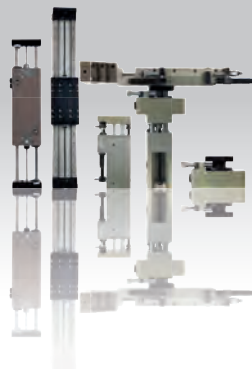


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Systems and components for machine and plant construction

20000

Linear modules
Lifting units
Rotary modules
Grip modules



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Linear modules pneumatic
with two round guides

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Linear modules pneumatic
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Stop screws

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Linear modules pneumatic
with rail guide

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Linear modules pneumatic
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Linear modules pneumatic
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Lifting units pneumatic
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Lifting units pneumatic
with round guides

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Lifting units pneumatic
with round guides

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Rotary module pneumatic

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Rotary module pneumatic

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Rotary module pneumatic

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Rotary module pneumatic
heavy duty version

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Rotary module pneumatic

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Rotary module pneumatic
heavy duty version

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Grip module
parallel grippers

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Linear gantry module
with rail guides

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Linear gantry module
with round guides

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Centring rings

20300
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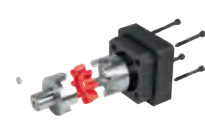
Linear actuators with toothed belt drive
and profile rail guide

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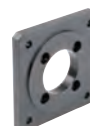
T-slot tables

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Motor adapter sets

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Adapter plates, aluminium

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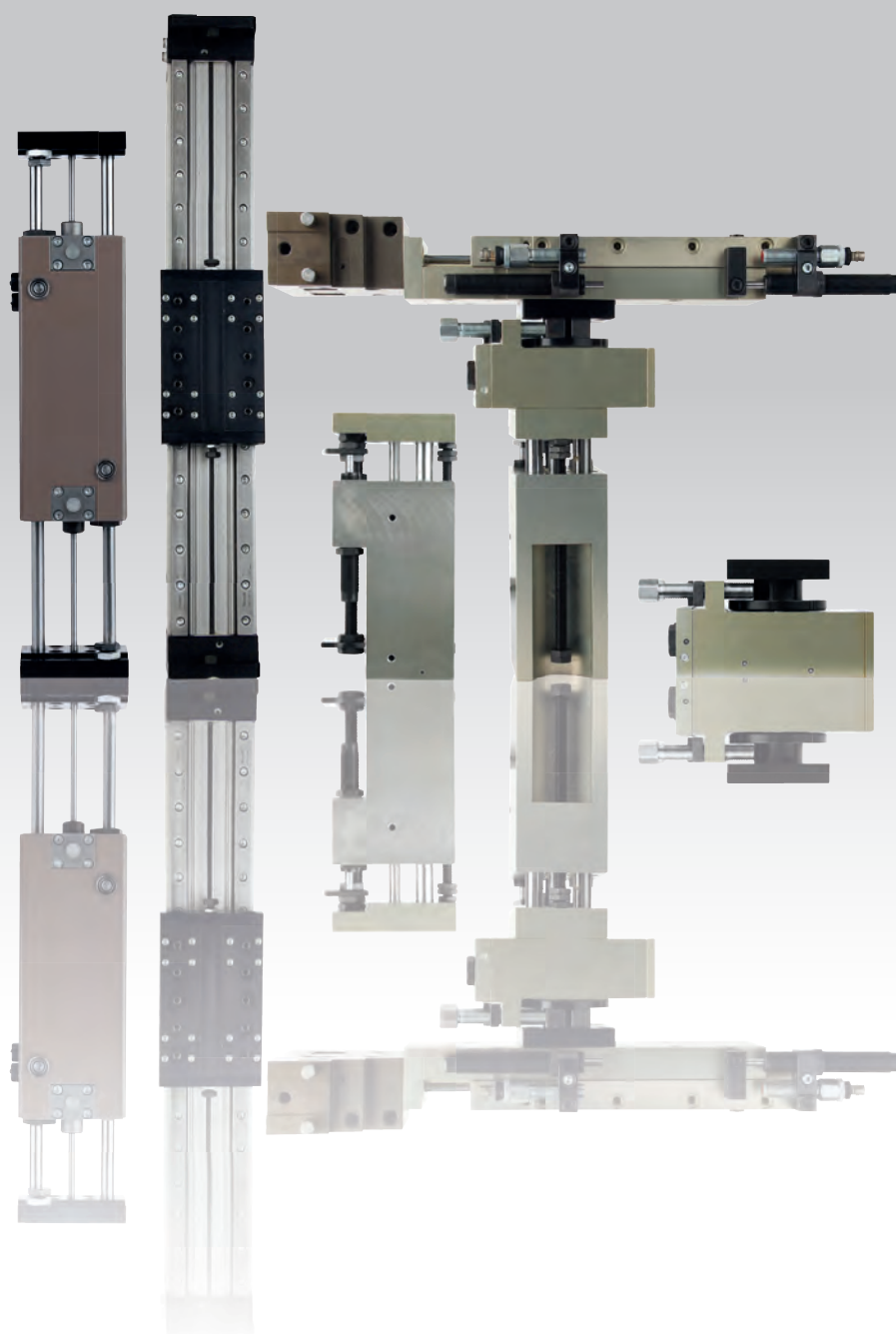


Synchronisation sets

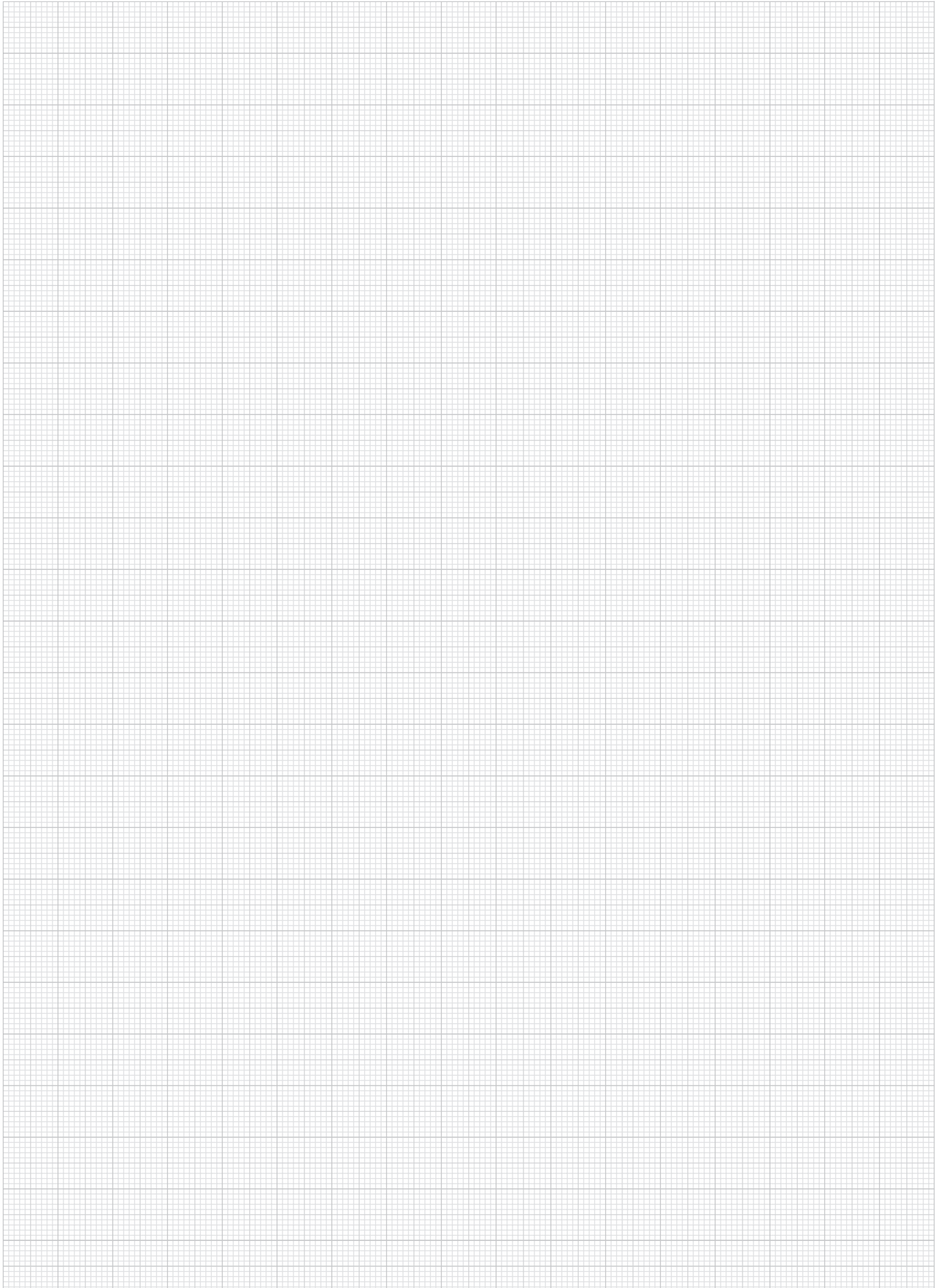
+ New/Expanded Items

20000

Linear modules
Lifting units
Rotary modules
Grip modules



Notes



Technical information for pneumatic linear modules with round guides

Housing:

Hard coated aluminium alloy with high corrosion resistance and surface hardness.

Flange plates:

Aluminium alloy. Weight reduction, no oxidation.

Mounting surfaces:

Three mounting faces with mounting and locating holes on the housing and flange plates for flexible application.

Fastening thread:

All fastening threads in the housing are reinforced with threaded inserts.

Guidance:

Ball guide bushing and precision steel shafts. Extremely precise and quiet run at high speeds. Low friction values due to rolling friction, low moving force, low wear.

No stick-slip phenomena.

Piston bores:

Fine honed piston bores ensure a long lifespan of the piston seals.

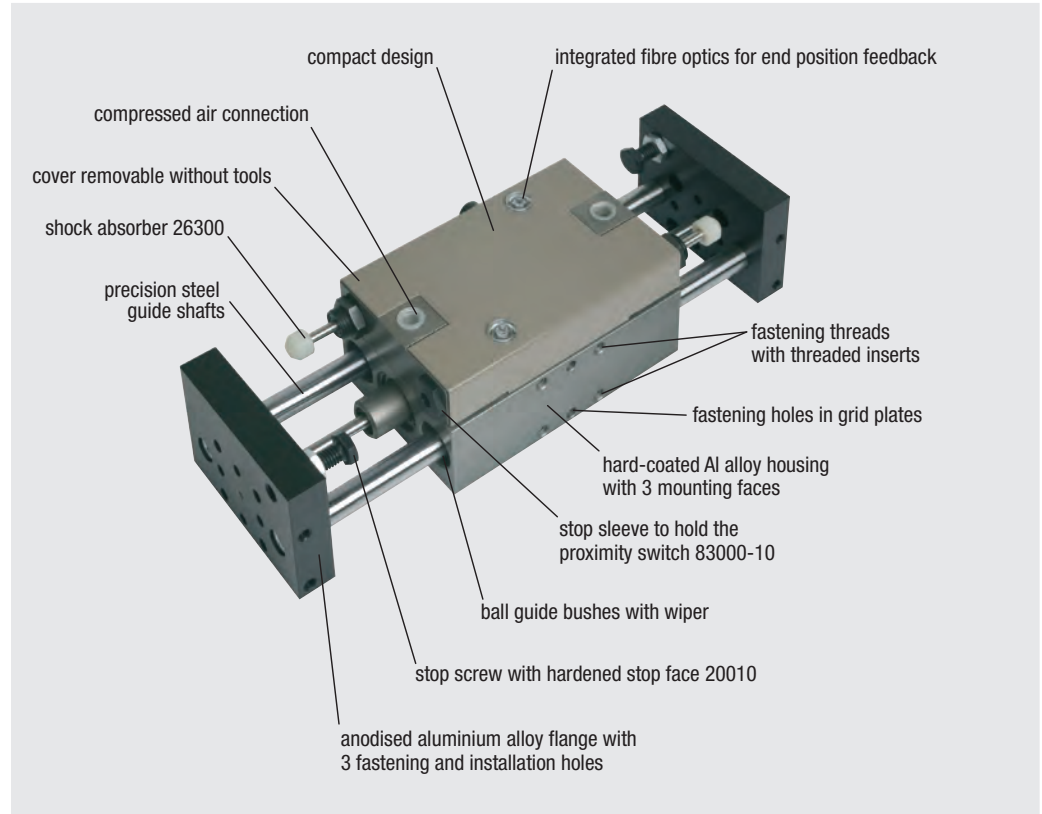
Piston seals:

The double grooved rings undertake ancillary sealing and guidance functions and guarantee optimal sealing at full pressure.

Advantages:

- Locating holes for highest fitting accuracy of the modules with each. All modules can be combined without intermediate plates (see combination table).
- Compact design, double action cylinder, integrated shock absorber and proximity switch.
- Assembly and maintenance friendly. Cover removable without tools.
- Any mounting position.
- Integrated fibre optics make the LED indicators easily visible from most perspectives.
- Optionally available with integrated stroke deviation safeguard to secure production.

The drive is a double-acting cylinder integrated in the carriage. Four sizes with two or three guide shafts and travel of 40 to 300 mm are available. The large dimensioned guide shafts with ball-bearing guides allow load bearing capacities up to max. 1080 N and repeat accuracies of ± 0.01 mm are realisable.



Combination possibilities without intermediate plate

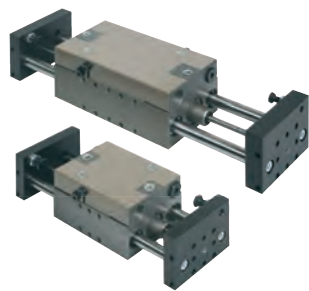
		Horizontal mounting			
		Size 1	Size 2	Size 3	Size 5
Vertical mounting	Size 1	X	X	X	
	Size 2		X	X	X
	Size 3			X	X
	Size 5				X

Unlisted combinations are possible with intermediate plates.

In principle, linear module combinations in all stroke variants and sizes are possible. However, in horizontal applications it is better to use modules of the same size or larger.

Linear modules pneumatic

with two round guides



Material:

Body and flange plate EN AW-5754.
Guide shafts steel

Version:

Body, hard-coated
Flange plates, anodised.
Guide shaft, hardened.

Sample order:

n1m 20000-21040

Note:

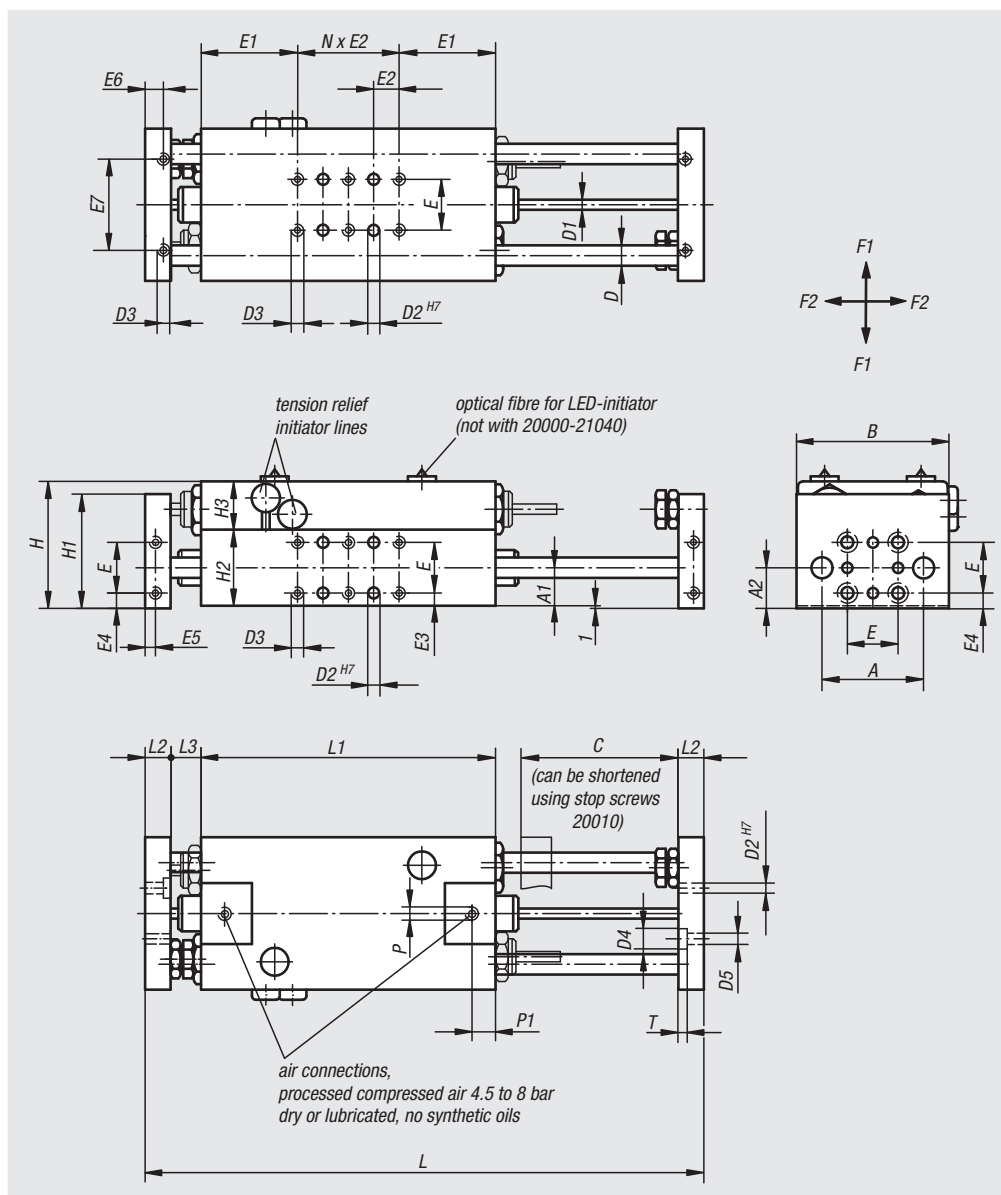
Maintenance-free pneumatic linear modules with two precision steel shafts and ball guide bushing with wipers. Double acting cylinder drive. All fastening threads have threaded inserts. The as accessory available shock absorbers and proximity switches can be integrated (no protruding edges). Positive fit construction for hundred per cent reproducibility. Combinations in all sizes and stroke variants are feasible without adapter plates. Repeat accuracies of ± 0.01 mm are possible. Specified loads apply by centred carriages.

Temperature range:

+5 °C up to +80 °C

On request:

Available with locking cartridge as stroke deviation safeguard.



Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20000-21040	1	26300-1415010	83000-10-010X5000	-
20000-21060	1	26300-1415010	83000-10-020	80150-030X2000
20000-21080	1	26300-1415010	83000-10-020	80150-030X2000
20000-21100	1	26300-1415010	83000-10-020	80150-030X2000
20000-22060	2	26300-1415010	83000-10-020	80150-030X2000
20000-22090	2	26300-1415010	83000-10-030	80150-030X2000
20000-22120	2	26300-1415010	83000-10-030	80150-030X2000
20000-22150	2	26300-1415010	83000-10-030	80150-030X2000
20000-23080	3	26300-2015016	83000-10-030	80150-030X2000
20000-23120	3	26300-2015016	83000-10-030	80150-030X2000
20000-23160	3	26300-2015016	83000-10-030	80150-030X2000
20000-23200	3	26300-2015016	83000-10-030	80150-030X2000
20000-25120	5	26300-2515030	83000-10-030	80150-030X2000
20000-25180	5	26300-2515030	83000-10-030	80150-030X2000
20000-25240	5	26300-2515030	83000-10-030	80150-030X2000
20000-25300	5	26300-2515030	83000-10-030	80150-030X2000

Linear modules pneumatic

with two round guides

Accessories:

See table for shock absorber,
proximity switch and plug connector.



Order No.	Size	A	A1	A2	B	C (travel)	D	D1	D2	D3	D4	D5	E	E1	E2	E3	E4	E5	E6	E7
20000-21040	1	40	15	16	60	40	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-21060	1	40	15	16	60	60	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-21080	1	40	15	16	60	80	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-21100	1	40	15	16	60	100	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-22060	2	55	20	21	82	60	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-22090	2	55	20	21	82	90	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-22120	2	55	20	21	82	120	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-22150	2	55	20	21	82	150	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-23080	3	70	25	26	100	80	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-23120	3	70	25	26	100	120	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-23160	3	70	25	26	100	160	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-23200	3	70	25	26	100	200	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-25120	5	104	38	39	150	120	25	12	10	M10	18	11	60	72	30	8	9	8	17	96
20000-25180	5	104	38	39	150	180	25	12	10	M10	18	11	60	72	30	8	9	8	17	96
20000-25240	5	104	38	39	150	240	25	12	10	M10	18	11	60	72	30	8	9	8	17	96
20000-25300	5	104	38	39	150	300	25	12	10	M10	18	11	60	72	30	8	9	8	17	96

Order No.	Size	H	H1	H2	H3	L	L1	L2	L3	N (number)	P	P1	T	F1 max. kN	F2 max. kN	Piston force at 6 bar (N)	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20000-21040	1	50	45	30	19	180	96	12	10	2	M5	9,3	3	0,14	0,38	100	16	11,3
20000-21060	1	50	45	30	19	220	116	12	10	4	M5	9,3	3	0,09	0,26	100	16	17
20000-21080	1	50	45	30	19	260	136	12	10	6	M5	9,3	3	0,05	0,18	100	16	22,6
20000-21100	1	50	45	30	19	300	156	12	10	8	M5	9,3	3	0,025	0,125	100	16	28,3
20000-22060	2	64	60	40	23	254	120	16	21	2	G1/8	9,9	5,7	0,3	0,61	250	25	56
20000-22090	2	64	60	40	23	314	150	16	21	4	G1/8	9,9	5,7	0,16	0,35	250	25	84
20000-22120	2	64	60	40	23	374	180	16	21	6	G1/8	9,9	5,7	0,08	0,24	250	25	112
20000-22150	2	64	60	40	23	434	210	16	21	8	G1/8	9,9	5,7	0,045	0,16	250	25	140
20000-23080	3	77	70	50	26	300	140	20	20	2	G1/8	9,5	5	0,46	0,84	407	32	118
20000-23120	3	77	70	50	26	380	180	20	20	4	G1/8	9,5	5	0,24	0,52	407	32	178
20000-23160	3	77	70	50	26	460	220	20	20	6	G1/8	9,5	5	0,12	0,32	407	32	236
20000-23200	3	77	70	50	26	540	260	20	20	8	G1/8	9,5	5	0,07	0,2	407	32	295
20000-25120	5	112	100	76	35	420	204	25	23	2	G1/4	14	7	0,75	1,08	660	40	354,6
20000-25180	5	112	100	76	35	540	264	25	23	4	G1/4	14	7	0,42	0,7	660	40	531,8
20000-25240	5	112	100	76	35	660	324	25	23	6	G1/4	14	7	0,25	0,48	660	40	709,1
20000-25300	5	112	100	76	35	780	384	25	23	8	G1/4	14	7	0,16	0,36	660	40	886,4

Linear modules pneumatic

with three round guides



Material:

Body and flange plate EN AW-5754.
Guide shafts steel

Version:

Body, hard-coated
Flange plates, anodised.
Guide shaft, hardened.

Sample order:

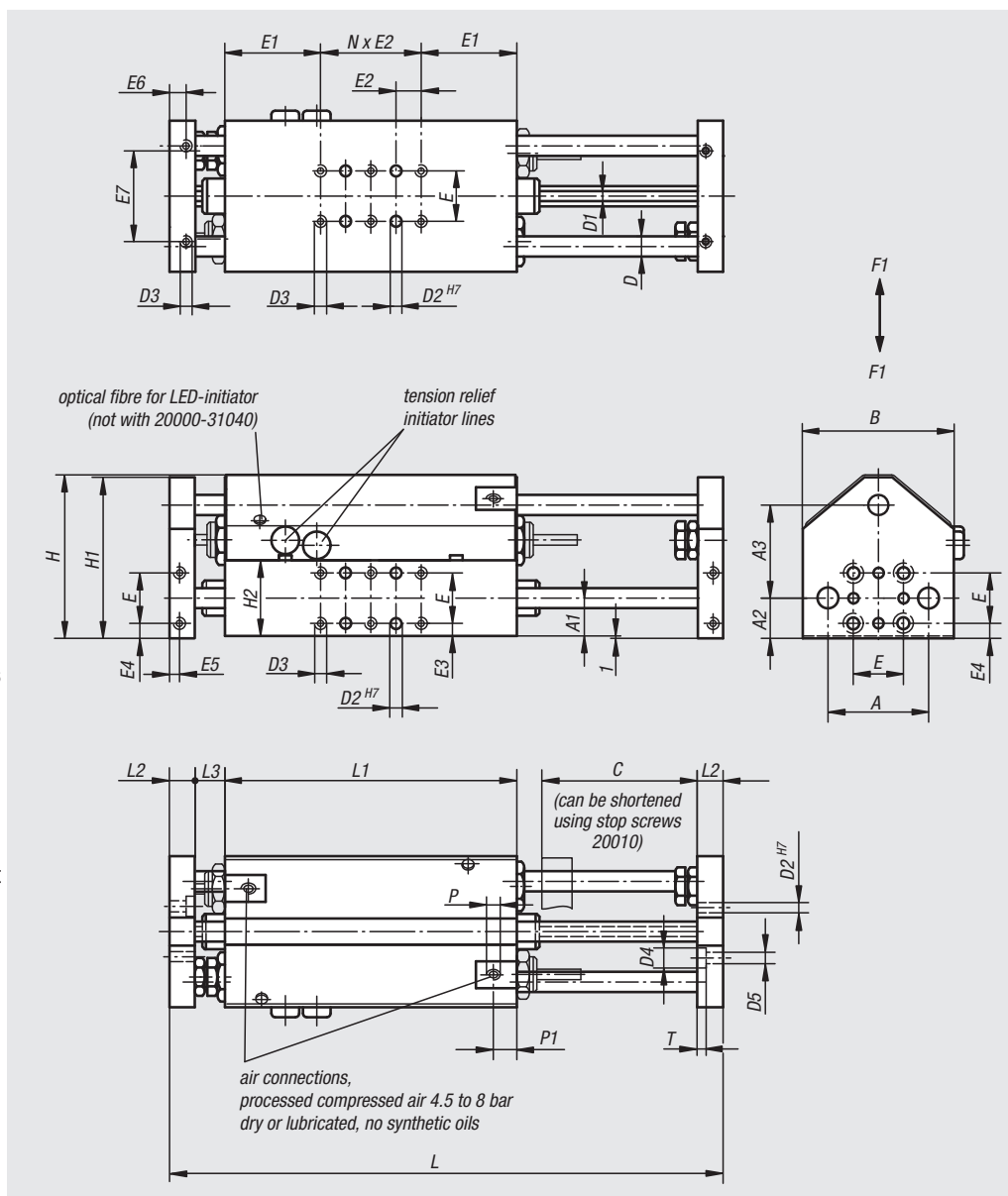
nlm 20000-31040

Note:

Maintenance-free pneumatic linear modules with three precision steel shafts and ball guide bushing with wipers. Double acting cylinder drive. All fastening threads have threaded inserts. The as accessory available shock absorbers and proximity switches can be integrated (no protruding edges). Positive fit construction for hundred per cent reproducibility. Combinations in all sizes and stroke variants are feasible without adapter plates. Repeat accuracies of ± 0.01 mm are possible. Specified loads apply by centred carriages.

Temperature range:

+5 °C up to +80 °C



Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20000-31040	1	26300-1415010	83000-10-010X5000	-
20000-31060	1	26300-1415010	83000-10-020	80150-030X2000
20000-31080	1	26300-1415010	83000-10-020	80150-030X2000
20000-31100	1	26300-1415010	83000-10-020	80150-030X2000
20000-32060	2	26300-1415010	83000-10-020	80150-030X2000
20000-32090	2	26300-1415010	83000-10-030	80150-030X2000
20000-32120	2	26300-1415010	83000-10-030	80150-030X2000
20000-32150	2	26300-1415010	83000-10-030	80150-030X2000
20000-33100	3	26300-2015016	83000-10-030	80150-030X2000
20000-33120	3	26300-2015016	83000-10-030	80150-030X2000
20000-33160	3	26300-2015016	83000-10-030	80150-030X2000
20000-33200	3	26300-2015016	83000-10-030	80150-030X2000
20000-35120	5	26300-2515030	83000-10-030	80150-030X2000
20000-35180	5	26300-2515030	83000-10-030	80150-030X2000
20000-35240	5	26300-2515030	83000-10-030	80150-030X2000
20000-35300	5	26300-2515030	83000-10-030	80150-030X2000

Linear modules pneumatic

with three round guides

On request:

Available with locking cartridge as stroke deviation safeguard.

Accessories:

See table for shock absorber, proximity switch and plug connector.



Order No.	Size	A	A1	A2	A3	B	C (travel)	D	D1	D2	D3	D4	D5	E	E1	E2	E3	E4	E5	E6	E7
20000-31040	1	40	15	16	37	60	40	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-31060	1	40	15	16	37	60	60	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-31080	1	40	15	16	37	60	80	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-31100	1	40	15	16	37	60	100	8	4	4	M4	8	4,5	20	38	10	5	6	4	9	36
20000-32060	2	55	20	21	50	82	60	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-32090	2	55	20	21	50	82	90	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-32120	2	55	20	21	50	82	120	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-32150	2	55	20	21	50	82	150	12	6	5	M5	10	5,5	30	45	15	5	6	5	11	50
20000-33100	3	70	25	26	62	100	80	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-33120	3	70	25	26	62	100	120	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-33160	3	70	25	26	62	100	160	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-33200	3	70	25	26	62	100	200	16	8	6	M6	11	6,6	40	50	20	5	6	6	14	70
20000-35120	5	104	38	39	93	150	120	25	12	10	M10	18	11	60	72	30	8	9	8	17	96
20000-35180	5	104	38	39	93	150	180	25	12	10	M10	18	11	60	72	30	8	9	8	17	96
20000-35240	5	104	38	39	93	150	240	25	12	10	M10	18	11	60	72	30	8	9	8	17	96
20000-35300	5	104	38	39	93	150	300	25	12	10	M10	18	11	60	72	30	8	9	8	17	96

Order No.	Size	H	H1	H2	L	L1	L2	L3	N (number)	P	P1	T	F1 max. kN	Piston force at 6 bar (N)	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20000-31040	1	65	64	30	180	96	12	10	2	M5	9,3	3	0,38	100	16	11,3
20000-31060	1	65	64	30	220	116	12	10	4	M5	9,3	3	0,26	100	16	17
20000-31080	1	65	64	30	260	136	12	10	6	M5	9,3	3	0,18	100	16	22,6
20000-31100	1	65	64	30	300	156	12	10	8	M5	9,3	3	0,125	100	16	28,3
20000-32060	2	86	85	40	254	120	16	21	2	G1/8	9,9	5,7	0,61	250	25	56
20000-32090	2	86	85	40	314	150	16	21	4	G1/8	9,9	5,7	0,35	250	25	84
20000-32120	2	86	85	40	374	180	16	21	6	G1/8	9,9	5,7	0,24	250	25	112
20000-32150	2	86	85	40	434	210	16	21	8	G1/8	9,9	5,7	0,16	250	25	140
20000-33100	3	107	106	50	300	140	20	20	2	G1/8	9,5	5	0,84	407	32	118
20000-33120	3	107	106	50	380	180	20	20	4	G1/8	9,5	5	0,52	407	32	178
20000-33160	3	107	106	50	460	220	20	20	6	G1/8	9,5	5	0,32	407	32	236
20000-33200	3	107	106	50	540	260	20	20	8	G1/8	9,5	5	0,2	407	32	295
20000-35120	5	159	158	76	420	204	25	23	2	G1/4	14	7	1,08	660	40	354,6
20000-35180	5	159	158	76	540	264	25	23	4	G1/4	14	7	0,7	660	40	531,8
20000-35240	5	159	158	76	660	324	25	23	6	G1/4	14	7	0,48	660	40	709,1
20000-35300	5	159	158	76	780	384	25	23	8	G1/4	14	7	0,36	660	40	886,4

Stop screws


Material:

Steel
grade 8.8.

Version:

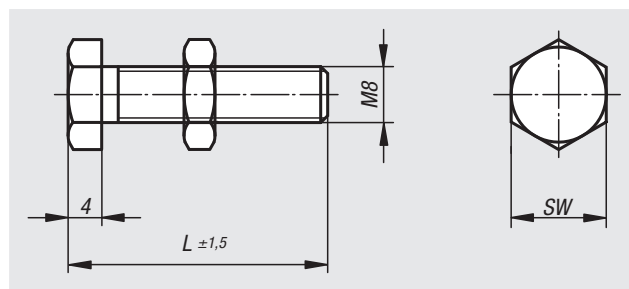
Stop screw black oxidised.
Stop face hardened (52 HRC).
Nut electro zinc-plated.

Sample order:

nlm 20010-08017

Note:

The screw heads are machined before being hardened giving a defined and permanently consistent stop face.

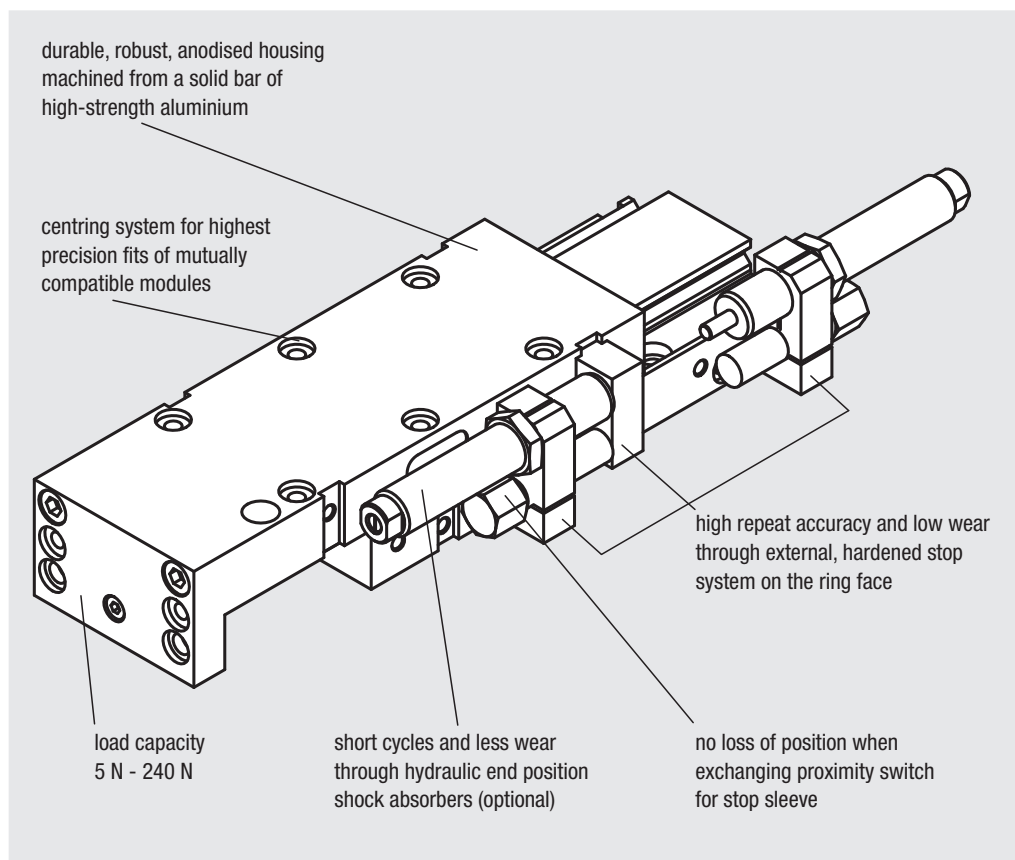


Order No.	L	SW
20010-08017	17	13
20010-08022	22	13
20010-08027	27	13
20010-08032	32	13
20010-08035	35	13
20010-08045	45	13
20010-08055	55	13
20010-08065	65	13
20010-08073	73	13
20010-08088	88	13

Technical information for pneumatic linear modules with rail guide

The linear modules can be mounted in any position. The standardised fastening holes enable diverse combinations with our other units. The precise centring system enables all modules to be combined with one another quickly and easily. No adapter plate required for same size combinations.

- piston force at 6 bar: 18 N – 76 N.
- cylinder diameter: 8 mm – 16 mm.
- stroke lengths: 20 mm – 200 mm.
- repeat accuracy: ± 0.01 mm.
- diverse fastening possibilities.
- recirculating linear ball bearings for heavy loads and positioning accuracy and quiet operation.
- cross roller guide for high torque loads and precision.



Travel times			
norelem	Stroke lengths (mm)	Load (kg)	time / cycle
20032	35 / 65	0,500	0,3 s / 0,45 s
20034	30 / 60 / 90	1,000	0,3 s / 0,4 s / 0,5 s
20036	50 / 100 / 150 / 200	5,000	0,5 s / 0,65 s / 0,8 s / 0,95 s

The specified guide values for cycle times were ascertained under operation specific conditions and represent effective values.

Selection overview			
Guidance	Recirculating balls		Cross roller
Design	for narrow spaces	-	-
Stroke lengths (mm)	35 / 65	20 / 30 / 45 / 60 / 75 / 90	30 / 50 / 75 / 100 / 125 / 150 / 200
Piston force at 6 bar (N)	18	33	76
Cylinder Ø (mm)	8	12	16
Load bearing max. (N)	12	33	100 - 240
norelem	20032	20034	20036

Linear modules pneumatic

with rail guide



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

nlm 20032-4035

Note:

Maintenance-free pneumatic linear modules for small installation spaces with recirculating ball bearing guide and load capacity of max. 12 N. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection M3. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240. The position of the stop system is variable.

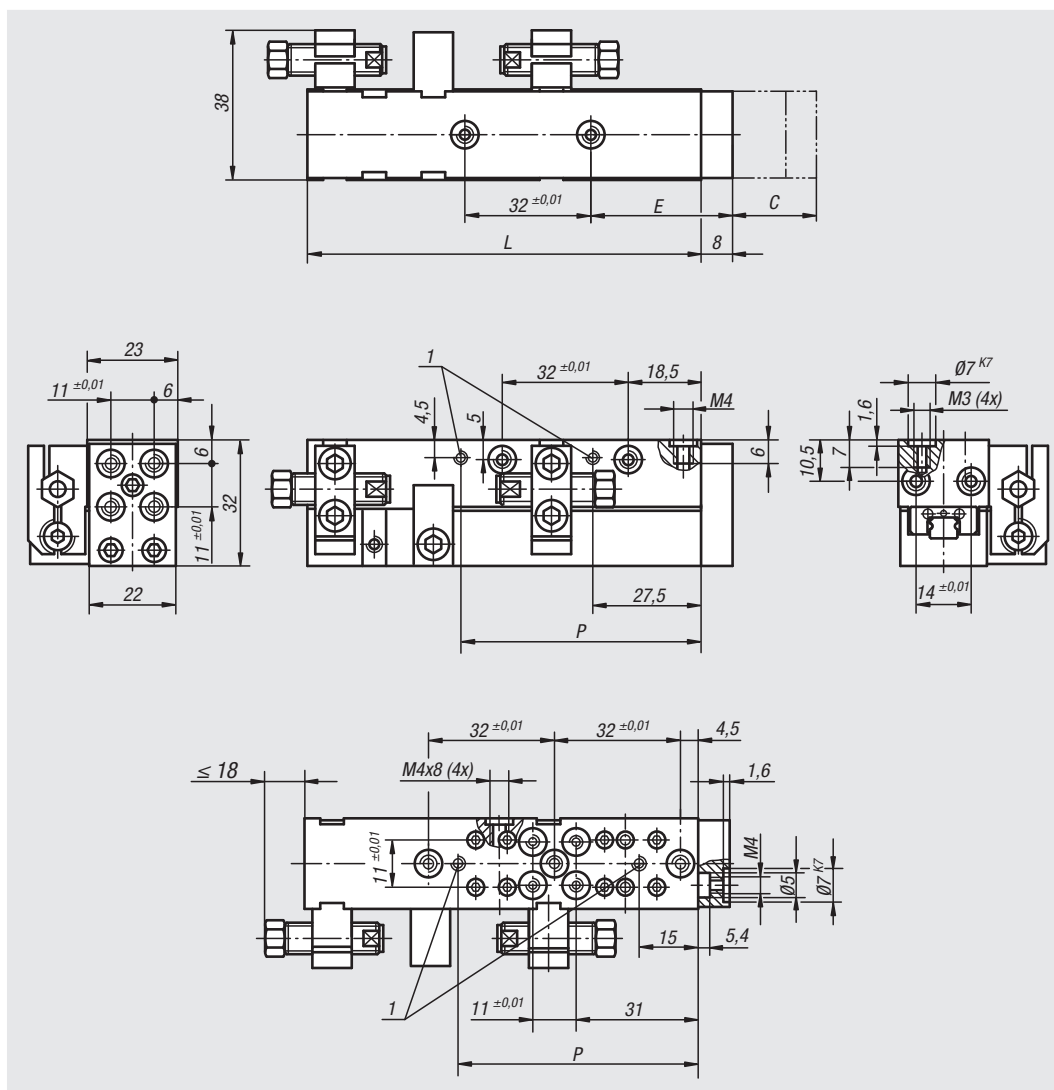
Repeat accuracy ± 0.01 mm.

Accessories:

See table for shock absorbers and proximity switches.

Drawing reference:

1) compressed air connections



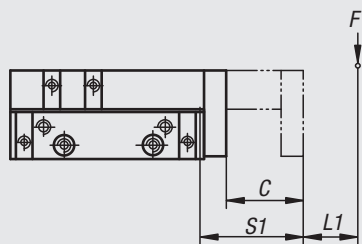
Order No.	Size	C (travel)	E	L	P	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20032-4035	4	35	36	100	61	18	13	8	30,8
20032-4065	4	65	51	130	91	18	13	8	57,2

Order No.	Size	Suitable shock absorber	Suitable proximity switch
20032-4035	4	26300-0810008	83000-020X5000
20032-4065	4	26300-0810008	83000-020X5000

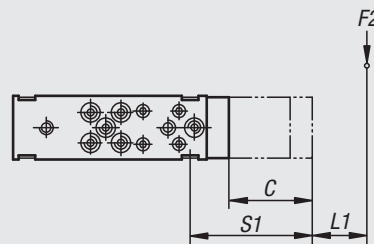
Linear modules pneumatic

with rail guide

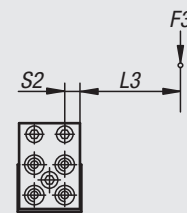
Load data



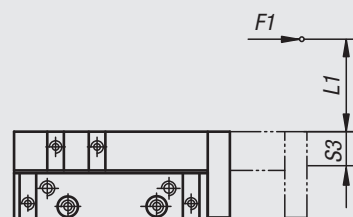
$$M1 = (S1 + L1) \times F1$$



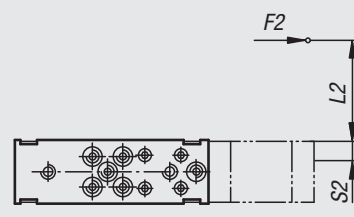
$$M2 = (S2 + L2) \times F2$$



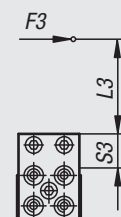
$$M3 = (S3 + L3) \times F3$$



$$M1 = (S3 + L1) \times F1$$



$$M2 = (S2 + L2) \times F2$$



$$M3 = (S3 + L3) \times F3$$

$$\frac{M1_{eff}}{M1_{zul}} + \frac{M2_{eff}}{M2_{zul}} + \frac{M3_{eff}}{M3_{zul}} \leq 1$$

Calculating the lifespan:

$$L = \left(\frac{M_{zul}}{M_{eff}} \right)^3 \times 10^5$$

L = lifespan (m)

M_{zul} = permissible torque (Nm)

M_{eff} = calculated torque (Nm)

$$L = \left(\frac{C}{F} \right)^3 \times 10^5$$

L = lifespan (m)

C = dynamic base load (N)

F = dynamic load (N)

Order No.	Size	M1 Nm	M2 Nm	M3 Nm	S1	S2	S3	Dynamic load rating N	Static load rating N
20032-4035	4	8	8	4	13 + C (travel)	7,5	10	1200	1960
20032-4065	4	8	8	4	13 + C (travel)	7,5	10	1200	1960

Linear modules pneumatic

with rail guide



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

nlm 20034-4020

Note:

Maintenance-free pneumatic linear modules with recirculating ball bearing guide and load capacity of max. 30 N. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection M5. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240. The position of the stop system is variable.

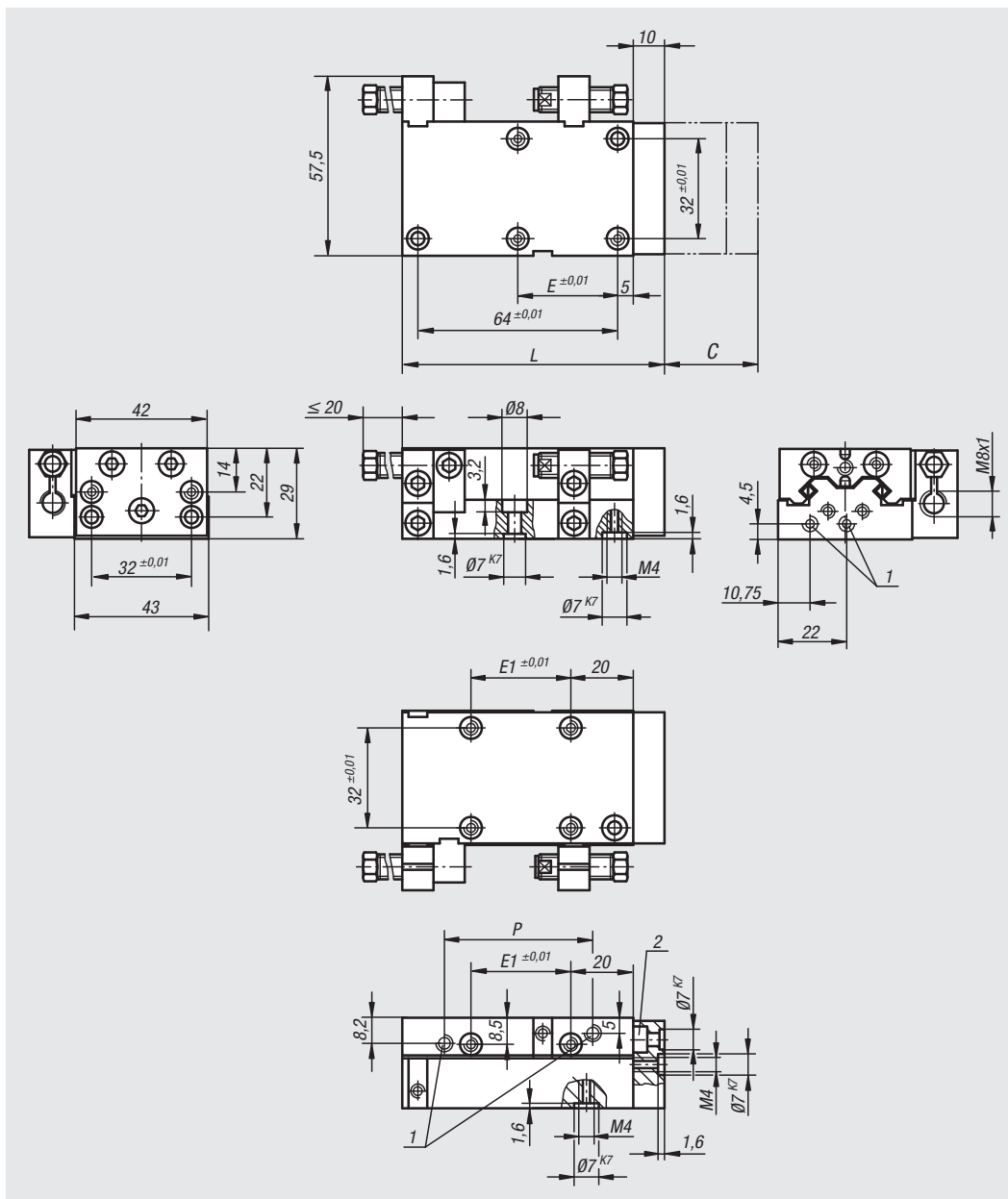
Repeat accuracy ± 0.01 mm.

Accessories:

See table for shock absorbers and proximity switches.

Drawing reference:

- 1) compressed air connections
- 2) counterbore for socket head screw ISO 4762-M4



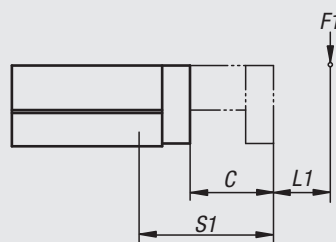
Order No.	Size	C (travel)	E	E1	L	P	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder $\emptyset$	Air consumption per cycle at 6 bar (ccm)
20034-4020	4	20	1 x 32	1 x 32	84	47,5	33	45	12	4
20034-4030	4	30	1 x 32	1 x 32	84	47,5	33	45	12	6
20034-4045	4	45	2 x 32	2 x 32	104	55	33	45	12	10,5
20034-4060	4	60	3 x 32	2 x 32	124	78,5	33	45	12	15
20034-4075	4	75	3 x 32	2 x 32	144	85	33	45	12	21,5
20034-4090	4	90	4 x 32	3 x 32	164	110,5	33	45	12	28

Order No.	Size	Suitable shock absorber	Suitable proximity switch
20034-4020	4	26300-0810008	83000-020X5000
20034-4030	4	26300-0810008	83000-020X5000
20034-4045	4	26300-0810008	83000-020X5000
20034-4060	4	26300-0810008	83000-020X5000
20034-4075	4	26300-0810008	83000-020X5000
20034-4090	4	26300-0810008	83000-020X5000

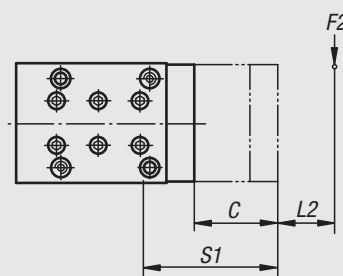
Linear modules pneumatic

with rail guide

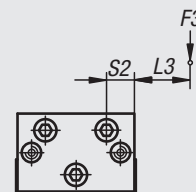
Load data



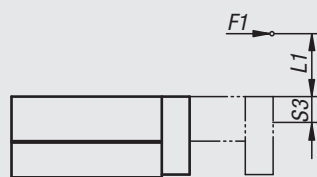
$$M1 = (S1 + L1) \times F1$$



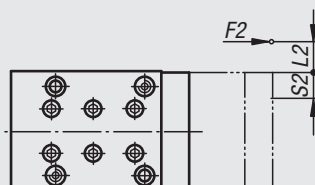
$$M2 = (S1 + L2) \times F2$$



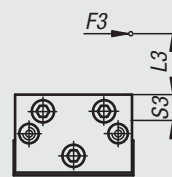
$$M3 = (S2 + L3) \times F3$$



$$M1 = (S3 + L1) \times F1$$



$$M2 = (S2 + L2) \times F2$$



$$M3 = (S3 + L3) \times F3$$

$$\frac{M1_{eff}}{M1_{zul}} + \frac{M2_{eff}}{M2_{zul}} + \frac{M3_{eff}}{M3_{zul}} \leq 1$$

Calculating the lifespan:

$$L = \left(\frac{M_{zul}}{M_{eff}} \right)^3 \times 10^5$$

L = lifespan (m)

M_{zul} = permissible torque (Nm)

M_{eff} = calculated torque (Nm)



Order No.	Size	M1 Nm	M2 Nm	M3 Nm	S1	S2	S3
20034-4020	4	12	12	17	29 + C/2 (travel)	9	13
20034-4030	4	12	12	17	29 + C/2 (travel)	9	13
20034-4045	4	15	15	20	36 + C/2 (travel)	9	13
20034-4060	4	18	18	23	44 + C/2 (travel)	9	13
20034-4075	4	21	21	26	51 + C/2 (travel)	9	13
20034-4090	4	25	25	29	59 + C/2 (travel)	9	13

Linear modules pneumatic

with rail guide



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

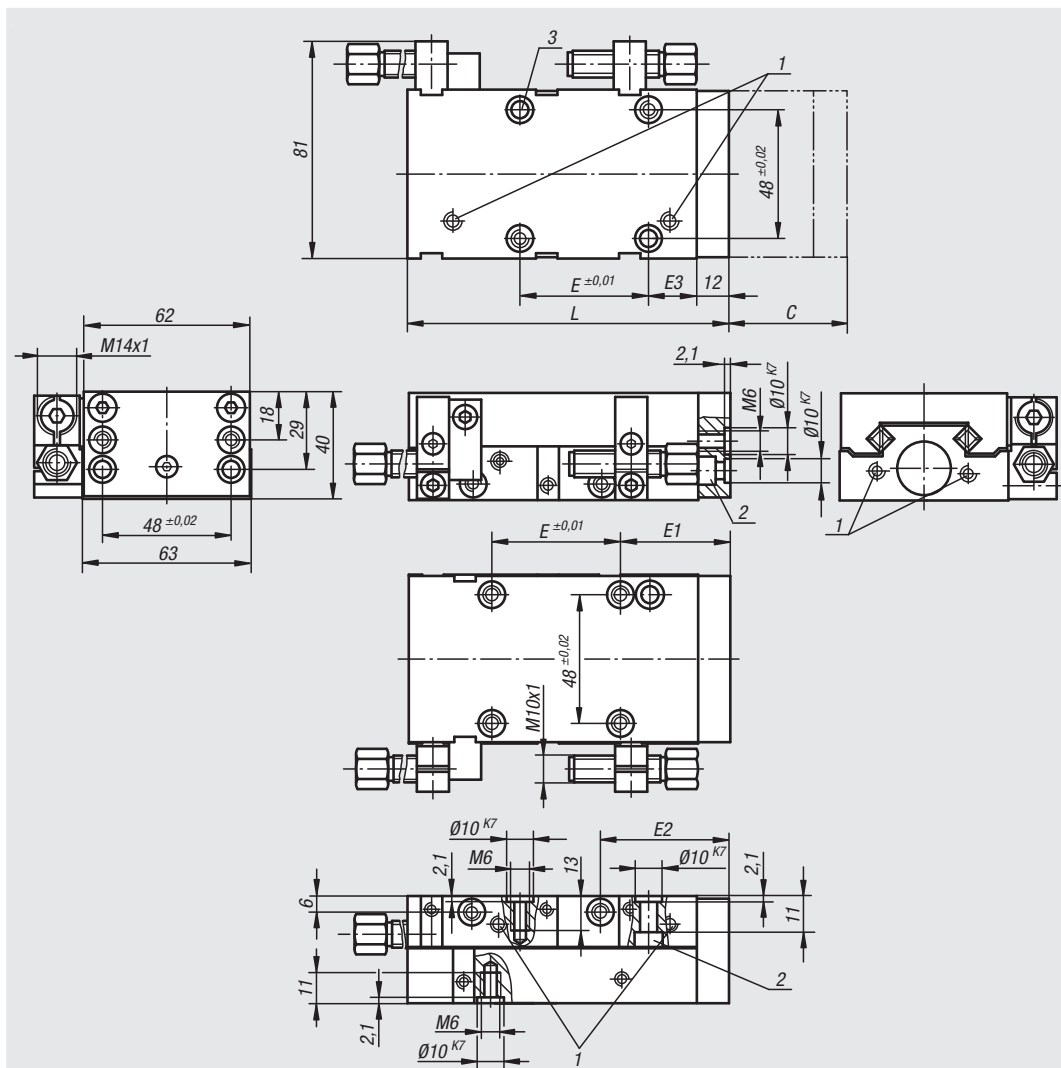
Sample order:

nlm 20036-6030

Note:

Maintenance-free pneumatic linear modules with recirculating ball bearing guide and load capacity of max. 240 N. Control by 4/2 or 5/2 directional valve. pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection M5. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240. The position of the stop system is variable.

Repeat accuracy ± 0.01 mm.



Order No.	Size	C (travel)	E	E1	E2	E3	L	Load capacity N	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20036-6030	6	30	1 x 48	29	36	18	121	240	76	66	16	11,2
20036-6050	6	50	1 x 48	29	36	18	121	220	76	66	16	18,7
20036-6075	6	75	2 x 48	35	42	21	175	200	76	66	16	28
20036-6100	6	100	2 x 48	35	42	21	175	180	76	66	16	37,4
20036-6125	6	125	3 x 48	17	45	27	231	160	76	66	16	46,8
20036-6150	6	150	3 x 48	17	45	27	231	140	76	66	16	56,1
20036-6175	6	175	4 x 48	26	52	34	288	120	76	66	16	65,5
20036-6200	6	200	4 x 48	26	52	34	288	100	76	66	16	74,8

Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20036-6030	6	26310-1410012	83000-15-020	80150-010X2000
20036-6050	6	26310-1410012	83000-15-020	80150-010X2000
20036-6075	6	26310-1410012	83000-15-020	80150-010X2000
20036-6100	6	26310-1410012	83000-15-020	80150-010X2000
20036-6125	6	26310-1410012	83000-15-020	80150-010X2000
20036-6150	6	26310-1410012	83000-15-020	80150-010X2000
20036-6175	6	26310-1410012	83000-15-020	80150-010X2000
20036-6200	6	26310-1410012	83000-15-020	80150-010X2000

Linear modules pneumatic

with rail guide

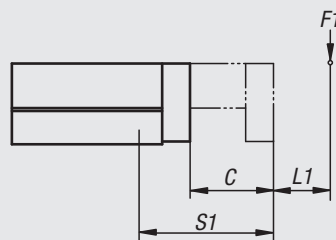
Accessories:

See table for shock absorbers, proximity switches and plug connectors.

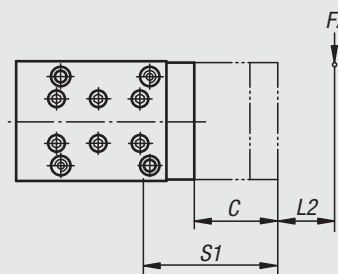
Drawing reference:

- 1) compressed air connections
- 2) counterbore for socket head screw ISO 4762-M6
- 3) screw cannot be installed by 30/75/125/175 travel

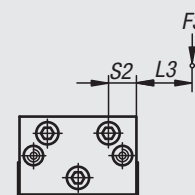
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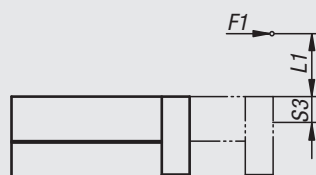
$$M1 = (S1 + L1) \times F1$$



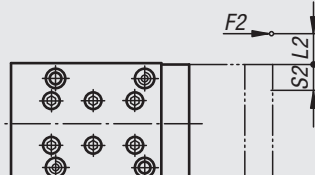
$$M2 = (S1 + L2) \times F2$$



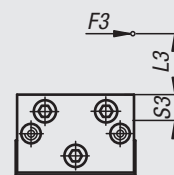
$$M3 = (S2 + L3) \times F3$$



$$M1 = (S3 + L1) \times F1$$



$$M2 = (S2 + L2) \times F2$$



$$M3 = (S3 + L3) \times F3$$

$$\frac{M1_{eff}}{M1_{zul}} + \frac{M2_{eff}}{M2_{zul}} + \frac{M3_{eff}}{M3_{zul}} \leq 1$$

Calculating the lifespan:

$$L = \left(\frac{M_{zul}}{M_{eff}} \right)^3 \times 10^5$$

L = lifespan (m)

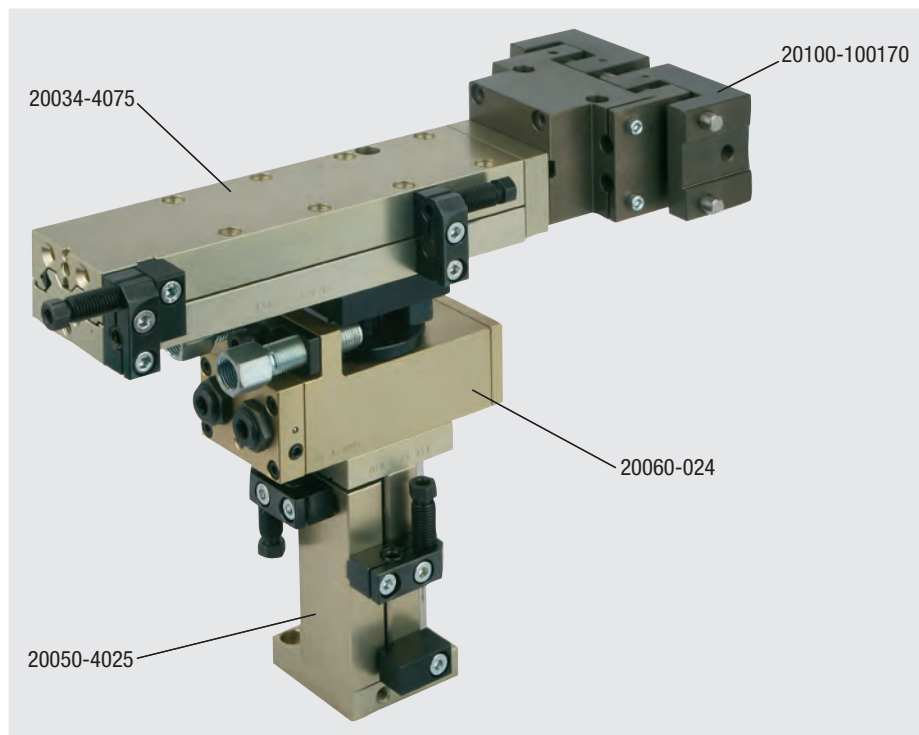
M_{zul} = permissible torque (Nm)

M_{eff} = calculated torque (Nm)



Order No.	Size	M1 Nm	M2 Nm	M3 Nm	S1	S2	S3
20036-6030	6	33,2	33,2	44,6	45 + C/2 (travel)	14	16
20036-6050	6	33,2	33,2	44,6	45 + C/2 (travel)	14	16
20036-6075	6	38,7	38,7	59,5	70 + C/2 (travel)	14	16
20036-6100	6	38,7	38,7	59,5	70 + C/2 (travel)	14	16
20036-6125	6	44,2	44,2	59,5	95 + C/2 (travel)	14	16
20036-6150	6	44,2	44,2	59,5	95 + C/2 (travel)	14	16
20036-6175	6	49,7	49,7	74,4	120 + C/2 (travel)	14	16
20036-6200	6	49,7	49,7	74,4	120 + C/2 (travel)	14	16

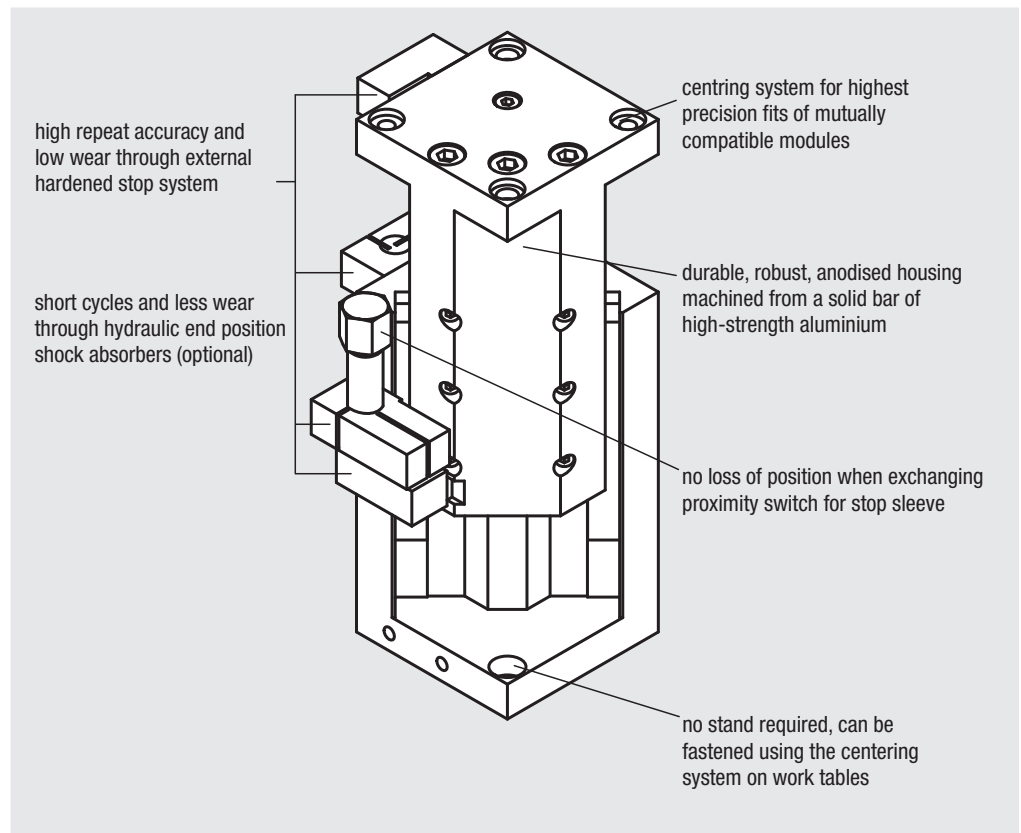
Construction of a lift-swivel unit made of four same size modules



Technical information for pneumatic lifting units

Highly robust lifting units for universal application as short stroke modules. The standardised fastening holes enable diverse combinations with our other units. Precise centring system enables all modules to be combined with one another quickly and easily. Same size combinations without adapter plates.

- piston force at 6 bar: 80 N – 360 N.
- cylinder diameter: 16 mm – 32 mm.
- stroke lengths: 10 mm – 100 mm.
- repeat accuracy: up to ± 0.01 mm.
- diverse fastening possibilities.
- double junction rolling guide for high torque loads and precision.
- ball-bearing guide sealed for hard application conditions with high precision.



Travel times				
norelem	Size	Travel lengths (mm)	Load (kg)	time / cycle (with shock absorbers)
20050	4	10 / 25	0,200	0,3 s / 0,4 s
20050	6	25 / 50	0,200	0,3 s / 0,4 s
20054	6	50 / 75 / 100	5,000	0,5 s / 0,7 s / 0,8 s
20056	9	50 / 75 / 100	10,000	0,5 s / 0,7 s / 0,9 s

The specified guide values for cycle times were ascertained under operation specific conditions and represent effective values.

Selection overview				
Guidance	Cross roller		Sealed ball guide	
Design	compact	compact	robust	robust
Size	4	6	6	6
Travel lengths (mm)	10 / 25	25 / 50	50 / 75 / 100	50 / 75 / 100
Piston force at 6 bar (N)	80	185	220	360
Cylinder Ø (mm)	16	25	25	32
norelem	20050	20050	20054	20056

Lifting units pneumatic

with rail guide



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

nIm 20050-4010

Note:

Maintenance-free pneumatic lifting units, compact construction with cross roller guides. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5.

Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

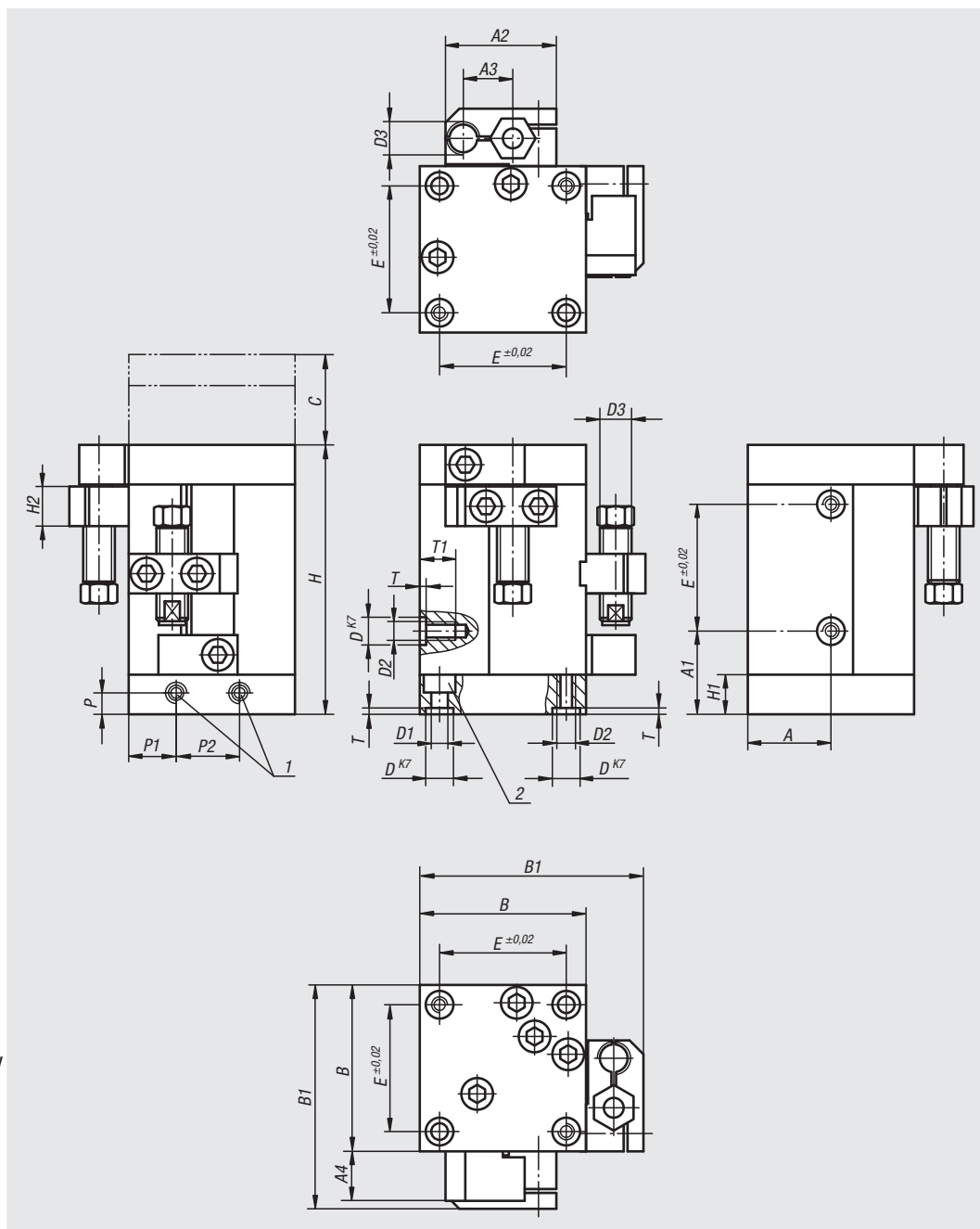
Repeat accuracy ± 0.01 mm.

Accessories:

See table for shock absorbers, proximity switches and plug connectors.

Drawing reference:

- 1) compressed air connections
- 2) counterbore for socket head screw ISO 4762-M4



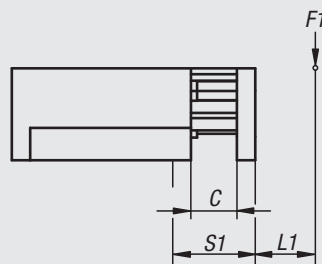
Order No.	Size	C (travel)	A	A1	A2	A3	A4	B	B1	D	D1	D2	D3	E	H	H1	H2	P	P1	P2	T	T1
20050-4010	4	10	21	21	27,5	12	12,5	42	57	7	4,2	M4	M8x1	32	68	10	10	5	12	16	1,6	6
20050-4025	4	25	21	39	27,5	12	12,5	42	57	7	4,2	M4	M8x1	32	86	10	10	5	12	16	1,6	6
20050-6025	6	25	30	38	38	17,5	14	60	78	10	6,4	M6	M14x1	48	104	12	12	6	16	18	2,1	9
20050-6050	6	50	30	63	38	17,5	14	60	78	10	6,4	M6	M14x1	48	129	12	12	6	16	18	2,1	9

Order No.	Size	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20050-4010	4	80	55	16	3,7	26300-0810008	83000-020X5000	-
20050-4025	4	80	55	16	9,3	26300-0810008	83000-020X5000	-
20050-6025	6	185	175	25	23,8	26310-1410012	83000-15-020	80150-010X2000
20050-6050	6	185	175	25	47,7	26310-1410012	83000-15-020	80150-010X2000

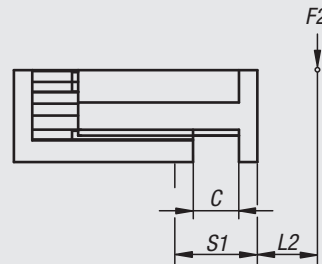
Lifting units pneumatic

with rail guide

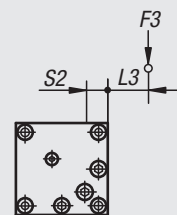
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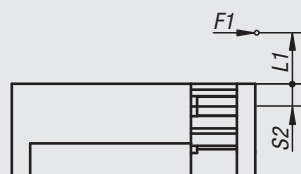
$$M1 = (S1 + L1) \times F1$$



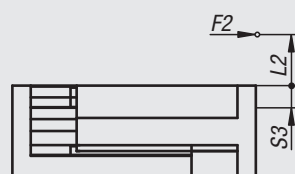
$$M2 = (S1 + L2) \times F2$$



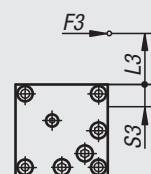
$$M3 = (S2 + L3) \times F3$$



$$M1 = (S2 + L1) \times F1$$



$$M2 = (S3 + L2) \times F2$$



$$M3 = (S3 + L3) \times F3$$

$$\frac{M1_{eff}}{M1_{zul}} + \frac{M2_{eff}}{M2_{zul}} + \frac{M3_{eff}}{M3_{zul}} \leq 1$$

Calculation of lifespan:

$$L = \left(\frac{M_{zul}}{M_{eff}} \right)^3 \times 10^5$$

L = lifespan (m)

M_{zul} = permissible torque (Nm)

M_{eff} = calculated torque (Nm)



Order No.	Size	M1 Nm	M2 Nm	M3 Nm	S1	S2	S3	Dynamic load rating N	Static load rating N
20050-4010	4	12,5	12,5	13,5	19 + C/2 (travel)	10	16,5	1435	1435
20050-4025	4	15	15	18	26 + C/2 (travel)	10	16,5	1640	1640
20050-6025	6	33	33	56	33 + C/2 (travel)	11	17	2600	2600
20050-6050	6	33	33	56	45 + C/2 (travel)	11	17	2600	2600

Lifting units pneumatic

with round guides



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

n1m 20054-6050

Note:

Highly robust maintenance-free pneumatic lifting units with sealed ball guide. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection M5. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

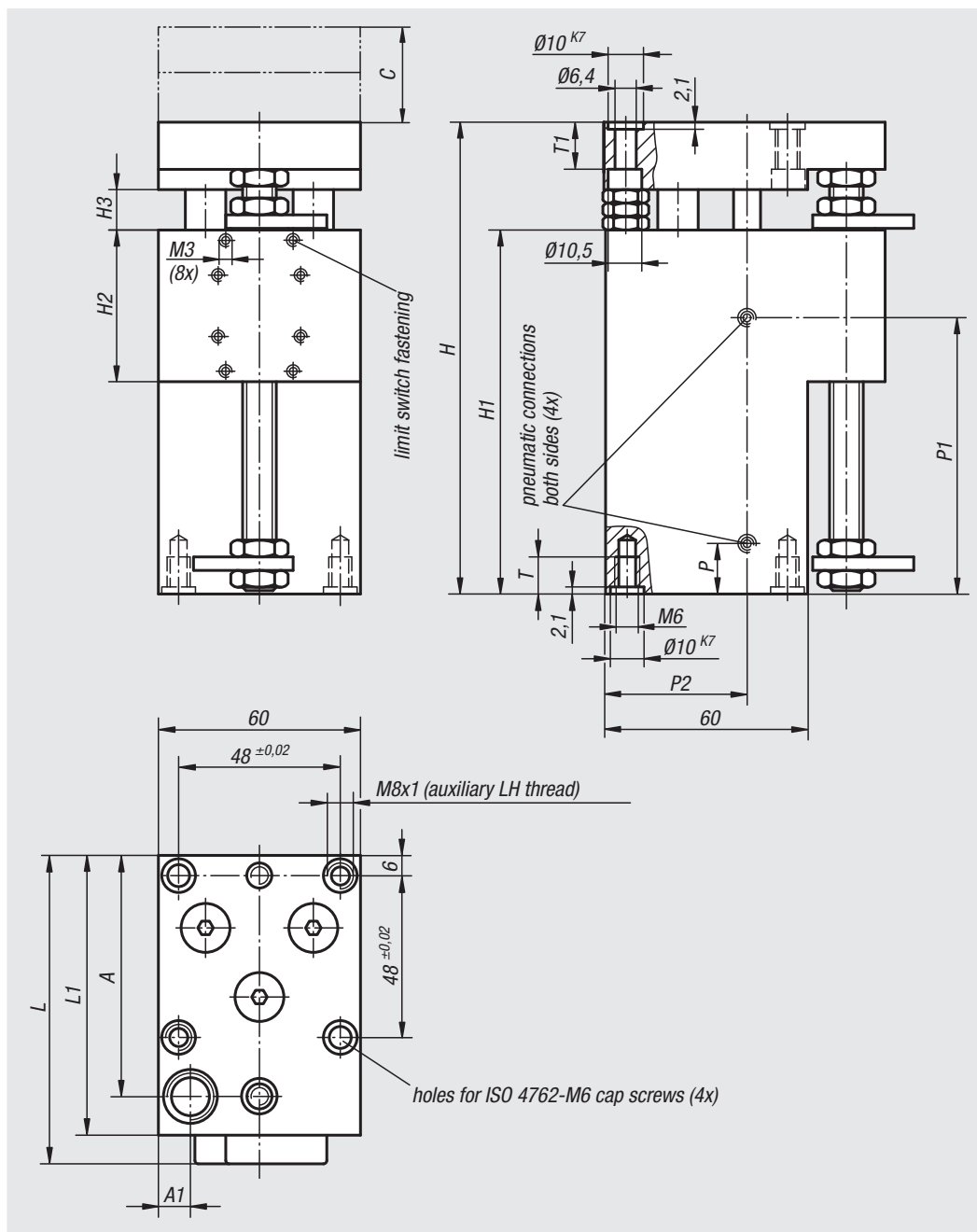
Repeat accuracy ± 0.02 mm.

On request:

Lifting units with shorter strokes available.

Accessories:

See table for shock absorbers, proximity switches and plug connectors.



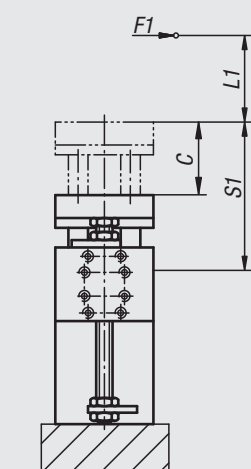
Order No.	Size	C (travel)	A	A1	H	H1	H2	H3	L	L1	P	P1	P2	T	T1
20054-6050	6	50	71,5	10	140	108	45	12	92	83	15	83	41,5	16	13
20054-6075	6	75	71,5	10	165	133	45	12	92	83	15	108	41,5	16	13
20054-6100	6	100	71,5	10	190	158	45	12	92	83	15	133	41,5	16	13

Order No.	Size	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20054-6050	6	220	200	25	33	26310-1410012	83000-05-010	80150-010X2000
20054-6075	6	220	200	25	50	26310-1410012	83000-05-010	80150-010X2000
20054-6100	6	220	200	25	66	26310-1410012	83000-05-010	80150-010X2000

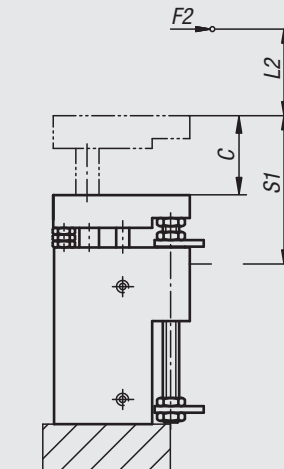
Lifting units pneumatic

with round guides

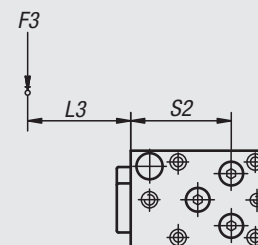
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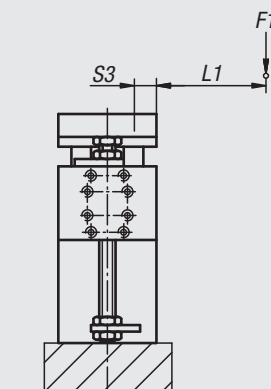
$$M1 = (S1 + L1) \times F1$$



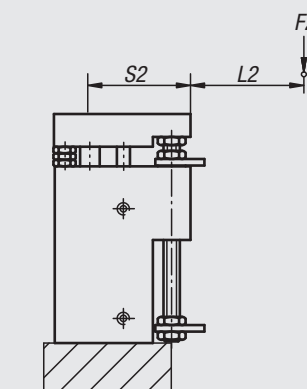
$$M2 = (S1 + L2) \times F2$$



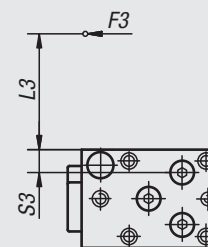
$$M3 = (S2 + L3) \times F3$$



$$M1 = (S3 + L1) \times F1$$



$$M2 = (S2 + L2) \times F2$$



$$M3 = (S3 + L3) \times F3$$

$$\frac{M1_{eff}}{M1_{zul}} + \frac{M2_{eff}}{M2_{zul}} + \frac{M3_{eff}}{M3_{zul}} \leq 1$$

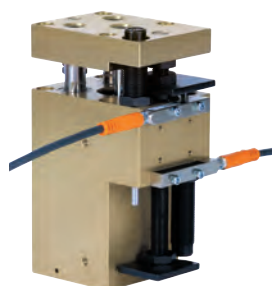
Calculating the lifespan:

$$L = \left(\frac{M_{zul}}{M_{eff}} \right)^3 \times 10^5$$

L = lifespan (m)

M_{zul} = permissible torque (Nm)

M_{eff} = calculated torque (Nm)



Order No.	Size	M1 Nm	M2 Nm	M3 Nm	S1	S2	S3
20054-6050	6	28	28	30	46 + C/2 (travel)	61	14
20054-6075	6	28	28	30	46 + C/2 (travel)	61	14
20054-6100	6	28	28	30	46 + C/2 (travel)	61	14

Lifting units pneumatic

with round guides



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

n1m 20056-9050

Note:

Robust maintenance-free pneumatic lifting units with sealed ball guide.
Control by 4/2 or 5/2 directional valve.
Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled.
Compressed air connection R1/8.
Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

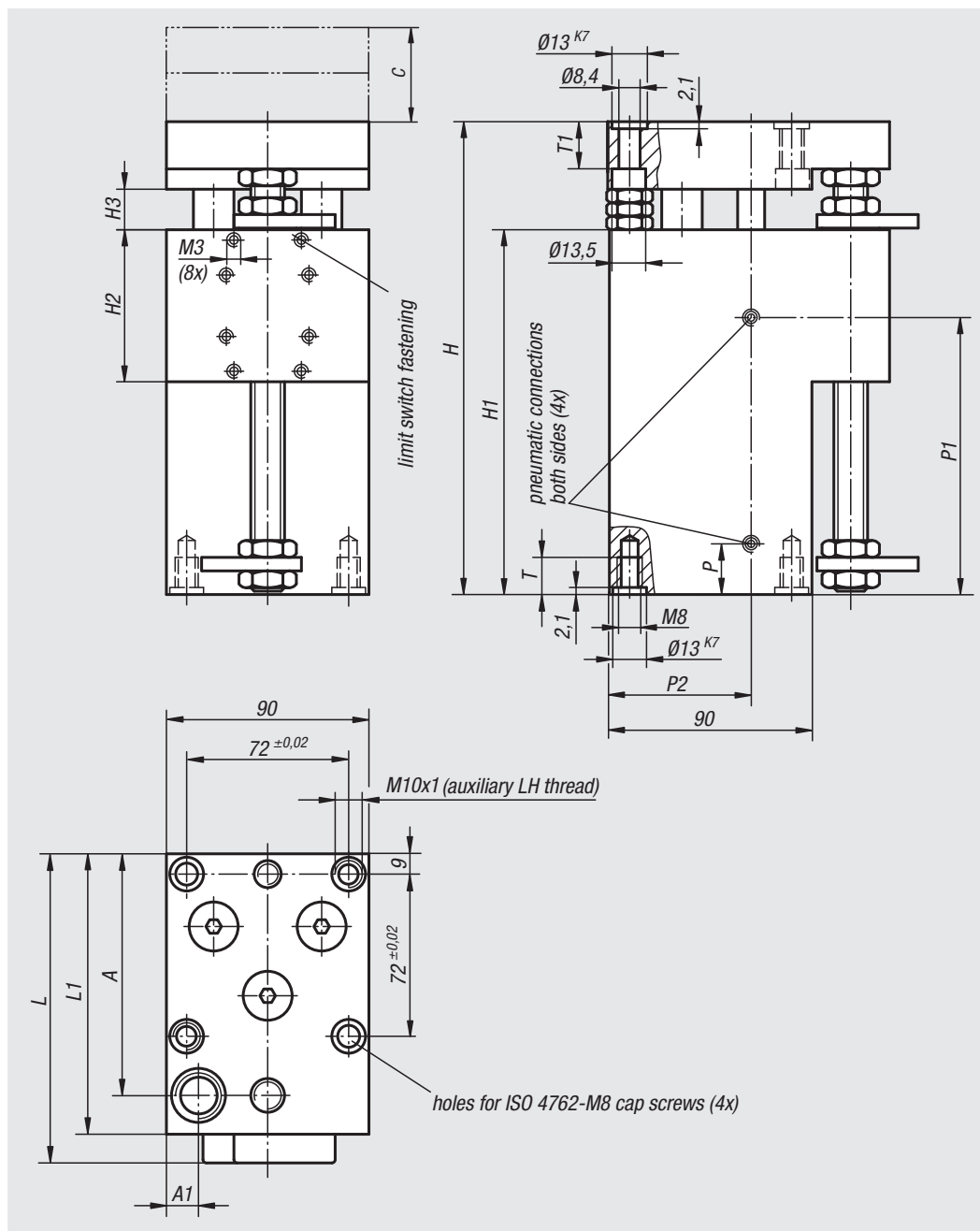
Repeat accuracy ± 0.02 mm.

On request:

Lifting units with shorter strokes available.

Accessories:

See table for shock absorber, proximity switch and plug connector.



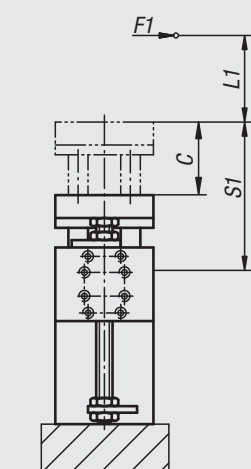
Order No.	Size	C (travel)	A	A1	H	H1	H2	H3	L	L1	P	P1	P2	T	T1
20056-9050	9	50	101,5	24,5	150	108	45	12	121	113	15,5	83	68	16	13
20056-9075	9	75	101,5	24,5	175	133	45	12	121	113	15,5	108	68	16	13
20056-9100	9	100	101,5	24,5	200	158	45	12	121	113	15,5	133	68	16	13

Order No.	Size	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20056-9050	9	360	325	32	56	26310-1410012	83000-05-010	80150-010X2000
20056-9075	9	360	325	32	84	26310-1410012	83000-05-010	80150-010X2000
20056-9100	9	360	325	32	112	26310-1410012	83000-05-010	80150-010X2000

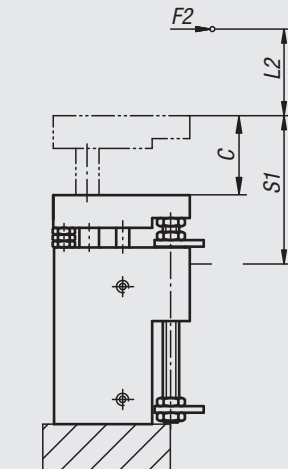
Lifting units pneumatic

with round guides

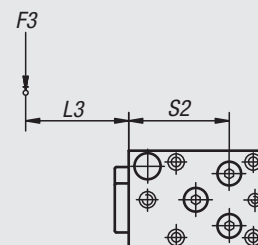
Load data



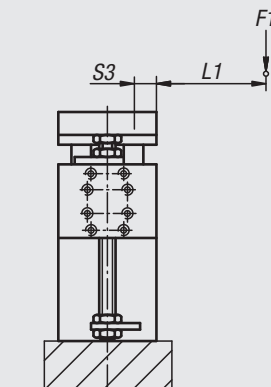
$$M1 = (S1 + L1) \times F1$$



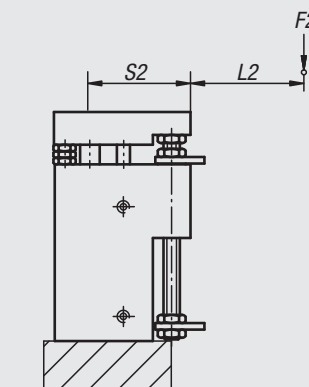
$$M2 = (S1 + L2) \times F2$$



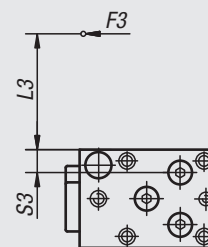
$$M3 = (S2 + L3) \times F3$$



$$M1 = (S3 + L1) \times F1$$



$$M2 = (S2 + L2) \times F2$$



$$M3 = (S3 + L3) \times F3$$

$$\frac{M1_{eff}}{M1_{zul}} + \frac{M2_{eff}}{M2_{zul}} + \frac{M3_{eff}}{M3_{zul}} \leq 1$$

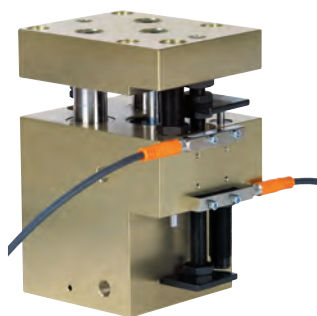
Calculating the lifespan:

$$L = \left(\frac{M_{zul}}{M_{eff}} \right)^3 \times 10^5$$

L = lifespan (m)

M_{zul} = permissible torque (Nm)

M_{eff} = calculated torque (Nm)



Order No.	Size	M1 Nm	M2 Nm	M3 Nm	S1	S2	S3
20056-9050	9	43	43	72	57 + C/2 (travel)	73	20
20056-9075	9	43	43	72	57 + C/2 (travel)	73	20
20056-9100	9	43	43	72	57 + C/2 (travel)	73	20

Technical information for pneumatic rotary modules

Compact, high-performance rotary modules open many fields of application. They are an indispensable component, when combined with linear modules to reach any point in a given space. Rotary modules can be mounted in any position. The extremely compact design of the rotary modules allow for high load bearing capacity in all directions with high rigidity of the entire system. The 0° – 190° rotation angle for all models is infinitely adjustable.

- cylinder diameter: 10 mm – 38 mm.
- axial load: 280 N – 1.800 N.
- radial load: 220 N – 2.400 N.
- repeat accuracy $\pm 0.01^\circ$.
- rotary angle infinitely adjustable.
- play-free end positions through double actuated drive cylinders with protected pinion rack drive.
- many applications covered by coordinated increases in torque per size.
- also available for small installation spaces and as heavy-duty versions.
- drive protected by rotation limiter.

centring system for
highest precision fits of
mutually compatible modules

high repeat accuracy and low
wear through external, hardened
stop system on the ring face

durable, robust, anodised
housing machined from a solid
bar of high-strength aluminium

rotation angle infinitely
adjustable (0° - 190°)

short cycle times and less wear through
hydraulic end position shock absorbers
(not supplied with all products)

no loss of position when
exchanging proximity switch
for stop sleeve

Swivel times		
norelem	Load (kg)	time / cycle
20060-014	0,250	0,3
20060-024	0,400	0,7 s
20062-016	1,500	0,8 s

The specified guide values for cycle times were ascertained under operation specific conditions and represent effective values.

Selection overview						
Design	for small spaces			heavy-duty		heavy-duty
Driving torque	0,28	0,94	3,5	6,5	12	24
Rotation angle	0°-190°	0°-190°	0°-190°	0°-190°	0°-190°	0°-190°
Axial load (N)	300	280	350	1100	1800	1800
Radial load (N)	220	350	450	1600	2400	2400
norelem	20060-014	20060-024	20062-016	20062-026	20065-019	20064-029

Rotary module pneumatic



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

n1m 20060-014

Note:

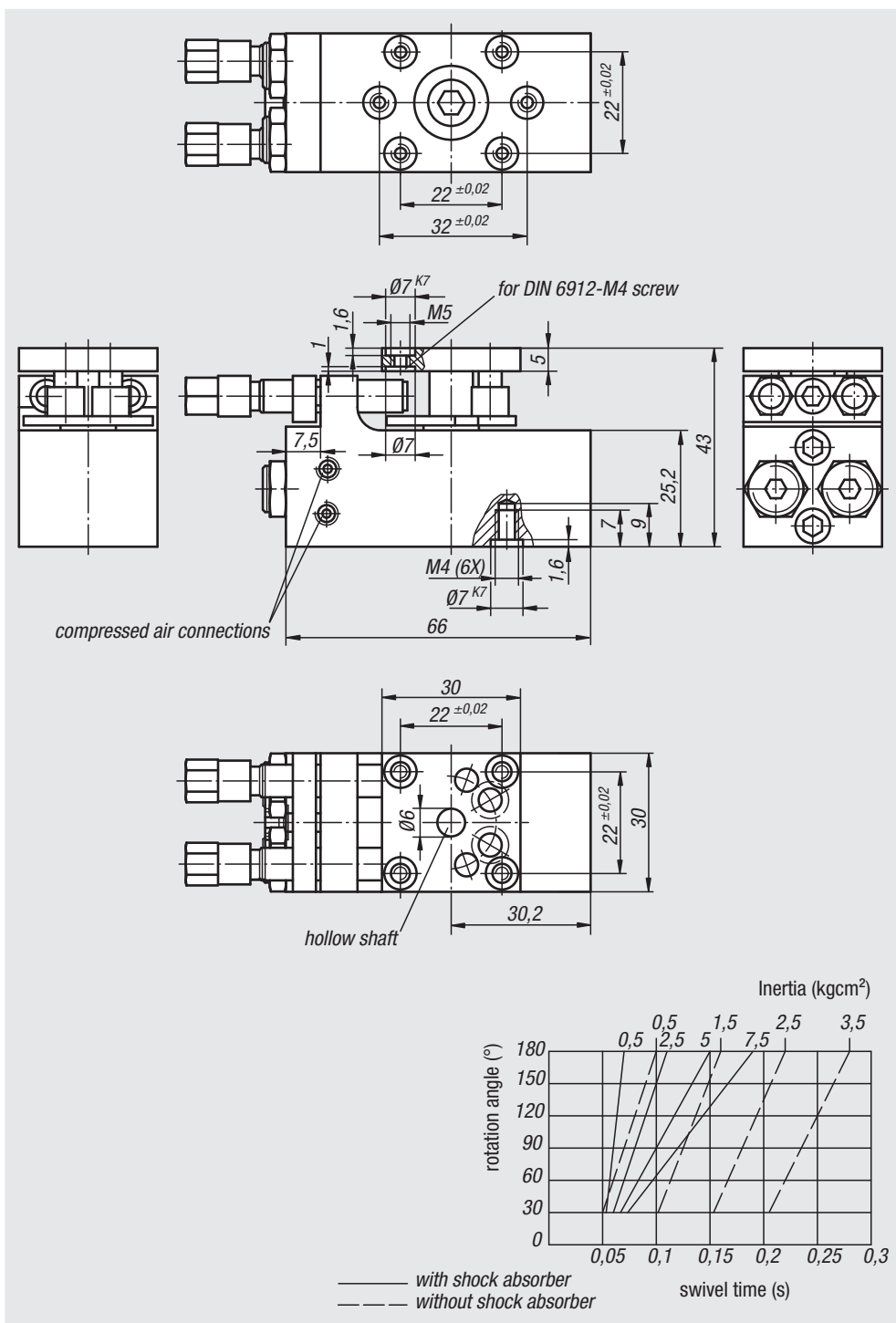
Maintenance-free pneumatic rotary module for small installation spaces with double actuated drive cylinder. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection M5.
Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

The 0° – 190° rotation angle is infinitely adjustable.

Repeat accuracy ±0.01°.

Accessories:

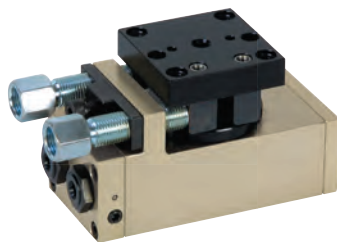
See table for shock absorber, proximity switch and plug connector.



Order No.	Size	Driving torque Nm	Rotation angle	Axial load N	Radial load N	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20060-014	4	0,28	0° - 190°	300	220	2 x 10	5

Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20060-014	4	26300-1010008	83000-15-010	80100-10-010X2000

Rotary module pneumatic



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

nlm 20060-024

Note:

Maintenance-free pneumatic rotary module with double actuated drive cylinder. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection M5.

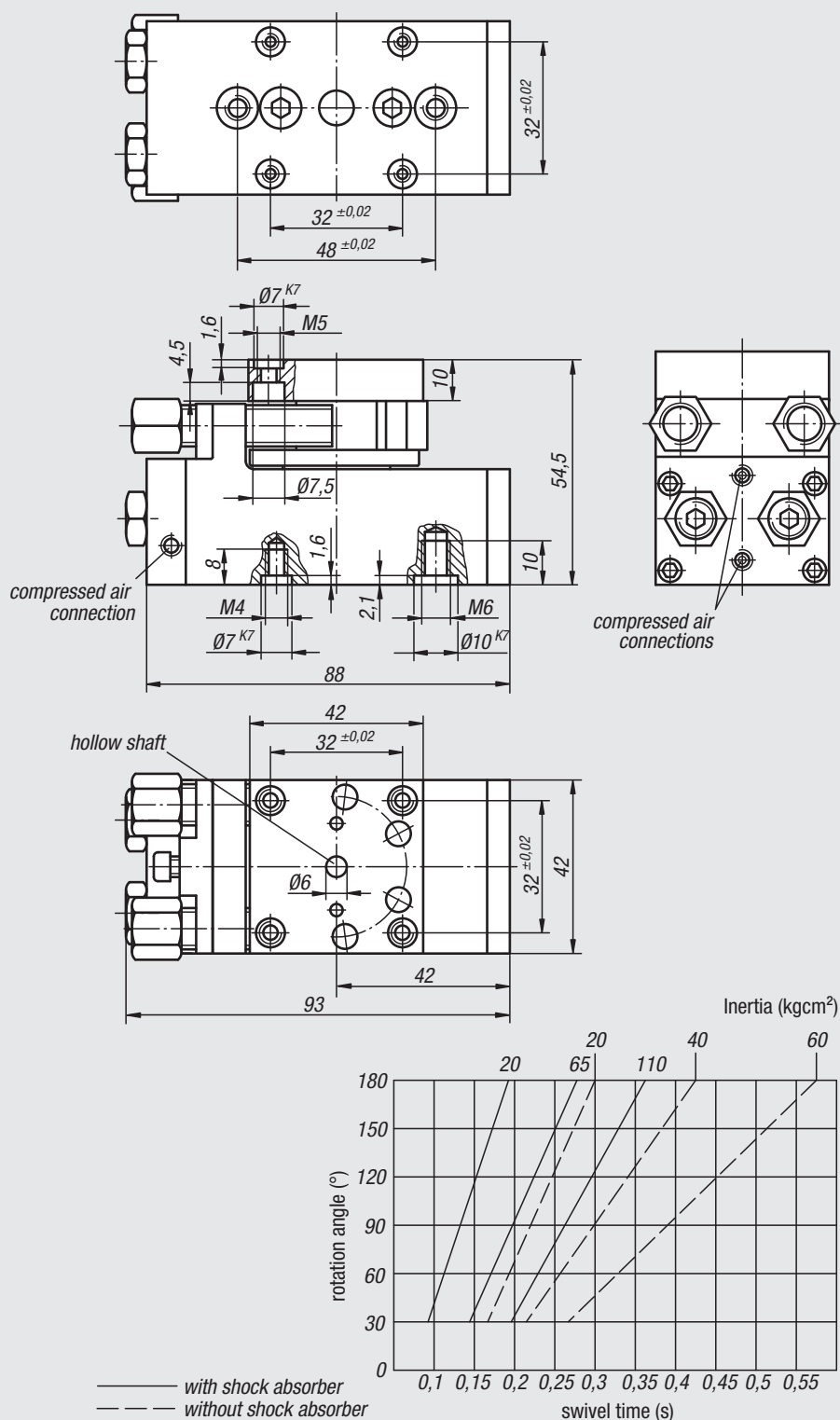
Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

The $0^\circ - 190^\circ$ rotation angle is infinitely adjustable.

Repeat accuracy $\pm 0.01^\circ$.

Accessories:

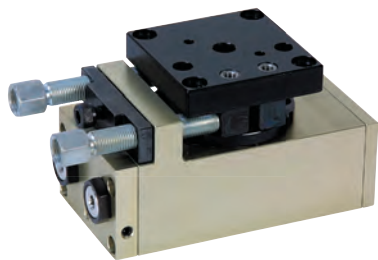
See table for shock absorber, proximity switch and plug connector.



Order No.	Size	Driving torque Nm	Rotation angle	Axial load N	Radial load N	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20060-024	4	0,94	0° - 190°	280	350	2 x 14	19

Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20060-024	4	26300-1210010	83000-15-020	80150-010X2000

Rotary module pneumatic



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

nlm 20062-016

Note:

Maintenance-free pneumatic rotary module with double actuated drive cylinder. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5.

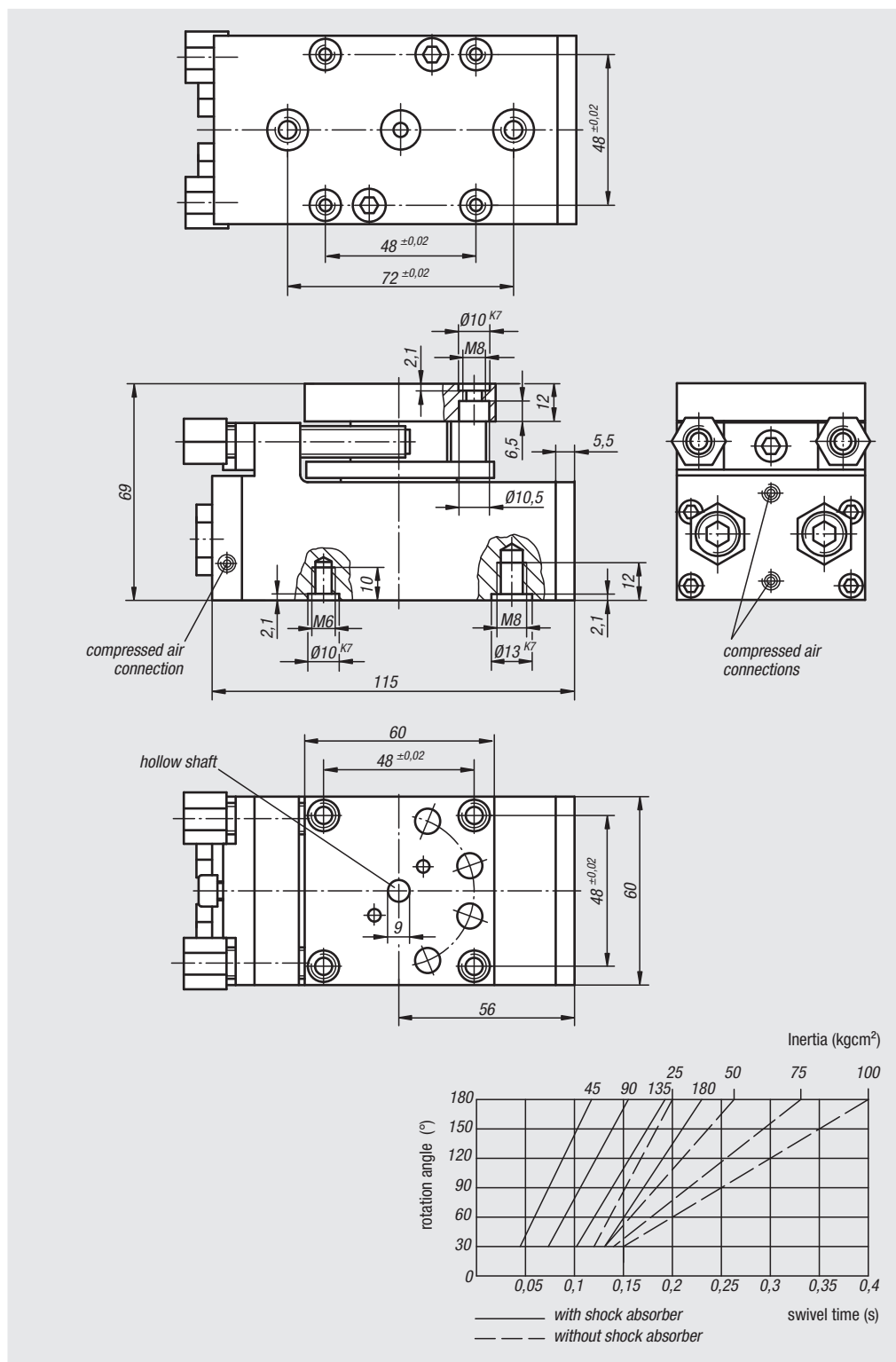
Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

The 0° – 190° rotation angle is infinitely adjustable.

Repeat accuracy ±0.01°.

Accessories:

See table for shock absorber, proximity switch and plug connector.

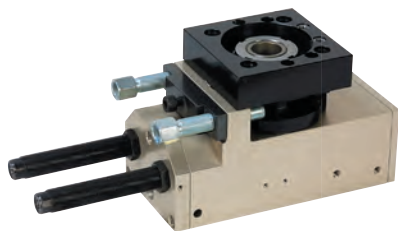


Order No.	Size	Driving torque Nm	Rotation angle	Axial load N	Radial load N	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20062-016	6	3,5	0° - 190°	350	450	2 x 22	45

Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20062-016	6	26310-1410012	83000-15-030	80150-010X2000

Rotary module pneumatic

heavy duty version



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

n1m 20062-026

Note:

Maintenance-free pneumatic rotary module with double actuated drive cylinder, heavy duty version. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection M5.

Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

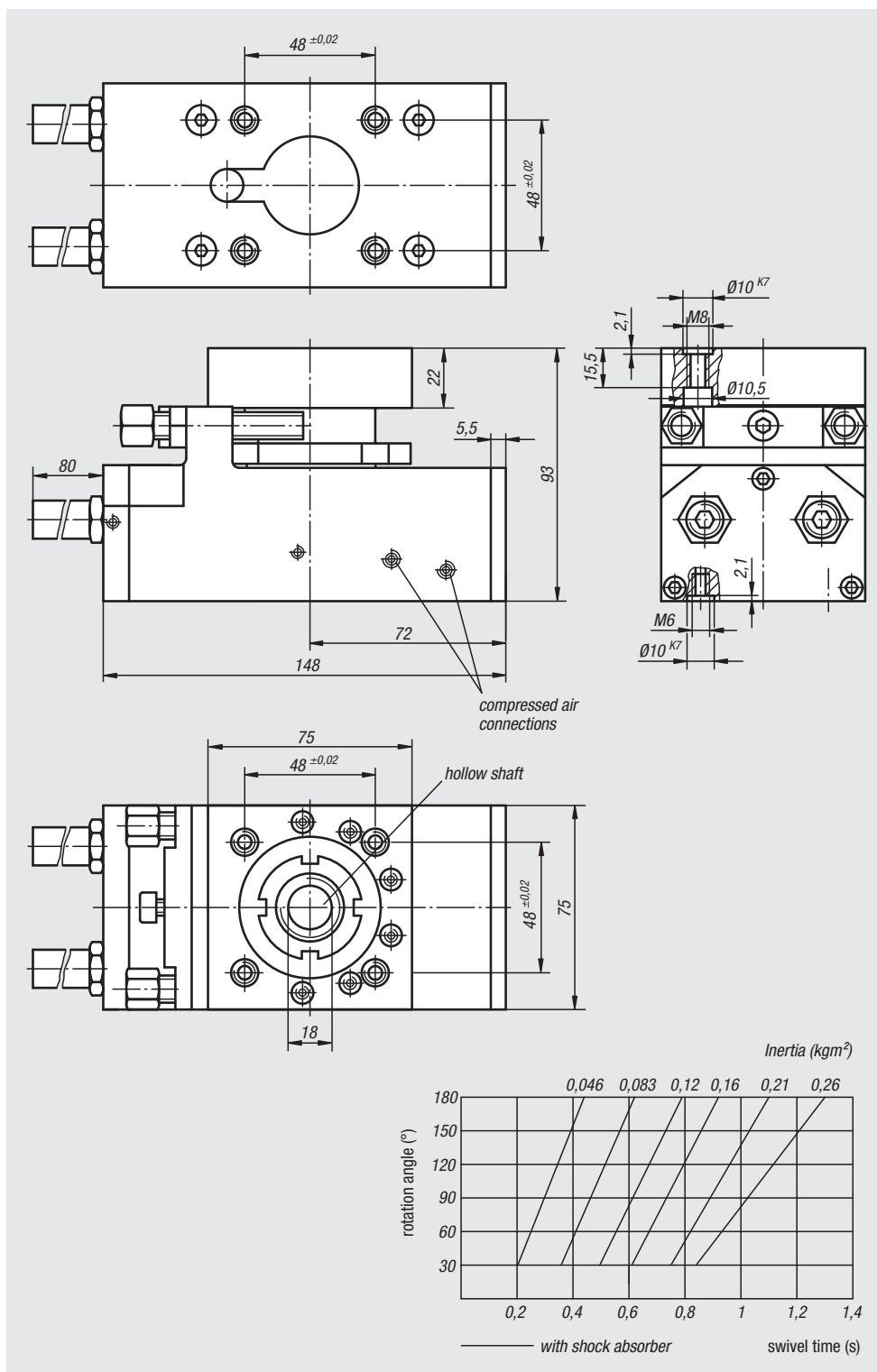
The 0° – 190° rotation angle is infinitely adjustable.

Repeat accuracy ±0.01°.

Shock absorbers are supplied.

Accessories:

See table for proximity switches and plug connectors.



Order No.	Size	Driving torque Nm	tilt moment max. Nm	Rotation angle	Axial load N	Radial load N	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20062-026	6	6,5	55	0° - 190°	1100	1600	2 x 25	88

Order No.	Size	Suitable proximity switch	Suitable plug connector
20062-026	6	83000-15-030	80150-010X2000

Rotary module pneumatic



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

nlm 20064-019

Note:

Maintenance-free pneumatic rotary module with double actuated drive cylinder. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection R1/8. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

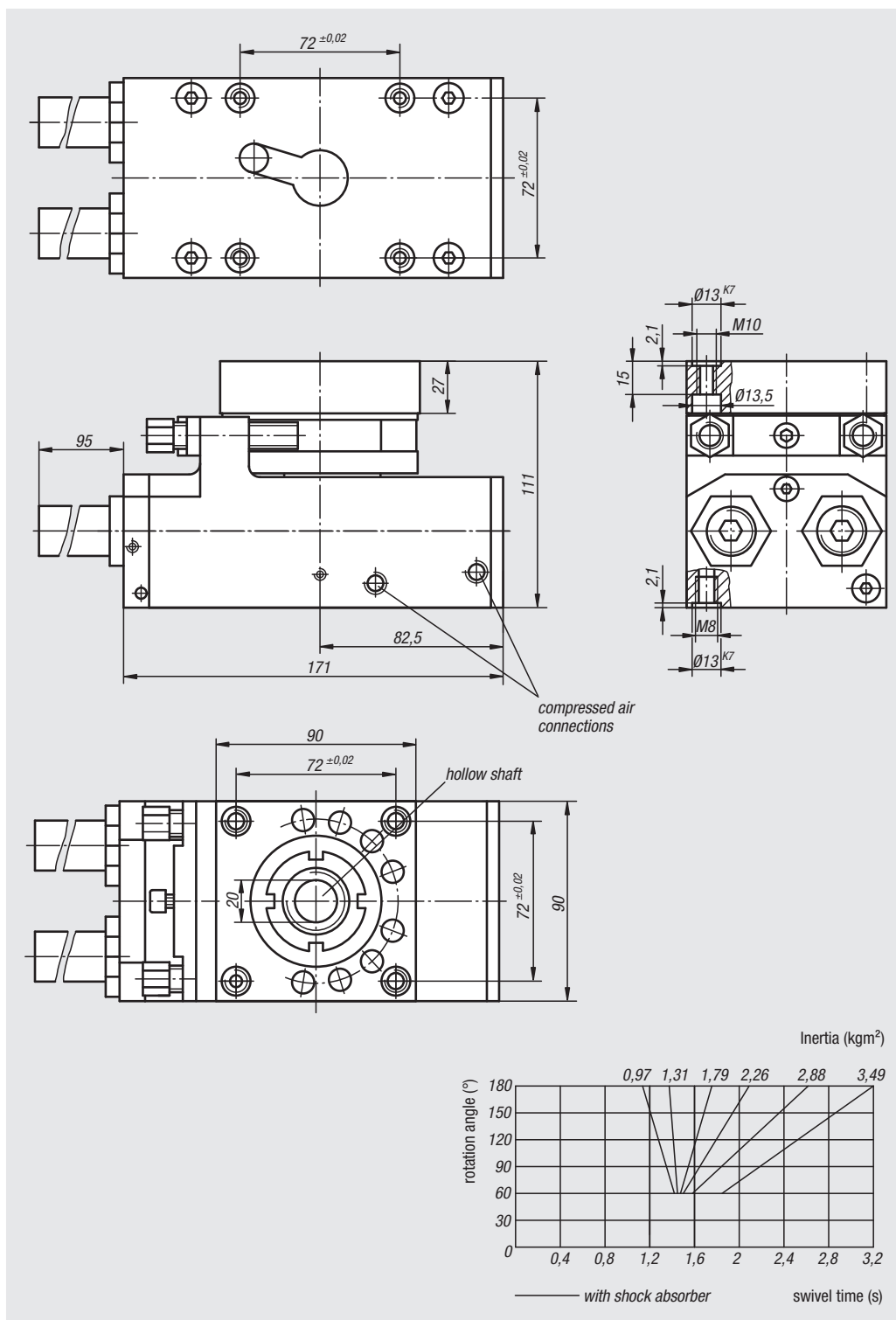
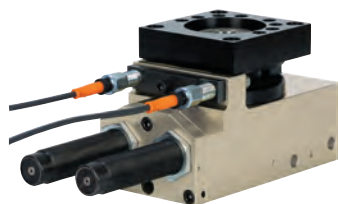
The 0° – 190° rotation angle is infinitely adjustable.

Repeat accuracy ±0.01°.

Shock absorbers are supplied.

Accessories:

See table for proximity switches and plug connectors.

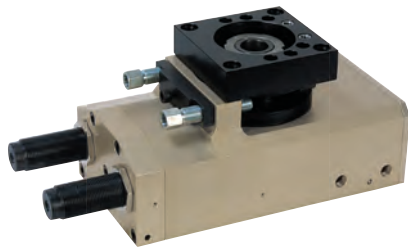


Order No.	Size	Driving torque Nm	tilt moment max. Nm	Rotation angle	Axial load N	Radial load N	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20064-019	9	12	110	0° - 190°	1800	2400	2 x 32	161

Order No.	Size	Suitable proximity switch	Suitable plug connector
20064-019	9	83000-15-030	80150-010X2000

Rotary module pneumatic

heavy duty version



Material:

Housing high-strength aluminium.
Stop system steel.

Version:

Housing anodised.
Stop system hardened and black oxidised.

Sample order:

nlm 20064-029

Note:

Maintenance-free pneumatic rotary module with double actuated drive cylinder, heavy-duty version. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Compressed air connection R1/8. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

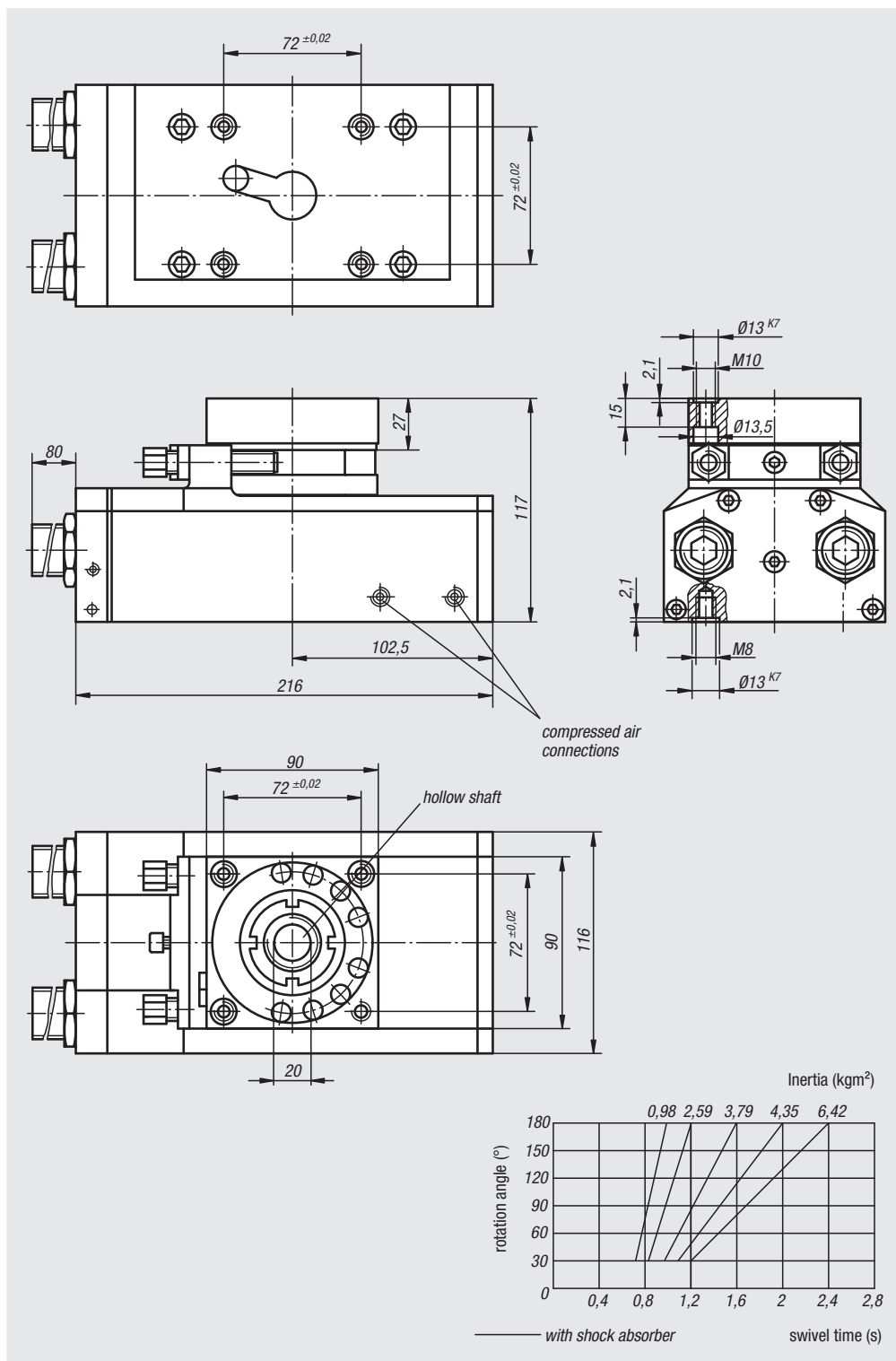
The 0° – 190° rotation angle is infinitely adjustable.

Repeat accuracy ±0.01°.

Shock absorbers are supplied.

Accessories:

See table for proximity switches and plug connectors.



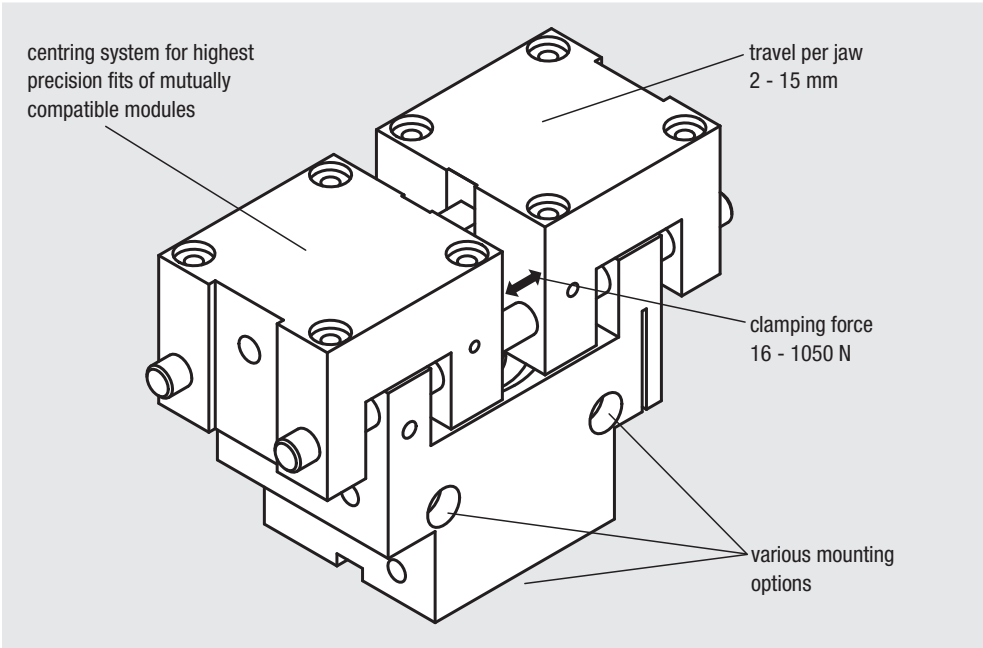
Order No.	Size	Driving torque Nm	tilt moment max. Nm	Rotation angle	Axial load N	Radial load N	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)
20064-029	9	24	110	0° - 190°	1800	2400	2 x 38	303

Order No.	Size	Suitable proximity switch	Suitable plug connector
20064-029	9	83000-15-030	80150-010X2000

Technical information for grip modules

Grip modules can be mounted in any position. The applications for pneumatic grip modules in assembly and machining are almost limitless. These components can manage a multitude of functions such as centring, feeding, transposing and loading. The standardised fastening holes allow diverse combinations with our other units.

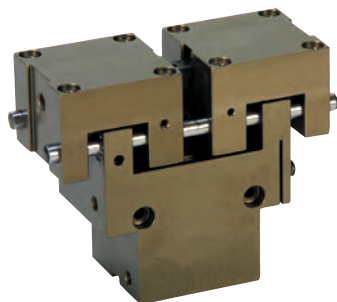
- workpiece weight 0.08 kg – 4.74 kg.
- also for particularly robust use.
- grip force feedback - open, closed, part gripped.
- steel slide – hardened and ground for universal use and long life.



Overview	
Type	Parallel grippers
Guidance	Steel slides
Design	robust
Travel per jaw (mm)	2 - 15
Clamping force at 6 bar (N)	16 - 1050
Workpiece weight (kg)	0,08 - 4,74
Finger length max. (mm)	15 - 140
Operating principle	Link rod kinematics
Application	Universal application in clean and lightly contaminated environments
norelem	20100

Grip module

parallel grippers



Material:

Housing high-strength aluminium.
Guide shafts and leverage steel.

Version:

Housing coated with Hart-Coat®.
Guide shafts hardened and ground.

Sample order:

nIm 20100-030025

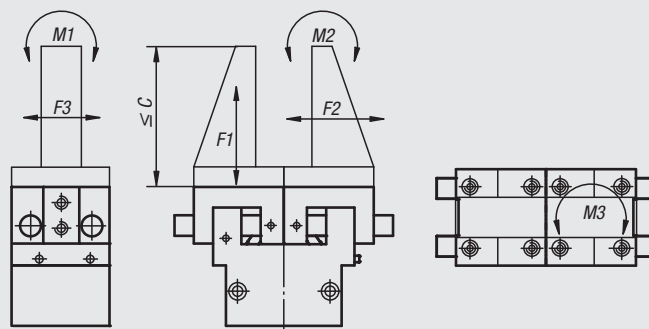
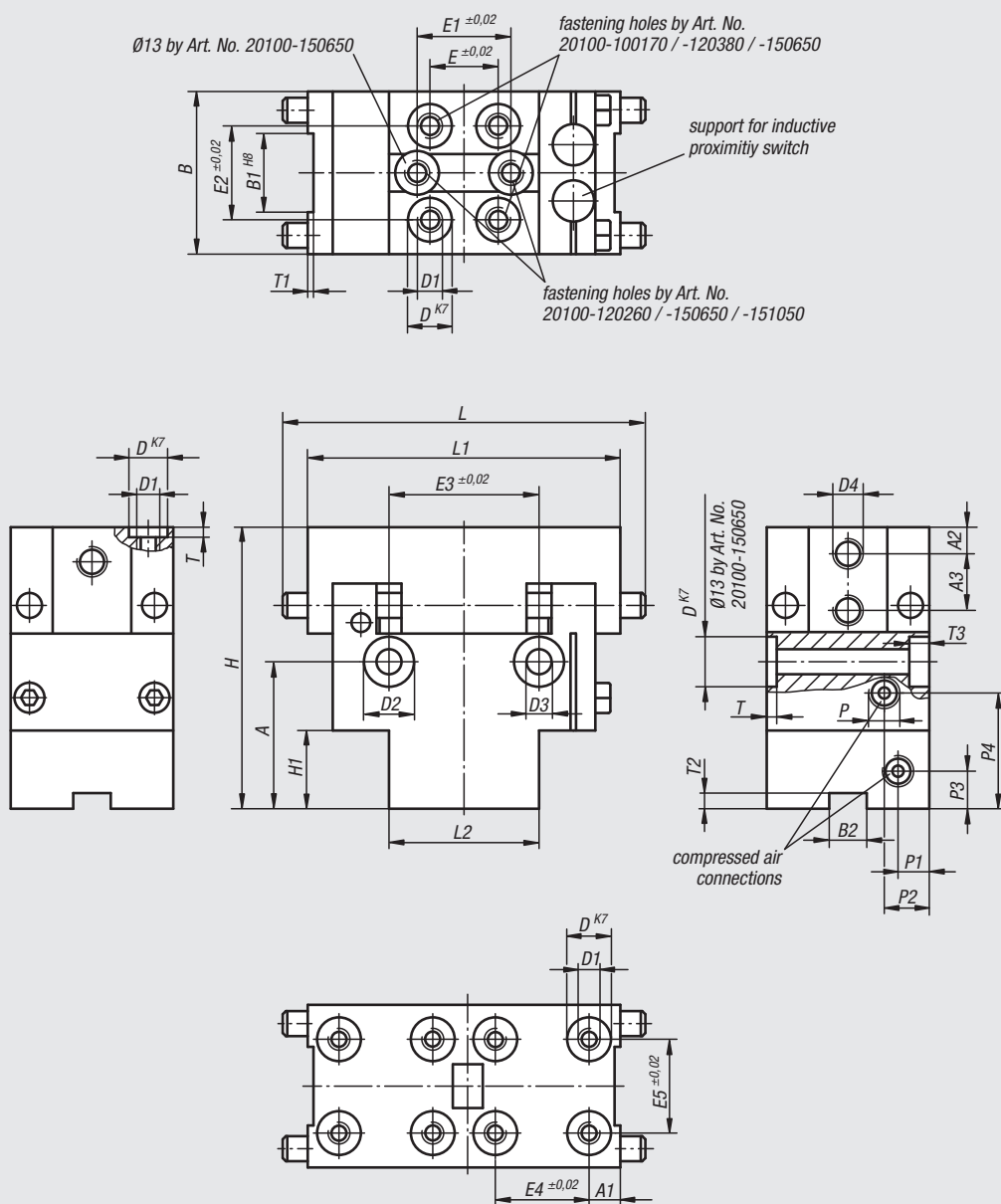
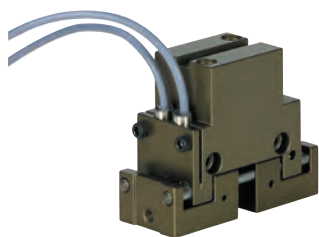
Note:

Maintenance-free pneumatic parallel gripper with leverage kinematics. Control by 4/2 or 5/2 directional valve. Pneumatic drive, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoled. Grips absolutely centrally. Can grip internally or externally. Proximity switches (accessories) can be integrated for end position feedback.

Repeat accuracy ± 0.02 mm.

Accessories:

See table for proximity switches and plug connectors.



$$\frac{M1_{e''}}{M1_{zul}} + \frac{M2_{e''}}{M2_{zul}} + \frac{M3_{e''}}{M3_{zul}} \leq 1$$

$$\frac{F1_{e''}}{F1_{zul}} + \frac{F2_{e''}}{F2_{zul}} + \frac{F3_{e''}}{F3_{zul}} \leq 1$$

zul = permissible
e'' = calculated

Grip module

parallel grippers

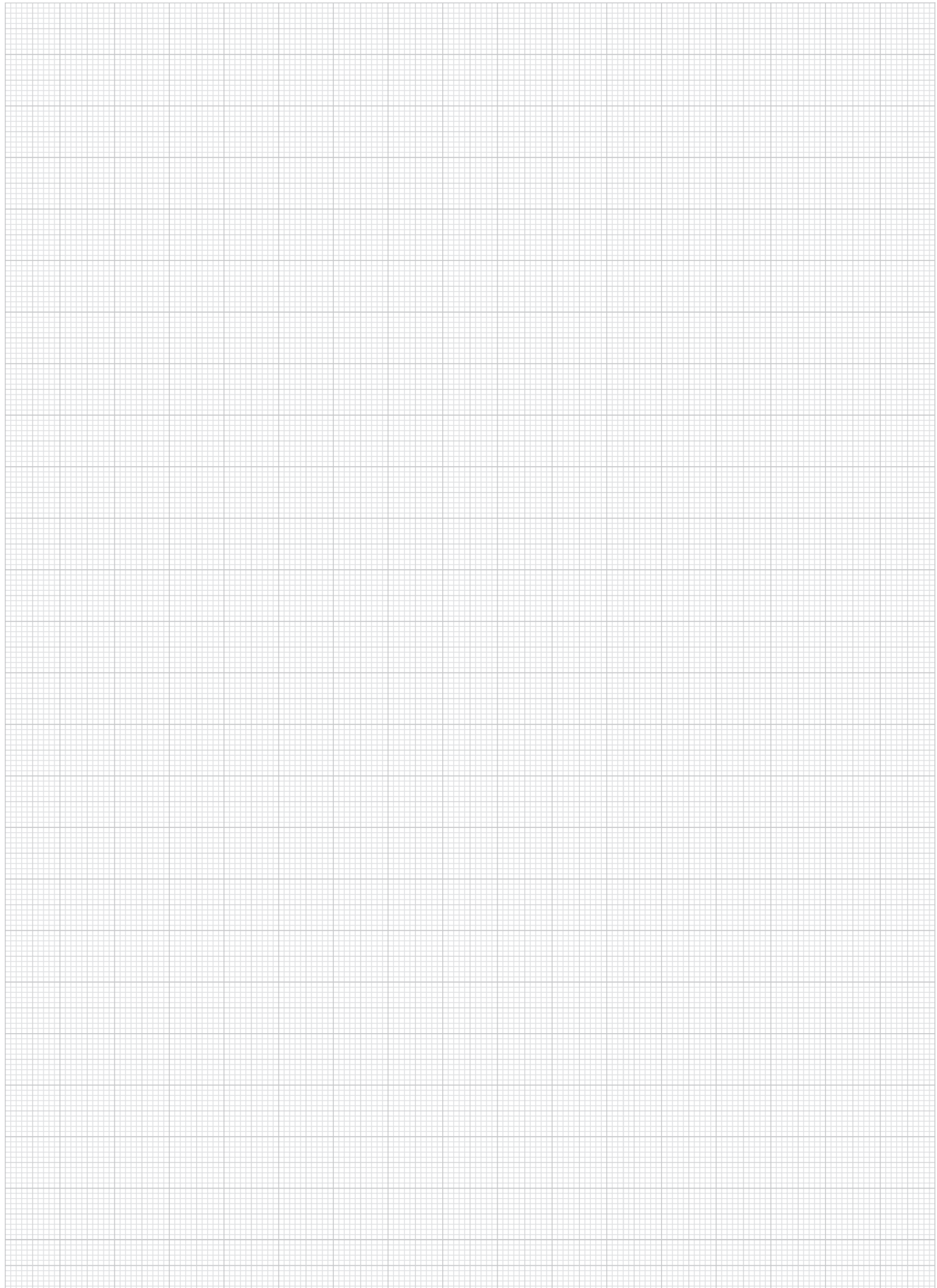
Order No.	A	A1	A2	A3	B	B1	B2	D	D1	D2	D3	D4	E	E1	E2	E3
20100-030025	21,5	5	4,5	-	19	6	-	7	M3	6	3	M3	11	-	11	17,5
20100-040036	24	5	6	-	26	10	6	7	M4	7,5	4,3	M4	15	-	15	24
20100-050085	33,5	5	5	-	28	12	6	7	M4	7,5	4,3	M5	26	-	15	32
20100-100170	22,5	4,5	10	-	40	16	6	7	M4	7,5	4,3	M6	32	-	32	38
20100-120260	20	8	11	-	45	20	-	10	M6	10,5	6,4	M8	48	48	24	48
20100-120380	21	6	9	16	60	25	-	10	M6	10,5	6,4	M8	48	-	48	58
20100-120660	21	6	9	16	60	25	-	10	M6	10,5	6,4	M8	48	-	48	58
20100-150650	27	11	12	20	75	28	-	10	M6	13,5	8,2	M8	48	72	48	72
20100-151050	27	11	12	20	75	28	-	10	M6	13,5	8,2	M8	48	72	48	72

Order No.	E4	E5	H	H1	L	L1	L2	P	P1	P2	P3	P4	T	T1	T2	T3
20100-030025	-	11	40	13	40	34	19	M5	9,5	9,5	4,5	16	1,6	0,5	-	3,5
20100-040036	15	15	45	12,5	60	50	24	M5	4,5	7	6	18,5	1,6	1	2,5	4,2
20100-050085	20	20	56	20	70	60	34	M5	4	7	6,5	28	1,6	1	2,5	4,5
20100-100170	32	32	67	18,5	100	82	42	M5	9	9	6	27	1,6	1,5	2,5	4,5
20100-120260	32	32	81	23,5	120	96	60	R1/8	8	8	8	30,5	2,1	1,5	-	6,5
20100-120380	48	48	87	39	145	120	70	R1/8	15	15	11,5	30	2,1	2	-	6,5
20100-120660	48	48	87	39	145	120	70	R1/8	15	15	11,5	30	2,1	2	-	6,5
20100-150650	48	48	108	47	171	140	90	R1/8	22	22	15	38	2,1	2	-	9
20100-151050	48	48	108	47	171	140	90	R1/8	22	22	15	38	2,1	2	-	9

Order No.	Travel per jaw	Clamping force at 6 bar (N)	Expanding force at 6 bars (N)	Recommended workpiece weight kg	Cylinder Ø	Air consumption per cycle at 6 bar (ccm)	Suitable proximity switch	Suitable plug connector
20100-030025	3	25	35	0,12	14	0,34	83000-010X2000	-
20100-040036	4	36	46	0,17	16	0,8	83000-030X3000	-
20100-050085	5	85	95	0,4	25	2,5	83000-030X3000	-
20100-100170	10	170	170	0,76	32	8	83000-040	80150-010X2000
20100-120260	12	260	260	1,17	40	15,1	83000-050	80150-010X2000
20100-120380	12	380	380	1,78	50	23,6	83000-040	80150-010X2000
20100-120660	12	660	660	2,96	50	23,6	83000-040	80150-010X2000
20100-150650	15	650	650	3	63	46,8	83000-050	80150-010X2000
20100-151050	15	1050	1050	4,74	63	46,8	83000-050	80150-010X2000

Order No.	M1 Nm	M2 Nm	M3 Nm	F1 N	F2 N	F3 N	C max.	Moment of inertia (10 ⁻³ kgm ²)
20100-030025	1,6	1,5	1,5	140	84	140	25	0,00632
20100-040036	3,9	3,7	1,3	250	82	71	40	0,0278
20100-050085	6	6	1,6	280	100	72	50	0,0767
20100-100170	12	14	12	540	150	400	65	0,416
20100-120260	27	30	12	1100	640	340	80	0,787
20100-120380	57	67	95	1500	350	2100	110	1,89
20100-120660	57	67	95	1500	350	2100	110	1,89
20100-150650	87	94	201	1900	890	3700	140	5,36
20100-151050	87	94	201	1900	890	3700	140	5,36

Notes



Technical information for pneumatic gantry modules

Note:

Pneumatically activated gantry modules in lengths as requested.

Drive is through a rodless cylinder integrated in the slide.

Three sizes are available with rail guide or round guides and travel up to 5000 mm with a repeat accuracy of ± 0.02 .

Application:

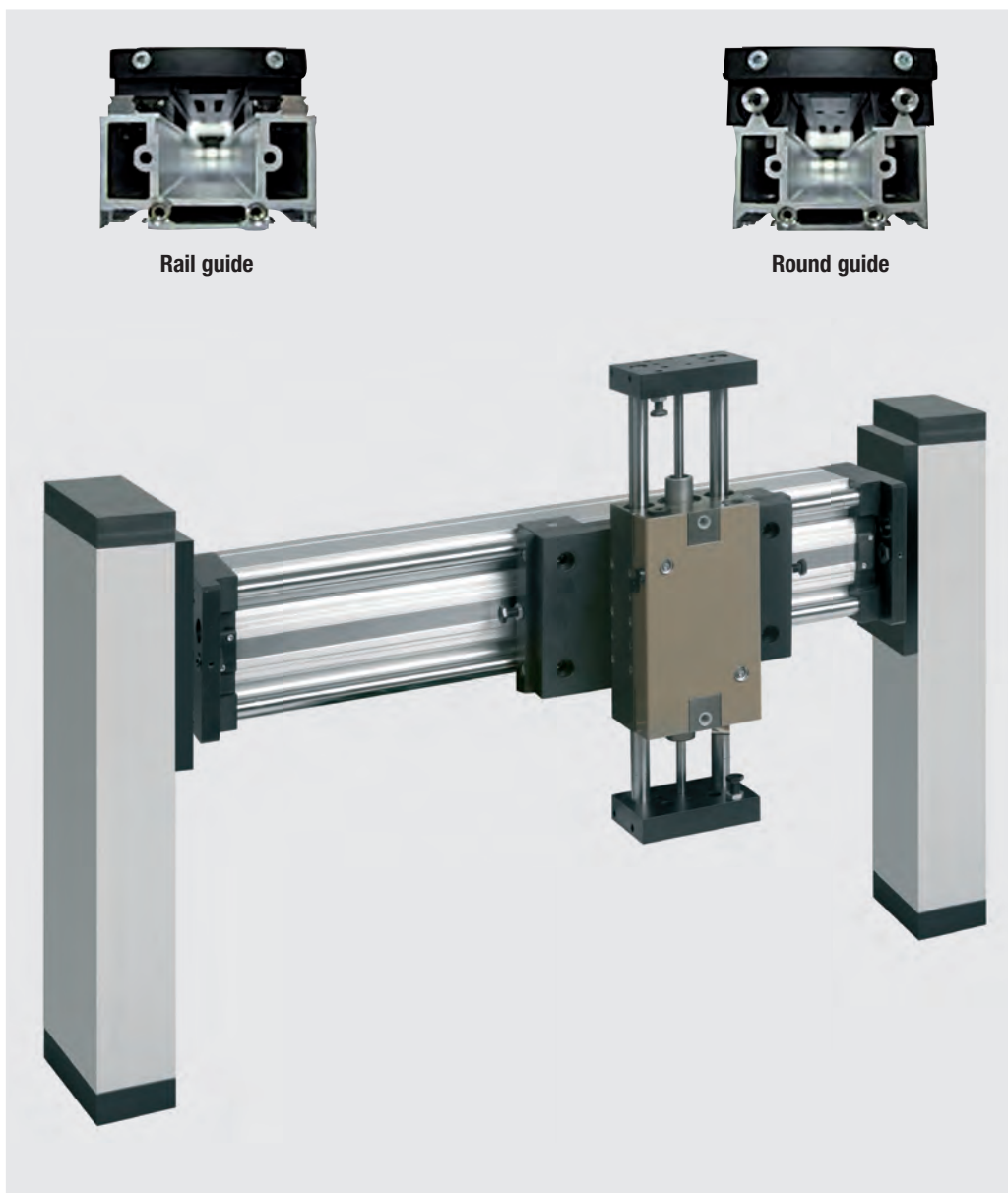
Gantry modules can be used anywhere loads are to be precisely guided. The profile structure with integrated drive cylinder is particularly well suited to cost-efficient integration in machining and assembly plants. The load bearing profile guarantees extreme rigidity with low module weight. The gantry module does not require a stable base structure, it is stable on its own and so is a load-bearing and space-saving element within a total system.

Features:

These gantry modules are constructed from heavy-duty, stiffened aluminium profiles. The user can choose between rail guide or round guide system. The structural dimensions of both guidance systems are identical. The gantry modules can be mounted in any position.

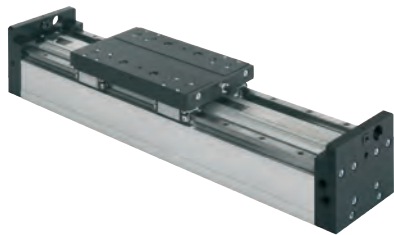
Advantages:

- low coefficients of friction due to rollers convert piston power almost entirely into motion force.
- low deflection makes high span sizes and long travel possible.
- optimised construction sizes with large piston diameters.
- high run accuracy.
- heavy loads possible due to stiffened self-supporting aluminium profiles.
- integrated shock absorbers and proximity switches can be mounted.
- steel cylinder cover (except for 20200-1065X0500).
- optional: several intermediate positions possible.



Linear gantry module

with rail guides



Material:

Body, carriage and flange plate
aluminium alloy.
Guide rails steel

Version:

Body anodised natural colour.
Carriage and flange plate anodised.
Rail guides hardened.

Sample order:

nln 20200-1065X0500

Note:

Portal modules with ball rail guides.
Pneumatic drive through a rodless
cylinder. High load rating due to stiffened
self-supporting aluminium profiles. The
modules can be mounted in any position.
Specified loads apply to dynamic loads.

Repeat accuracy ± 0.02 mm.

Temperature range:

+5 °C to +70 °C
(+5 °C to +60 °C by size 65)

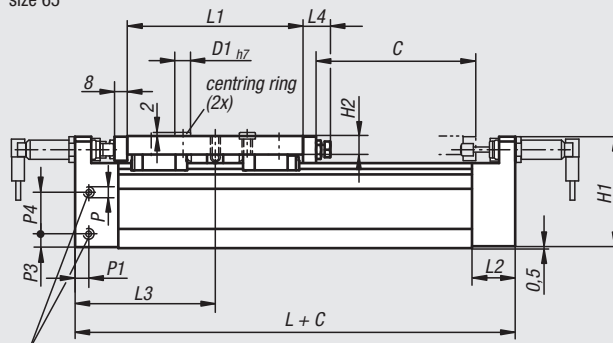
On request:

* Other lengths (travel C max. 5000 mm)
and intermediate positions.

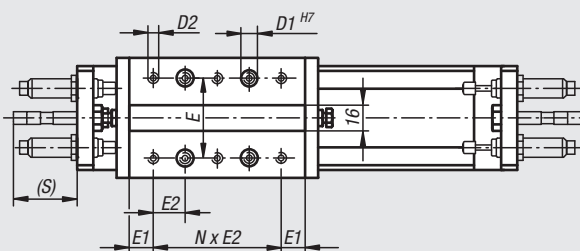
Accessories:

See table for shock absorbers, proximity
switches and plug connectors.

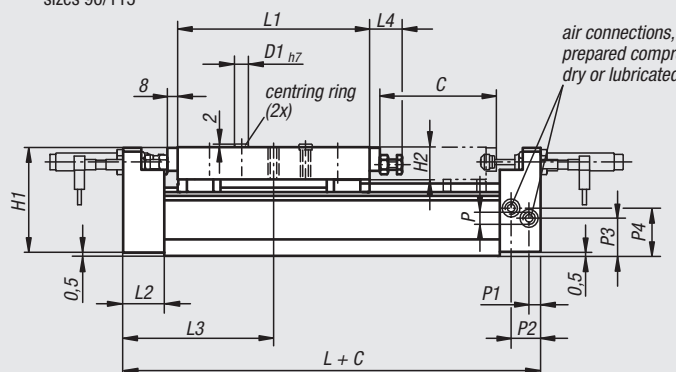
size 65



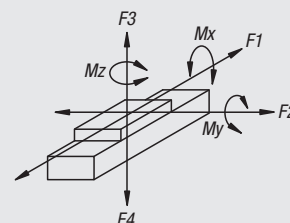
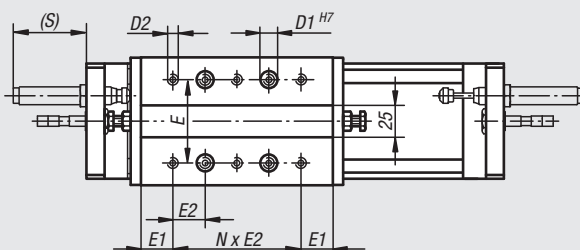
air connections,
prepared compressed air 1 to 8 bar dry or lubricated



sizes 90/115



air connections,
prepared compressed air 1 to 8 bar
dry or lubricated



Linear gantry module

with rail guides

Order No.	Size	A	B	B1	C1	C2	C3	C (travel)	D1	D2	E	E1	E2	H	H1	H2	H3	L
20200-1065X0500	65	42	65	75	8,1	2,5	6,8	500*	10	M5	50	15	20	70	69,5	11,5	21,5	175
20200-1090X0500	90	67	90	100	8,1	2,5	6,8	500*	10	M6	65	25	25	85	84,5	25	35	235
20200-1115X0500	115	97	125	135	10	5	8,5	500*	13	M8	90	20	30	115	114,5	25	44,8	305

Order No.	Size	L1	L2	L3	L4	N (number)	P	P1	P2	P3	P4	S
20200-1065X0500	65	110	27	87,5	17	4	M5	8,5	-	8,5	25,8	40
20200-1090X0500	90	150	32	117,5	25,5	4	G1/8	9	23	30	38	64,5
20200-1115X0500	115	220	32	152,5	25,5	6	G1/4	15,5	19,5	40,5	60,5	62,5

Order No.	Size	Piston force at 6 bar (N)	Cylinder Ø	Air consumption per 10 mm travel at 6 bar (ccm)	Mx Nm	My Nm	Mz Nm	F1 N	F2 N	F3 N	F4 (N)
20200-1065X0500	65	150	18	18	155	260	260	460	610	610	610
20200-1090X0500	90	250	25	35	310	410	410	560	750	750	750
20200-1115X0500	115	640	40	88	1570	2270	2270	1550	2070	2070	2070

Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20200-1065X0500	65	26300-1210010	83000-10-030	80150-010X2000
20200-1090X0500	90	26300-1415010	83000-10-030	80150-010X2000
20200-1115X0500	115	26300-2015016	83000-10-030	80150-010X2000

Linear gantry module

with round guides



Material:

Body, carriage and flange plate
aluminium alloy.
Guide shafts steel.

Version:

Body anodised natural colour.
Carriage and flange plate anodised.
Rail guides hardened.

Sample order:

nIm 20200-2090X0500

Note:

Portal modules with precision steel shafts
and ball guide bushes. Pneumatic drive
through a rodless cylinder. High load
rating due to stiffened self-supporting
aluminium profiles. The modules can be
mounted in any position.
Specified loads apply to dynamic loads.

Repeat accuracy ± 0.02 mm.

Temperature range:

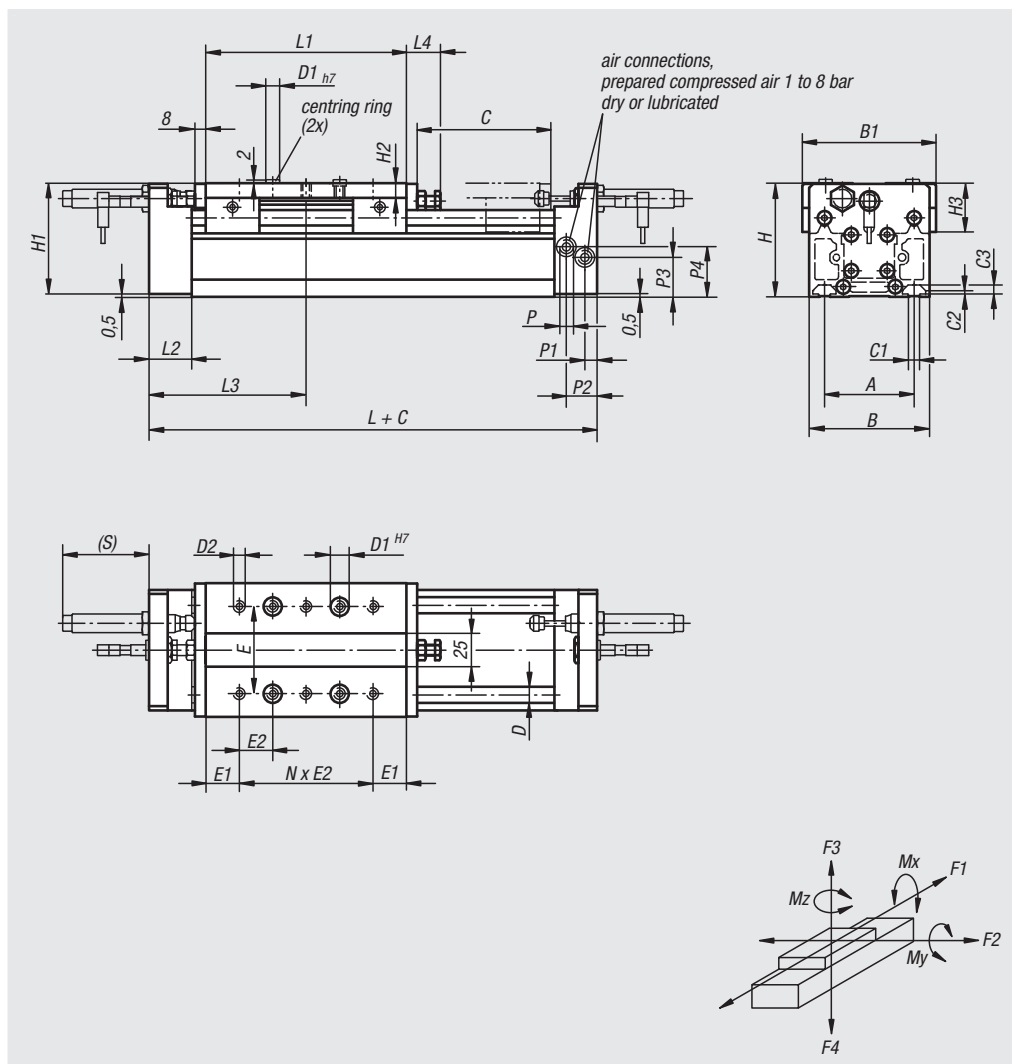
+5 °C to +70 °C

On request:

* Other lengths (travel C max. 5000 mm)
and intermediate positions.

Accessories:

See table for shock absorbers, proximity
switches and plug connectors.



Linear gantry module

with round guides

Order No.	Size	A	B	B1	C1	C2	C3	C (travel)	D	D1	D2	E	E1	E2	H	H1	H2	H3	L
20200-2090X0500	90	67	90	100	8,1	2,5	6,8	500*	12	10	M6	65	25	25	85	84,5	11	36,5	235
20200-2115X0500	115	97	125	135	10	5	8,5	500*	16	13	M8	90	20	30	115	114,5	12,5	46,5	305

Order No.	Size	L1	L2	L3	L4	N (number)	P	P1	P2	P3	P4	S
20200-2090X0500	90	150	32	117,5	25,5	4	G1/8	9	23	30	38	64,5
20200-2115X0500	115	220	32	152,5	25,5	6	G1/4	15,5	19,5	40,5	60,5	62,5

Order No.	Size	Piston force at 6 bar (N)	Cylinder Ø	Air consumption per 10 mm travel at 6 bar (ccm)	Mx Nm	My Nm	Mz Nm	F1 N	F2 N	F3 N	F4 (N)
20200-2090X0500	90	250	25	35	50	65	160	90	45	120	290
20200-2115X0500	115	640	40	88	70	130	310	180	90	145	340

Order No.	Size	Suitable shock absorber	Suitable proximity switch	Suitable plug connector
20200-2090X0500	90	26300-1415010	83000-10-030	80150-010X2000
20200-2115X0500	115	26300-2015016	83000-10-030	80150-010X2000

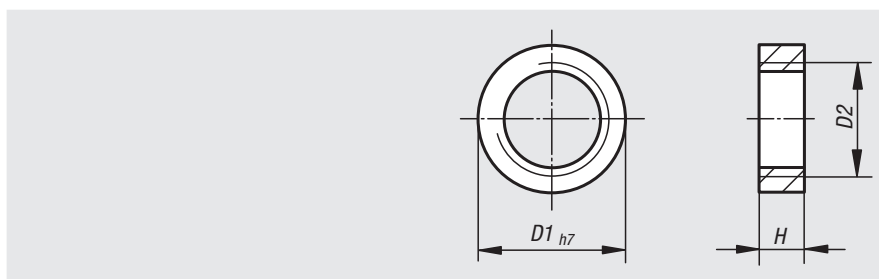
Centring rings



Material:
Stainless steel 1.4301.

Sample order:
nlm 20240-0705

Note:
The centring rings are used to precisely join modules, or to mount the modules indirectly using adapter plates.
The female thread is used to pull the centring rings out.



Order No.	D1	D2	H
20240-0403	4	M3	2
20240-0504	5	M4	2
20240-0705	7	M5	3
20240-1008	10	M8	4
20240-1310	13	M10	4

Linear actuators with toothed belt drive

and profile rail guide



Material:

Body, extruded aluminium section.
Bearing housing and slide, aluminium.
Profile guide rail and guide carriage, steel.
Toothed belt, polyurethane with steel cord reinforcement.

Version:

Body natural colour anodised
Bearing housing and slide, black anodised.
Tracks of the profile guide rail, inductively hardened and ground.

Sample order:

nIm 20300-1060X1000

Note:

Compact and flexible linear actuators with toothed belt drive. The body consists of a self-supporting aluminium extruded section with integrated profile guide rail. This rail system is able to absorb highest forces from all directions, is low-wear, and is optimised for moving large masses.

Slots are located on the outer sides of the aluminium profile, ensuring easy, reliable assembly and enabling accessories mounted. Proximity switches can be positioned and fastened in the upper T-slot. The aluminium profile is fully compatible with our standard I series profiles.

The steel cord reinforced toothed belt enables high power transmission with alternating loads, and simultaneously ensures excellent positioning accuracy with low wear and very little noise generation. The toothed belt runs on the upper side of the aluminium profile in guide slots, thus protecting all parts housed within the profile from dirt.

With its symmetrical design, the linear actuator enables motors and transmissions to be attached to all four sides of the bearing housing. The open ends of the unused hollow shafts on the bearing housing can be sealed using the optional protective caps 20300.

An additional centring hole is located on each tapped hole on the upper side of the slide. Other connecting elements can be precisely mounted on the slide in combination with the centring rings 20240.

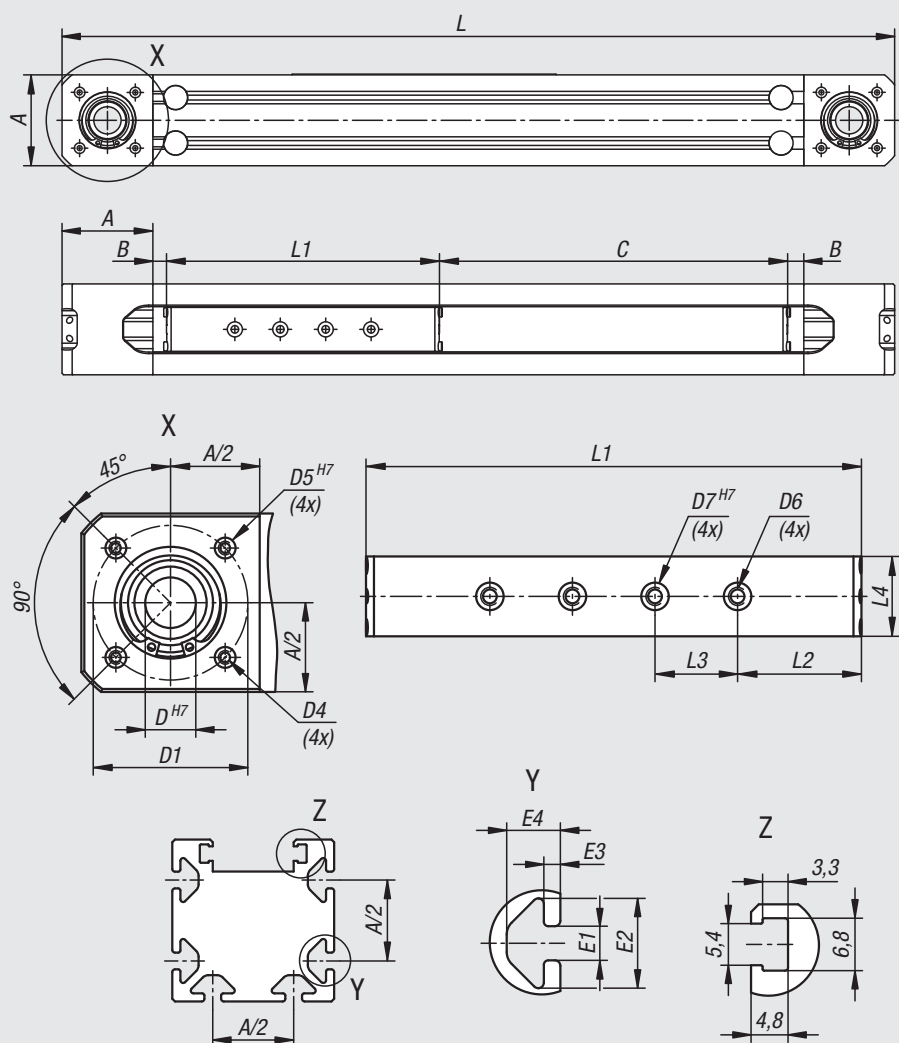
Load specifications apply for dynamic loading.

Temperature range:

-20°C to +70°C.

On request:

Other lengths (travel C max. 4000 mm).



Accessories:

Protective caps. Slot table, motor adapter set, synchronisation set and proximity switch, see table.

Technical data:

Safety rating IP50.

Linear actuators with toothed belt drive

and profile rail guide

Order No.	Size	Matching cap	Matching slot table	Matching coupling set	Matching synchronisation set	Suitable proximity switch
20300-1060X0200	60	20300-91060	20310-06174	20320-604710	20330-6016X	83000-05-015
20300-1060X0500	60	20300-91060	20310-06174	20320-604710	20330-6016X	83000-05-015
20300-1060X1000	60	20300-91060	20310-06174	20320-604710	20330-6016X	83000-05-015
20300-1060X1500	60	20300-91060	20310-06174	20320-604710	20330-6016X	83000-05-015
20300-1080X0300	80	20300-91080	20310-08230	20320-806960	20330-8025X	83000-05-015
20300-1080X0500	80	20300-91080	20310-08230	20320-806960	20330-8025X	83000-05-015
20300-1080X1000	80	20300-91080	20310-08230	20320-806960	20330-8025X	83000-05-015
20300-1080X1500	80	20300-91080	20310-08230	20320-806960	20330-8025X	83000-05-015

Order No.	Size	Slot width	A	B	C (travel)	D	D1	D4	D5	D6	D7	E1	E2	E3	E4	L	L1	L2	L3	L4
20300-1060X0200	60	6	60	25	200	17	52	M4	7	M6	10	6,2	16,3	3	9,75	550	180	45	30	29
20300-1060X0500	60	6	60	25	500	17	52	M4	7	M6	10	6,2	16,3	3	9,75	850	180	45	30	29
20300-1060X1000	60	6	60	25	1000	17	52	M4	7	M6	10	6,2	16,3	3	9,75	1350	180	45	30	29
20300-1060X1500	60	6	60	25	1500	17	52	M4	7	M6	10	6,2	16,3	3	9,75	1850	180	45	30	29
20300-1080X0300	80	8	80	30	300	24	76	M6	10	M8	13	8	20	4,5	12,25	760	240	60	40	45
20300-1080X0500	80	8	80	30	500	24	76	M6	10	M8	13	8	20	4,5	12,25	960	240	60	40	45
20300-1080X1000	80	8	80	30	1000	24	76	M6	10	M8	13	8	20	4,5	12,25	1460	240	60	40	45
20300-1080X1500	80	8	80	30	1500	24	76	M6	10	M8	13	8	20	4,5	12,25	1960	240	60	40	45

Order No.	Size	Repeat accuracy	Max. speed m/s	Max. acceleration m/sc	Weight of carriage kg	Weight Stroke 0 kg	Weight per 1000 mm stroke kg	Fx N	Fy dynamic N	Fz dynamic N
20300-1060X0200	60	±0,05	3	80	0,30	2,34	4,82	844	1384	1384
20300-1060X0500	60	±0,05	3	80	0,30	2,34	4,82	844	1384	1384
20300-1060X1000	60	±0,05	3	80	0,30	2,34	4,82	844	1384	1384
20300-1060X1500	60	±0,05	3	80	0,30	2,34	4,82	844	1384	1384
20300-1080X0300	80	±0,05	5	50	0,87	5,33	8,39	1572	3662	3662
20300-1080X0500	80	±0,05	5	50	0,87	5,33	8,39	1572	3662	3662
20300-1080X1000	80	±0,05	5	50	0,87	5,33	8,39	1572	3662	3662
20300-1080X1500	80	±0,05	5	50	0,87	5,33	8,39	1572	3662	3662

Order No.	Size	Mx dynamic Nm	My dynamic Nm	Mz dynamic Nm	Iy cm ⁴	Iz cm ⁴	Toothed belt type	Constant feed mm/rev	Idle torque Nm	Max. driving torque M Nm	Typical payload kg
20300-1060X0200	60	8	42	42	43,26	57,88	32AT5	101	0,3	14	15
20300-1060X0500	60	8	42	42	43,26	57,88	32AT5	101	0,3	14	15
20300-1060X1000	60	8	42	42	43,26	57,88	32AT5	101	0,3	14	15
20300-1060X1500	60	8	42	42	43,26	57,88	32AT5	101	0,3	14	15
20300-1080X0300	80	27	146	146	127,09	184,78	50AT5	146	0,7	38	50
20300-1080X0500	80	27	146	146	127,09	184,78	50AT5	146	0,7	38	50
20300-1080X1000	80	27	146	146	127,09	184,78	50AT5	146	0,7	38	50
20300-1080X1500	80	27	146	146	127,09	184,78	50AT5	146	0,7	38	50

T-slot tables

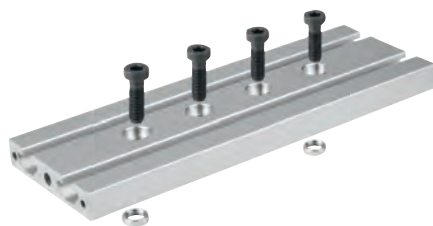

Material:

Table aluminium.
Centring rings 1.4301 stainless steel.
Screws steel.

Version:

Table natural tone anodised
Screws, bright.

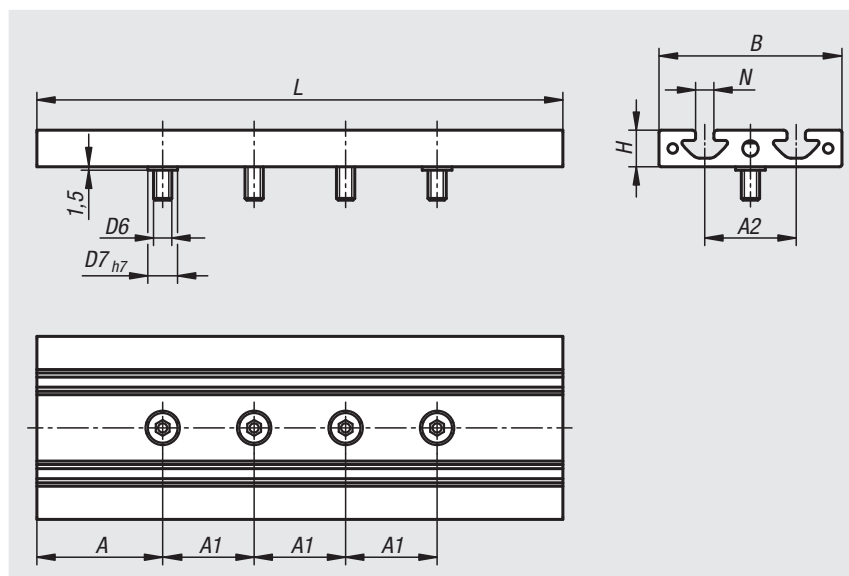
Sample order:

nIm 20310-06174

Note:

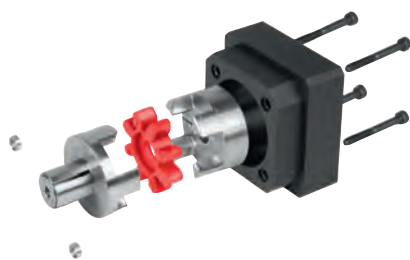
An additional centring hole is located on each tapped hole on the underside of the table, this enables the table to be precisely mounted on a linear guide slide using the centring rings.

The profile slots on the upper side enable universal mounting possibilities.



Order No.	Size	Type	Slot width	A	A1	A2	B	D6	D7	H	L	N
20310-06174	60	I	6	42	30	30	60	M6	10	12	174	6
20310-08230	80	I	8	55	40	40	80	M8	13	16	230	8

Motor adapter sets



Material:

Elastomer spider polyurethane Shore 98A.
Coupling housing and clamping hub, aluminium.
Expanding mandrel steel.
Screws steel.
Centring rings 1.4301 stainless steel.

Version:

Coupling housing black anodised.

Sample order:

nlm 20320-604710

Note:

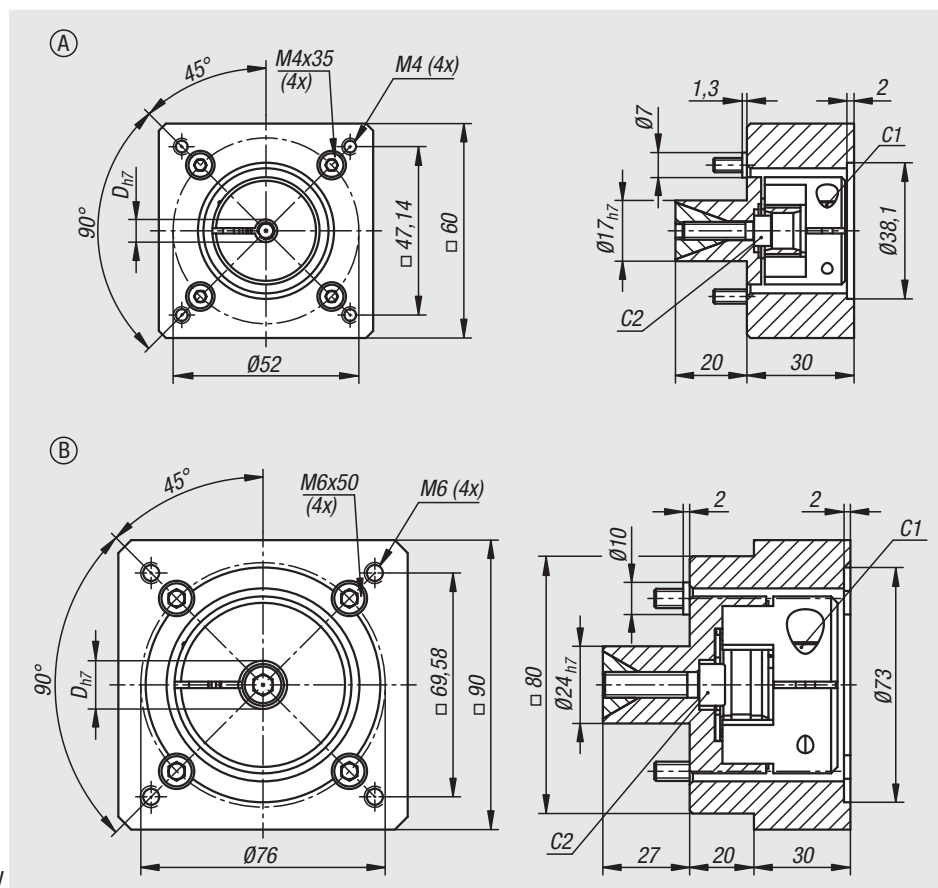
The motor adapter set with elastomer dog coupling system (elastomer coupling with expanding mandrel) provides a simple and cost-effective solution for connecting electric motors.

Advantages of the elastomer dog coupling:

- Hub with expanding mandrel can be mounted axially
- Play-free with vibration absorption
- Excellent retaining force
- Excellent concentric accuracy
- Short design
- Easy to assemble
- Can be mounted axially on spigot side
- Electrical insulation
- Nominal torque up to 30 Nm

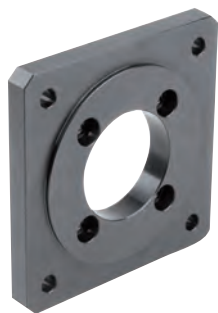
On request:

Larger hub bore D.
Higher nominal torque.



Order No.	Form	Size	C1	C2	D	Nominal torque Nm	Moment of inertia (10 ⁻³ kgm ²)	Max. rpm	Tightening torque of screw C1 Nm	tightening torque of screw C2 Nm
20320-604710	A	60	M3	M5	6,35	4,8	0,01	20000	1,4	9
20320-806960	B	80	M6	M8	14	30	0,15	14000	15	32

Adapter plates, aluminium

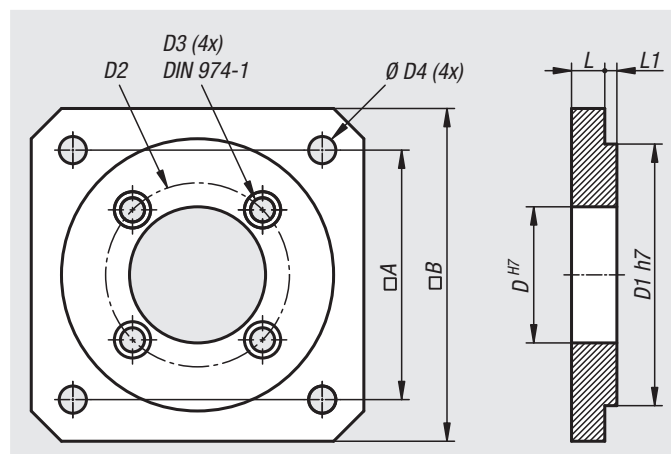


Material:
Aluminium.

Version:
Black anodised

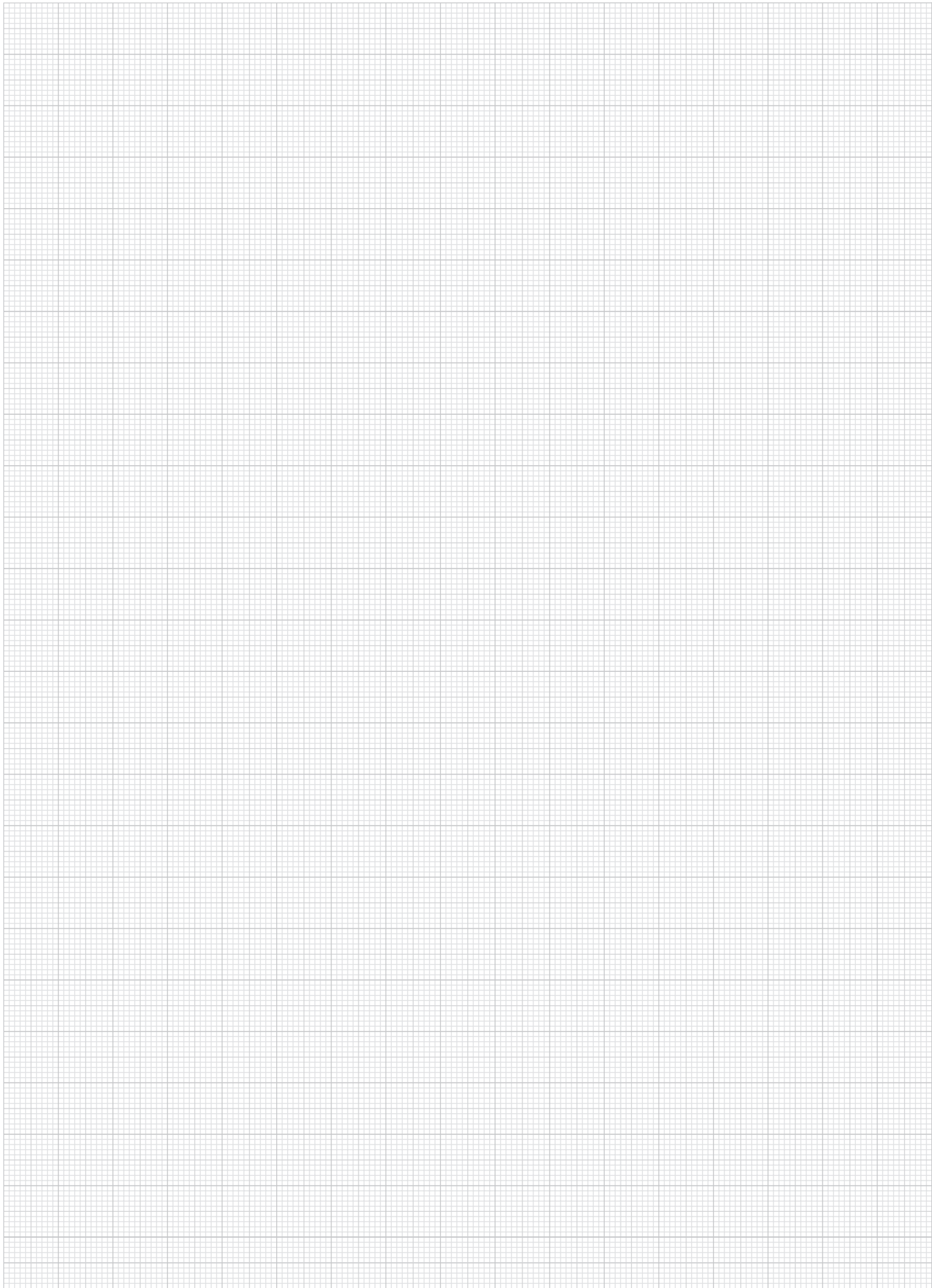
Sample order:
nlm 20321-806960

Note:
These adapter plates are required for mounting the planetary gearing. They are installed between the planetary gearing and the motor adapter set.



Order No.	Size	A	B	D	D1	D2	D3	D4	L	L1
20321-604710	60	47,14	60	25	38,1	33	4	4,5	8	1,6
20321-806960	80	69,6	90	40	73	52	5	6,6	8	1,6

Notes



20000

21000

22000

23000

24000

26000

27000

28000

29000

31000

32000

33000

Synchronisation sets



Material:

Elastomer spider, polyurethane Shore 98A.
Intermediate tube and clamping hub, aluminium.
Expanding mandrel steel.
Screws steel.

Version:

Bright.

Sample order:

nIm 20330-6016X500
(include length $L4 = 500$ mm)

Note:

The synchronisation set enables two parallel linear axles to be operated with just one motor.

Synchronisation sets consist of two couplings, which are connected with a synchronous shaft. They are produced to the appropriate length. Suitable for lengths up to max. 3000 mm.

Advantages of the elastomer dog coupling:

- Hub with expanding mandrel, can be mounted axially
- Play-free with vibration absorption
- Excellent retaining force
- Excellent concentric accuracy
- Short design
- Easy to assemble
- Can be mounted axially on spigot side
- Electrical insulation
- Nominal torque up to 53 Nm

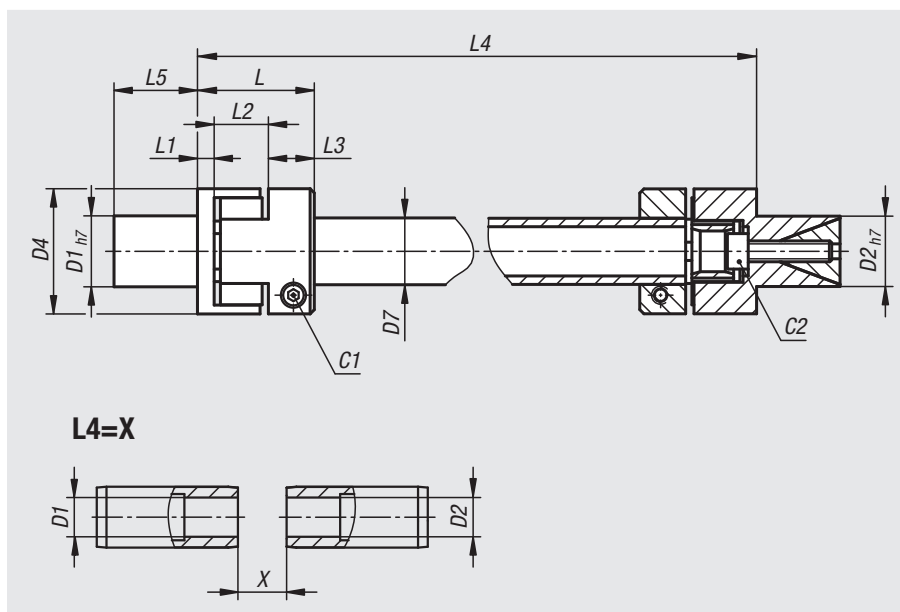
Assembly:

An axial displacement of the attachment parts is not required as the intermediate tube can be inserted as a spacer between the coupling halves.

Both coupling halves with expanding mandrel are fully inserted into the hub bores of the linear units. The frictional connection is achieved by tightening the screws in the expanding mandrel to the specified torque. Push the coupling halves, together with the clamping hub and elastomer spider, onto the intermediate tube. Bring the intermediate tube into position and connect the coupling halves by manually applying a low level of axial force. Tighten the screws on both clamping hubs to the specified torque.

Drawing reference:

X = distance between shafts



Synchronisation sets



Order No.	Size	C1	C2	D1	D2	D4	D7	L	L1	L2	L3	L4 min.	L5	Nominal torque Nm
20330-6016X	60	M3	M5	17	17	32,2	16	28	4	13	11	80	20	6,5
20330-8025X	80	M6	M8	24	24	56,4	25	46	8	18	20	130	27	53

Order No.	Size	Moment of inertia (10 ⁻³ kgm ²) 0,5 m	Moment of inertia (10 ⁻³ kgm ²) 1,0 m	Moment of inertia (10 ⁻³ kgm ²) 2,0 m	Moment of inertia (10 ⁻³ kgm ²) 3,0 m	Max. rpm	tightening torque of screw C1 Nm	tightening torque of screw C2 Nm
20330-6016X	60	0,024	0,031	0,044	0,058	20000	1,4	9
20330-8025X	80	0,326	0,352	0,404	0,455	14000	15	32

Notes

