

Series HMU

Randzylinder, double acting

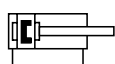
Technical details

Operating pressure	1 ... 10 bar
Temperature range	-20°C ... +80°C
Max. stroke	900 mm
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Differing the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Cylinder tube: stainless steel End caps: Al (anodized) Piston rod: stainless steel Seals: PU, NBR

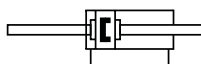


Double acting pneumatic cylinder with magnetic piston and built-in cushioning rings or adjustable cushions.

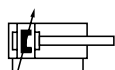
Versions



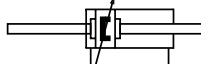
HMU
double acting, with magnetic piston



HMUDE
double acting, double end piston rod, with magnetic piston



HMUP
double acting, adjustable cushioning, with magnetic piston



HMUPDE
double acting, double end piston rod, adjustable cushioning, with magnetic piston

Order code

HMU***-**-**-***-*			
Series		Options	
HMU		RG	piston rod thread according to ISO
HMUP		Stroke (mm)	
HMUDE		XXX	max. 900 mm
HMUPDE		Standard [#]	25, 40, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500 mm
Version		Piston Ø	
without	standard version	32	32 mm
S	lateral air connection, rear	40	40 mm
Z	central air connection, rear		

[#] only for series HMU and HMUP

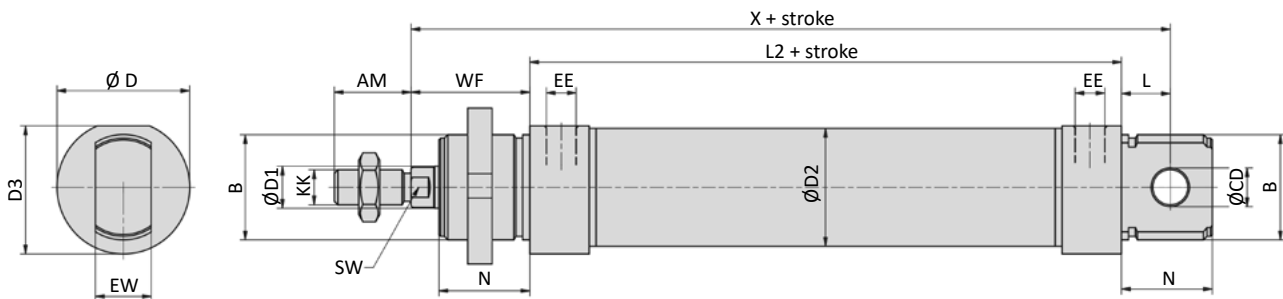
Series HMU

Randzylinder, double acting

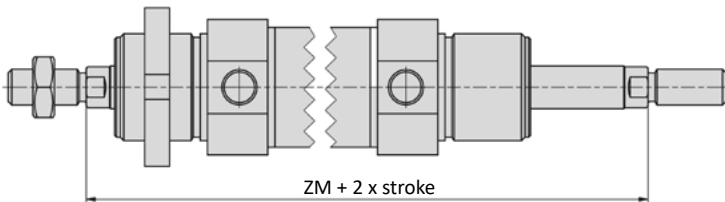
Technical data

Model-no.:	HMU-32-...	HMU-40-...	HMUP-32-...	HMUP-40-...
Piston Ø (mm)	32	40	32	40
Force at 6 bar (N)	434	678	434	678
Extension				
Retraction				
Connection	G1/8	G1/4	G1/8	G1/4
Piston rod thread	M10 x 1.25	M12 x 1.25	M10 x 1.25	M12 x 1.25
Cushioning length (mm)	-	-	22.5	24.5

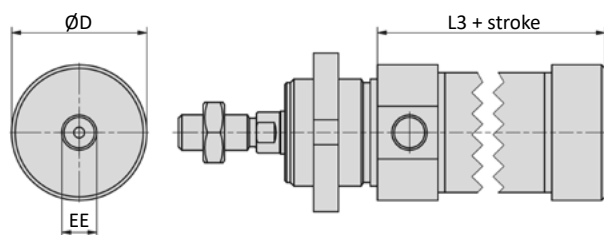
Dimensions series HMU, HMUP



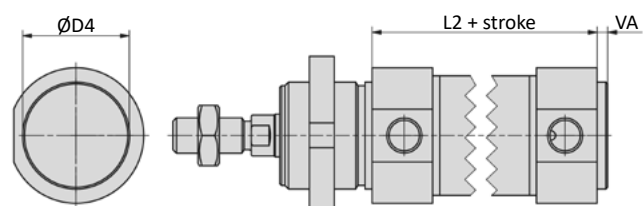
double end piston rod



Version -Z



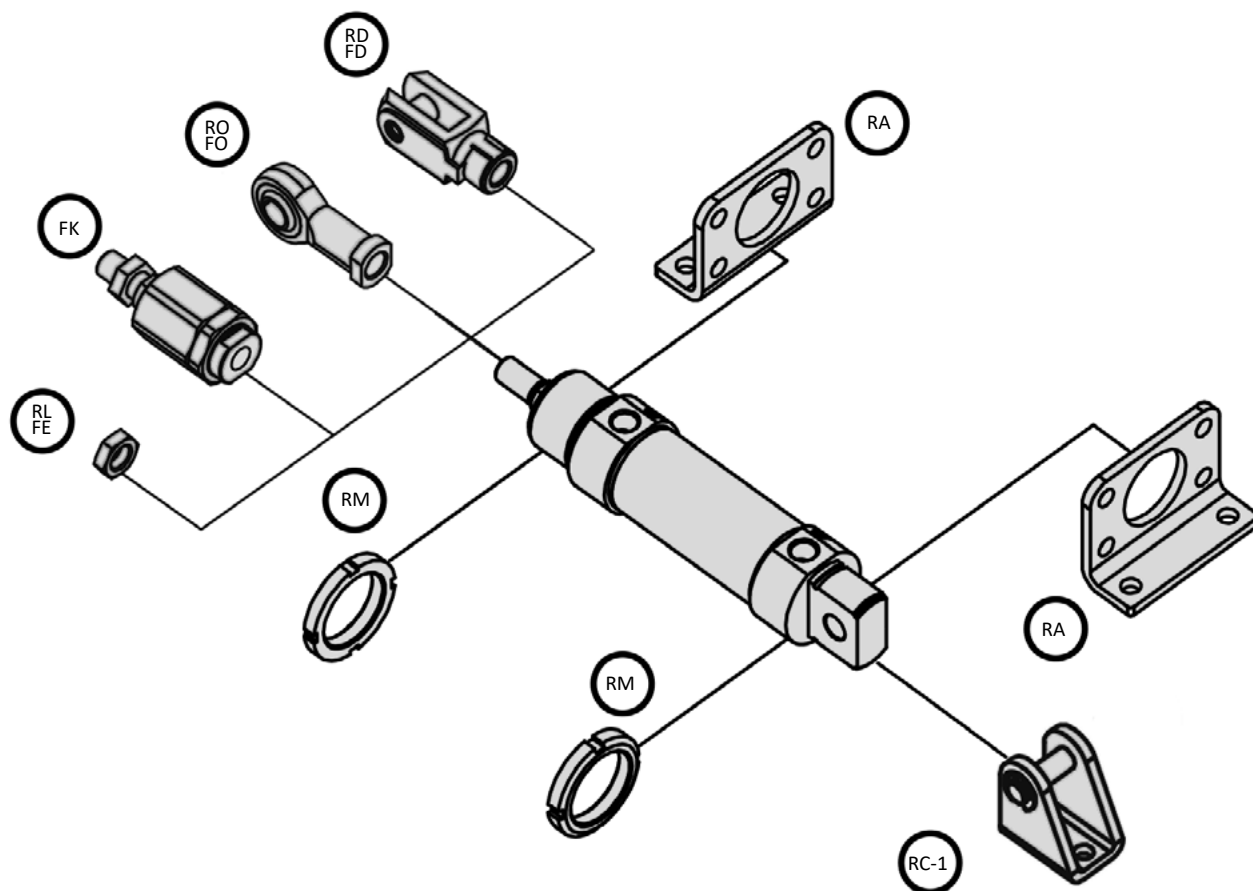
Version -S



Piston Ø	AM	B	Ø CD	Ø D	Ø D1	Ø D2	D3	Ø D4	EE	EW
32	22	M30 x 1.5	10	38	12	33.6	36.5	30	G1/8	16
40	24	M38 x 1.5	12	46	16	41.6	44	38	G1/4	18

Piston Ø	KK	L	L2	L3	N	SW	VA	WF	X	ZM
32	M10 x 1.25	14	69.5	65.5	26	10	3	34	117.5	137.5
40	M12 x 1.25	16	84.5	77.5	30	13	4	39	139.5	162.5

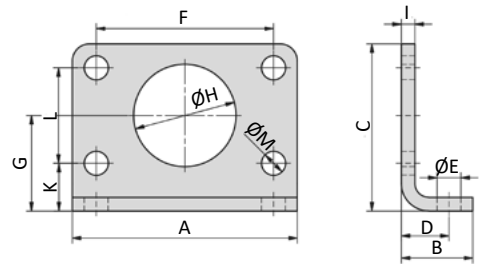
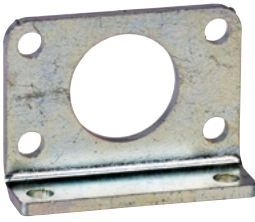
Mounting the add-on parts



Series HMU

Mounting accessories

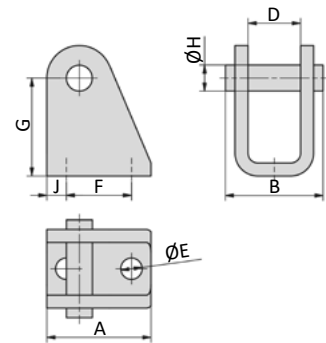
RA-xx Foot mount



Model-no.:	A	B	C	D	Ø E	F	G	Ø H	I	K	L	Ø M
RA-32	66	21	49	14	7	52	28	30	4	14	28	7
RA-40	80	30	58	20	9	60	33	38	5	18	30	9

Materials: steel, zinc plated

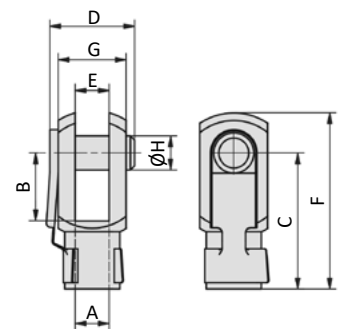
RC-xx-1 Clevis mount



Model-no.:	A	B	D	Ø E	F	G	Ø H	J
RC-32-1	35	31.3	16.1	6.6	24	35	10	5.5
RC-40-1	45	35.5	18.1	9	30	40	12	7.5

Materials: steel, zinc plated, 2 snap rings are included..

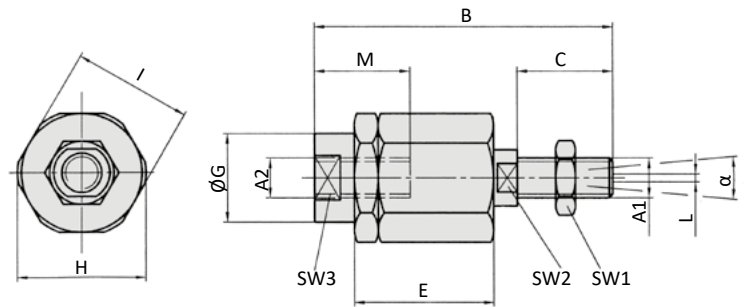
RD-xx, FD-xx Rod clevis



Model-no.:	A	B	C	D	E	F	G	Ø H
RD-25	M10 x 1.25	20	40	26	10	52	20	10
FD-40	M12 x 1.25	24	48	32	12	62	24	12

Materials: steel, zinc plated

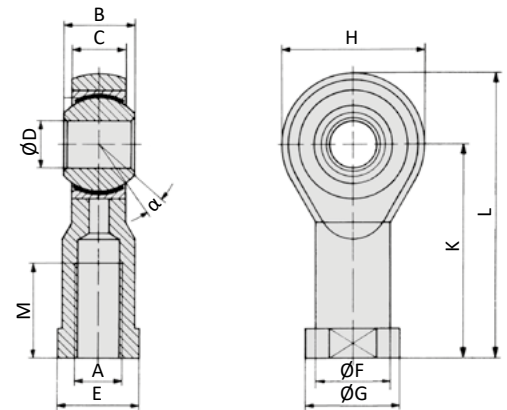
FK-xx Flexible coupling



Model-no.:	A1, A2	B	C	D	E	Ø G	H	I	L	M	SW1	SW2	SW3	α
FK-32	M10 x 1.25	71.5	20	7.5	35	22	32	30	2	22	17	12	19	8°
FK-40	M12 x 1.25	75	24	7.5	35	22	32	30	2	22	19	12	19	8°

Materials: steel, zinc plated

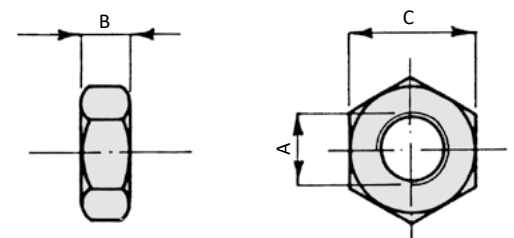
RO-xx, FO-xx Rod eye



Model-no.:	A	B	C	Ø D	E	Ø F	Ø G	H	K	L	M	α
RO-25	M10 x 1.25	14	10.5	10	17	15	19	28	43	57	20	13°
FO-40	M12 x 1.25	16	12	12	19	17.5	22	32	50	66	22	13°

Materials: steel, zinc plated, bearing steel, bronze bushing

RL-xx, FE-xx Piston rod nut



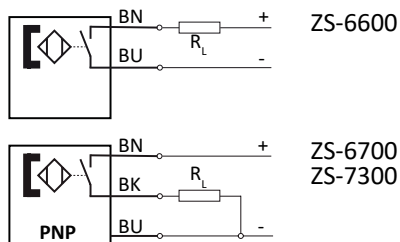
Model-no.:	for cylinder Ø	A	B	C
RL-25	32	M10 x 1.25	5	17
FE-40	40	M12 x 1.25	6	19

Materials: steel, zinc plated

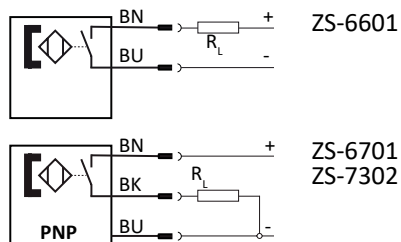
Series ZS

Proximity sensors

Proximity sensors with cable



Proximity sensors with plug

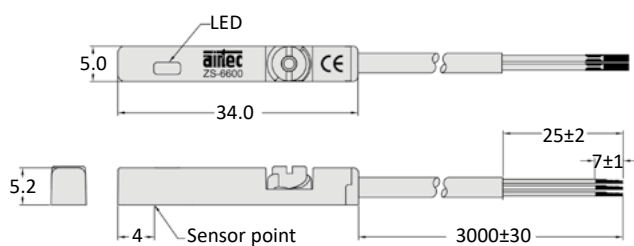
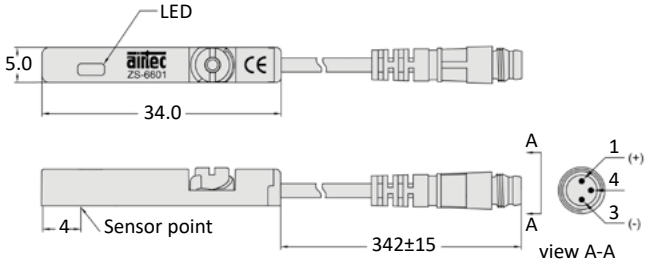
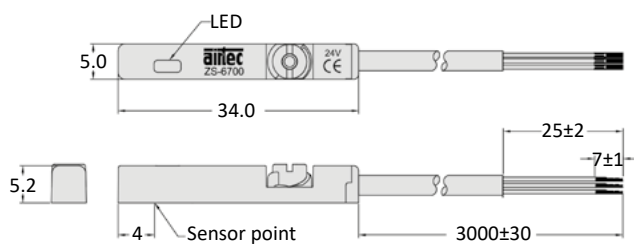
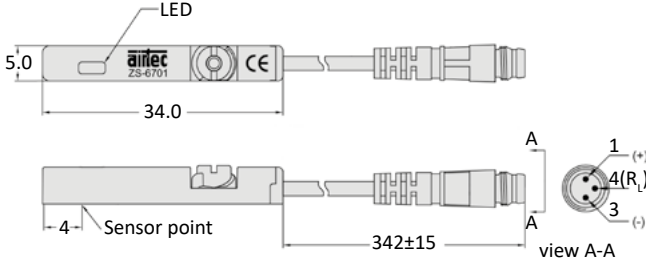


Technical data

Model-no.:	ZS-6600	ZS-6601	ZS-6700	ZS-6701
				
Design	2-pole inductive	2-pole inductive	3-pole inductive	3-pole inductive
Contact function	NO	NO	NO	NO
Output	NO	NO	PNP	PNP
Rated operational voltage	10 ... 30 V DC	10 ... 30 V DC	5 ... 30 V DC	5 ... 30 V DC
Rated operational current I_E	≤ 50 mA	≤ 50 mA	≤ 100 mA	≤ 100 mA
Max. voltage drop at I_E	≤ 2.65	≤ 2.65	≤ 1.0	≤ 1.0
Breaking capacity	1,4 W	1,4 W	3 W	3 W
Sensitivity	40 ~ 800 Gauss	40 ~ 800 Gauss	40 ~ 800 Gauss	40 ~ 800 Gauss
Cable length	3 m	0.3 m with M8 connection	3 m	0.3 m with M8 connection
Reverse polarity protection	nein	nein	ja	ja
Temperature range	-10 ... +70°C	-10 ... +70°C	-10 ... +70°C	-10 ... +70°C
Protection	IP 67	IP 67	IP 67	IP 67
Switching status indication	LED red	LED red	LED red	LED red

Model-no.:	ZS-7300	ZS-7302
		
Design	3-pole inductive	3-pole inductive
Contact function	NO	NO
Output	PNP	PNP
Rated operational voltage	10 ... 30 V DC	10 ... 30 V DC
Rated operational current I_E	≤ 100 mA	≤ 100 mA
Max. voltage drop at I_E	≤ 2.5	≤ 2.5
Breaking capacity	3 W	3 W
Cable length	6 m	0.3 m with M12 connection
Temperature range	-20 ... +60°C	-20 ... +60°C
Protection	IP 67	IP 67
Switching status indication	LED yellow	LED yellow
	II 3G Ex nA T4 II 3D Ex tD A22 IP67 T 125°C	II 3D Ex tc IIIC T125°C Dc X

Dimensions

ZS-6600

ZS-6601

ZS-6700

ZS-6701


Mounting

For this cylinder series separate mounting brackets are necessary for the sensor mounting.

Mounting brackets for proximity sensors

Model-no.:

NT-550



Design

sensor mounting

Series ZS

Proximity sensors



Connection cable M8

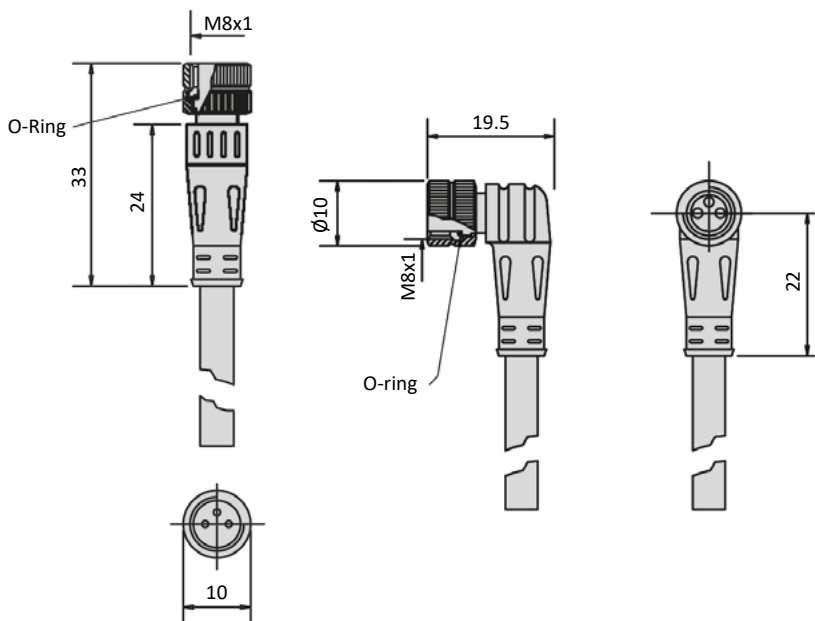
Contacts	M8 Plug socket
Protection	IP 67 according to EN 60529 in conjunction with suitable connection plug
Duty cycle	100 %
Temperature range*	-25°C...+90°C
max. voltage	60 V AC / DC
Use for	Solenoids with M8 plug, cylinder switch with M8 plug



Model-no.:	KA-10-01	KA-30-01	KA-50-01	KA-100-01
Contacts	M8 Socket, straight	M8 Socket, straight	M8 Socket, straight	M8 Socket, straight
Mounting	Coupling nut	Coupling nut	Coupling nut	Coupling nut
Cable	3-pin	3-pin	3-pin	3-pin
Length (L)	1 m	3 m	5 m	10 m

Model-no.:	KA-11-01	KA-31-01	KA-51-01	KA-101-01
Contacts	M8 Socket, elbow 90°	M8 Socket, elbow 90°	M8 Socket, elbow 90°	M8 Socket, elbow 90°
Mounting	Coupling nut	Coupling nut	Coupling nut	Coupling nut
Cable	3-pin	3-pin	3-pin	3-pin
Length (L)	1 m	3 m	5 m	10 m

Dimensions



Pin assignment



1 = brown
3 = blue
4 = black



Exceptions

Round cylinders are described by the designation of the series.
A design code is only used if there are deviations from the standard described.

If it is not possible to describe the version of the cylinder using the version code, a project number in the form Pxxxx should be used.

Not all options are suitable for all cylinder series



Cylinders

Device marking

Piston rod cylinders are marked as follows:


II 2G Ex h IIC T5...T4 Gb X
II 2D Ex h IIC T100°C...T135°C Db X
-20°C T_{amb} +40°C...+60°C

Marking according to DIN EN ISO 80079-36/ -37.

Piston rod cylinders conform to Equipment category 2 and can be used in Zone 1 respectively Zone 21.

Available cylinders

Series	Versions
HMU	HMU, HMUP, HMUDE, HMUPDE

Piston rod cylinders

Piston rod cylinders according ATEX are marked with following suffix:

-ATEX
-EX
-X

Accessories for piston rod cylinders

The cylinders are intended to be used with the following accessories:

Accessories	series
Flexible coupling	FK-Ø
Rod eye	FO-Ø, RO-Ø, PO-Ø (v _{max} 1 m/s)
Rod clevis	FD-Ø, RD-Ø, PD-Ø
Piston rod nut	FE-Ø, RL-Ø, PL-Ø
Mounting accessories XL	XLB-Ø-01, XLB-Ø-02, XLB-Ø-03, XLB-Ø-04, XLB-Ø-05, XLB-Ø-06, XLB-Ø-07, XLB-Ø-08, XLB-Ø-09, XLB-Ø-10, XLB-Ø-11, XLB-Ø-12, XLB-Ø-13, XLB-Ø-14,
Mounting accessories XG	VLB-Ø-01, VLB-Ø-02, VLB-Ø-03, VLB-Ø-04, VLB-Ø-05, VLB-Ø-06, VLB-Ø-08, VLB-Ø-09, VLB-Ø-12
Mounting accessories HM	RA-Ø, RC-Ø, RG-Ø, RH-Ø, RB-Ø, RM-Ø
Mounting accessories CM	PA-Ø, PC-Ø, PB-Ø, PM-Ø

Proximity switches

Model-No.	Classification / Identification marking
ZS-7300	 II 3G Ex nA T4 II 3D Ex tD A22 IP67 T 125°C
ZS-7302	 II 3D Ex tc IIC T125°C Dc X



The operating instructions for the valve and the electrical equipment must be taken into account before putting into operation. These are included with each valve and are available at www.airtec.de.

Air consumption cylinder (NI for a single stroke of 100 mm, based upon extension)

Piston-Ø	Pressure in bar						
	2	3	4	5	6	7	8
32	0.24	0.32	0.40	0.48	0.56	0.64	0.72
40	0.38	0.50	0.63	0.75	0.88	1.01	1.13

Required flow rate (NI/min at p = 6 bar)

Piston-Ø	speed (m/s)				
	0.25	0.5	1	1.5	2
32	84	169	338	506	675
40	132	264	528	791	1055

Force chart cylinders (N)

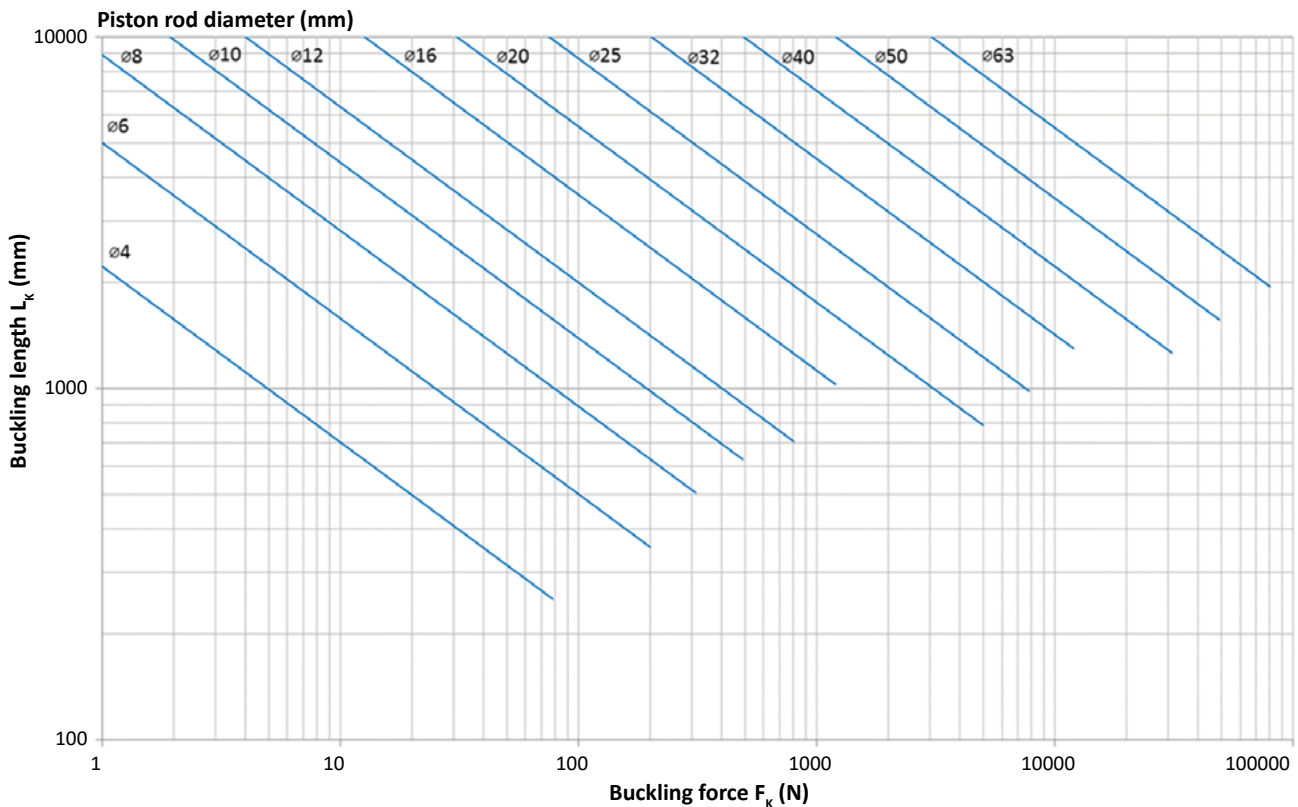
Piston-Ø	Series	Piston rod Ø (mm)	Pressure in bar						
			2	3	4	5	6	7	8
32			145	217	289	362	434	506	579
	HMU	12	124	187	249	311	373	435	497
40			226	339	452	565	678	791	904
	HMU	16	190	285	380	475	570	665	760

extension force*

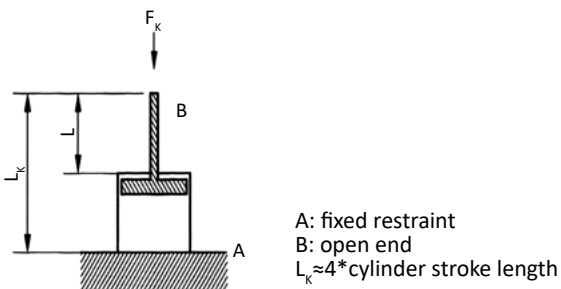
retraction force*

* A correction factor of 0.9 for the internal friction is already calculated.

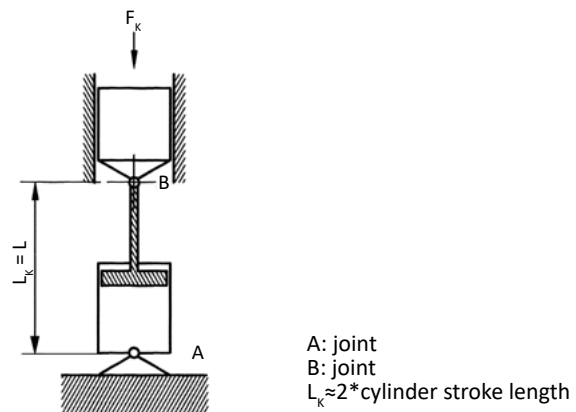
Critical load diagram for the piston rod



First elastic case of buckling



Second elastic case of buckling



Knowing the actual buckling case, either 1 or 2, and knowing the requested stroke length you can calculate the buckling length L_k . If you know the buckling force F_k (compressive force) you determine in the diagram above the intersection of both data. Choose the next graph line above to get the necessary rod diameter.