125	145

- These values are not cumulative
- Subject to operating under normal conditions
Consult us for more information



Size	L1
1	21
2	26
3	32

L1 : the distance between the rail centre and face of carriage body.

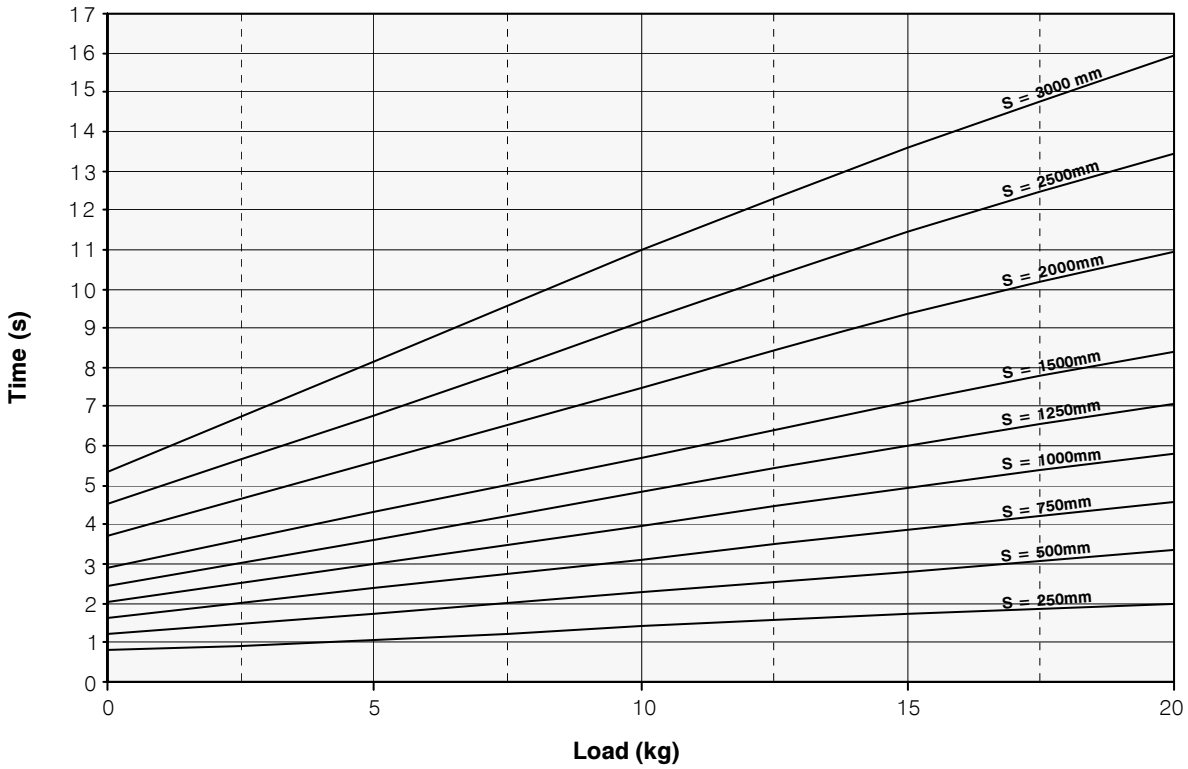
Technical information

Features	
Type of guide rail	4 double recirculating ball bearing cartridges, with scrapers treated rail, corrosion proof treated
End of stroke stops	On actuator ends
Cushioning	Adjustable pneumatic shock absorbers
Detection	Magnetic or magneto-inductive sensors
Pneumatic connection	Supply ports on each end plate or on the same side
Rail lubrication	By grease nipple on ends of carriages
Carrier fixing	By bolt holes on 2 ends
Intermediate support	By dovetail slot on body
Fixing other units or accessories on the carriage	Dowel pin to carriage or rectangular nut and screw in T-grooves Centring with cylindrical sleeve and plastic cotter pin Possible accessory adjustment at 90° intervals

Cycle time size 1

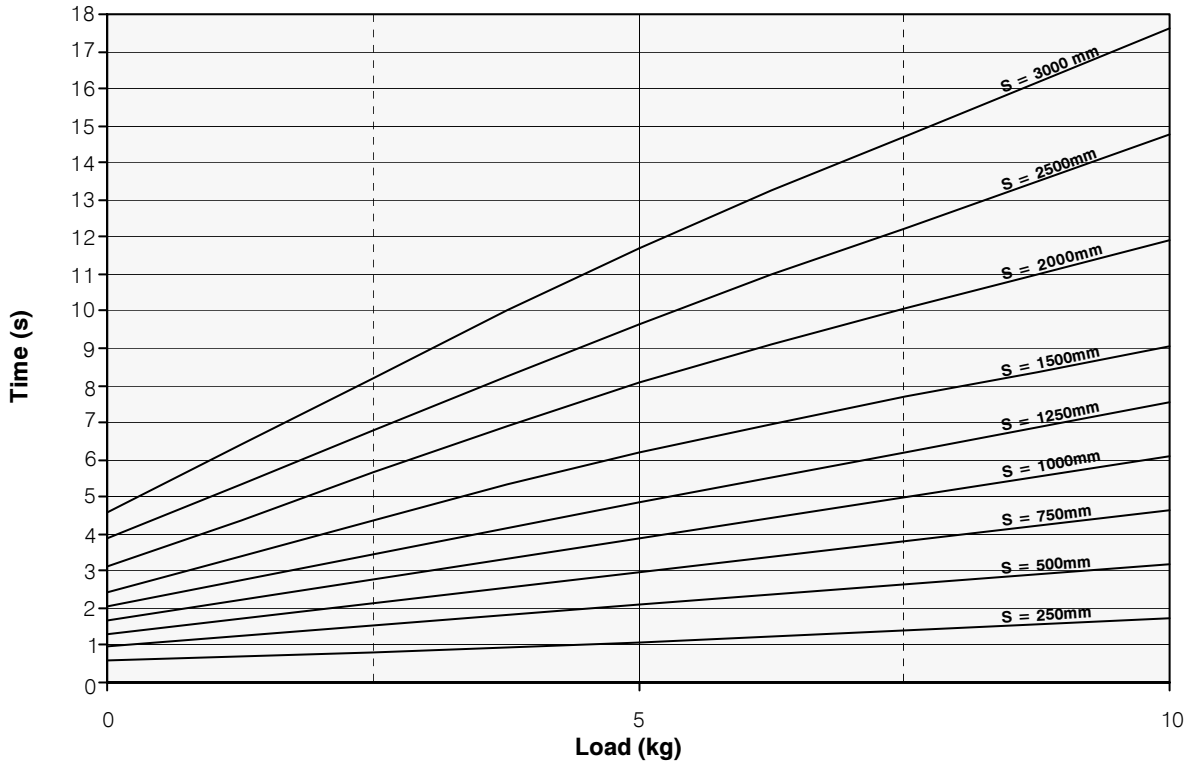
Horizontal position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



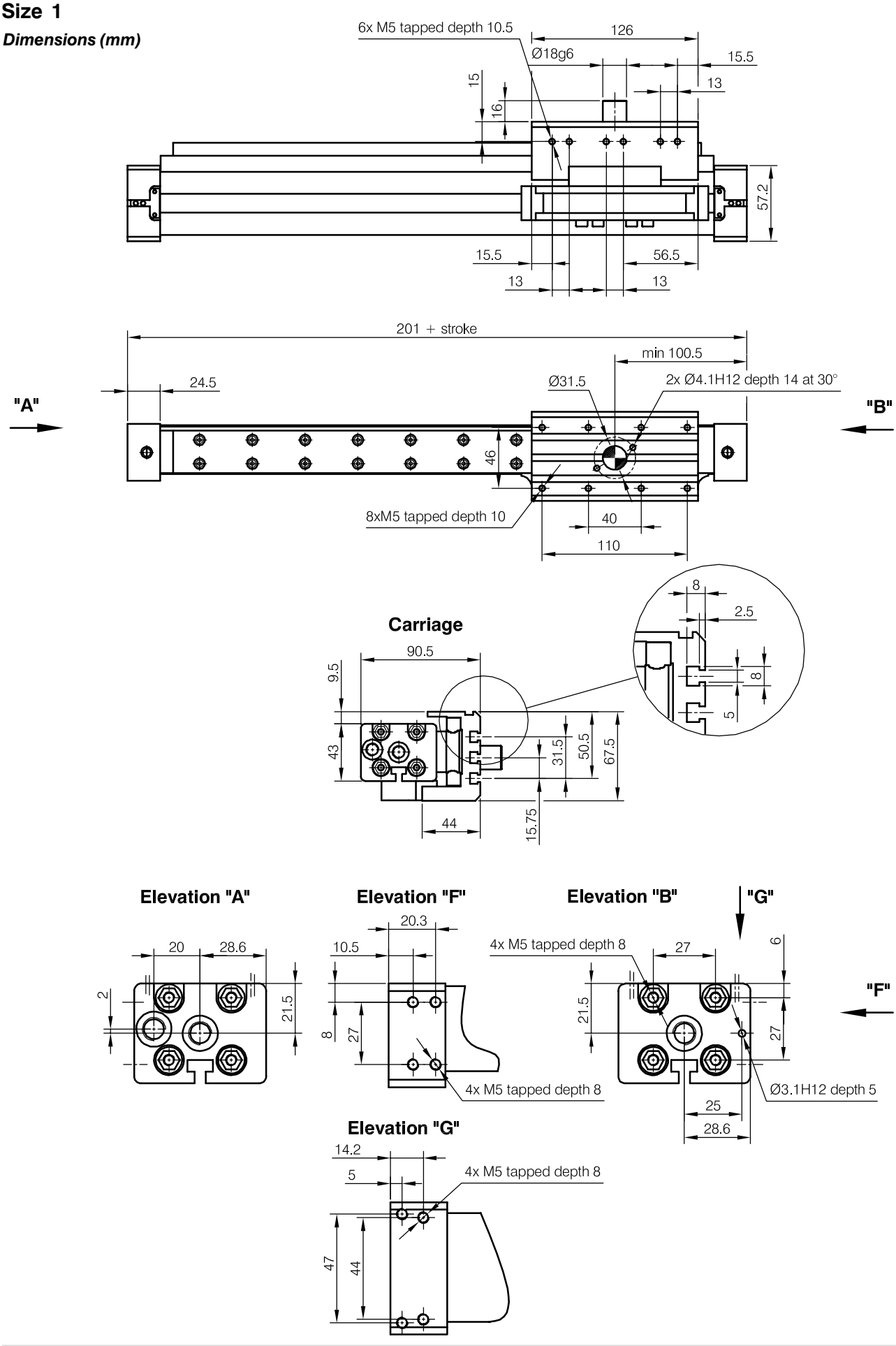
Vertical position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



Size 1

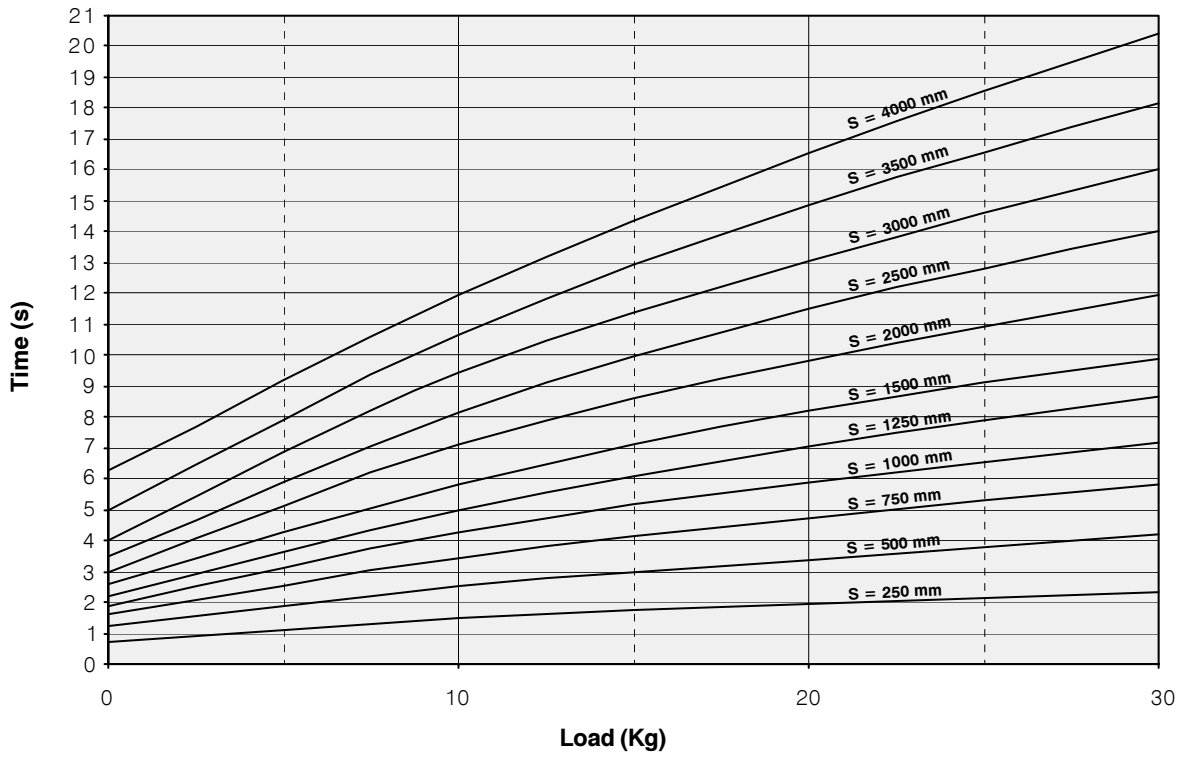
Dimensions (mm)



Cycle time size 2

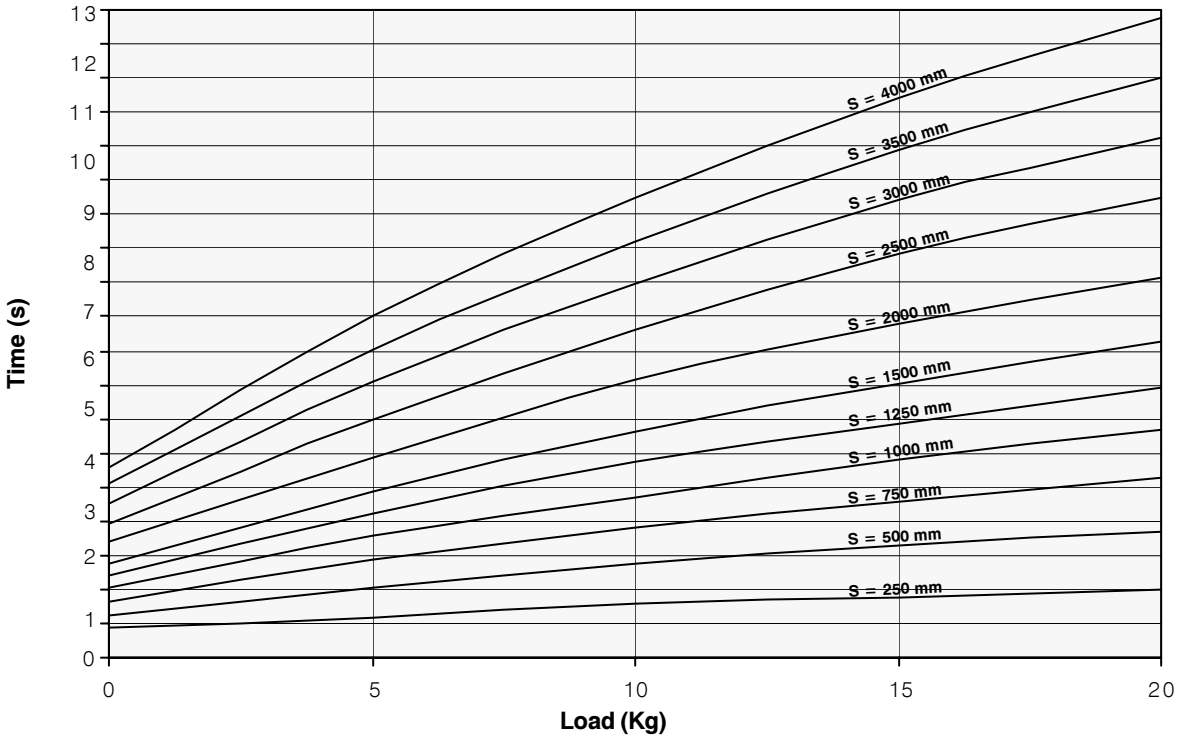
Horizontal position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



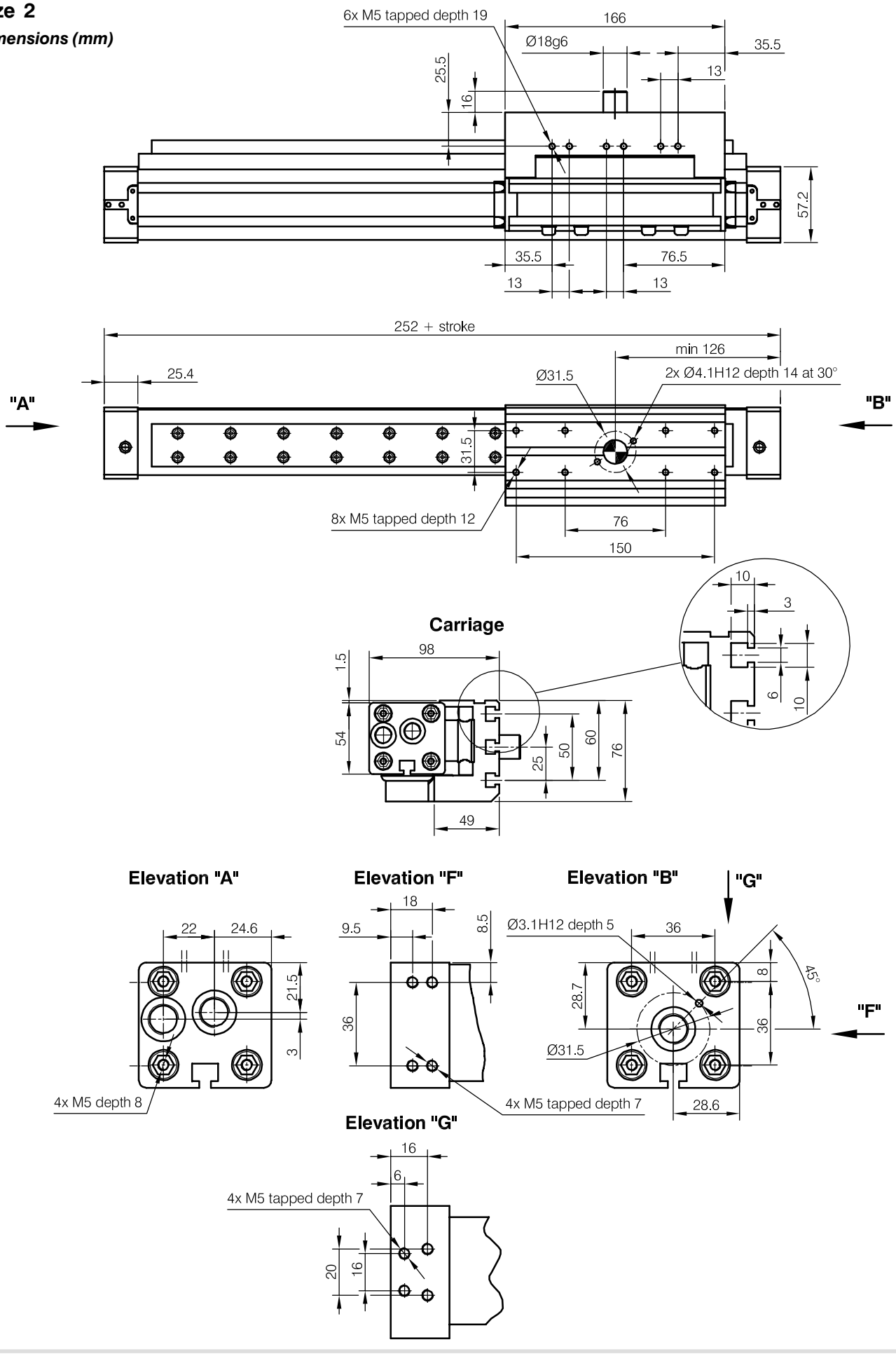
Vertical position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



Size 2

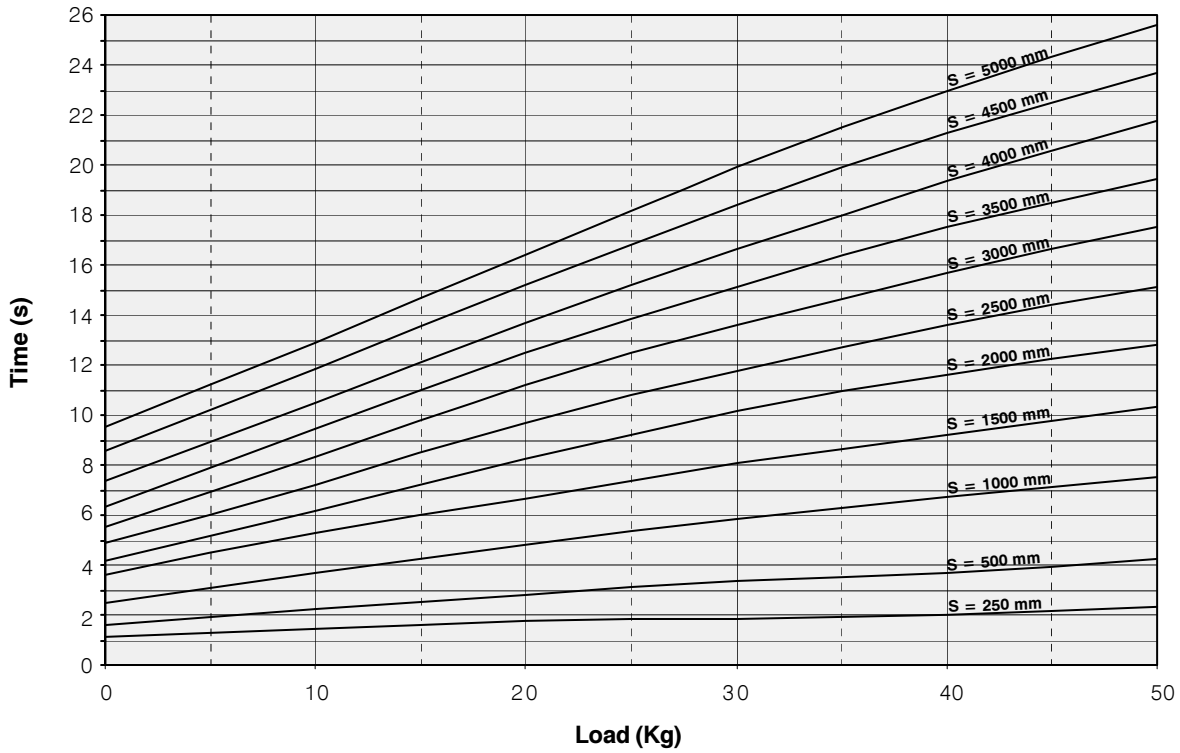
Dimensions (mm)



Cycle time size 3

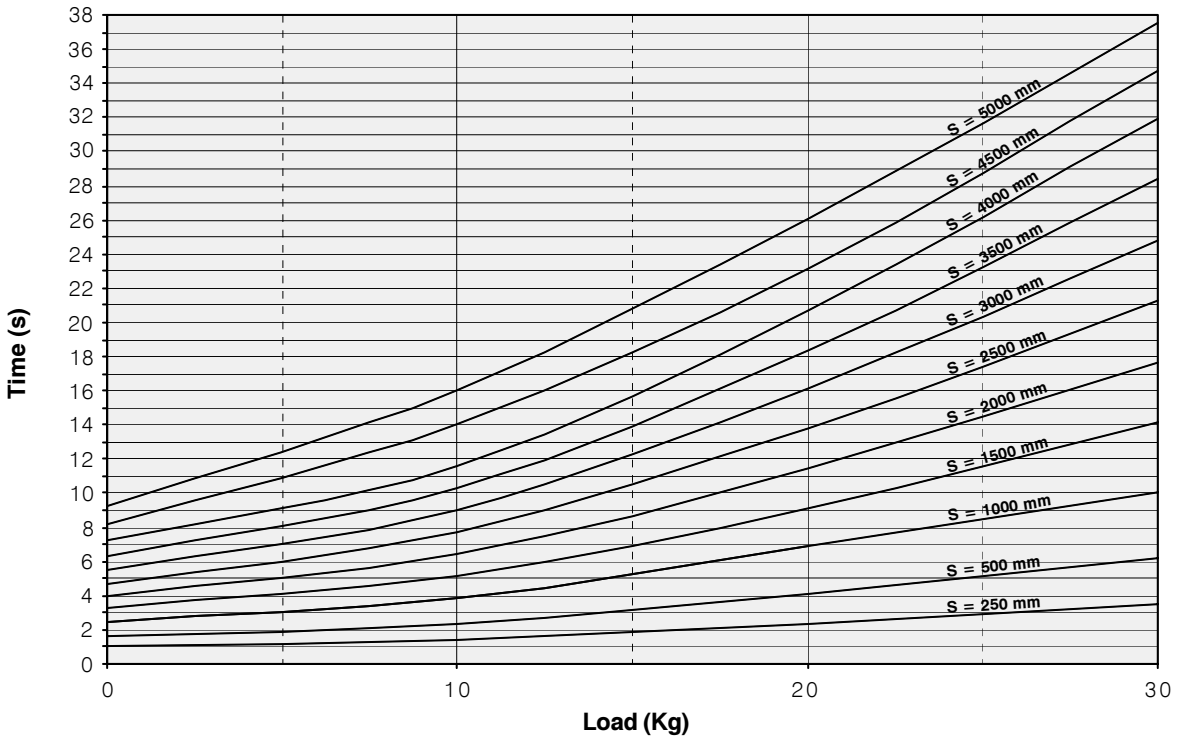
Horizontal position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



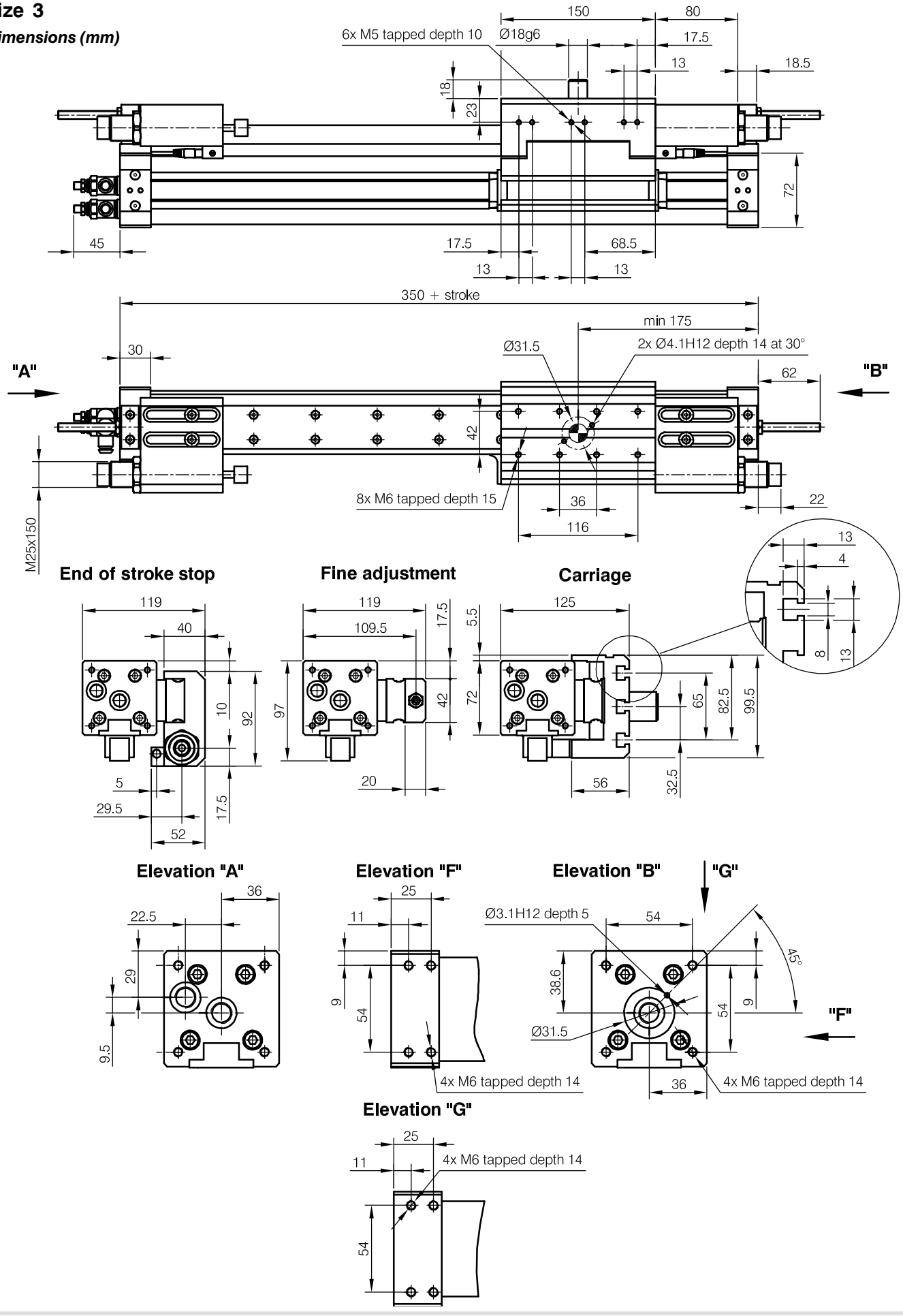
Vertical position

(P = 6 bar; cycle = extend + retract; pneumatic feed at each end)



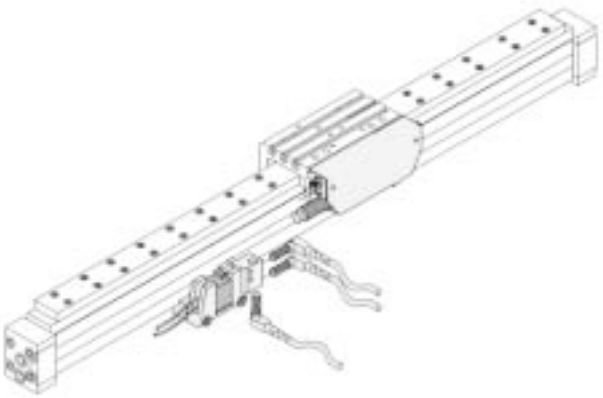
Size 3

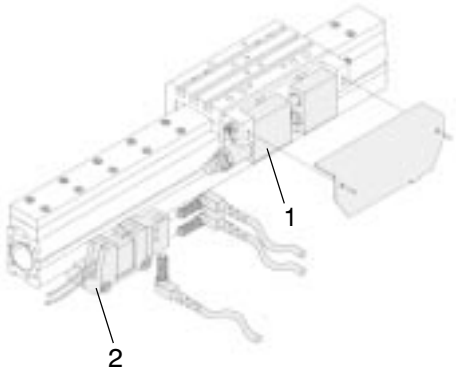
Dimensions (mm)



Simple Carrier Units with Variable Mid-Position Stop (MPS)

Technical information





The MPS is for:

- mechanical stops along the stroke of the "Pneumatic 3D" Carrier Unit
- stopping the carriage in both directions at the same point (adjusting the same stop point with the adjustment screw)

The MPS is made up of two parts:

- the top part built in the carrier unit carriage (1)
- the bottom part fixed on the carrier unit body (2).

A hydraulic shock absorber is for fast vibration free deceleration.

The MPS is built in the carrier unit. ± 2mm fine adjustment reduces adjustment time and provides stopping accuracy.

The MPS provides carriage stop positions with 0.03 mm repeatability.

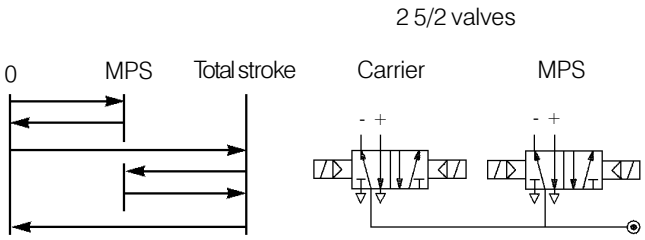
Other MPSs can easily be fitted on a carrier unit with an MPS by only adding the bottom part (2) as many times as required (see page 65 for minimum distance between two stops).

A cover, making the unit aesthetic and safe, protects the MPS.

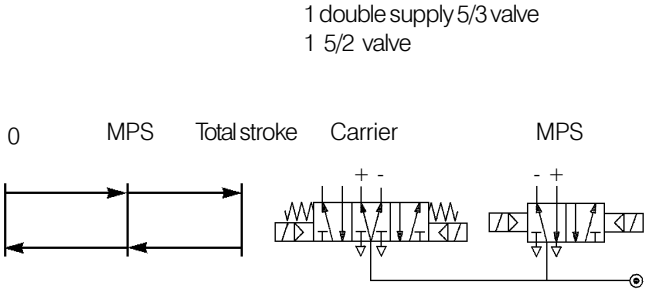
The range includes an MPS by carrier size.

The MPS consists of:
- a double acting piston controlling the extendable stop (polyurethane pipe supply on push in connections)
- three inductive sensors with connections which provide information on the status of the stop and carriage stop on the MPS (stop extending, stop retracting, carriage stop position).

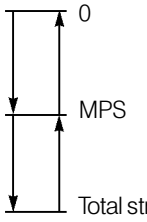
Reversing direction after each intermediate stop
(carrier unit vertical or horizontal):



No direction reverse after each intermediate stop
(carrier unit horizontal):

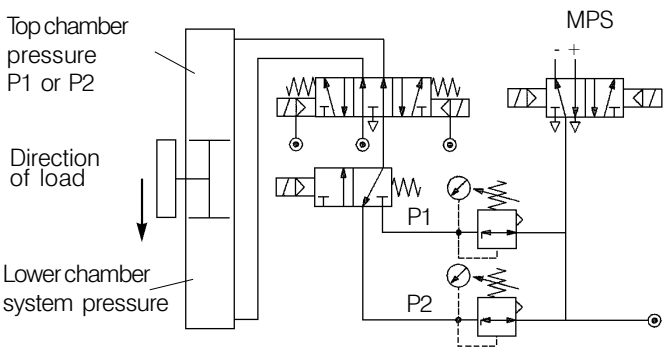


No direction reverse after each intermediate stop
(carrier unit vertical):



1 5/3 valve, pressure centre **with external pilot supply**
1 5/2 valve
1 3/2 NF valve
2 controls

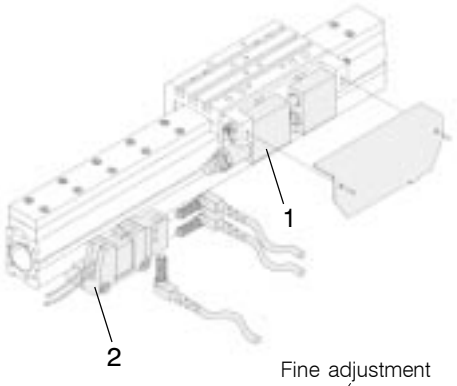
Several compensating pressures are required to retract the MPS in the vertical position with different loads and stopping directions.



Simple Carrier Units with Variable Mid-Position Stop (MPS)

Technical information

Size	Connections per tube Ø mm	Mass kg	Part No. Carrier + MPS
1	2,7 x 4	1,5	see
2	2,7 x 4	2,4	part No.
3	2,7 x 4	2,6	page 69



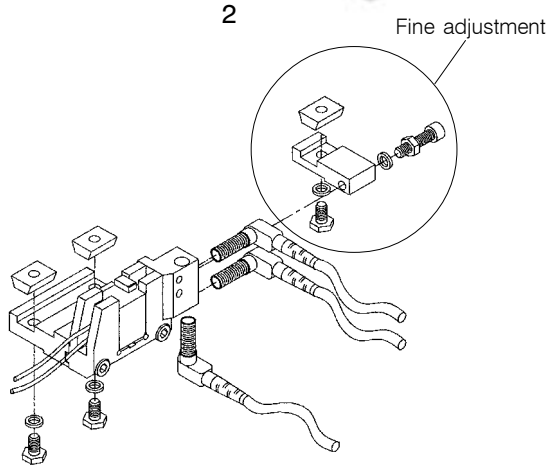
Order code

(Additional MPS: bottom part reference 2)

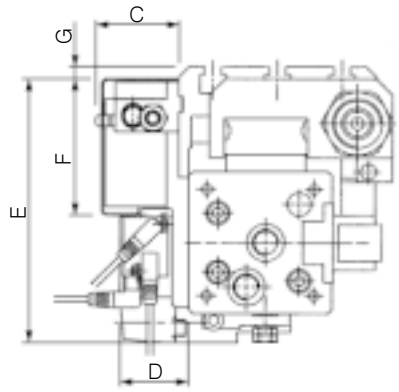
3 F 1 K E

	Size
1	Size 1
2	Size 2
3	Size 3

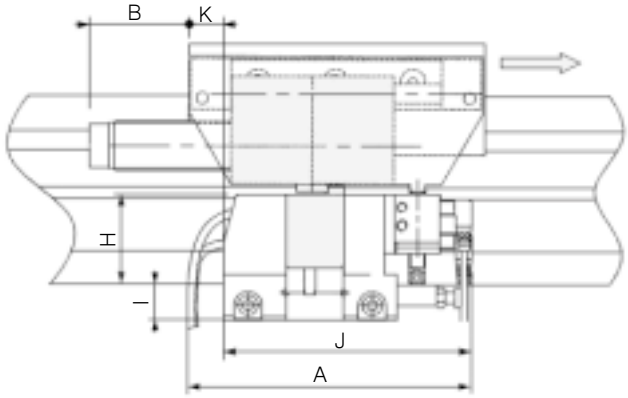
	Sensors
E	PNP
F	NPN

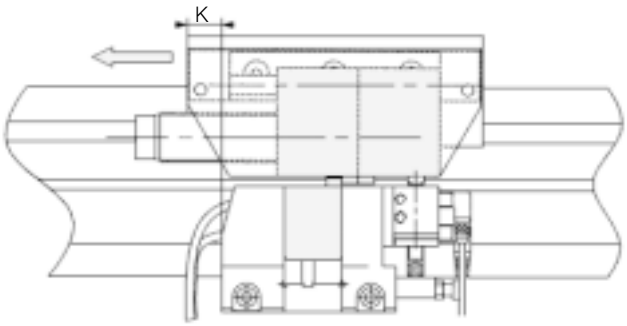


Dimensions (mm)



Carriage shown in the stop position on the MPS



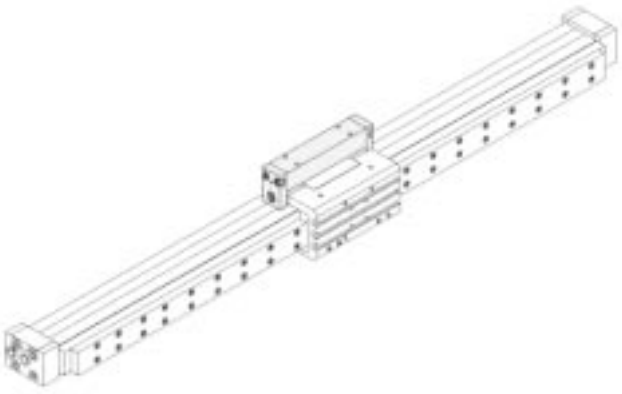


Size	A	B	C	D	E	F	G	H	I	J	K
1	115	32,5	27,5	33	100	53,5	0,5	30,5	15	24	100
2	145	43	37,5	31	115,5	50,5	0,5	44	20	26	125
3	145	49,5	41,5	34,5	134	69	6	46	18	19	125

A: minimum distance between two MPSs.

Simple Carrier Unit with passive brake

Technical information



The brake consists of a main body in a single part in which the braking system is integrated.

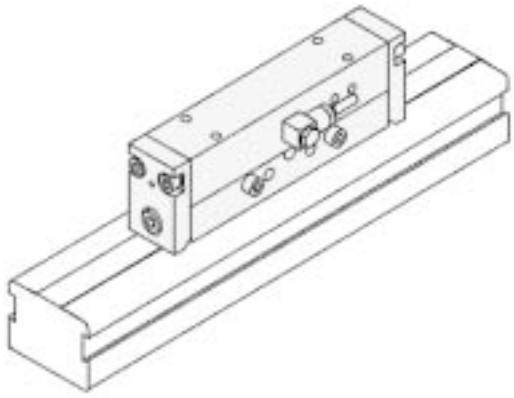
The brake is for:

- stopping the carriage immediately in the event of the compressed air supply being cut off

The range includes one brake by carrier size.

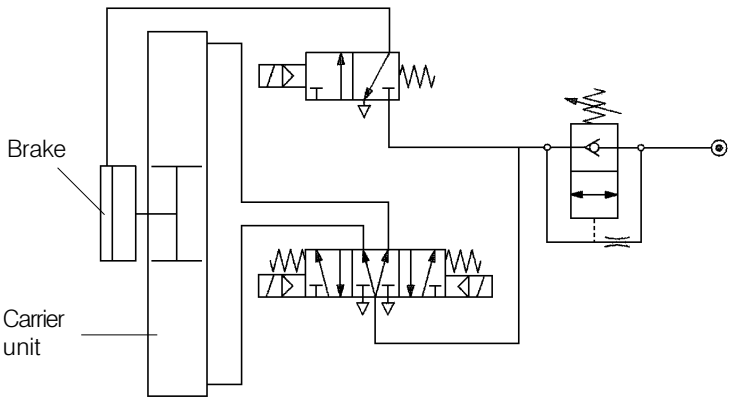
The brake is mounted on only one side of the carrier unit and enables multiple combinations with other options like the MPS and mounting accessories.

Brake operating pressure 5 to 8 bar.



⚠ Caution: The brake must only be used with balancing the 2 chambers of the piston (pressurized or not).
The unit shall be restarted with all required precautions (gradual pressurizing)

Pneumatic circuitry



- 1 5/3 valve, pressure centre
- 1 3/2 NC valve
- 1 soft start valve

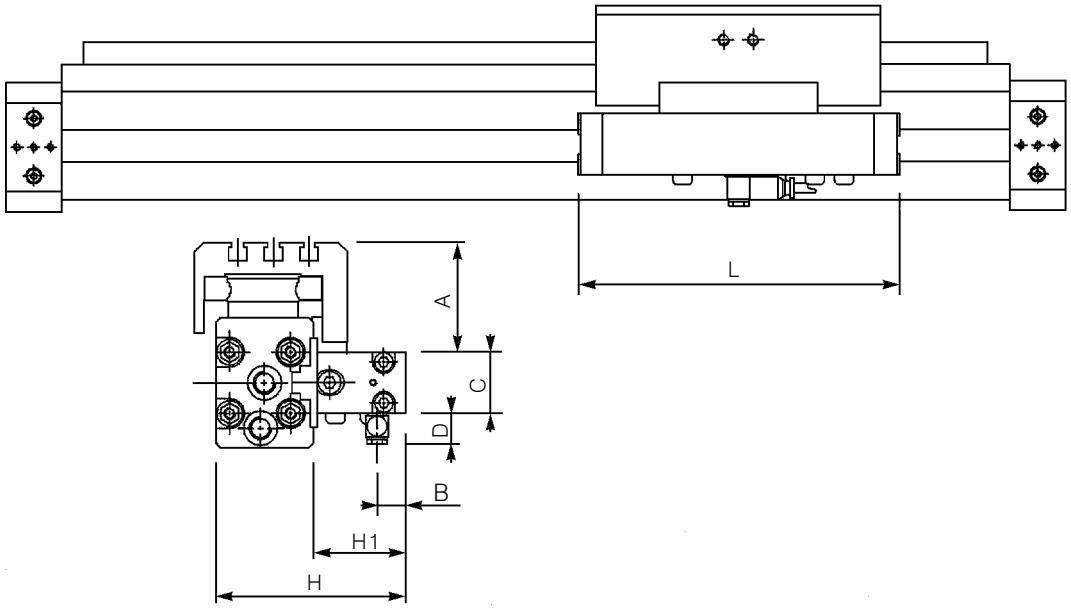
Simple Carrier Unit with passive brake

Technical information

Size	Connections per tube Ø	Mass	Static holding force	Part No. Carrier + Brake
	mm	kg	N	
1	2,7 x 4	0,85	240	see part No. page 69
2	2,7 x 4	1,1	400	
3	2,7 x 4	1	630	

⚠ It is strongly recommended that a quick exhaust valve near the supply port be used to get better brake reaction times.

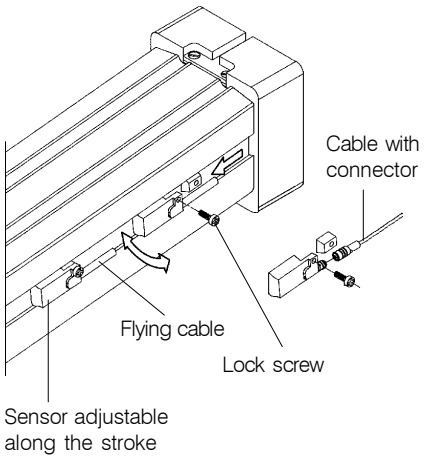
Dimensions (mm)



Size	A	B	C	D	H1	H	L
1	48,5	12,5	27	13,5	41	84	142,5
2	53,5	13,5	32	13,5	47	101	184,5
3	73	17	32	13,5	49	121	172,5

Detection

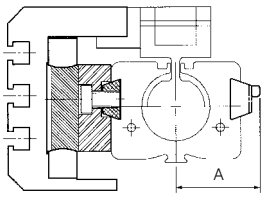
Part No.	Description
P8S-DRFLX	Sensor + LED with 3 m cable
P8S-DRSHX	Sensor + LED for connector
P8S-DPFLX	PNP sensor + LED with 3 m cable
P8S-DPSHX	PNP sensor + LED for connector
71211001-95	Straight connector with 5 m cable



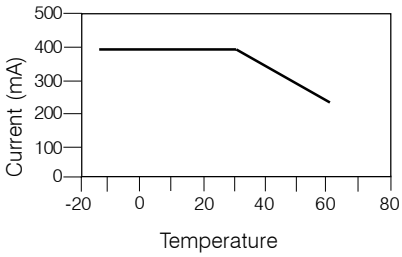
Sensors can be used for providing information at the end of stroke (simple carrier unit) or in intermediate stroke ("Pneumatic 3D" Carrier Unit and simple carrier unit)

Dimensions (mm)

Size	A
1	31
2	33,5
3	40



Current variations according to the temperature for magneto-inductive sensors

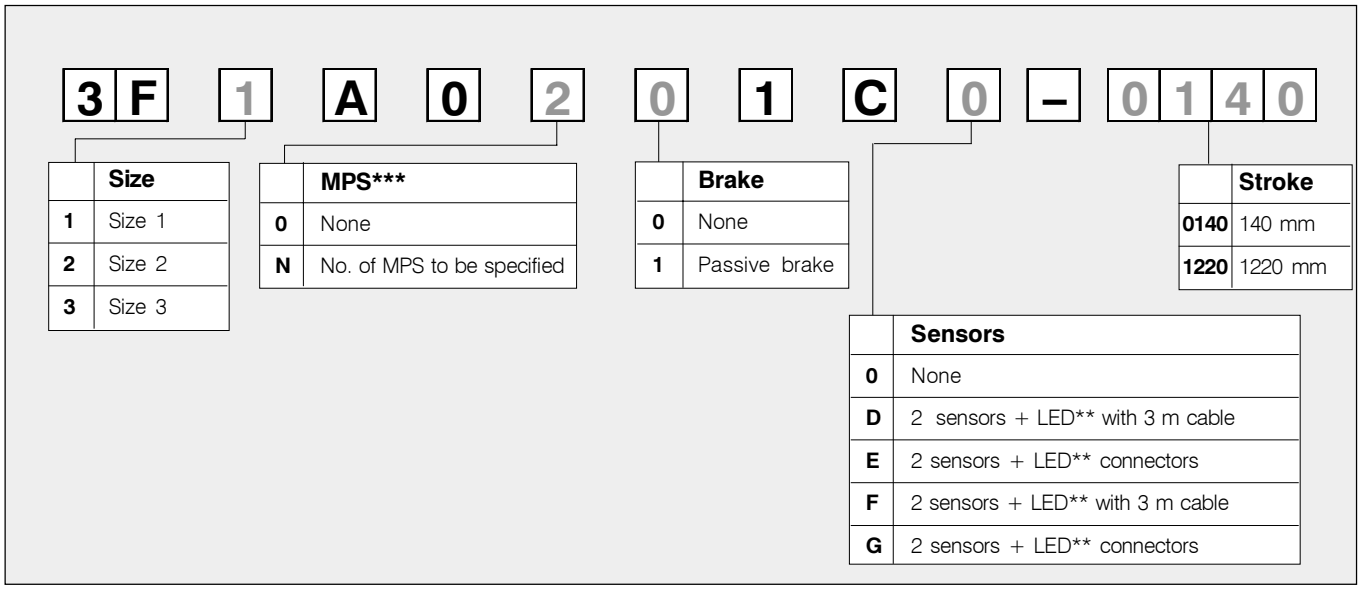


Note: 25° to 70° linear current drop from 400 mA to 250 mA.

Technical features

Description	References			
	P8S-DRFLX	P8S-DRSHX	P8S-DPFLX	P8S-DPSHX
Cable length L (m)	3	-	3	-
Operating temperature (°C)	-10 to + 70			
Protection number	IP67	IP67	IP67	IP67
Frequencies (Hz)	50 to 1000			
Opening response time (ms)	1	1	0,01	0,01
Closing response time (ms)	1	1	0,01	0,01
Repeatability (mm)	± 0,01			
Technology	magnetic sensor		PNP magneto-inductive sensor	
Contact	NO	NO	NO	NO
Maximum current (mA)	380		see note opposite	
Maximum power (W)	10		12	
Max 50 Hz voltage	110 AC	60 AC	-	-
Voltage = max	110 AC	60 AC	10 to 28 DC	
Max voltage drop (V)	2,8		1	
Cable	2 Arctic 0,2 mm PVC conductors	71211001-95 connector	3 Arctic 0,2 mm PVC conductors	71211001-95 connector
Cable diameter (mm)	4	-	4	-
Body	Black 66 nylon			
Red LED	Standard			
Protection	-	-	Polarity inversion protection. Diode protected outlet	

Order code



** LED : Light Emitting Diode
*** Variable Mid-Position Stop
MPS and brake options can be combined

Additional Intermediate Sensor:

The carrier unit can be fitted with one or more additional sensors.
They should be ordered separately (part nos. on page 68).

Standard stroke options

Part No.	Size	Standard stroke options in mm at the intervals below
		0 — 3000 — 4000 — 5000
3F1A0001C0-XXXX*	**1**	
3F2A0001C0-XXXX*	**2**	
3F3A0001C0-XXXX*	**3**	

*Show the stroke in mm.