

# Table of contents

<b>ATEX</b>	<b>Page 13-02</b>
General information	Page 13-02
Mechanically operated valves	Page 13-06
Pneumatically operated valves	Page 13-06
Electrically operated valves	Page 13-07
Function valves	Page 13-10
Cylinders	Page 13-11
Accessories	Page 13-13



<b>Technical informations</b>	<b>Page 13-14</b>
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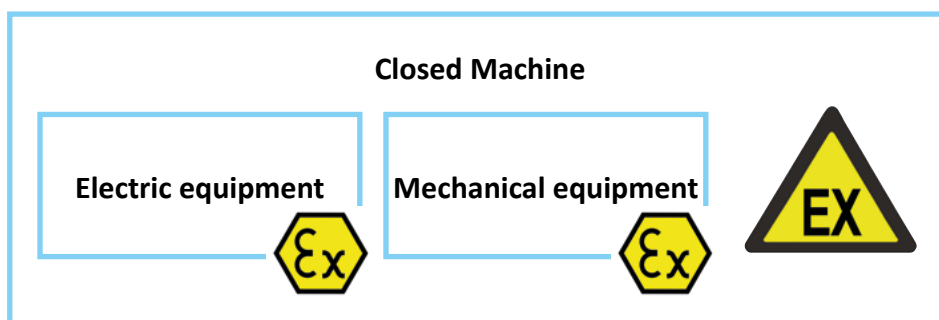
## General information

### The directive 2014/34/EU

ATEX derives its name from ATmosphere EXposable and stands for the Directive 2014/34/EU of the European Parliament. The Directive concerns electrical and non-electrical equipment and protection systems for use in potential explosive atmospheres. Since 1st of July 2003, devices and protection systems for use in potentially explosive areas must satisfy the new Directive 94/9/EC. This directive has been replaced by 2014/34/EU since 20th of April 2016.

### ATEX classifies explosive atmospheres and associates equipment

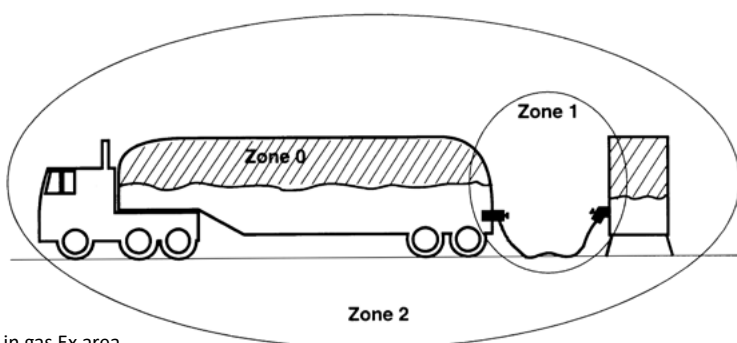
<b>Problem:</b>	Plant evaluation acc. to ATEX directive 99/92/EC		Equipment evaluation according to ATEX directive 2014/34/EU	
<b>Guarantor:</b>	Equipment manufacturer		AIRTEC Pneumatic GmbH	
<b>Outcome:</b>	<b>Zone classification</b>		<b>Equipment group</b>	
	<ul style="list-style-type: none"> <li>- Temperature class</li> <li>- Explosion group</li> <li>- Ambient temperature</li> </ul>		<ul style="list-style-type: none"> <li>- Temperature class</li> <li>- Explosion group</li> <li>- Ambient temperature</li> </ul>	



### Zone and category

Zone classification reflects the likelihood of the occurrence of an explosive atmosphere. Furthermore, differentiation is made as to whether the hazard is due to gases, vapour and mists or due to dust.

The category indicates in which zone the equipment is suitable.



Example of zone classification in gas Ex area

Equipments are divided in 2 groups. Group I is subdivided in category M1 and M2 and specifies the use of which equipment can be used in underground mining works.

All further equipment is classified into Group II.

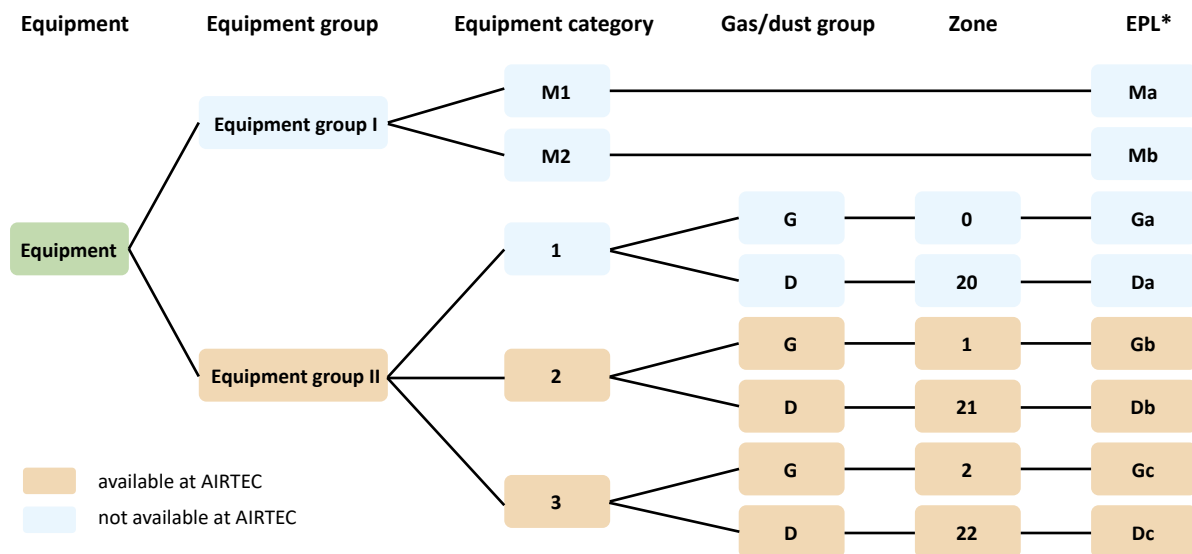
Group II is divided in Category 1, 2 and 3.

Category 1: Equipment in this category is characterised by a very high degree of safety and is specified in Zone 0 and 20.

Category 2: Equipment in this category is characterised by a high degree of safety and is specified in Zone 1 and 21

Category 3: Equipment in this category affords the necessary degree of safety in normal operation and is specified in Zone 2 and 22

## Overview Zones und Categories



\* EPL = Equipment protection level

### Equipment category 1

Devices in Equipment category 1 guarantee a very high level of safety. They are designed for areas, in which an explosive gas atmosphere is present continuously, frequently or for long periods. Devices in this category can also be used in Equipment category 2 and 3.

#### Category 1G

Devices for use in **Zone 0**

Inflammable gases, vapors or mists

An area in which an explosive gas atmosphere is present continuously, frequently or for long periods.  
Equipment protection level Ga, very high level of safety.

#### Category 1D

Devices for use in **Zone 20**

Inflammable dusts

An area in which an explosive dust atmosphere, in the form of a cloud of dust in air, is present continuously, frequently or for long periods.  
Equipment protection level Da, very high level of safety.

### Equipment category 2

Devices in Equipment category 2 guarantee a high level of safety. They are designed for areas, in which an explosive gas atmosphere is likely to occur periodically or occasionally in normal operation. Devices in this category can also be used Equipment category 3.

#### Category 2G

Devices for use in **Zone 1**

Inflammable gases, vapors or mists

An area in which an explosive gas atmosphere is likely to occur periodically or occasionally in normal operation  
Equipment protection level Gb, high level of safety.

#### Category 2D

Devices for use in **Zone 21**

Inflammable dusts

An area in which an explosive dust atmosphere, in the form of a cloud of dust in air, is likely to occur in normal operation occasionally.  
Equipment protection level Db, high level of safety.

### Equipment category 3

Devices in Equipment category 3 guarantee a normal level of safety. They are designed for areas, in which an explosive gas atmosphere is not likely to occur in normal operation but, if it does occur, it will exist for a short period only.

#### Category 3G

Devices for use in **Zone 2**

Inflammable gases, vapors or mists

An area in which an explosive gas atmosphere is not likely to occur in normal operation but, if it does occur, it will exist for a short period only.  
Equipment protection level Gc, normal level of safety.

#### Category 3D

Devices for use in **Zone 22**

Inflammable dusts

An area in which an explosive dust atmosphere, in the form of a cloud of combustible dust in air, is not likely to occur in normal operation but, if it does occur, will persist for a short period only.  
Equipment protection level Dc, normal level of safety.



## General information

### Equipment protection level

#### EPL Ga or Da

Equipment with a very high protection level for use in hazardous areas. In normal operation this equipment represents no risk of ignition in the event of predictable or rare faults/malfunctions.

#### EPL Gb or Db

Equipment with a high protection level for use in hazardous areas which represents no risk of ignition in normal operation or in the event of predictable faults/malfunctions.

#### EPL Gc or Dc

Equipment with an advanced protection level for use in hazardous areas. There is no risk of ignition during normal operation. The equipment has additional protective measures that ensure no risk of ignition in the event of typically predictable equipment faults.


### Temperature class

It must be ensured that the ignition temperature of an inflammable material is not reached during operation. For this purpose, the maximum surface temperature of a device must be less than the minimum ignition temperature. For this reason, the maximum surface temperature of equipment for use with inflammable gases, vapors or mists is specified in temperature classes. For dusty environments, the maximum surface temperature is specified in °C.

Temperature class	Maximum permissible surface temperature of the device
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C



## Device marking


**II 2G Ex h IIC T5 Gb**  
**II 2D Ex h IIIC T100°C Db**

## 1. row

**marking according to RL 2014/34/EU**

**II** Equipment group: II Equipment for hazardous areas - apart from mining

**2G** Equipment category: 2 for Zone 1 and G for gases

**marking according to DIN EN ISO 80079-36**

**Ex** abbreviation for explosion protection

**h** Symbol for ignition protection class: h is representative for 6 different ignition protection classes  
h can be e.g. constructional safety c, flameproof enclosure d, pressurised enclosure p etc.

**IIC** Explosion group II = gases  
The device group II is sub-divided into explosion group A, B and C. The subdivision is indicating the gap width of a technical device. C indicates the highest and A the lowest requirement class.  
The selection of the explosion is depending of the media and the correspondent explosion group requirement.

**T5** Temperature class: T5 assignment of gases and vapors accordance to the ignition temperature > 100°C

**Gb** Equipment protection level (EPL) G = gases b = Equipment with a high protection level for use in hazardous areas which represents no risk of ignition in normal operation or in the event of predictable faults/malfunctions.  
suitable for zone 1

## 2. row

**marking according to RL 2014/34/EU**

**II** Equipment group: II Equipment for hazardous areas - apart from mining

**2D** Equipment category: 2 for Zone 1 and D for dust Zone 21

**marking according to DIN EN ISO 80079-36**

**Ex** abbreviation for explosion protection

**h** Symbol for ignition protection class: h is representative for 6 different ignition protection classes  
h can be e.g. constructional safety c, flameproof enclosure d, pressurised enclosure p etc.

**IIIC** Explosion group III = Inflammable dusts, fluff  
C is indicating the type of dust for which the equipment is suitable. Additionally it's divided in A: flammable suspended materials, B: flammable suspended materials and non-conductive dusts and C: flammable suspended materials and conductive dusts.

**T100°C** maximum permissible surface temperature

**Db** Equipment protection level (EPL) D = dust b = Equipment with a high protection level for use in hazardous areas which represents no risk of ignition in normal operation or in the event of predictable faults/malfunctions.  
suitable for zone 21



## Valves

Mechanically and pneumatically operated

### Mechanically operated valves

#### Device marking

Mechanically operated valves are marked as follows:

**II 2G Ex h IIB T6 Gb**  
**II 2D Ex h IIIC T85°C Db**  
**-10°C T<sub>amb</sub> +50°C**

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

Mechanically operated valves conform to Equipment category 2 and can be used in Zone 1 respectively Zone 21.

#### Available valves


Series	Versions
HF-12	310, 510, 530, 533
HF-14	310, 510, 530, 533
HF-18	310, 510, 530, 533
HR-12	320, 520, 530, 533

Series	Versions
HR-14	320, 520, 530, 533
HR-18	320, 520, 530, 533
T-28	311
T-30	310, 510

### Pneumatically operated valves

#### Device marking

Pneumatically operated valves are marked as follows:

 **II 2G Ex h IIC T5 Gb**  
**II 2D Ex h IIIC T100°C Db**  
**-10°C T<sub>amb</sub> +50°C**

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

Pneumatically operated valves conform to Equipment category 2 and can be used in Zone 1 respectively Zone 21.

#### Available Valves

Series	Versions
L-25	311, 320, 511, 520
L-28	311, 320, 511, 520
P-05	311, 320, 511, 520, 530, 533, 534
P-07	311, 320, 511, 520, 530, 533, 534
P-12	311, 320, 511, 520, 530, 533, 534
PI-01	511, 520
PI-02	511, 520, 530, 533, 534
PI-03	511, 520, 530, 533, 534

Series	Versions
PKX-09	511, 520
PKX-10	511, 520, 530
PN-05	311, 511, 520, 530
PNX-55	311, 511, 520



The operating instructions for the valve must be taken into account before putting into operation. These are included with each valve and are available at [www.airtec.de](http://www.airtec.de).

## Device marking

Electrically operated valves are marked as follows:

II 2G Ex h IIC T5 Gb  
II 2D Ex h IIIC T100°C Db  
-10°C T<sub>amb</sub> +50°C

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



Electrically operated valves conform to equipment category 2 can be used in Zone 1 respectively in Zone 21. For the use in hazardous areas the category group of the used coil has to be taken into account. The specification of the whole equipment corresponds always to the lowest category of the single components.

## Available valves

Series	Versions
KM-09	510, 511, 520, 530, 533, 534
KM-10	510, 511, 520, 530, 533, 534
KMX-09	511, 520
KMX-10	511, 520, 530
KN-05	310, 311, 510, 511, 520, 530, 533, 534
KN-55	311, 511
KNX-55	311, 511, 520
M-04	310, 510, 511, 520, 530, 533
M-05	310, 311, 510, 511, 520, 530, 533, 534
M-07	310, 311, 510, 511, 520, 530, 533, 534
M-22	310, 311, 510, 511, 520, 530, 533
M-94	510, 511
M-95	310, 311, 510, 511, 520, 530, 533

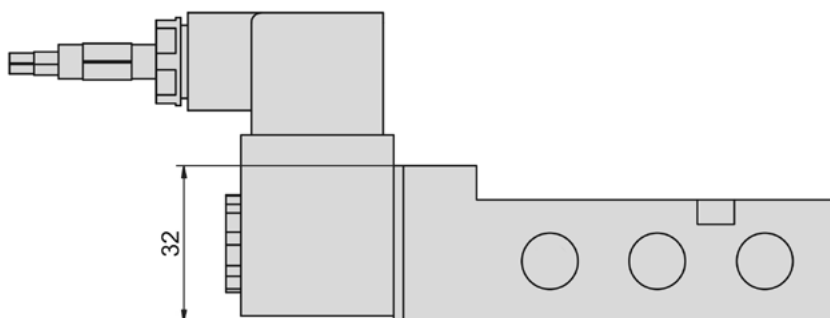
Series	Versions
M-97	311, 510, 511, 520, 530, 533
ME-05	311, 320, 511, 520
ME-07	311, 320, 511, 520
MO-05	311
MO-07	311
MO-22	310, 311
MI-01	511, 520, 530, 533
MI-02	511, 520, 530, 533
MI-03	511, 520, 530, 533
MN-06	310, 311, 510, 511, 520, 530
MS-18	310
MS-98	310



The use of special electrical equipment and operators requires in certain cases a design change of the valve. All changes are shown on the following pages.

For the NAMUR valve as well the body dimension is different to standard. Please see below.

## KN-05, MN-06 Divergent dimensions



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](http://www.airtec.de).



## Valves

Electrically operated



### Solenoid coils

#### 23-SP-037

Ignition protection class	Encapsulated with casting compound mb (gases) mb tb (dust)
Classification	II 2G Ex mb IIC T5 II 2D Ex mb tb IIIC T95°C IP65
Overall width	30 mm
Temperature range*	-20°C...+50°C (battery fitted -20°C...+40°C)
Temperature range medium	-10°C...+50°C (battery fitted -10°C...+40°C)

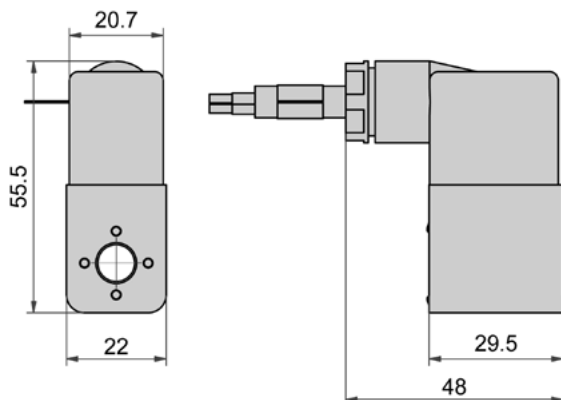
\* The max. applicable operating temperature depends on the temperature specification of the used valve.



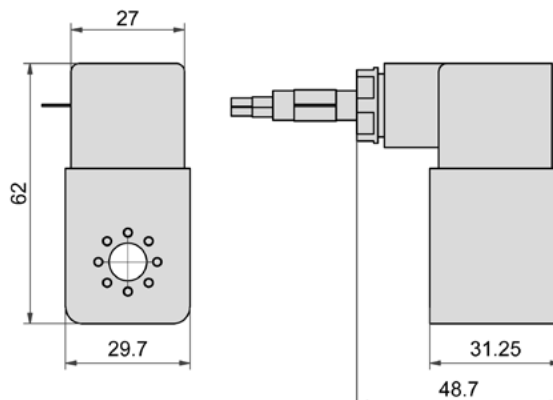
Model-no.:	23-SP-037-012-xx	23-SP-037-025-xx	23-SP-037-027-xx
Voltage	24 V DC	110...120 V AC	230 V AC
Power consumption	3.3 W	3 VA	3.1 VA
Rated current	136 mA	27 mA	14 mA
Connecting cable (xx)	03 = 3 m, 05 = 5 m, 10 = 10 m	03 = 3 m	03 = 3 m, 05 = 5 m

### Dimensions

#### 23-SP-036



#### 23-SP-037



## Solenoid coils

### 23-SP-038

<b>Ignition protection class</b>	Intrinsically safe ia (gases) t (dust)
<b>Classification</b>	II 2G Ex ia IIC T6 Ga ( $\leq 28$ V DC) II 2G Ex ia IIB T6 Ga ( $\leq 32$ V DC) II 2D Ex t IIIC T80°C Db IP65
<b>Overall width</b>	30 mm
<b>Temperature range*</b>	-40°C...+50°C
<b>Temperature range medium</b>	-10°C...+50°C (battery fitted -10°C...+40°C)

\* The max. applicable operating temperature depends on the temperature specification of the used valve.



<b>Model-no.:</b>	23-SP-038-01-912
<b>Voltage</b>	$U \leq 28$ V DC / $U \leq 32$ V DC
<b>Rated current</b>	$I \leq 115$ mA / $I \leq 195$ mA
<b>Rated current</b>	375 mA
<b>Connection</b>	plug (part of delivery)

### 23-SP-040

<b>Ignition protection class</b>	Non-sparking device na (gases) tc (dust)
<b>Classification</b>	II 3G Ex na IIC T6 Gc II 3D Ex tc IIIC T95°C Dc IP65
<b>Overall width</b>	30 mm
<b>Temperature range*</b>	-20°C...+50°C
<b>Temperature range medium</b>	-10°C...+50°C (battery fitted not allowed)

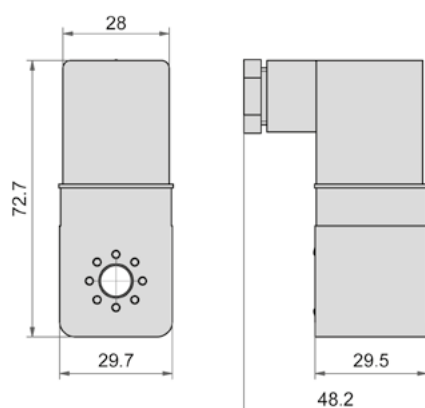
\* The max. applicable operating temperature depends on the temperature specification of the used valve.



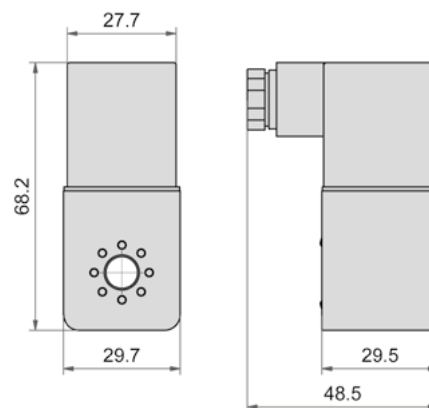
<b>Model-no.:</b>	23-SP-040-B12	23-SP-040-B27
<b>Voltage</b>	24 V DC	230 V AC
<b>Power consumption</b>	2.7 W	4 VA
<b>Rated current</b>	112 mA	15...18 mA
<b>Connection</b>	plug (part of delivery)	plug (part of delivery)

## Dimensions

### 23-SP-038



### 23-SP-040






## Valves

### Function valves

#### Function valves

#### Device marking

Function valves are marked as follows:


**II 2G Ex h IIB T6 Gb**  
**II 2D Ex h IIIC T85°C Db**  
**-10°C T<sub>amb</sub> +50°C**

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

Function valves conform to Equipment category 2 and can be used in Zone 1 respectively Zone 21.

#### Available valves

Series	Versions
SE	SE-18, SE-14, SE-12

Function valves according ATEX are marked with following suffix:

**-ATEX**



## Piston rod cylinders

### Device marking

Piston rod cylinders are marked as follows:

**II 2G Ex h IIC T5 Gb**  
**II 2D Ex h IIIC T100°C Db**  
**-20°C T<sub>amb</sub> +80°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
XL	XL, XLH
	XLC (-40°C T <sub>amb</sub> +80°C)
XG	XG, XGH (only up to Ø 200 mm)
HM	HM, HMP, HMDE, HMPDE
CM	CM, CMP, CMDE, CMPDE

### Device marking

Piston rod cylinders are marked as follows:

**II 2G Ex h IIB T4 Gb**  
**II 2D Ex h IIIC T120°C Db**  
**-20°C T<sub>amb</sub> +80°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
XM	XM, XM4, XMH, XM4H
NYD	Ø 20 and 25 with 5 ... 60 mm stroke, Ø 32 up to 100 with 5 ... 80 mm stroke
NYE	5, 10, 15, 20 and 25 mm stroke
NYDK	NYDK2, NYDK3, NYDK4
NYM	MYM2AG, NYM2IG, NYM3AG, NYM3IG
NYR2	NYR2

Piston rod cylinders according ATEX are marked with following suffix:

**-ATEX**  
**-EX**  
**-X**



The operating instructions for the cylinder must be taken into account before putting into operation. These are included with each cylinder and are available at [www.airtec.de](http://www.airtec.de).




## Cylinders

### Rodless cylinders series ZX

#### Device marking

ZX-cylinder are marked as follows:

 II 2G Ex h IIC T6 Gb  
 $-10^{\circ}\text{C} \leq T_{\text{amb}} \leq 60^{\circ}\text{C}$

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

Rodless cylinders conform to Equipment category 2G and can be used in Zone 1.

#### Available rodless cylinders

ZX      ZX-Ø-S, ZX-Ø-K, ZX-Ø-SG, ZX-Ø-KG, ZX-Ø-SR, ZX-Ø-KR,

Rodless cylinders according ATEX are marked with following suffix:

**-EX**  
**-X**



The operating instructions for the cylinder must be taken into account before putting into operation. These are included with each cylinder and are available at [www.airtec.de](http://www.airtec.de).

## Accessories for valves

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

Accessories	series
Manifolds	R-181/n, R-281/n, R-141/n
Manifolds	RF-09/n, RF-10/n
Blind plates	RF-181-V, RF-281-V, R-141-V, RF-09-V, RF-10-V
Mounting brackets	R-181-W, R-281-W, R-141-W

## 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

## Accessories for rodless cylinders

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

Accessories	series
Mounting accessories ZX	ZXB-Ø-01, ZXB-Ø-02, ZXB-Ø-10, ZXB-Ø-20

## 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 IIIC T125°C Dc X



The operating instructions for the equipment must be taken into account before putting into operation. These are available at [www.airtec.de](http://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
8	0.02	0.02	0.03	0.03	0.04	0.04	0.05
10	0.02	0.03	0.04	0.05	0.05	0.06	0.07
12	0.03	0.05	0.06	0.07	0.08	0.09	0.10
16	0.06	0.08	0.10	0.12	0.14	0.16	0.18
20	0.09	0.13	0.16	0.19	0.22	0.25	0.28
25	0.15	0.20	0.25	0.29	0.34	0.39	0.44
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
50	0.59	0.79	0.98	1.18	1.37	1.57	1.77
63	0.94	1.25	1.56	1.87	2.18	2.49	2.81
80	1.51	2.01	2.51	3.02	3.52	4.02	4.52
100	2.36	3.14	3.93	4.71	5.50	6.28	7.07
125	3.72	4.96	6.21	7.42	8.64	9.91	11.14
160	6.09	8.12	10.16	12.16	14.16	16.23	18.25
200	9.52	12.68	15.88	19.00	22.12	25.36	28.52
250	14.88	19.81	24.81	29.69	34.56	39.63	44.56

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

Piston-Ø	speed (m/s)				
	0.25	0.5	1	1.5	2
8	5	11	21	32	42
10	8	16	33	49	66
12	12	24	47	71	95
16	21	42	84	127	169
20	33	66	132	198	264
25	52	103	206	309	412
32	84	169	338	506	675
40	132	264	528	791	1055
50	206	412	824	1236	1649
63	327	654	1309	1963	2617
80	528	1055	2110	3165	4220
100	824	1649	3297	4946	6594
125	1288	2576	5152	7727	10303
160	2110	4220	8440	12660	16881
200	3297	6594	13188	19782	26376

## Force chart cylinders (N)

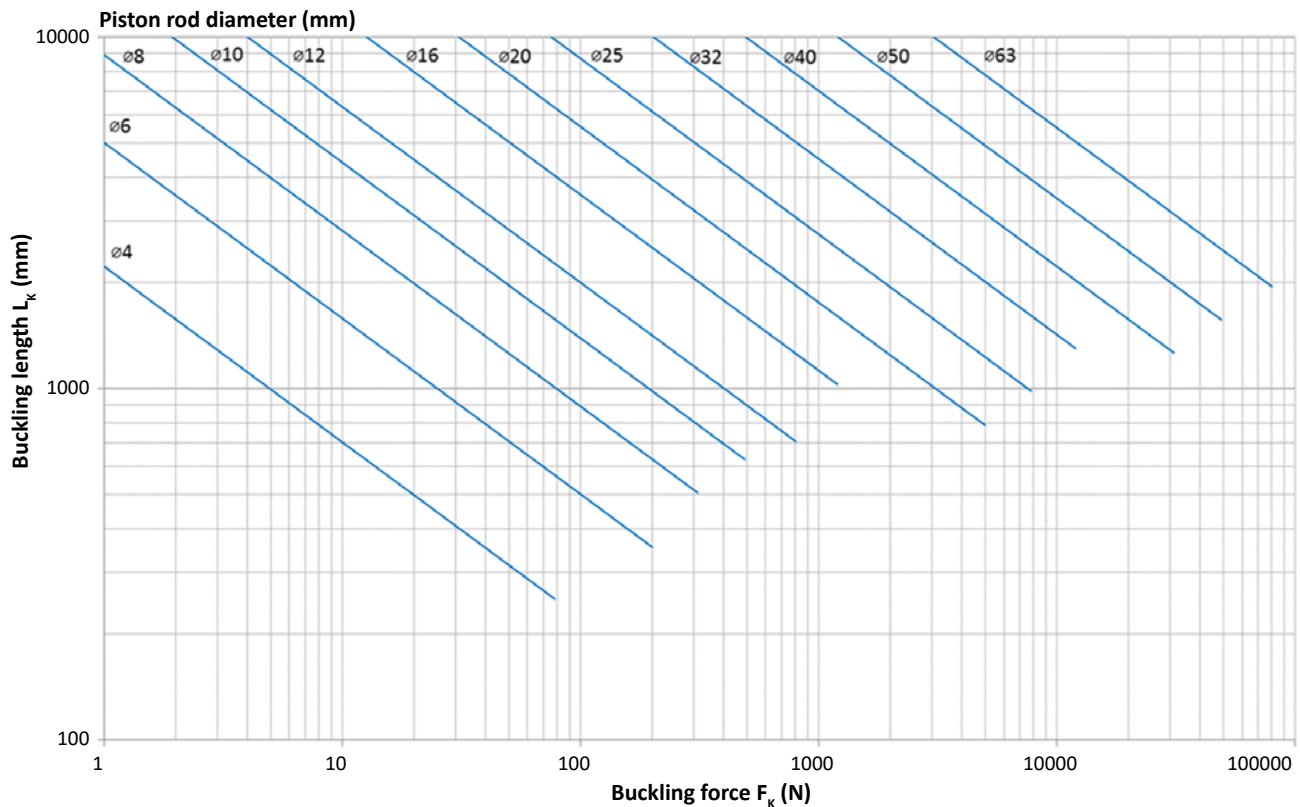
Piston-Ø	Series	Piston rod Ø (mm)	Pressure in bar						
			2	3	4	5	6	7	8
8			9	14	18	23	27	32	36
	HM	4	7	10	14	17	20	24	27
10			14	21	28	35	42	49	57
	HM	4	12	18	24	30	36	42	47
12			20	31	41	51	61	71	81
	HM	6	15	23	31	38	46	53	61
16			36	54	72	90	109	127	145
	HM, CM	6	31	47	62	78	93	109	124
	NXD	8	27	41	54	68	81	95	109
20			57	85	113	141	170	198	226
	HM, CM	8	47	71	95	119	142	166	190
	NYD, NXD, LX	10	42	64	85	106	127	148	170
25			88	132	177	221	265	309	353
	HM, CM, NYD, NXD	10	74	111	148	185	223	260	297
	LX	12	68	102	136	170	204	238	272
32			145	217	289	362	434	506	579
	XL, XM, NYD, NXD, HMU	12	124	187	249	311	373	435	497
	LX	16	109	163	217	271	326	380	434
40			226	339	452	565	678	791	904
	NYD, NXD	12	206	309	411	514	617	720	823
	XL, XM, LX, HMU	16	190	285	380	475	570	665	760
50			353	530	707	883	1060	1236	1413
	NYD, NXD	16	317	476	634	793	951	1110	1268
	XL, XM, LX	20	297	445	593	742	890	1039	1187
63			561	841	1122	1402	1682	1963	2243
	NYD, NXD	16	525	787	1049	1312	1574	1836	2099
	XL, XM, LX	20	504	756	1009	1261	1513	1765	2017
80			904	1356	1809	2261	2713	3165	3617
	NYD, NXD	20	848	1272	1696	2120	2543	2967	3391
	XL, XM	25	816	1224	1632	2040	2448	2856	3264
100			1413	2120	2826	3533	4239	4946	5652
	XL, XM, NYD, NXD	25	1325	1987	2649	3312	3974	4636	5299
125			2208	3312	4416	5520	6623	7727	8831
	XL, XM, NYD	32	2063	3095	4126	5158	6189	7221	8252
160			3617	5426	7235	9043	10852	12660	14469
	XG	40	3391	5087	6782	8478	10174	11869	13565
200			5652	8478	11304	14130	16956	19782	22608
	XG	40	5426	8139	10852	13565	16278	18991	21704
250			8831	13247	17663	22078	26494	30909	35325
	XG	50	8478	12717	16956	21195	25434	29673	33912
320			14469	21704	28938	36173	43407	50642	57876
	XG	63	13908	20862	27817	34771	41725	48679	55633

extension force\*

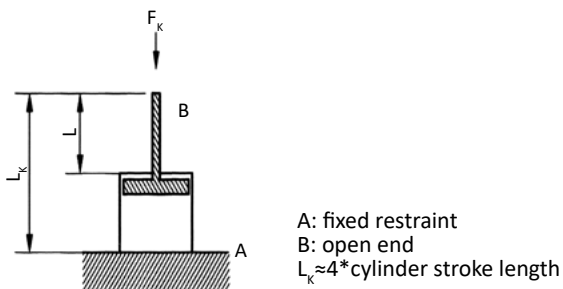
retraction force\*

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

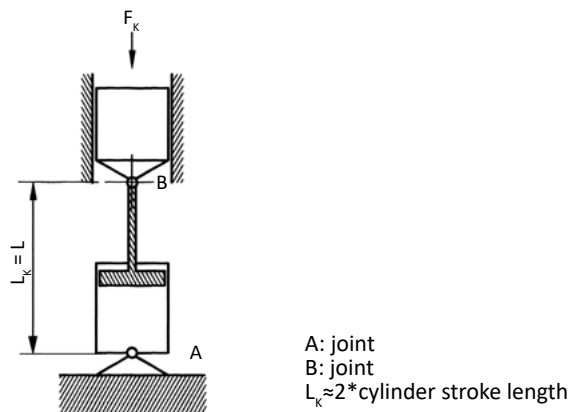
## Critical load diagram for the piston rod



### First elastic case of buckling

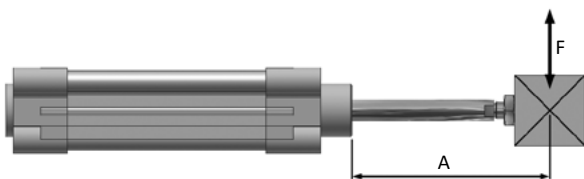


### Second elastic case of buckling



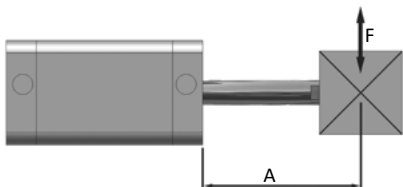
Knowing the actual buckling case, either 1 or 2, and knowing the requested stroke length you can calculate the buckling length  $L_k$ . If you know the buckling force  $F_k$  (compressive force) you determine in the diagram above the intersection of both data. Choose the next graph line above to get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

### Permissible side load F (N), series XL and XM



Piston-Ø	Distance A (mm)											
	25	40	50	80	100	125	160	200	250	320	400	500
<b>32</b>	75	55	50	40	34	28	23	20	16	12	9	7
<b>40</b>	175	150	130	105	91	78	62	55	45	35	28	21
<b>50 + 63</b>	220	180	170	130	120	105	90	80	65	52	43	33
<b>80 + 100</b>	500	450	400	350	310	270	230	205	180	150	125	100
<b>125</b>	810	710	680	590	520	470	420	390	330	270	230	200

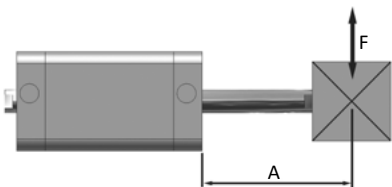
### Permissible side load F (N), series NYD\* and NXD, version 200 and 210



Piston-Ø	Distance A (mm)									
	25	30	40	50	60	70	80	90	100	125
<b>12 + 16</b>	8	7	6	6	5	5	4	3	2	-
<b>20 + 25</b>	12	11	9	7	6	5	4	3	3	-
<b>32 + 40</b>	23	20	16	12	10	8	7	7	6	4
<b>50 + 63</b>	38	34	28	22	18	15	13	12	11	3
<b>80</b>	49	43	35	28	24	20	18	17	16	12
<b>100</b>	93	82	67	55	46	40	37	34	31	23

\* series NYD from Ø 20 mm

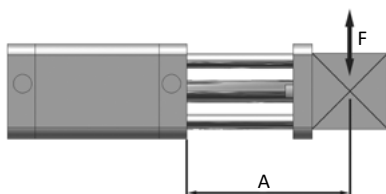
### Permissible side load F (N), series NYD\* and NXD, version 600 and 610



Piston-Ø	Distance A (mm)									
	25	30	40	50	60	70	80	90	100	125
<b>12 + 16</b>	22	20	18	15	13	11	10	10	9	6
<b>20 + 25</b>	32	30	26	21	19	16	14	13	12	9
<b>32 + 40</b>	47	43	38	32	28	26	22	20	18	13
<b>50 + 63</b>	83	78	68	59	51	46	41	38	36	27
<b>80</b>	112	108	93	83	74	67	60	57	54	40
<b>100</b>	194	181	160	144	130	118	108	101	96	72

\* series NYD from Ø 20 mm

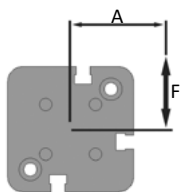
# Permissible side load F (N), series NYD\* and NXD, version 220



Piston-Ø	Distance A (mm)									
	25	30	40	50	60	70	80	90	100	125
16 + 20	38	33	27	23	20	18	16	14	12	9
25	59	53	43	37	31	27	24	23	22	15
32	76	68	58	49	43	38	35	34	32	24
40	112	101	84	72	62	56	50	47	46	34
50 + 63	145	130	108	92	83	74	66	61	56	42
80 + 100	200	180	155	135	120	110	100	90	80	60

\* series NYD from Ø 20 mm

# Permissible torque F x A (Nm), series NYD\* and NXD, version 220



Piston-Ø	Distance A (mm)											
	10	15	20	25	30	40	50	60	70	80	90	100
16	0.75	0.7	0.6	0.5	0.45	0.4	0.35	0.3	0.25	0.2	0.15	0.1
20	1.0	0.85	0.8	0.7	0.6	0.4	0.35	0.35	0.3	0.25	0.2	0.2
25	2.0	1.75	1.6	1.3	1.2	0.9	0.75	0.6	0.5	0.45	0.45	0.4
32	2.7	2.5	2.2	2.0	1.8	1.6	1.3	1.1	1.0	0.9	0.9	0.8
40	5.0	4.0	3.5	3.3	3.0	2.5	2.2	2.0	1.8	1.5	1.4	1.3
50	8.8	7.6	6.7	6.0	5.4	4.6	4.0	3.5	3.0	2.8	2.6	2.4
63	10.7	9.4	8.3	7.4	6.7	5.5	4.8	4.2	3.8	3.5	3.2	2.9
80	17.5	15.3	13.7	12.4	11.3	9.6	8.5	7.6	7.0	6.3	5.8	5.3
100	20.0	19.0	17.0	15.5	14.0	12.0	10.5	9.5	8.5	7.7	7.0	6.5

\* series NYD from Ø 20 mm

# Applicable load, series NYSE

