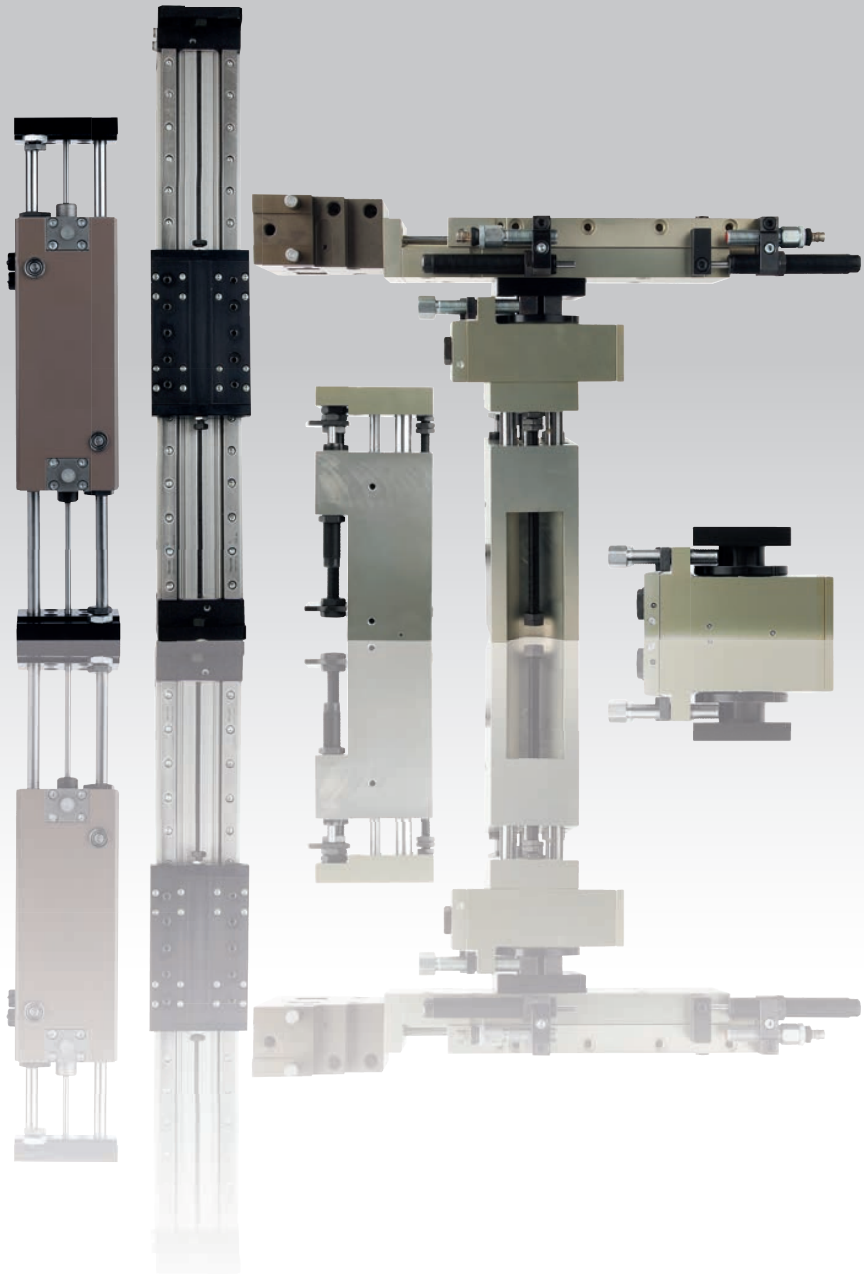
20000

Linear modules
Lifting units
Rotary modules
Grip modules
Inductive proximity switches
Plug connectors



Notes

Technical Information for linear modules, pneumatic, with circular channels

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

Flange plates:
Of aluminium alloy. Weight reduction, no oxidation.

Mounting surfaces:
Three screw-on faces with fastening and installation drill holes on the housing and flange plates present flexible application possibilities

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

Guidance:
Recirculating ball bushes and precision steel shafts. Extremely precise and quiet run at high speed. Low friction values due to rollingn friction, low motivity, minor wear.

No stick-slip occurrences.

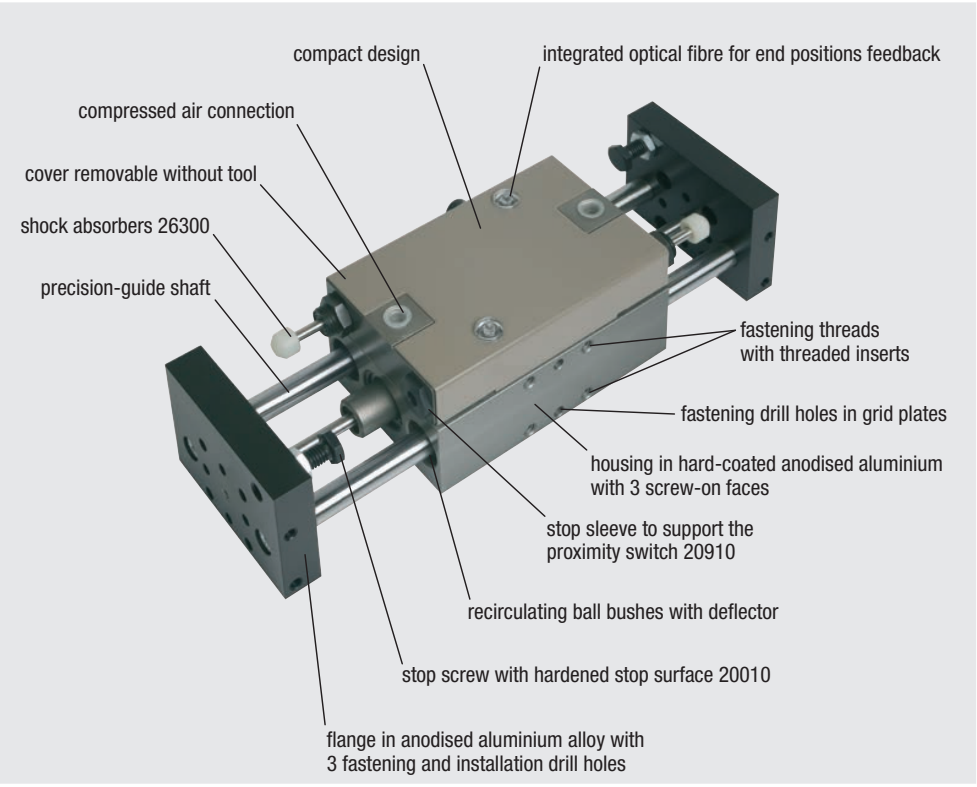
Piston drill holes:

Fine honed piston drill holes make for a long lifespan of the piston seals

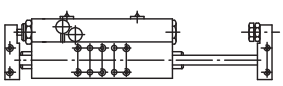
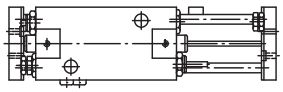
Piston seals:
The double grooved rings undertake ancillary sealing and guidance functions and guarantee optimal sealing at full compressive force

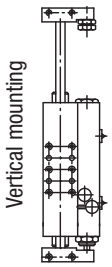
Advantages:
- Highest accuracy of modular fit viafastening drill holes. All Modules combinable without insert plates (see Combination Table.
- Compact design, double action cylinder, integrated shock absorber and proximity switch.
- Assembly and maintenance friendly. Cover removable without tool.
- User-defined assembly position.
- LED indicators easily visible owing to fibre optics from the most diverse perspectives.
- Optionally available with integrated stroke drop-off covering for production security.

Drive proceeds via a double-acting cylinder without piston rods integrated in the slide. Four sizes with two or three guide shafts and strokes of 40 up to 300 mm are available. Owing to the large sized guide shafts with ball-bearing guides, load bearing capacities up to a maximum of 1080 N are possible and repeat accuracies of ±0.01 mm are achievable.



Combination possibilities without insert plate

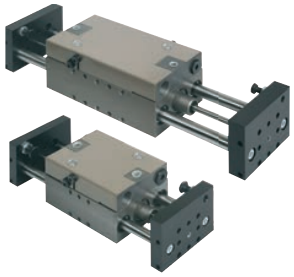
		Horizontal mounting			
		Size 1	Size 2	Size 3	Size 5
 Vertical mounting	Size 1	X	X	X	
	Size 2		X	X	X
	Größe 3			X	X
	Size 5				X

Unlisted combinations are possible with insert plates.

With the linear modules, combinations in all stroke variants and sizes are, in principle, feasible. However, in horizontal application, it makes sense always to use a module of similarly large or larger size.

Pneumatic linear modules

with two round guides



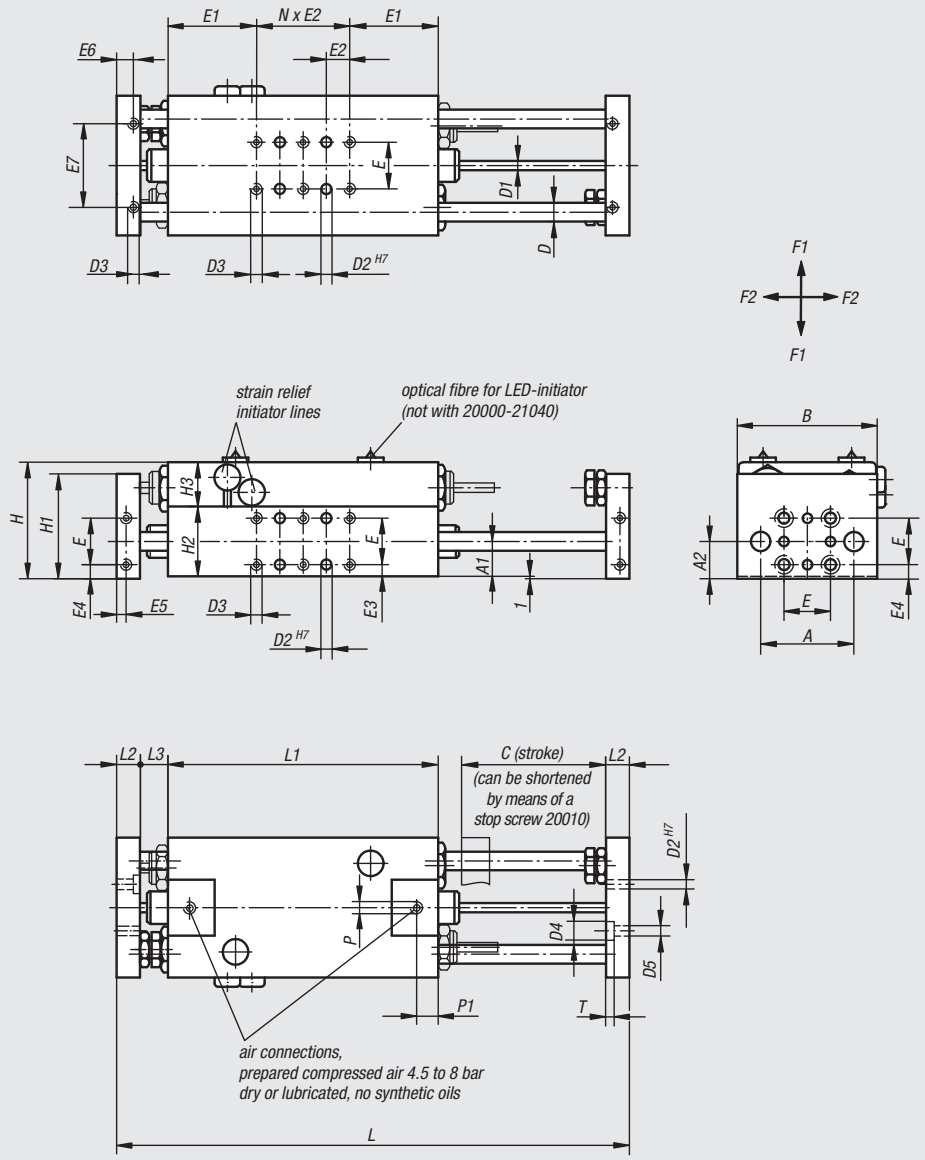
Material:
Base body and flange plate EN AW-5754; guide shafts in steel

Version:
Body, hard-coated
Flange plates, anodized.
Guide shaft, hardened.

Sample order:
nlm 20000-21040

Note:
Maintenance-free pneumatic linear modules with three precision steel shafts and recirculating ball bushes with stripping. Drive via double action cylinder. Fastening threads are provided with threaded inserts. shock absorbers and proximity switches are installable in an integrated fashion (no protruding edges) and available as accessories. Hundred per cent reproducibility through positive locking design. Combinations in all sizes and stroke variants are feasible without adapter plates.
Repeat accuracies of ±0,01 mm are possible. Weight specifications apply if the dovetail slides are centred.

Temperature range:
+5 °C up to +80 °C



Order No.	Size	Suitable shock absorber	Suitable proximitiy switch	Suitable plug connector
20000-21040	1	26300-1415010	20910-010X5000	-
20000-21060	1	26300-1415010	20910-020	20950-030X2000
20000-21080	1	26300-1415010	20910-020	20950-030X2000
20000-21100	1	26300-1415010	20910-020	20950-030X2000
20000-22060	2	26300-1415010	20910-020	20950-030X2000
20000-22090	2	26300-1415010	20910-030	20950-030X2000
20000-22120	2	26300-1415010	20910-030	20950-030X2000
20000-22150	2	26300-1415010	20910-030	20950-030X2000
20000-23080	3	26300-2015016	20910-030	20950-030X2000
20000-23120	3	26300-2015016	20910-030	20950-030X2000
20000-23160	3	26300-2015016	20910-030	20950-030X2000
20000-23200	3	26300-2015016	20910-030	20950-030X2000
20000-25120	5	26300-2515030	20910-030	20950-030X2000
20000-25180	5	26300-2515030	20910-030	20950-030X2000
20000-25240	5	26300-2515030	20910-030	20950-030X2000
20000-25300	5	26300-2515030	20910-030	20950-030X2000

Pneumatic linear modules

with two round guides

On request:
Available with locking cartridge as stroke deviation safeguard.

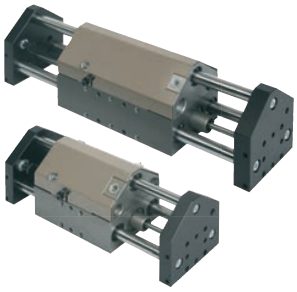
Accessory:
See table for shock absorber, proximitiy switch and plug connector.

Order No.	Size	A	A1	A2	B	C (stroke)	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)	Approx. weight kg
20000-21040	1	50	45	30	19	180	96	12	10	2	M5	9,3	3	0,140	0,380	100	16	11,3	1,100
20000-21060	1	50	45	30	19	220	116	12	10	4	M5	9,3	3	0,090	0,260	100	16	17	1,200
20000-21080	1	50	45	30	19	260	136	12	10	6	M5	9,3	3	0,050	0,180	100	16	22,6	1,300
20000-21100	1	50	45	30	19	300	156	12	10	8	M5	9,3	3	0,025	0,125	100	16	28,3	1,400
20000-22060	2	64	60	40	23	254	120	16	21	2	G 1/8	9,9	5,7	0,300	0,610	250	25	56	2,600
20000-22090	2	64	60	40	23	314	150	16	21	4	G 1/8	9,9	5,7	0,160	0,350	250	25	84	2,900
20000-22120	2	64	60	40	23	374	180	16	21	6	G 1/8	9,9	5,7	0,080	0,240	250	25	112	3,180
20000-22150	2	64	60	40	23	434	210	16	21	8	G 1/8	9,9	5,7	0,045	0,160	250	25	140	3,200
20000-23080	3	77	70	50	26	300	140	20	20	2	G 1/8	9,5	5	0,460	0,840	407	32	118	4,800
20000-23120	3	77	70	50	26	380	180	20	20	4	G 1/8	9,5	5	0,240	0,520	407	32	178	5,500
20000-23160	3	77	70	50	26	460	220	20	20	6	G 1/8	9,5	5	0,120	0,320	407	32	236	6,200
20000-23200	3	77	70	50	26	540	260	20	20	8	G 1/8	9,5	5	0,070	0,200	407	32	295	6,900
20000-25120	5	112	100	76	35	420	204	25	23	2	G 1/4	14	7	0,750	1,080	660	40	354,6	14,300
20000-25180	5	112	100	76	35	540	264	25	23	4	G 1/4	14	7	0,420	0,700	660	40	531,8	16,700
20000-25240	5	112	100	76	35	660	324	25	23	6	G 1/4	14	7	0,250	0,480	660	40	709,1	19,100
20000-25300	5	112	100	76	35	780	384	25	23	8	G 1/4	14	7	0,160	0,360	660	40	886,4	21,500

Linear modules pneumatic

with three circular channels

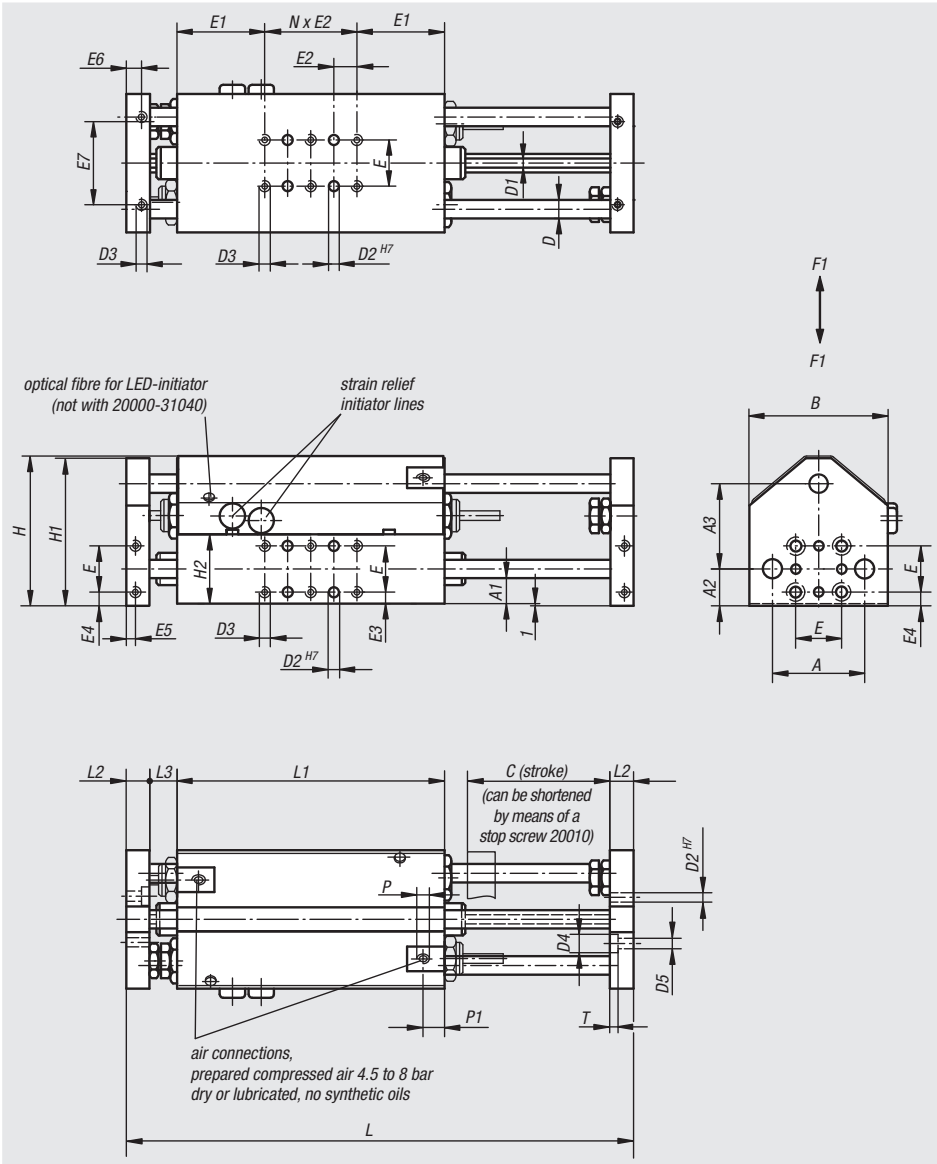


Material:
Base body and flange plate EN AW-5754; guide shafts in steel

Version:
Body, hard-coated
Flange plates, anodized.
Guide shaft, hardened.

Sample order:
nlm 20000-31040

Note:
Maintenance-free pneumatic linear modules with three precision steel shafts and recirculating ball bushes with stripping. Drive via double action cylinder. Fastening threads are provided with threaded inserts. shock absorbers and proximity switches are installable in an integrated fashion (no protruding edges) and available as accessories. Hundred per cent reproducibility through positive locking design. Combinations in all sizes and stroke variants are feasible without adapter plates.
Repeat accuracies of ±0,01 mm are possible.
Weight specifications apply if the dovetail slides are centred.



Order No.	Size	Suitable shock absorber	Suitable proximitiy switch	Suitable plug connector
20000-31040	1	26300-1415010	20910-010X5000	-
20000-31060	1	26300-1415010	20910-020	20950-030X2000
20000-31080	1	26300-1415010	20910-020	20950-030X2000
20000-31100	1	26300-1415010	20910-020	20950-030X2000
20000-32060	2	26300-1415010	20910-020	20950-030X2000
20000-32090	2	26300-1415010	20910-030	20950-030X2000
20000-32120	2	26300-1415010	20910-030	20950-030X2000
20000-32150	2	26300-1415010	20910-030	20950-030X2000
20000-33100	3	26300-2015016	20910-030	20950-030X2000
20000-33120	3	26300-2015016	20910-030	20950-030X2000
20000-33160	3	26300-2015016	20910-030	20950-030X2000
20000-33200	3	26300-2015016	20910-030	20950-030X2000
20000-35120	5	26300-2515030	20910-030	20950-030X2000
20000-35180	5	26300-2515030	20910-030	20950-030X2000
20000-35240	5	26300-2515030	20910-030	20950-030X2000
20000-35300	5	26300-2515030	20910-030	20950-030X2000

Linear modules pneumatic

with three circular channels

Temperature range:
+5 °C up to +80 °C

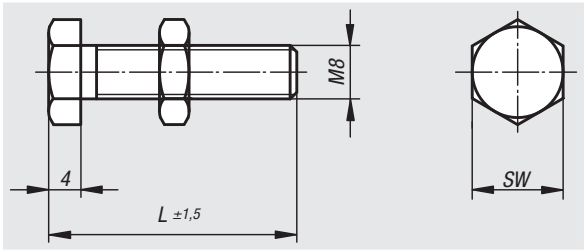
On request:
Available with locking cartridge as stroke deviation safeguard.

Accessory:
Shock absorber. Proximitiy switch. Plug connector.

Order No.	Size	A	A1	A2	A3	B	C (stroke)	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)	Approx. weight kg
20000-31040	1	65	64	30	180	96	12	10	2	M5	9,3	3	0,380	100	16	11,3	1,300
20000-31060	1	65	64	30	220	116	12	10	4	M5	9,3	3	0,260	100	16	17	1,600
20000-31080	1	65	64	30	260	136	12	10	6	M5	9,3	3	0,180	100	16	22,6	1,900
20000-31100	1	65	64	30	300	156	12	10	8	M5	9,3	3	0,125	100	16	28,3	2,200
20000-32060	2	86	85	40	254	120	16	21	2	G 1/8	9,9	5,7	0,610	250	25	56	3,100
20000-32090	2	86	85	40	314	150	16	21	4	G 1/8	9,9	5,7	0,350	250	25	84	3,500
20000-32120	2	86	85	40	374	180	16	21	6	G 1/8	9,9	5,7	0,240	250	25	112	4,100
20000-32150	2	86	85	40	434	210	16	21	8	G 1/8	9,9	5,7	0,160	250	25	140	4.300
20000-33100	3	107	106	50	300	140	20	20	2	G 1/8	9,5	5	0,840	407	32	118	5,500
20000-33120	3	107	106	50	380	180	20	20	4	G 1/8	9,5	5	0,520	407	32	178	6,400
20000-33160	3	107	106	50	460	220	20	20	6	G 1/8	9,5	5	0,320	407	32	236	7,200
20000-33200	3	107	106	50	540	260	20	20	8	G 1/8	9,5	5	0,200	407	32	295	8,100
20000-35120	5	159	158	76	420	204	25	23	2	G 1/4	14	7	1,080	660	40	354,6	16,300
20000-35180	5	159	158	76	540	264	25	23	4	G 1/4	14	7	0,700	660	40	531,8	19,200
20000-35240	5	159	158	76	660	324	25	23	6	G 1/4	14	7	0,480	660	40	709,1	22,100
20000-35300	5	159	158	76	780	384	25	23	8	G 1/4	14	7	0,360	660	40	886,4	24,900

Set screws



Material:
Steel

Version:
Black oxide finish; stop surface hardened

Sample order:
nlm 20010-08017

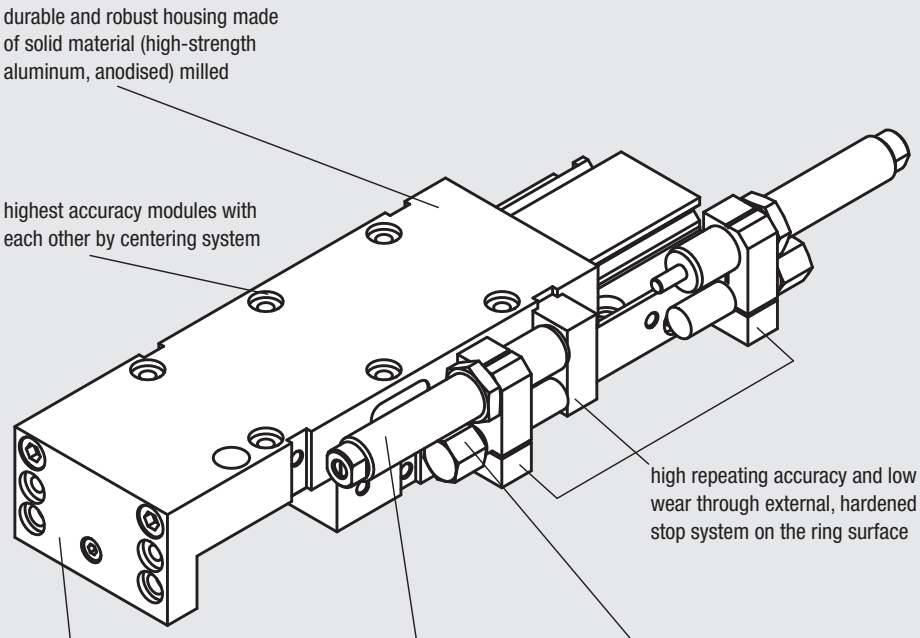
Note:
Set screws serve to reduce the nominal stroke of the linear modules, pneumatic, with two or three circular channels.

Order No.	L	SW	Approx. weight kg
20010-08017	17	13	0,012
20010-08022	22	13	0,014
20010-08027	27	13	0,015
20010-08032	32	13	0,017
20010-08035	35	13	0,019
20010-08045	45	13	0,023
20010-08055	55	13	0,027
20010-08065	65	13	0,030
20010-08073	73	13	0,034
20010-08088	88	13	0,040

Technical information for linear modules, pneumatic, with guide rail

The linear modules can be set in any assembly position. The standardised fastening drill holes make versatile combinations with out other units possible. Due to the precise centring system, all modules can be combined with one another quickly and smoothly.
Within the individual sizes without adapter plates.

– piston force at 6 bar: 11 N – 76 N.
– cylinder diameter: 6 mm – 16 mm.
– stroke lengths: 20 mm – 200 mm.
– repeat accuracy: ±0.01 mm.
– diverse fastening possibilities.
– linear guidance system with recirculating linear ball bearings for heavy loads and positioning accuracy with quiet running performance.
– double junction rolling guide for high torque loads and precision.



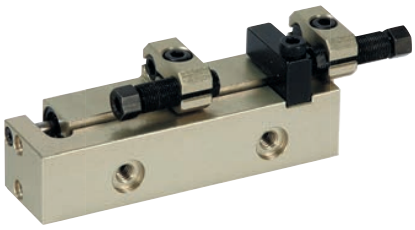
Travel times			
norelem	**Stroke lengths (mm)**	**Load (kg)**	**time / cycle**
20030	20 / 35 / 50	0,250	0,2 s / 0,3 s / 0,4 s
20032	35 / 65	0,500	0,3 s / 0,45 s
20034	30 / 60 / 90	1,000	0,3 s / 0,4 s / 0,5 s
20036	50 / 100 / 150 / 200	5,000	0,5 s / 0,65 s / 0,8 s / 0,95 s

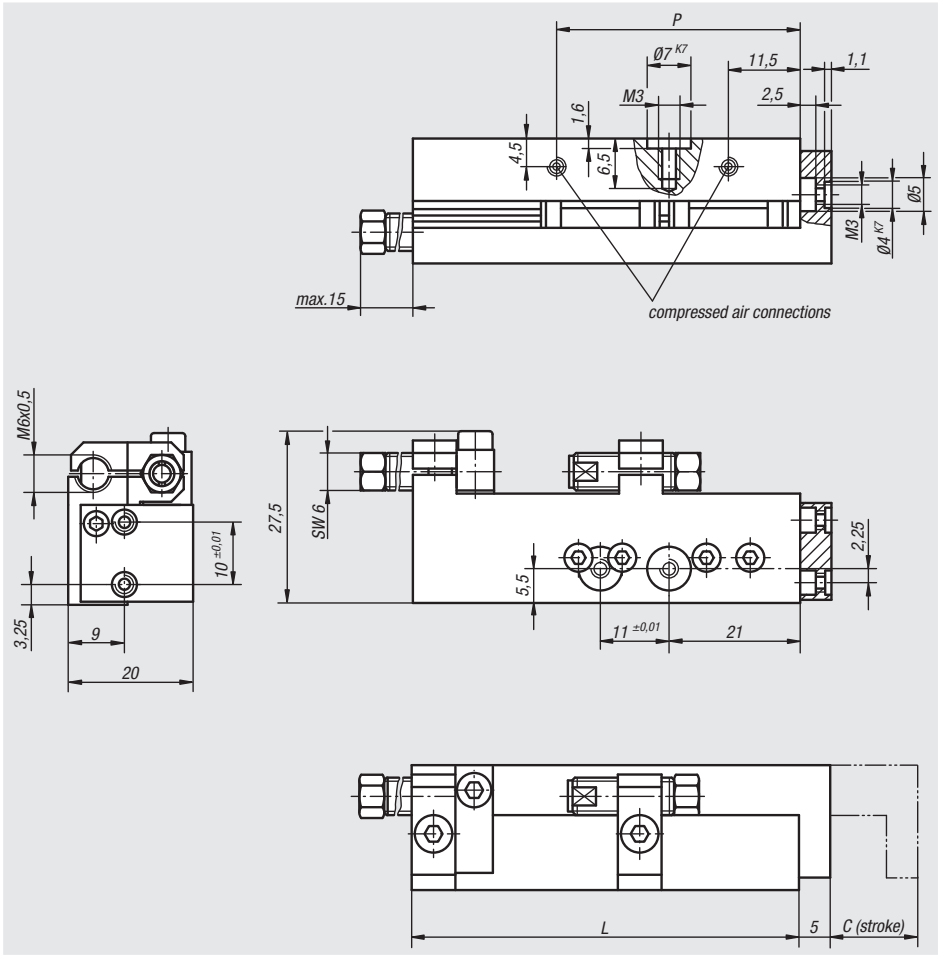
The specified guide values for cycle times were ascertained under operation specific conditions and represent effective values.

Selection overview				
Guidance	Recirculating balls		Cross roller	
Design	for smallest installations	for small installations	-	-
Stroke lengths (mm)	20 / 35 / 50	35 / 65	20 / 30 / 45 / 60 / 75 / 90	30 / 50 / 75 / 100 / 125 / 150 /200
Piston force at 6 bar (N)	11	18	33	76
Cylinder Ø (mm)	6	8	12	16
Load bearing max. (N)	5	12	33	100 - 240
norelem	**20030**	**20032**	**20034**	**20036**

Linear modules pneumatic

with aligning guide





Material:
Housing in high-strength aluminium;
stop system steel

Version:
Housing anodized; stop system hardened

Sample order:
nlm 20030-2020

Note:
Maintenance-free pneumatic linear modules for the smallest installation spaces with recirculating ball bearing guide and load capacity of max. 5 N. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. 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.

Accessory:
Shock absorber. Proximitiy switch.

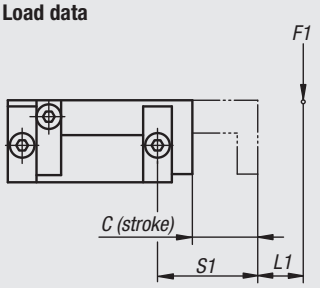
Order No.	Size	C (stroke)	L	P	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20030-2020	2	20	62	39	11	7	6	8,8	0,060
20030-2035	2	35	77	63	11	7	6	15,4	0,080
20030-2050	2	50	92	69	11	7	6	22	0,100

Order No.	Size	Suitable shock absorber	Suitable proximitiy switch
20030-2020	2	26310-0605005	20900-010X2000
20030-2035	2	26310-0605005	20900-010X2000
20030-2050	2	26310-0605005	20900-010X2000

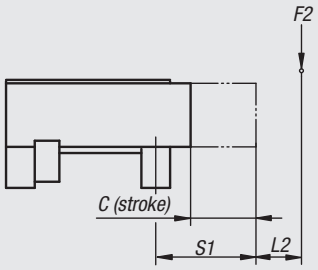
Linear modules pneumatic

with aligning guide

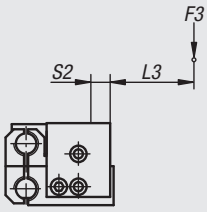
Load data



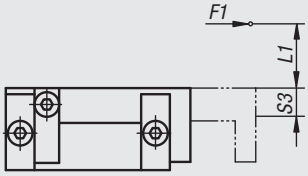
M1 = (S1 + L1) x F1



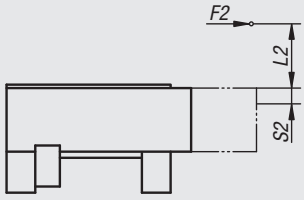
M2 = (S1 + L2) x F2



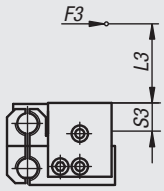
M3 = (S2 + L3) x F3



M1 = (S3 + L1) x F1



M2 = (S2 + L2) x F2



M3 = (S3 + L3) x F3

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

Calculation of 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)

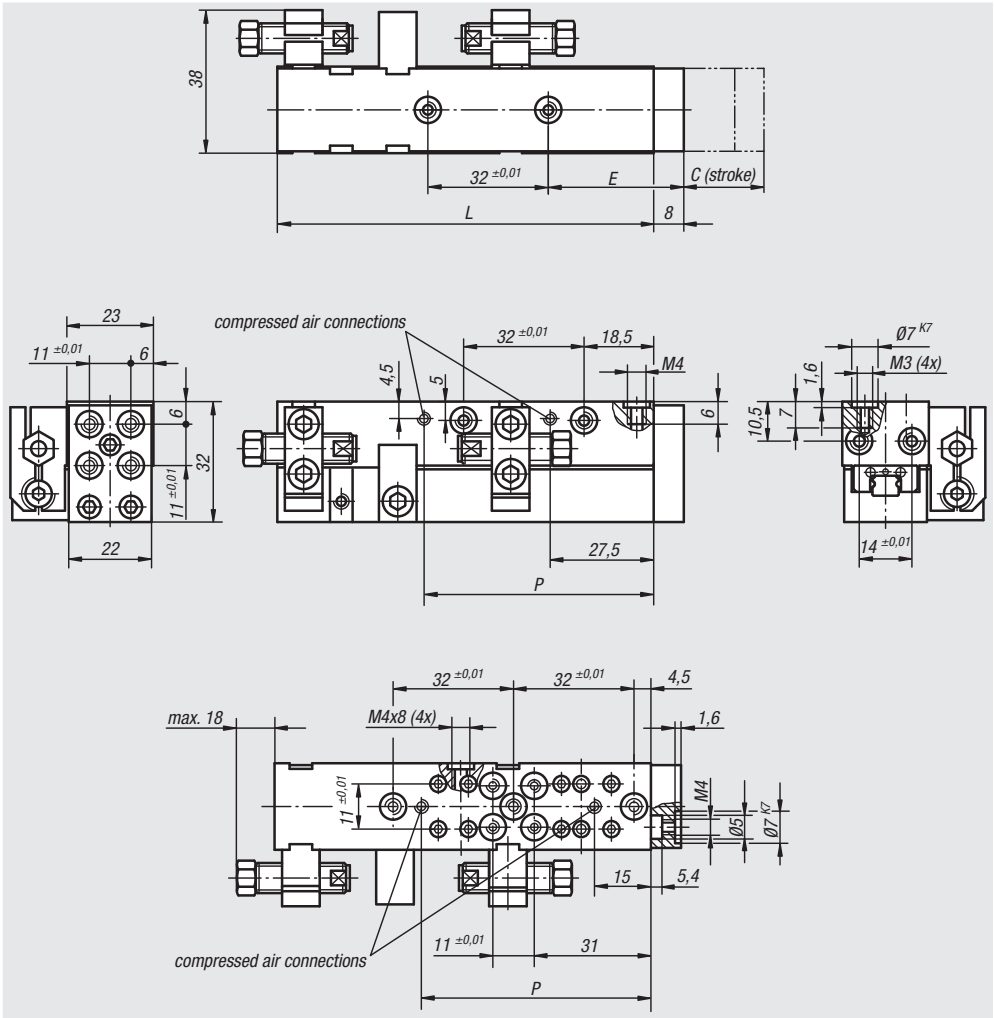
$$L = \left(\frac{C}{F}\right)^3 \times 10^5$$

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 base loads N	Static base loads N
20030-2020	2	4	4	2	9 + stroke C	3,5	7	541	951
20030-2035	2	4	4	2	9 + stroke C	3,5	7	541	951
20030-2050	2	4	4	2	9 + stroke C	3,5	7	541	951

Linear modules pneumatic

with aligning guide



Material:
Housing in high-strength aluminium; stop system steel

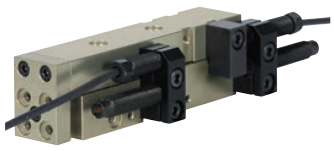
Version:
Housing anodized; stop system hardened

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. Drive ensues via compressed air, 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 position of the stop system is variable.

Repeat accuracy ±0.01 mm.

Accessory:
Shock absorber. Proximitiy switch.



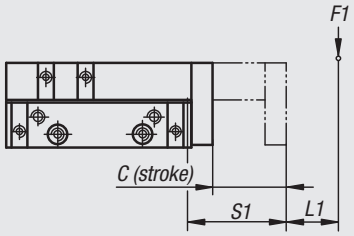
Order No.	Size	C (stroke)	E	L	P	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20032-4035	4	35	36	100	61	18	13	8	30,8	0,200
20032-4065	4	65	51	130	91	18	13	8	57,2	0,300

Order No.	Size	Suitable shock absorber	Suitable proximitiy switch
20032-4035	4	26300-0810008	20900-020X5000
20032-4065	4	26300-0810008	20900-020X5000

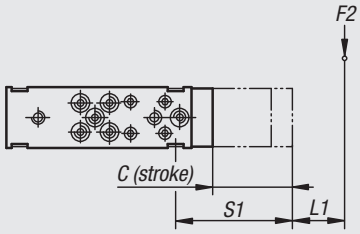
Linear modules pneumatic

with aligning guide

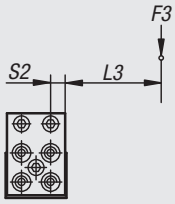
Load data



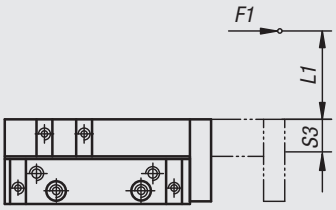
M1 = (S1 + L1) x F1



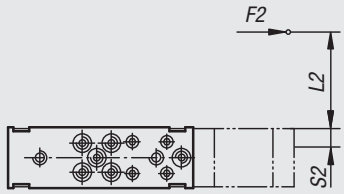
M2 = (S1 + L2) x F2



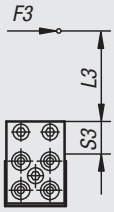
M3 = (S2 + L3) x F3



M1 = (S3 + L1) x F1



M2 = (S2 + L2) x F2



M3 = (S3 + L3) x F3

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

Calculation of 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 base loads N	Static base loads N
20032-4035	4	8	8	4	13 + stroke C	7,5	10	1200	1960
20032-4065	4	8	8	4	13 + stroke C	7,5	10	1200	1960

Linear modules pneumatic

with aligning guide

Material:
Housing in high-strength aluminium;
stop system steel

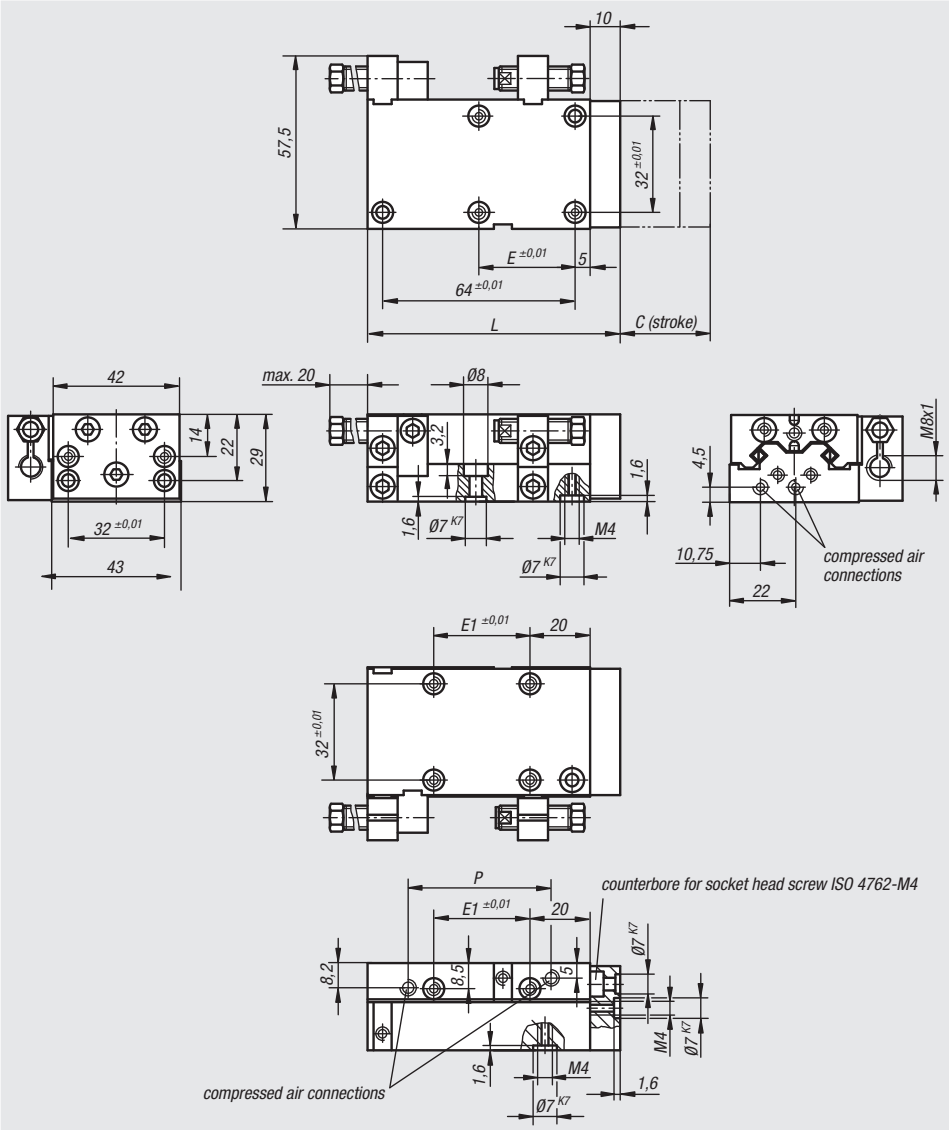
Version:
Housing anodized; stop system hardened

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. Drive ensues via compressed air, 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 position of the stop system is variable.

Repeat accuracy ±0.01 mm.

Accessory:
Shock absorber. Proximitiy switch.



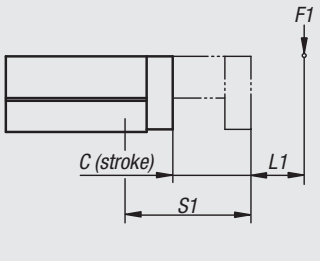
Order No.	Size	C (stroke)	E	E1	L	P	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20034-4020	4	20	1 x 32	1 x 32	84	47,5	33	45	12	4	0,500
20034-4030	4	30	1 x 32	1 x 32	84	47,5	33	45	12	6	0,500
20034-4045	4	45	2 x 32	2 x 32	104	55	33	45	12	10,5	0,740
20034-4060	4	60	3 x 32	2 x 32	124	78,5	33	45	12	15	0,740
20034-4075	4	75	3 x 32	2 x 32	144	85	33	45	12	21,5	0,980
20034-4090	4	90	4 x 32	3 x 32	164	110,5	33	45	12	28	0,980

Order No.	Size	Suitable shock absorber	Suitable proximitiy switch
20034-4020	4	26300-0810008	20900-020X5000
20034-4030	4	26300-0810008	20900-020X5000
20034-4045	4	26300-0810008	20900-020X5000
20034-4060	4	26300-0810008	20900-020X5000
20034-4075	4	26300-0810008	20900-020X5000
20034-4090	4	26300-0810008	20900-020X5000

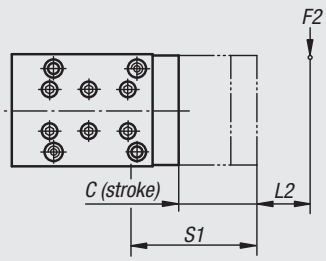
Linear modules pneumatic

with aligning guide

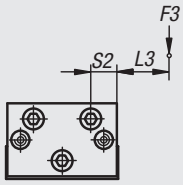
Load data



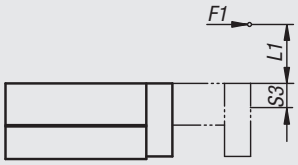
M1 = (S1 + L1) x F1



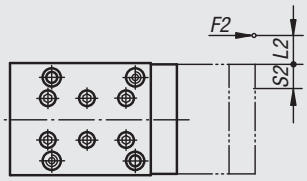
M2 = (S1 + L2) x F2



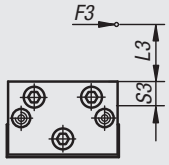
M3 = (S2 + L3) x F3



M1 = (S3 + L1) x F1



M2 = (S2 + L2) x F2



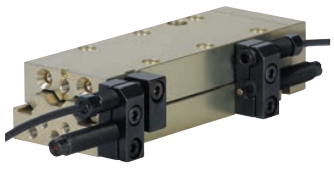
M3 = (S3 + L3) x F3

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

Calculation of 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 + stroke C/2	9	13
20034-4030	4	12	12	17	29 + stroke C/2	9	13
20034-4045	4	15	15	20	36 + stroke C/2	9	13
20034-4060	4	18	18	23	44 + stroke C/2	9	13
20034-4075	4	21	21	26	51 + stroke C/2	9	13
20034-4090	4	25	25	29	59 + stroke C/2	9	13

Linear modules pneumatic

with aligning guide

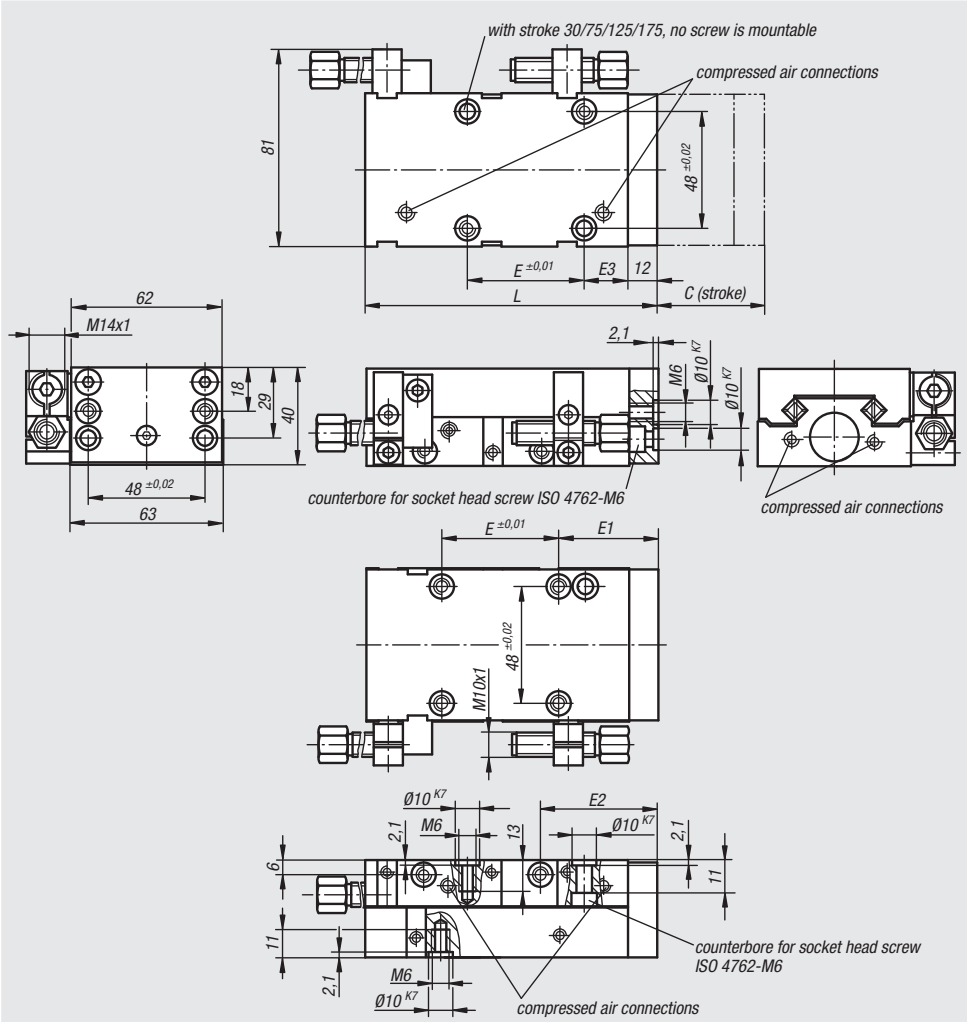
Material:
Housing in high-strength aluminium;
stop system steel

Version:
Housing anodized; stop system hardened

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. Drive ensues via compressed air, 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 position of the stop system is variable.

Repeat accuracy ±0.01 mm.



Order No.	Size	C (stroke)	E	E1	E2	E3	L	Load bearing capacity N	Piston force at 6 bar (N)	Retraction force at 6 bars (N)	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20036-6030	6	30	1 x 48	29	36	18	121	240	76	66	16	11,2	1,070
20036-6050	6	50	1 x 48	29	36	18	121	220	76	66	16	18,7	1,070
20036-6075	6	75	2 x 48	35	42	21	175	200	76	66	16	28	1,470
20036-6100	6	100	2 x 48	35	42	21	175	180	76	66	16	37,4	1,470
20036-6125	6	125	3 x 48	17	45	27	231	160	76	66	16	46,8	1,830
20036-6150	6	150	3 x 48	17	45	27	231	140	76	66	16	56,1	1,830
20036-6175	6	175	4 x 48	26	52	34	288	120	76	66	16	65,5	2,200
20036-6200	6	200	4 x 48	26	52	34	288	100	76	66	16	74,8	2,200

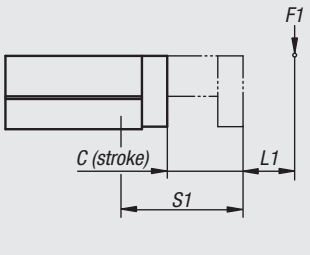
Order No.	Size	Suitable shock absorber	Suitable proximitiy switch	Suitable plug connector
20036-6030	6	26310-1410012	20915-020	20950-010X2000
20036-6050	6	26310-1410012	20915-020	20950-010X2000
20036-6075	6	26310-1410012	20915-020	20950-010X2000
20036-6100	6	26310-1410012	20915-020	20950-010X2000
20036-6125	6	26310-1410012	20915-020	20950-010X2000
20036-6150	6	26310-1410012	20915-020	20950-010X2000
20036-6175	6	26310-1410012	20915-020	20950-010X2000
20036-6200	6	26310-1410012	20915-020	20950-010X2000

Linear modules pneumatic

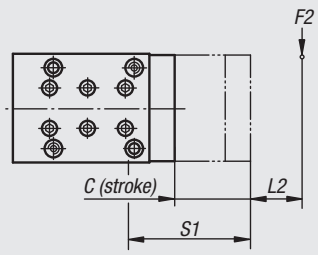
with aligning guide

Accessory:
Shock absorber. Proximitiy switch. Plug connector.

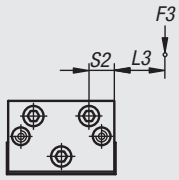
Load data



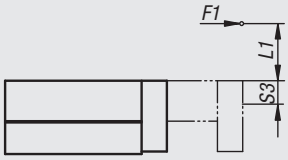
M1 = (S1 + L1) x F1



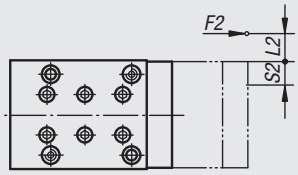
M2 = (S1 + L2) x F2



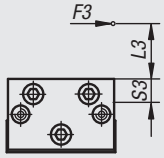
M3 = (S2 + L3) x F3



M1 = (S3 + L1) x F1



M2 = (S2 + L2) x F2



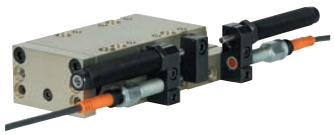
M3 = (S3 + L3) x F3

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

Calculation of the lifespan:

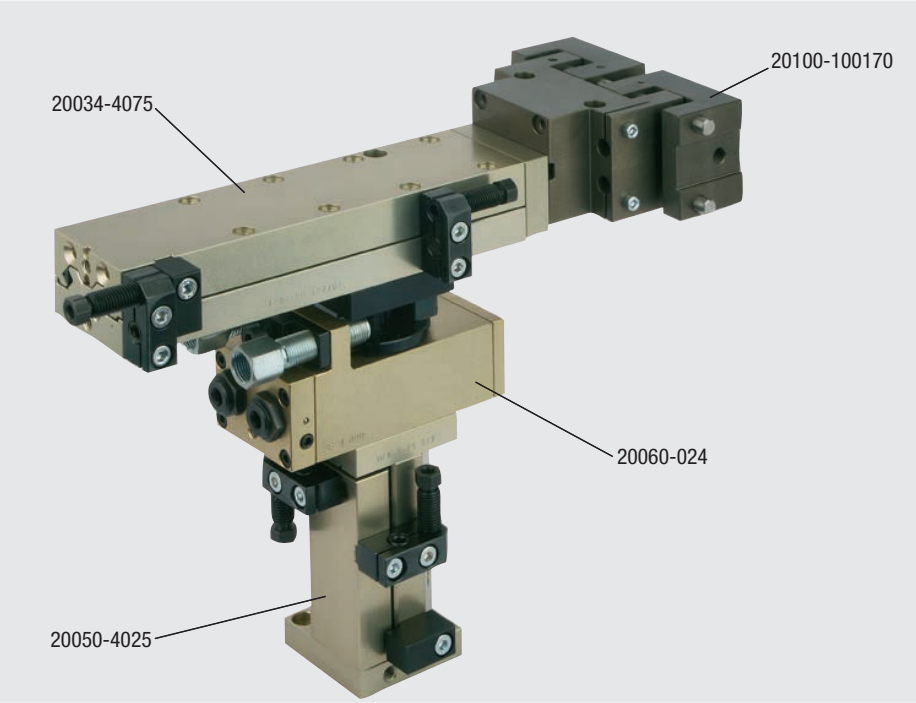
$$L = \left(\frac{M_{zul}}{M_{eff}}\right)^3 \times 10^5$$

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 + stroke C/2	14	16
20036-6050	6	33,2	33,2	44,6	45 + stroke C/2	14	16
20036-6075	6	38,7	38,7	59,5	70 + stroke C/2	14	16
20036-6100	6	38,7	38,7	59,5	70 + stroke C/2	14	16
20036-6125	6	44,2	44,2	59,5	95 + stroke C/2	14	16
20036-6150	6	44,2	44,2	59,5	95 + stroke C/2	14	16
20036-6175	6	49,7	49,7	74,4	120 + stroke C/2	14	16
20036-6200	6	49,7	49,7	74,4	120 + stroke C/2	14	16

Layout of the lift-swivel unit
made up of four modules of the same installation size



Technical information for lifting units, pneumatic

Lifting units with high load rating for universal application in the short stroke module. The standardised fastening drill holes make versatile combinations with out other units possible. Due to the precise centring system, all modules can be combined

with one another quickly and smoothly. Within the individual sizes without adapter plates.

– piston force at 6 bar: 80 N – 360 N.

– cylinder diameter: 16 mm – 32 mm.

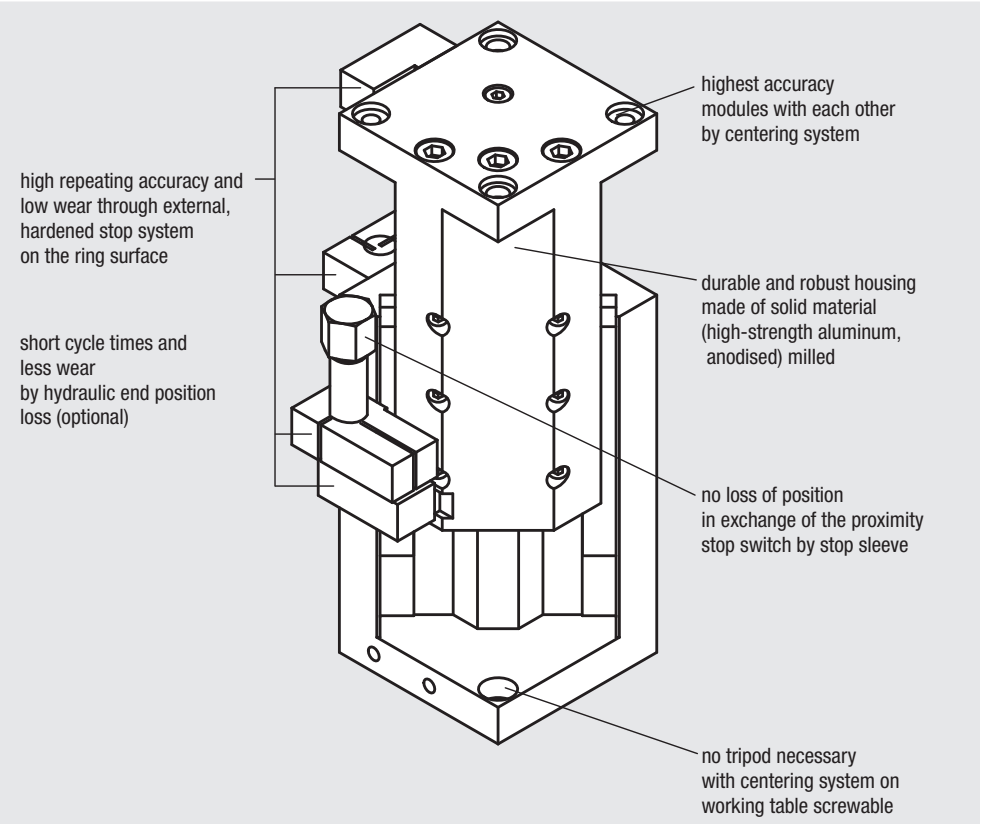
– stroke lengths: 10 mm – 100 mm.

– 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**	**Stroke 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
Stroke 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 aligning guide

Material:
Housing in high-strength aluminium; stop system steel

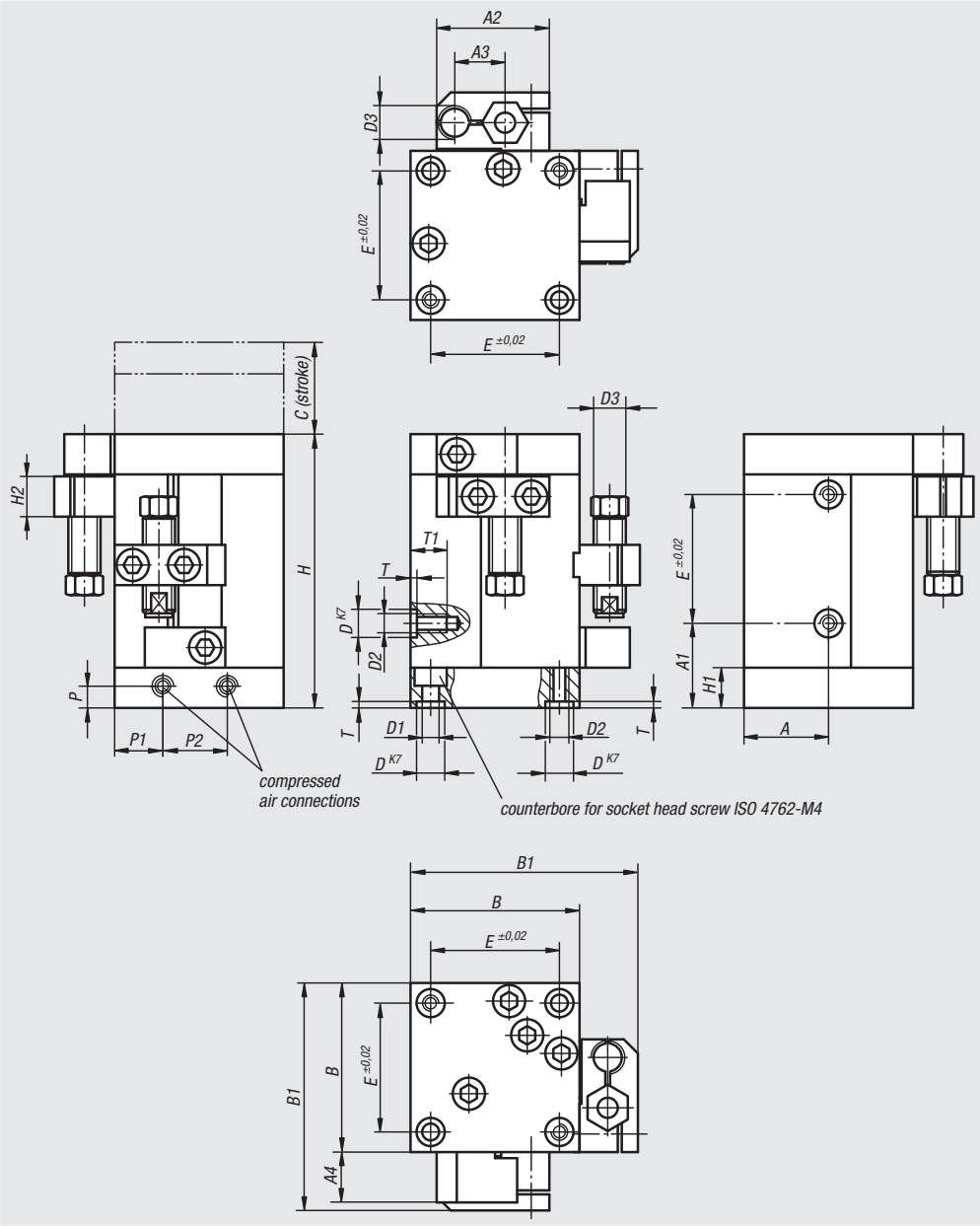
Version:
Housing anodized; stop system hardened

Sample order:
nlm 20050-4010

Note:
Maintenance-free pneumatic lifting units in compact structural shape with cross roll guide. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 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.

Accessory:
Shock absorber. Proximitiy switch. Plug connector.



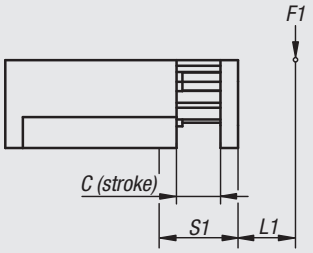
Order No.	Size	C (stroke)	A	A1	A2	A3	A4	B	B1	D	D1	D2	D3	E	H	H1	H2	P	P1	P2	T	T1	Approx. weight kg
20050-4010	4	10	21	21	27,5	12	12,5	42	57	7	4,2	M4	M8x1	32	68	10	10	5	12	16	1,6	6	0,500
20050-4025	4	25	21	39	27,5	12	12,5	42	57	7	4,2	M4	M8x1	32	86	10	10	5	12	16	1,6	6	0,740
20050-6025	6	25	30	38	38	17,5	14	60	78	10	6,4	M6	M14x1	48	104	12	12	6	16	18	2,1	9	1,140
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	1,320

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 proximitiy switch	Suitable plug connector
20050-4010	4	80	55	16	3,7	26300-0810008	20900-020X5000	-
20050-4025	4	80	55	16	9,3	26300-0810008	20900-020X5000	-
20050-6025	6	185	175	25	23,8	26310-1410012	20915-020	20950-010X2000
20050-6050	6	185	175	25	47,7	26310-1410012	20915-020	20950-010X2000

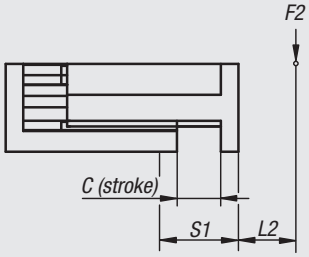
Lifting units, pneumatic

with aligning guide

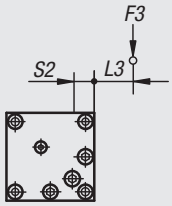
Load data



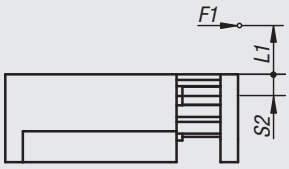
M1 = (S1 + L1) x F1



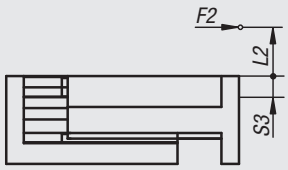
M2 = (S1 + L2) x F2



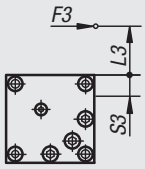
M3 = (S2 + L3) x F3



M1 = (S2 + L1) x F1



M2 = (S3 + L2) x F2



M3 = (S3 + L3) x F3

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

Calculation of 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	Dynamic base loads N	Static base loads N
20050-4010	4	12,5	12,5	13,5	19 + stroke C/2	10	16,5	1435	1435
20050-4025	4	15	15	18	26 + stroke C/2	10	16,5	1640	1640
20050-6025	6	33	33	56	33 + stroke C/2	11	17	2600	2600
20050-6050	6	33	33	56	45 + stroke C/2	11	17	2600	2600

Lifting units, pneumatic

with circular channels

Material:
Housing in high-strength aluminium; stop system steel

Version:
Housing anodized; stop system hardened

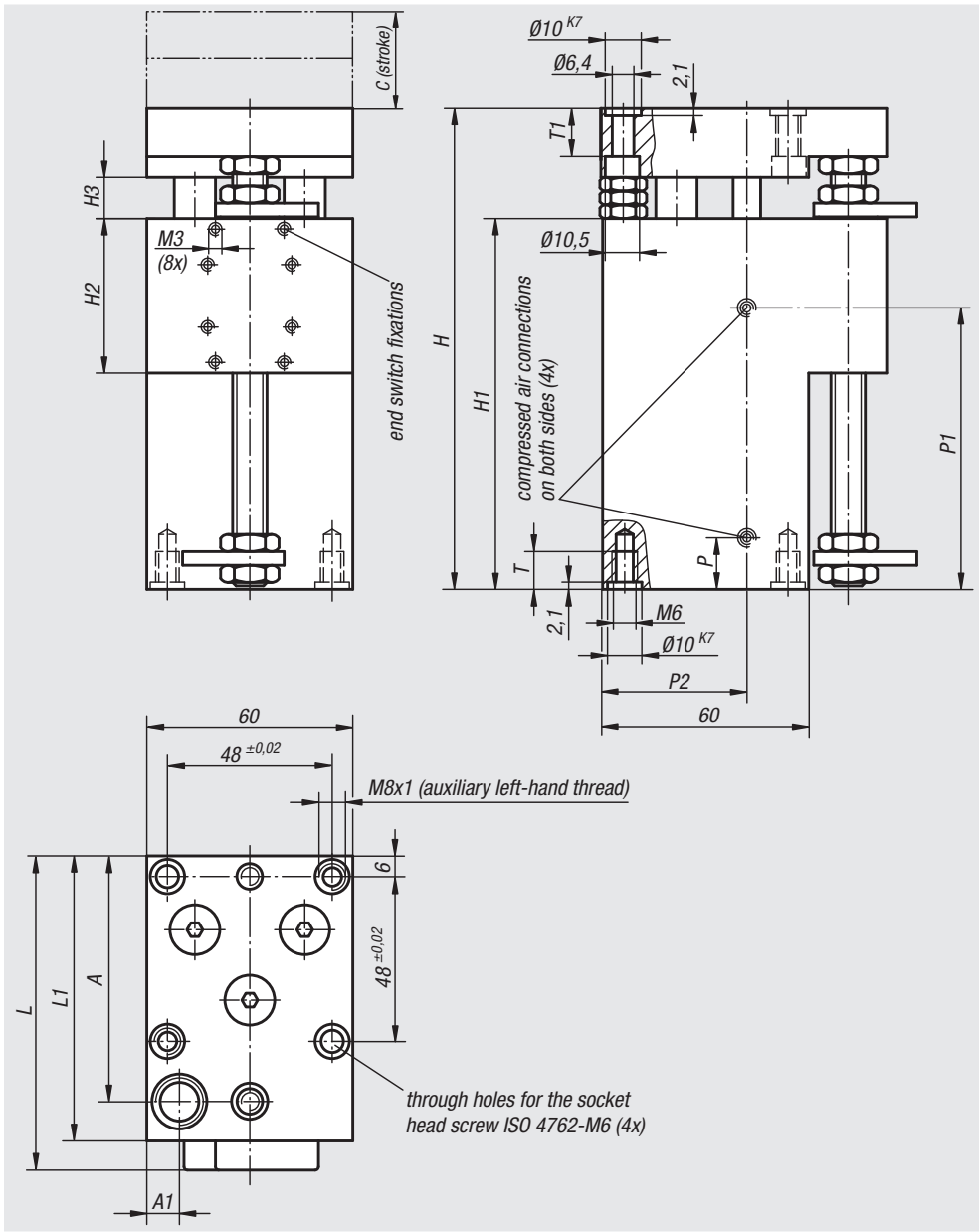
Sample order:
nlm 20054-6050

Note:
Maintenance-free pneumatic lifting units in robust structural shape with gasketed ball guide. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 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 ±0.02 mm.

On request:
Lifting units with shorter strokes available.

Accessory:
Shock absorber. Proximitiy switch. Plug connector.



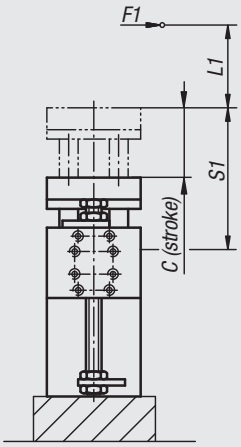
Order No.	Size	C (stroke)	A	A1	H	H1	H2	H3	L	L1	P	P1	P2	T	T1	Approx. weight kg
20054-6050	6	50	71,5	10	140	108	45	12	92	83	15	83	41,5	16	13	1,600
20054-6075	6	75	71,5	10	165	133	45	12	92	83	15	108	41,5	16	13	2,000
20054-6100	6	100	71,5	10	190	158	45	12	92	83	15	133	41,5	16	13	2,400

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 proximitiy switch	Suitable plug connector
20054-6050	6	220	200	25	33	26310-1410012	20905-010	20950-010X2000
20054-6075	6	220	200	25	50	26310-1410012	20905-010	20950-010X2000
20054-6100	6	220	200	25	66	26310-1410012	20905-010	20950-010X2000

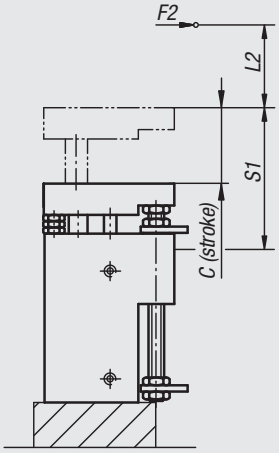
Lifting units, pneumatic

with circular channels

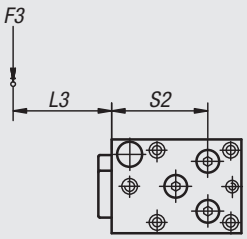
Load data



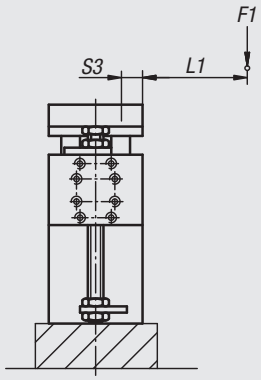
M1 = (S1 + L1) x F1



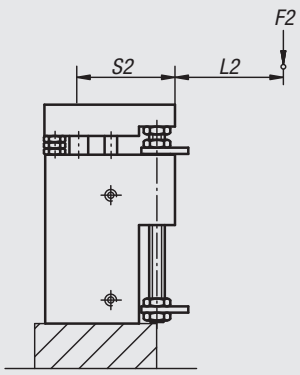
M2 = (S1 + L2) x F2



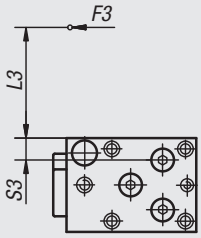
M3 = (S2 + L3) x F3



M1 = (S3 + L1) x F1



M2 = (S2 + L2) x F2



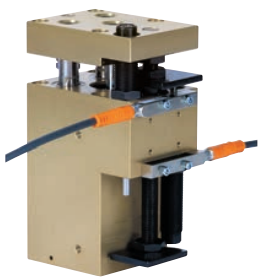
M3 = (S3 + L3) x F3

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

Calculation of 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 + stroke C/2	61	14
20054-6075	6	28	28	30	46 + stroke C/2	61	14
20054-6100	6	28	28	30	46 + stroke C/2	61	14

Lifting units, pneumatic

with circular channels

Material:
Housing in high-strength aluminium; stop system steel

Version:
Housing anodized; stop system hardened

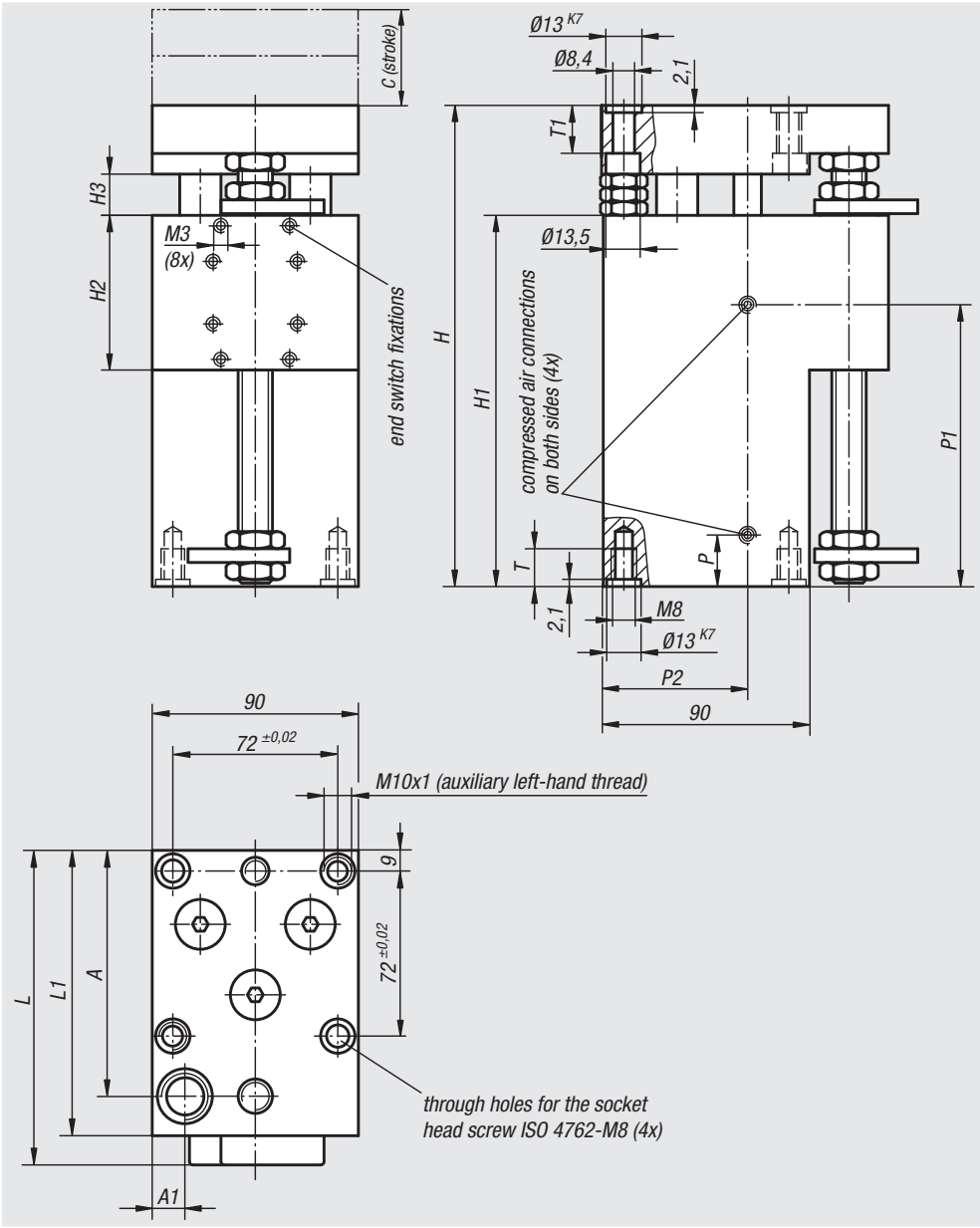
Sample order:
nlm 20056-9050

Note:
Maintenance-free pneumatic lifting units in robust structural shape with gasketed ball guide. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. 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.

Accessory:
Shock absorber. Proximitiy switch. Plug connector.



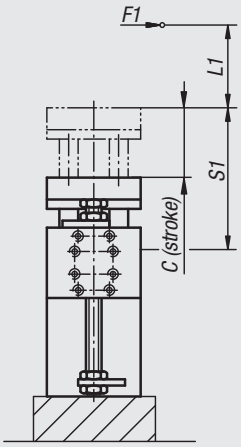
Order No.	Size	C (stroke)	A	A1	H	H1	H2	H3	L	L1	P	P1	P2	T	T1	Approx. weight kg
20056-9050	9	50	101,5	24,5	150	108	45	12	121	113	15,5	83	68	16	13	3,800
20056-9075	9	75	101,5	24,5	175	133	45	12	121	113	15,5	108	68	16	13	4,200
20056-9100	9	100	101,5	24,5	200	158	45	12	121	113	15,5	133	68	16	13	4,600

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 proximitiy switch	Suitable plug connector
20056-9050	9	360	325	32	56	26310-1410012	20905-010	20950-010X2000
20056-9075	9	360	325	32	84	26310-1410012	20905-010	20950-010X2000
20056-9100	9	360	325	32	112	26310-1410012	20905-010	20950-010X2000

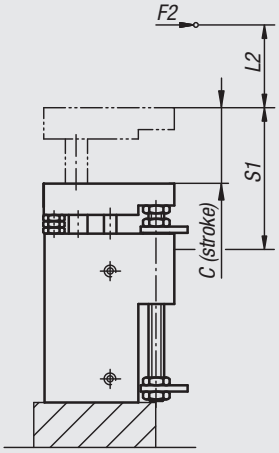
Lifting units, pneumatic

with circular channels

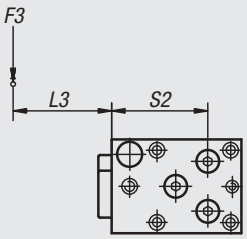
Load data



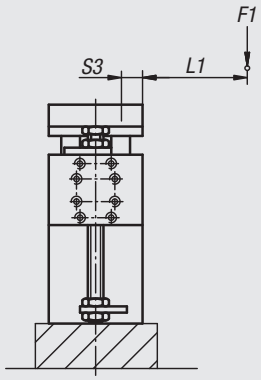
$M1 = (S1 + L1) \times F1$



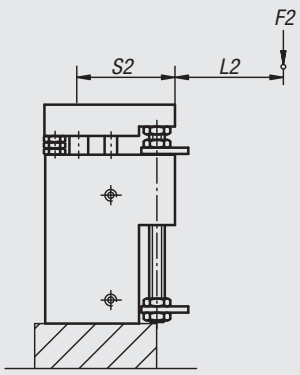
$M2 = (S1 + L2) \times F2$



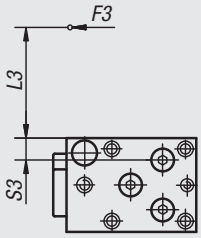
$M3 = (S2 + L3) \times F3$



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



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



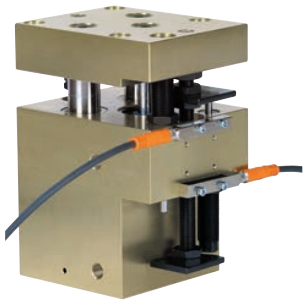
$M3 = (S3 + L3) \times F3$

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

Calculation of 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)

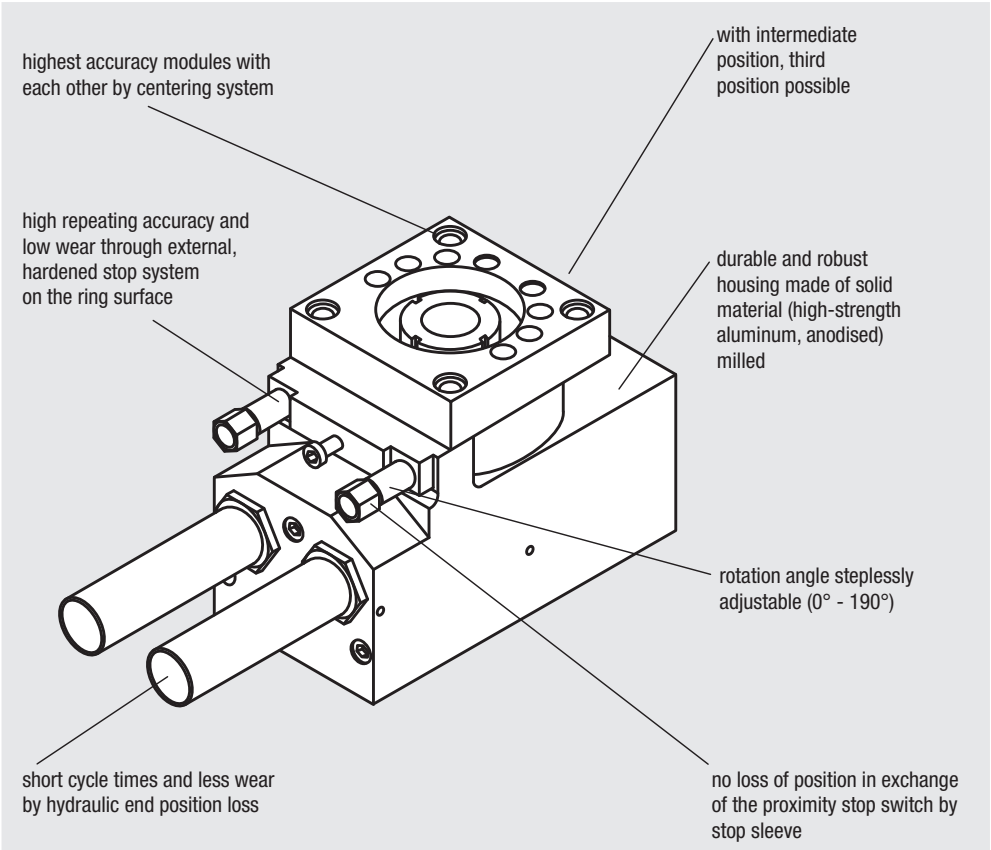


Order No.	Size	M1 Nm	M2 Nm	M3 Nm	S1	S2	S3
20056-9050	9	43	43	72	57 + stroke C/2	73	20
20056-9075	9	43	43	72	57 + stroke C/2	73	20
20056-9100	9	43	43	72	57 + stroke C/2	73	20

Technical information for rotary modules, pneumatic

Compact and heavy-duty rotary modules open up many fields of application.
In order to get at a user-defined point within a range, they are, in combination with linear modules, an indispensable component. The rotary modules can be set in any assembly position. The extremely compact design of the rotary modules allow for high load bearing capacity in all directions for an exacting rigidity of the entire system. The 0° – 190° rotation angle for all models is continuously adjustable. To realise a third position, intermediate positions are available as accessories.

– cylinder diameter: 10 mm – 38 mm.
– axial load: 280 N – 1.800 N.
– radial load: 220 N – 2.400 N.
– repeat accuracy ±0.01°.
– rotary angle continuously adjustable.
– play-free end positions via dual loaded drive
cylinders with secured pinion steering racks drive.
– many applications covered via coordinated increases in torque per size.
– also available for small installation spaces and in a heavy-duty version.
– secured drive via rated capacity limiter.



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 in high-strength aluminium;
stop system steel

Version:
Housing anodized; stop system hardened

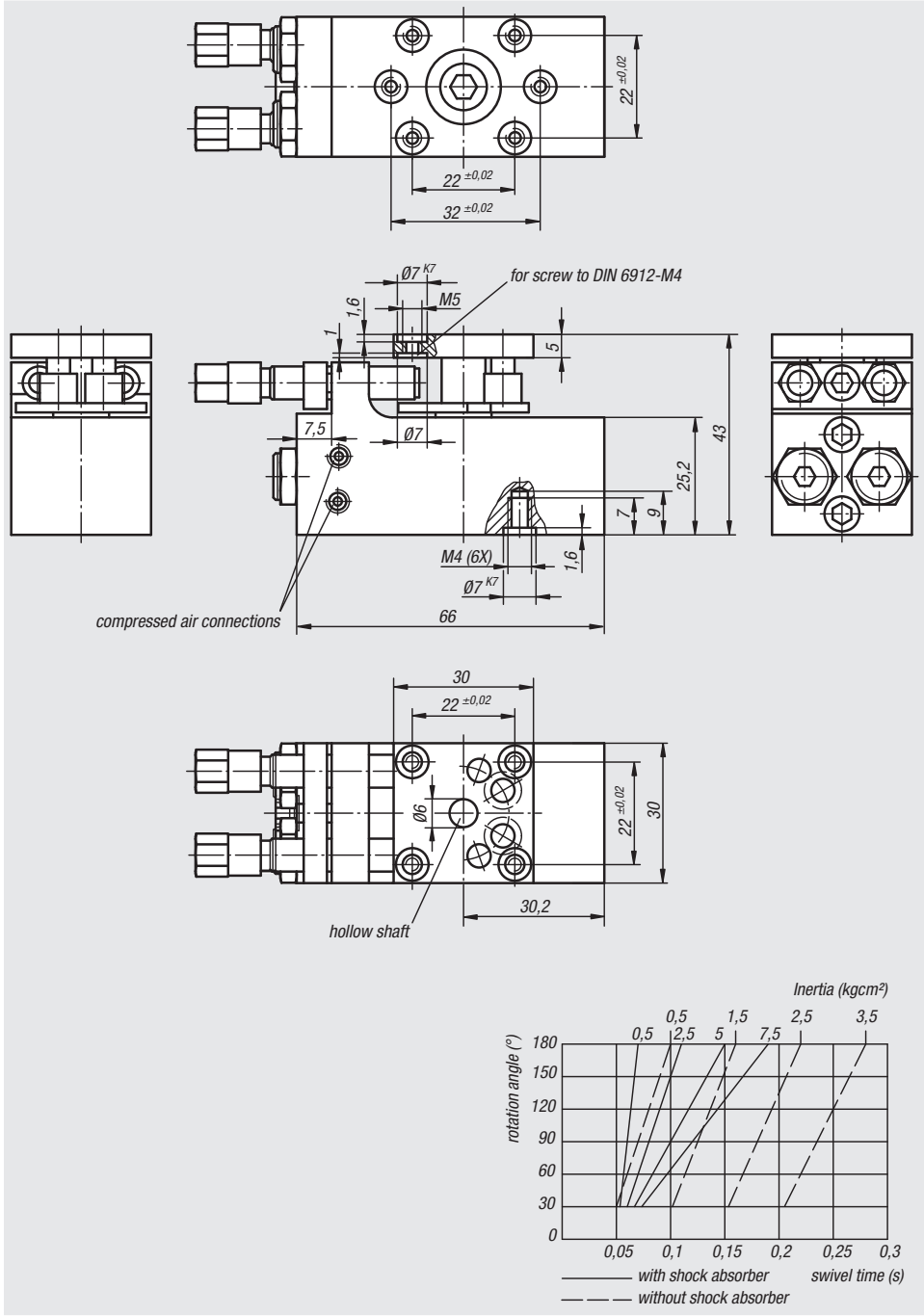
Sample order:
nlm 20060-014

Note:
Maintenance-free pneumatic rotary module for small installation spaces with dual pressurised drive cylinder. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 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 continuously adjustable.

Repeat accuracy ±0.01°.

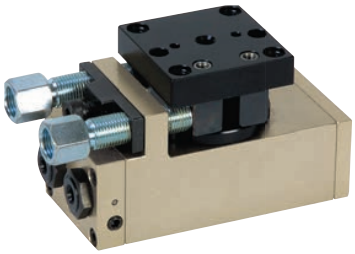
Accessory:
Shock absorber. Proximitiy switch. Plug connector.



Order No.	Size	Driving torque Nm	Rotation angle	Axial load N	Radial load N	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20060-014	4	0,28	0° - 190°	300	220	2 x 10	5	0,240

Order No.	Size	Suitable shock absorber	Suitable proximitiy switch	Suitable plug connector
20060-014	4	26300-1010008	20915-010	20960-010X2000

Rotary module, pneumatic



Material:
Housing in high-strength aluminium; stop system steel

Version:
Housing anodized; stop system hardened

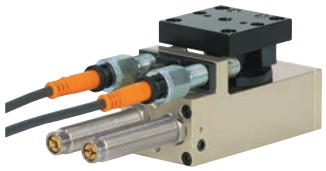
Sample order:
nlm 20060-024

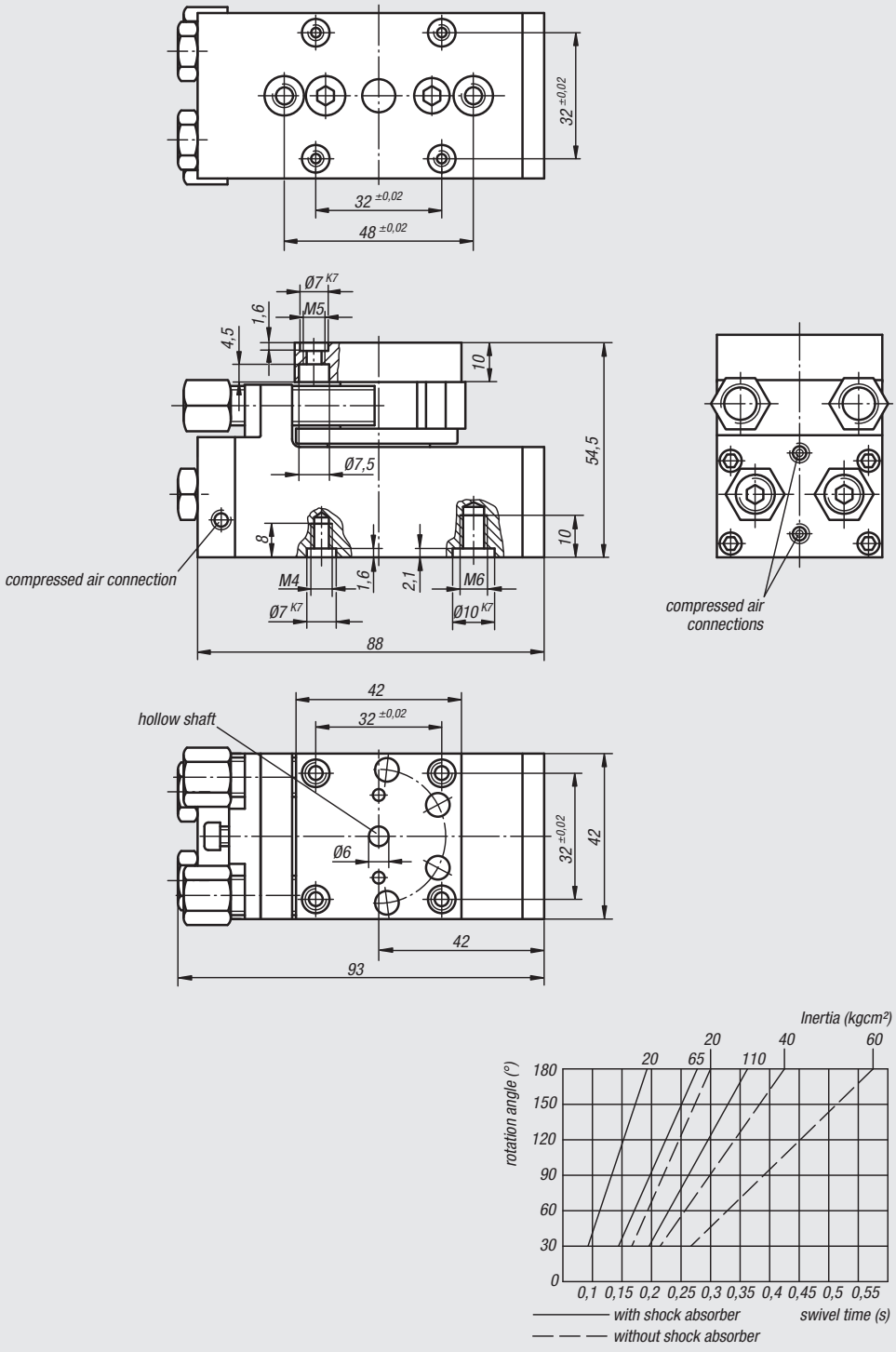
Note:
Maintenance-free pneumatic rotary module with dual pressurised drive cylinder. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5.
Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

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

Repeat accuracy ±0.01°.

Accessory:
Shock absorber. Proximitiy switch. Plug connector.

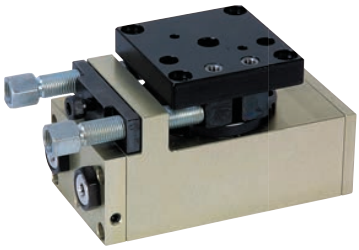




Order No.	Size	Driving torque Nm	Rotation angle	Axial load N	Radial load N	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20060-024	4	0,94	0° - 190°	280	350	2 x 14	19	0,450

Order No.	Size	Suitable shock absorber	Suitable proximitiy switch	Suitable plug connector
20060-024	4	26300-1210010	20915-020	20950-010X2000

Rotary module, pneumatic



Material:
Housing in high-strength aluminium;
stop system steel

Version:
Housing anodized; stop system hardened

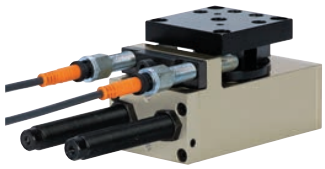
Sample order:
nlm 20062-016

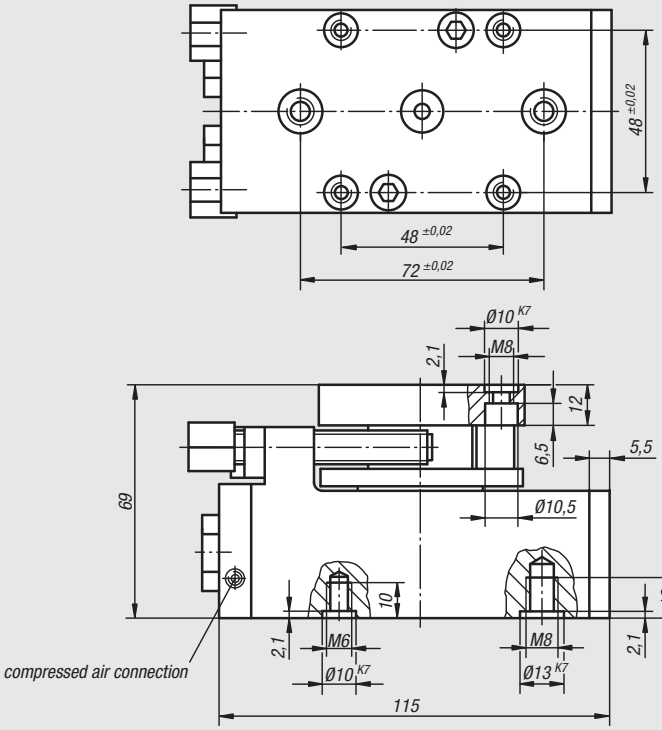
Note:
Maintenance-free pneumatic rotary module with dual pressurised drive cylinder. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

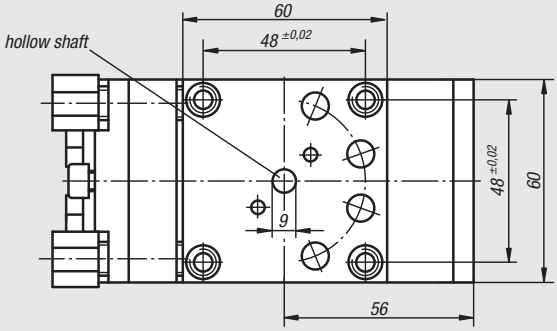
The 0° – 190° rotation angle is continuously adjustable.

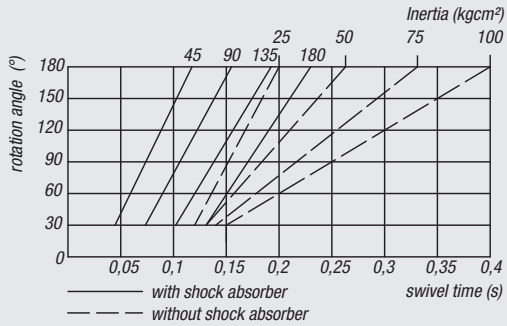
Repeat accuracy ±0.01°.

Accessory:
Shock absorber. Proximitiy switch. Plug connector.







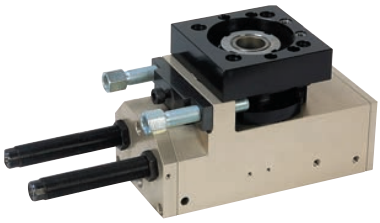


Order No.	Size	Driving torque Nm	Rotation angle	Axial load N	Radial load N	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20062-016	6	3,5	0° - 190°	350	450	2 x 22	45	1,100

Order No.	Size	Suitable shock absorber	Suitable proximitiy switch	Suitable plug connector
20062-016	6	26310-1410012	20915-030	20950-010X2000

Rotary module, pneumatic

heavy duty version



Material:
Housing in high-strength aluminium;
stop system steel

Version:
Housing anodized; stop system hardened

Sample order:
nlm 20062-026

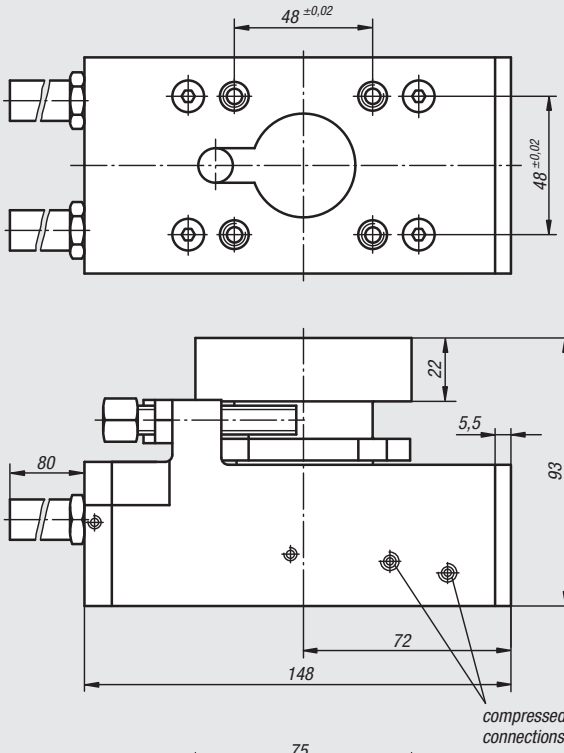
Note:
Maintenance-free pneumatic rotary module with dual pressurised drive cylinder in heavy duty version. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5. Modules of the same size can be combined with one another without adapter plates via the precise centring system by means of centring rings 20240.

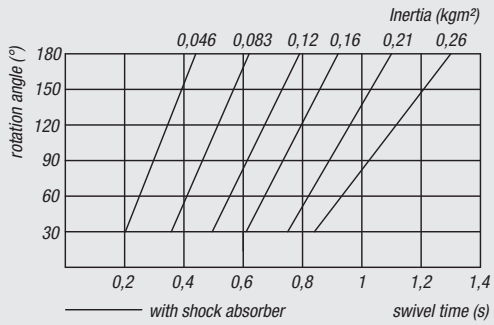
The 0° – 190° rotation angle is continuously adjustable.

Repeat accuracy ±0.01°.

Shock absorbers are included in delivery.

Accessory:
Proximitiy switch. Plug connector.

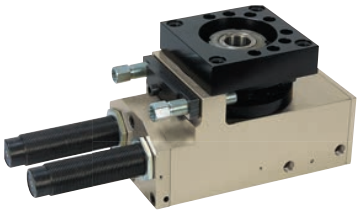




Order No.	Size	Driving torque Nm	Overturning moment max. Nm	Rotation angle	Axial load N	Radial load N	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20062-026	6	6,5	55	0° - 190°	1100	1600	2 x 25	88	2,600

Order No.	Size	Suitable proximitiy switch	Suitable plug connector
20062-026	6	20915-030	20950-010X2000

Rotary module, pneumatic



Material:
Housing in high-strength aluminium; stop system steel

Version:
Housing anodized; stop system hardened

Sample order:
nlm 20064-019

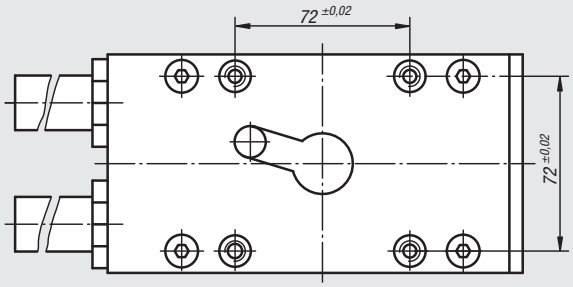
Note:
Maintenance-free pneumatic rotary module with dual pressurised drive cylinder. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection R1/8. Modules of the same size can be combined with one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

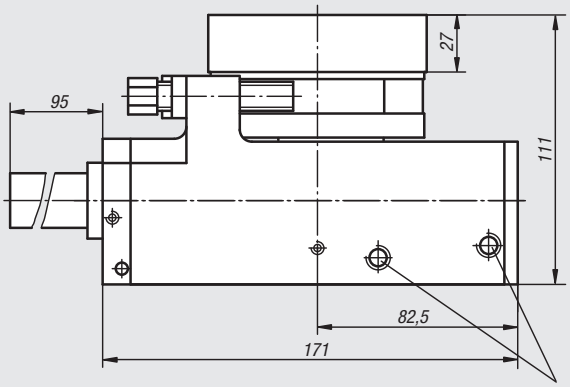
The 0° – 190° rotation angle is continuously adjustable.

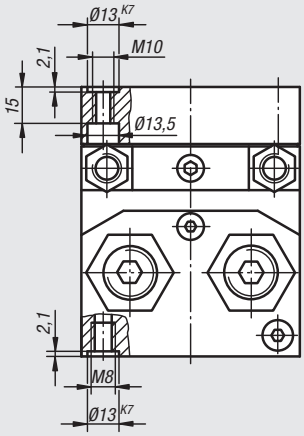
Repeat accuracy ±0.01°.

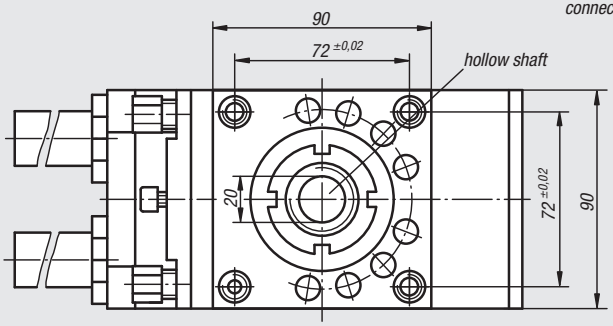
Shock absorbers are included in delivery.

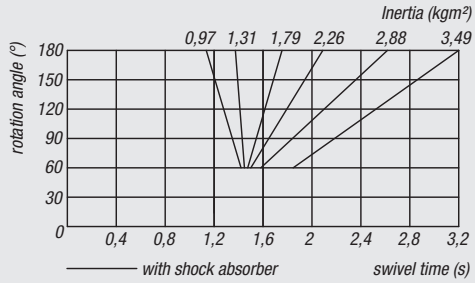
Accessory:
Proximitiy switch. Plug connector.









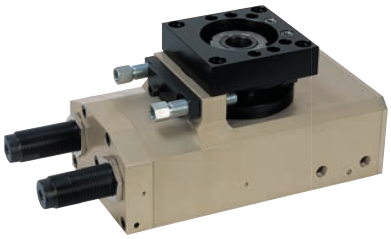


Order No.	Size	Driving torque Nm	Overturning moment max. Nm	Rotation angle	Axial load N	Radial load N	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20064-019	9	12	110	0° - 190°	1800	2400	2 x 32	161	4,100

Order No.	Size	Suitable proximitiy switch	Suitable plug connector
20064-019	9	20915-030	20950-010X2000

Rotary module, pneumatic

heavy duty version



Material:
Housing in high-strength aluminium;
stop system steel

Version:
Housing anodized; stop system hardened

Sample order:
nlm 20064-029

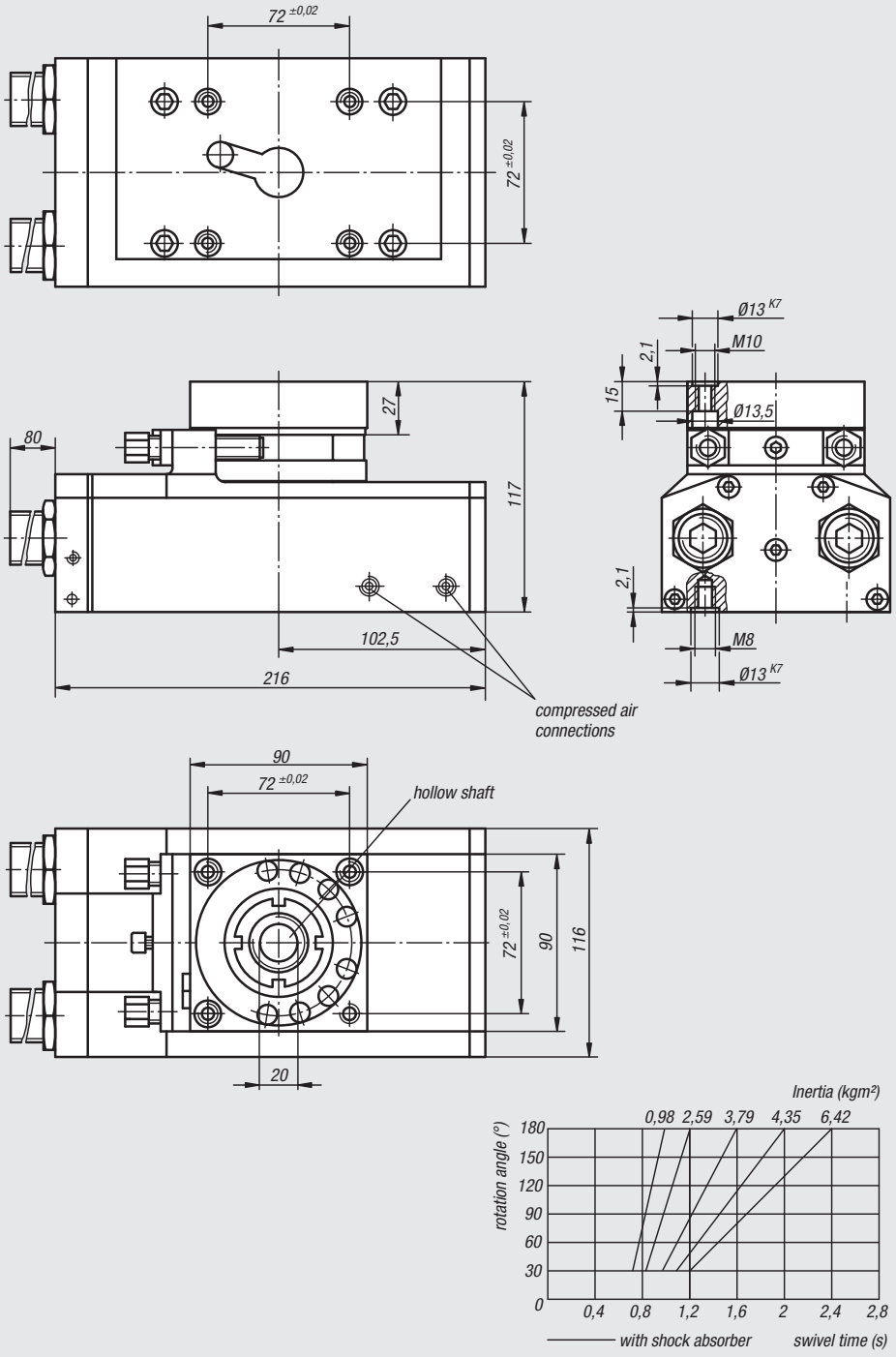
Note:
Maintenance-free pneumatic rotary module with dual pressurised drive cylinder in heavy-duty version. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection R1/8. Modules of the same size can 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 continuously adjustable.

Repeat accuracy ±0.01°.

Shock absorbers are included in delivery.

Accessory:
Proximitiy switch. Plug connector.

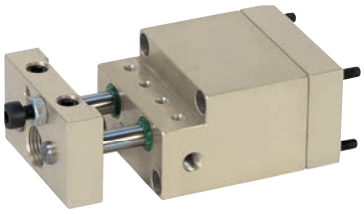


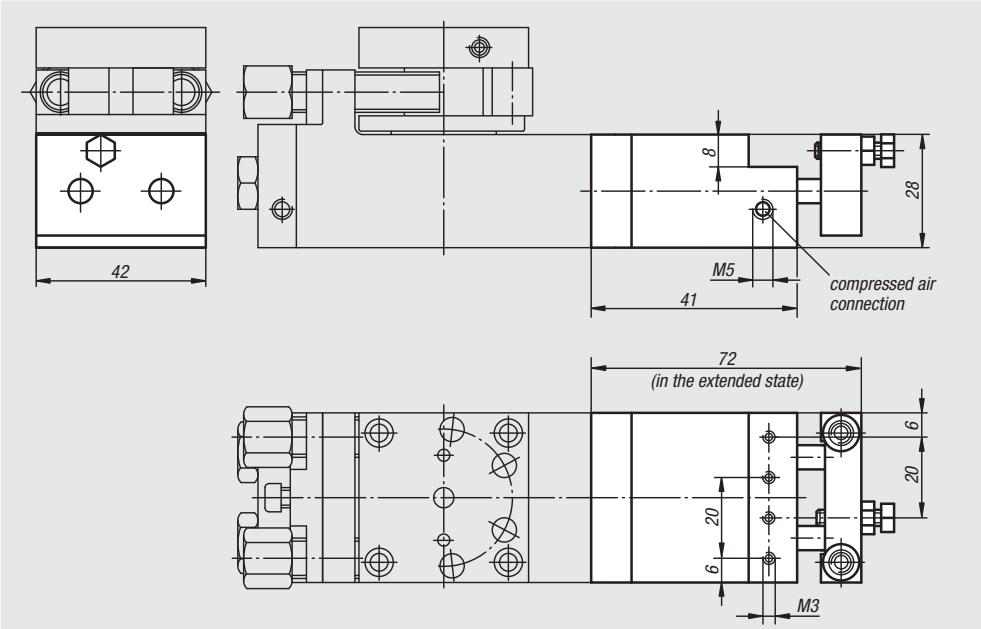
Order No.	Size	Driving torque Nm	Overturning moment max. Nm	Rotation angle	Axial load N	Radial load N	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg
20064-029	9	24	110	0° - 190°	1800	2400	2 x 38	303	7,000

Order No.	Size	Suitable proximitiy switch	Suitable plug connector
20064-029	9	20915-030	20950-010X2000

Inclined position

for rotary module 20060-024





Material:
Housing in high-strength aluminium

Version:
Housing anodized

Sample order:
nlm 20080-014

Note:
Maintenance-free pneumatic inclined position.

For implementation of a third position with Rotary Module 20060-024.

Control by 3/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5.

Adjustment range ±20° based on 90°.

Repeat accuracy ±0.01°.

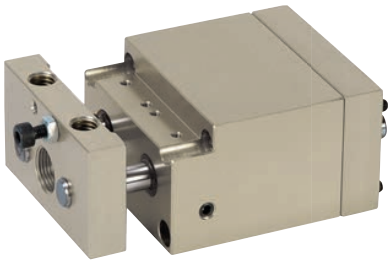
Proximity switch, connector cable and exhaust throttle are included in delivery.

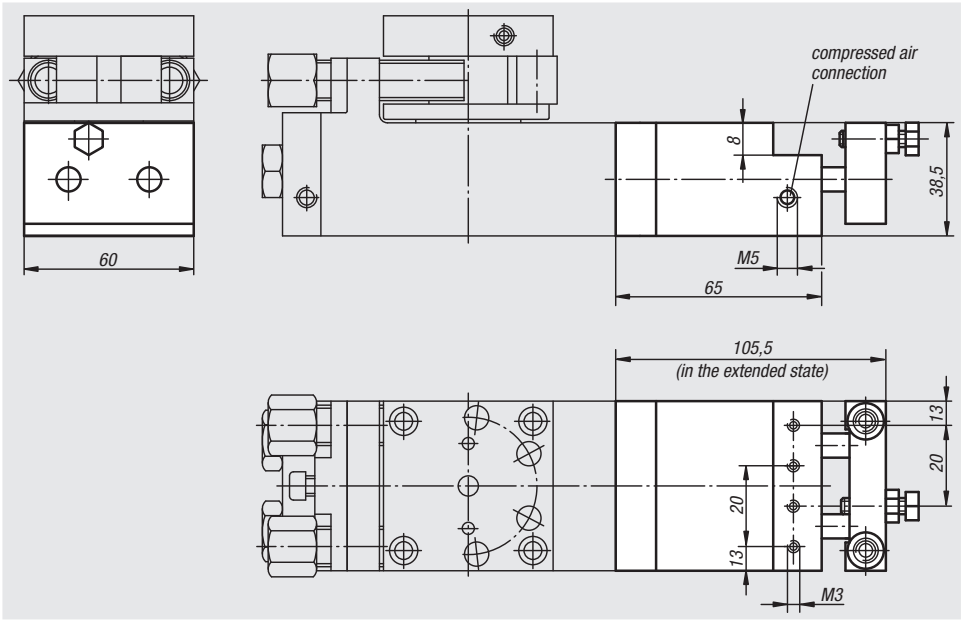
Accessory:
Shock absorber.

Order No.	Size	Driving torque Nm	Cylinder- Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg	Suitable shock absorber
20080-014	4	0,8	2 x 16	4	0,180	26300-1210010

Inclined position

for rotary module 20062-016





Material:
Housing in high-strength aluminium

Version:
Housing anodized

Sample order:
nlm 20082-016

Note:
Maintenance-free pneumatic inclined position.

For implementation of a third position with Rotary Module 20062-016.

Control by 3/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5.

Adjustment range ±20° based on 90°.

Repeat accuracy ±0.01°.

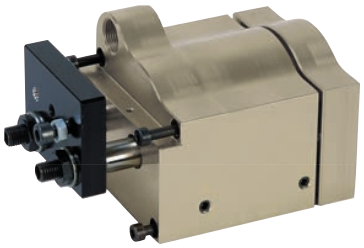
Proximity switch, connector cable and exhaust throttle are included in delivery.

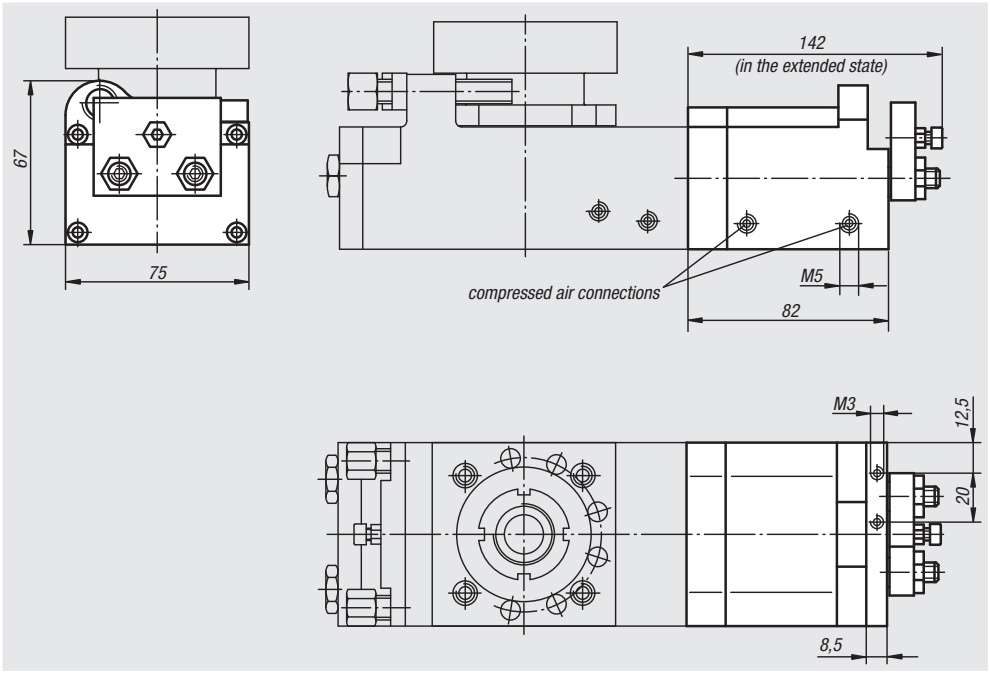
Accessory:
Shock absorber.

Order No.	Size	Driving torque Nm	Cylinder- Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg	Suitable shock absorber
20082-016	6	3,5	2 x 25	22	0,400	26310-1410012

Inclined position

for rotary module 20062-026





Material:
Housing in high-strength aluminium

Version:
Housing anodized

Sample order:
nlm 20082-026

Note:
Maintenance-free pneumatic inclined position.

For implementation of a third position with Rotary Module 20062-026.

Control by 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection M5.

Adjustment range ±20° based on 90°.

Repeat accuracy ±0.01°.

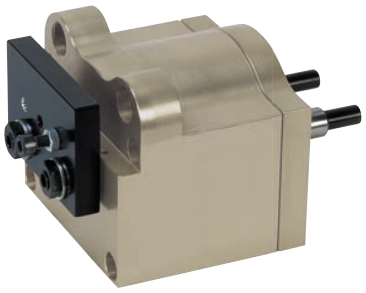
Proximity switch, connector cable and exhaust throttle are included in delivery.

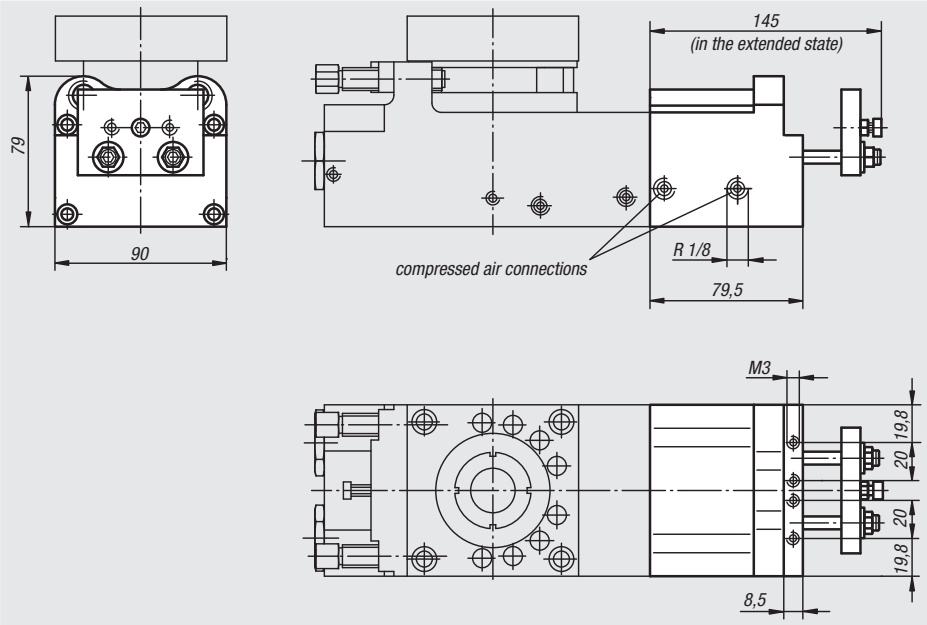
Accessory:
Shock absorber.

Order No.	Size	Torque (swivel unit, pressure-free) Nm	Torque (swivel unit, pressurised at 6 bars) Nm	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg	Suitable shock absorber
20082-026	6	10,13	1,92	50	104	0,950	26310-1410012

Inclined position

for rotary module 20064-019





Material:
Housing in high-strength aluminium

Version:
Housing anodized

Sample order:
nlm 20084-019

Note:
Maintenance-free pneumatic inclined position.

For implementation of a third position with Rotary Module 20064-019.

Control by 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection R1/8.

Adjustment range ±20° based on 90°.

Repeat accuracy ±0.01°.

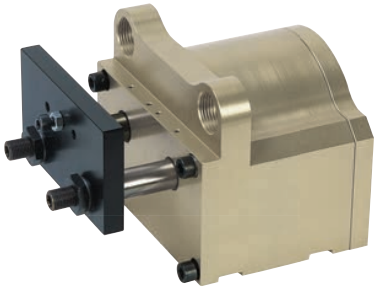
Proximity switch, connector cable and exhaust throttle are included in delivery.

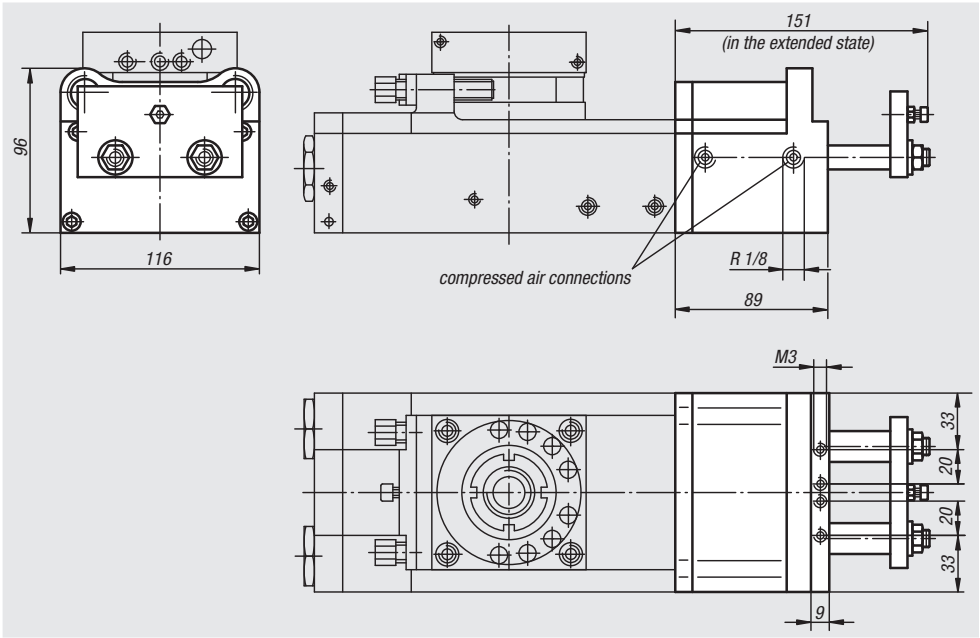
Accessory:
Shock absorber.

Order No.	Size	Torque (swivel unit, pressure-free) Nm	Torque (swivel unit, pressurised at 6 bars) Nm	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg	Suitable shock absorber
20084-019	9	20,26	5,36	63	186	1,250	26310-1410012

Inclined position

for rotary module 20064-029





Material:
Housing in high-strength aluminium

Version:
Housing anodized

Sample order:
nlm 20084-029

Note:
Maintenance-free pneumatic inclined position.

For implementation of a third position with Rotary Module 20064-029.

Control by 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled. Compressed air connection R1/8.

Adjustment range ±10° based on 90°.

Repeat accuracy ±0.01°.

Proximity switch, connector cable and exhaust throttle are included in delivery.

Accessory:
Shock absorber.

Order No.	Size	Torque (swivel unit, pressure-free) Nm	Torque (swivel unit, pressurised at 6 bars) Nm	Cylinder-Ø	Air consumption per cycle at 6 bar (ccm)	Approx. weight kg	Suitable shock absorber
20084-029	9	40	8	80	186	1,600	26300-2015016

Notes

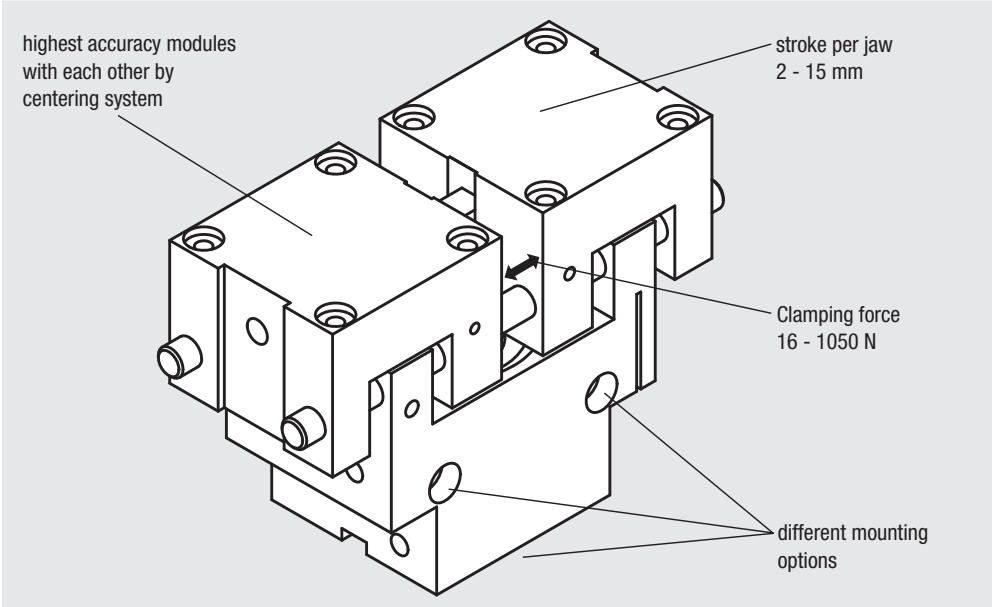
Technical information for gripping modules

The gripping modules can be set in any assembly position. The applications of pneumatic gripping modules in assembly and manufacture are almost limitless.

These components can manage a multitude of functions such as centring, feeding, converting and loading.

The standardised fastening drill holes make versatile combinations with out other units possible.

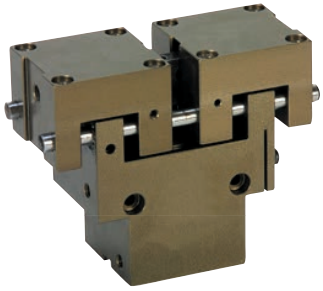
– workpiece weight 0.08 kg – 4.74 kg.
– also for particularly robustapplications.
– gripping force query open, closed, part gripped.
– steel slip-in guide – hardened and ground, for universal application and long lifespan.



Overview	
Type	Parallel grippers
Guidance	Steel slideways
Design	robust
Stroke 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 in high-strength aluminium; guide shafts and connecting rod, steel.

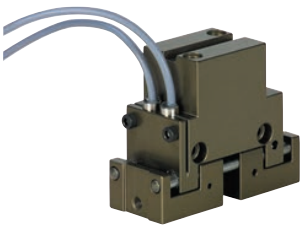
Version:
Housing coated with Hart-Coat®.
Guide shafts hardened and ground.

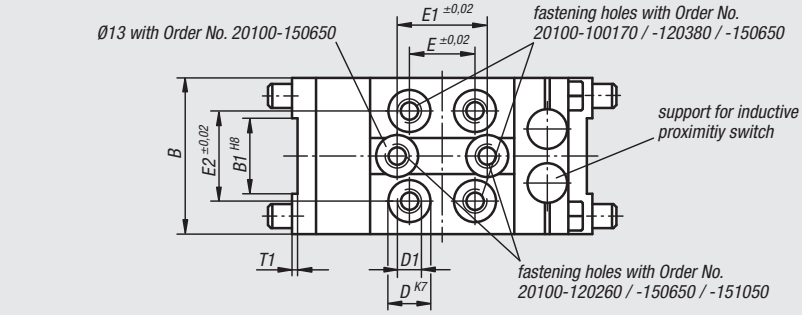
Sample order:
nlm 20100-030025

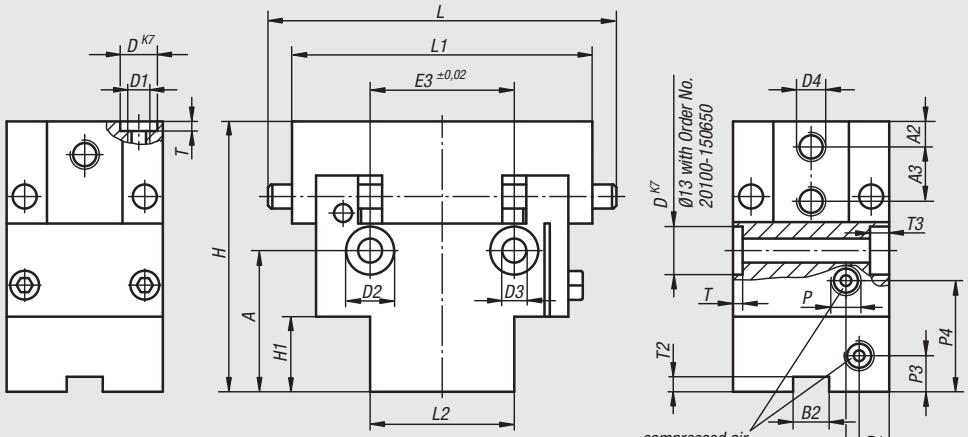
Note:
Maintenance-free pneumatic parallel gripper with connecting rod bell-crank linkage. Control by 4/2 or 5/2 directional valve. Drive ensues via compressed air, 4-8 bar, constant, filtered (10 µm), dried, oiled or unoiled.
Fastened absolutely centrically. Selectively fasten on the inside or outside. Proximity switches which are available as accessories can be integrated for end positions feedback.

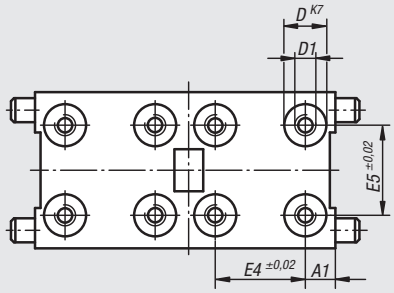
Repeat accuracy ±0.02 mm.

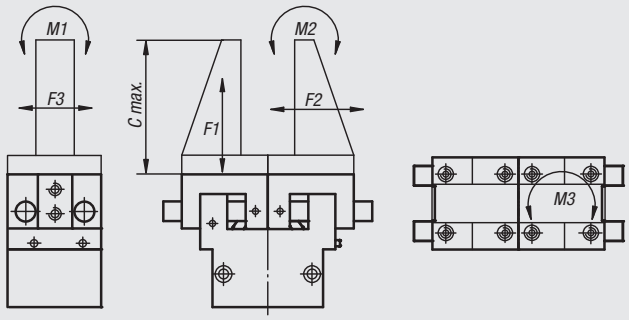
Accessory:
Proximitiy switch. Plug connector.











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

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

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.	Stroke 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 proximitiy switch	Suitable plug connector
20100-030025	3	25	35	0,120	14	0,34	20900-010X2000	-
20100-040036	4	36	46	0,170	16	0,8	20900-030X3000	-
20100-050085	5	85	95	0,400	25	2,5	20900-030X3000	-
20100-100170	10	170	170	0,760	32	8	20900-040	20950-010X2000
20100-120260	12	260	260	1,170	40	15,1	20900-050	20950-010X2000
20100-120380	12	380	380	1,780	50	23,6	20900-040	20950-010X2000
20100-120660	12	660	660	2,960	50	23,6	20900-040	20950-010X2000
20100-150650	15	650	650	3,000	63	46,8	20900-050	20950-010X2000
20100-151050	15	1050	1050	4,740	63	46,8	20900-050	20950-010X2000

Order No.	M1 Nm	M2 Nm	M3 Nm	F1 (N)	F2 (N)	F3 (N)	C max.	Moment of inertia (10^{-3} kgm^2)	Approx. weight kg
20100-030025	1,6	1,5	1,5	140	84	140	25	0,00632	0,050
20100-040036	3,9	3,7	1,3	250	82	71	40	0,0278	0,105
20100-050085	6	6	1,6	280	100	72	50	0,0767	0,210
20100-100170	12	14	12	540	150	400	65	0,416	0,600
20100-120260	27	30	12	1100	640	340	80	0,787	0,840
20100-120380	57	67	95	1500	350	2100	110	1,89	1,260
20100-120660	57	67	95	1500	350	2100	110	1,89	1,260
20100-150650	87	94	201	1900	890	3700	140	5,36	2,550
20100-151050	87	94	201	1900	890	3700	140	5,36	2,550

Notes

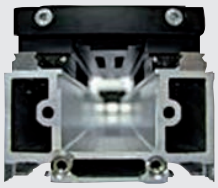
Technical information for portal modules, pneumatic

Note:
Pneumatically activated portal modules in lengths as requested.
Drive proceeds via a cylinder without piston rods integrated in the slide.
They are available in three sizes with guide rail or circular channel and strokes up to 5000 mm at a repeating accuracy of ±0.02.

Application:
Portal modules are useable anywhere loads are to be guided precisely. The profile structure with integrated drive cylinder is particularly well suited to cost-efficient integration in manufactory and assembly shops. At low dead load, the carrier section guarantees extreme rigidity. As a result, the portal module does not require a stabile skeletal structure; it brings its own stability along with it and thus becomes a load-bearing and space-saving component within a total system.

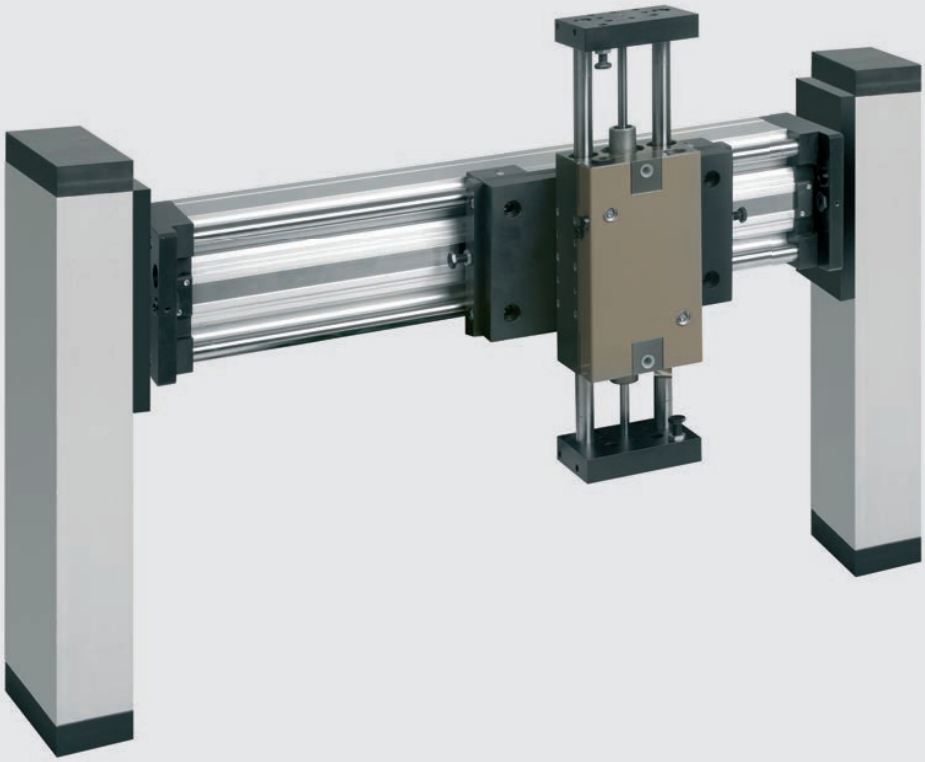
Characteristics:
These portal modules are based on a heavy-duty, stiffened aluminium profile. The use can choose between guide rail or circular channel system. The structural dimensions of both guidance systems are identical. The profile modules can be set in any assembly position.

Advantages:
– small coefficients of friction due to rolling friction convert piston force into motion force virtually entirely.
– low deflexion makes high span and wide travel possible.
– optimized sizes with large piston diameters.
– high run accuracy.
– owing to stiffened cantilever aluminium profile, loadable with very heavy loads.
– integrated easy-to-assemble shockabsorber and proximity switch.
– cylinder cover band in steel version (except for 20200-1065X0500).
– optional: several intermediate positions possible.



Guide rail

Circular channel



Portal modules, pneumatic

with circular channels

Material:
Base body, carriage and flange plate in aluminium alloy; guide rails in steel

Version:
Base body natural finish;
carriage and flange plate anodized;
guide rails hardened

Sample order:
nlm 20200-1065X0500 or to DIN specifications.

Note:
Portal modules with ball aligning guide. Drive ensues pneumatically via a rodless pneumatic cylinder. High load rating by use of stiffened cantilever aluminium profile. The modules can be set in any assembly position.
Weight specifications apply in the case of dynamic load.

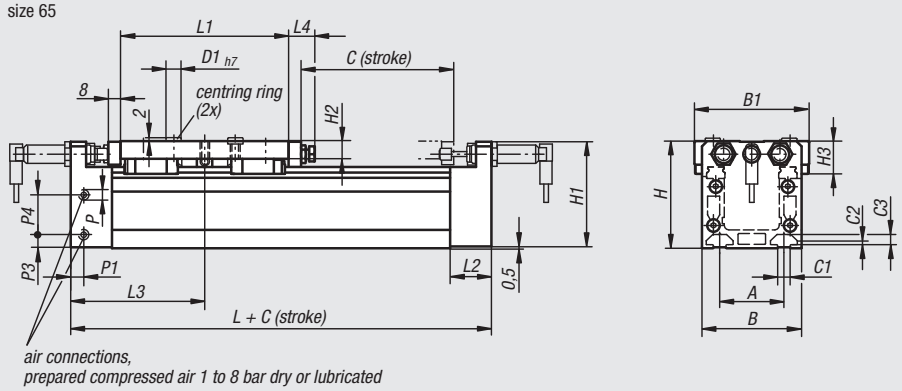
Repeat accuracy ±0.02 mm.

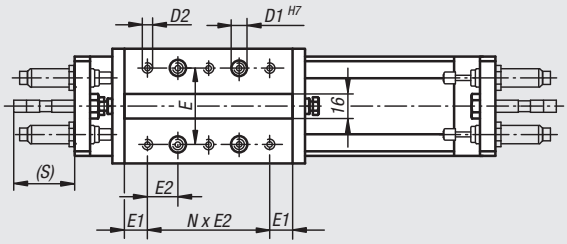
Temperature range:
+5 °C to +70 °C
(+5 °C to +60 °C at size 65)

On request:
* Other lengths (stroke C max. 5000 mm) as well as inclined positions.

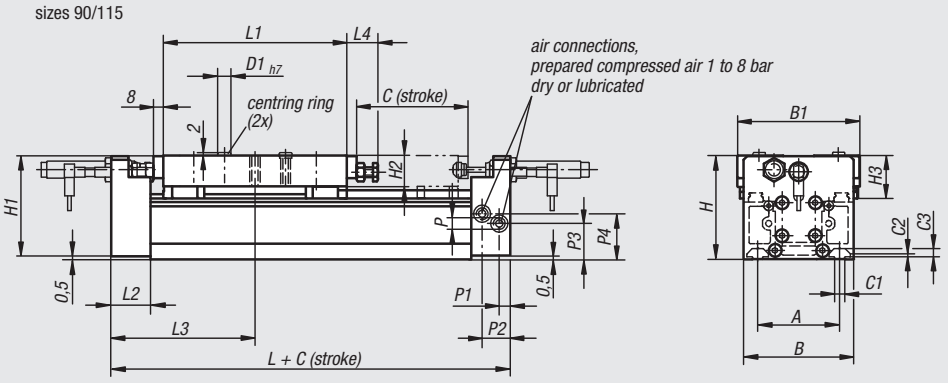
Accessory:
Shock absorber. Proximitiy switch. Plug connector.

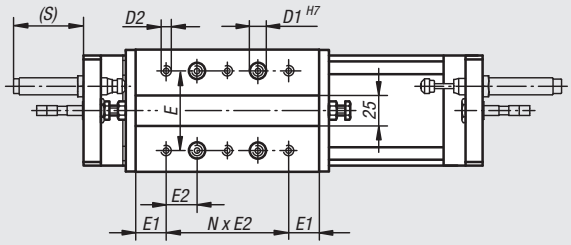
size 65

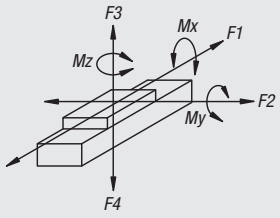




sizes 90/115







Portal modules, pneumatic

with circular channels

Order No.	Size	A	B	B1	C1	C2	C3	C (stroke)	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

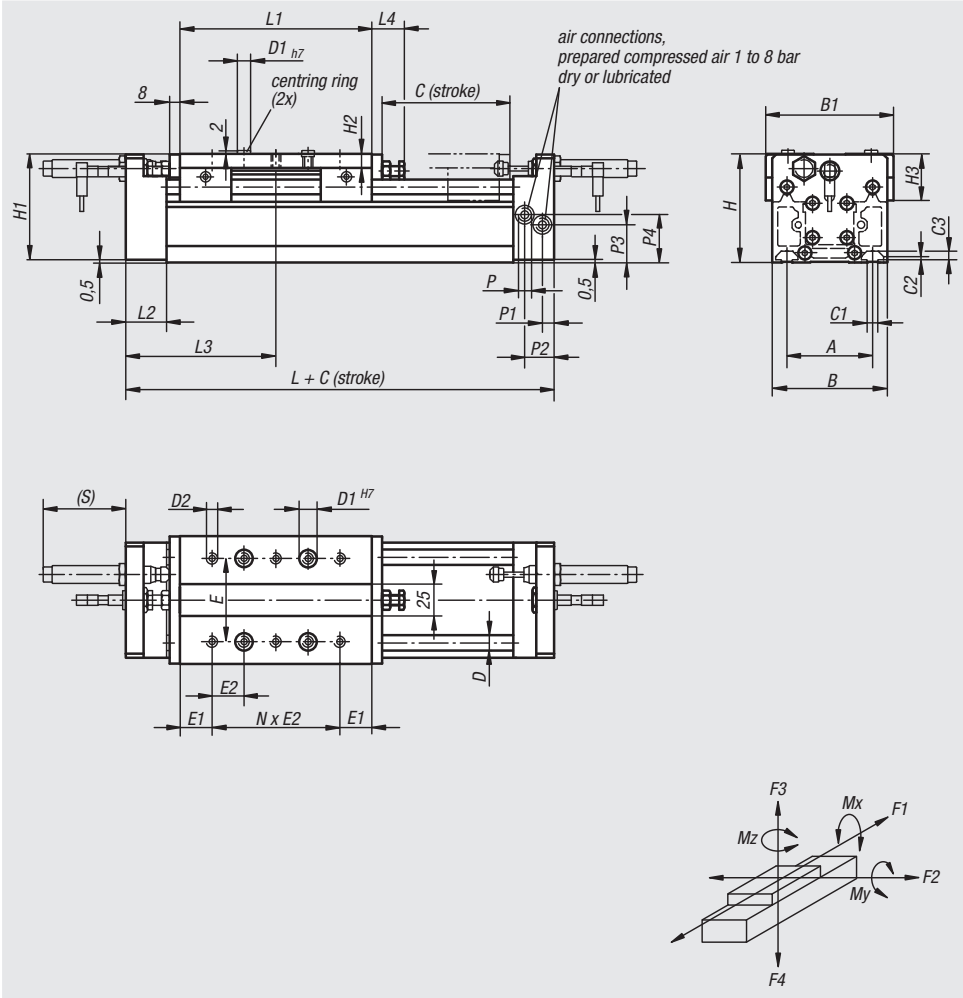
Order No.	Size	L1	L2	L3	L4	N (number)	P	P1	P2	P3	P4	S	Approx. weight kg / 0 stroke	Approx. weight kg/100 stroke
20200-1065X0500	65	110	27	87,5	17	4	M5	8,5	-	8,5	25,8	40	1,690	0,580
20200-1090X0500	90	150	32	117,5	25,5	4	G1/8	9	23	30	38	64,5	3,420	0,800
20200-1115X0500	115	220	32	152,5	25,5	6	G1/4	15,5	19,5	40,5	60,5	62,5	9,690	1,420

Order No.	Size	Piston force at 6 bar (N)	Cylinder-Ø	Air consumption per 10 mm stroke 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 proximitiy switch	Suitable plug connector
20200-1065X0500	65	26300-1210010	20910-030	20950-010X2000
20200-1090X0500	90	26300-1415010	20910-030	20950-010X2000
20200-1115X0500	115	26300-2015016	20910-030	20950-010X2000

Portal modules, pneumatic

with aligning guide



Material:
Base body, carriage and flange plate in aluminium alloy; guide shafts in steel

Version:
Base body natural finish;
carriage and flange plate anodized;
guide shafts hardened

Sample order:
nlm 20200-2090X0500 or to DIN specifications.

Note:
Portal modules with precision steel shafts and recirculating ball bushes. Drive ensues pneumatically via a rodless pneumatic cylinder. High load rating by use of stiffened cantilever aluminium profile. The modules can be set in any assembly position.
Weight specifications apply in the case of dynamic load.

Repeat accuracy ±0.02 mm.

Temperature range:
+5 °C to +70 °C

On request:
* Other lengths (stroke C max. 5000 mm) as well as inclined positions.

Accessory:
Shock absorber. Proximitiy switch. Plug connector.

Portal modules, pneumatic

with aligning guide

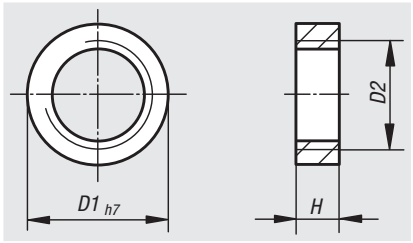
Order No.	Size	A	B	B1	C1	C2	C3	C (stroke)	D	D1	D2	E	E1	E2	H	H1	H2	H3	L
20200-2090X0500	90	67	90	100	8,1	2,5	6,8	500*	12	10	M6	65	25	25	85	84,5	11	36,5	235
20200-2115X0500	115	97	125	135	10	5	8,5	500*	16	13	M8	90	20	30	115	114,5	12,5	46,5	305

Order No.	Size	L1	L2	L3	L4	N (number)	P	P1	P2	P3	P4	S	Approx. weight kg / 0 stroke	Approx. weight kg/100 stroke
20200-2090X0500	90	150	32	117,5	25,5	4	G1/8	9	23	30	38	64,5	3,770	0,810
20200-2115X0500	115	220	32	152,5	25,5	6	G1/4	15,5	19,5	40,5	60,5	62,5	8,750	1,410

Order No.	Size	Piston force at 6 bar (N)	Cylinder-Ø	Air consumption per 10 mm stroke 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 proximitiy switch	Suitable plug connector
20200-2090X0500	90	26300-1415010	20910-030	20950-010X2000
20200-2115X0500	115	26300-2015016	20910-030	20950-010X2000

Centring rings



Material:
Steel

Version:
Black oxide finish

Sample order:
nlm 20240-0705

Note:
The centring rings which serve to connect modules precisely or the indirect mounting of modules are installed by means of adapter plates. The internal thread serves to remove the centring rings.

Order No.	D1	D2	H	Approx. weight kg
20240-0705	7	M5	3	0,001
20240-1008	10	M8	4	0,002
20240-1310	13	M10	4	0,002

Inductive proximity switches

housing shape, round

Material:
Housing in stainless steel;
active surface in POM or PBT

Version:
Voltage: U = 10 – 30 V DC
Function: Normally open
Connection type: PNP
Mounting type: flush
Security type: IP 67

Sample order:
nlm 20900-010X2000 or to DIN specifications.

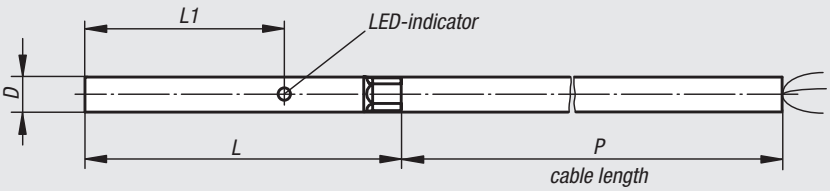
Note:
Non-contact, wear-free mode of operation, as well as high switching frequency and switching accuracy. Non-sensitive to vibrations, dust and moisture. Inductive sensors record all metals without contact.

Short-circuit proof and reverse-polarity protected.

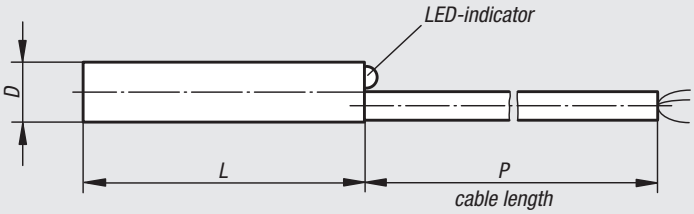
Temperature range:
-25°C to +70 °C

Safety:
This product is not suited as a sensor for the protection of persons.

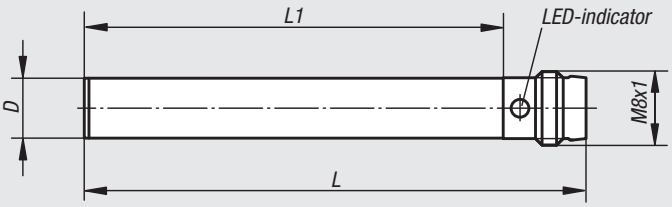
Form A



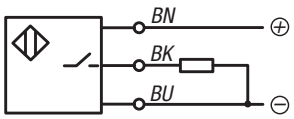
Form B



Form C



Connection diagram:

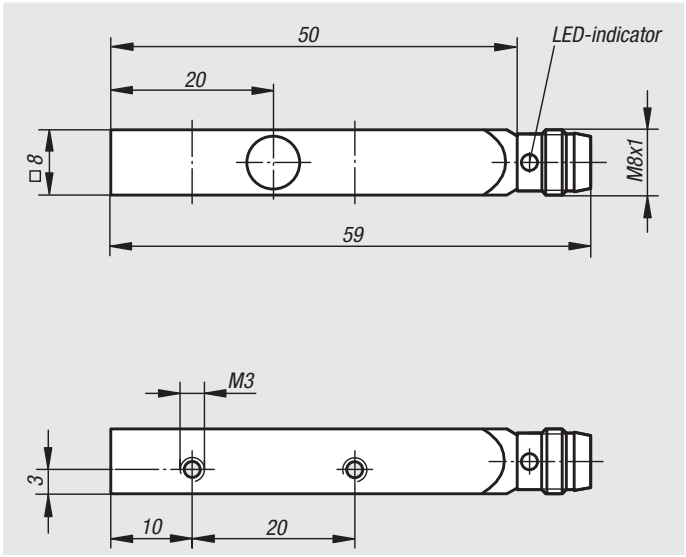


BN = brown
BK = black
BU = blue

Order No.	Form	D	L	L1	P	Material active surface	Switching distance Sn (mm)	Electricity I max. (mA)	Switching frequency f (Hz)	Connection type	Number of conductors x conductor cross-section
20900-010X2000	A	3	27	16,7	2000	POM	1	100	2000	PUR cable	3 x 0,09 mm²
20900-020X5000	A	4	27	15,4	5000	POM	1,5	100	3000	PUR cable	3 x 0,14 mm²
20900-030X3000	B	6,5	30	-	3000	PBT	1,5	200	3000	PVC cable	3 x 0,14 mm²
20900-040	C	6,5	55	43	-	PBT	1,5	200	3000	plug connector	3
20900-050	C	6,5	60	48	-	PBT	1,5	200	5000	plug connector	3

Inductive proximity switches

housing shape, rectangular



Material:
Housing in die cast zinc alloy;
active surface in POM

Version:
Voltage: U = 10 – 30 V DC
Function: Normally open
Connection type: PNP
Mounting type: flush
Security type: IP 67

Sample order:
nlm 20905-010

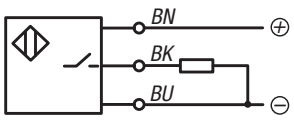
Note:
Non-contact, wear-free mode of operation, as well as high switching frequency and switching accuracy. Non-sensitive to vibrations, dust and moisture. Inductive sensors record all metals without contact.

Short-circuit proof and reverse-polarity protected.

Temperature range:
-25°C to +70 °C

Safety:
This product is not suited as a sensor for the protection of persons.

Connection diagram:



BN = brown
BK = black
BU = blue

Order No.	Switching distance Sn (mm)	Electricity I max. (mA)	Switching frequency f (Hz)	Connection type	Number of conductors x conductor cross-section
20905-010	1,5	200	5000	plug connector	3

Inductive proximity switches

with threaded holder

Material:
Housing in stainless steel or brass nickel-plated;
active surface in PBT or PA 12

Version:
Voltage: U = 10 – 30 V DC
Function: Normally open
Connection type: PNP
Mounting type: flush
Security type: IP 67

Sample order:
nlm 20910-010X5000 or to DIN specifications.

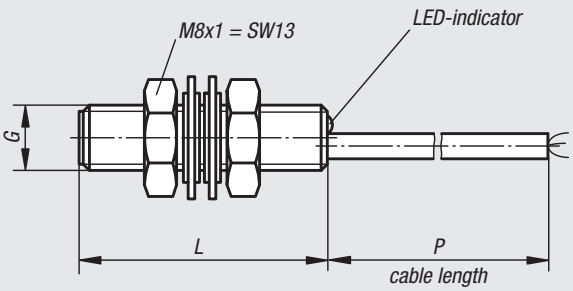
Note:
Non-contact, wear-free mode of operation, as well as high switching frequency and switching accuracy. Non-sensitive to vibrations, dust and moisture. Inductive sensors record all metals without contact.

Short-circuit proof and reverse-polarity protected.

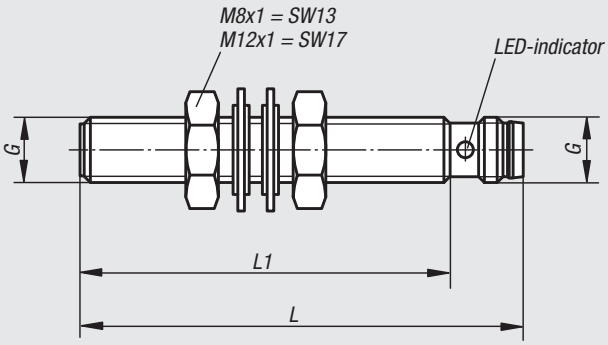
Temperature range:
-25 °C to +70 °C.

Safety:
This product is not suited as a sensor for the protection of persons.

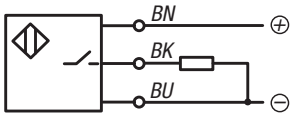
Form A



Form B



Connection diagram:



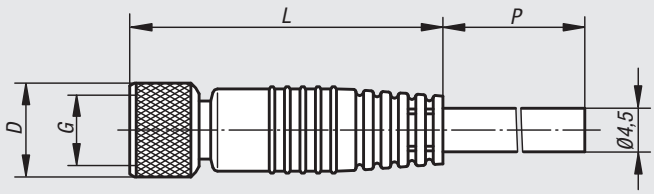
BN = brown
BK = black
BU = blue

Order No.	Material	Form	G	L	L1	P	Material active surface	Switching distance Sn (mm)	Electricity I max. (mA)	Switching frequency f (Hz)	Connection type	Number of conductors x conductor cross-section
20910-010X5000	stainless steel	A	M8x1	30	-	5000	PBT	1,5	200	3000	PUR cable	3 x 0,14 mm²
20910-020	stainless steel	B	M8x1	45	34,5	-	PBT	2	200	1500	plug connector	3
20910-030	stainless steel	B	M8x1	55	44,5	-	PBT	2	200	1500	plug connector	3
20910-040	brass	B	M8x1	59	50	-	PA 12	1,5	100	1000	plug connector	3
20910-050	brass	B	M8x1	59	50	-	PA 12	2	200	700	plug connector	3
20910-060	brass	B	M12x1	65	50	-	PA 12	2	200	1200	plug connector	3
20910-070	brass	B	M12x1	65	50	-	PA 12	4	200	500	plug connector	3

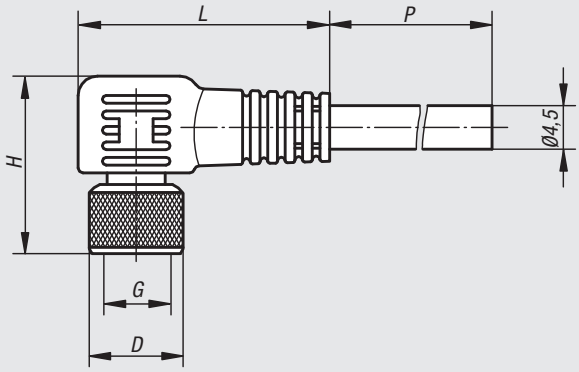
Plug connectors

with screw fitting

Form A



Form B



Material:
Cable and housing PUR
Contacts, gold-plated bronze.

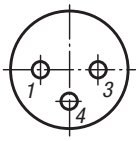
Version:
Bush (female)
Voltage: U max. 60 V
Current: I max. 4 A
Number of terminals: 3-pin
Security type: IP 67

Sample order:
nlm 20950-010X2000 or to DIN specifications.

Note:
Plug connector with screw locking. Plug connector coated at the cable.

Temperature range:
-25°C to +70 °C

Connection diagram of sleeve:



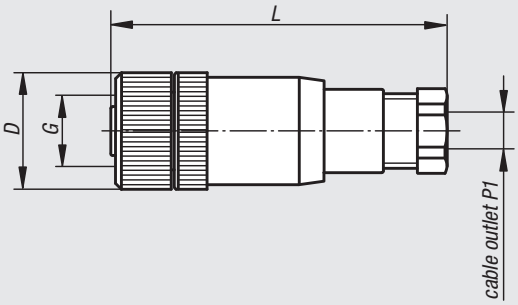
1 = brown (BN)
3 = blue (BU)
4 = black (BK)

Order No.	Form	D	H	G	L	P	Number of conductors x conductor cross-section
20950-010X2000	A	9,7	-	M8x1	32	2000	3 x 0,25 mm²
20950-020X2000	A	14,5	-	M12x1	41,5	2000	3 x 0,34 mm²
20950-030X2000	B	9,7	18,2	M8x1	26	2000	3 x 0,25 mm²
20950-040X2000	B	14,5	26,5	M12x1	38,5	2000	3 x 0,34 mm²

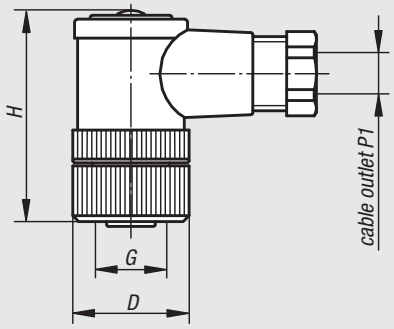
Plug connectors

convertible with screw fitting

Form A



Form B



Material:
Housing, plastic
Contacts, gold-plated bronze at M8x1.
Contacts brass Optaloy coated at M12x1.

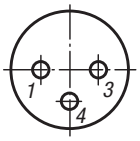
Version:
Bush (female)
Voltage: U max. 60 V
Current: I max. 4 A
Number of terminals: 3-pin
(4-pin at M12x1)
Security type: IP 67

Sample order:
nlm 20955-010

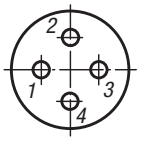
Note:
Convertible plug connector with screw locking.

Temperature range:
-25 °C to +85 °C.

Connection diagram of sleeve:



1 = brown (BN)
3 = blue (BU)
4 = black (BK)



1 = brown (BN)
2 = white (WH)
3 = blue (BU)
4 = black (BK)

Order No.	Form	D	G	H	L	P1	Connection type	Connection cross-section max. (mm^2)
20955-010	A	12	M8x1	-	45	3,5 - 5	screw fitting	0,5
20955-020	A	20	M12x1	-	54	4 - 6	screw fitting	0,75
20955-030	B	12	M8x1	28	-	3,5 - 5	soldered connection	0,25
20955-040	B	20	M12x1	38	-	4 - 6	screw fitting	0,75