STRÁNSKÝ A PETRŽÍK

11.

CATALOGUE
OF PNEUMATIC COMPONENTS

CERTIFIED ISO 9001

Dear customer,
this is the latest version of the catalogue of pneumatic components. Thank you for your interest and we hope that this catalogue will be usefull for you.

Our company, Stransky a Petrzik, Pneumaticke valce spol. s r.o., exists on the market with pneumatic components since 1991, as traditional and Czech producer of pneumatic cylinders and accessories. On the 1200 m2 process area, the state-of-the-art technologies are used, which in conjunction with our development allows not only fast and high-quality production of standard pneumatic components, but also special components, designed and produced accordingly to the customer's requirements.

The our goal is to offer high-quality products with long lifetime and reliable service, to maximum satisfy the customers. The result of our hard work are thousands of customers not only located in EU countries. However our the most remarkable customers are traditionally from the Czech Republic, which pleases us very much.

If you are interested in our products, we are looking forward to good cooperation with you.

Petr Stránský
executioner

Tomáš Petržík
executioner

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There is no question, that the internet is important communication tool nowadays. To make your access to the our latest information easy, you can always find our up to date catalogue and many other informations at address

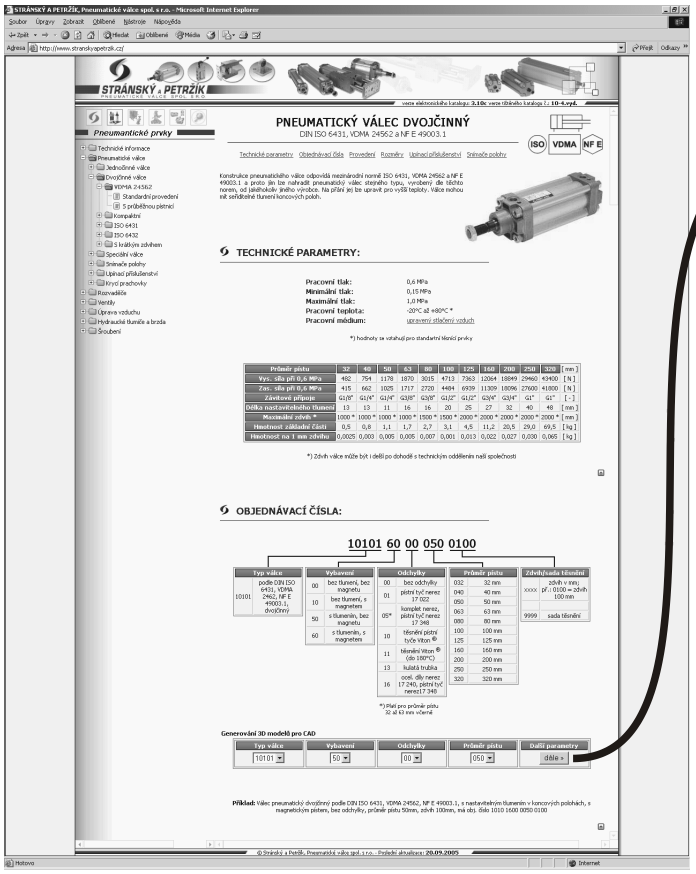
http://www.stranskyapetrzik.cz

If you haven't got permanent access to the internet and you prefer electronic catalogue, we have got solution for you. Our up to date catalogue on CD is available at our address or at our consulting engineers.

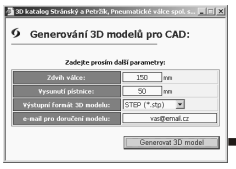
3D models for your CAD system

... may be simply generated any time at our web site!

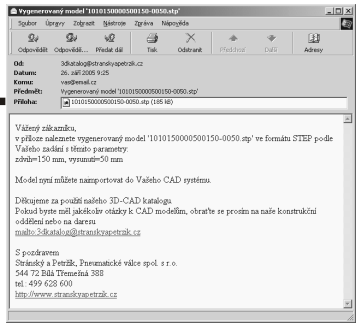
1. chose the product from our internet catalogue:



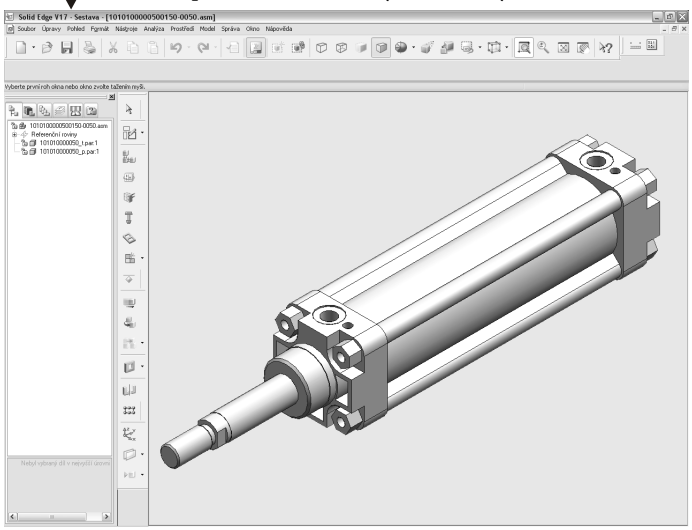
2. enter 3D model parameters and e-mail address:



3. save enclosed model from incoming e-mail message

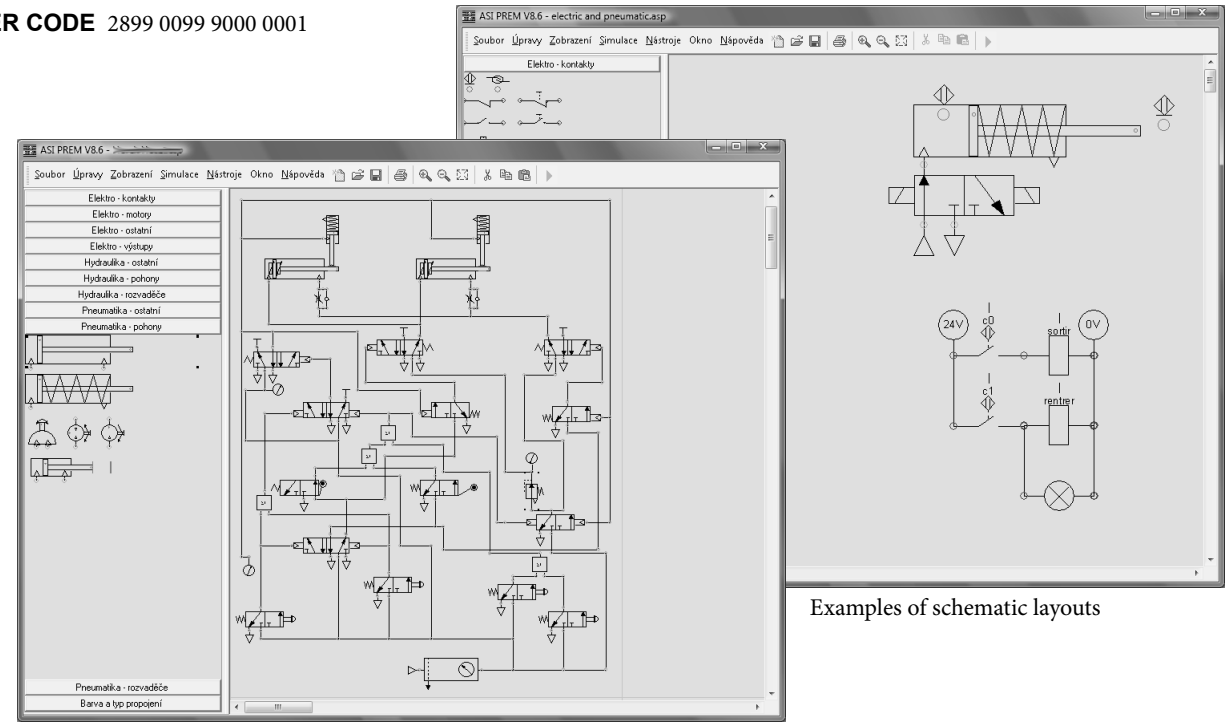


4. import model into the your CAD system



If you design pneumatic, electric, or hydraulic schematic layouts or their combination, you surely appreciate our new software in our offer.
It is software AUTOMSIM PREMIUM designed by Irai France for creating and simulating of schematic layouts.

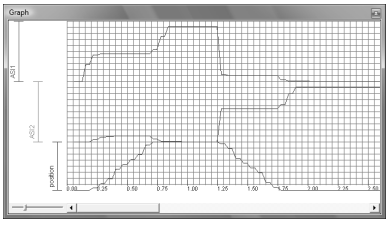
ORDER CODE 2899 0099 9000 0001

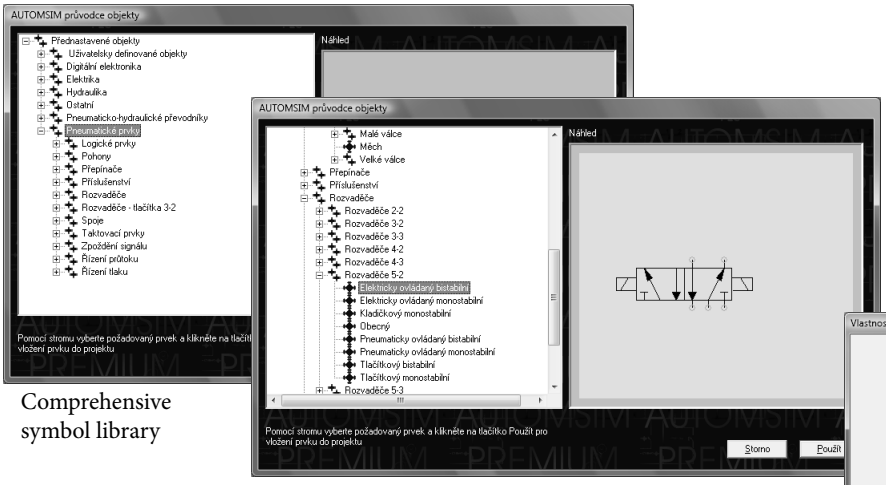


Examples of schematic layouts

Using the symbol library, you can simply insert just the right symbol, which is necessary in your layout. If there is no specific symbol in the library, it can be easily modified from similar symbol by changing of the properties. Pneumatic cylinders can be related to proximity switches or roller lever valves, proximity switches to relays, relays to valve coils, etc. So it isn't just drawing of layouts, but circuit, which you simple built can be simulate during run and check, if the function conform the submission. Of course, the pressure level as well as percentage of adjustment of speed control and many other properties could be set and changed while simulating. It is also possible to display graph with various values.
You can also create the layout of your current circuit, with which you have some problems and check, where are the critical points.
Layouts can be printed and exported into EMF file format, which is standard file format, which could be imported by any office software.
If you will fill fields like designation, supplier, description and other during inserting the symbols into the layout, the automatic creating of bill of material is available.

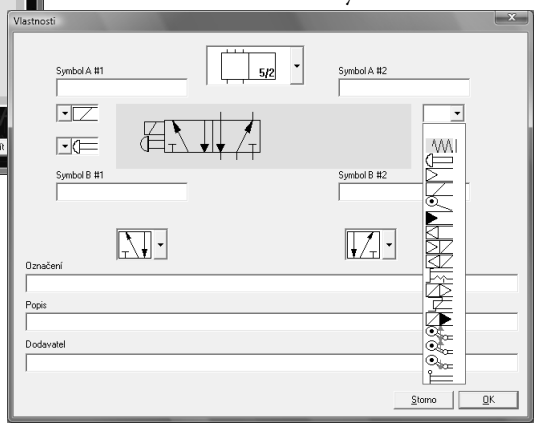
Example of graph





Comprehensive symbol library

Features of inserted symbol



AUTOMSIM PREMIUM is excellent for creating and functional simulating of layouts not only for its simplicity, but also for its price!
The full functional demo is available. Please contact us for possibility of delivery.

General conditions for pneumatic circuits

- it is necessary to observe appropriate safety rules, instructions, recommendation and specified parameters (temperature, pressure etc.), during setting in operation
- areas, which are pressurized even after closing of main air supply, should be specially marked in pneumatic circuits
- it is necessary to make allowance to product failure, eventually danger situations due to wrong operation, age or failure
- we recommend to mark with special sign whole pneumatic circuits, where the high caution during service is necessary
- we do not recommend to weld by electric arc on machinery, where pneumatic cylinders are mounted
- end users must take sufficient preventive steps to prevent injuries on material and health of employees

Conditions of use and running of pneumatic cylinders

- disassembly of single acting cylinders must be done very canny, because inside spring in mounted with preload
- working medium is modified compressed air
- we recommend to use our pneumatic oil for air lubricating, or some oil listed on recommended oil list, for renewing of lifetime grease use grease SAP-FML2A
- using of other than recommended oils leads to damage of O-rings and gaskets built-in not only in cylinders, but also in other components in pneumatic circuit
- if the piston rod speed if lower than 1 ms^{-1} the compressed air needn't to be lubricated; if piston rod speed is higher, we recommend to lubricate air by lubricator and pneumatic oil (see above); we also recommend to lubricate air, when dew point of compressed air is lower than -20°C
- special surface treatment, or material change (stainless steel) or using dust covers are possible options for hard conditions and aggressive surrounding
- other special designs or material exchange, gaskets exchange etc. are possible after consultation with our technical dept.
- it is necessary to observe correct mounting of cylinders and correct guiding of piston rod without radial forces (instead of versions which allows radial forces e.g. guide unit H)
- we recommend to use hydraulic shock absorbers, when heavy mass and high piston rod speed may occur - the machinery lifetime will be dramatically extended

Stroke tolerance of pneumatic cylinders

Stroke of cylinder may be bigger by tolerance accordingly to DIN ISO 6431, DIN ISO 6432 and VDMA 24562. The value of tolerance is due to production tolerances and depend on diameter and stroke as follows:

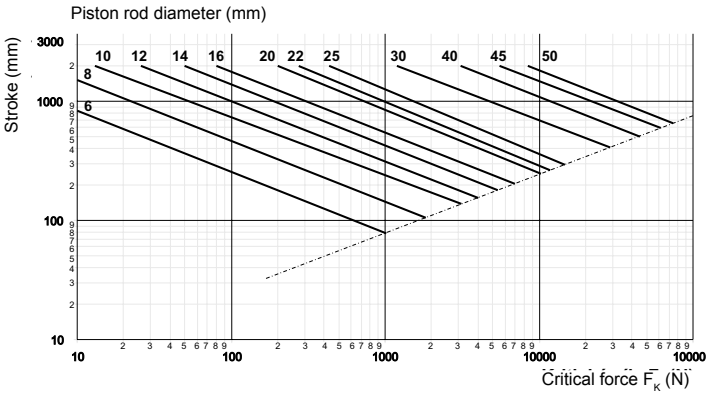
Standard	Piston diameter [mm]	Stroke [mm]	Allowable tolerance [mm]
DIN ISO 6432	8, 10, 12, 16, 20, 25	0 to 500	+1,5
DIN ISO 6431 VDMA 24562 NF E 49003.1	32, 40, 50	0 to 500	+2,0
		501 to 1250*	+3,2**
	63, 80, 100	0 to 500	+2,5
		501 to 1250*	+4,0**
	125, 160, 200, 250, 320	0 to 500	+4,0
		501 to 1250*	+5,0**

*) For strokes bigger than 1250 mm the tolerance is depending on agreement of producer and customer
**) This value is not listed in standard VDMA 24562, or NF E 49003.1 and it is valid only for standard DIN ISO 6431

When stroke is big, there must be checked, if exceed of strength in buck-

Critical strength on piston rod (buckling length)

ling can't occur, even if cylinder should pass due to piston diameter. Fast check should be done by read the data in graph below:



For exact calculate, if critical force wasn't exceed use this formulae, F_K must be higher than load to prevent piston rod damage:
Where: F_K is critical force on piston rod [N]

$$F_K = \frac{\pi^2 \times E \times J}{l^2 \times k}$$

E is stress modulus $2{,}1 * 10^5$ MPa
J is quadratic cross section moment [mm^4]
l is critical length (=double stroke) [mm]
k is safety coefficient (about 4 in practice)

Conditions of use and running of pneumatic valves

- it is necessary to keep in mind, that spool of valve could be in undefined position, before first activation and uncontrolled movements should occur
- when 5/3 valves or non-return valves are used, it is necessary to keep in mind that some parts of circuit should be always pressurized - high caution during service is necessary
- it is necessary to observe listed technical data, especially pressure, air cleanness and solenoids voltage
- exhaust ports on valves should be equipped with silencers to prevent intrusion of junk into valve
- valves can work on either lubricated or non-lubricated air (for more information see chapter Modified compressed air)

Short form port designations:

Port	Designation to ISO 5599	Designation to DIN*	Designation to ANSI*
Supply port	1	P	P
Working line	2	A	B
Exhaust line	3	R	EB
Working line	4	B	A
Exhaust line	5	S	EA
Pilot line	12	Z	CA
Pilot line	14	Y	CB

*) Designation by letters shouldn't be used anymore.

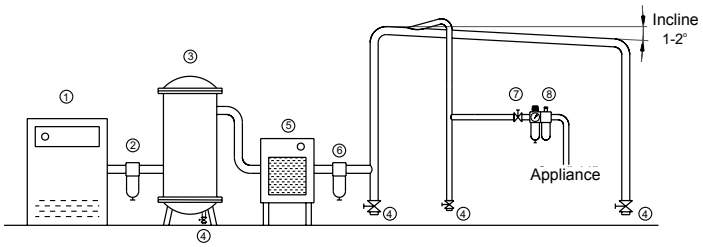
Contacts protecting when electromagnetic coils are used

Electromagnetic coil is coil, which defend against any voltage change. Due this, it is possible, that voltage spike or electrical ark will occur when switching voltage. By this, the damage of isolation or contacts burning may occur. There are at least four ways how this danger eliminate:

- serial connection of RC circuit, it is necessary to calculate values of resistance and capacitor for each application
- for DC voltage, the diode could be used, it is necessary to calculate values of diode for each application
- Zener diode could be used for AC even DC voltage, it is necessary to calculate values of diode for each application
- varistor could be used for AC even DC voltage, varistor should be built-in in connector of valve (see connectors for valves)

Distribution of compressed air

The operational reliability and service life of a pneumatic system depend to a large extent on the preparation of the compressed air. Impurities in the compressed air such as scale, rust and dust as well as the liquid constituents in the air which deposit as condensate can cause a great deal of damage in pneumatic systems. These contaminants accelerate wear on sliding surfaces and sealing elements, adversely affecting the functioning and service life of pneumatic components. As a result of switching the compressors on and off, pressure fluctuations occur which have an unfavourable effect on the functioning of the system. In order to eliminate these effects, compressed air service units must be installed in every pneumatic control system.



Example of air distribution:
Compressed air goes from compressor through coarse filter to air receiver. Then the air is led into air dryer and another filter, which should catch junk, released from air receiver and dryer. Air drier is used only in substantiated cases. Then distribution in plastic or metal tubes follows, whereas the tubes should incline 1-2° due to appropriate condensed water drain. Particular distributaries to consuming devices should go out from main distribution towards to crossways up. If there are intense pressure beats during compressed air consumption, it is useful to use another smaller air receiver between distributary and consuming device. This another receiver should balance the pressure beats. Finally, the standard FRL unit is piped, or some of air preparation modules.

Legend:
1) compressor
2) coarse filter
3) air receiver
4) drain cock
5) air dryer
6) filter
7) shut off valve
8) standard FRL unit

Modified compressed air

Modified compressed air = filtered air without solid particles and liquids, eventually lubricated.
All our produced pneumatic items are greased with special grease, so it isn't necessary to lubricate air in standard conditions. But we recommend to regularly check lifetime grease level and if decline will occur, renew grease filling. However these items couldn't be exposed to air polluted by water or oil, because the lifetime grease should flush out. Since this, the air should be lubricated, or lifetime grease filling should be renewed. Special grease for lifetime filling is available, please see chapter Air preparation or contact our sales dept.
If pneumatic circuit is stressed and heavy duty, we recommend to lubricate air due to increase lifetime of pneumatic items.

The operational reliability and service life of pneumatic systems depend among others to quality of incoming compressed air.
Junk and moisture contained in air increases surface wear of parts and gaskets, what brings decline of economy and lifetime of pneumatic items. So, air preparation consist of liquid removal (mainly water and oil), suitable dimensioned filtration of solid junk and appropriate air lubricator.

Air after the modification must be so clean to not cause any damage on pneumatic system and sequentially damage to machinery. Using of filter the maximal flow capacity is lower because filter is basically resistance, which intercepts air flow. Filter should be with such a filter element, so the sufficient quality will be reached with reference to economy of system. If high quality of compressed air is required, the air should be filtered in several steps. If we use only coalescing filter, which will ensure requested air quality, we have to calculate with serious decrease its lifetime.
The compressed air quality is expressed by quality classes, which are described in ISO 8573-1 standard. Acceptable values of junk are listed in this standard too.

Quality classes according to ISO 8573-1

Class	Solid junk		Max. pressure dew point [˚C]	Max. oil concentration [mg/m³]
	Max. particle size [µm]	Max. concentration [mg/m³]		
1	0,1	0,1	-70	0,01
2	1	1	-40	0,1
3	5	5	-20	1
4	15	8	+3	5
5	40	10	+7	25
6	—	—	+10	—
7	—	—	unstipulated	—

Recommended using of quality classes

Area	Solid junk		Water		Oil	
	Max. class	Max. particle size [µm]	Max. class	Max. dew point [˚C]	Max. class	Max. concentration [mg/m³]
Pneumatic cylinders	5	40	4	+3	5	25
Pneumatic valves	3 to 5	5 to 40	4	+3	5	25
Fine regulators	3	5	4	+3	3	1
Measurements	2	1	4	+3	3	1
Other industry	5	40	3 to 7	-20 to +10 and more	3 to 5	1 to 25

Mounting, operation and service of air preparation units

There is necessary to pay attention to flow direction, which is marked by arrows or marks IN/OUT during mounting of units. The following sequence of units sort should be observed: shut off valve, particulate filter, coalescing filter regulator, lubricator. Bowls of particulate units must be mounted towards to bottom. Lubricator should be as closed as possible to consuming device (max. 5 to 10 m).

Condensate water level in bowl mustn't exceed level of bottom of filter element. For drain, there is connection for tube i.d. 5 mm when manual drain is used on the bottom of bowl, or i.d. 8 mm when automatic drain is used. Automatic drain doesn't practically need service, but if manual drain is used, it is necessary to regularly check level of condensed water in bowl and expel it always if level of water achieve filter element. For expelling of water simply turn plastic screw on the bottom of bowl and after bowl is empty tighten this screw. If the filter element is polluted, it must be changed. Before disassembling shut off air supply and depressurize the filter, remove bowl (unscrew it in series 14, for series 22 and 32: release safety lock on side of bowl, turn it off 45° and pull it out). Then unscrew the baffle and remove filter element. Procedure at assembling is the same, but in reverse order. If lubricator is used, it is necessary to keep sufficient level of oil.

Oil refilling is possible directly into bowl when air supply is shut off, or by button head fill (optionally) during operation. Before disassembling shut off air supply and depressurize the lubricator, remove bowl (unscrew it in series 14, for series 22 and 32: release safety lock on side of bowl, turn it off 45° and pull it out). Fill in bowl within 25 mm from the top and mount bowl back. Procedure at assembling is the same, but in reverse order. It is necessary to use only recommended oils.

Standard bowls are made from polycarbonate and could be cleaned only with household soap and water. Do not use any solvent (alcohol), bowls may crackle.

Primarily we recommend to use our pneumatic oil with order code

Recommended oils for compressed air lubricating

2995 0101 0000 0000, which composition was specially designed for this purpose. It is oil, which is foamless, nonaggressive to gaskets and has suitable mechanical characteristics (viscosity etc.).

In case of need, the following oils could be used too:

Supplier	Designation	Supplier	Designation
Stránský a Petržík	Pneumatic oil, order code 2995 0101 0000 0000	Fuchs	Renolin MR1, MR3
Shell	Tellus Ol 10	Optimol	Ultra 10
Mobil Oil	Velocite Oil No. 6	Agip	OSO10
BP	Energol HLP10	Elf	Spinelf 5, 10
Esso	Spinesso 10, Nutto H5, H10	Total	Azolla 10
Aral	Vitamol GF10, DE 10, Sumorol CM5, CM10	Fina	Cirkan 10

Compressed air consumption

Calculation of air consumption for pneumatic cylinder:

$$Q = Z \times (qp + qz) \times n \times 0{,}1$$

where Q is air consumption [l/min]
Z is stroke [mm]
qp is air consumption for 10 mm of stroke when thrust [l]
qz is air consumption for 10 mm of stroke when retract [l]
n is number of complete strokes (thrust+retract) in a minute

Table of air consumption sp / sz [l] for 10 mm of stroke:

Piston diameter	Piston area		Working pressure (MPa)									
mm	mm²		0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0
8	50	qp	0,0010	0,0015	0,0020	0,0025	0,0030	0,0035	0,0040	0,0045	0,0050	0,0055
	38	qz	0,0007	0,0011	0,0015	0,0019	0,0023	0,0026	0,0030	0,0034	0,0038	0,0041
10	79	qp	0,0015	0,0024	0,0031	0,0039	0,0047	0,0055	0,0063	0,0071	0,0079	0,0086
	66	qz	0,0013	0,0020	0,0026	0,0033	0,0040	0,0046	0,0053	0,0059	0,0066	0,0073
12	113	qp	0,0023	0,0034	0,0045	0,0056	0,0067	0,0078	0,0089	0,01	0,0111	0,0123
	90	qz	0,0018	0,0027	0,0036	0,0045	0,0054	0,0063	0,0072	0,0081	0,009	0,0099
16	200	qp	0,004	0,006	0,008	0,01	0,012	0,014	0,016	0,018	0,02	0,022
	170	qz	0,0034	0,0051	0,0068	0,0085	0,012	0,0119	0,0136	0,0153	0,017	0,0187
20	314	qp	0,0063	0,0094	0,0126	0,0157	0,0188	0,022	0,0251	0,0283	0,0314	0,0345
	260	qz	0,0052	0,0078	0,0104	0,013	0,0156	0,0182	0,0208	0,0234	0,026	0,0288
25	491	qp	0,0098	0,0147	0,0196	0,0245	0,0295	0,0344	0,0393	0,0442	0,0491	0,054
	410	qz	0,0082	0,0123	0,0164	0,0205	0,0246	0,0287	0,0328	0,0369	0,041	0,0451
32	804	qp	0,016	0,024	0,032	0,04	0,048	0,056	0,064	0,072	0,08	0,088
	691	qz	0,014	0,021	0,028	0,035	0,042	0,049	0,056	0,063	0,07	0,076
40	1256	qp	0,025	0,038	0,05	0,063	0,076	0,088	0,1	0,113	0,126	0,138
	1002	qz	0,02	0,03	0,04	0,05	0,06	0,07	0,08	0,09	0,1	0,11
50	1963	qp	0,039	0,059	0,079	0,089	0,118	0,137	0,157	0,177	0,196	0,216
	1708	qz	0,034	0,051	0,068	0,085	0,102	0,12	0,137	0,154	0,17	0,188
63	3116	qp	0,062	0,093	0,125	0,156	0,187	0,218	0,249	0,28	0,312	0,343
	2726	qz	0,055	0,072	0,109	0,136	0,164	0,191	0,218	0,245	0,273	0,3
80	5024	qp	0,1	0,15	0,2	0,25	0,301	0,351	0,402	0,452	0,502	0,552
	4644	qz	0,093	0,139	0,186	0,232	0,279	0,325	0,372	0,418	0,464	0,51
100	7850	qp	0,157	0,236	0,314	0,382	0,471	0,549	0,628	0,706	0,785	0,862
	7144	qz	0,143	0,214	0,286	0,357	0,429	0,5	0,571	0,643	0,714	0,786
125	12266	qp	0,245	0,368	0,49	0,613	0,736	0,859	0,981	1,104	1,226	1,349
	11559	qz	0,231	0,347	0,462	0,578	0,694	0,809	0,925	1,04	1,156	1,272
160	20096	qp	0,402	0,603	0,804	1,005	1,206	1,407	1,608	1,809	2,01	2,211
	18840	qz	0,377	0,565	0,754	0,942	1,13	1,319	1,507	1,696	1,884	2,072
200	31400	qp	0,628	0,942	1,256	1,57	1,884	2,198	2,512	2,826	3,14	3,454
	30144	qz	0,603	0,904	1,206	1,507	1,808	2,11	2,412	2,713	3,014	3,316
250	49063	qp	0,981	1,473	1,964	2,455	2,946	3,437	3,928	4,419	4,91	5,401
	47100	qz	0,942	1,413	1,884	2,355	2,826	3,297	3,768	4,239	4,71	5,181
320	80425	qp	1,609	2,413	3,217	4,021	4,826	5,630	6,434	7,238	8,042	8,847
	77308	qz	1,546	2,319	3,092	3,865	4,639	4,412	6,185	6,958	7,731	8,504

Recommended flow capacity [l/min] depending on pressure:

Pressure [MPa]	Port size					
	G1/8“	G1/4“	G3/8“	G1/2“	G3/4“	G1“
0,2	126	227	357	797	1416	2213
0,4	212	377	593	1328	2361	3689
0,6	297	529	826	1860	3306	5163
0,8	382	680	1062	2391	4250	6640
1,0	468	830	1299	2923	5194	8115

Values of flow capacity are applied to standard conditions at 20˚C and pressure 0,1 MPa. The flow velocity 25 ms^{-1} is supposed for calculation.

Action force

Calculation of force on piston rod of pneumatic cylinder*:*

$$F = (Sp \text{ (or } Sz) \times p) - T$$

where F is force on piston rod of pneumatic cylinder [N]
Sp is piston area at thrust [mm^2]
Sz is piston area at retract [mm^2]
p is working pressure [MPa]
T is friction force (about 10% in practice)

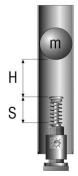
Table of retract force on piston rod of pneumatic cylinder [N]

Piston diameter [mm]	Working pressure [MPa]											
	0,1	**0,2**	**0,3**	**0,4**	**0,5**	**0,6**	**0,7**	**0,8**	**0,9**	**1**	**1,1**	**1,2**
8	4,5	9,0	13,6	18,1	22,6	27,1	31,7	36,2	40,7	45,2	49,8	54,3
10	7,1	14,1	21,2	28,3	35,3	42,4	49,5	56,5	63,6	70,7	77,8	84,8
12	10,2	20,4	30,5	40,7	50,9	61,1	71,2	81,4	91,6	102	112	122
16	18,1	36,2	54,3	72,4	90,5	109	127	145	163	181	199	217
20	28,3	56,5	84,8	113	141	170	198	226	254	283	311	339
25	44,2	88,4	133	177	221	265	309	353	398	442	486	530
32	72,4	145	217	290	362	434	507	579	651	724	796	869
40	113	226	339	452	565	679	792	905	1018	1131	1244	1357
50	177	353	530	707	884	1060	1237	1414	1590	1767	1944	2121
63	281	561	842	1122	1403	1683	1964	2244	2525	2805	3086	3367
80	452	905	1357	1810	2262	2714	3167	3619	4071	4524	4976	5429
100	707	1414	2121	2827	3534	4241	4948	5655	6362	7068	7775	8482
125	1104	2209	3313	4418	5522	6627	7731	8835	9940	11044	12149	13253
160	1810	3619	5429	7238	9048	10857	12667	14476	16286	18095	19905	21714
200	2827	5655	8482	11309	14137	16964	19791	22619	25446	28274	31101	33928
250	4418	8835	13253	17671	22089	26506	30924	35342	39760	44177	48595	53013
320	7238	14476	21714	28952	36190	43428	50666	57904	65142	72380	79618	86856

Hydraulic shock absorber selection

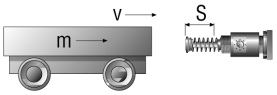
Five basic criteria are required for sizing the shock absorbers:
a) impacting mass m (kg)
b) impact speed v (m/s)
c) additional external forces acting on the mass e.g. propelling force F (N)
d) number of strokes of the shock absorber per hour X (1/h)
e) number of parallel shock absorbers

Free falling mass



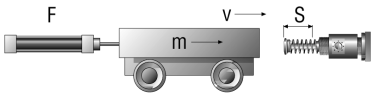
1. $W_k = m \cdot g \cdot H$
2. $W_A = m \cdot g \cdot S$
3. $W_{kg} = W_k + W_A$
4. $W_{kg/h} = W_{kg} \cdot X$
5. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$
6. $v = v_e = \sqrt{2 \cdot g \cdot H}$

Mass without propelling force



1. $W_{kg} = \frac{m \cdot v^2}{}$
2. $W_{kg/h} = W_{kg} \cdot X$
3. $v = v_e$
4. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$

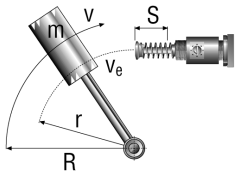
Mass with propelling force, horizontal



Movement downward: $W_A = (F + m \cdot g) \cdot S$
Movement upward: $W_A = (F - m \cdot g) \cdot S$

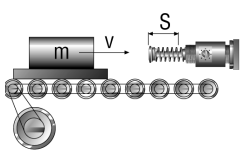
1. $v_e = \frac{v}{K1}$
2. $W_k = \frac{m \cdot v_e^2}{2}$
3. $W_A = F \cdot S$
4. $W_{kg} = W_k + W_A$
5. $W_{kg/h} = W_{kg} \cdot X$
6. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$

Swinging mass without propelling force



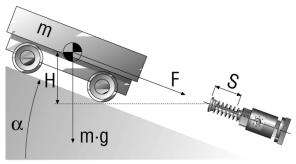
1. $W_k = \frac{m \cdot v^2}{2} = \frac{J \cdot \omega^2}{2}$
2. $W_A = \frac{M \cdot S}{r}$
3. $W_{kg} = W_k + W_A$
4. $W_{kg/h} = W_{kg} \cdot X$
5. $v_e = r \cdot \omega = \frac{v \cdot r}{R}$
6. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$

Mass on driven rollers



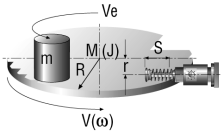
1. $W_k = \frac{m \cdot v^2}{2}$
2. $W_A = m \cdot g \cdot S \cdot \mu$
3. $W_{kg} = W_k + W_A$
4. $W_{kg/h} = W_{kg} \cdot X$
5. $v = v_e$
6. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$

Mass on incline



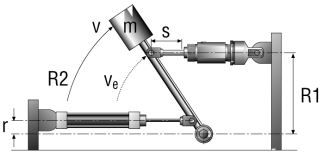
1. $W_k = m \cdot g \cdot H$
2. $W_A = m \cdot g \cdot \sin\alpha \cdot S$
3. $W_{kg} = W_k + W_A$
4. $W_{kg/h} = W_{kg} \cdot X$
5. $v = v_e = \sqrt{2 \cdot g \cdot H}$
6. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$

Rotary table with propelling force



1. $W_k = \frac{m \cdot v^2}{2} = \frac{J \cdot \omega^2}{2}$
2. $W_A = \frac{M \cdot S}{r}$
3. $W_{kg} = W_k + W_A$
4. $W_{kg/h} = W_{kg} \cdot X$
5. $v_e = r \cdot \omega = \frac{v \cdot r}{R}$
6. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$

Swinging mass with propelling force



1. $W_k = \frac{m \cdot v^2}{2}$
2. $W_A = \frac{M \cdot S}{R1} = \frac{F \cdot r \cdot S}{R1}$
3. $W_{kg} = W_k + W_A$
4. $W_{kg/h} = W_{kg} \cdot X$
5. $v_e = R1 \cdot \omega = \frac{v \cdot R1}{R2}$
6. $m_e = \frac{2 \cdot W_{kg}}{v_e^2}$

Formulae

Effective mass

$$m_e = \frac{2 \cdot W_{kg}}{v_e^2}$$

Counter force

$$F_G = \frac{W_{kg} \cdot 1.2^*}{S}$$

Deceleration time

$$t = \frac{2 \cdot S}{v_e} \cdot 1.2^*$$

Deceleration time

$$a = \frac{v^2}{2 \cdot S} \cdot 1.2^*$$

Stroke

$$S = \frac{v^2}{2 \cdot a} \cdot 1.2^*$$

*) Calculation for optimum setting. Allow a safety margin!

Used values and variables

W_k	[Nm]	kinetic energy
W_A	[Nm]	propelling force energy
W_{kg}	[Nm]	total energy
$W_{kg/h}$	[Nm·h^{-1}]	total energy per hour
m	[kg]	mass
m_e	[kg]	effective mass
v	[m·s^{-1}]	impact speed
v_e	[m·s^{-1}]	effective speed
X	[h^{-1}]	number of strokes per hour
S	[m]	stroke
F	[N]	propelling force
F_p	[N]	pneumatic drive force
K_1	[1]	correction factor for pneumatic drive force (K_1=0,65)
M	[Nm]	torque
R, r	[m]	radius
H	[m]	height
g	[m·s^{-2}]	acceleration due to gravity
J	[kg·m^2]	moment of inertia
ω	[s^{-1}]	angular velocity
μ	[1]	coefficient of friction (steel=0,2)
a	[°]	angle
a	[m·s^{-2}]	acceleration / deceleration
t	[s]	deceleration time
F_G	[N]	counter force

Summary of the pneumatic symbols based on DIN ISO 1219

Energy conversion

Single acting cylinder, return movement by external force

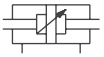
Single acting cylinder, return movement by spring

Double acting cylinder

Double acting cylinder with double-ended piston rod

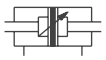
Double acting cylinder with adjustable cushioning at end of stroke

Double acting cylinder with double-ended piston rod and adjustable cushioning at end of stroke



Double acting cylinder with adjustable cushioning at end of stroke and magnetic piston

Double acting cylinder with double-ended piston rod and adjustable cushioning at end of stroke and magnetic piston



Pneumatic motor with limited range of swivel

Pressure intensifier for the same fluid

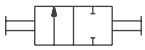
Pressure intensifier for air and liquid

Compressor

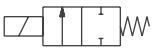
Vacuum pump

Directional control valves

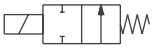
2/2-way valve, manually actuated



2/2-way valve, normally closed, solenoid actuated



2/2-way valve, normally opened solenoid actuated



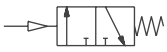
3/2-way valve, manually actuated

3/2-way valve, actuated by lever

3/2-way valve, actuated by pushbutton

3/2-way valve, actuated by pedal

3/2-way valve, pneumatically actuated, monostable



3/2-way valve, pneumatically actuated, bistable

5/2-way valve, pneumatically actuated, bistable

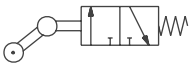
5/2-way valve, indirect solenoid actuated, monostable

5/2-way valve, indirect solenoid actuated, bistable

3/2-way valve, normally closed, actuated by roller lever

3/2-way valve, normally opened, actuated by roller lever

3/2-way valve, normally closed, actuated by roller lever with idle return



3/2-way valve, normally closed, indirect solenoid actuated

3/2-way valve, normally opened, indirect solenoid actuated

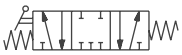
5/2-way valve, actuated by lever

5/2-way valve, actuated by pushbutton

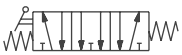
5/2-way valve, actuated by pedal

5/2-way valve, pneumatically actuated, monostable

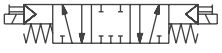
5/3-way valve, actuated by lever, centre position closed



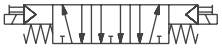
5/3-way valve, actuated by lever, centre position exhausted



5/3-way valve, indirect solenoid actuated, centre position closed



5/3-way valve, indirect solenoid actuated, centre position opened



Directional control valves generally and control mechanisms

2 positions 

3 positions 

Manual control - general 

Pushbutton 

Lever 

Pedal 

Plunger

Spring 

Roller lever 

Roller lever with idle return 

Direct solenoid 

Direct application of pressure

Direct application by pressure relief

Indirect by application of pressure (pilot) 

Solenoid and pilot valve 

Solenoid and pilot valve with manual override 

Detent for 3 positions 

Air preparation

Filter 

Water separator 

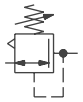
Water separator with automatic drain 

Filter with water separator with automatic drain 

Dryer 

Lubricator 

Standard unit (filter pressure regulator with gauge, lubricator), simplified representation 

Pressure regulator 

Energy transmission, valves

Working line

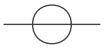
Control line

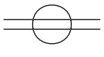
Exhaust line

Flexible pipeline 

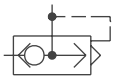
Line connection 

Quick coupling with mechanically opened non-return valves, coupled 

Rotary connection with 1 path 

Rotary connection with 2 paths 

Silencer 

Quick exhaust valve 

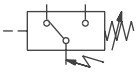
Pneumatic capacitor 

Gauge 

Pressure source 

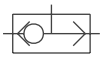
One-way flow control valve, adjustable 

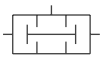
Bidirectional flow control valve, adjustable 

Pressure switch 

Check valve with spring 

Piloted check valve 

OR disjunction (logical sum) 

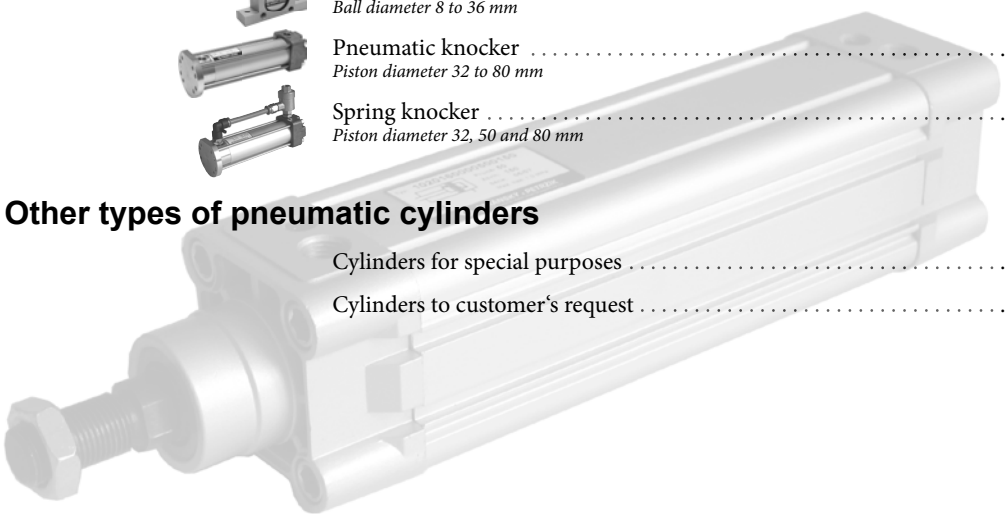
AND conjunction (logical product) 

Double acting pneumatic cylinders

Single acting pneumatic cylinders

Pneumatic shake devices

Other types of pneumatic cylinders



DOUBLE ACTING PNEUMATIC CYLINDERS
ISO 15552, VDMA 24562, NF E 49003.1

Modern design, quality processing and high-quality of used parts - there are characteristics of new cylinders series. Dimensions conforms to the international standards ISO 6431, VDMA 24562 and NF E 49003.1, that is why it can replace pneumatic cylinder, which is made by any producer to these standards. Fully adjustable cushioning at end of stroke and magnet for proximity switches are standard for this series. The proximity switches can be mounted directly to the tube's groove - so no brackets are necessary. The lifetime of cylinders is more than 4000 km at standard conditions.

Working pressure	0,6 MPa
Min. pressure	0,1 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Piston diameter [mm]	**32**	**40**	**50**	**63**	**80**	**100**
Thrust at 0,6 MPa [N]	482	754	1178	1870	3015	4713
Thrust at 0,6 MPa [N] with double ended piston rod	415	633	990	1682	2720	4418
Return force at 0,6 MPa [N]	415	633	990	1682	2720	4418
Connection	G1/8“	G1/4“	G1/4“	G3/8“	G3/8“	G1/2“
Length of adjustable cushioning [mm]	17	17	17	16	20	18
Max. stroke [mm] *	1000*	1000*	1000*	1000*	1500*	1500*
Working speed [mm/s]	50 to 500					
Min. stroke for proximity sensing [mm]	17	21	25	25	25	25
Weight 0 mm stroke [kg]	0,46	0,74	1,27	1,70	2,65	3,67
Weight add. per 1 mm stroke [kg]	0,003	0,004	0,007	0,007	0,011	0,013
Weight 0 mm stroke [kg] with double ended piston rod	0,52	0,84	1,37	1,90	2,97	4,31
Weight add. per 1 mm stroke [kg] with dbl. ended piston rod	0,004	0,006	0,009	0,009	0,015	0,017

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

10201 60 00 050 0100

Type	
10201	to ISO 15552, VDMA 24562, NF E 49003.1, double acting

Equipment	
60	with cushioning, with magnet
65	with double ended piston rod, with cushioning, with magnet

Options	
00	without options
01	1.4021 stainless steel piston rod

For more options regarding materials or dimensions, please contact our technical dept.

Piston diameter	
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

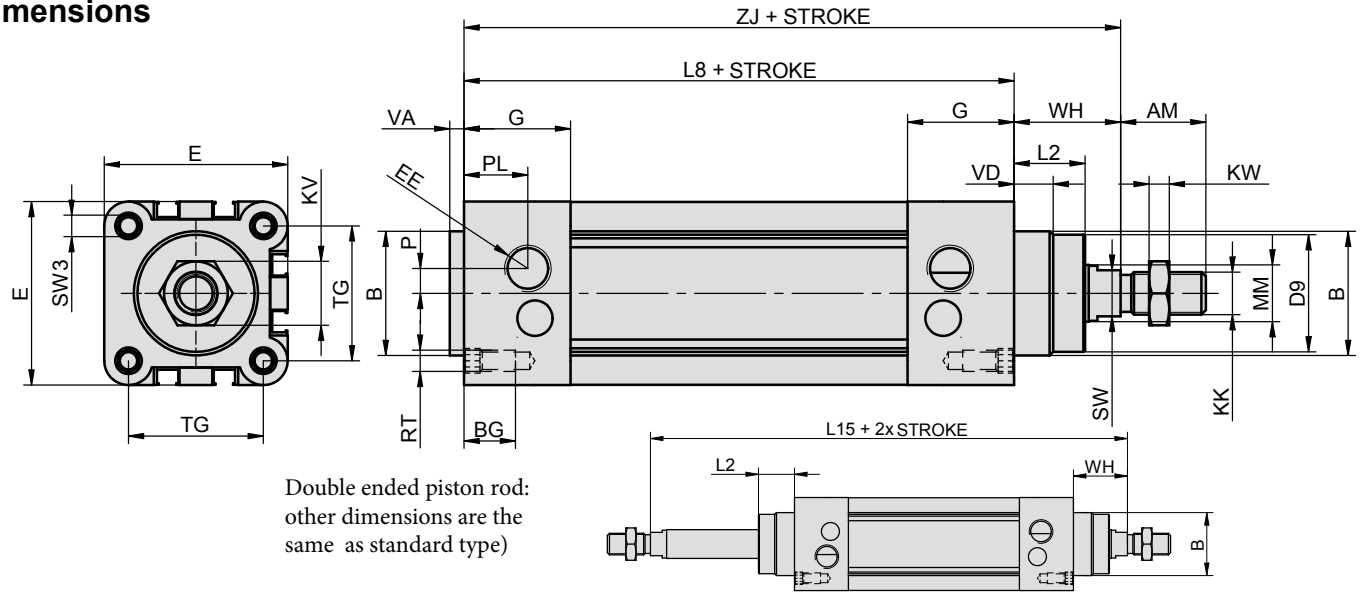
Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

Construction / materials

- caps: aluminium mold casting
- body: drawn dural profile, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

DOUBLE ACTING PNEUMATIC CYLINDERS
ISO 15552, VDMA 24562, NF E 49003.1

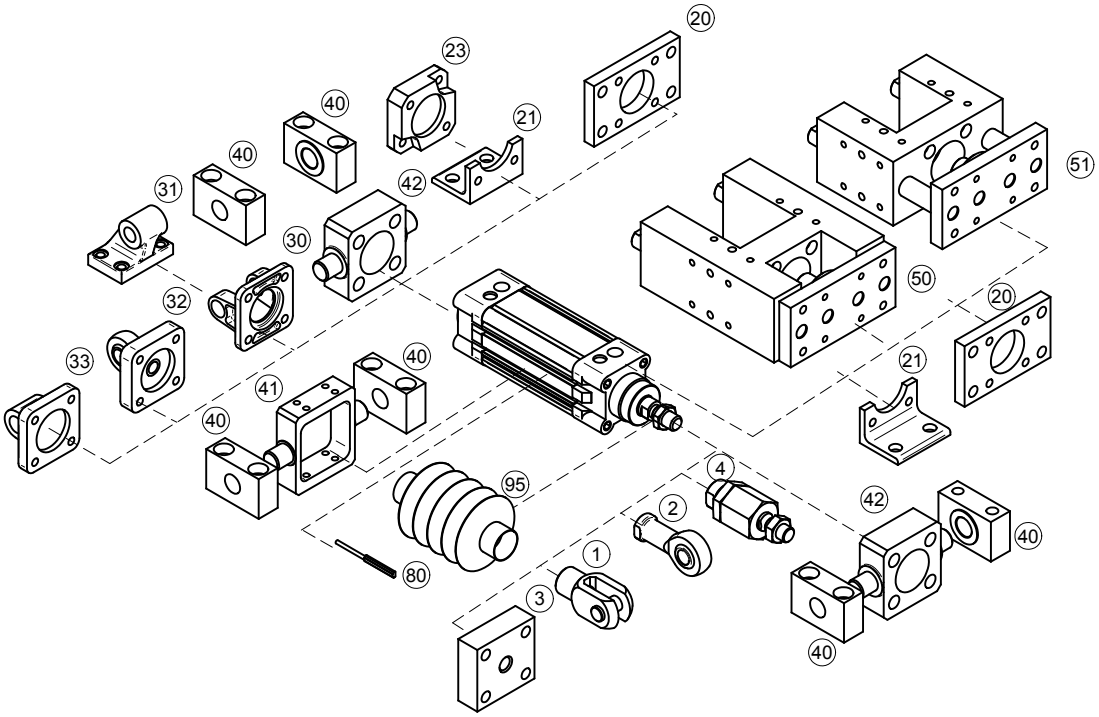
Dimensions



Double ended piston rod: other dimensions are the same as standard type)

∅	AM	B	BG	D9	E	EE	G	KK	KV	KW	L2	L8	L15	MM	P	PL	RT	SW	SW3	TG	VA	VD	WH	ZJ
32	22	30	16	28	46	G1/8“	25	M10x1,25	17	6	18	94	146	12	5	16	M6	10	6	32,5	4	10	26	120
40	24	35	14,5	33	52	G1/4“	30	M12x1,25	19	7	21,5	105	165	16	6	14	M6	13	6	38	4	11	30	135
50	32	40	17	38	64	G1/4“	30	M16x1,5	24	8	28	106	180	20	8,5	23	M8	16	8	46,5	4	11	37	143
63	32	45	17	38	75	G3/8“	36	M16x1,5	24	8	28,5	121	195	20	10	17	M8	16	8	56,5	4	11	37	158
80	40	45	17	44	93	G3/8“	36	M20x1,5	30	9	34,7	128	220	25	8	28	M10	21	10	72	4	11	46	174
100	40	55	17	44	110	G1/2“	39	M20x1,5	30	9	38,2	138	240	25	10	32	M10	21	10	89	4	11	51	189

Mounting accessories



Mounting accessories		... see page
1	Piston rod clevis	... 4-2
2	Piston rod eye	... 4-3
3	Flanged piston rod coupling	... 4-2
4	Self-aligning piston rod coupling	... 4-3
20	Flange mounting	... 4-6
21	Foot mounting	... 4-4
23	Boxer flange mounting	... 4-9
30	Swivel flange	... 4-8
31	Clevis foot mounting	... 4-8
32	Swivel flange with spherical bearing	... 4-9
33	Swivel flange	... 4-7
40	Trunnion mounting	... 4-11
41	Pivot pin	... 4-10
42	Pivot pin to front/end cap	... 4-11
50	Guide unit H with ball bearings	... 4-14
51	Guide unit with slide bearings	... 4-16
80	Proximity switch	... 3-2, 3-4
95	Piston rod protective cover	... 4-12

DOUBLE ACTING PNEUMATIC CYLINDERS
VDMA 24562, NF E 49003.1

Cylinders are designed to meet the specifications of international standards ISO 6431, VDMA 24562 and NF E 49003.1, that is why it can replace pneumatic cylinder, which is made by any producer to these standards. The cylinders can work in higher temperatures by request. Fully adjustable cushioning at end of stroke is available.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	32	40	50	63	80	100	125	160	200	250	320	400
Thrust at 0,6 MPa [N]	482	754	1178	1870	3015	4713	7363	12064	18849	29460	48254	75398
Thrust at 0,6 MPa [N] with double ended piston rod	415	633	990	1682	2720	4418	6880	11581	18096	28274	46384	71657
Return force at 0,6 MPa [N]	415	633	990	1682	2720	4418	6880	11581	18096	28274	46384	71657
Connection	G1/8“	G1/4“	G1/4“	G3/8“	G3/8“	G1/2“	G1/2“	G3/4“	G3/4“	G1“	G1“	G1“
Length of adjustable cushioning [mm]	13	13	11	16	16	20	25	27	32	40	48	48
Max. stroke [mm] *	1000*	1000*	1000*	1000*	1500*	1500*	2000*	2000*	2000*	2000*	2000*	1500*
Weight 0 mm stroke [kg]	0,54	0,80	1,10	1,70	2,70	4,20	7,60	13,30	20,50	29,00	69,50	120,00
Weight add. per 1 mm stroke [kg]	0,0028	0,0037	0,0060	0,0062	0,0100	0,0110	0,0160	0,0280	0,0300	0,0340	0,0650	0,113
Weight 0 mm stroke [kg] with double ended piston rod	0,64	0,90	1,30	1,90	3,40	5,00	9,40	16,30	22,50	33,00	74,00	129,00
Weight add. per 1 mm stroke [kg] with double ended piston rod	0,0038	0,0047	0,0080	0,0082	0,0140	0,0150	0,0220	0,0400	0,0420	0,0460	0,0810	0,137

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

10101 60 00 050 0100

Type	
10101	to DIN ISO 6431, VDMA 24562, NF E 49003.1, double acting

Equipment	
00	w/o cushioning, w/o magnet
05	with double ended piston rod, w/o cushioning, w/o magnet
10	w/o cushioning, with magnet
15	with double ended piston rod, w/o cushioning, with magnet
50	with cushioning, w/o magnet
55	with double ended piston rod, with cushioning, w/o magnet
60	with cushioning, with magnet
65	with double ended piston rod, with cushioning, with magnet

Options	
00	without options
01	1.4021 stainless steel piston rod
05*	all parts stainless steel, piston rod 1.4401
10	Viton® piston rod sealing
11	Viton® gaskets (up to 180°C)
13	tie rod version
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

*) For piston dia. 32 to 63 incl.

For more options regarding materials or dimensions, please contact our technical dept.

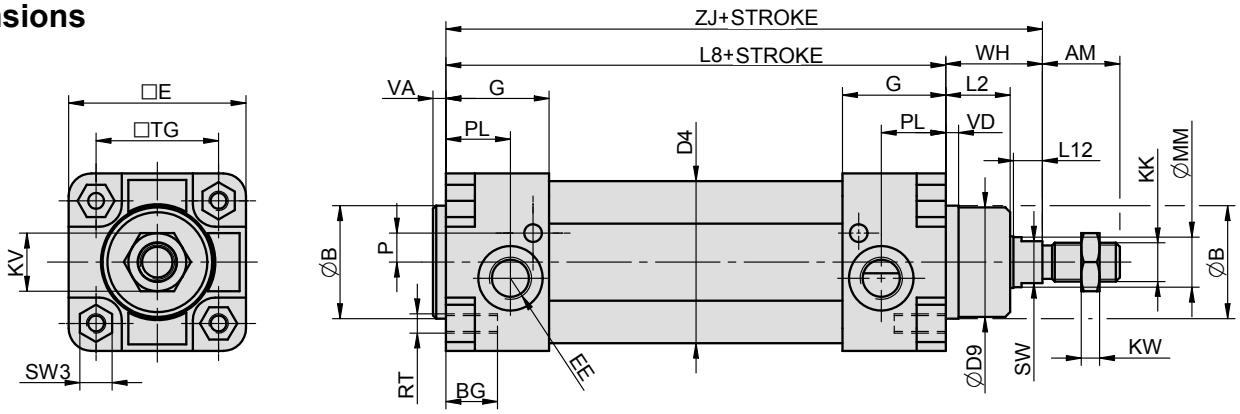
Piston diameter	
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
125	125 mm
160	160 mm
200	200 mm
250	250 mm
320	320 mm
400	400 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

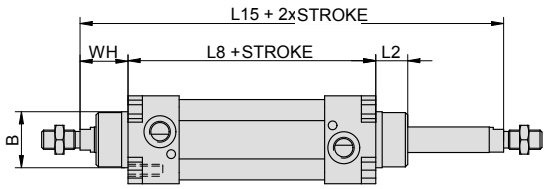
Construction / materials

- caps: aluminium mold casting, piston dia. 200 and more: aluminium casting
- body: drawn dural profile, hard anodized, piston dia. 125 (with magnet), 250 and 320 mm: drawn dural tube, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

Dimensions

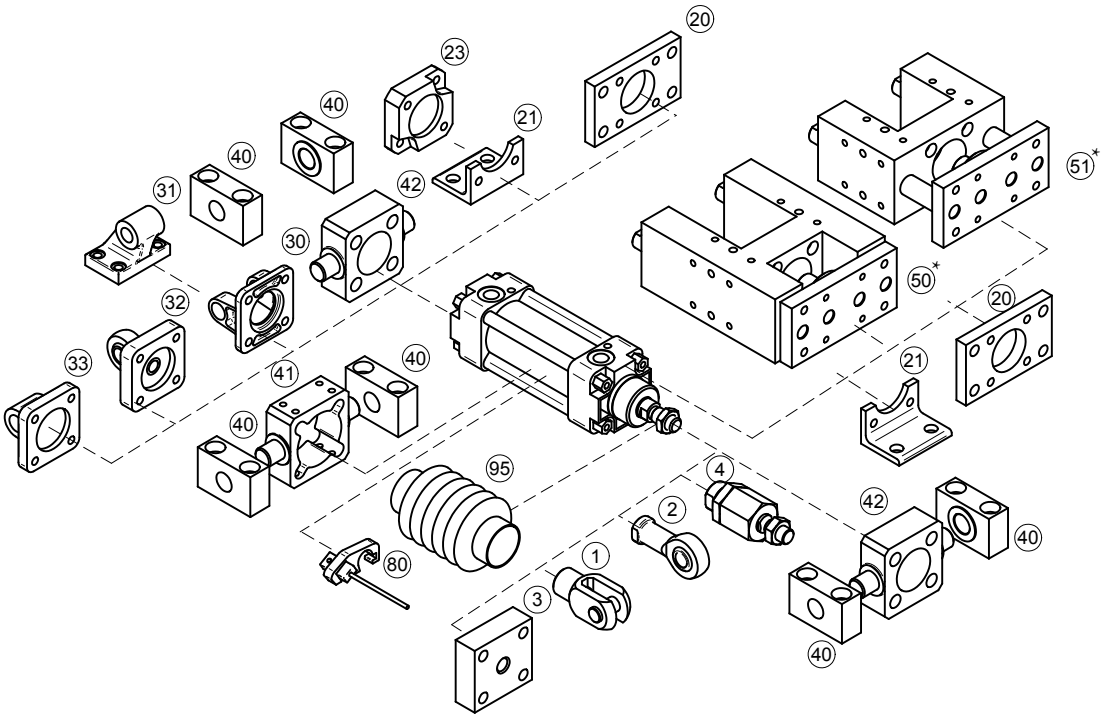


Double ended piston rod: other dimensions are the same as standard type)



∅	AM	B	BG	D4	D9	E	EE	G	KK	KV	KW	L2	L8	L12	L15	MM	P	PL	RT	SW	SW3	TG	VA	VD	WH	ZJ
32	22	30	16	36	28	48	G1/8“	31,5	M10x1,25	17	6	18	94	8	146	12	5	22,5	M6	10	10	32,5	4	4	26	120
40	24	35	16	45	34	55	G1/4“	32	M12x1,25	19	10	20	105	9	165	16	5	20	M6	13	10	38	4	4	30	135
50	32	40	19	55	39	65	G1/4“	30	M16x1,5	24	10	22	106	10	180	20	3	17	M8	16	14	46,5	4	5	37	143
63	32	45	19	68	44	75	G3/8“	30	M16x1,5	24	8	23	121	10	195	20	6	16	M8	16	14	56,5	4	5	37	158
80	40	45	19	86	44	94	G3/8“	30	M20x1,5	30	9	31	128	10	220	25	10	16	M10	21	17	72	4	5	46	174
100	40	55	19	106	54	115	G1/2“	36	M20x1,5	30	9	34	138	10	240	25	11	18	M10	21	17	89	4	17	51	189
125	54	60	20	132	58	140	G1/2“	40	M27x2	41	12	50	160	14	290	32	11	22	M12	27	22	110	6	6	65	225
160	72	65	24	168	64	185	G3/4“	50	M36x2	55	18	50	180	20	340	40	10	25	M16	36	30	140	6	10	80	260
200	72	75	24	212	74	235	G3/4“	50	M36x2	55	18	55	180	20	370	40	12	25	M16	36	30	175	6	20	95	275
250	84	90	32	262	84	270	G1“	54	M42x2	65	21	76	200	22	410	50	25	32	M20	46	36	220	10	10	105	305
320	96	110	30	340	100	350	G1“	57	M48x2	75	24	85	220	24	560	63	23	32	M24	55	41	270	10	35	120	340
400	96	110	28	420	100	430	G1“	57,5	M48x2	75	24	85	220	26		63	23	32	M24	55	41	350	10	35	120	340

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-4
23 Boxer flange mounting	... 4-9
30 Swivel flange	... 4-8
31 Clevis foot mounting	... 4-8
32 Swivel flange with spherical bearing	... 4-9
33 Swivel flange	... 4-7
40 Trunnion mounting	... 4-11
41 Pivot pin	... 4-10
42 Pivot pin to front/end cap	... 4-11
50 Guide unit H with ball bearings*	... 4-14
51 Guide unit with slide bearings*	... 4-16
80 Prox. switch	... 3-2, 3-4, 3-6, 3-9
95 Piston rod protective cover	... 4-12

*) When guide unit H or U is used on cylinder with magnetic piston, it is necessary to use cylinder with tie rod version (option No. 13). There is no free space to mount switch bracket near the front cap when the profile tube is used (position for extend piston rod).

DOUBLE ACTING PNEUMATIC CYLINDERS WITH DOUBLE PISTON ROD VDMA 24562, NF E 49003.1

Mounting dimensions meets standard VDMA 24562. Fully adjustable cushioning at end of stroke is available. Using of double piston rod, the rotation of equipment mounted on connecting plate is prevented. This cylinder may not be efforted by torque. Piston rods are guided in slide bearings without clearance.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Piston diameter [mm]	32	40	50	63	80	100	125
Thrust at 0,6 MPa [N]	482	754	1178	1870	3015	4713	7363
Return force at 0,6 MPa [N]	422	660	1042	1735	2775	4335	6774
Connection	G1/8“	G1/4“	G1/4“	G3/8“	G3/8“	G1/2“	G1/2“
Length of adjustable cushioning [mm]	12	12	12	16	16	20	30
Max. stroke [mm] *	1000*	1000*	1000*	1000*	1500*	1500*	1500*
Weight 0 mm stroke [kg]	0,57	0,68	1,15	1,75	2,90	5,10	9,1
Weight add. per 1 mm stroke [kg]	0,003	0,003	0,005	0,007	0,008	0,009	0,017

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

10115 61 00 050 0100

Type	
10115	to DIN ISO 6431, VDMA 24562, NF E 49003.1, double acting, with double piston rod

Equipment	
01	w/o cushioning, w/o magnet
11	w/o cushioning, with magnet
51	with cushioning, w/o magnet
61	with cushioning, with magnet

Options	
00	without options
01	1.4021 stainless steel piston rod
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

For more options regarding materials or dimensions, please contact our technical dept.

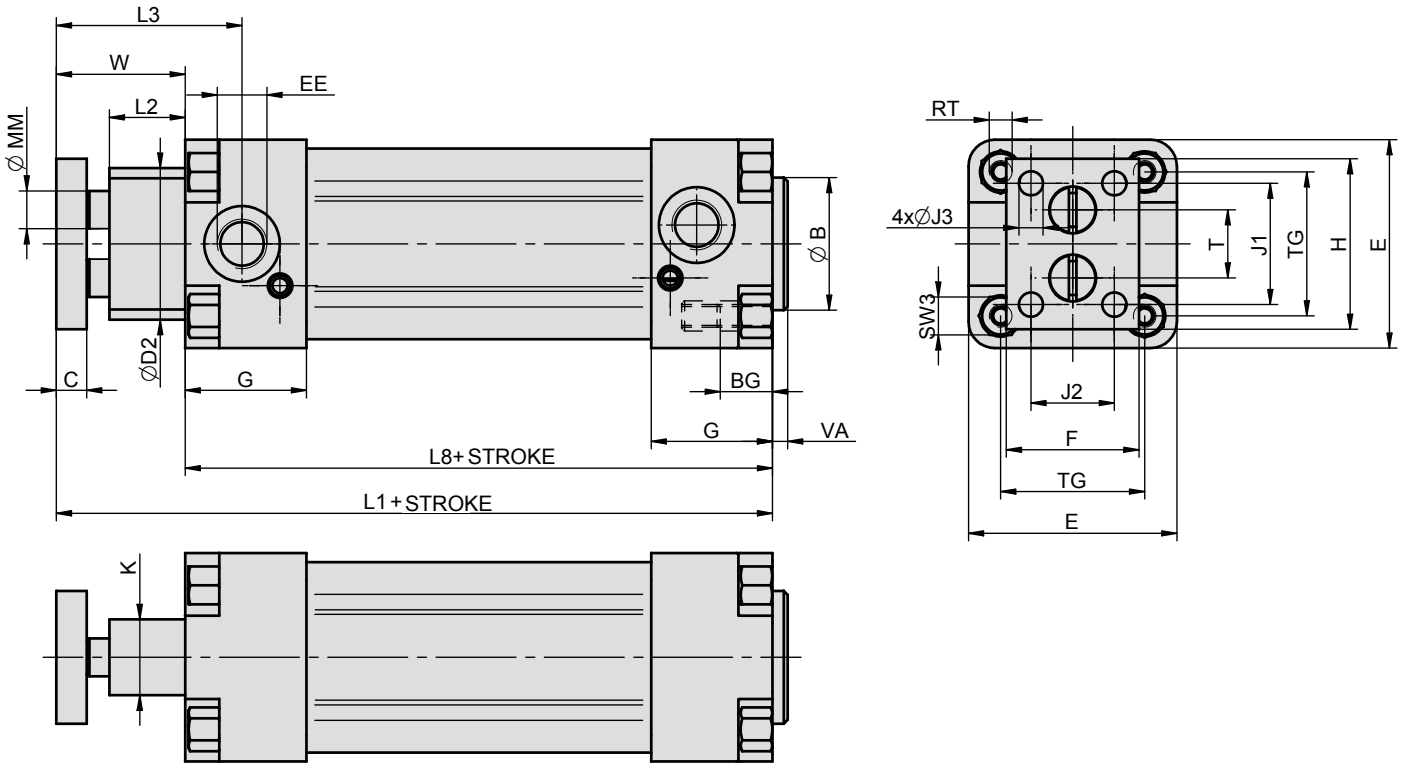
Piston diameter	
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
125	125 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

Construction / materials

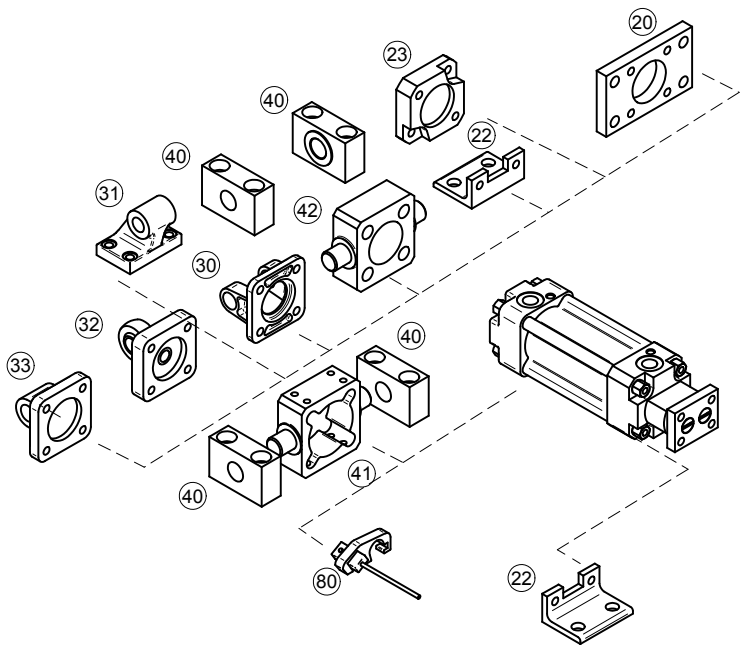
- caps: aluminium mold casting
- body: drawn dural profile, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

Dimensions



∅	B	BG	C	D2	E	EE	F	G	H	J1	J2	J3	K	L1	L2	L3	L8	MM	RT	SW3	T	TG	VA	W
32	30	16	8	36	48	G1/8“	30	31,5	40	30	20	5,4	16	126	18	47	94	8	M6	10	14	32,5	4	32
40	35	16	8	40	55	G1/4“	35	32	45	32	22	6,4	20	139	20	49	105	10	M6	10	18	38	4	34
50	40	16	8	50	65	G1/4“	40	30	50	38	28	6,4	24	143	22	53	106	12	M8	14	25	46,5	4	37
63	45	17	8	60	75	G3/8“	45	30	60	45	30	6,4	28	158	22	53	121	12	M8	14	26	56,5	4	37
80	45	19	10	76	94	G3/8“	60	30	75	60	45	8,2	40	178	31	65	128	16	M10	17	40	72	4	50
100	55	19	12	90	115	G1/2“	70	36	90	75	55	8,2	50	192	34	72	138	20	M10	17	50	89	4	54
125	60	19	16	120	140	G1/2“	90	40	110	90	70	10,5	60	231	40	89	160	25	M12	22	62	110	6	71

Mounting accessories



Mounting accessories	... see page
20 Flange mounting	... 4-6
22 Foot mounting	... 4-4
23 Boxer flange mounting	... 4-9
30 Swivel flange	... 4-8
31 Clevis foot mounting	... 4-8
32 Swivel flange with spherical bearing	... 4-9
33 Swivel flange	... 4-7
40 Trunnion mounting	... 4-11
41 Pivot pin	... 4-10
42 Pivot pin to front/end cap	... 4-11
80 Prox. switch	... 3-2, 3-4, 3-6, 3-9

DOUBLE ACTING PNEUMATIC CYLINDERS WITH LOCK DEVICE VDMA 24562, NF E 49003.1

Cylinders are designed to meet the specifications of international standard VDMA 24562 for mounting. The cylinders can work in higher temperatures by request. Fully adjustable cushioning at end of stroke is available. Lock device is actuated by spring force and deactivated by compressed air. Lock device is self-locking.

Lock device is not a safety element! The user must take relevant safety precautions!

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Min. pressure for lock release	0,2 MPa
Locking direction	both direction
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Warning

Clamping force is purely static. When exceeding load, slipping of piston rod may occur, or piston rod and/or lock device can be damaged. Right connection and suitable designed control is necessary for impact free work. Please consult your connection with our technical dept.

Piston diameter [mm]	32	40	50	63	80	100
Thrust at 0,6 MPa [N]	482	754	1178	1870	3015	4713
Thrust at 0,6 MPa [N] with double ended piston rod	415	633	990	1682	2720	4418
Return force at 0,6 MPa [N]	415	633	990	1682	2720	4418
Static clamping force [N]	>482	>754	>1178	>1870	>3015	>4713
Connection	G1/8“	G1/4“	G1/4“	G3/8“	G3/8“	G1/2“
Length of adjustable cushioning [mm]	13	13	11	16	16	20
Max. stroke [mm] *	1000*	1000*	1000*	1000*	1000*	1000*
Weight 0 mm stroke [kg]	1,15	1,62	2,80	3,90	6,20	9,80
Weight add. per 1 mm stroke [kg]	0,0028	0,0037	0,0060	0,0062	0,0100	0,0110
Weight 0 mm stroke [kg] with double ended piston rod	1,25	1,72	3,00	4,10	6,90	10,60
Weight add. per 1 mm stroke [kg] with dbl. ended piston rod	0,0038	0,0047	0,0080	0,0082	0,0140	0,0150

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

10110 60 00 050 0100

Type	
10110	to DIN ISO 6431, VDMA 24562, NF E 49003.1, double acting, with lock device

Equipment	
00	w/o cushioning, w/o magnet
05	double ended piston rod, w/o cushioning, w/o magnet
10	w/o cushioning, with magnet
15	double ended piston rod, w/o cushioning, with magnet
50	with cushioning, w/o magnet
55	double ended piston rod, with cushioning, w/o magnet
60	with cushioning, with magnet
65	double ended piston rod, with cushioning, with magnet

Options	
00	without options
11	Viton® gaskets (up to 180°C)

For more options regarding materials or dimensions, please contact our technical dept.

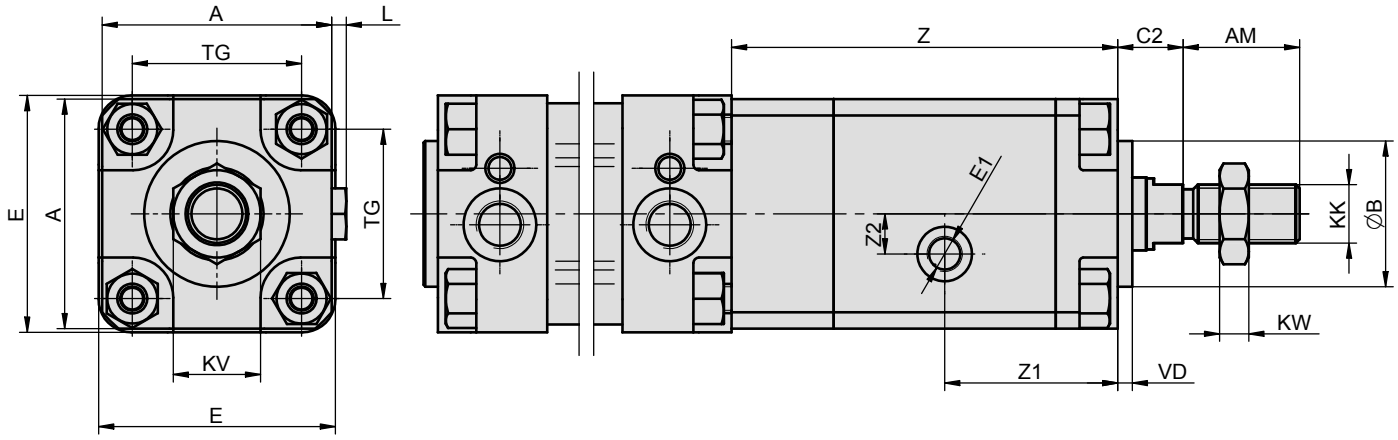
Piston diameter	
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

Construction / materials

- caps: aluminium mold casting
- body: drawn dural profile, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

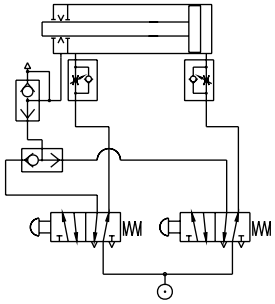
Dimensions



∅	A	AM	B	C2	E	E1	KK	KV	KW	L	TG	VD	Z	Z1	Z2
32	45	22	30	13,5	48	G1/8“	M10x1,25	16	5	4	32,5	4	95	47	5
40	56	24	35	16	55	G1/8“	M12x1,25	18	6	4	38	4	107	49,5	9
50	63	32	40	18	65	G1/8“	M16x1,5	24	8	4	46,5	4	106	46,5	11
63	70	32	45	18	75	G1/8“	M16x1,5	24	8	4	56,5	4	116	52,5	11
80	90	40	45	18	94	G1/8“	M20x1,5	30	10	5	72	5	150	65	18
100	110	43	55	18	115	G1/8“	M20x1,5	30	10	5	89	5	158	66,5	18

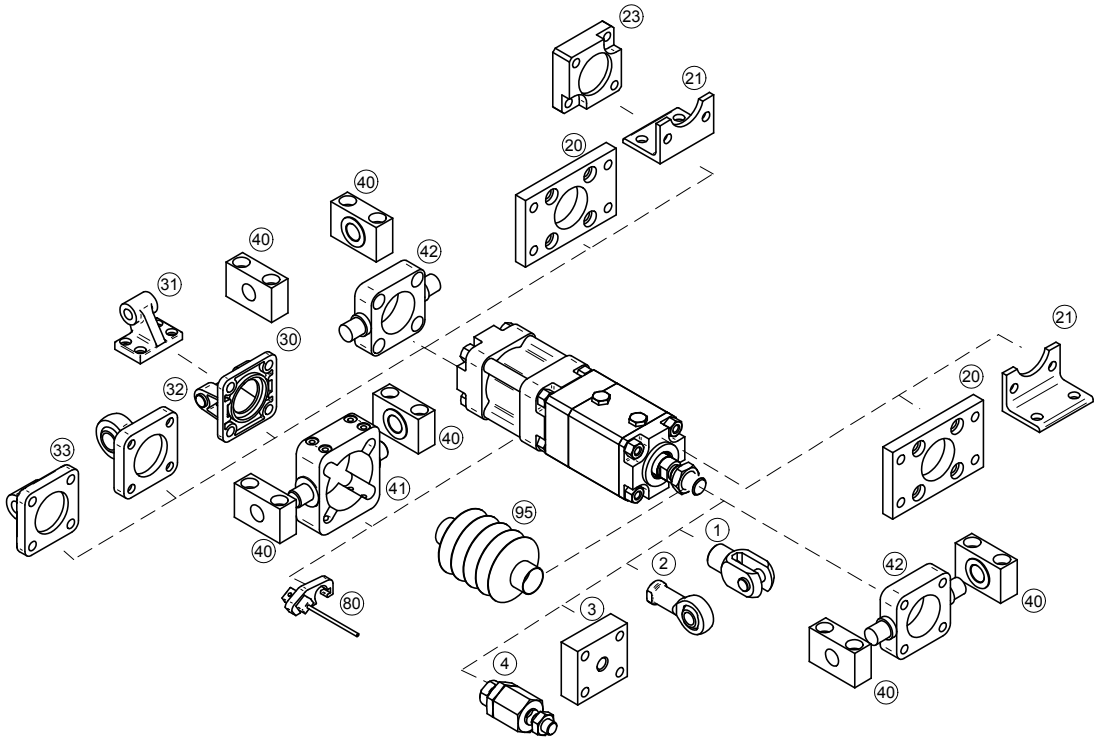
For dimensions of pneumatic cylinder on which the lock device is attached, see page 2-5

Connection example for pushbutton control:



Pressing the left pushbutton, the lock unit will unclamp and air which flows through right push-button into cylinder will extend it. After release pushbutton, compressed air is released from lock unit, which clamps piston rod and cylinder stops. For quick stopping of cylinder, the quick exhaust valve is used. The important on this connection is, that both chambers of cylinder are still with compressed air and for motion control discharging of air from particular chambers is used, which prevents from impacts or unwanted countermovements.

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-4
23 Boxer flange mounting	... 4-9
30 Swivel flange	... 4-8
31 Clevis foot mounting	... 4-8
32 Swivel flange with spherical bearing	... 4-9
33 Swivel flange	... 4-7
40 Trunnion mounting	... 4-11
41 Pivot pin	... 4-10
42 Pivot pin to front/end cap	... 4-11
80 Prox. switch	... 3-2, 3-4, 3-6, 3-9
95 Piston rod protective cover	... 4-12

DOUBLE ACTING PNEUMATIC CYLINDERS
TANDEM
VDMA 24562, NF E 49003.1

Tandem cylinder is built-up from two or three cylinders, has common piston rod and almost double or triple thrust and return force. Cylinders are designed to meet the specifications of international standard ISO 6431, VDMA 24562 a NF E 49003.1 for mounting. The cylinders can work in higher temperatures by request. Fully adjustable cushioning at end of stroke is available.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	63	80	100	125	160	200	250	320
Thrust at 0,6 MPa [N] for double tandem	3552	5737	9130	14243	23373	36945	57726	94639
Return force at 0,6 MPa [N] for double tandem	3363	5442	8835	13761	22618	36192	56548	92769
Thrust at 0,6 MPa [N] for triple tandem	5234	8458	13548	21124	34682	55041	86002	141023
Return force at 0,6 MPa [N] for triple tandem	5045	8164	13253	20641	33927	54288	84823	139153
Connection	G3/8“	G3/8“	G1/2“	G1/2“	G3/4“	G3/4“	G1“	G1“
Length of adjustable cushioning [mm]	16	20	25	25	32	32	36	48
Max. stroke [mm] *	500*	1000*	1000*	1000*	1000*	1000*	1000*	1000*
Weight 0 mm stroke [kg] for double tandem	2,83	5,5	7,2	12,7	26,1	37,3	52,5	105,0
Weight add. per 1 mm stroke [kg] for double tandem	0,010	0,014	0,020	0,026	0,044	0,054	0,060	0,120
Weight 0 mm stroke [kg] for triple tandem	4,00	8,2	10,2	17,8	38,9	54,1	76,0	140,0
Weight add. per 1 mm stroke [kg] for triple tandem	0,014	0,019	0,029	0,036	0,060	0,078	0,086	0,175

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

10122 60 00 160 0100

Type	
10122	double tandem, double acting
10123	triple tandem, double acting

Equipment	
00	w/o cushioning, w/o magnet
05	double ended piston rod, w/o cushioning, w/o magnet
10	w/o cushioning, with magnet
15	double ended piston rod, w/o cushioning, with magnet
50	with cushioning, w/o magnet
55	double ended piston rod, with cushioning, w/o magnet
60	with cushioning, with magnet
65	double ended piston rod, with cushioning, with magnet

Options	
00	without options
01	1.4021 stainless steel piston rod
10	Viton® piston rod sealing
11	Viton® gaskets (up to 180°C)
13	tie rod version
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

For more options regarding materials or dimensions, please contact our technical dept.

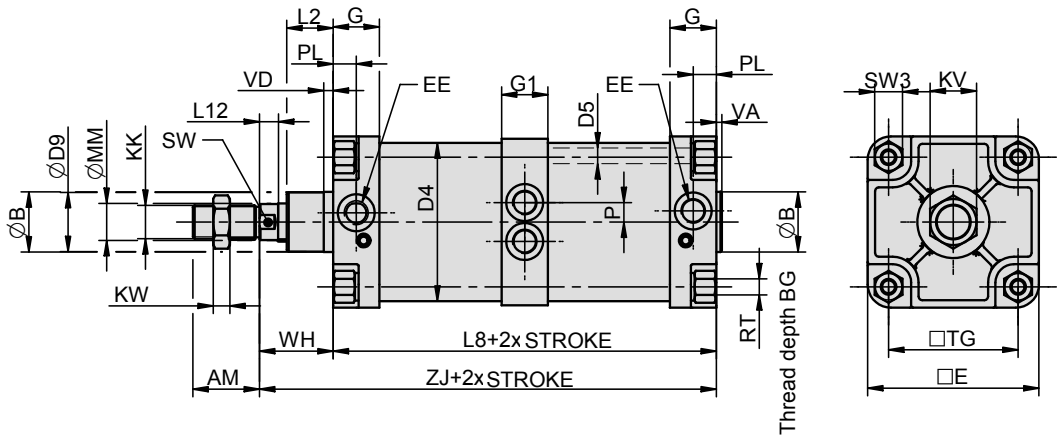
Piston diameter	
063	63 mm
080	80 mm
100	100 mm
125	125 mm
160	160 mm
200	200 mm
250	250 mm
320	320 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

Construction / materials

- caps: aluminium mold casting, piston dia. 200 and more: aluminium casting
- centre part: drawn dural profile, hard anodized
- body: drawn dural profile, hard anodized, piston dia. 125 (with magnet), 250 and 320 mm: drawn dural tube, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

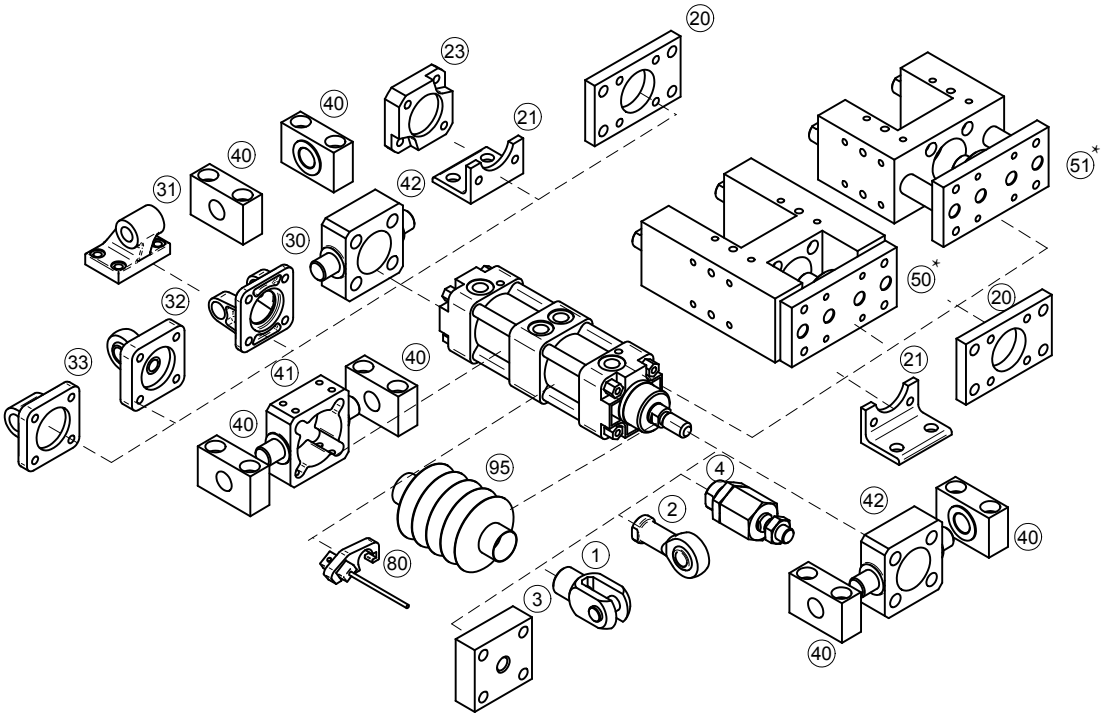
Dimensions



∅	AM	B	BG	D4	D5	D9	E	EE	G	G1	KK	KV	KW	L2	L8*	L8**	L12	MM	P	PL	RT	SW	SW3	TG	VA	VD	WH	ZJ*	ZJ**
63	32	45	17	68	8	44	75	G3/8“	30	26	M16x1,5	24	8	23	208*	295**	10	20	6	16	M8	16	14	56,5	4	5	37	245*	332**
80	40	45	19	86	10	44	95	G3/8“	30	30	M20x1,5	30	9	31	226*	324**	10	25	16	16	M10	21	17	72	4	5	46	272*	370**
100	40	55	19	106	10	54	115	G1/2“	36	36	M20x1,5	30	9	34	240*	342**	10	25	16	18	M10	21	17	89	4	17	51	291*	393**
125	54	60	20	132	12	58	140	G1/2“	40	32	M27x2	41	12	50	272*	384**	14	32	16	22	M12	27	22	110	6	6	65	337*	449**
160	72	65	24	171	16	64	185	G3/4“	50	50	M36x2	50	14	50	314*	446**	20	40	21	25	M16	36	30	140	6	10	80	394*	526**
200	72	75	24	210	16	74	235	G3/4“	50	50	M36x2	50	14	55	310*	440**	20	40	25	25	M16	36	30	175	6	20	95	405*	535**
250	84	90	30	262	20	84	270	G1“	54	54	M42x2	65	21	76	346*	492**	22	50	32	32	M20	46	36	220	10	10	105	451*	597**
320	96	110	30	340	24	100	350	G1“	57	57	M48x2	75	24	85	383*	546**	27	63	23	32	M24	55	41	270	10	35	120	503*	666**

*) Values are valid for double tandem
**) Values are valid for triple tandem

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-4
23 Boxer flange mounting	... 4-9
30 Swivel flange	... 4-8
31 Clevis foot mounting	... 4-8
32 Swivel flange with spherical bearing	... 4-9
33 Swivel flange	... 4-7
40 Trunnion mounting	... 4-11
41 Pivot pin	... 4-10
42 Pivot pin to front/end cap	... 4-11
50 Guide unit H with ball bearings*	... 4-14
51 Guide unit with slide bearings*	... 4-16
80 Prox. switch	... 3-2, 3-4, 3-6, 3-9
95 Piston rod protective cover	... 4-12

*) When guide unit H or U is used on cylinder with magnetic piston, it is necessary to use cylinder with tie rod version (option No. 13).
There is no free space to mount switch bracket near the front cap when the profile tube is used (position for extend piston rod).

DOUBLE ACTING PNEUMATIC CYLINDERS
COMPACT

Compact cylinders are smaller than standard cylinders and they are suitable especially, when there isn't enough space for standard cylinder. Dimensions of mounting holes meets international standards ISO 6431, VDMA 24562 and NF E 49003.1, that is why standard mounting accessories can be used. There are bumpers in both end positions.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	**32**	**40**	**50**	**63**	**80**	**100**
Thrust at 0,6 MPa [N]	482	754	1178	1870	3015	4713
Thrust at 0,6 MPa [N] with double ended piston rod	415	662	1025	1717	2720	4484
Return force at 0,6 MPa [N]	415	662	1025	1717	2720	4484
Connection	G1/8“	G1/8“	G1/8“	G1/8“	G1/8“	G1/4“
Max. stroke [mm] *	150*	150*	200*	200*	200*	200*
Weight 0 mm stroke [kg]	0,24	0,34	0,50	0,72	1,20	1,89
Weight add. per 1 mm stroke [kg]	0,0020	0,0034	0,0047	0,0055	0,0076	0,0095
Weight 0 mm stroke [kg] with double ended piston rod	0,28	0,36	0,55	0,76	1,30	2,07
Weight add. per 1 mm stroke [kg] with dbl. ended piston rod	0,0040	0,0044	0,0065	0,0067	0,0103	0,0131

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

12001 10 00 050 0100

Type	
12001	compact, double acting

Equipment	
00	w/o magnet, external thread
01	w/o magnet, internal thread
05	with double ended piston rod, w/o magnet, external thread
06	with double ended piston rod, w/o magnet,internal thread
10	with magnet, external thread
11	with magnet, internal thread
15	with double ended piston rod, with magnet, external thread
16	with double ended piston rod, with magnet, internal thread

Options	
00	without options
01	1.4021 stainless steel piston rod
02	steel parts from stainless 1.4301 piston rod stainless 1.4021
14	1.4301 stainless steel piston rod
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

For more options regarding materials or dimensions, please contact our technical dept.

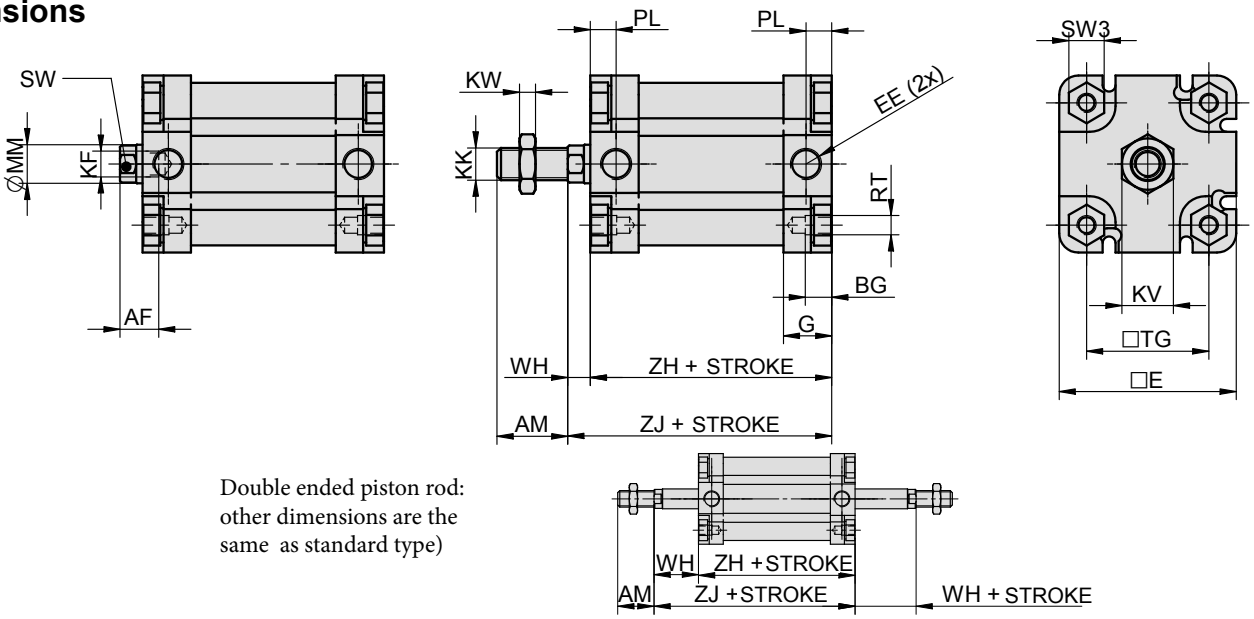
Piston diameter	
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

Construction / materials

- caps: aluminium mold casting
- body: drawn dural profile, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

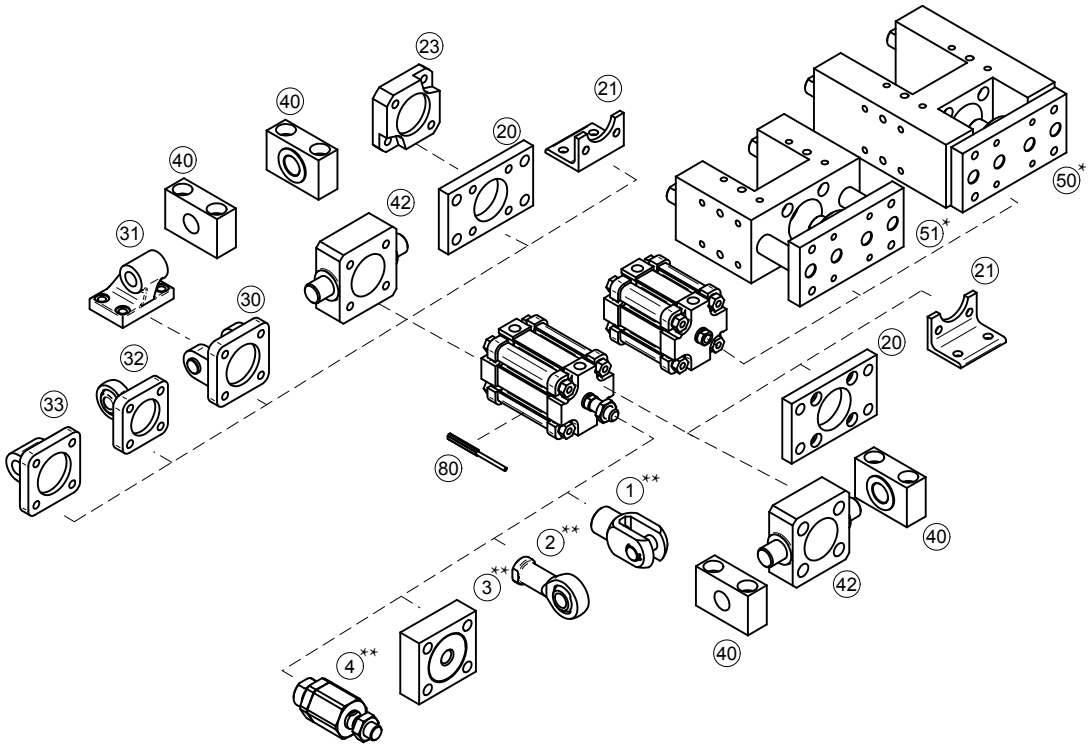
Dimensions



Double ended piston rod: other dimensions are the same as standard type)

∅	AF	AM	BG	E	EE	G	KF	KK	KV	KW	MM	PL	RT	SW	SW3	TG	WH	ZH	ZJ
32	12	22	9	48	G1/8“	15	M8	M10x1,25	17	6	12	8	M6	10	11	32,5	7	45	52
40	12	22	9	55	G1/8“	15	M8	M10x1,25	17	6	12	8	M6	10	11	38	7	45	52
50	16	24	9	65	G1/8“	15	M10	M12x1,25	19	10	16	8	M8	13	14	46,5	8	45	53
63	16	24	9	75	G1/8“	15	M10	M12x1,25	19	10	16	8	M8	13	14	56,5	8	49	57
80	20	32	11	95	G1/8“	17	M12	M16x1,5	24	8	20	8,5	M10	16	17	72	10	54	64
100	22	40	11	115	G1/4“	20	M12	M20x1,5	30	9	25	10,5	M10	21	17	89	10	62	72

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis**	... 4-2
2 Piston rod eye**	... 4-3
3 Flanged piston rod coupling**	... 4-2
4 Self-aligning piston rod coupling**	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-4
23 Boxer flange mounting	... 4-9
30 Swivel flange	... 4-8
31 Clevis foot mounting	... 4-8
32 Swivel flange with spherical bearing	... 4-9
33 Swivel flange	... 4-7
40 Trunnion mounting	... 4-11
42 Pivot pin to front/end cap	... 4-11
50 Guide unit H with ball bearings*	... 4-14
51 Guide unit with slide bearings*	... 4-16
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8

*) When guide unit H or U is used, it is necessary to use piston rod thread reduction (for more information please contact our technical dept.)

**) Please check dimensions of thread on cylinder and accessories for piston rod, before you order it (for example: compact cylinder piston dia. 40 mm has thread M10x1,25 on piston rod, piston rod clevis for cylinder dia. 40 has thread M12x1,25, so it is necessary to order picton rod clevis for cylinder dia. 25/30, where is thread M10x1,25).

DOUBLE ACTING PNEUMATIC CYLINDERS DIN ISO 6432

Cylinders are designed to meet the specifications of international standard ISO 6432. The cylinders can work in higher temperatures by request. There is no cushioning at the end of stroke.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	8	10	12	16
Thrust at 0,6 MPa [N]	30	47	66	121
Thrust at 0,6 MPa [N] with double ended piston rod	22	39	50	102
Return force at 0,6 MPa [N]	22	39	50	102
Connection	M5	M5	M5	M5
Max. stroke [mm] *	200*	200*	300*	300*
Weight 0 mm stroke [kg]	0,04	0,04	0,06	0,07
Weight add. per 1 mm stroke [kg]	0,0006	0,0006	0,0005	0,0008
Weight 0 mm stroke [kg] with double ended piston rod	0,04	0,04	0,06	0,07
Weight add. per 1 mm stroke [kg] with dbl. ended piston rod	0,0006	0,0006	0,0006	0,0009

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

11001 00 00 016 0050

Type	
11001	to DIN ISO 6432, double acting

Equipment	
00	w/o cushioning, w/o magnet
05	with double ended piston rod, w/o cushioning, w/o magnet
10[1)]	w/o cushioning, with magnet
15[1)]	with double ended piston rod, w/o cushioning, with magnet

1) For piston dia. 12 and 16 mm

Options	
00	without options
01	1.4021 stainless steel piston rod
10	Viton® piston rod sealing
11	Viton® gaskets (up to 180°C)
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

For more options regarding materials or dimensions, please contact our technical dept.

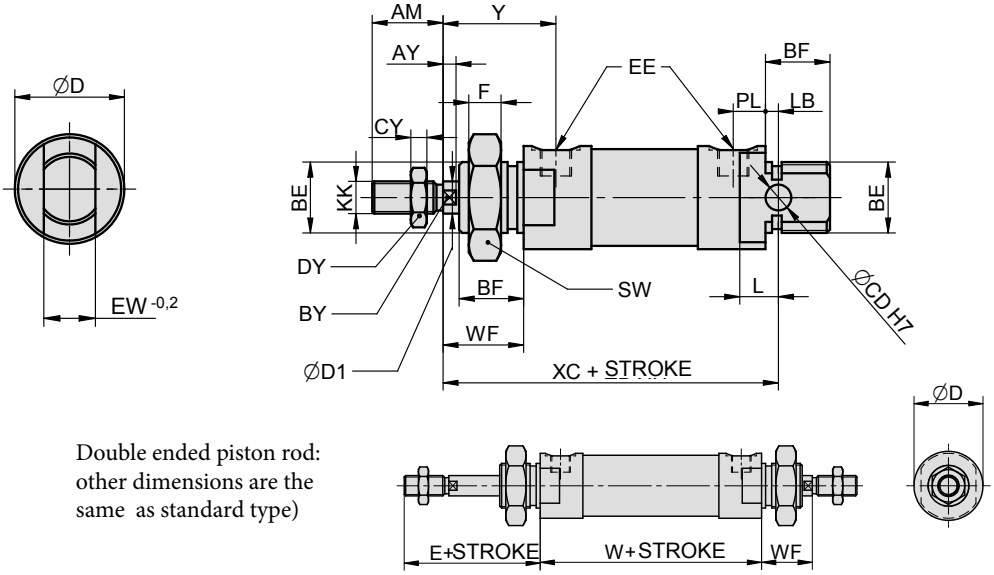
Piston diameter	
008	8 mm
010	10 mm
012	12 mm
016	16 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

Construction / materials

- caps: hard anodized dural
- body: drawn dural tube, hard anodized, piston dia 8 and 10 mm: drawn brass tube
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

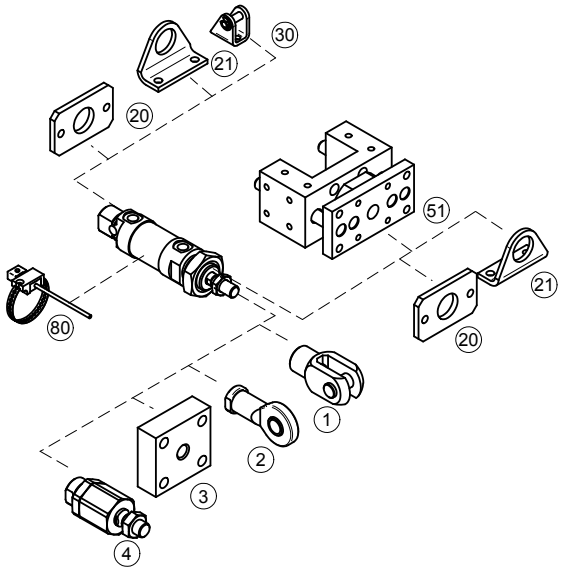
Dimensions



Double ended piston rod: other dimensions are the same as standard type)

∅	AM	AY	BE	BF	BY	CD	CY	D	D1	DY	E	EE	EW	F	KK	L	LB	PL	SW	WF	XC	Y	W
8	12	3	M12x1,25	12	3	4	3	16	4	7	28	M5	8	7	M4	9	3	5	18	16	64	21	45
10	12	3	M12x1,25	12	3	4	3	16	4	7	28	M5	8	7	M4	9	3	5	18	16	64	21	45
12	16	3	M16x1,5	15	5	6	3	22	6	10	36	M5	12	8	M6	10	4	5	24	20	75	25	45
16	16	3	M16x1,5	15	5	6	3	25	6	10	36	M5	12	8	M6	11	5	5	24	20	82	25	50

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-7
21 Foot mounting	... 4-5
30 Swivel flange	... 4-5
51 Guide unit with slide bearings	... 4-16
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8

DOUBLE ACTING PNEUMATIC CYLINDERS DIN ISO 6432

Cylinders are designed to meet the specifications of international standard ISO 6432. The cylinders can work in higher temperatures by request. Fully adjustable cushioning at end of stroke is available.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	**20**	**25**
Thrust at 0,6 MPa [N]	188	295
Thrust at 0,6 MPa [N] with double ended piston rod	158	248
Return force at 0,6 MPa [N]	158	248
Connection	G1/8“	G1/8“
Length of adjustable cushioning [mm]	11	9
Max. stroke [mm] *	300*	500*
Weight 0 mm stroke [kg]	0,17	0,22
Weight add. per 1 mm stroke [kg]	0,0010	0,0013
Weight 0 mm stroke [kg] with double ended piston rod	0,20	0,30
Weight add. per 1 mm stroke [kg] with dbl. ended piston rod	0,0014	0,0020

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

11101 60 00 020 0100

Type	
11101	to DIN ISO 6432, double acting

Equipment	
00	w/o cushioning, w/o magnet
05	with double ended piston rod, w/o cushioning, w/o magnet
10	w/o cushioning, with magnet
15	with double ended piston rod, w/o cushioning, with magnet
50	with cushioning, w/o magnet
55	with double ended piston rod, with cushioning, w/o magnet
60	with cushioning, with magnet
65	with double ended piston rod, with cushioning, with magnet

Options	
00	without options
01	1.4021 stainless steel piston rod
10	Viton® piston rod sealing
11	Viton® gaskets (up to 180°C)
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

For more options regarding materials or dimensions, please contact our technical dept.

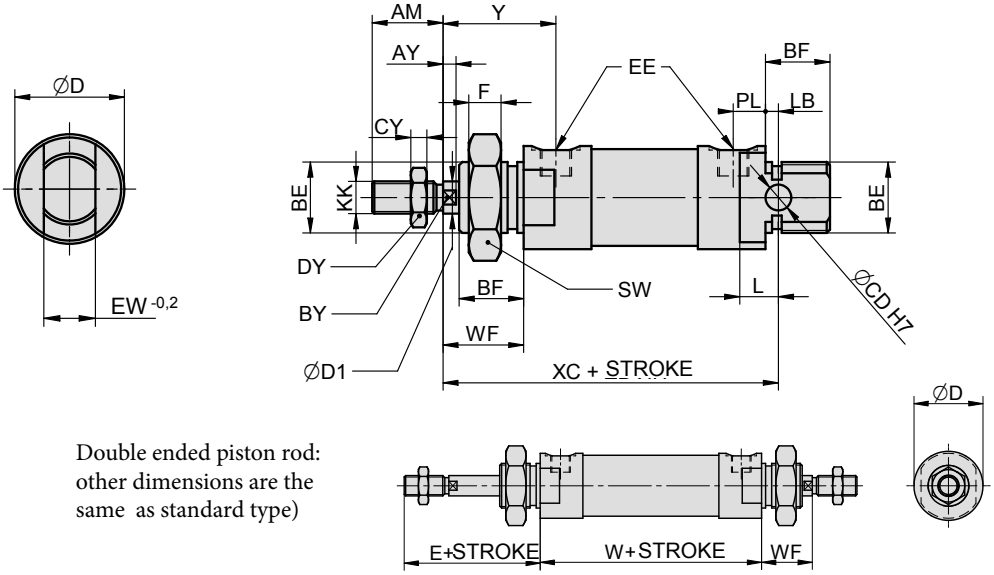
Piston diameter	
020	20 mm
025	25 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm
9999	repair kit

Construction / materials

- caps: hard anodized dural
- body: drawn dural tube, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

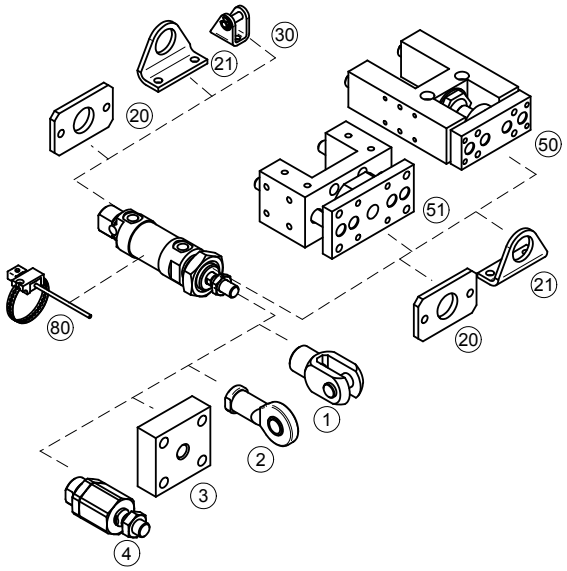
Dimensions



Double ended piston rod: other dimensions are the same as standard type)

∅	AM	AY	BE	BF	BY	CD	CY	D	D1	DY	E	EE	EW	F	KK	L	LB	PL	SW	WF	XC	Y	W
20	20	4	M22x1,5	20	7	8	6	27,5	8	13	44,5	G1/8“	16	10	M8	12	3	9,5	34	24,5	95	34	67,5
25	22	4	M22x1,5	20	9	8	6	32	10	17	47	G1/8“	16	10	M10x1,25	12	4	10	34	25,5	104	35	75

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-7
21 Foot mounting	... 4-5
30 Swivel flange	... 4-5
50 Guide unit H with ball bearings	... 4-14
51 Guide unit with slide bearings	... 4-16
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8

DOUBLE ACTING PNEUMATIC CYLINDERS
SHORT STROKE

Pneumatic cylinder may be used, when small mounting dimensions are required. The cylinders can work in higher temperatures by request. There is no cushioning at the end of stroke.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	20	25	32	40	50	63	80	100	160	250
Thrust at 0,6 MPa [N]	188	295	482	754	1178	1870	3015	4713	12064	29460
Thrust at 0,6 MPa [N] with double ended piston rod	158	248	415	662	1025	1717	2720	4484	11309	27600
Return force at 0,6 MPa [N]	158	248	415	662	1025	1717	2720	4484	11309	27600
Connection	M5	G1/8“	G1/8“	G1/8“	G1/8“	G1/8“	G1/4“	G1/4“	G3/8“	G1/2“
Max. stroke [mm] *	50*	50*	50*	50*	50*	50*	50*	50*	60*	40*
Weight 0 mm stroke [kg]	0,05	0,08	0,16	0,29	0,43	0,60	1,10	1,80	8,20	30,00
Weight add. per 1 mm stroke [kg]	0,0014	0,0015	0,0040	0,0060	0,0080	0,0100	0,0160	0,0200	0,0600	0,0830
Weight 0 mm stroke [kg] with double ended piston rod	0,06	0,09	0,17	0,32	0,50	0,70	1,20	2,00	8,90	33,00
Weight add. per 1 mm stroke [kg] with double ended piston rod	0,0022	0,0036	0,0050	0,0070	0,0100	0,0120	0,0190	0,0250	0,0700	0,0980

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

12501 10 00 050 0010

Type	
12501	short stroke, double acting

Equipment	
00	w/o magnet, external thread
01	w/o magnet, internal thread
05	with double ended piston rod, w/o magnet, external thread
06	with double ended piston rod, w/o magnet, internal thread
10	with magnet, external thread
11	with magnet, internal thread
15	with double ended piston rod, with magnet, external thread
16	with double ended piston rod, with magnet, internal thread

Options	
00	without options
01	1.4021 stainless steel piston rod
10	Viton® piston rod sealing
11	Viton® gaskets (up to 180°C)
14	1.4301 stainless steel piston rod

For more options regarding materials or dimensions, please contact our technical dept.

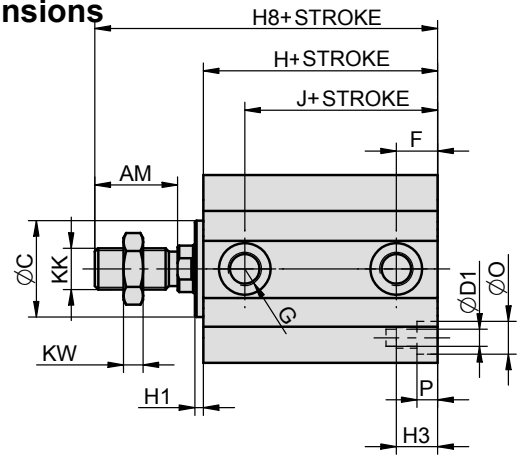
Piston diameter	
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
160	160 mm
250	250 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0010 = stroke 10 mm
9999	repair kit

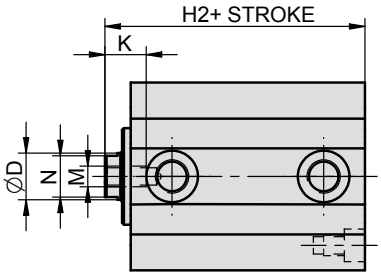
Construction / materials

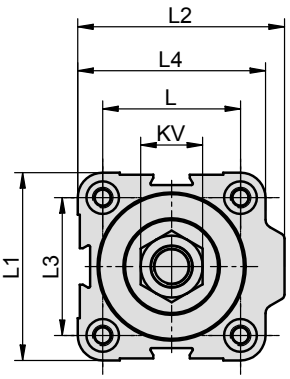
- caps: anodized dural, piston dia. 250 mm: aluminium casting
- body: drawn dural profile, hard anodized¨, piston dia. 160 and 250 mm: aluminium casting
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

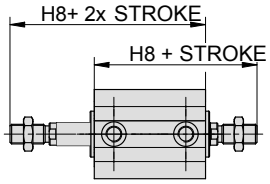
Dimensions

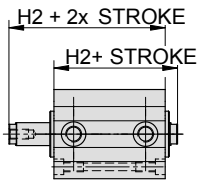


Double ended piston rod: other dimensions are the same as standard type)





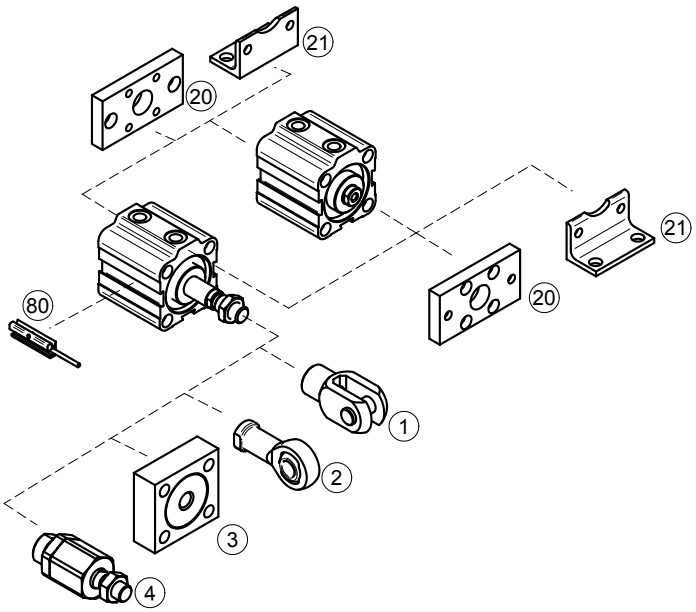




∅	AM	C	D	D1	F	G	H	H1	H2	H3	H8	J	K	KK	KV	KW	L	L1	L2	L3	L4	M	N	O	P
20	20	12	8	M5	9	M5	28	2,5	35,5	15	55,5	19	8	M8	13	6	22	32	35	22	32	M5	7	7	5
20M	20	12	8	M5	9	M5	53,5	2,5	61	15	81	44,5	8	M8	13	6	22	32	35	22	32	M5	7	7	5
25	22	17	10	M5	10	G1/8“	32	2,5	39,5	15	61,5	22	8	M10x1,25	17	6	28	38	45	26	39	M5	8	8	5
25M	22	17	10	M5	10	G1/8“	46	2,5	53,5	15	75,5	36	8	M10x1,25	17	6	28	38	45	26	39	M5	8	8	5
32	22	21	12	M6	11	G1/8“	40	2,5	47,5	18	69,5	29	12	M10x1,25	17	6	36	45	54	32	48	M6	10	9,5	6
32M	22	21	12	M6	11	G1/8“	52	2,5	59,5	18	81,5	41	12	M10x1,25	17	6	36	45	54	32	48	M6	10	9,5	6
40	24	28	14	M6	12	G1/8“	48	2,5	55,5	18	79,5	36	12	M12x1,25	19	10	40	55	60	40	55	M6	12	9,5	6
50	32	36	18	M8	13	G1/8“	49	2,5	57,5	24	89,5	36	14	M16x1,5	24	8	50	65	73	50	65	M8	16	11	8
63	32	48	18	M10	14,5	G1/8“	47	3,5	56,5	24,5	88,5	32,5	14	M16x1,5	24	8	62	80	88	62	80	M8	16	14	8,5
80	43	54	22	M10	16,5	G1/4“	52	3,5	61,5	24,5	104,5	35,5	17	M20x1,5	30	9	82	100	110	82	100	M10	19	14	8,5
80M	43	54	22	M10	16,5	G1/4“	57	3,5	66,5	24,5	109,5	40,5	17	M20x1,5	30	9	82	100	110	82	100	M10	19	14	8,5
100	43	60	22	M12	20	G1/4“	60	6	72	29	115	40	20	M20x1,5	30	9	103	124	134	103	124	M12	19	17	11
100M	43	60	22	M12	20	G1/4“	62	6	74	29	117	42	20	M20x1,5	30	9	103	124	134	103	124	M12	19	17	11
160	72	110	40	M20	23	G3/8“	96	–	113	45	185	73,5	25	M36x2	50	18	154	200	210	154	200	M16	36	26	21
250	84	–	50	M20	42	G1/2“	146	–	169	60	253	104	35	M42x2	65	21	220	275	300	220	–	M24	46	26	20

Notice: M after piston diameter size means cylinder with magnetic piston.

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-5
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8

DOUBLE ACTING PNEUMATIC CYLINDERS SHORT STROKE WITH GUIDE WITH SLIDE BEARINGS

Pneumatic cylinder may be used, when small mounting dimensions are required. The cylinders can work in higher temperatures by request. There is no cushioning at end of stroke. This design features a torque resistant guide system to prevent piston rod rotation. Guiding rods are mounted in slide bearings without clearance.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	20	25	32	40	50	63	80	100	160
Thrust at 0,6 MPa [N]	188	295	482	754	1178	1870	3015	4713	12064
Return force at 0,6 MPa [N]	158	248	415	662	1025	1717	2720	4484	11309
Connection	M5	G1/8“	G1/8“	G1/8“	G1/8“	G1/8“	G1/4“	G1/4“	G3/8“
Max. stroke [mm] *	50*	50*	50*	50*	50*	50*	50*	50*	60*
Weight 0 mm stroke [kg]	0,20	0,25	0,30	0,37	0,50	0,69	1,46	1,78	13,5
Weight add. per 1 mm stroke [kg]	0,01	0,01	0,01	0,08	0,10	0,15	0,17	0,20	0,60

*) Stroke of cylinder may be longer after agreement with our technical dept.

Order codes

12517 11 00 050 0010

Type	
12517	short stroke with guide with slide bearings, double acting

Equipment	
01	w/o magnet
11	with magnet

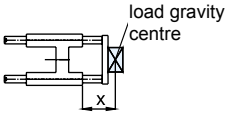
Options	
00	without options
01	1.4021 stainless steel piston rod
10	Viton® piston rod sealing
11	Viton® gaskets (up to 180°C)
14	1.4301 stainless steel piston rod

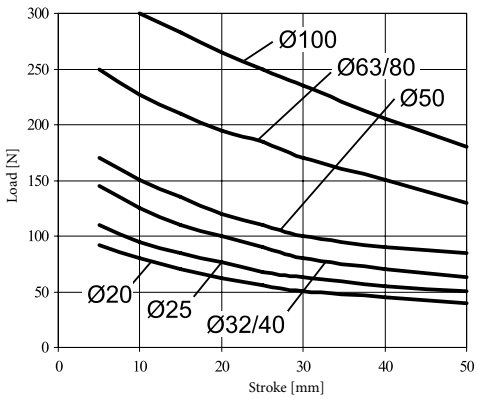
For more options regarding materials or dimensions, please contact our technical dept.

Piston diameter	
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
160	160 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0010 = stroke 10 mm
9999	repair kit

Useful load

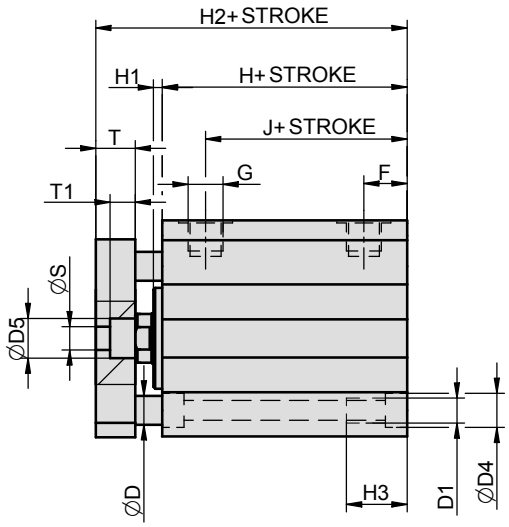


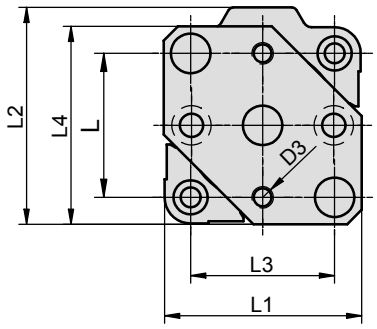


Construction / materials

- caps: anodized dural
- body: drawn dural profile, hard anodized, piston dia. 160 mm: aluminium casting
- piston rod and guiding rods: grounded round steel bar CK45 with hard chrome plated surface
- flange: zinc plated steel
- guiding rods are mounted in slide bearings

Dimensions

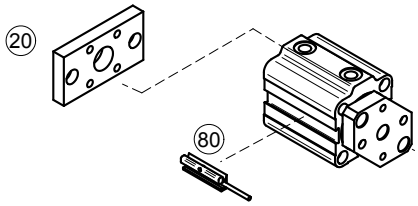




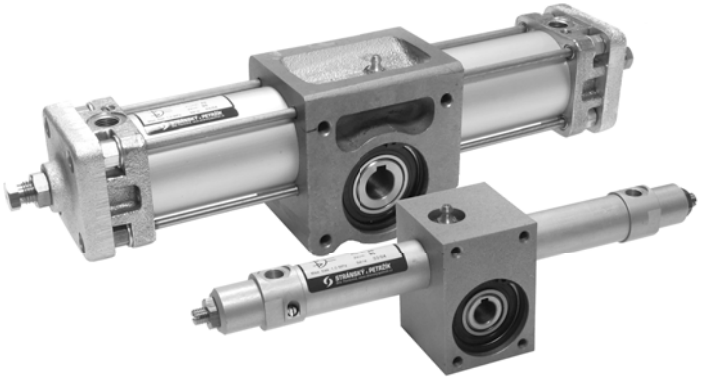
∅	D	D1	D3	D5	F	G	H	H1	H2	H3	J	L	L1	L2	L3	L4	S	T	T1
20	5	M5	M4	8	9	M5	28	2,5	44,5	15	19	22	32	35	22	32	4,5	9	5
20M	5	M5	M4	8	9	M5	53,5	2,5	70	15	44,5	22	32	35	22	32	4,5	9	5
25	6	M5	M4	8	10	G1/8“	32	2,5	48,5	15	22	28	38	44,5	26	39	4,5	9	5
25M	6	M5	M4	8	10	G1/8“	46	2,5	62,5	15	22	28	38	44,5	26	39	4,5	9	5
32	8	M6	M5	10	11	G1/8“	40	2,5	57,5	18	29	36	45	54	32	48	5,5	10	6
32M	8	M6	M5	10	11	G1/8“	52	2,5	69,5	18	41	36	46	54	32	48	5,5	10	6
40	8	M6	M6	11	12	G1/8“	48	2,5	66,5	18	36	40	55	60	40	55	6,5	11	7
50	10	M8	M6	11	13	G1/8“	49	2,5	70,5	24	36	50	65	73	50	65	6,5	13	7
63	12	M10	M8	15	14,5	G1/8“	47	3,5	69,5	24,5	32,5	62	80	88	62	80	8,5	13	9
80	12	M10	M8	15	16,5	G1/4“	52	3,5	76,5	24,5	34,5	82	100	109	82	100	8,5	15	9
80M	12	M10	M8	15	16,5	G1/4“	57	3,5	81,5	24,5	39,5	82	100	109	82	100	8,5	15	9
100	14	M12	M8	15	20	G1/4“	60	6	89	29	40	103	124	134	103	124	8,5	17	9
100M	14	M12	M8	15	20	G1/4“	62	6	91	29	42	103	124	134	103	124	8,5	17	9
160	22	M20	M12	20	22,5	G3/8“	96	-	137	45	73,5	154	200	210	154	200	13	24	13

Notice: M after piston diameter size means cylinder with magnetic piston.

Mounting accessories



Mounting accessories	... see page
20 Flange mounting	... 4-2
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8



Linear piston movement is converted to rotary motion by rack and pinion. The cylinders can work in higher temperatures by request. Fully adjustable cushioning at end of stroke is available.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C *
End position regulation	±5°
Working medium	modified compressed air

*) values are valid for standard gaskets

Piston diameter [mm]	**20**	**25**	**32**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Torque at 0,6 MPa [Nm]	3,5	5,5	8,7	13,6	27	42	108	173	397	651
Connection	G1/8“	G1/8“	G1/8“	G1/8“	G1/4“	G3/8“	G3/8“	G1/2“	G1/2“	G3/4“
Length of adjustable cushioning [mm]	15	15	18	20	20	22	25	25	25	45
Max. angle of pinion rotation [°]	360	360	360	360	360	360	360	360	360	360
Weight 0 mm stroke [kg]	0,95	1,02	1,1	1,23	6,2	6,35	9,4	9,72	14,2	16,8
Weight add per 10° pinion rotation [kg]	0,02	0,02	0,03	0,04	0,05	0,06	0,07	0,085	0,09	0,1

Order codes

15001 61 00 050 0180

Type	
15001	rotary actuator, double acting

Equipment	
01	w/o cushioning, w/o magnet
11	w/o cushioning, with magnet
51	with cushioning, w/o magnet
61	with cushioning, with magnet

Options	
00	without options
09	polyurethane gaskets (up to 110°C)
11	Viton® gaskets (up to 180°C)

For more options regarding materials or dimensions, please contact our technical dept.

Piston diameter	
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
125	125 mm
160	160 mm

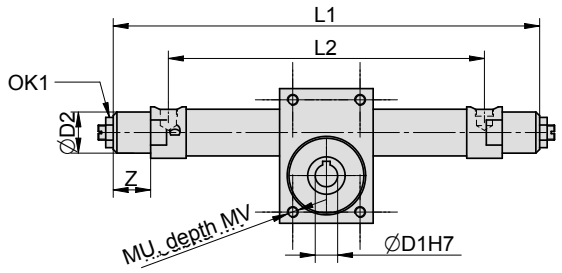
Angle / repair kit	
xxxx	angle of pinion rotation in degrees
0090	angle 90°
0180	angle 180°
0270	angle 270°
0360	angle 360°
9999	repair kit

Construction / materials

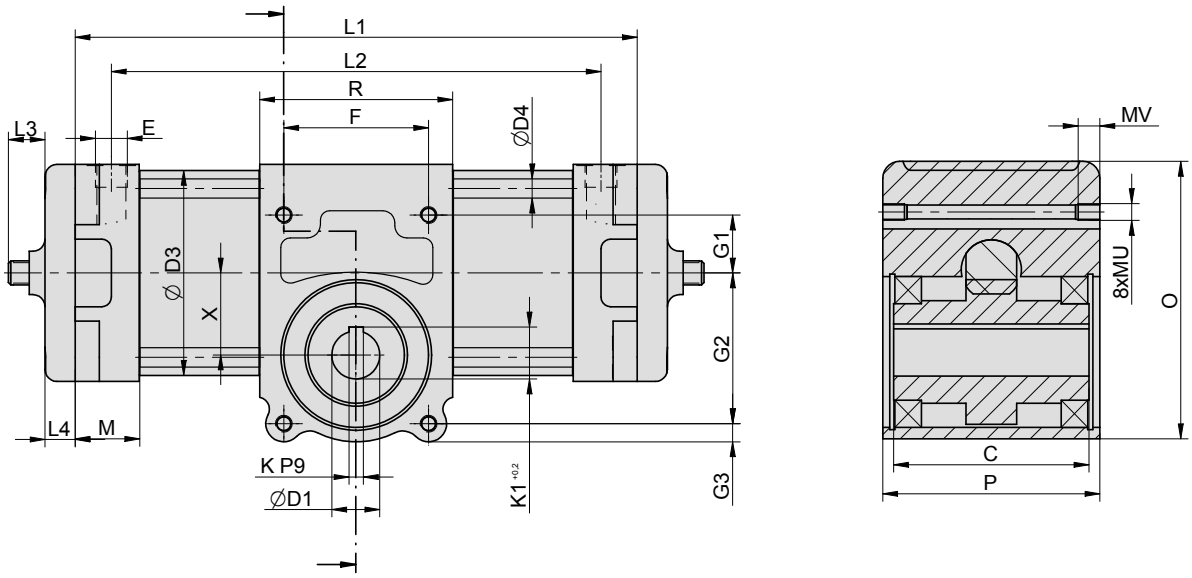
- caps: piston dia. 20 to 40: anodized dural, piston dia. 50 and more: aluminium casting
- gear body: anodized dural
- body: drawn dural tube, hard anodized
- regulation flange: piston dia. 20 to 40: none, piston dia. 50 and more: zinc plated cast iron
- rack and pinion: steel 1.0060
- pinion is mounted between ball bearings

Dimensions

Piston diameter 20 to 40 mm:



Piston diameter 50 mm and more:



∅	C	D1	D2	D3	D4	E	F	G1	G2	G3	K	K1	L3 max.	L4	M	MU	MV	O	OK1	P	R	X	Z
20	42	12	22	25	27,5	G1/8“	36	17	43	6	4	13,6	8	—	19	M6	8	72	14	54	50	23,5	20
25	42	12	24	30	32	G1/8“	36	17	43	6	4	13,6	8	—	22	M6	8	72	14	54	50	23,5	14
32	42	12	30	36	40	G1/8“	36	17	43	6	4	13,6	8	—	22	M6	8	72	14	54	50	23,5	21
40	42	12	35	46	50	G1/8“	36	17	43	6	4	13,6	8	—	22	M6	8	72	14	54	50	23,5	14,5
50	60	18	—	55	6	G1/4“	75	17	50	10,5	6	20,5	28,8	14	22	M8	12	97	—	73	96	27,5	—
63	60	18	—	70	6	G3/8“	75	17	50	10,5	6	20,5	28,5	14	26	M8	12	97	—	73	96	27,5	—
80	94	24	—	86	8	G3/8“	85	27	86	13,5	8	27	30,3	15	28	M10	13	155	—	111	116	46	—
100	94	24	—	108	8	G1/2“	85	29	86	13,5	8	27	38	15	32	M12	15	155	—	111	116	46	—
125	162	40	—	133	12	G1/2“	120	48	125	15	12	43,1	21	25	32	M14	18	230	—	180	160	68	—
160	162	40	—	170	16	G3/4“	120	48	125	15	12	43,1	34	25	53	M14	18	230	—	180	160	68	—

∅	20				25				32		40		50		63		80		100		125		160	
—	L1		L2		L1		L2																	
Angle	w/o mag	with mag	w/o mag	with mag	w/o mag	with mag	w/o mag	with mag	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2
90°	253	318	194	259	254	282	204	232	281	217	280	228	304	282	333	307	433	407	431	399	534	502	616	563
180°	312	377	253	318	313	341	263	292	340	276	339	287	375	353	404	378	546	520	544	512	704	672	786	733
270°	370	436	311	318	372	390	322	350	399	335	398	346	445	423	474	448	569	633	657	625	874	842	955	902
360°	430	495	371	436	431	459	381	409	458	394	457	405	516	494	545	519	772	746	770	738	1043	1011	1125	1072

RODLESS PNEUMATIC CYLINDERS
SERIES S1, S5

These mechanically coupled rodless cylinders offer long strokes with reduced installation place. Thanks to max. stroke up to 6 meters, these cylinders can be used in such an applications, where use of standard cylinder is impossible. This series uses well-proved two bands principle.

Working pressure	0,6 MPa
Min. pressure	0,35 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air
Carriage speed	max. 3 ms^{-1}

Piston diameter [mm]	25	32	40	50
Force at 0,6 MPa [N]	265	432	675	1053
Connection	G1/8“	G1/4“	G3/8“	G3/8“
Max. stroke [mm]	6000	6000	6000	6000

Piston diameter [mm]	25	32	40	50
Weight 0 mm stroke (series S1) [kg]	0,75	1,31	2,6	4,79
Weight 0 mm stroke (series S5) [kg]	1,63	2,78	6,1*	10,1*
Weight add. per 1 mm stroke (series S1) [kg]	0,21	0,325	0,555	0,955
Weight add. per 1 mm stroke (series S5) [kg]	0,365	0,495	0,92*	1,28*

*) Values with asterisk are valid for medium carriage, other values are for standard carriage.

Order codes

NS1 0 5 5 25 0500 M M 0

Type	
S1	standard rodless cylinder, double acting
S5	rodless cylinder with integrated turcite bearing guides

Carriage	
0	standard*
2	medium
3	long

*) only for piston diameter 25 and 32 when series S5 is used

Right end cap supply port	
5	side supply
6	bottom supply
7	rear supply
8	both chambers supplied from right end cap

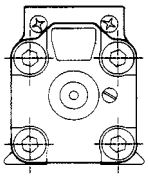
Piston diameter	
25	25 mm
32	32 mm
40	40 mm
50	50 mm

Equipment	
0	w/o magnet
M	with magnet (series S1 only)

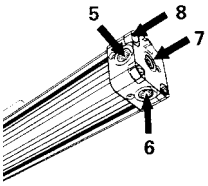
Left end cap supply port	
5	side supply
6	bottom supply
7	rear supply
0	no supply port (when both chambers are supplied from right end cap)

Stroke	
xxxx	mm of stroke e.g.: 0100 = stroke 100 mm

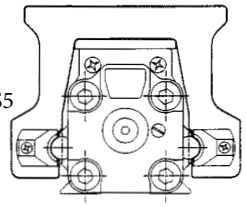
Type S1



Supply ports options:



Type S5



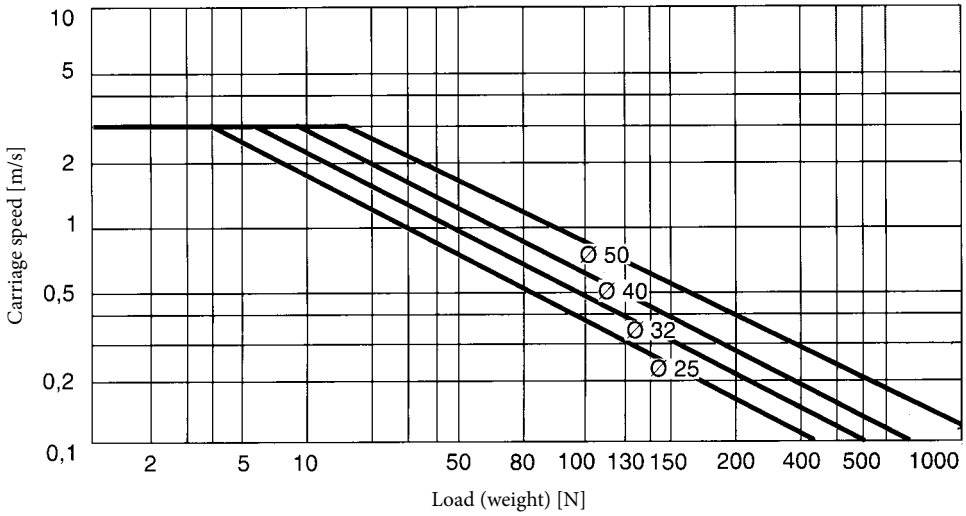
Examination and selection of cushioning

In a system with dynamic masses as for example with the rodless cylinder, it is essential to control the dissipation of the kinetic energy during braking until standstill. The first thing to be done is to select cushioning. Two kinds are available: 1. internal cushioning and 2. external cushioning.
It is of special significance that the carriage with load does not hit the end cap at high speed. If the point corresponding to a given load and speed lies beneath the appropriate curve, the cushioning is able to absorb the kinetic energy of the system. Vice versa if the point lies above the curve, the cushioning is not able to absorb the kinetic energy, in which case you must:

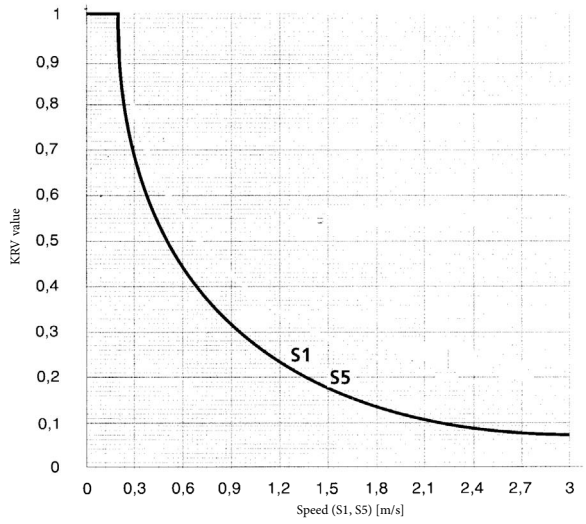
a) reduce load and keep the speed the same
b) decrease the speed and maintain the load
c) select a larger cylinder
d) use external damping

Cushioning capacity is shown in the diagrams on the right (in respect to final speed, when carriages get close to end caps).

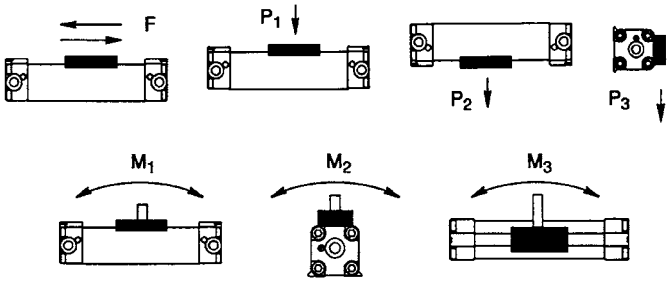
Cushioning of S1 and S5 series



Calculation of admissible dynamic load (depending on speed)



How to find allowable value at dynamic load:
- take KRV value from graph according to the speed
- allowable values of static load multiple by KRV value and we will get max. allowable value for dynamic load



Allowable values of static load for S1 series

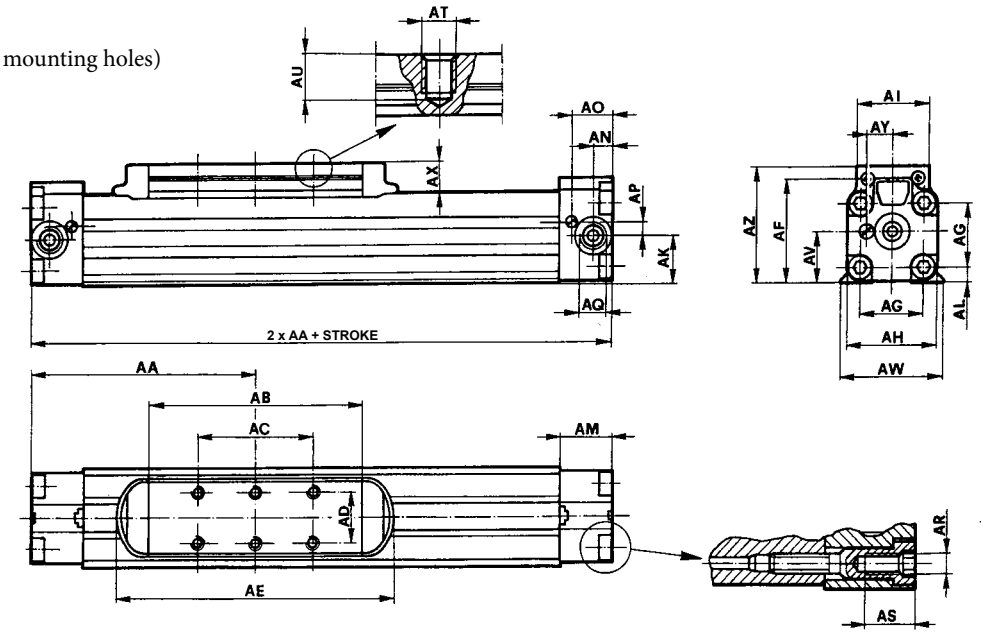
∅	F [N]	P1 [N]	P2 [N]	P3 [N]	Standard carriage			Medium carriage			Long carriage		
					M1 [Nm]	M2 [Nm]	M3 [Nm]	M1 [Nm]	M2 [Nm]	M3 [Nm]	M1 [Nm]	M2 [Nm]	M3 [Nm]
25	250	200	200	50	8	2	3	14	3	5	25	6	9
32	420	250	250	65	9	3	4	15	4	7	28	8	12
40	640	350	350	90	11	9	14	16	14	20	31	27	39
50	1050	500	500	125	19	13	19	29	20	30	52	36	53

Allowable values of static load for S5 series

∅	F [N]	P1 [N]	P2 [N]	P3 [N]	Standard carriage			Medium carriage			Long carriage		
					M1 [Nm]	M2 [Nm]	M3 [Nm]	M1 [Nm]	M2 [Nm]	M3 [Nm]	M1 [Nm]	M2 [Nm]	M3 [Nm]
25	250	400	400	400	13	8	16	20	10	25	40	15	50
32	420	400	400	400	20	9	27	30	12	40	55	18	75
40	640	600	600	600	–	–	–	60	30	80	110	45	150
50	1050	800	800	800	–	–	–	85	50	110	150	75	210

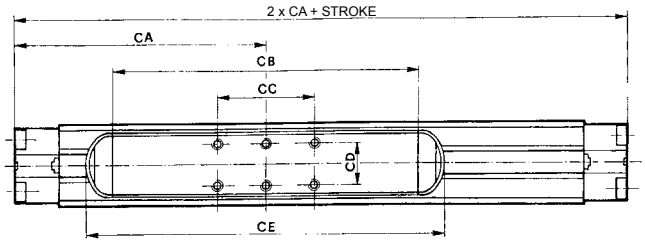
Dimensions
Series S1

Standard carriage (6 mounting holes)



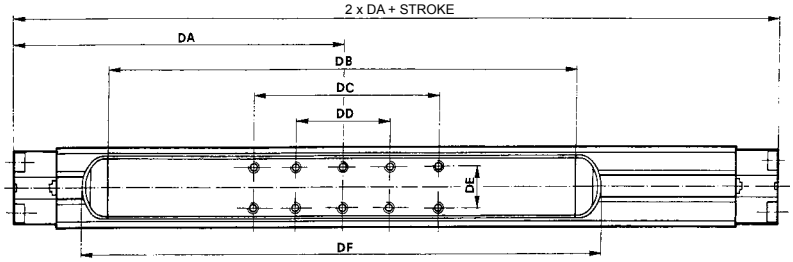
∅	AA	AB	AC	AD	AE	AF	AG	AH	AI	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
25	100	95	50	24	130	48	27,9	40,4	33	20	7,1	24	7,4	18,3	5,6	G1/8“	M5	11,9	M5	8,9	22,6	42,8	15,5	12,2	57,4
32	125	118	65	31	156	57	35,1	50	40	25,4	8,4	29	10,4	22,6	7,4	G1/4“	M6	15,5	M6	8,9	27,9	54,6	15,5	14,2	66,3
40	150	134	65	31	177	74	43,7	64	44	33,8	11,8	33	12,4	26,4	8,6	G3/8“	M8	20,1	M6	10,9	37,1	67,1	19,6	16,5	85,6
50	177	164	105	39	211	90,5	55,1	80	53,6	41,1	14,7	33	14,2	25,7	11,7	G3/8“	M10	20,1	M6	11,9	47,5	86,1	19,6	19,1	103,1

Medium carriage (6 mounting holes)



∅	CA	CB	CC	CD	CE
25	114,6	125	50	23,9	160
32	142,5	152,9	65	31	191
40	168,9	172	65	31	214,9
50	207	224	104,9	39,1	271

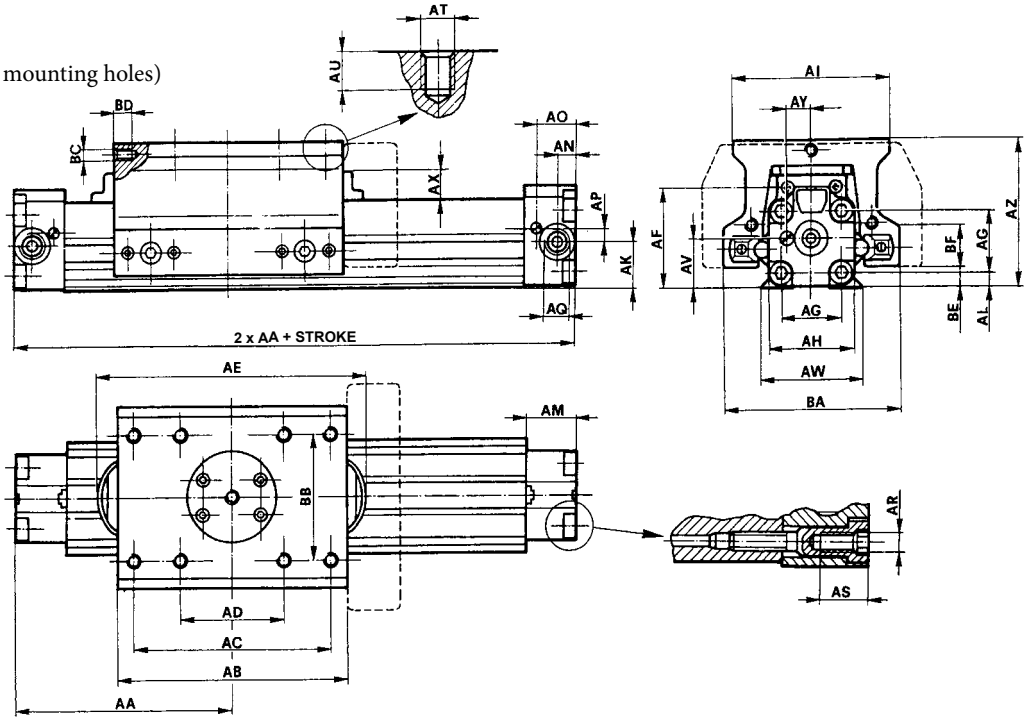
Long carriage (10 mounting holes)



∅	DA	DB	DC	DD	DE	DF
25	147,6	190	101	50	23,9	225
32	190	247,9	130	65	31	286
40	225	284	130	65	31	326,9
50	277,1	364	315	104,9	39,1	411

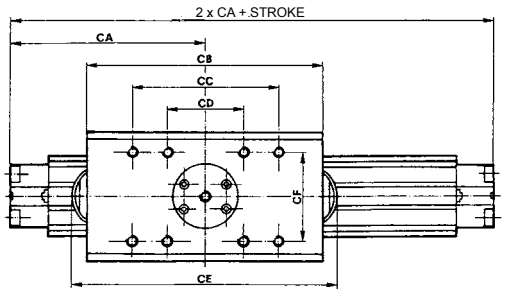
Series S5

Standard carriage (8 mounting holes)



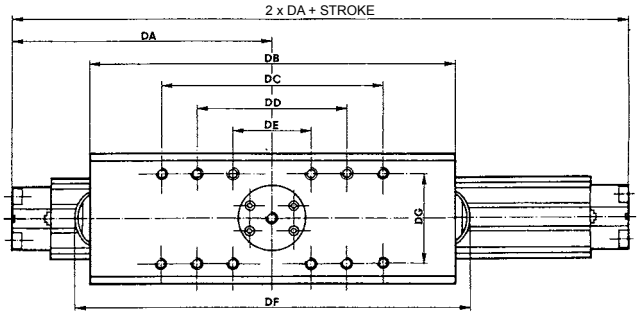
∅	AA	AB	AC	AD	AE	AF	AG	AH	AI	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF
25	100,1	105,9	89,9	50	130	48,3	27,9	40,4	70,1	20,1	7,1	23,9	7,4	18,3	5,8	G1/8“	M5	11,9	M6	9,9	22,9	42,9	16	122	71,9	85,1	50	M6	15	5,6	23,9
32	125	140	115,1	55,1	156	56,9	35,1	50	87,9	25,4	8,1	29	10,4	22,6	7,4	G1/4“	M6	15,5	M8	11,7	27,9	56,9	16	14,2	82,6	100,1	67,6	M6	15	7,1	24,9
40	—	—	—	—	—	—	43,9	64	89,9	33,8	11,9	33	12,4	26,4	8,6	G3/8“	M8	20,1	M8	14	37,1	67,1	19,6	16,5	106,7	134,9	65	M6	15	7,1	39,1
50	—	—	—	—	—	—	551,	80	100,1	41,4	14,7	33	14,2	25,7	11,7	G3/8“	M10	20,1	M8	16	47,8	86,1	20,6	19,1	123,7	149,1	76,5	M8	16	7,1	40,9

Medium carriage (8 mounting holes)



∅	CA	CB	CC	CD	CE	CF
25	114,6	135,9	89,9	50	160	50
32	142,5	175	115,1	55,1	191	67,6
40	168,9	205	180,1	74,9	214,9	65
50	207	258,1	190	80	271	765

Long carriage (12 mounting holes)



∅	DA	DB	DC	DD	DE	DF	DG
25	147,6	200,9	130	89,9	50	225	50
32	190	270	175	115,1	55,1	286	67,6
40	225	317	279,9	184,9	74,9	326,9	65
50	277,1	398	320	199,9	80	411	76,5

SINGLE ACTING PNEUMATIC CYLINDERS
VDMA 24562, NF E 49003.1

Cylinders are designed to meet the specifications of international standards ISO 6431, VDMA 24562 and NF E 49003.1, that is why it can replace pneumatic cylinder, which is made by any producer to these standards. The cylinders can work in higher temperatures by request. There is no cushioning at the end of stroke.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Piston diameter [mm]	32	40	50	63	80	100
Thrust at 0,6 MPa [N]*	482	754	1178	1870	3015	4713
Return force at 0,6 MPa [N]*	415	633	990	1682	2720	4418
Spring restoring force [N]	42	42	66	66	70	74
Connection	G1/8“	G1/4“	G1/4“	G3/8“	G3/8“	G1/2“
Max. stroke [mm]	50	50	70	70	70	70
Weight 0 mm stroke [kg]	0,54	0,80	1,10	1,70	2,70	4,20
Weight add. per 1 mm stroke [kg]	0,0028	0,0037	0,0060	0,0062	0,0100	0,0110

*) Cylinder will make out either thrust or return force, accordingly to the type (spring return / extend).

Order codes

10105 10 00 050 0010

Type	
10105	to DIN ISO 6431, VDMA 24562, NF E 49003.1, single acting, spring return
10106	to DIN ISO 6431, VDMA 24562, NF E 49003.1, single acting, spring extend

Equipment	
00	w/o magnet
10	with magnet

Options	
00	without options
01	1.4021 stainless steel piston rod
05*	all parts stainless steel, piston rod 1.4401
13	tie rod version
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

*) for cylinders piston dia. 32 to 63 mm incl.

For more options regarding materials or dimensions, please contact our technical dept.

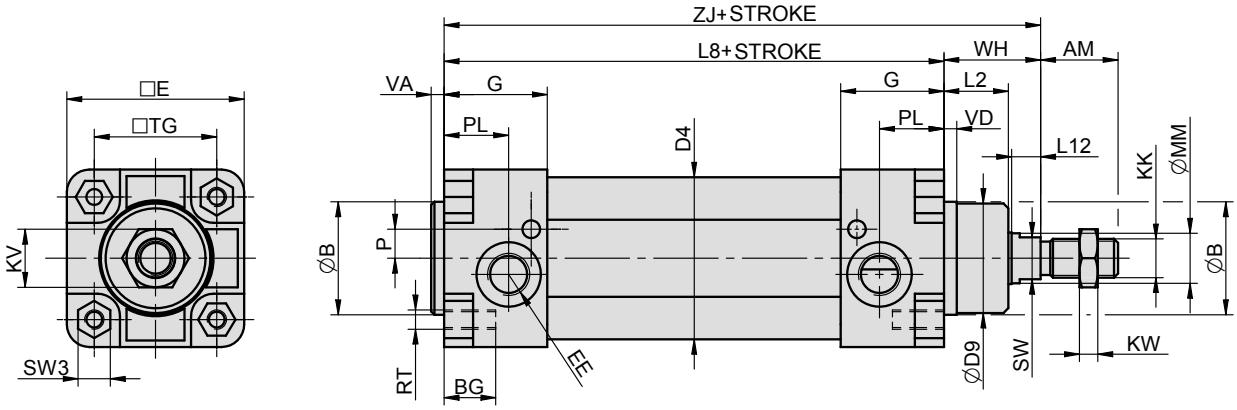
Piston diameter	
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0010 = stroke 10 mm
9999	repair kit

Construction / materials

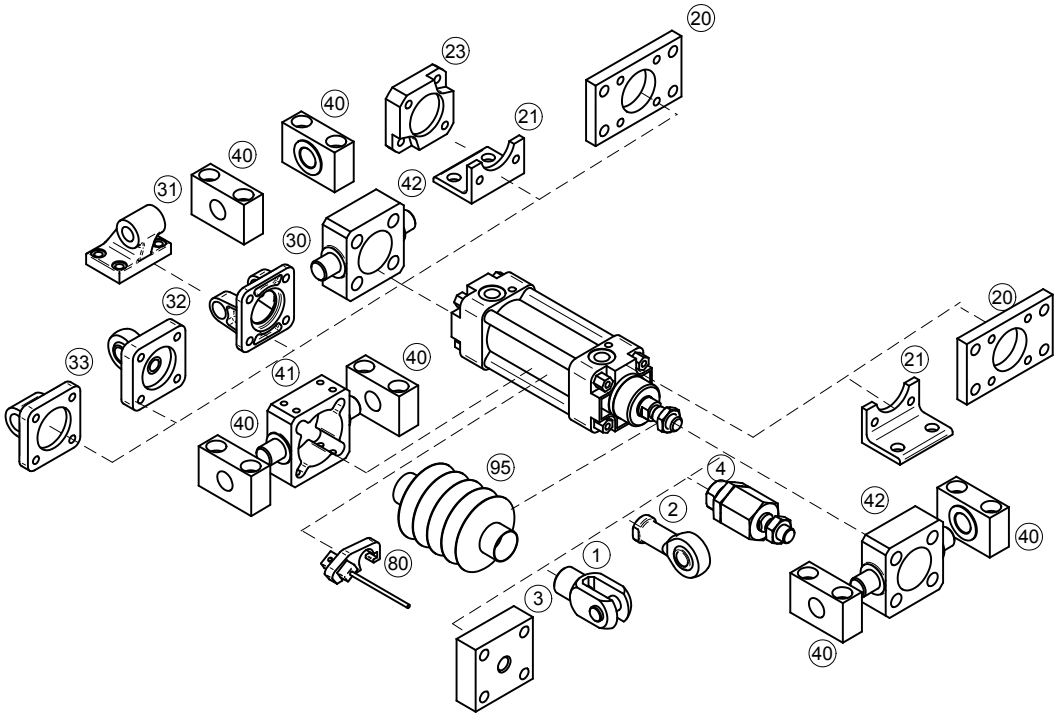
- caps: aluminium mold casting
- body: drawn dural profile, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

Dimensions



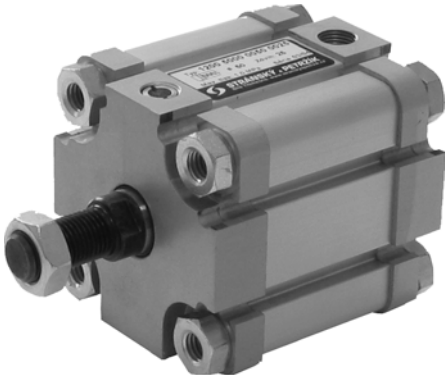
∅	AM	B	BG	D4	D9	E	EE	G	KK	KV	KW	L2	L8	L12	MM	P	PL	RT	SW	SW3	TG	VA	VD	WH	ZJ
32	22	30	16	36	28	48	G1/8“	31,5	M10x1,25	17	6	18	94	8	12	5	22,5	M6	10	10	32,5	4	4	26	120
40	24	35	16	45	34	55	G1/4“	32	M12x1,25	19	10	20	105	9	16	5	20	M6	13	10	38	4	4	30	135
50	32	40	19	55	39	65	G1/4“	30	M16x1,5	24	10	22	106	10	20	3	17	M8	16	14	46,5	4	5	37	143
63	32	45	19	68	44	75	G3/8“	30	M16x1,5	24	8	23	121	10	20	6	16	M8	16	14	56,5	4	5	37	158
80	40	45	19	86	44	94	G3/8“	30	M20x1,5	30	9	31	128	10	25	10	16	M10	21	17	72	4	5	46	174
100	40	55	19	106	54	115	G1/2“	36	M20x1,5	30	9	34	138	10	25	11	18	M10	21	17	89	4	17	51	189

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-4
23 Boxer flange mounting	... 4-9
30 Swivel flange	... 4-8
31 Clevis foot mounting	... 4-8
32 Swivel flange with spherical bearing	... 4-9
33 Swivel flange	... 4-7
40 Trunnion mounting	... 4-11
41 Pivot pin	... 4-10
42 Pivot pin to front/end cap	... 4-11
80 Prox. switch	... 3-2, 3-4, 3-6, 3-9
95 Piston rod protective cover	... 4-12

SINGLE ACTING PNEUMATIC CYLINDERS
COMPACT



Compact cylinders are smaller than standard cylinders and they are suitable especially, when there isn't enough space for standard cylinder. Dimensions of mounting holes meets international standards ISO 6431, VDMA 24562 and NF E 49003.1, that is why standard mounting accessories can be used. Cylinders aren't equipped with cushioning.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Piston diameter [mm]	**32**	**40**	**50**	**63**	**80**	**100**
Thrust at 0,6 MPa [N]*	482	754	1178	1870	3015	4713
Return force at 0,6 MPa [N]*	415	662	1025	1717	2720	4487
Spring restoring force [N]	17	24	22	42	33	120
Connection	G1/8“	G1/8“	G1/8“	G1/8“	G1/8“	G1/4“
Max. stroke [mm]	25	25	40	50	50	50
Weight 0 mm stroke [kg]	0,25	0,34	0,51	0,75	1,23	1,99
Weight add. per 1 mm stroke [kg]	0,0030	0,0034	0,0047	0,0055	0,0076	0,0095

*) Cylinder will make out either thrust or return force, accordingly to the type (spring return / extend).

Order codes

12005 10 00 050 0010

Type	
12005	compact single acting, spring return
12006	compact single acting, spring extend

Equipment	
00	w/o magnet, external thread
01	w/o magnet, internal thread
10	with magnet, external thread
11	with magnet, internal thread

Options	
00	without options
01	1.4021 stainless steel piston rod
02	steel parts from stainless 1.4301 piston rod stainless 1.4021
14	1.4301 stainless steel piston rod
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

For more options regarding materials or dimensions, please contact our technical dept.

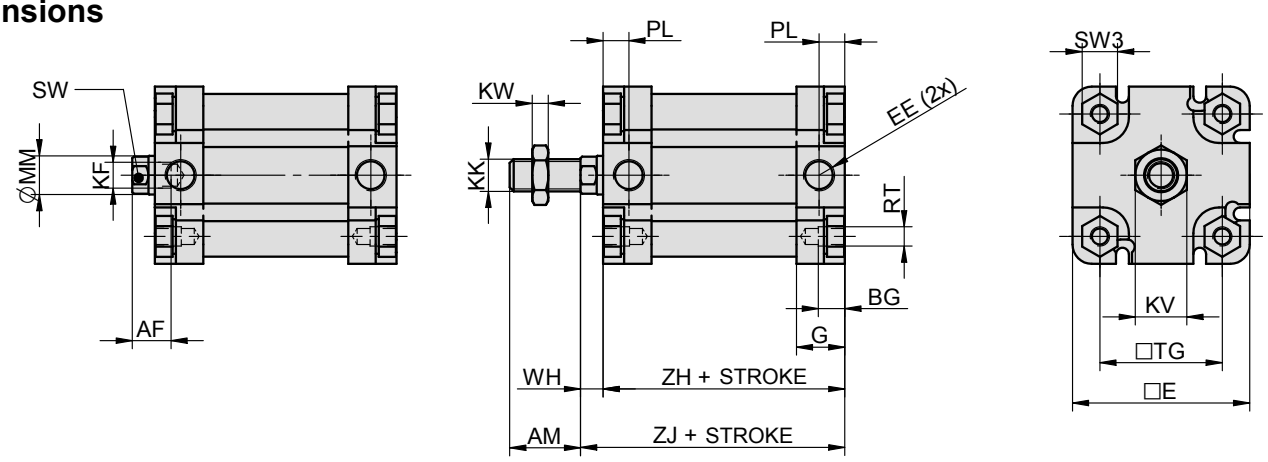
Piston diameter	
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0010 = stroke 10 mm
9999	repair kit

Construction / materials

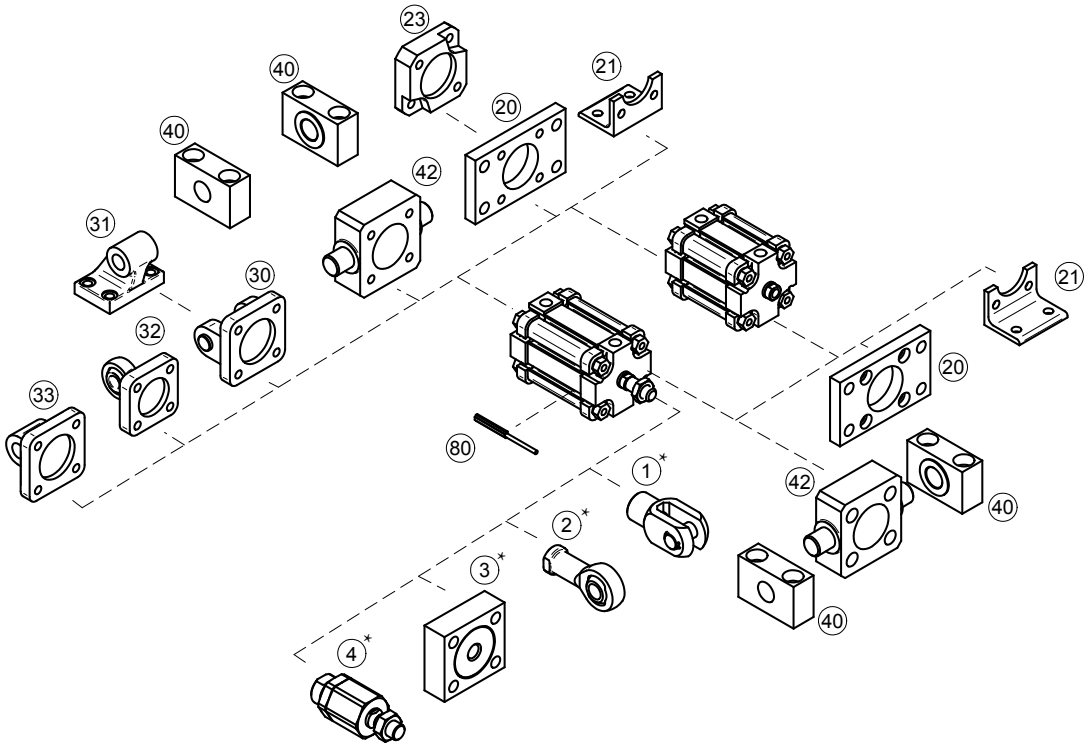
- caps: aluminium mold casting
- body: drawn dural profile, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

Dimensions



∅	AF	AM	BG	E	EE	G	KF	KK	KV	KW	MM	PL	RT	SW	SW3	TG	WH	ZH	ZJ
32	12	22	9	48	G1/8“	15	M8	M10x1,25	17	6	12	8	M6	10	11	32,5	7	53	60
40	12	22	9	55	G1/8“	15	M8	M10x1,25	17	6	12	8	M6	10	11	38	7	45	52
50	16	24	9	65	G1/8“	15	M10	M12x1,25	19	10	16	8	M8	13	14	46,5	8	45	53
63	16	24	9	75	G1/8“	15	M10	M12x1,25	19	10	16	8	M8	13	14	56,5	8	49	57
80	20	32	11	95	G1/8“	17	M12	M16x1,5	24	8	20	8,5	M10	16	17	72	10	54	64
100	22	40	11	115	G1/4“	20	M12	M20x1,5	30	9	25	10,5	M10	21	17	89	10	62	72

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis*	... 4-2
2 Piston rod eye*	... 4-3
3 Flanged piston rod coupling*	... 4-2
4 Self-aligning piston rod coupling*	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-4
23 Boxer flange mounting	... 4-9
30 Swivel flange	... 4-8
31 Clevis foot mounting	... 4-8
32 Swivel flange with spherical bearing	... 4-9
33 Swivel flange	... 4-7
40 Trunnion mounting	... 4-11
42 Pivot pin to front/end cap	... 4-11
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8

*) Please check dimensions of thread on cylinder and accessories for piston rod, before you order it (for example: compact cylinder piston dia. 40 mm has thread M10x1,25 on piston rod, piston rod clevis for cylinder dia. 40 has thread M12x1,25, so it is necessary to order picton rod clevis for cylinder dia. 25/30, where is thread M10x1,25).

SINGLE ACTING PNEUMATIC CYLINDERS DIN ISO 6432

Cylinders are designed to meet the specifications of international standard ISO 6432. Cylinders aren't equipped with cushioning.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Piston diameter [mm]	**12**	**16**	**20**	**25**
Thrust at 0,6 MPa [N]*	66	121	188	295
Return force at 0,6 MPa [N]*	50	102	158	248
Spring restoring force [N]	11	11	13	13
Connection	M5	M5	G1/8“	G1/8“
Max. stroke [mm]	50	50	50	50
Weight 0 mm stroke [kg]	0,04	0,05	0,15	0,18
Weight add. per 1 mm stroke [kg]	0,0005	0,0005	0,0010	0,0013

*) Cylinder will make out either thrust or return force, accordingly to the type (spring return / extend).

Order codes

11005 10 00 020 0010

Type	
11005	to DIN ISO 6432, single acting, spring return
11006	to DIN ISO 6432, single acting, spring extend

Equipment	
00	w/o magnet
10	with magnet

Options	
00	without options
01	1.4021 stainless steel piston rod
16	steel parts from stainless 1.4301 piston rod stainless 1.4401

Piston diameter	
012	12 mm
016	16 mm
020	20 mm
025	25 mm

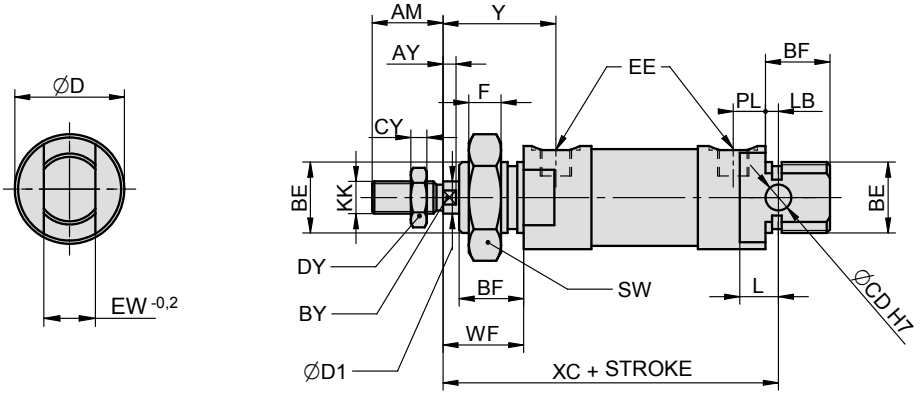
Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0010 = stroke 10 mm
9999	repair kit

For more options regarding materials or dimensions, please contact our technical dept.

Construction / materials

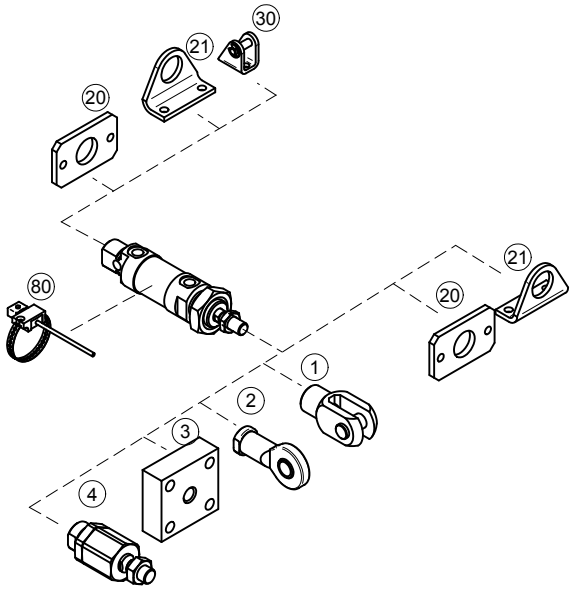
- caps: hard anodized dural
- body: drawn dural tube, hard anodized
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

Dimensions



∅	AM	AY	BE	BF	BY	CD	CY	D	D1	DY	EE	EW	F	KK	L	LB	PL	SW	WF	XC	Y
12	16	3	M16x1,5	15	5	6	3	22	6	10	M5	12	8	M6	10	4	5	24	22	75	25
12M	16	3	M16x1,5	15	5	6	3	22	6	10	M5	12	8	M6	10	4	5	24	22	80	25
16	16	3	M16x1,5	15	5	6	3	25	6	10	M5	12	8	M6	11	5	5	24	22	82	25
16M	16	3	M16x1,5	15	5	6	3	25	6	10	M5	12	8	M6	11	5	5	24	22	87	25
20	20	4	M22x1,5	20	7	8	6	27,5	8	13	G1/8“	16	10	M8	12	3	9,5	34	24,5	95	34
25	22	4	M22x1,5	20	9	8	6	32	10	17	G1/8“	16	10	M10x1,25	12	4	10	34	25,5	104	35

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-7
21 Foot mounting	... 4-5
30 Swivel flange	... 4-5
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8

SINGLE ACTING PNEUMATIC CYLINDERS
SHORT STROKE

Pneumatic cylinder may be used, when small mounting dimensions are required. There is no cushioning at end of stroke.

Working pressure	0,6 MPa
Min. pressure	0,15 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Piston diameter [mm]	**20**	**25**	**32**	**40**	**50**	**63**	**80**	**100**	**160**
Thrust at 0,6 MPa [N]*	188	295	482	754	1178	1870	3015	4713	12064
Return force at 0,6 MPa [N]*	158	248	415	662	1025	1717	2720	4484	11309
Spring restoring force [N]	15	16	24	27	46	46	124	124	402
Connection	M5	G1/8“	G1/8“	G1/8“	G1/8“	G1/8“	G1/4“	G1/4“	G3/8“
Max. stroke [mm]	25	25	25	25	25	25	25	25	50
Weight 0 mm stroke [kg]	0,05	0,08	0,16	0,29	0,43	0,60	1,10	1,80	8,20
Weight add. per 1 mm stroke [kg]	0,0014	0,0015	0,0040	0,0060	0,0080	0,0100	0,0160	0,0200	0,0600

*) Cylinder will make out either thrust or return force, accordingly to the type (spring return / extend).

Order codes

12505 10 00 050 0010

Type	
12505	short stroke, single acting, spring return
12506	short stroke, single acting, spring extend

Equipment	
00	w/o magnet, external thread
01	w/o magnet, internal thread
10	with magnet, external thread
11	with magnet, internal thread

Options	
00	without options
01	1.4021 stainless steel piston rod
10	Viton® piston rod sealing
14	1.4301 stainless steel piston rod

For more options regarding materials or dimensions, please contact our technical dept.

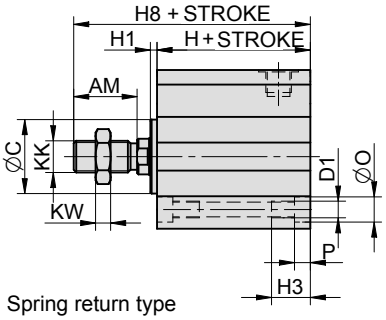
Piston diameter	
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
160	160 mm

Stroke / Repair kit	
xxxx	mm of stroke e.g.: 0010 = stroke 10 mm
9999	repair kit

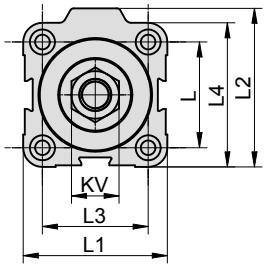
Construction / materials

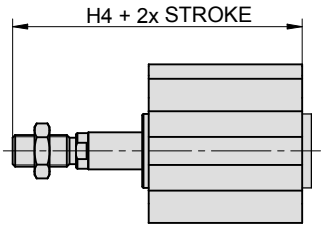
- caps: anodized dural
- body: drawn anodized dural profile, piston diameter 160: aluminium casting
- piston rod: grounded round steel bar CK45 with hard chrome plated surface

Dimensions

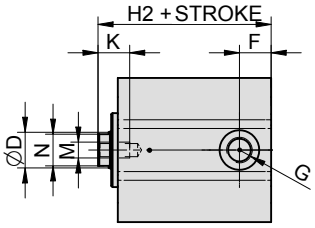


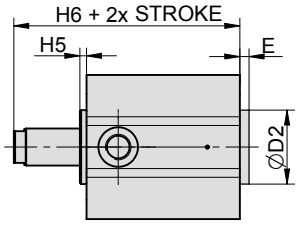
Spring return type





Spring extend type

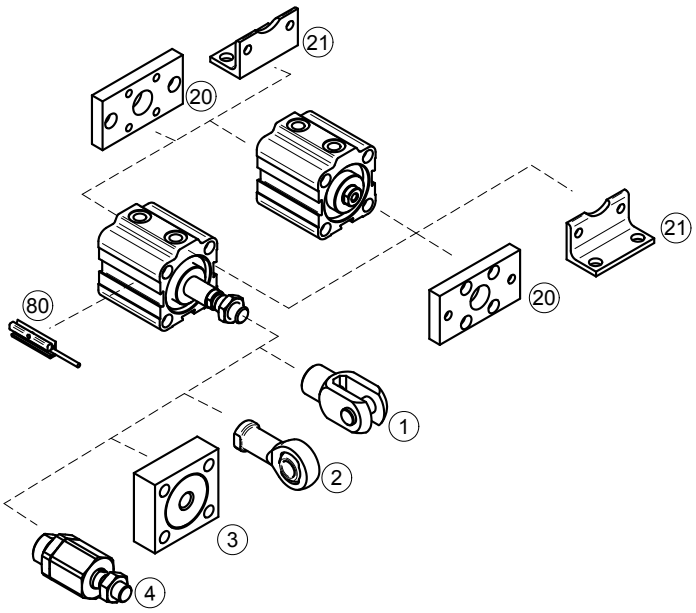




∅	AM	C	D	D1	D2	E	F	G	H	H1	H2	H3	H4	H5	H6	H8	K	KK	KV	KW	L	L1	L2	L3	L4	M	N	O	P
20	20	12	8	M5	12	16	9	M5	23,5	16	44,5	15	51	2,5	31	64,5	8	M8	13	6	22	32	35	22	32	M5	7	7	5
20M	20	12	8	M5	12	16	9	M5	41,5	16	62,5	15	69	2,5	49	82,5	8	M8	13	6	22	32	35	22	32	M5	7	7	5
25	22	17	10	M5	17	12	10	G1/8“	26,5	11	42,5	15	56	2,5	34	64,5	8	M10x1,25	17	6	28	38	45	26	39	M5	8	8	5
25M	22	17	10	M5	17	12	10	G1/8“	34,5	11	50,5	15	64	2,5	42	72,5	8	M10x1,25	17	6	28	38	45	26	39	M5	8	8	5
32	22	21	12	M6	21	12,5	11	G1/8“	35	12,5	52,5	18	64,5	2,5	42,5	74,5	12	M10x1,25	17	6	36	45	54	32	48	M6	10	9,5	6
32M	22	21	12	M6	21	12,5	11	G1/8“	45,5	15,5	63	18	75	2,5	53	85	12	M10x1,25	17	6	36	45	54	32	48	M6	10	9,5	6
40	24	28	14	M6	28	11	12	G1/8“	44	10,5	59,5	18	75,5	2,5	51,5	83,5	12	M12x1,25	19	10	40	55	60	40	55	M6	12	9,5	6
50	32	36	18	M8	36	12	13	G1/8“	46	12	64	24	86,5	2,5	54,5	96	14	M16x1,5	24	8	50	65	73	50	65	M8	16	11	8
63	32	48	18	M10	48	7	14,5	G1/8“	46	7	59	24,5	87,5	3,5	55,5	91	14	M16x1,5	24	8	62	80	88	62	80	M8	16	14	8,5
63M	32	48	18	M10	48	7	14,5	G1/8“	50	7	63	24,5	91,5	3,5	59,5	95	14	M16x1,5	24	8	62	80	88	62	80	M8	16	14	8,5
80	43	54	22	M10	54	8,5	16,5	G1/4“	50	8,5	64,5	24,5	102,5	3,5	59,5	107,5	17	M20x1,5	30	9	82	100	110	82	100	M10	19	14	8,5
80M	43	54	22	M10	54	8,5	16,5	G1/4“	57	8,5	71,5	24,5	109,5	3,5	66,5	114,5	17	M20x1,5	30	9	82	100	110	82	100	M10	19	14	8,5
100	43	60	22	M12	60	7	20	G1/4“	57	7	70	29	112	6	69	113	20	M20x1,5	30	9	103	124	134	103	124	M12	19	17	11
100M	43	60	22	M12	60	7	20	G1/4“	61	7	74	29	116	6	73	117	20	M20x1,5	30	9	103	124	134	103	124	M12	19	17	11
160	72	110	40	M20	–	–	22,5	G3/8“	96	–	113	45	–	–	–	185	25	M36x2	50	18	154	200	210	154	200	M16	36	26	21

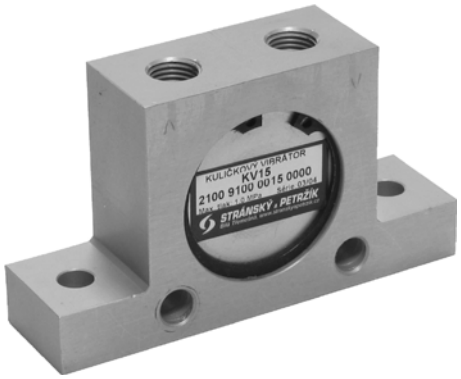
Notice: M after piston diameter size means cylinder with magnetic piston.

Mounting accessories



Mounting accessories	... see page
1 Piston rod clevis	... 4-2
2 Piston rod eye	... 4-3
3 Flanged piston rod coupling	... 4-2
4 Self-aligning piston rod coupling	... 4-3
20 Flange mounting	... 4-6
21 Foot mounting	... 4-5
80 Prox. switch	... 3-2, 3-4, 3-6, 3-8

PNEUMATIC SHAKE DEVICES
BALL VIBRATOR



Ball vibrator could be used for bulk material release if the bulk material was adhesed on walls of tubes or filling hopper. It can be used for such as materials which doesn't solidify by intensive shedding; in this case pneumatic knocker should be used.

Working pressure	0,6 MPa
Min. pressure	0,2 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Type	KV8	KV15	KV25	KV36
Ball diameter [mm]	8	15	25	36
Connection	G1/4“	G1/4“	G1/4“	G3/8“
Weight [kg]	0,4	0,5	0,7	1,6
Recommended hose orifice of air supply [mm]	8	10	10	12
Minimal tightening torque of fixing screws [Nm]	10,4	25	25	51

Order codes

2100 91 0 00 025 0000

Device type	
2100	pneumatic shake device

Equipment	
91	ball vibrator

Options	
00	without options

Vibrator type	
008	KV8
015	KV15
025	KV25
036	KV36

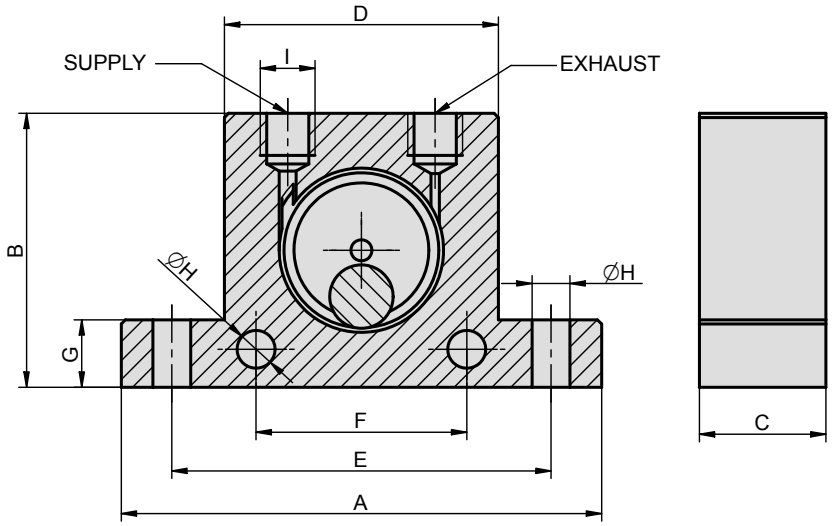
Installation and operation notes

There is necessary to adhere minimal tightening torque of fixing screws (see values in table above). Fixing screws aren't included in supply.
We recommend to fix fixing screws with Loctite 242E or similar adhesive.
There is necessary to check right tightening of fixing screws regularly to prevent their releasing.
The silencer is required on exhaust to avoid excessive noise. The silencer must be kept clear otherwise danger of vibrator body failure and injury impend.
Compressed air supply must be connected to port marked as V (eventually VSTUP, IN, or 1).

Construction / materials

- body and caps: hard anodized dural
- ball: precise bearing ball
- ball guide: hardened steel

Dimensions

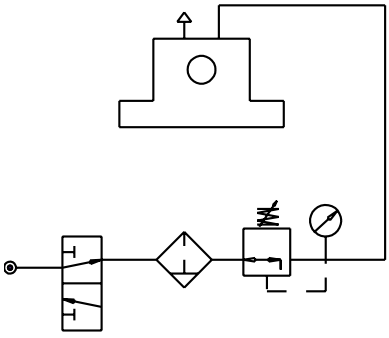


TYPE	A	B	C	D	E	F	G	H	I	Ball diameter
KV8	86	50	25	50	68	40	12	7	G1/4“	8
KV15	114	65	30	65	90	50	15	9	G1/4“	15
KV25	123	80	40	80	104	60	15	9	G1/4“	25
KV36	160	100	56	100	130	80	20	10,5	G3/8“	36

Technical data

Type	KV8 values at pressure [MPa]			KV15 values at pressure [MPa]			KV25 values at pressure [MPa]			KV36 values at pressure [MPa]		
	0,2	**0,4**	**0,6**	**0,2**	**0,4**	**0,6**	**0,2**	**0,4**	**0,6**	**0,2**	**0,4**	**0,6**
Frequence [1/min]	24500	31000	35000	14300	17600	20200	10100	13200	14500	7500	9300	10300
Centrifugal force [N]	180	290	370	540	820	1090	1180	2000	2420	2340	3590	4400
Air consumption [l/min]	83	145	195	122	200	280	160	280	425	260	475	675

Recommended connection



There is useful to use pressure regulator in circuit to enable vibration intensity regulation. If you need to start vibrator by another way than manually, there is necessary to use appropriate 2/2 or 3/2 valve which should be connected between pressure regulator and vibrator.

PNEUMATIC SHAKE DEVICES
PNEUMATIC KNOCKER

Pneumatic knocker could be used for bulk material release if the bulk material was adhesed on walls of tubes or filling hopper. Compared to ball vibrator, knocker can be used for materials which solidify by intensive shedding; in this case individual shakes are well-proven. Knocker should be controlled as well as double acting cylinder. From piston diameter 50 mm incl. knockers are equipped with fully adjustable cushioning at end of return piston movement.

Working pressure	0,6 MPa
Min. pressure	0,2 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Type	OK32	OK40	OK50	OK63	OK80
Piston diameter [mm]	32	40	50	63	80
Stroke [mm]	60	75	100	120	150
Piston weight [kg]	0,2	0,4	1	2,3	4
Recommended orifice of air supply [mm]	8	8	10	10	10
Recommended flow capacity [Nl/min]	900	900	1600	1600	2200
Impulse [Ns]	1,7	3,5	8	15	30
Kinetic energy [Nm]	7	14	32	60	100

Order codes

2100 90 0 00 0500100

Device type	
2100	pneumatic shake device

Equipment	
90	pneumatic knocker

Options	
00	without options

Knocker type	
0320060	diameter 32, stroke 60 mm
0400075	diameter 40, stroke 75 mm
0500100	diameter 50, stroke 100 mm
0630120	diameter 63, stroke 120 mm
0800150	diameter 80, stroke 150 mm

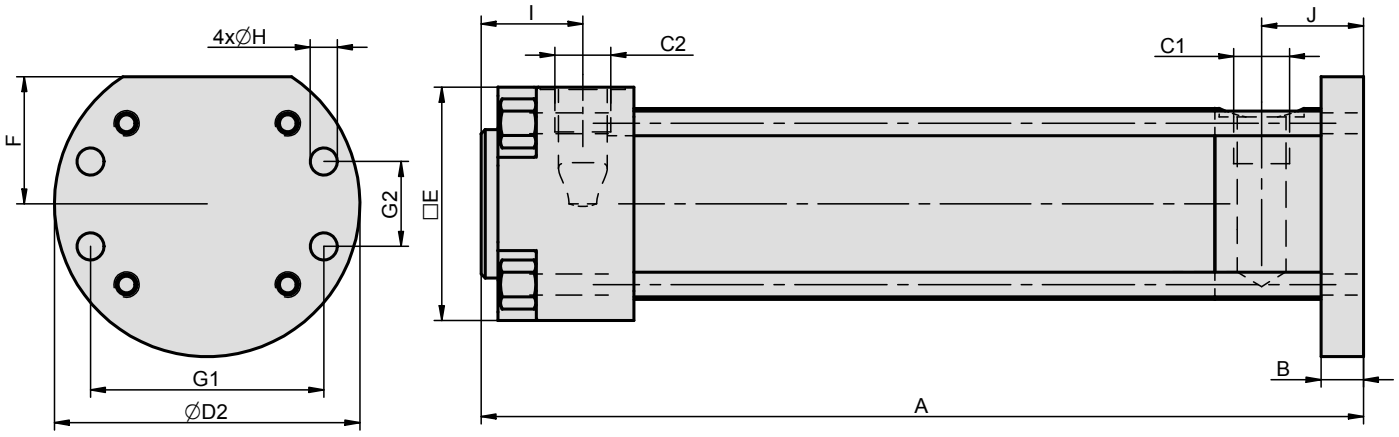
Installation and operation notes

We recommend to fix fixing screws with Loctite 242E or similar adhesive.
There is necessary to check right tightening of fixing screws regularly to prevent their releasing.
We recommend to use quick exhaust valve on exhaust on impact side not to decrease knocker's effectivity.

Construction / materials

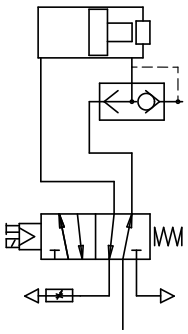
- flange: zinc plated steel
- end cap: aluminium casting
- body: drawn dural tube, hard anodized
- piston: steel

Dimensions



∅	A	B	C1	C2	D2	E	F	G1	G2	H	I	J
32	180	8	G1/4“	G1/4“	69	48	28	50	18	6,4	26	22
40	208	10	G1/4“	G1/4“	72	55	30	55	20	6,4	24	24
50	274	12	G3/8“	G3/8“	98	65	40	70	30	8,4	20	34
63	332	15	G3/8“	G3/8“	119	75	45	85	40	10,5	20	38
80	368	20	G3/8“	G3/8“	138	95	55	100	50	13	20	38

Recommended connection

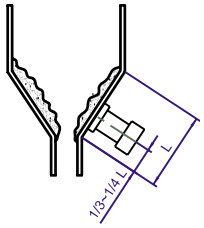


The 5/2 valve is suitable for knocker control. Valve should be placed as closest to knocker as possible, but we recommend to fix it so that valve will be isolated to shocks from knocker. We recommend to use quick exhaust valve on exhaust (mounted parallel to knocker‘s axis to prevent from shocks) so as not to decrease impact intensity. It is suitable to use speed control silencer during piston return movement, to get possible to control of return speed of piston into home position to prevent chocks.

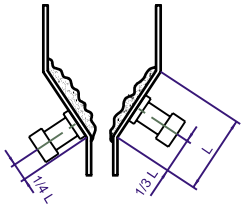
Attention: knocker is designed for make shocks only by movement of piston towards to front cap with flange! Do not allow to make shocks during piston return movement in any case! It may be the cause of permanent damage of end cap of knocker!

Mounting examples

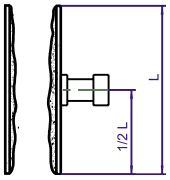
Single knocker on filling hopper



Two knockers on filling hopper
(edge distances should be different)



Single knocker on tube



PNEUMATIC SHAKE DEVICES
SPRING KNOCKER

Pneumatic knocker could be used for bulk material release if the bulk material was adhesed on walls of tubes or filling hopper. Compared to ball vibrator, knocker can be used for materials which solidify by intensive shedding; in this case individual shakes are well-proven. The principle is simple: by pressurize of air chamber the spring is pre-tensioned and by air exhausting the spring causes the impact. This system should be used, when there is no sufficient flow rate in the line for standard pneumatic knockers without springs.

Working pressure	0,6 MPa
Min. pressure	0,4 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air

Type	OKP32	OKP50	OKP80
Piston diameter [mm]	32	50	80
Stroke [mm]	25	35	50
Piston weight [kg]	0,16	0,75	2,60
Impulse [Ns]	1,5	7	20
Kinetic energy [Nm]	6,5	28	75

Order codes

2100 92 0 00 0500035

Device type	
2100	pneumatic shake device

Equipment	
92	spring knocker

Options	
00	without options

Knocker type	
0320025	diameter 32, stroke 25 mm
0500035	diameter 50, stroke 35 mm
0800050	diameter 80, stroke 50 mm

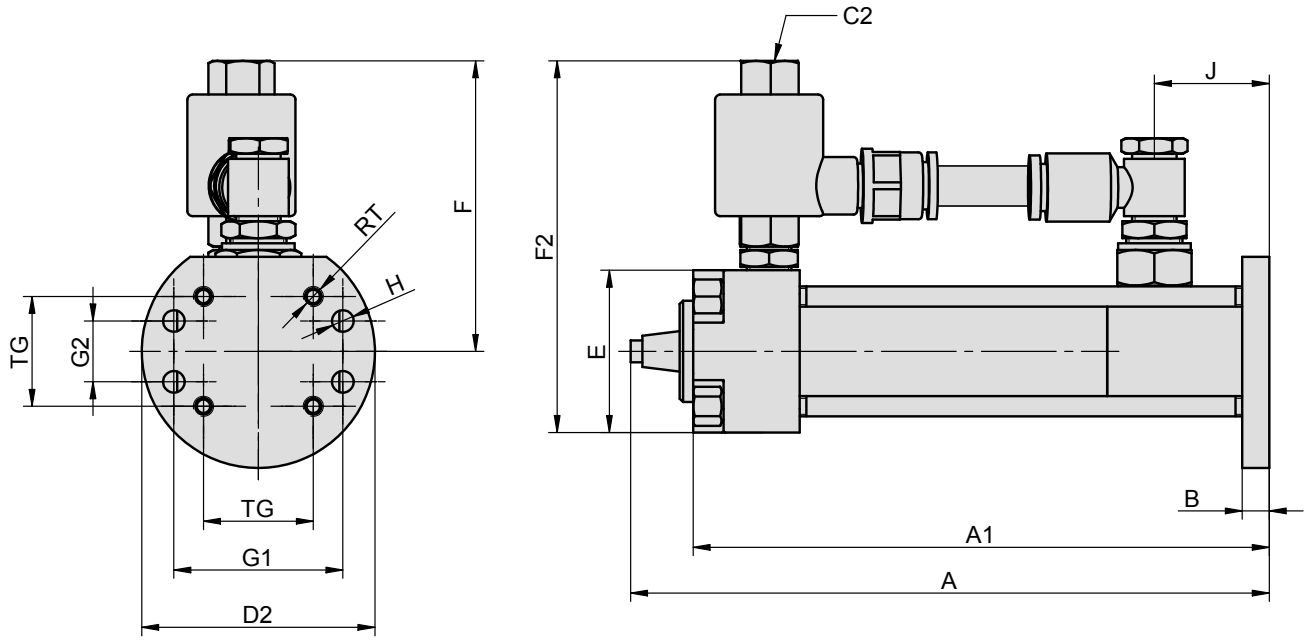
Instalation and operation notes

We recommend to fix fixing screws with Loctite 242E or similar adhesive.
There is necessary to check right tightening of fixing screws regularly to prevent their releasing.
The quick exhaust valve and connections of both chambers are included in delivery, compressed air should be connected to the quick exhaust valve.

Construction / materials

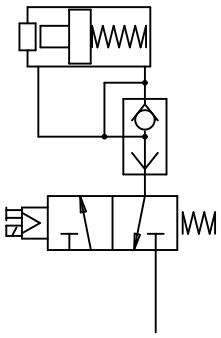
- flange: zinc plated steel
- end cap: aluminium casting
- body: drawn dural tube, hard anodized
- piston: steel

Dimensions



∅	A	A1	B	C2	D2	E	F	F2	G1	G2	J	H	RT	TG
32	189	171	8	G1/4“	69	48	86	110	50	18	34	6,4	M6	32,5
50	267	250	12	G3/8“	98	65	96	128	70	30	44	8,4	M8	46,5
80	343	309	20	G1/2“	150	94	126	173	110	60	58	13	M10	72

Recommended connection

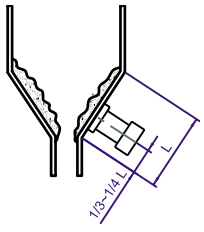


The 3/2 valve is suitable for knocker control. The force of knocker does not depend on distance between knocker and valve. We recommend to mount the valve outside, where the knocker‘s shocks couldn‘t reach the valve.

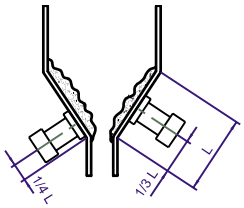
Attention: knocker is designed for make shocks only by movement of piston towards to front cap with flange! Do not allow to make shocks during piston return movement in any case! It may be the cause of permanent damage of end cap of knocker!

Mounting examples

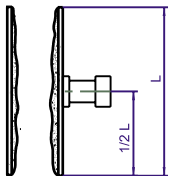
Single knocker on filling hopper



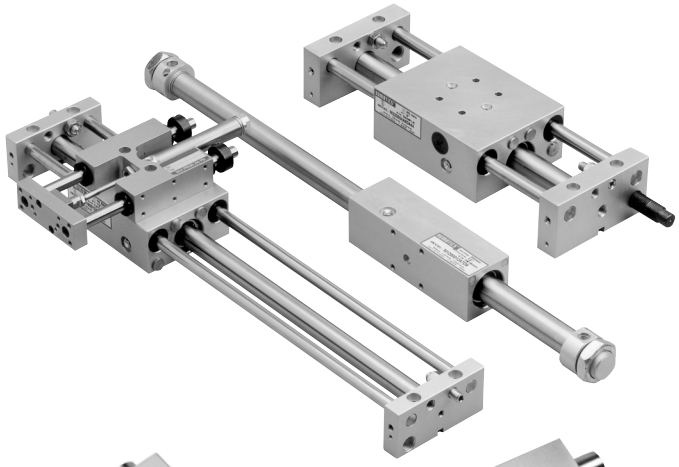
Two knockers on filling hopper
(edge distances should be different)



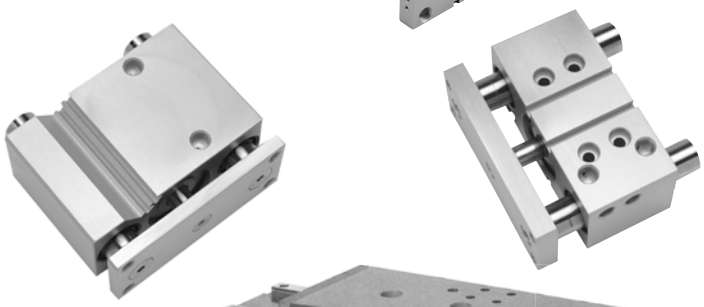
Single knocker on tube



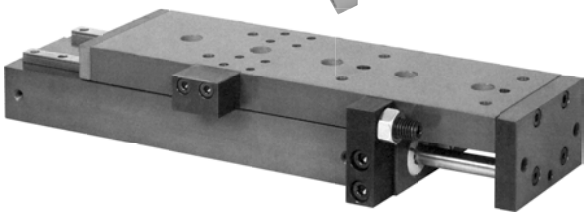
We can offer other types of cylinders for special usage outside before mentioned cylinders:



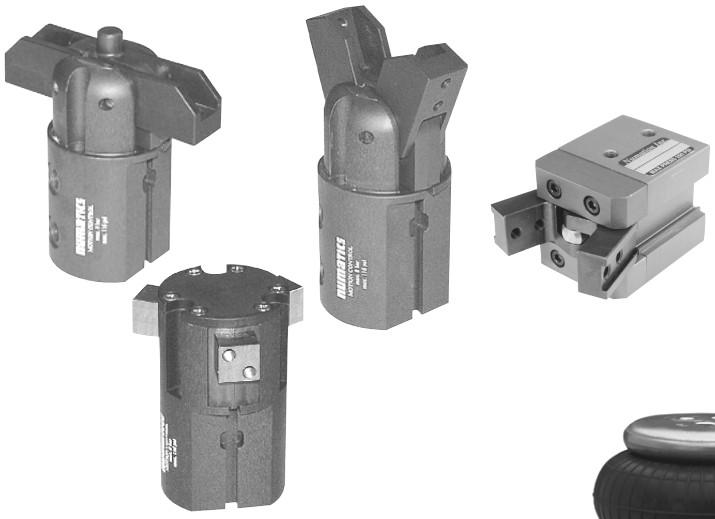
Magnetically coupled rodless cylinders
- piston diameters from 12 to 40 mm
- without guidance with standard or reduced magnet force
- with guidance with hardened or stainless steel shafts
- with integrated end position proximity switches
- with integrated shock absorbers



Compact guide slide
- piston diameters from 16 to 50 mm
- stroke from 10 to 100 mm
- with precise ball bearing
- two choices - compact or heavy-duty applications



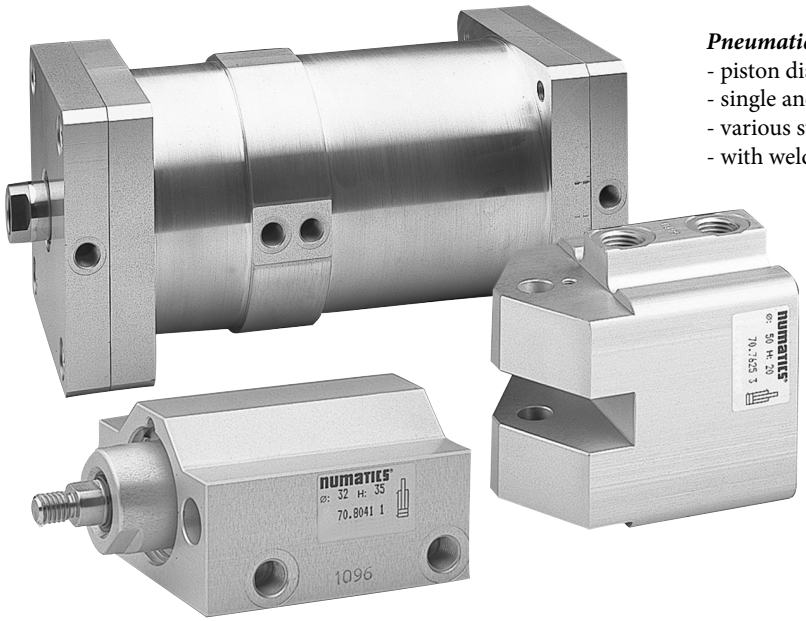
Precision slide table
- piston diameters from 16 to 25 mm, with double effect (tandem)
- stroke from 10 to 150 mm
- with integrated end position proximity switches
- with dual square rails for precise linear motion



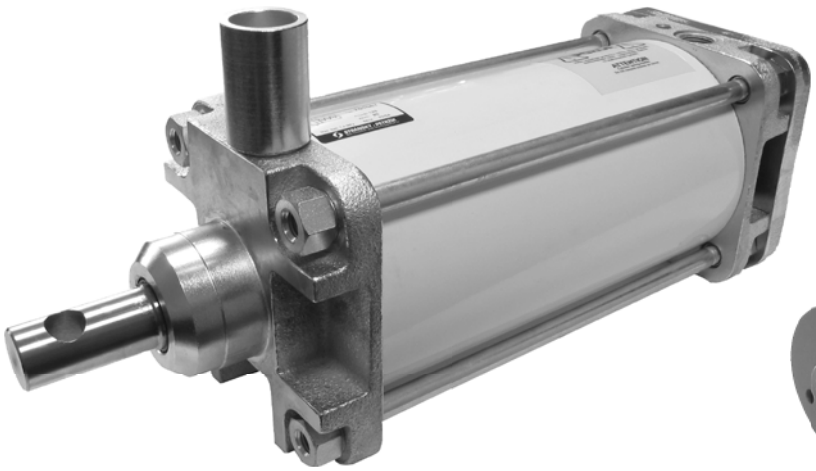
Grippers
- two or three jaws
- parallel or angular movement
- piston diameters up to 32 mm
- standard or miniature dimensions
- possibility of position sensing

Air bellows
- flange diameters from 108 to 287 mm
- one, two or three chambers

We also produce cylinders to customer's request:



Pneumatic cylinders for welding applications in automotive industry
- piston diameters from 20 to 125 mm
- single and double acting
- various strokes incl. more stroke design (boxer)
- with welding sparks sealing protection



Pneumatic cylinders to customer's request
- piston diameters from 8 to 500 mm
- single and double acting
- various strokes incl. more stroke design (boxer)
- various material construction incl. stainless steel
- possibility of various surface finishing
- various types and materials of gaskets

PROXIMITY SWITCHES - CONTENTS

PROXIMITY SWITCHES SERIES KT-21 AND KT-50

KT-xxP series of electronic (PNP) proximity switches eliminates negative features of reed relays. Those switches are fully electronic, which brings excellent properties, long lifetime and integrated protections. We also offer reed switches, series KT-xxR. Series KT switches can be used with all types of Stránský a Petržík's cylinders. For various types of cylinders the right bracket must be used.
Switches KT-50 can be used with cylinders with T-slot made by other producer.

Technical data

Description	Value / Switch type			
	KT-21P	KT-21R	KT-50P	KT-50R
Supply voltage U_b [V]	5 to 30 DC	5 to 240 DC / AC	10 to 30 DC	5 to 240 DC / AC
Max. switching power [W / VA]	6	10	3	10
Continuous current I_a [mA]	≤ 200	≤ 100	≤ 100	≤ 100
Power consumption [mA] at 24V on-state	20	—	20	—
Voltage drop U_d [V]	≤ 0,5	≤ 3,5	≤ 2	≤ 3
Leakage current [mA]	≤ 0,01	—	≤ 0,05	—
Enclosure rating	IEC529 IP67			
Temperature range T_a [°C]	-10 to +70			
Cable	PVC, 3x0,22 mm², ø4 mm	PVC, 2x0,22 mm², ø4 mm	PU, 3x0,22 mm², ø3 mm	PU, 2x0,22 mm², ø3 mm
Cable length	2 m or 0,15 m with M8x1 connector		2 m or 0,30 m with M8x1 connector	
Housing material	plastic, metal sheet		plastic, metal fixing device	
Integrated protection	against short circuit, overvoltage and reversing of polarity	—	against short circuit, overvoltage and reversing of polarity	—

Order codes

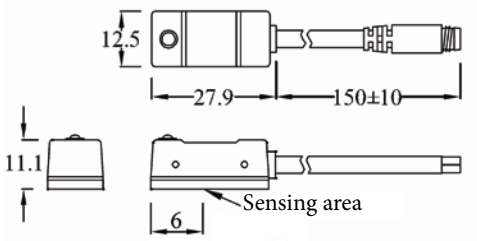
Type	Switching output	Max. switching frequency [Hz]	Function indicator	Order codes for switch with connection	
				cable 2 m	cable 0,15 (0,30) m with M8x1 connector
KT-21P	PNP	1000	LED	2202 5111 0210 2000	2202 5111 0215 0000
KT-21R	reed	200	LED	2201 5102 0110 2000	2201 5102 0115 0000
KT-50P	PNP	1000	LED	2202 5011 0110 2000	2202 5011 0115 0000
KT-50R	reed	200	LED	2201 5002 0110 2000	2201 5002 0115 0000

How to fix switch on cylinder and which series for which cylinder type

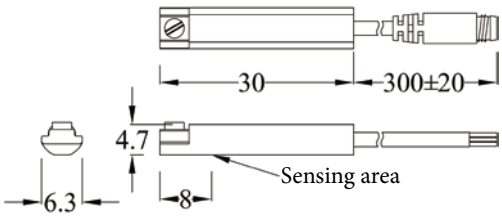
Pneumatic cylinder type	Switch can be used				
	directly	with PM-x[1] bracket	with PI-x [2] bracket	with PAB bracket (up to Ø100)	with bracket for dovetail groove
VDMA 24562, Ø32 to 100 mm			✓ KT-21		
VDMA 24562, Ø125 to 320 mm [3]		✓ KT-21			
Compact and ISO 15552 (order code 10201...)	✓ KT-50				
DIN ISO 6432				✓ KT-21	
Short stroke, Ø20 to 100 mm					✓ KT-50
Rotary actuator, Ø 20 to 40 mm				✓ KT-21	
Rotary actuator, Ø50 and more mm		✓ KT-21			
With guide unit U or H [4]		✓ KT-21		✓ KT-21	

1) PM-6 bracket is for cylinders with tie rods diameter 5 to 6 mm (cylinders dia. 32 to 63), PM-8 bracket is for tie rod diameter 8 mm (cylinders dia. 80, 100, 160 to 320), PM-12 bracket is for tie rod diameter 12 mm (cylinders dia. 125 mm)
2) PI-1 bracket is for cylinders dia. 32 and 40 mm, PI-2 is for cyl. dia 50 and 63 mm, PI-3 is for cyl. dia 80 mm and PI-4 is for cyl. dia 100 mm
3) It is necessary to use PM-12 bracket for cylinder to VDMA 24562 dia. 125 mm, and bracket PM-8 for cylinders dia. 160 to 320 mm
4) We recommend to use bracket for tube with cylinder with guide unit, to provide sensing in section, where the guide unit is mounted. The guide body inhibits using of bracket for tie rod / profile. On the other side, or in the area out of guide body, bracket for tie rod / profile can be used.

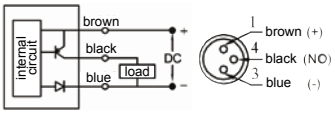
Dimensions of series KT-21



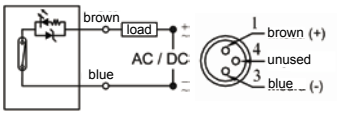
Dimensions of series KT-50



Connection of KT-xxP



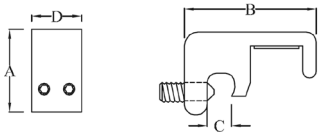
Connection of KT-xxR



Brackets for switches series KT-21

Bracket PM-x for cylinder tie rods

Type	Order codes	For cylinder	Tie rod
PM-6	2290 5119 0000 0000	Ø32 to 63	Ø5 to 6
PM-8	2290 5120 0000 0000	Ø80, 100, 160 to 320	Ø8
PM-12	2290 5121 0000 0000	Ø125	Ø12

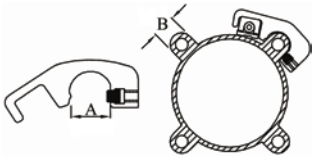


Type	A	B	C	D
PM-6	19	31,0	6,5	12
PM-8	20	34,5	8	12
PM-12	20	35,5	11,5	12

Bracket PI-x for profile tube

Type	Order codes	For cylinder
PI-1	2290 5115 0000 0000	Ø32, 40
PI-2	2290 5116 0000 0000	Ø50, 63
PI-3	2290 5117 0000 0000	Ø80
PI-4	2290 5118 0000 0000	Ø100

It is necessary to use PM-12 bracket for cylinder to VDMA 24562 dia. 125 mm, and bracket PM-8 for cylinders dia. 160 to 320 mm



Type	A max	B max
PI-1	11,15	10,4
PI-2	14,10	13,5
PI-3	15,45	15
PI-4	16,3	16

Bracket PAB for tube

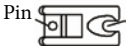
Type	Order codes	For cylinder
PAB	2290 5114 0000 0000	do Ø100

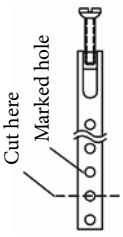
We recommend to use bracket for tube with cylinder with guide unit, to provide sensing in section, where the guide unit is mounted. The guide body inhibits using of bracket for tie rod / profile. On the other side, or in the area out of guide body, bracket for tie rod / profile can be used.

How to use PAB bracket:

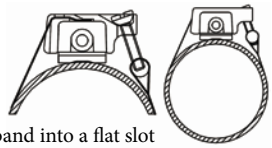
Step 1:
Start by keeping screw 3 to 4 turns into barrel nut on the end of band assembly

Step 2:
Place the screw head into clamp slot and wrap the band around the cylinder, position the pin with the nearest hole on the band and mark the hole with permanent marker





Step 3:
Remove clamp assembly from the cylinder. Locate the marked hole and cut the band at midway between next two adjacent holes

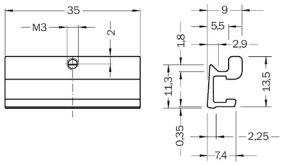


Step 4:
Insert cut of the band into a flat slot opposite from the clamp slot. Place the chosen hole over the pin and bend the band firmly down with thumb pressure. Then wrap the band around the cylinder barrel and re-insert screw head into clamp. Position the switch and tighten.

Bracket for switches series KT-50

Bracket for dovetail groove

Order codes	For cylinder
2290 2011 0000 0000	Ø20 to 100



Cables with M8x1 connector

Description	Order codes - straight connector	Order codes - elbow connector
Connector only for cable max. 3x0,25 mm², max. dia. 5,5 mm	2291 0001 0000 0000	2291 0002 0000 0000
PVC cable with connector 3x0,22 mm², length 2m	2291 0010 0000 0000	2291 0015 0000 0000
PVC cable with connector 3x0,22 mm², length 5m	2291 0011 0000 0000	2291 0016 0000 0000
PVC cable with connector 3x0,22 mm², length 10m	2291 0012 0000 0000	2291 0017 0000 0000

PROXIMITY SWITCHES
SERIES RZT6, MZT6 AND MZT1

These proximity switches are produced as reed switches or electronic switches. Advantage of these switches is that they can be used with all types of Stránský a Petržík's cylinders. It means, that there can be used not only several diameters but also more types of cylinders (VDMA, compact, DIN ISO, etc.) in pneumatic circuit and for all cylinders only one type of switch can be used (it is necessary to select proper bracket for various types of cylinder - see table bellow). It brings cost savings at designing electrical circuits, at connection as well as at circuit maintaining.
Switch can be used with cylinders with T-slot made by other producers.

Technical data of series RZT6

Description	Value
Supply voltage U_b [V]	10 to 30 DC / AC
Max. switching power [W / VA]	6
Continuous current I_a [mA]	≤ 500
Time delay [ms]	1,5 switch on, 0,5 switch off
Hysteresis H Type. [mm]	≤ 1,5 mm
Repeatability R [mm]	≤ 0,2
Enclosure rating to EN 60 529	IP 67
Temperature range T_a [˚C]	-25 to +75
Housing material	plastic
Cable	PVC, 3 x 0,14 mm^2
Function indicator	LED

Technical data of series MZT6 / MZT1

Description	Value
Supply voltageU_b [V]	10 to 30 DC, ±10%
Voltage drop U_d [V]	≤ 2,5
Power consumption [mA]	≤ 10
Continuous current I_a [mA]	≤ 100
Hysteresis H Type. [mm]	≤ 1,5 mm
Repeatability R [mm]	≤ 0,2
Enclosure rating to EN 60 529	IP 67
Temperature range T_a [˚C]	-25 to +75
Housing material	plastic
Cable	PVC, 3 x 0,14 mm^2
Function indicator	LED
Integrated wire-break, short circuit and reverse polarity protection	

Order codes

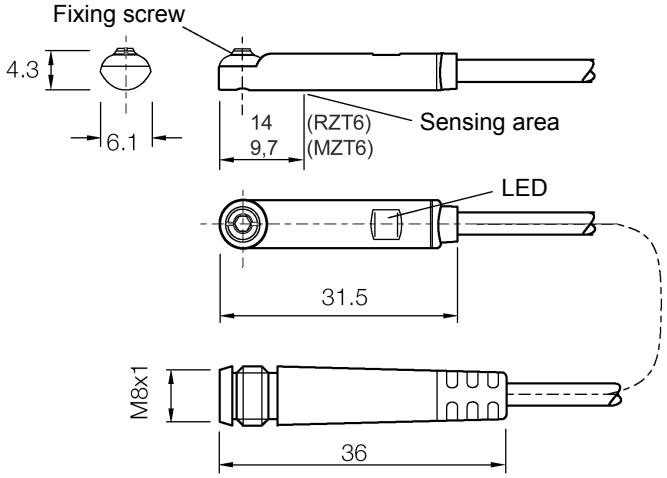
Type	Switching output	Max. switching frequency [Hz]	Sensitivity [mT]	Connection	Order codes
RZT6	reed	400	3	cable 2 m	2201 2210 0510 2000
RZT6	reed	400	3	cable 5 m	2201 2210 0510 5000
RZT6	reed	400	3	cable 0,3 m with M8x1 connector	2201 2210 0515 0000
MZT6	PNP	5000	2,8	cable 2 m	2202 2311 0110 2000
MZT6	PNP	5000	2,8	cable 5 m	2202 2311 0110 5000
MZT6	PNP	5000	2,8	cable 0,3 m with M8x1 connector	2202 2311 0115 0000
MZT1	NPN	5000	2,8	cable 2 m	2202 2411 0110 2000
MZT1	NPN	5000	2,8	cable 0,3 m with M8x1 connector	2202 2411 0115 0000

How to fix switch on cylinder and which series for which cylinder type

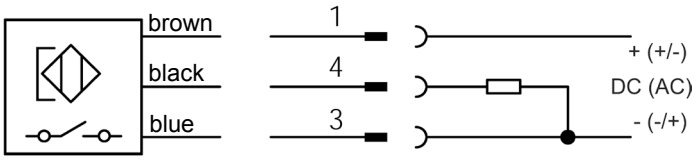
Pneumatic cylinder type	Switch can be used					
	directly	with bracket	with bracket for dovetail groove	With bracket for tube		
				up to Ø25	up to Ø63	up to Ø125
VDMA 24562		✓				
Compact and ISO 15552	✓					
DIN ISO 6432				✓		
Short stroke, Ø20 to 100 mm			✓			
Rotary actuator, Ø 20 to 40 mm				✓	✓	
Rotary actuator, Ø50 and more mm		✓				
With guide unit U or H*		✓		✓	✓	✓

*) We recommend to use bracket for tube with cylinder with guide unit, to provide sensing in section, where the guide unit is mounted. The guide body inhibits using of bracket for tie rod / profile. On the other side, or in the area out of guide body, bracket for tie rod / profile can be used.

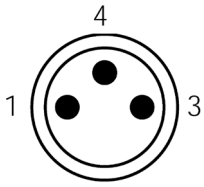
Dimensions



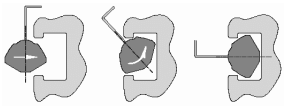
Connection



Wire colour	Pin	Assignment
brown	1	+V DC
black	4	NO
blue	3	-V DC



T-slot mounting



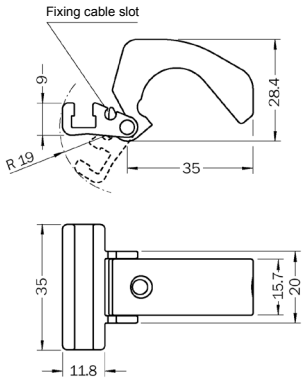
Drop in from the top, turn max 90° and tighten screw

Brackets for switches series RZT6, MZT6 and MZT1

Bracket for tie rod / profile

Order code 2290 2010 0000 0000

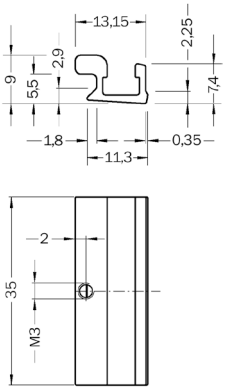
suitable for cylinders with tie rods or profile tubes cylinders to ISO 6431 and VDMA 24562 (except guide unit U or H) tie rod diameter / profile width: 5 to 18 mm



Bracket for dovetail groove

Order code 2290 2011 0000 0000

suitable for short stroke cylinders with dovetail groove



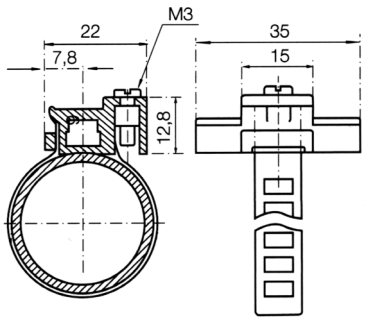
Bracket for round tube

Order code 2290 2012 0000 0000 (up to Ø25)
Order code 2290 2013 0000 0000 (up to Ø63)
Order code 2290 2014 0000 0000 (up to Ø125)

up to Ø25: suitable for cylinders with round tube (ISO 6432 and rotary actuators dia. 20-32) and cylinders to VDMA 24562 with guide unit U or H diameter 32

up to Ø63: suitable for cylinders with round tube (rotary actuator dia. 40) and cylinder to VDMA 24562 with guide unit U or H dia. 40 to 63

up to Ø125: suitable for cylinders with round tube and cylinders to VDMA 24562 with guide unit U or H dia. 80 to 125



Cables with M8x1 connector

Description	Order codes - straight connector	Order codes - elbow connector
Connector only for cable max. 3x0,25 mm², max. dia. 5,5 mm	2291 0001 0000 0000	2291 0002 0000 0000
PVC cable with connector 3x0,22 mm², length 2m	2291 0010 0000 0000	2291 0015 0000 0000
PVC cable with connector 3x0,22 mm², length 5m	2291 0011 0000 0000	2291 0016 0000 0000
PVC cable with connector 3x0,22 mm², length 10m	2291 0012 0000 0000	2291 0017 0000 0000

This series of switches uses only reed relay. It necessary to select proper switch series for specific type of cylinder. SP2 switches are for pneumatic cylinders to DIN ISO 6431 (piston diameter 32 to 200 mm) and to VDMA 24562 (piston diameter 125 to 320 mm). Switches are fixed by M6 screws on tie rod dia. 4,5 - 12 mm. SP4 switches are for short stroke cylinders (piston diameter 20 to 100 mm). They are fixed so, that mounting strip (included in pack) and switch are inserted into groove side by side. Then switch is moved to required position and by the help of e.g. screwdriver the mounting strip is moved bellow switch, which will be fixed in position by tightening of screw. These switches can be used with cylinders with round tube; in this case carrier should be used (included in pack). SP5 and SP6 switches are for pneumatic cylinders to VDMA 24562 (piston diameter 32 to 100 mm). Switches are fixed by M5 screws on tube profile with width 10 to 16 mm.

Technical data

Description	Value
Enclosure rating to EN 60 529	IP 54 (SP2, SP5, SP6), IP56 (SP4)
Temperature range T_a [°C]	-30 to +80
Housing material	aluminium (SP2, SP5, SP6) plastic (SP4)
Cable	Semoflex, 2 x 0,24 mm^2, length 2m
Function indicator	LED (except 2201 0103 3000 2000)

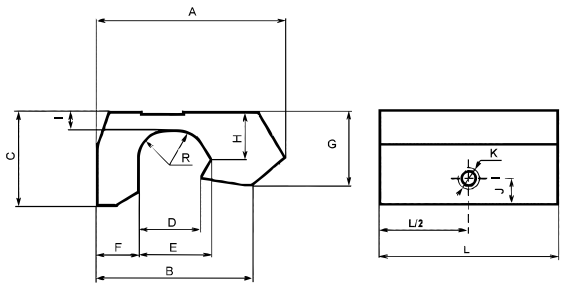
Order codes

Type	DC voltage[V]	AC voltage [V]	Switched current [A]	Switched output [W / VA]	Wiring	Order codes
SP2	5 to 50	5 to 50	0,2	10	A	2201 0101 0210 2000
SP2	5 to 50	5 to 50	0,5	30	A	2201 0101 0510 2000
SP2	5 to 200	5 to 250	0,7	30	A	2201 0102 0710 2000
SP2	—	90 to 250	3,0	550	B	2201 0103 3000 2000
SP4	5 to 50	5 to 50	0,2	10	A	2201 0401 0210 2000
SP4	—	90 to 250	0,6	80	C	2201 0403 0610 2000
SP5	5 to 50	5 to 50	0,2	10	A	2201 0201 0210 2000
SP6	5 to 50	5 to 50	0,2	10	A	2201 0301 0210 2000

How to fix switch on cylinder and which series for which cylinder type

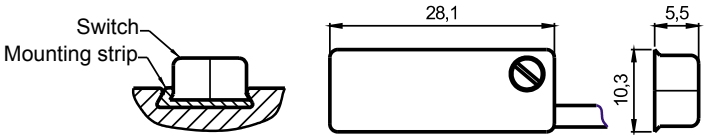
Pneumatic cylinder type	Suitable switch			
	SP2	SP4	SP5	SP6
VDMA 24562, piston diameter 32 to 63 mm			✓	
VDMA 24562, piston diameter 80 and 100 mm				✓
VDMA 24562, piston diameter 125 to 320 mm	✓			
Compact		✓		
DIN ISO 6432		✓		
Short stroke, piston diameter 20 to 100 mm		✓		
Rotary actuator, piston diameter 20 to 40 mm		✓		
Rotary actuator, piston diameter 50 and more mm	✓			

Dimensions of series SP2, SP5, SP6



Type	Switched current [A]	A	B	C	D	E	F	G	H	I	J	K	L	R
SP2	0,2	36,5	30	17	12,3	14	7,5	14	9	3	7	M6	26	5
SP2	0,5 and 0,7	36,5	30	17	12,3	14	7,5	14	9	3	7	M6	36	5
SP2	3	36,5	30	17	12,3	14	7,5	14	9	3	7	M6	40	5
SP5	0,2	32	–	19	13	–	5	22	–	5	5	M5	26	7
SP6	0,2	35	–	25	16	–	5	27	–	6	5	M5	26	8

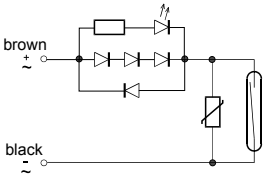
Dimensions of series SP4



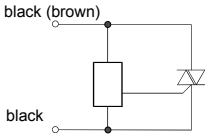
(Example of switch mounting on short stroke and compact cylinders)

Connection

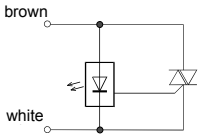
Wiring A



Wiring B



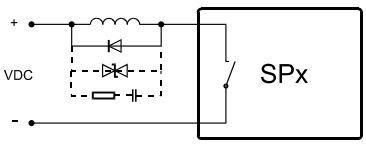
Wiring C



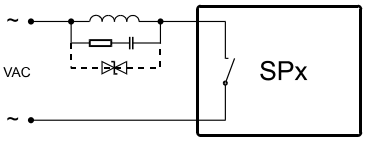
Rules for using with inductive load

Parameters of SPx contacts are defined for using with ohmic load. When inductive load or load with inductive component is switched, these parameters (max. voltage) are exceed. To secure proper function, the influence of overvoltage must be reduced by using of diode or RC circuit, overvoltage protection (varistor, transil) or their combination.
Max. allowed value of switched current and voltage are at least 50% lower, when inductive load is switched. When the values are near to max. allowed parameters, we recommend to check if U_{max}^2/R_{DC}< max. allowed switching power. R_{DC} is ohmic resistance of load measured by DC voltage, U_{max} is switching voltage amplitude.

Contacts protecting when DC voltage is used:
Parameters of protective elements:
DIODE must be projected for current passing the circuit and cut off voltage of diode must be twice to switching voltage.
VARISTOR must be projected to 1,5 multiple of switched voltage.



Contacts protecting when AC voltage is used:
Parameters of protective elements:
CAPACITY of capacitor is recommended to 0,05 to 0,5 μF, capacitor type MP for min. 3x Uef switched voltage.
VARISTOR must be projected to 2,5 multiple of effective value of switched voltage.



Proximity switches series SPH are electronic solid-state sensors, intended for sensing of magnetic piston position of pneumatic cylinders. They are especially suitable for use with PLC. They can switch also DC relays in valve circuits, without necessity to use any protections and without lower of lifetime due to inductive load (protection is built-in in switch). SPH switches are supplied from switched circuit and they need very small supply current. Switch strains circuit by current lower than 1/10 actuating current of PLC. Advantage of 2 wire switch lay-out is saving of one supply wire and related clamps in circuit connection, saving of space and work difficulty reduction. SPH switches will be soon available in all types of SP housing (SP2,4,5 and 6) and in new type for groove 6,7 x 4,5 mm of pneumatic compact cylinders. Frequency of switching of SPH is faster than 11 Hz, typically 20 Hz. Response time during switch on is 0,045 to 0,090 sec.
SPH4 switches are for short stroke cylinders (piston diameter 20 to 100 mm). They are fixed so, that mounting strip (included in pack) and switch are inserted into groove side by side. Then switch is moved to required position and by the help of e.g. screwdriver the mounting strip is moved bellow switch, which will be fixed in position by tightening of screw. These switches can be used with cylinders with round tube; in this case carrier should be used (included in pack).

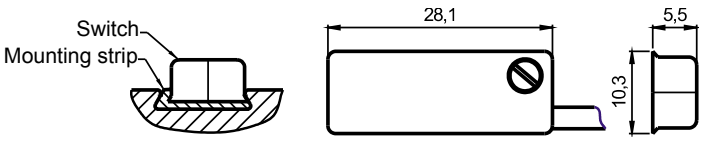
Technical data

Description	Value
Supply voltage U_b [V]	10 to 30 ±10% DC
Max. switched current I_a [mA]	120
Max. switched output [W]	3,5
Resistance in nonactivated state [kΩ]	> 240
Voltage drop in on-state U_d [V]	< 2,4
Hysteresis H typ. [mm]	1,5
Repeatability R [mm]	≥ 0,2
Overvoltage protection	transil
Reverse polarity protection	unitransil, when reversed polarity, switch is on-state (without LED lighting)
Enclosure rating to EN 60 529	IP 54
Temperature range T_a [˚C]	-25 to +85
Housing material	plast ic
Cable	Semoflex, 2 x 0,24 mm², length 2m
Function indicator	LED

Order codes

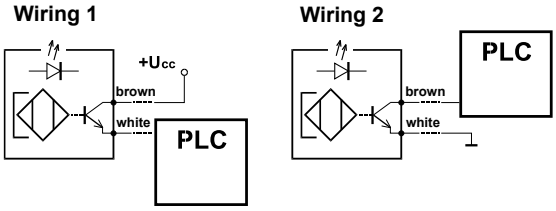
Type	DC voltage [V]	Switched current [A]	Switched output [W]	Order codes
SPH4	10 to 30 ±10%	0,12	3,5	2202 0411 0110 2000

Dimensions of series SPH4



(Example of switch mounting on short stroke and compact cylinders)

Connection



How to fix switch on cylinder and which series for which cylinder type

Pneumatic cylinder type	Suitable switch
	SPH4
Compact	✓
DIN ISO 6432	✓
Short stroke, Ø 20 to 100 mm	✓
Rotary actuator, Ø 20 to 40 mm	✓

This proximity switch is designed for use in extreme temperature conditions. It can be placed and used in ambient temperatures from -40 to +150°C. This switch is suitable for use with cylinders to VDMA 24562 and DIN ISO 6431 when proper bracket is used. Switch is mounted to bracket with M3 screws (included in pack).

Technical data

Description	Value
Supply voltage U_b [V]	10 to 50 DC
Power consumption [mA]	20
Continuous current I_a [mA]	200
Enclosure rating to EN 60 529	IP 56K
Temperature range T_a [°C]	-40 to +150
Housing material	dural
Cable	silicone, 3 x 0,22 mm², length 2 m
Function indicator	none
Built-in reverse polarity protection, shock and vibration resistivity, switch hasn't built-in short circuit protection	

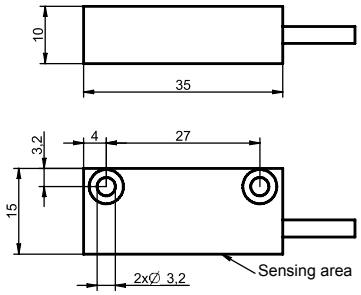
Order codes

Type	Switching output	Max. switching frequency [Hz]	Sensitivity [mm]	Connection	Order codes
SP-472	PNP	10000	5 to 10	cable 2 m	2202 8012 5200 2000

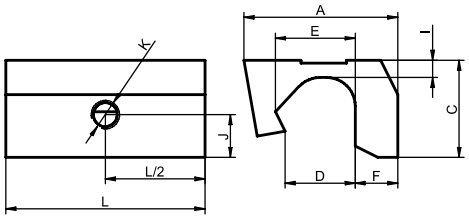
Bracket for pneumatic cylinders	Bracket type	Order codes
VDMA 24562, piston diameter 32, 40, 125 to 320 mm	1	2290 8010 0000 0000
VDMA 24562, piston diameter 50 and 63 mm (with profile tube)	2	2290 8010 0050 0063
VDMA 24562, piston diameter 80 and 100 mm (with profile tube)	3	2290 8010 0080 0100

Dimensions

Switch



Bracket



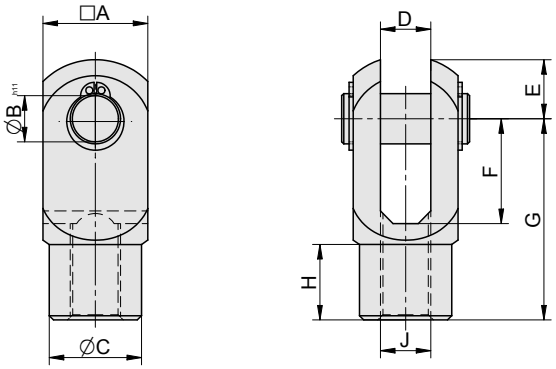
Type	A	C	D	E	F	I	J	K	L
1	27	17	12,3	14	7,5	3	7	M6	35
2	27	19	13	–	5	5	5	M5	35
3	27	25	16	–	5	6	5	M5	35

How to fix switch on cylinder and which series for which cylinder type

Pneumatic cylinder type	Switch can be used with bracket		
	type 1	type 2	type 3
VDMA 24562, piston diameter 32, 40, 125 to 320 mm	✓		
VDMA 24562, piston diameter 50 and 63 mm		✓	
VDMA 24562, piston diameter 80 and 100 mm			✓
Rotary actuator, piston diameter 50 and more mm	✓		

PISTON ROD CLEVIS

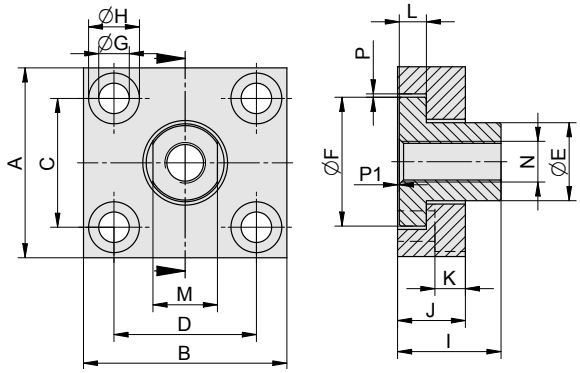
Supply contain:
1 pc clevis
1 pcs pivot pin
2 pcs retaining ring



Piston ∅	A	B	C	D	E	F	G	H	J	Weight	Order codes
12 / 16	12	6	10	6	7,6	12	24	10	M6	0,005	2110 0100 0012 0000
20	16	8	14	8	10	16	32	14	M8	0,02	2110 0100 0020 0000
25 / 32	20	10	18	10	12,6	22	40	13	M10x1,25	0,06	2110 0100 0025 0000
40	25	12	22	12	14	25	48	18	M12x1,25	0,12	2101 0100 0040 0000
50 / 63	28	16	26	16	14	32	64	23	M16x1,5	0,16	2101 0100 0050 0000
80 / 100	35	20	34	20	18	45	80	23,5	M20x1,5	0,36	2101 0100 0080 0000
125	55	30	48	30	38	60	110	40	M27x2	1,56	2101 0100 0125 0000
160 / 200	70	35	60	35	57	85	144	45	M36x2	3,60	2101 0100 0160 0000
250	85	40	70	40	64	84	168	65	M42x2	6,32	2101 0100 0250 0000
320	96	50	80	50	73	96	192	70	M48x2	6,86	2101 0100 0320 0000

FLANGED PISTON ROD COUPLING

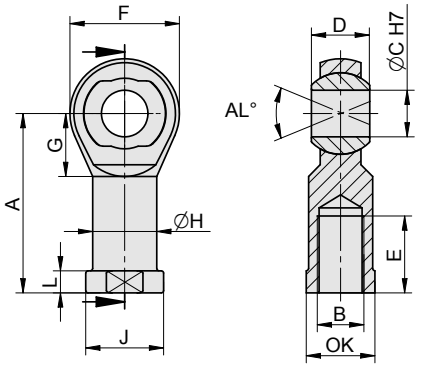
Supply contain:
1 pc flange



Piston ∅	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	P1	Weight	Order codes
12 / 16	30	25	20	15	12	18	5,5	-	16	8	-	3,5	10	M6	1	0,5	0,02	2110 0300 0012 0000
20	35	30	25	20	14	20	5,5	-	22	8	-	3,5	13	M8	1	0,5	0,04	2110 0300 0020 0000
25 / 32	60	37	36	23	20	30	6,4	11	24	15	7	7	17	M10x1,25	1	0,5	0,20	2110 0300 0025 0000
40	60	56	42	38	25	40	9	15	30	20	9	8	19	M12x1,25	1	0,5	0,44	2101 0300 0040 0000
50 / 63	80	80	58	58	30	50	11	18	32	20	11	9	24	M16x1,5	1	0,5	0,84	2101 0300 0050 0000
80 / 100	90	90	65	65	40	60	14	20	35	20	13	10	36	M20x1,5	1	0,5	1,10	2101 0300 0080 0000
125	90	90	65	65	40	60	14	20	35	20	13	10	36	M27x2	1	0,5	1,06	2101 0300 0125 0000
160 / 200	120	120	80	80	50	70	17	26	42	20	14	12	46	M36x2	1	0,5	1,98	2101 0300 0160 0000

PISTON ROD EYE

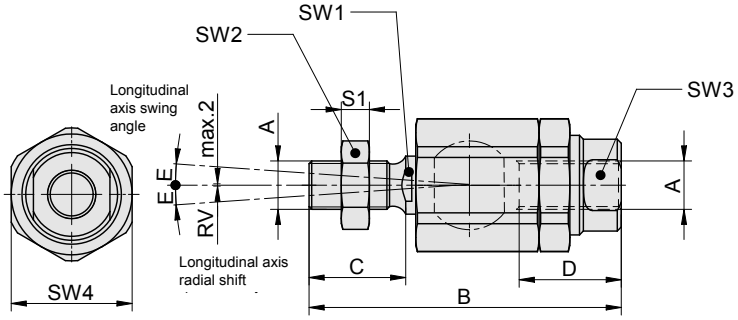
Supply contain:
1 pc eye



Piston ∅	A	B	C	D	E	F	G	H	J	L	OK	AL	Weight	Order codes
20	36	M8	8	8	14	26	13	13	16	5	14	30	0,02	2110 0200 0020 0000
25	42	M10x1,25	10	9	16	28	15	14	16	6	14	24	0,06	2110 0200 0025 0000
32	43	M10x1,25	10	14	20	30	15	15	19	6	16	24	0,04	2101 0200 0025 0000
40	50	M12x1,25	12	16	22	34	17	17	21	6	18	22	0,10	2101 0200 0040 0000
50 / 63	64	M16x1,5	16	21	28	40	22	21	27	8	22	15	0,14	2101 0200 0050 0000
80 / 100	77	M20x1,5	20	25	33	51	27	28	34	10	30	18	0,38	2101 0200 0080 0000
125	110	M27x2	30	37	42	70	36	38	50	15	41	12	1,40	2101 0200 0125 0000
160 / 200	125	M36x2	35	43	56	100	44	52	60	18	55	16	1,74	2101 0200 0160 0000
250	142	M42x2	40	49	60	110	46	60	73	19	65	14	3,32	2101 0200 0250 0000
320	160	M48x2	50	60	68	128	59	65	75	23	66	12	5,50	2101 0200 0320 0000

SELF-ALIGNING PISTON ROD COUPLING

Supply contain:
1 pc coupling

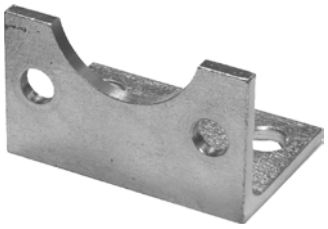


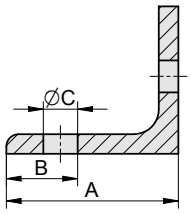
Piston ∅	A	B	C	D	E	S1	SW1	SW2	SW3	SW4	RV	Weight	Order codes
10	M4	33	8	13	4	2,2	3,2	7	7	11	0,5	0,015	N155-281
12 / 16	M6	39	12	14	4	3,2	5	10	7	13	0,5	0,02	N155-282
20	M8	55	16	18	4	4	7	13	10	17	0,5	0,06	N155-283
25 / 32	M10x1,25	72	20	26	5	6	12	17	19	30	0,7	0,21	NSC16/032-S
40	M12x1,25	76,5	24	26	5	7	12	19	19	30	0,7	0,22	NSC16/040-S
50 / 63	M16x1,5	108	32	34	5	8	19	24	30	42	1,0	0,65	NSC16/050-S
80 / 100	M20x1,5	124	40	42	5	9	19	30	30	42	1,0	0,72	NSC16/080-S
125	M27x2	147	44	48	5	13	24	36	32	55	2,0	1,78	NSC16/125-S
160 / 200	M36x2	242	72	80	4	14	36	55	50	75	2,0	5,2	NSC16/160-S
250	M42x2	271	82	88	4	16	36	65	60	80	2,0	8,7	NSC16/250-S

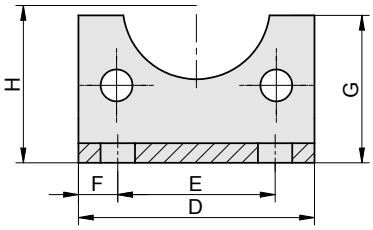
FOOT MOUNTING FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc foot mounting
2 pcs screws





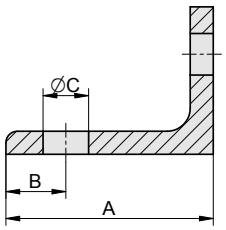


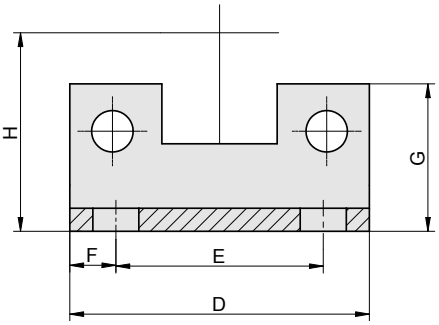
Piston ∅	A	B	C	D	E	F	G	H	Weight	Order codes
32	35	11	7	48	32	5	30	32	0,08	2101 2100 0032 0000
40	40	12	10	55	36	9,5	32	36	0,12	2101 2100 0040 0000
50	45	13	10	65	45	10	40	45	0,16	2101 2100 0050 0000
63	45	13	10	75	50	12,5	40	50	0,22	2101 2100 0063 0000
80	60	19	12	95	63	16	60	63	0,50	2101 2100 0080 0000
100	60	19	12	115	75	20	60	71	0,54	2101 2100 0100 0000
125	70	30	16,5	140	90	25	70	90	1,22	2101 2100 0125 0000
160	85	25	18,5	185	115	35	90	115	2,55	2101 2100 0160 0000
200	105	35	24	235	135	50	120	135	4,68	2101 2100 0200 0000
250	115	40	28	270	165	52,5	150	165	10,84	2101 2100 0250 0000
320	130	45	35	350	200	75	170	200	14,75	2101 2100 0320 0000

FOOT MOUNTING FOR CYLINDER

- **DIN ISO 6431, VDMA 24562 WITH DOUBLE PISTON ROD**

Supply contain:
1 pc foot mounting
2 pcs screws



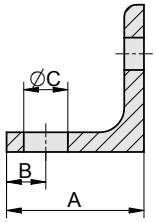


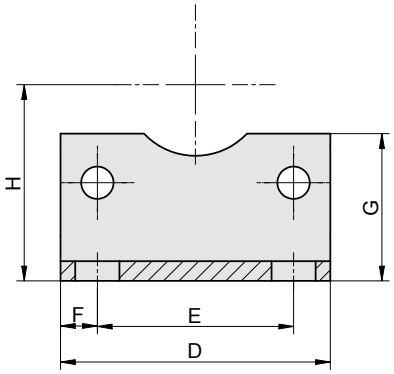
Piston ∅	A	B	C	D	E	F	G	H	Weight	Order codes
32	35	11	7	48	32	5	23,5	32	0,08	2101 2200 0032 0000
40	40	12	10	55	36	9,5	25,5	36	0,12	2101 2200 0040 0000
50	45	13	10	65	45	10	32	45	0,16	2101 2200 0050 0000
63	45	13	10	75	50	12,5	35	50	0,22	2101 2200 0063 0000
80	60	19	12	95	63	16	42	63	0,50	2101 2200 0080 0000
100	60	19	12	115	75	20	45	71	0,54	2101 2200 0100 0000

FOOT MOUNTING FOR CYLINDER

• SHORT STROKE

Supply contain:
1 pc foot mounting
2 pcs screws



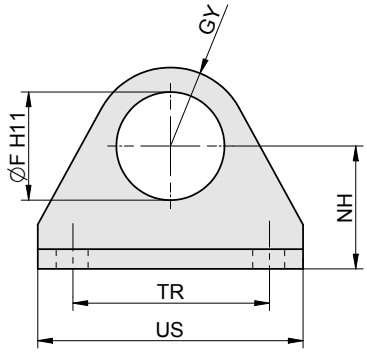


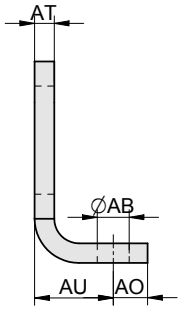
Piston ∅	A	B	C	D	E	F	G	H	Weight	Order codes
20	22	6	6,6	32	22	5	25	27	0,04	2125 2100 0020 0000
25	22	6	6,6	39	28	5,5	25	29	0,04	2125 2100 0025 0000
32	26	8	6,6	48	36	6	30	34	0,08	2125 2100 0032 0000
40	28	8	9	55	40	7,5	30	40	0,08	2125 2100 0040 0000
50	32	8	9	65	50	7,5	40	47	0,14	2125 2100 0050 0000
63	38	12	9	80	62	9	45	56	0,22	2125 2100 0063 0000
80	42	12	12	100	82	9	55	68	0,40	2125 2100 0080 0000
100	45	12	14	124	103	10,5	60	81	0,68	2125 2100 0100 0000

FOOT MOUNTING FOR CYLINDER

• DIN ISO 6432

Supply contain:
1 pc foot mounting



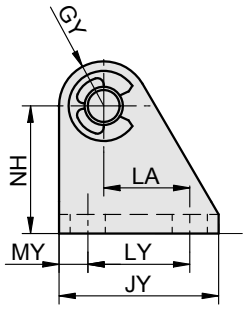


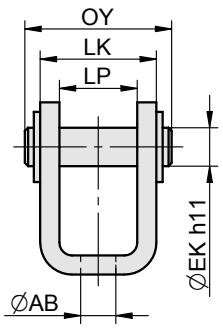
Piston ∅	AB	AO	AT	AU	F	GY	NH	TR	US	Weight	Order codes
12 / 16	5,5	6	3	13	16	12	20	32	44	0,04	2110 2100 0012 0000
20 / 25	6,5	7	4	16	22	16	25	40	54	0,10	2110 2100 0020 0000

CLEVIS FOOT MOUNTING FOR CYLINDER

• DIN ISO 6432

Supply contain:
1 pc clevis
1 pc pivot pin
2 pcs retaining ring



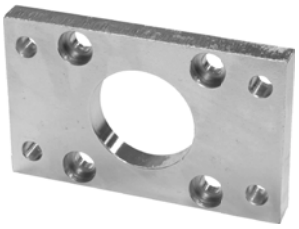


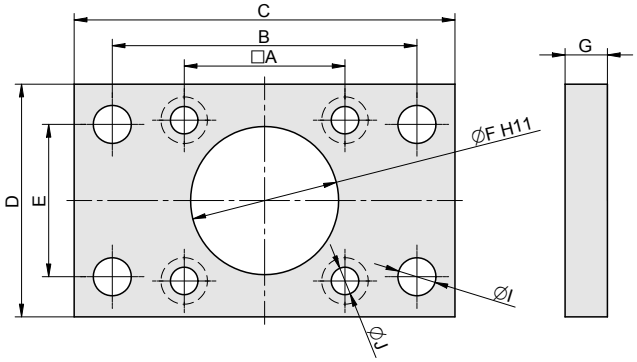
Piston ∅	AB	EK	GY	JY	LA	LK	LP	LY	MY	NH	OY	Weight	Order codes
12 / 16	5,5	6	7	25	2,5	18,2	12,2	16	4,5	20	23	0,02	2110 3000 0012 0000
20 / 25	6,5	8	10	32	4	22,2	16,2	20	6	25	30	0,02	2110 3000 0020 0000

FLANGE MOUNTING FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc flange mounting
4 pcs screws



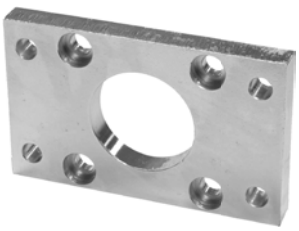


Piston ∅	A	B	C	D	E	F	G	I	J	Weight	Order codes
32	32,5	64	80	50	32	30	10	7	6,5	0,24	2101 2000 0032 0000
40	38	72	90	55	36	35	10	9	6,5	0,28	2101 2000 0040 0000
50	46,5	90	110	70	45	40	12	9	9	0,56	2101 2000 0050 0000
63	56,5	100	120	75	50	45	12	9	9	0,64	2101 2000 0063 0000
80	72	126	153	100	63	45	16	12	11	1,60	2101 2000 0080 0000
100	89	150	178	115	75	55	16	14	11	2,18	2101 2000 0100 0000
125	110	180	220	140	90	60	20	16	14	4,16	2101 2000 0125 0000
160	140	230	260	190	115	65	20	18	18	7,06	2101 2000 0160 0000
200	175	270	312	220	135	75	25	22	18	12,20	2101 2000 0200 0000
250	220	330	380	270	165	90	25	26	22	18,48	2101 2000 0250 0000
320	270	400	460	340	200	110	30	33	26	32,90	2101 2000 0320 0000

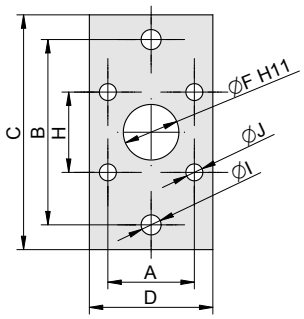
FLANGE MOUNTING FOR CYLINDER

- **SHORT STROKE**

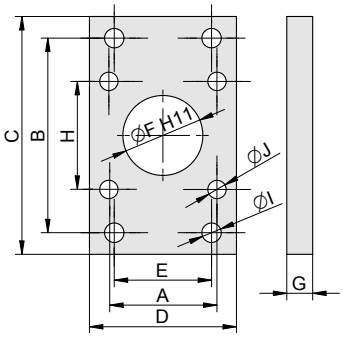
Supply contain:
1 pc flange mounting
4 pcs screws



For piston dia. 20 and 25



For piston dia. 32 to 100

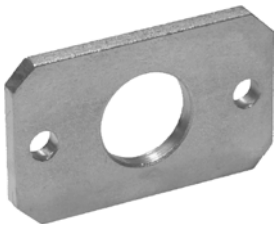


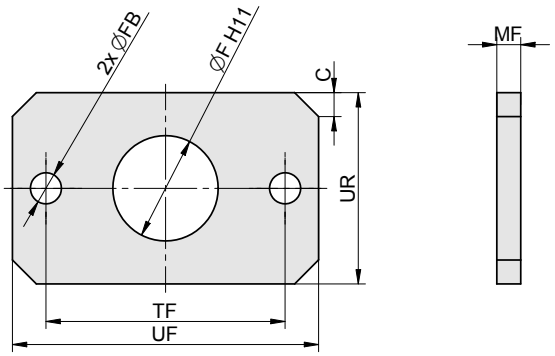
Piston ∅	A	B	C	D	E	F	G	H	I	J	Weight	Order codes
20	22	55	70	36	-	13	10	22	6,6	5,5	0,16	2125 2000 0020 0000
25	28	60	76	40	-	18	10	26	6,6	5,5	0,18	2125 2000 0025 0000
32	36	65	80	50	32	22	10	32	7	6,5	0,22	2125 2000 0032 0000
40	40	82	102	60	36	29	10	40	9	6,5	0,36	2125 2000 0040 0000
50	50	90	110	68	45	37	12	50	9	8,5	0,56	2125 2000 0050 0000
63	62	110	130	87	50	49	16	62	9	10,5	1,08	2125 2000 0063 0000
80	82	135	160	107	63	55	16	82	12	10,5	1,76	2125 2000 0080 0000
100	103	163	190	130	75	61	16	103	13	13	2,68	2125 2000 0100 0000

FLANGE MOUNTING FOR CYLINDER

- **DIN ISO 6432**

Supply contain:
1 pc flange mounting



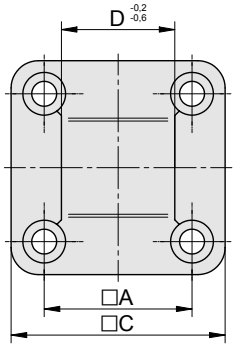


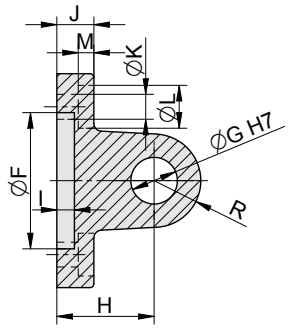
Piston ∅	C	F	FB	MF	TF	UF	UR	Weight	Order codes
12 / 16	5	16	5,5	4	40	52	28	0,04	2110 2000 0012 0000
20 / 25	5	22	6,5	5	50	64	38	0,12	2110 2000 0020 0000

SWIVEL FLANGE FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc swivel flange
4 pcs screws



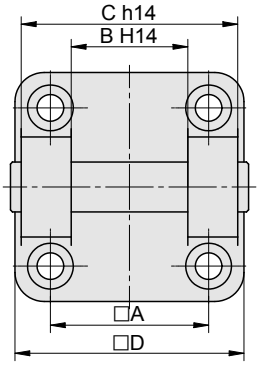


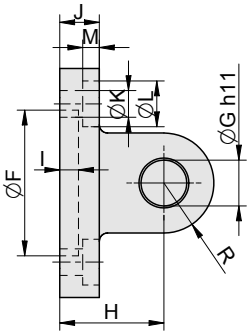
Piston ∅	A	C	D	F	G	H	I	J	K	L	M	R	Weight	Order codes
32	32,5	48	26	30	10	22	4,5	9	6,4	11	3,5	10	0,08	2101 3300 0032 0000
40	38	55	28	35	12	25	4,5	9,5	6,4	11	4	12	0,11	2101 3300 0040 0000
50	46,5	65	32	40	12	27	5	11	9	15	4,5	12	0,18	2101 3300 0050 0000
63	56,5	75	40	45	16	32	5	11	9	15	4,5	16	0,30	2101 3300 0063 0000
80	72	95	50	45	16	36	5	15	11	18	5	16	1,30	2101 3300 0080 0000
100	89	115	60	55	20	41	5	15	11	18	5	20	2,20	2101 3300 0100 0000
125	110	140	70	60	25	50	7	19	14	20	9	25	3,90	2101 3300 0125 0000
160	140	185	90	65	30	55	7	19	18	26	9	30	7,00	2101 3300 0160 0000
200	175	235	90	75	30	60	7	24	18	26	13	30	12,20	2101 3300 0200 0000
250	220	270	110	90	40	70	12	25	22	34	14	40	15,10	2101 3300 0250 0000
320	270	350	120	110	45	80	12	30	26	46	15	45	33,00	2101 3300 0320 0000

SWIVEL FLANGE FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc flange
1 pc pivot pin
2 pcs retaining ring
4 pcs screw



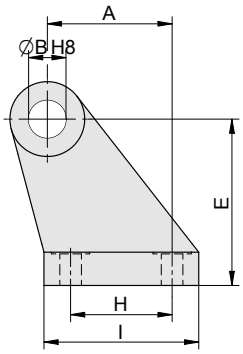


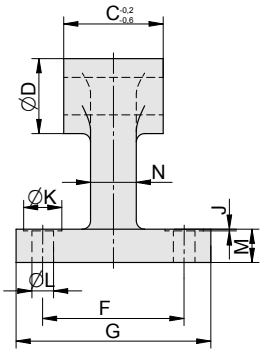
Piston ∅	A	B	C	D	F	G	H	I	J	K	L	M	R	Weight	Order codes
32	32,5	26	45	48	30	10	22	4,5	9	6,4	11	3	10	0,10	2101 3000 0032 0000
40	38	28	52	55	35	12	25	4,5	9,5	6,4	11	4	12	0,16	2101 3000 0040 0000
50	46,5	32	60	65	40	12	27	4,3	6,5	9,2	-	-	10	0,26	2101 3000 0050 0000
63	56,5	40	70	75	45	16	32	4,5	6,5	9,2	-	-	12	0,38	2101 3000 0063 0000
80	72	50	90	95	45	16	36	-	11	11	-	-	13	0,72	2101 3000 0080 0000
100	89	60	110	115	55	20	41	4,5	10	11,2	-	-	16	1,06	2101 3000 0100 0000
125	110	70	130	140	60	25	50	7	19	14	20	9	25	3,90	2101 3000 0125 0000
160	140	90	170	185	65	30	55	7	20	18	26	10	30	7,44	2101 3000 0160 0000
200	175	90	170	235	75	30	60	7	24	18	26	11	30	12,08	2101 3000 0200 0000
250	220	110	200	270	90	40	70	11	25	22	34	14	40	17,55	2101 3000 0250 0000
320	270	120	220	350	110	45	80	11	30	26	46	1,5	45	31,60	2101 3000 0320 0000

CLEVIS FOOT MOUNTING FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc clevis





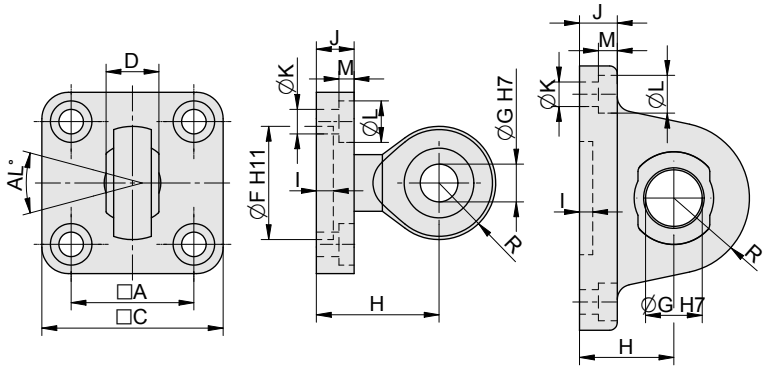
Piston ∅	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Weight	Order codes
32	21	10	26	20	32	38	51	18	31	1	11	6,4	8	10	0,06	2101 3100 0032 0000
40	24	12	28	23	36	41	54	22	35	1	11	6,4	10	12	0,09	2101 3100 0040 0000
50	33	12	31,8	20	45	50	65	30	45	-	-	9	12	15	0,20	2101 3100 0050 0000
63	37	16	39,8	24	50	52	67	35	50	-	-	9,2	12	15	0,28	2101 3100 0063 0000
80	47	16	49,8	26	63	66	86	40	60	-	-	11	14	20	0,52	2101 3100 0080 0000
100	55	20	59,8	32	71	76	93	50	67	-	-	11	15	20	0,62	2101 3100 0100 0000
125	70	25	69,6	50	90	94	124	60	90	3	20	14	20	28	3,16	2101 3100 0125 0000
160	97	30	89,5	60	115	118	156	88	126	4	20	14	25	35	6,98	2101 3100 0160 0000
200	105	30	89,5	60	135	122	162	90	130	2	26	18	30	38	8,56	2101 3100 0200 0000
250	128	40	108,5	80	165	150	200	110	160	4	34	22	35	45	14,92	2101 3100 0250 0000
320	150	45	119,5	90	200	170	234	122	186	2	46	26	40	55	25,34	2101 3100 0320 0000

SWIVEL FLANGE WITH SPHERICAL BEARING

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc flange
4 pcs screws

Flange design for piston dia 125 and more

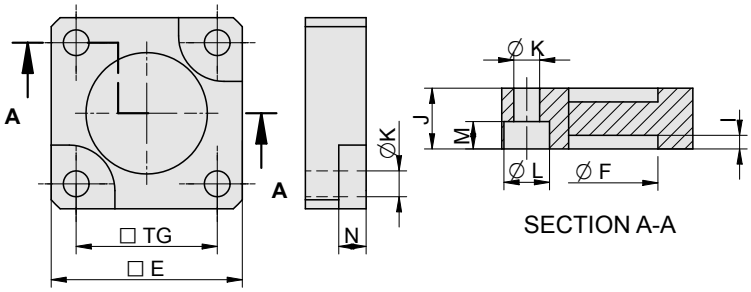


Piston ∅	A	AL	C	D	F	G	H	I	J	K	L	M	R	Weight	Order codes
32	32,5	15	48	14	30	10	32,5	4,5	10	6,4	11	4	17	0,20	2101 3200 0032 0000
40	38	15	55	16	35	12	32,5	4,5	10	6,4	11	4	17	0,26	2101 3200 0040 0000
50	46,5	15	65	21	40	16	40	6,5	12	8,5	15	8	20	0,44	2101 3200 0050 0000
63	56,5	15	75	21	45	16	40	6,5	12	8,5	15	8	20	0,56	2101 3200 0063 0000
80	72	18	94	25	45	20	49	5,5	14	10,5	18	10	23,5	1,16	2101 3200 0080 0000
100	89	18	115	25	55	20	49	5,5	14	10,5	18	10	23,5	1,54	2101 3200 0100 0000
125	110	15	140	37	60	30	50	7	20	13	20	10	40	3,46	2101 3200 0125 0000
160	140	16	185	43	65	35	55	7	20	18	26	10	50	5,60	2101 3200 0160 0000
200	175	16	235	43	75	35	60	7	24	18	26	13	50	10,72	2101 3200 0200 0000
250	220	16	270	49	90	40	70	12	24	22	34	13	60	14,80	2101 3200 0250 0000
320	270	16	350	60	110	50	80	12	30	26	46	15	70	28,94	2101 3200 0320 0000

BOXER FLANGE MOUNTING FOR CYLINDER

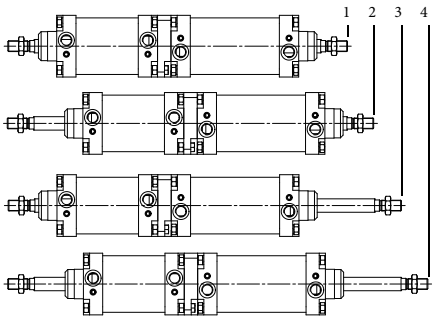
- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc flange
4 pcs screws



Using the boxer flange mounting, the 2 cylinders can be mounted together by end caps, so the piston rods will move against each other. If the cylinders will have the same stroke, the final assembly will have 3 positions when cylinders will be in end positions. When the cylinders will have various strokes, the final assembly will have 4 positions.

Attention: the body of cylinders are moving in this assembly, so it is necessary to use flexible air connections.

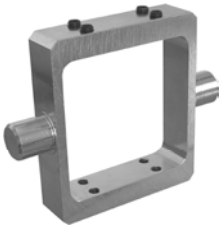


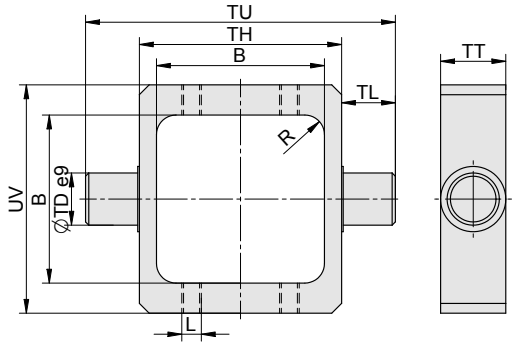
Piston ∅	TG	E	F	J	M	N	K	L	I	Weight	Order codes
32	32,5	45	30	15	6,5	8	6,5	11	4,5	0,052	2101 2300 0032 0000
40	38	56	35	15	6,5	8	6,5	11	4,5	0,084	2101 2300 0040 0000
50	46,5	63	40	20	9	9	8,5	15	4,5	0,154	2101 2300 0050 0000
63	56,5	75	45	20	9	9	8,5	15	4,5	0,223	2101 2300 0063 0000
80	72	95	45	25	12	12	10,5	18	4,5	0,511	2101 2300 0080 0000
100	89	115	55	25	12	12	10,5	18	4,5	0,774	2101 2300 0100 0000
125	110	140	60	30	15	13	12,5	20	6,5	1,714	2101 2300 0125 0000
160	140	185	65	35	17,5	15	16,5	26	6,5	2,945	2101 2300 0160 0000
200	175	235	75	35	17,5	15	16,5	26	6,5	4,844	2101 2300 0200 0000
250	220	270	90	45	21,5	18	21	34	10,5	8,167	2101 2300 0250 0000
320	270	350	110	50	27	20	25	40	10,5	15,47	2101 2300 0320 0000

PIVOT PIN FOR CYLINDER

• ISO 15552, VDMA 24562, NF E 49003.1

Supply contain:
1 pc pivot pin
8 pcs screws



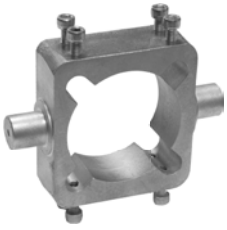


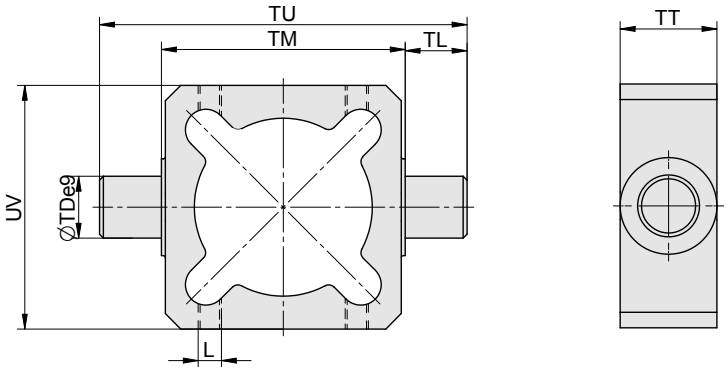
Piston ∅	L	TD	TL	TH	TT	TU	UV	B	R	Weight	Order codes
32	M6	12	12	50	20	74	65	44,5	5	0,20	2102 4100 0032 0000
40	M6	16	16	63	20	95	70	51,5	6	0,31	2102 4100 0040 0000
50	M6	16	16	75	20	107	85	64,5	6	0,37	2102 4100 0050 0000
63	M6	20	20	90	25	130	95	75,5	8	0,61	2102 4100 0063 0000
80	M8	20	20	110	25	150	120	94	10	0,90	2102 4100 0080 0000
100	M8	25	25	132	30	182	130	112	10	1,63	2102 4100 0100 0000

PIVOT PIN FOR CYLINDER

• DIN ISO 6431, VDMA 24562, NF E 49003.1

Supply contain:
1 pc pivot pin
8 pcs screws





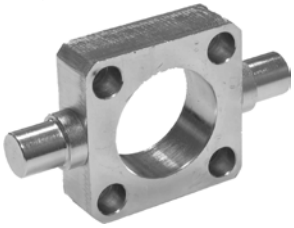
Piston ∅	L	TD	TL	TM	TT	TU	UV	Weight	Order codes
32	M5	12	12	50	25	74	63	0,12	2101 4100 0032 0000
40	M6	16	16	63	25	95	63	0,17	2101 4100 0040 0000
50	M6	16	16	75	28	107	85	0,70	2101 4100 0050 0000
63	M6	20	20	90	32	130	95	1,03	2101 4100 0063 0000
80	M6	20	20	110	32	150	120	1,46	2101 4100 0080 0000
100	M8	25	25	132	40	182	142	2,69	2101 4100 0100 0000
125	M10	25	25	160	46	210	160	3,53	2101 4100 0125 0000
160	M10	32	32	200	50	264	218	6,62	2101 4100 0160 0000
200	M10	32	32	250	50	314	260	9,23	2101 4100 0200 0000
250*		40	40	320	55	400	314	21,50	2101 4100 0250 0000
320*		50	50	400	70	500	400	35,80	2101 4100 0320 0000

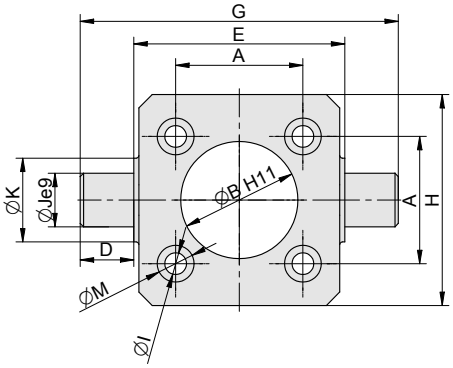
*) Round tubes are using for piston dia. 250 and 320 mm, that is why there is no cutouts inside.

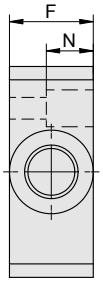
PIVOT PIN TO FRONT/END CAP FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc pivot pin
4 pcs screws





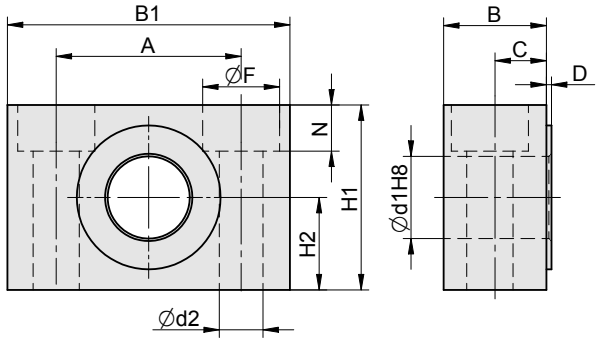


Piston ∅	A	B	D	E	F	G	H	I	J	K	M	N	Weight	Order codes
32	32,5	30	12	50	23	74	50	6,5	12	23	11	14	0,10	2101 4200 0032 0000
40	38	35	16	63	25	95	63	6,5	16	25	11	14	0,20	2101 4200 0040 0000
50	46,5	40	16	75	20	107	65	8,5	16	20	14	12	0,45	2101 4200 0050 0000
63	56,5	45	20	90	25	130	75	8,5	20	25	15	17	0,86	2101 4200 0063 0000
80	72	45	20	110	30	150	95	10,5	20	30	18	23	1,76	2101 4200 0080 0000
100	89	55	25	132	40	182	115	10,5	25	40	18	32	2,83	2101 4200 0100 0000

TRUNNION MOUNTING FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc trunnion

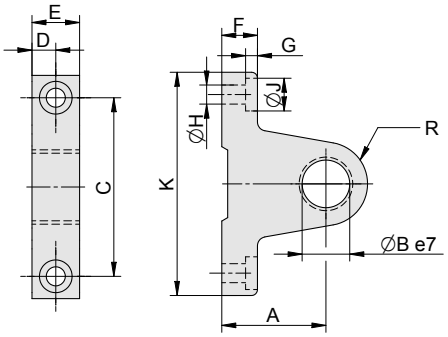


Piston ∅	A	B	B1	C	D	d1	d2	F	H1	H2	N	Weight	Order codes
32	32	17	46	9,5	1	12	6,5	11	30	15	10	0,04	2101 4000 0032 0000
40 / 50	36	20	55	11	1	16	8,5	15	36	18	9	0,08	2101 4000 0040 0000
63 / 80	42	21,5	63	11,5	1,5	20	11	18	40	20	11	0,10	2101 4000 0063 0000
100 / 125	50	27	75	14,5	1,5	25	14	20	50	25	13	0,22	2101 4000 0100 0000
160 / 200	60	40	92	22,5	4	32	18	26	60	30	17,5	0,40	2101 4000 0160 0000
250	90	54	140	29	2	40	22	34	70	35	21,5	1,08	2101 4000 0250 0000

TRUNNION MOUNTING FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**

Supply contain:
1 pc trunnion

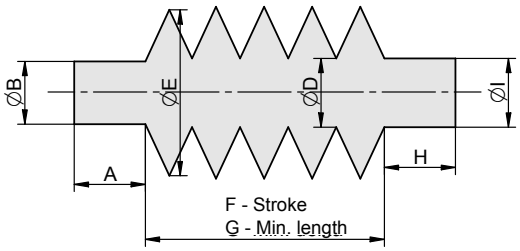


Piston ∅	A	B	C	D	E	F	G	H	J	K	R	Weight	Order codes
32	22	12	40	6	12	8	4	5,3	10	55	12	0,20	2110 4000 0032 0000
40 / 50	35	16	60	8	16	12	4	6,4	11	75	14	0,22	2110 4000 0040 0000
63 / 80	38	20	71	10	20	14	7	8,5	14	90	23	0,40	2110 4000 0063 0000
100 / 125	50	25	90	15	30	20	12	13	20	120	25	0,86	2110 4000 0100 0000

PISTON ROD PROTECTIVE COVER

- **FOR ALL CYLINDER TYPES**
- **FOR ANY EQUIPMENT**

Supply contain:
1 pc protective cover



Size	D	E	For cylinders ∅	Number of annulus for 100 mm stroke	Width of 10 pcs annulus	Order codes
5	20	60	32, 40	10	10	2195 0000 5 zzzz xxx
4	40	80	50, 63, 80	8	10	2195 0000 4 zzzz xxx
3	50	130	100, 125	4	10	2195 0000 3 zzzz xxx
2	60	155	160, 200	3	10	2195 0000 2 zzzz xxx
1	100	180	250, 320	3	10	2195 0000 1 zzzz xxx

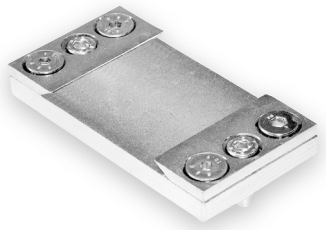
Notice: zzzz means cover stroke in mm, xxx is ordinal number, which will be assigned by sales dept. on the base of A,B,H and I dimensions.

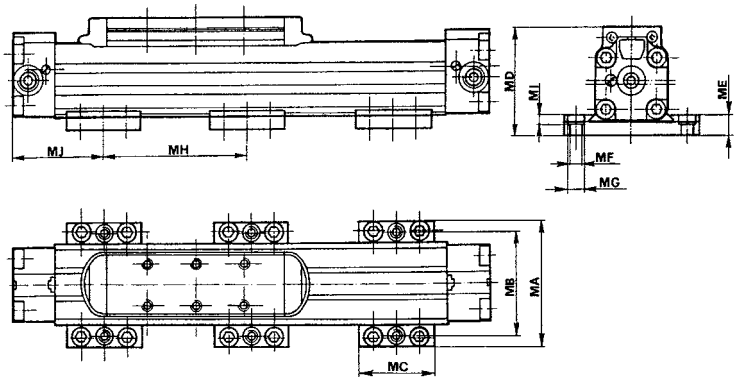
Material: double-sided hyped-up fabric, water, oil and dust resistant
Temperature range: -20 to +80°C
Covers are fixed by clamps - there is necessary to select proper size according to diameters, to which will be the cover fixed
We produce protective covers to customer's request (length, form, flange form. If you need protective cover for our pneumatic cylinder, just let us know order code of that cylinder and order code of mounting accessories, which is mounted on piston rod. If you need protective cover for another application, send us a request with dimensions which are important and we will send you offer by return.

MOUNTING PLATE FOR RODLESS CYLINDER

- **SERIES S1 AND S5**

Supply contain:
1 pc flange
2 pc mounting plates
4 pcs bolts to fix mounting plates

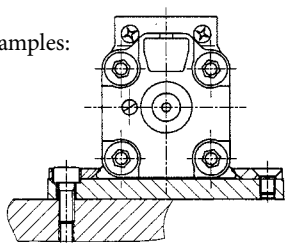


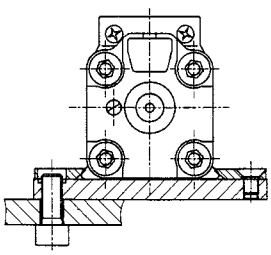


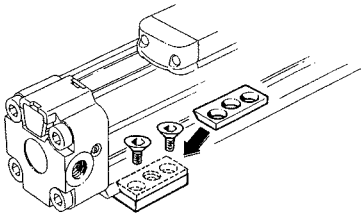
Piston ∅	MA	MB	MC	MD (S1)	MD (S5)	ME	MF	MG	MH*	MI	MJ	Weight	Order codes
25	78,5	63,5	50	65,5	79,8	11,9	M8	10,9	500	6,6	551	0,31	NSF-12025
32	91,9	77,5	50	74,2	90,4	15	M8	10,9	600	5,6	59,9	0,34	NSF-12032
40	117,1	96	59,9	95,8	116,6	15	M10	14	700	8,1	70,1	0,66	NSF-12040
50	135,9	115,1	59,9	113	133,6	15	M10	14	800	8,1	70	0,70	NSF-12050

*) Maximum dimension in order to limit the deflection of the cylinder under its own weight (if exceeded, we recommend to use another flange)

Mounting examples:







FOOT MOUNTING FOR RODLESS CYLINDER

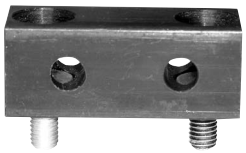
- **SERIES S1 AND S5**

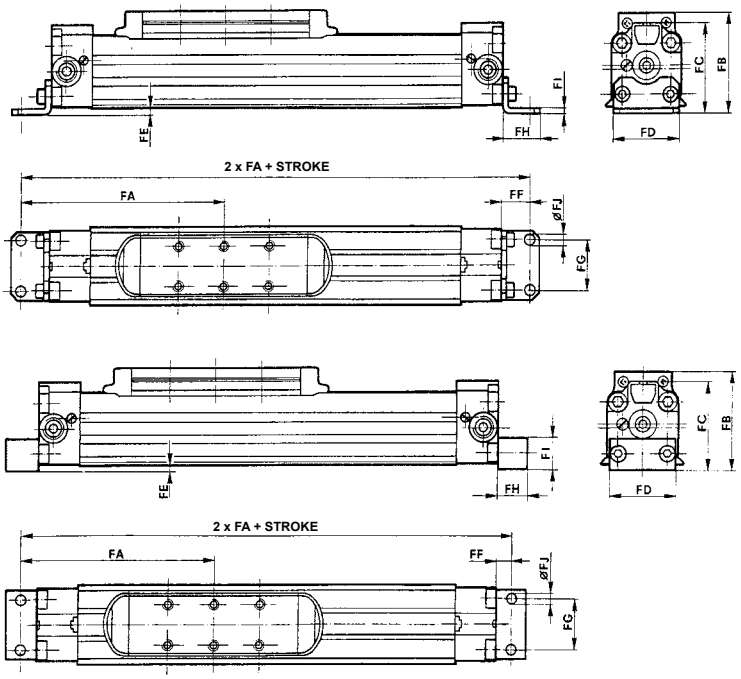
ONLY FOR CYLINDERS WITH STROKE UP TO 400 MM

Foot mounting for cylinder ∅ 25 and 32 mm

Supply contain:
1 pc foot mounting
2 pcs screw

Foot mounting for cylinder ∅ 40 and 50 mm





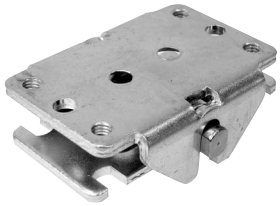
Piston ∅	FA	FB (S1)	FB (S5)	FC	FD	FE	FF	FG	FH	FI	FJ	Weight	Order codes
25	116,1	57,9	72,4	488	39,9	0,5	16	26,9	22,1	25	5,6	0,04	NSF-13025
32	143,5	68,8	85,1	59,2	48	2,5	18,5	36,1	25,9	3	6,6	0,06	NSF-13032
40	162,6	86,4	107,5	74,9	63	0,8	12,4	30	249	24,9	8,9	0,12	NSF-13040
50	189,5	104,4	125	925	79	1,3	12,4	39,9	24,9	30	9,4	0,17	NSF-13050

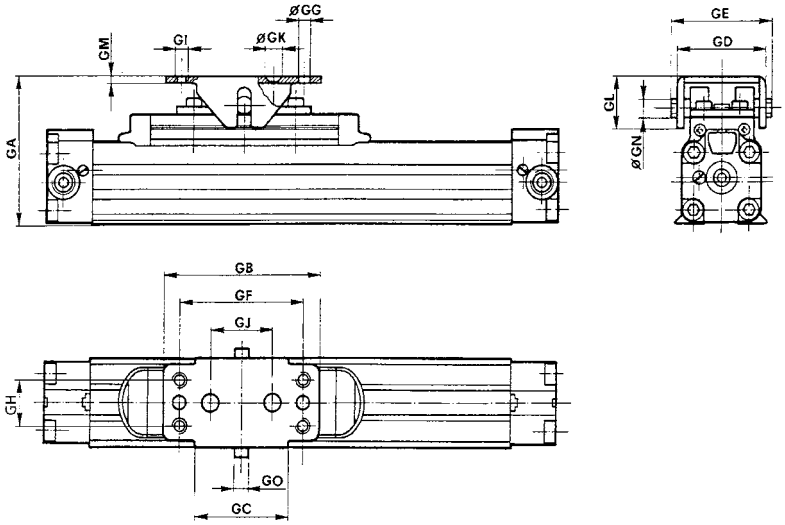
Notice: foot mounting is only recommended for strokes up to 400 mm

FLOATING FLANGE FOR RODLESS CYLINDER

- **SERIES S1 AND S5**

Supply contain:
1 pc floating flange
4 pcs screws

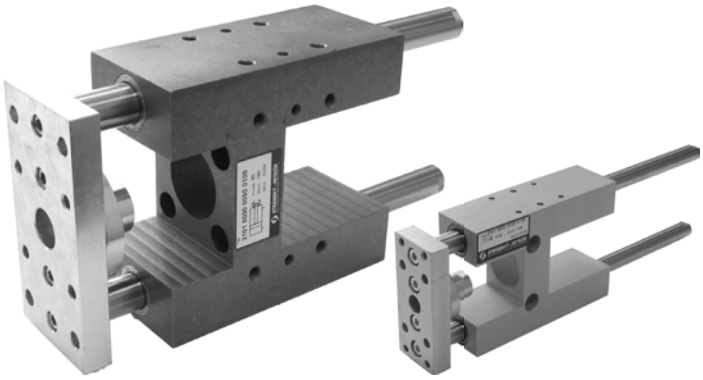




Piston ∅	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	Weight	Order codes
25	73,4	59,9	39,9	44,5	50	50	5,6	24,9	M5	16	5,6	20,6	3	7,9	6,1	0,04	NSF-24025
32	88,9	100,1	59,9	55,9	64	80	56	30	M6	39,9	66	30	4,1	11,9	8,1	0,06	NSF-24032
40	108,5	100,1	59,9	55,9	64	80	5,6	30	M6	39,9	6,6	30	4,1	11,9	8,1	0,12	NSF-24040
50	133,9	152,4	98	66,8	76,2	120,7	6,6	38,1	M8	63,5	8,4	36,6	4,8	16	12,7	0,19	NSF-24050

GUIDE UNIT „H“ WITH BALL BEARINGS FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**
- **DIN ISO 6432**



Supply contain:
1 pc guide body
1 pc flange
2 pcs guide rods
1 pc flange for fix to the cylinder

Guide unit can be mounted to any pneumatic cylinder to VDMA 24562 (there is necessary to use option 13 for cylinders with magnetic piston dia. 32 to 63 mm), ISO 15552, compact cylinders or DIN ISO 6432. Guide secures piston rod against rotation, high torque loads and radial forces. Guide rods are mounted in ball bearings without clearance.

Order codes

2101 500 00 050 0100

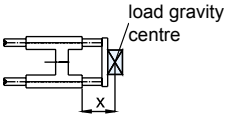
Guide unit H	
2101	for cylinder ISO 15552, DIN ISO 6431, VDMA 24562, NF E 49003.1 and compact
2110	for cylinder DIN ISO 6432

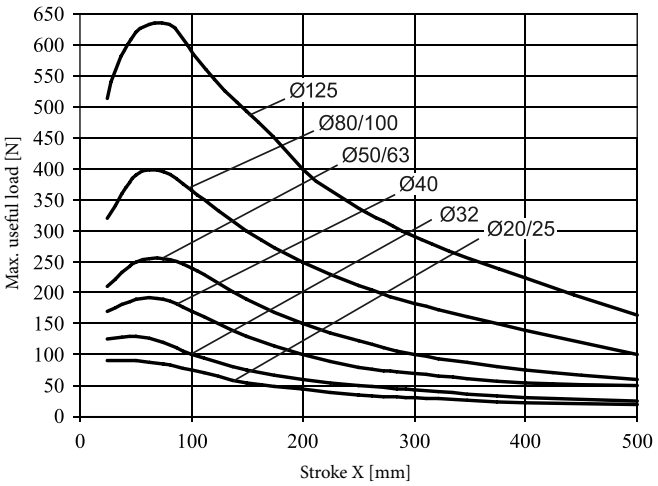
Options	
00	without options

Piston diameter	
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
125	125 mm

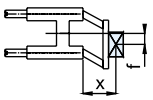
Stroke	
xxxx	mm of stroke e.g.. 0100 = stroke 100 mm

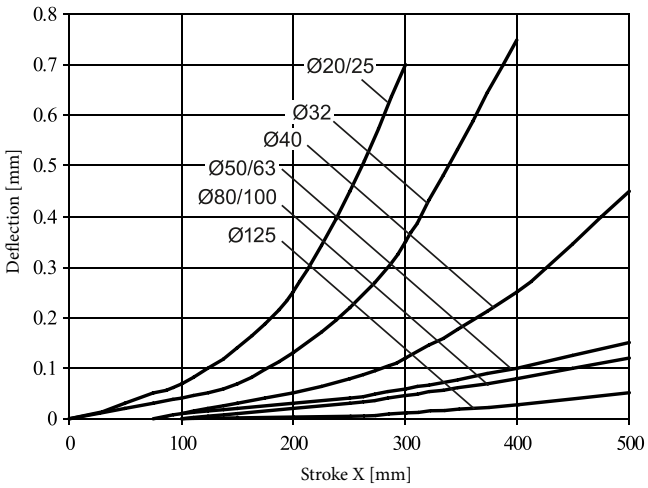
Useful load





Deflection caused by load of 10 N



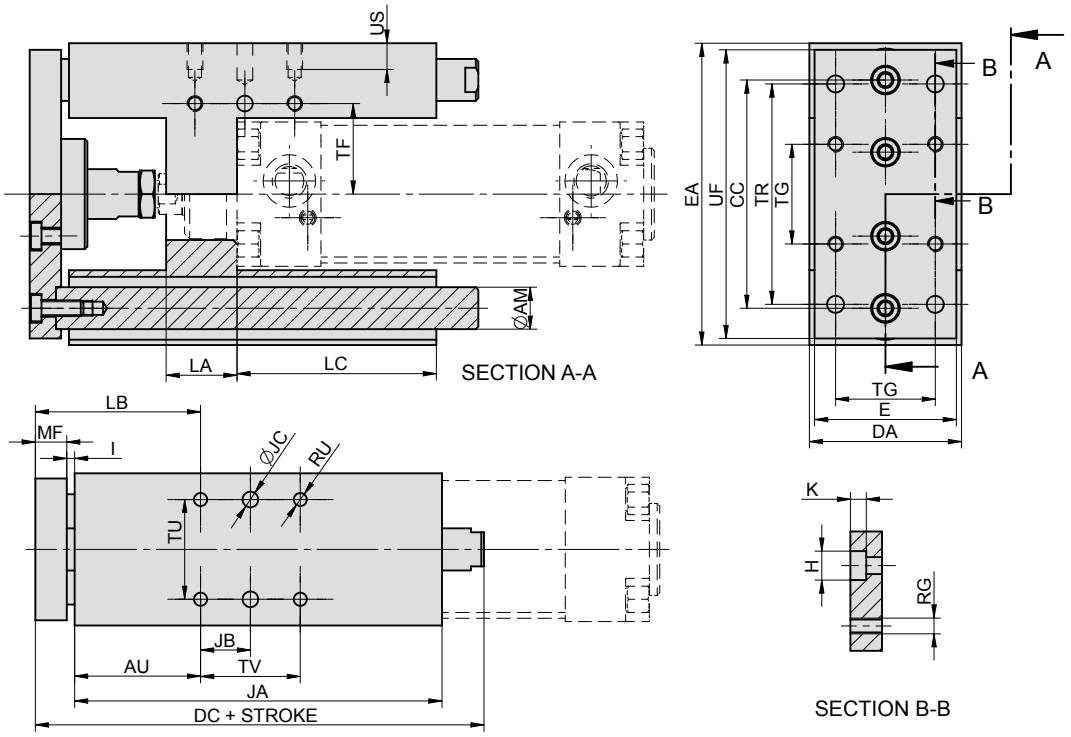


Construction / materials

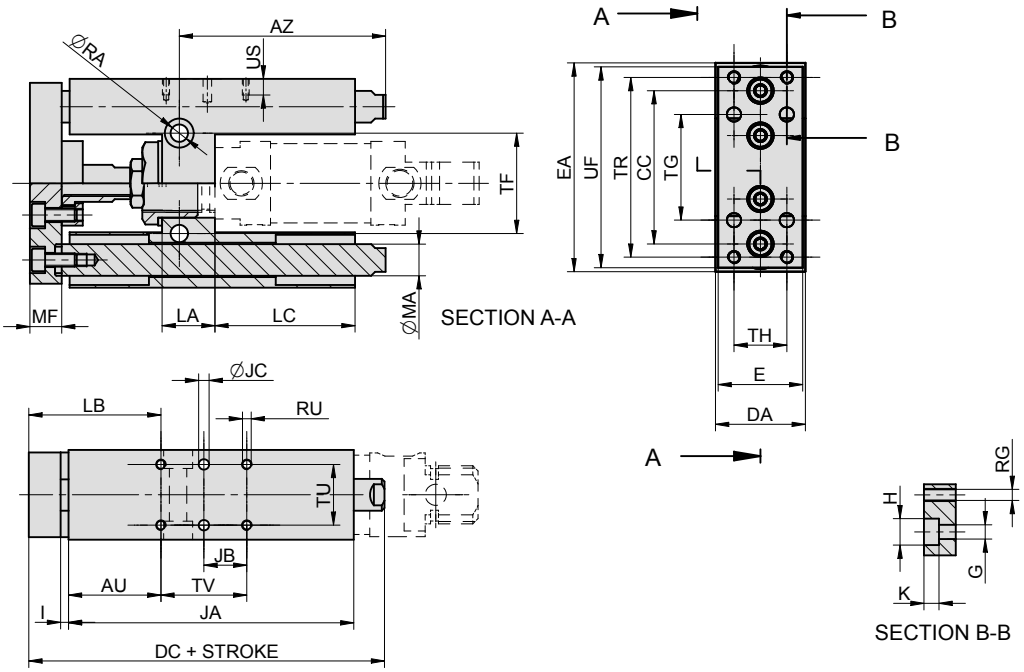
- guide bars: grounded hardened steel bar Cs-53 with hard chrome plated surface
- guide body: aluminium casting
- flange and nut: zinc plated steel
- bearings: covered linear ball bearings

Dimensions

For cylinder to DIN ISO 6431, VDMA 24562 and NF E 49003.1 (piston diameter 32 to 100 mm)



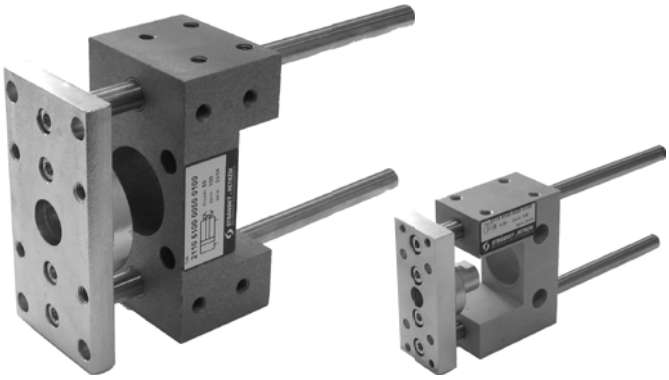
For cylinder to DIN ISO 6432 (piston diameter 20 and 25 mm)



∅	AU	AZ	CC	DA	DC	E	EA	G	H	I	JA	JB	JC	K	LA	LB	LC	MA	MF	RA	RG	RU	TR	TF	TG	TH	TU	TV	UF	US
20/25	35	66,5	58	34	135	32	79	5,4	10	3	108	16,25	4	5,7	20	50-60	53	12	12	6,6	M5	M4	68	38	40	20	23	32,5	76	8
32	44	–	74	50	152	45	97	6,5	11	3	125	16,25	6	6	23	59-69	65	12	12	–	M6	M6	78	30,5	32,5	–	32,5	32,5	92	10
40	48	–	87	58	171	54	115	6,5	11	3	140	19	6	6	27	63-73	76	16	12	–	M6	M6	84	34,5	38	–	38	38	110	10
50	52	–	104	70	182	63	137	9	15	3	150	23,25	6	9	34	70-80	79	20	15	–	M8	M8	100	42,5	46,5	–	46,5	46,5	130	13
63	55,5	–	119	85	218	80	152	9	15	3	182	28,25	6	9	34	73,5-83,5	103	20	15	–	M8	M8	105	50	56,5	–	56,5	56,5	145	13
80	66	–	148	105	256	100	189	11	18	3	215	36	6	11	40	89-99	122	25	20	–	M10	M10	130	65	72	–	72	72	180	16
100	67,5	–	172	130	261	120	213	11	18	3	220	44,5	6	11	45	90,5-100,5	122	25	20	–	M10	M10	140	75	89	–	89	89	200	16
125	65	–	202	150	285	140	250	13	20	3	230	55	8	13	52	93-103	108	30	25	–	M12	M12	170	90	110	–	110	110	240	20

GUIDE UNIT „U“ WITH SLIDE BEARINGS FOR CYLINDER

- **ISO 15552, VDMA 24562, NF E 49003.1**
- **DIN ISO 6431, VDMA 24562, NF E 49003.1**
- **COMPACT**
- **DIN ISO 6432**



Supply contain:
1 pc guide body
1 pc flange
2 pcs guide rods
1 pc flange for fix to the cylinder

Guide unit can be mounted on any pneumatic cylinder to VDMA 24562, ISO 15552, compact or DIN ISO 6431 / 6432. Guide secures piston rod against rotation, high torque loads and radial forces. Guide rods are mounted in slide bearings without clearance.

Order codes

2101 510 00 050 0100

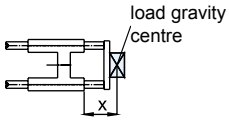
Guide unit U	
2101	for cylinder ISO 15552, DIN ISO 6431, VDMA 24562, NF E 49003.1 and compact
2110	for cylinder DIN ISO 6432

Options	
00	without options

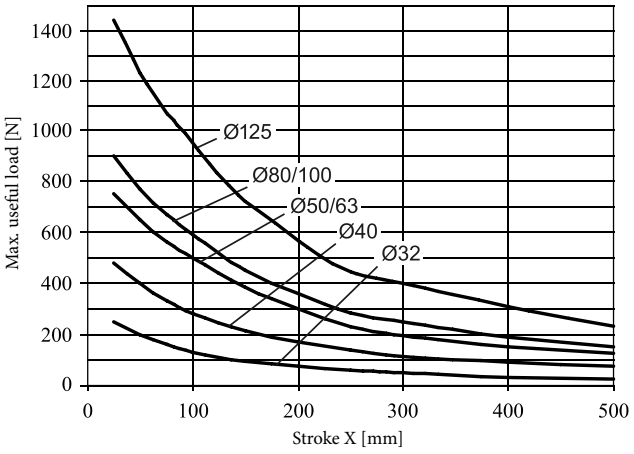
Piston diameter	
012	12 mm, 16 mm
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm
125	125 mm

Stroke	
xxxx	mm of stroke e.g. 0100 = stroke 100 mm

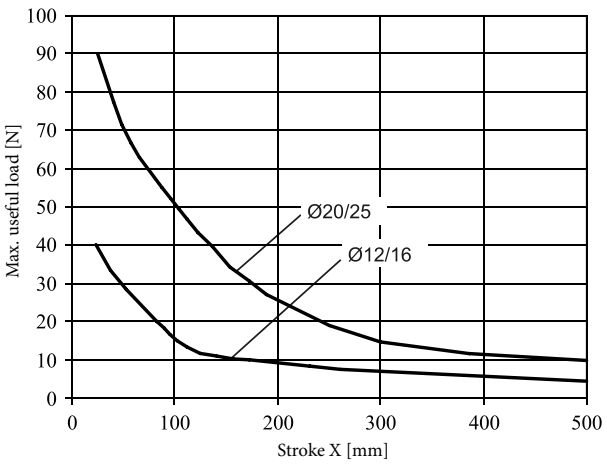
Useful load



For cylinders to DIN ISO 6431, VDMA 24562 and NF E 49003.1



For cylinders to DIN ISO 6432

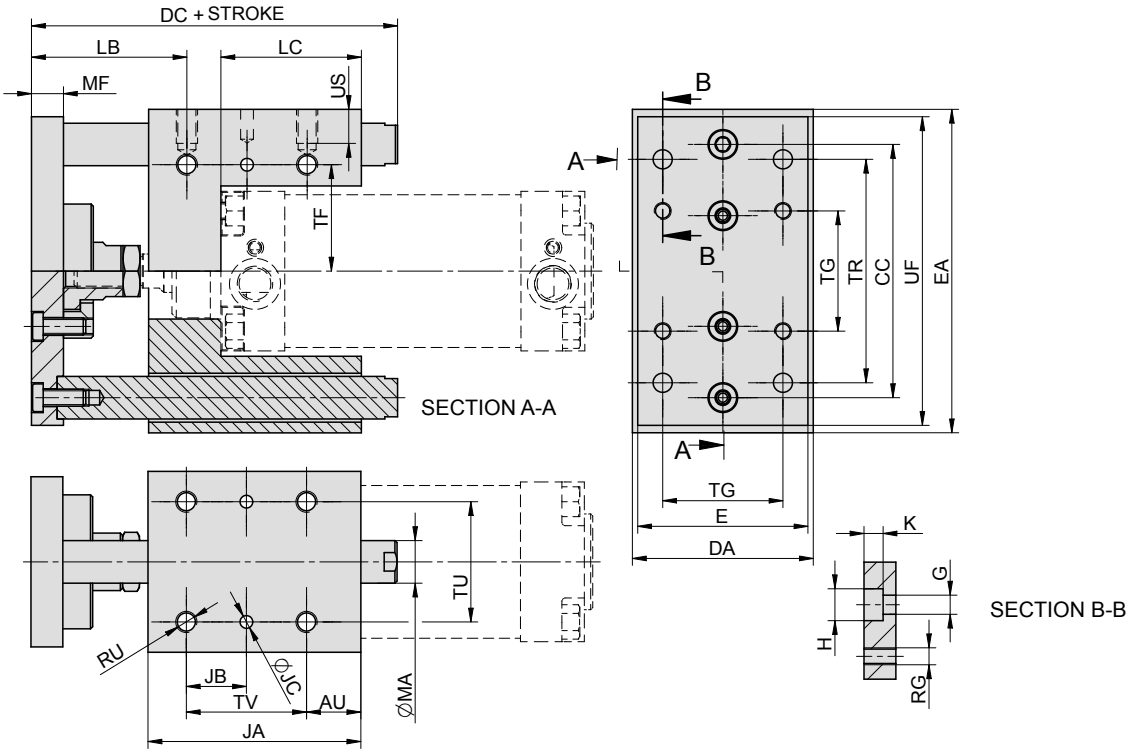


Construction / materials

- guide bars: grounded round steel bar CK45 with chrome plated surface
- guide body: aluminium casting
- flange and nut: zinc plated steel
- bearings: slide, self-lubricating

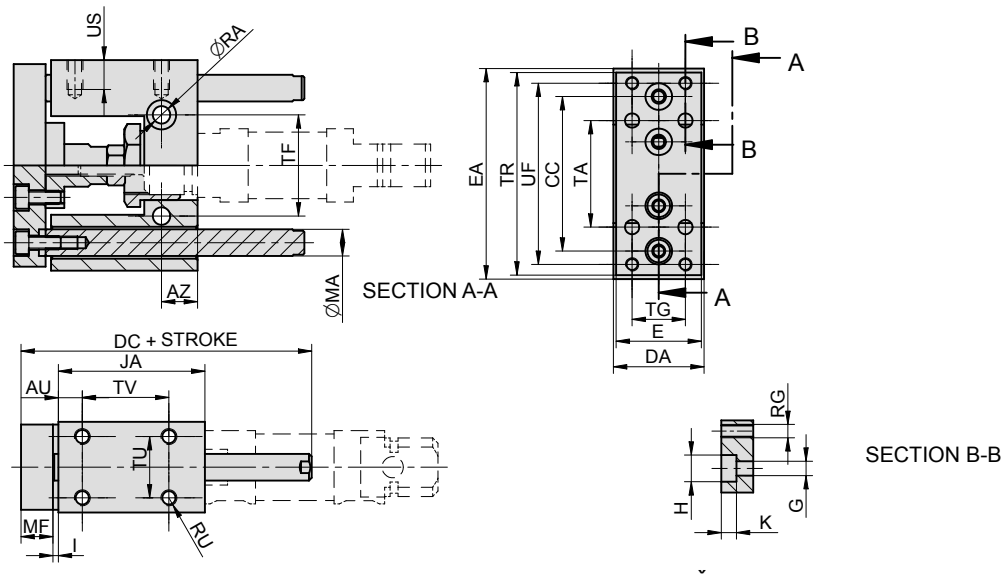
Dimensions

For cylinder to DIN ISO 6431, VDMA 24562 and NF E 49003.1 (piston diameter 32 to 100 mm)

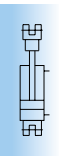


∅	AU	CC	DA	DC	E	EA	G	H	JA	JB	JC	K	LB	LC	MA	MF	RG	RU	TR	TF	TG	TU	TV	UF	US
32	12	74	50	130	45	97	6,5	11	70	16,25	6	6	59-69	50	12	12	M6	M6	78	30,5	32,5	32,5	32,5	92	10
40	14	87	58	145	54	115	6,5	11	80	19	6	6	63-73	55	16	12	M6	M6	84	34,5	38	38	38	110	10
50	18	104	70	162	63	137	9	15	90	23,25	6	9	70-80	56	20	15	M8	M8	100	42,5	46,5	46,5	46,5	130	13
63	18	119	85	172	80	152	9	15	100	28,25	6	9	73-83	66	20	15	M8	M8	105	50	56,5	56,5	56,5	145	13
80	18	148	105	220	100	189	11	18	130	36	6	11	89-99	90	25	20	M10	M10	130	65	72	72	72	180	16
100	19,5	172	130	230	120	213	11	18	140	44,5	6	11	90,5-100,5	95	25	20	M10	M10	140	75	89	89	89	200	16
125	20	202	157	285	140	254	13	20	175	55	6	13	110-120	117	32	25	M12	M12	175	92	110	110	110	240	25

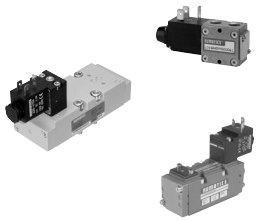
For cylinder to DIN ISO 6432 (piston diameter 12 to 25 mm)

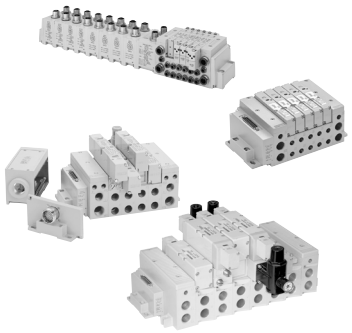


∅	AU	AZ	CC	DA	DC	E	EA	G	H	I	JA	K	MA	MF	RA	RG	RU	TA	TR	TF	TG	TU	TV	UF	US
12/16	7,5	58	46	30	62	27	65	4,5	8	3	39	4,6	8	10	5,5	M4	M4	32	54	24	15	22	25	63	8
20/25	9	13,5	58	34	80	32	79	5,5	10	3	55	6	10	12	6,5	M5	M6	40	68	38	20	23	32,5	76	12

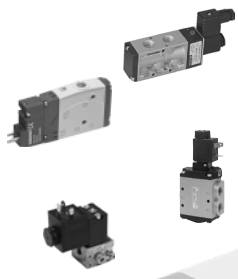


4/2, 5/2 and 5/3 function valves

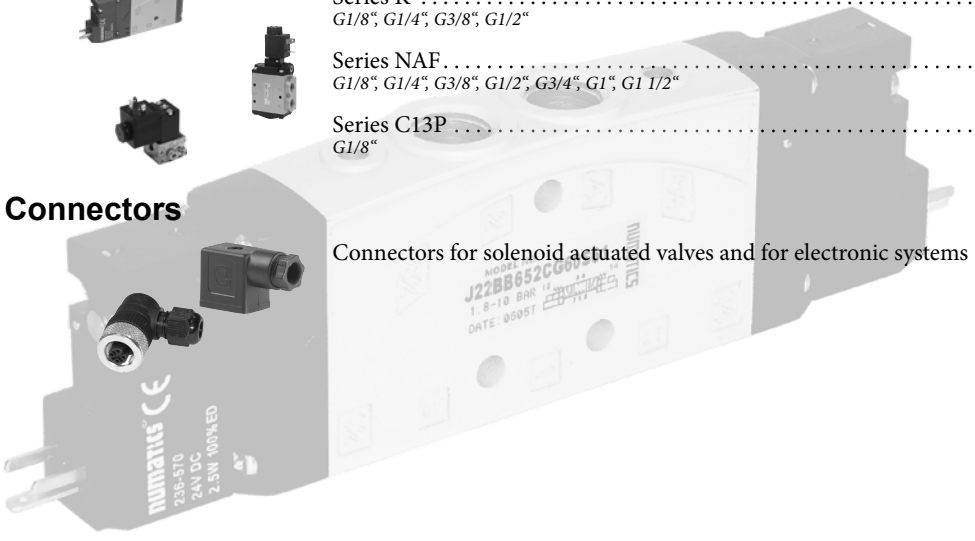




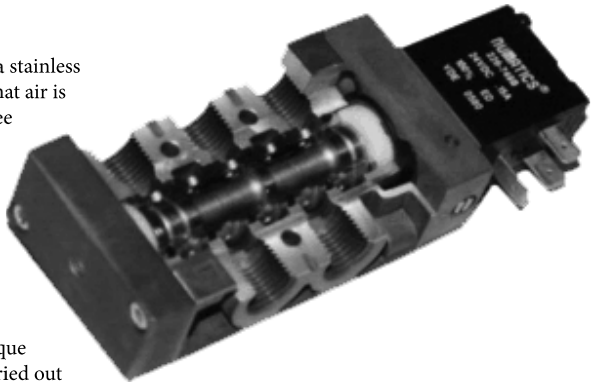
2/2 and 3/2 function valves



Connectors



Solenoid actuated valves NUMATICS®

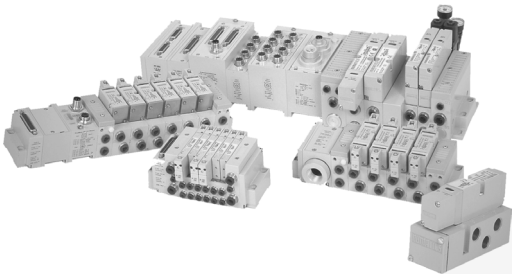


The spool and sleeve assembly is a matched set consisting of a stainless steel spool assembled into a stainless steel sleeve. The steel used is a 440C stainless hardened to 62 Rockwell „C“. The tolerance is such that air is entrained between the spool and sleeve forming an „airbearing“ effect which ensures safe, wear-free operation with extremely short cycles and low shift forces. At the same time reliability of the spool and sleeve assembly is maintained both for lubricated and non-Iubricated air. Under both sets of conditions the spool moves with minimal friction leading to very low shifting forces enabling quick response.
The hardness of the spool and sleeve ensures no damage from pipe scale or other airline contaminants while the stainless steel construction combats any line moisture. these features will allow a typical service life in excess of 200 million cycles. The spool is balanced with respect to air pressure and coupled with the absence of wearing parts allows extreme versatility of valve applications. On NUMATICS valves,the air can flow in any direction at any pressure or vaccum. This unique design enables cylinder working strokes at one pressure while unloaded reverse strokes can be carried out economically at low pressures.

Solenoid actuated valves MINDMAN

We add the Mindman valves into our offer as the reasonable and high-quality supplement of Numatics valve. Those pilot operated valves with classic slide and rubber gaskets are offered as 3/2 normally closed, 5/2 with single or double solenoid and 5/3 with closed centre position, which is compare to Numatics spool and sleeve assembly, 100% leakage proof.
Valves with rubber gaskets can not ce compared to valves with spool and sleeve assembly regarding lifetime, but their lifetime is sufficient for lot of small and mid-range applications.

Valves with Fieldbus electronics (BUS systems)



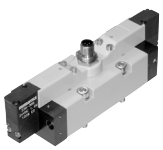
Numatics valves are available also with Fieldbus electronics. There are two lines of electronic modules available. First, G2-1 modules, which are used mainly with valves 2002 series and second, G2-2 modules, which could be connected among others with 2005, 2012 a 2035 valves series.
There is a short characteristics of particular Fieldbus technology which are implemented into Numatics valve islands:
- completely wireless solution
- G2-1: up to 16 discrete inputs, 40 valve coils and 16 discrete outputs in one node
- G2-2: up to 192 discrete outputs, 32 valve coils and 96 discrete inputs in one node
- extended on-board diagnostics incl. status of particular I/O and short circuit protection
- manual or software configuration
- back-plane technology allowing easy upgrade and quick replacement and service
- all modules and assembled nodes are tested
- G2-1: using universal inputs, PNP as well as NPN sensors can be connected into one module

- G2-2: NPN and PNP modules I/O
- NEMA4/IP65
- low cost upgrade and expansion
- remote inputs and outputs connection available
- for more information about BUS systems please contact our technical dept.

Wide range of valves

You can find overview of the most common valves in this catalogue. But there is lot of variants of these standard valves as well as other valve series, which are designed for special purposes (e.g. for high temperatures etc.). In case, that the series/type of valve doesn't meet your criteria, please ask our sales dept. for detailed Numatics catalogue. In this catalogue you will not find for example the following valves:

series L, NAMUR interface

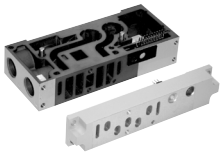


ISO Compact with M12 connector

slow-start ISO 3

series CL18 and CL26

3/2 ISO valves



adapter for series 2005/2012 valves to ISO 15407-2

4/2, 5/2 a 5/3 function valves - valve properties and selection table

Series	Port size	Flow capacity [Nl/min]	Working pressure [MPa]***	Connection*			Voltage		Connector type	Page
				1*	2*	3*	DC [V]	AC [V]		
MVSC	G1/4“,G3/8“,G1/2“	980 to 2730	0,2 to 0,7	✓	×	×	24	24, 230	22	5-4
J	G1/8“,G1/4“,G3/8“,G1/2“	1000 to 2500	0,18 to 1,0	✓	×	×	24	110, 230	DIN 43650 C	5-6
L01	G1/8“	200	vacuum to 1,0	✓	×	✓	24	24, 110, 230	22	5-13
L1*	G1/8“, G1/4“	1000	0,1 to 1,0	✓	×	✓	24	24, 110, 230	22, M12, DIN 43650 A,B	5-8 5-9
L2*	G1/4“, G3/8“	1700	0,1 to 1,0	✓	×	✓	24	24, 110, 230	22, M12, DIN 43650 A,B	5-8, 5-9
L8	G1/2“	3500	0,2 to 1,6	✓	×	×	24	24, 110, 230	DIN 43650 A, M12	—
ISO 1**	ISO 1 - G1/4“	1200	0,1 to 1,6	×	✓	✓	24	24, 110, 230	DIN 43650 A, M12	5-16
ISO 1 Compact	ISO 1 - G1/4“	1300	0,1 to 1,6	×	✓	✓	24	24, 110, 230	DIN 43650 A, M12	5-15
ISO 2**	ISO 2 - G3/8“	1700	0,1 to 1,6	×	✓	✓	24	24, 110, 230	DIN 43650 A, M12	5-16
ISO 2 Compact	ISO 2 - G3/8“	2200	0,1 to 1,6	×	✓	✓	24	24, 110, 230	DIN 43650 A, M12	5-15
ISO 3**	ISO 3 - G1/2“	4400	0,1 to 1,6	×	✓	✓	24	24, 110, 230	DIN 43650 A, M12	5-16
ISO 3 Compact	ISO 3 - G1/2“	4400	0,1 to 1,6	×	✓	✓	24	24, 110, 230	DIN 43650 A, M12	5-15
2002	M5, G1/8“, 4/2, 6/4	200 / 250	vacuum to 1,0	×	✓	✓	12, 24	—	more choices	5-21
2005	G1/8“, 6/4, 8/6	560	vacuum to 1,0	×	✓	✓	12, 24	24, 110	more choices	5-22
2012	G1/4“,G3/8“,8/6,10/8	1200	vacuum to 1,0	×	✓	✓	12, 24	24, 110	more choices	5-23
2035	G3/8“, G1/2“	3500	vacuum to 1,0	×	✓	✓	12, 24	24, 110	more choices	5-24
CL18	G1/8“, 6/4	400 / 500	vacuum to 1,6	×	✓	✓	24	110	more choices	—
CL26	G1/4“, 10/8	800	vacuum to 1,6	×	✓	✓	24	110	17, DIN 43650 C	—
MicroAir	M5, G1/8“	128	vacuum to 1,0	×	✓	✓	12, 24	—	with cable	—
140	G1“,G1 1/4“,G1 1/2“	až 16300	vacuum to 1,0	×	✓	×	24	110, 230	in the base	—
ISO 5599/2 1	ISO 1 - G1/4“	1300	vacuum to 1,6	×	✓	✓	24	24, 110, 230	in the base	—
ISO 5599/2 2	ISO 2 - G3/8“	2900	vacuum to 1,6	×	✓	✓	24	24, 110, 230	in the base	—
ISO 5599/2 3	ISO 3 - G1/2“	5250	vacuum to 1,6	×	✓	✓	24	24, 110, 230	in the base	—

*) Valve connection:
1 - in-line
2 - individual base
3 - manifold block

**) Valves are available with explosion proof solenoids too.

***) Working pressure may be higher / lower, when option coils and external pilot supply is used.

Standard valve series are ***highlighted***.

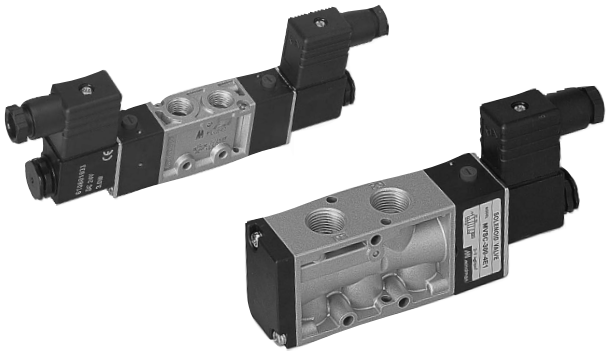
Notice: due to spool and sleeve assembly, minor leakage may occur in 5/3 with closed centre. If you need to ensure 100% leakproof, it is necessary to use valve with rubber packed spool.

2/2 and 3/2 function valves - valve properties and selection table

Series	Port size	Flow capacity [Nl/min]	Working pressure [MPa]	Function			Voltage		Connector type	Page
				2/2	3/2 NC	3/2 NO	DC [V]	AC [V]		
S	M5, G1/8“	30	vacuum to 0,7	✓	✓	×	5, 6, 12, 24	24, 120, 230	—	—
C13P	G1/8“	55	vacuum to 1,6	×	✓	×	24, 60, 110	24, 110, 230	DIN 43650 A	5-34
MVSC	G1/4“, G3/8“, G1/2“	980 to 2730	0,2 to 0,7	×	✓	×	24	24, 230	22	5-4
K	G1/8“, G1/4“, G3/8“, G1/2“	1000 to 4900	0,18 to 1,0	×	✓	✓	24	110, 230	DIN 43650 C	5-30
NAF	G1/8“	580	0,15 to 1,0	×	✓	✓	24	24, 110, 230	22	5-32
NAF	G1/4“, G3/8“	1100 / 1500	0,16 to 1,0	×	✓	✓	24	24, 110, 230	22	5-32
NAF	G1/2“, G3/4“	5400 / 6500	0,2 to 1,0	✓	✓	✓	24	24, 110, 230	DIN 43650 A	5-32
NAF	G1“	13500	0,22 to 1,0	✓	✓	✓	24	24, 110, 230	DIN 43650 A	5-32
NAF	G1 1/2“	35000	0,25 to 1,0	✓	✓	✓	24	24, 110, 230	DIN 43650 A	5-32
B1LSAD	G1/4“	866	vacuum to 1,0	×	✓	×	24	24, 110, 230	DIN 43650 A	—

Standard valve series are ***highlighted***

SOLENOID ACTUATED VALVES
SERIES MVSC



The new valve series, which complements valves series L, J and K. The basic usable features are kept and brings some improvements such as lower wattage, comparable or bigger flow capacity and better accessibility. Valves are solenoid pilot actuated. The product range covers functions 3/2 normally closed, 5/2 single or double solenoid and 5/3 with centre closed position. Connector and coil are included in delivery.

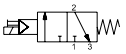
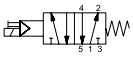
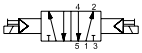
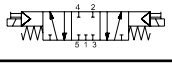
This valve series contains rubber gaskets.

Series	MVSC 220	MVSC 300	MVSC 460
Ports	G1/4“ (G1/8“ for exhaust port 3 and 5)	G3/8“	G1/2“
Flow capacity [Nl/min]	980, or 860 for function 5/3	1905, or 1355 for function 5/3	2730, or 1630 for function 5/3
Working pressure [MPa]	0,2 to 0,7, or 0,3 to 0,7 for function 5/3		
Power input [W, VA]	2,5W for DC voltage, 6/4,9VA for AC voltage (inrush/hold)		
Response time [ms]	30, or 40 for function 5/3	50	50
Coil voltage tolerance	±10%		
Temperature range [°C]	ambient temperature -5 to +50		

Order codes

PMVSC 220 4E2C A220

Size	
220	series MVSC 220, thread G1/4“
300	series MVSC 300, thread G3/8“
460	series MVSC 460, thread G1/2“

Function		
3E1C		3/2 normally closed
4E1		5/2 monostable (with 1 coil)
4E2		5/2 bistable (with 2 coils)
4E2C		5/3 with closed center position

Voltage	
D24	24 V DC ± 10%
A220	230 V AC ± 10%, 50-60 Hz
A24	24 V AC ± 10%, 50-60 Hz

Supply contain connector(s).

Order codes of manifolds

PMVSC 220 - 5B 4

Size	
220	series MVSC 220, thread G1/4“
300	series MVSC 300, thread G3/8“

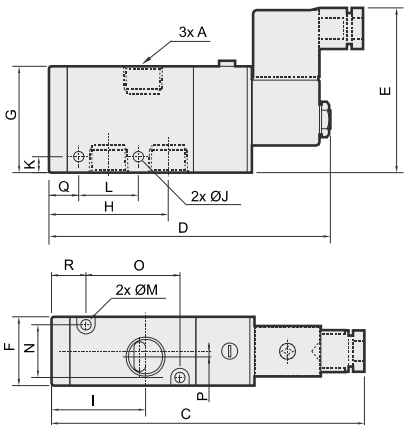
Number of positions / Blank station plate	
2	for 2 valves
3	for 3 valves
4	for 4 valves
5	for 5 valves

Number of positions / Blank station plate	
6	for 6 valves
7	for 7 valves
8	for 8 valves
X	blank station plate for 1 position

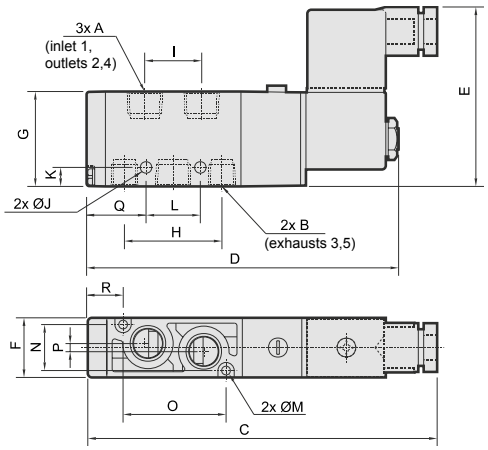
It is possible to mount series MVSC (except 3E1C function) valves on manifold with predefined number of position. It isn‘t possible to add another position to created assembly - it could be necessary to replace manifold or create another manifold. If there is possibility that more valves will be needed in future, we recommend to use manifold with more positions and use blank station plate for unused positions. Valves are mounted to manifold directly - no adaptor is necessary. Valves mounted on manifold could be unmounted separately by unscrew of 2 bolts, which are accessible from top side (side with ports 2 and 4 of valves).

Dimensions of valve series MVSC

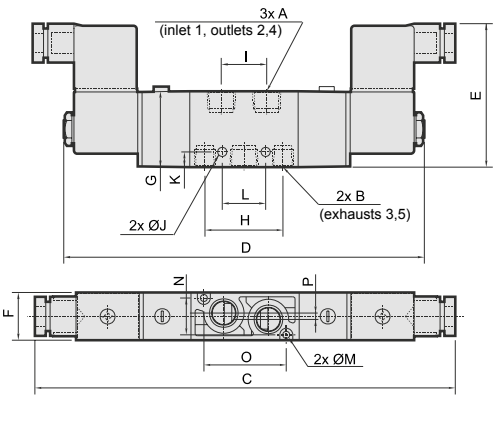
Type 3/2:



Type 5/2 with single solenoid:



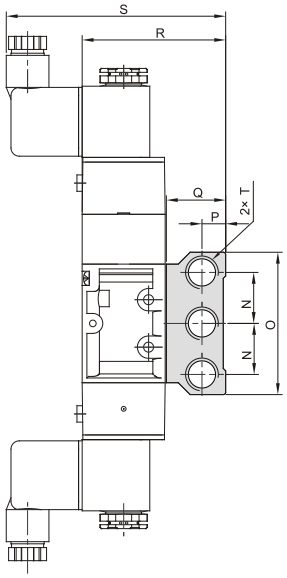
Type 5/2 and 5/3 with double solenoid:

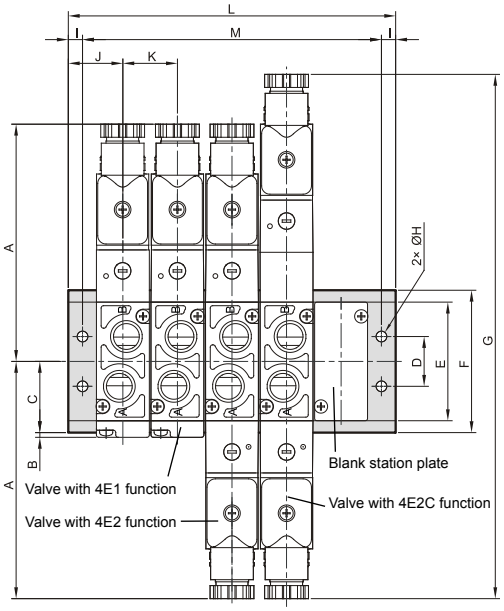


Series	Function	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Weight [kg]
220	3E1C	G1/4“	—	120	105,5	68	22,3	35	35	26	4,2	26,5	25	3,2	17	25	2	13,5	13,5	0,20
	4E1	G1/4“	G1/8“	130	155,5	67	22,3	35	36	21	4,2	7	20	3,2	17	38	3	22	13	0,20
	4E2	G1/4“	G1/8“	198	167	67	22,3	35	36	21	4,2	7	20	3,2	17	38	3	—	—	0,29
	4E2C	G1/4“	G1/8“	219	188	67	22,3	35	36	21	4,2	7	20	3,2	17	38	3	—	—	0,34
300	3E1C	G3/8“	—	137	123	72	30	46,4	52	41	4,5	7	26	4,5	23	41	0	13	15	0,35
	4E1	G3/8“	G3/8“	156	142	72	30	46,4	52	30	5,5	6	26	4,5	23	13	0	32	38,5	0,34
	4E2	G3/8“	G3/8“	222	194	72	30	46,4	52	30	5,5	6	26	4,5	23	13	0	—	—	0,42
	4E2C	G3/8“	G3/8“	275	244	72	30	46,4	52	30	5,5	6	26	4,5	23	13	0	—	—	0,68
460	3E1C	G1/2“	—	145	130,5	72	30	46,4	56	40,5	4,5	7	29	4,5	23	48	2,5	12,5	15	0,35
	4E1	G1/2“	G1/2“	168	154	72	30	46,4	58	28	4,5	7	29	4,5	23	72	4,5	36,5	15	0,41
	4E2	G1/2“	G1/2“	234	206	72	30	46,4	58	28	4,5	7	29	4,5	23	72	4,5	—	—	0,49
	4E2C	G1/2“	G1/2“	287	256	72	30	46,4	58	28	4,5	7	29	4,5	23	72	4,5	—	—	0,76

Dimensions of manifold assemblies of valves series MVSC

Series	Number of positions	L	M	Weight [kg]
220	2	69	57	0,20
	3	92	80	0,26
	4	115	103	0,32
	5	138	126	0,38
	6	161	149	0,46
	7	184	172	0,52
	8	207	195	0,60
300	2	81	71	0,25
	3	112	102	0,35
	4	143	133	0,44
	5	174	164	0,54
	6	205	195	0,64
	7	236	226	0,74
	8	267	257	0,83





Series	A	B	C	D	E	F	G	H	I	J	K	N	O	P	Q	R	S	T
220	100	2	30	21	50	60	221	4,5	6	23	23	21,5	60	10	25	60,5	92,5	G1/4“
300	114	3	42	30	74	84	281,4	4,5	5	25	31	30,5	84	12	27	73,9	100,2	G3/8“

SOLENOID ACTUATED VALVES
SERIES J

New valve series, which will replace popular L series in future. Product manufacture qualities are of course kept and new improvements as lower wattage, possibility of mounting with bigger screws, compact shape and not least also innovated design are added. Valves are solenoid pilot actuated. Valves are offered with port threads G1/8“, G1/4“, G3/8“ and G1/2“.

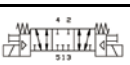
Valves series J contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	J11	J22	J33	J34
Ports	G1/8“	G1/4“	G3/8“	G1/2“
Connection of external pressure supply port	M5			
Flow capacity [Nl/min]	500	1000	2200	2500
Working pressure [MPa]	0,18 to 1,0 (vacuum to 1,0 MPa when external pilot supply is used)			
Pilot pressure range [MPa]	0,18 to 1,0			
Power input [W, VA]	2,5W for DC voltage, 3VA for AC voltage			
Response time for DC voltage [ms]	10 energize, 20 de-energize	12 energize, 40 de-energize	15 energize, 70 de-energize	15 energize, 70 de-energize
Response time for AC voltage [ms]	10 energize, 26 de-energize	13 energize, 40 de-energize	17 energize, 73 de-energize	17 energize, 73 de-energize
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +50			

Order codes

NJ22 BA4 52 C G 60S 61

Size	
NJ11	series J11 thread G1/8“
NJ22	series J22 thread G1/4“
NJ33	series J33 thread G3/8“
NJ34	series J34 thread G1/2“

Function	
BA4	
BB4	
BB5	
BB6	

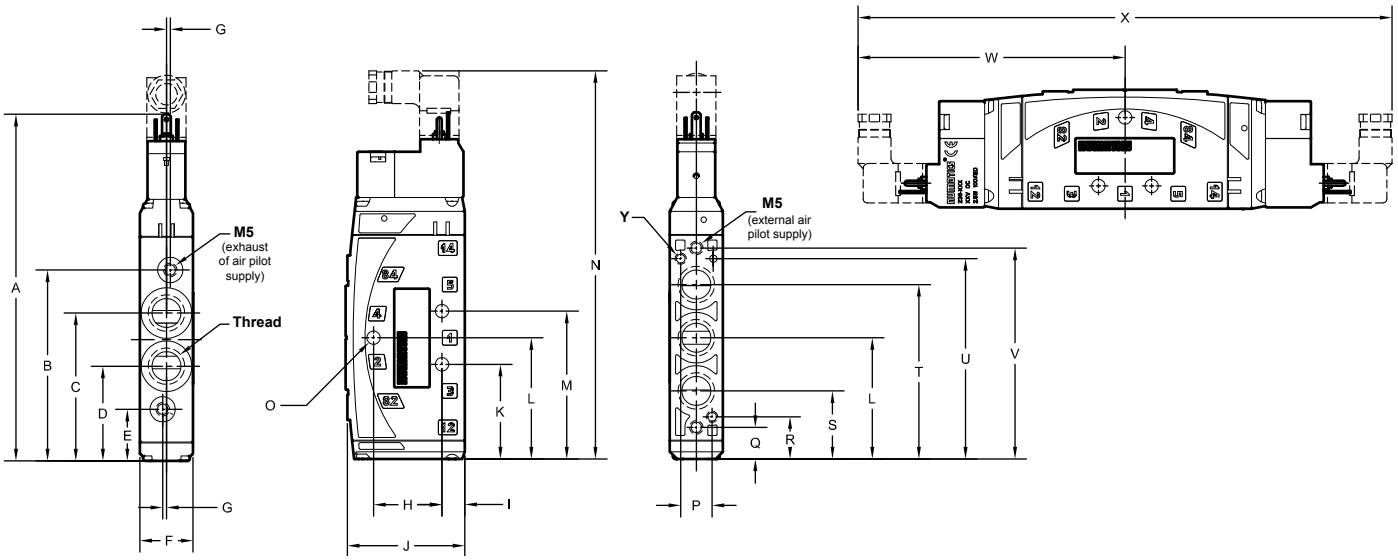
Coil type	
C	standard, for connector to DIN EN 175301-803 (formerly DIN 43650), type C, 8 mm pin size

Options	
60S	standard with non-locking manual override, 0,18 to 1,0 MPa
67W	solenoid with locking manual override, 0,18 to 1,0 MPa
000	low wattage coil 1W, with non-locking manual override, max. pressure 0,8 MPa
14A	option 000 with external pilot supply
67Y	option 60S with external pilot supply
68J	coil without manual override, 0,18 to 1,0 MPa

Voltage	
61	24 V DC ± 10%
40*	230 V AC ± 10% 50-60 Hz
30*	110 V AC ± 10% 50-60 Hz

*) This voltage is not available for coil for pressure up to 1,6 MPa

Dimensions of valve series J



Series	Thread	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Weight [kg]
J11	G1/8“	127,3	69,1	52,1	34,1	17,1	16	2	25	11	46,8	35,1	43,1	51,1	143,7	44	10	12,9	18,6	26,9	59,3	67,6	73,3	100,6	201,2	M3	0,174
J22	G1/4“	136,9	75,4	58,4	37,4	20,4	21	1,5	27	9	47	37,4	47,9	58,4	15,3,	5,3	12,4	15,2	16,7	26,9	68,9	79,1	83,3	105,4	210,8	M4	0,276
J33	G3/8“	182	115,2	87,7	56,7	29,2	30	5	35,5	16	68	27,2	72,2	117,2	198,4	6,4	18	19,7	27,2	44,2	100,2	117,2	124,7	126,2	252,4	M5	0,665
J34	G1/2“	182	115,2	87,7	56,7	29,2	30	5	35,5	16	68	27,2	72,2	117,2	198,4	6,4	18	19,7	27,2	44,2	100,2	117,2	124,7	126,2	252,4	M5	0,665

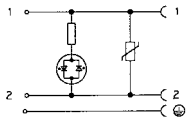
Coils for valve series J

Standard coils DIN EN 175301-803, form C, type 8

Order codes	Voltage	Type	Options (see options in order code of valve)	Weight [kg]
N236-570	24V DC	2,5 W, 1,0 MPa	60S	0,04
N237-1177	120V 50-60 Hz	3 VA, 1,0 MPa	60S	0,04
N237-1178	230V 50-60 Hz	3 VA, 1,0 MPa	60S	0,04
N236-575	24V DC	1 W, 0,8 MPa	000	0,04
N237-1182	120V 50-60 Hz	1,5 VA, 0,8 MPa	000	0,04
N237-1183	230V 50-60 Hz	1,5 VA, 0,8 MPa	000	0,04
N236-437	24V DC	2,5 W, 1,6 MPa	66V	0,04

Connector DIN EN 175301-803, form C, type 8 with cable grommet PG9

Order codes	Type	Voltage [V]	Wiring	Colour	Weight [kg]
N230-802	standard	up to 250	—	black	0,01
N230-803	with red LED and varistor	24	b	transparent	0,01
N230-804	with red LED and varistor	110 to 130	b	transparent	0,01



Wiring b

Conversion of internal to external air pilot supply of valve series J

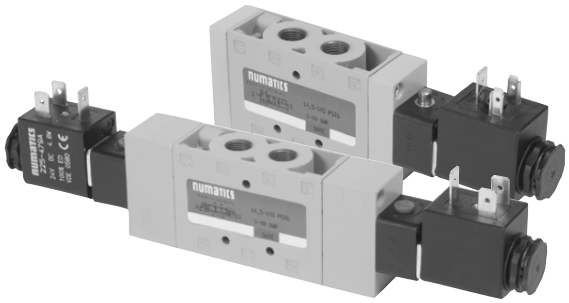
External air pilot supply is used, when air supply pressure is lower than 0,18 MPa (1,8 bar) as well as for vacuum and or if another medium than compressed air is used. It is necessary to order valve which is already prepared for this feature or change standard setting (when air pilot supply is drawn from valve supply port 1) in that cases.

Picture 1
Position of gasket for internal pilot supply

Picture 2
Position of gasket for external pilot supply

When converting from internal to external pilot supply, please proceed as follows:
1) Unmount connector
2) Unscrew two screws, unmount solenoid, unscrew four screws of valve cap, take off the gasket and insert gasket as shown on picture 2
3) Check proper gasket settings, re-mount and fix the valve cap and then also solenoid and connector
4) The same operation must be proceed when valve is double solenoid
5) Connect modified compressed air supply with pressure 1 to 10 bars into the port marked 12 or 14, you can mount silencers into ports marked 82 and 8

SOLENOID ACTUATED VALVES
SERIES L1/L2 WITH EXCHANGEABLE COIL



The most common solenoid pilot actuated valve, which offers high flow capacity although it's small dimensions. coil can be turned so that it will serve the purpose. Various coil types are available for this valve. Valves can be used as standalone or they can be mounted on manifolds. Valves can be delivered in stainless steel version on request as well as with NAMUR interface.

Valves series L1/L2 contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	L1		L2	
	L11	L12	L22	L23
Ports	G1/8“	G1/4“	G1/4“	G3/8“
Connection of external pressure supply port	M5	M5	G1/8“	G1/8“
Flow capacity [Nl/min]	1000	1000	1700	1700
Working pressure [MPa]	0,1 to 1,0 (vacuum to 2,1 MPa when external pilot supply is used)			
Pilot pressure range [MPa]	0,1 to 1,0			
Power input [W, VA]	4,8W for DC voltage, 10VA inrush and 7VA hold for AC voltage			
Response time for DC voltage [ms]	10 energize, 35 de-energize			
Response time for AC voltage [ms]	7 energize, 35 de-energize			
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +80			

Order codes

NL22 BA4 52 B Q 000 61

Size	
NL11	series L1 thread G1/8“
NL12	series L1 thread G1/4“
NL22	series L2 thread G1/4“
NL23	series L2 thread G3/8“

Function	
BA4	
BB4	
BB5	
BB6	
BB7	

Coil type	
0	standard, typ 22 for AC voltage
B	standard, typ 22 for DC voltage
A	DIN 43650, form B
T	ISO 20401 with M12 connector and LED for 24V DC
7	DESINA with M12 connector and LED for 24V DC
C	standard type 22 with UL and CSA approval
2	DIN 43650, form A, type 30 for AC voltage
4	DIN 43650, form A, type 30 for DC voltage

Options	
000	standard with push/locking manual override, 0,1 to 1,0 MPa
14A	with external pilot supply with push/locking manual override, vacuum to 2,1 MPa
17P	with non-locking manual override, 0,1 to 1,0 MPa
17G	low wattage coil 1,42W (only for DC voltage, max. pressure 0,8 MPa)

Other options are available - please contact our technical dept.

Voltage	
61	24 V DC ± 10%
40	230 V AC ± 10% 50-60 Hz
30	110 V AC ± 10% 50-60 Hz
20	24 V AC ± 10% 50-60 Hz

For dimensions see page 5-10.

For connectors for valves see pages 5-36 and 5-37.

Popular series of solenoid pilot actuated valve, which offers high flow capacity and long lifetime due to robust coil. Valves can be used as standalone or they can be mounted on manifolds. Valve can be delivered with position sensing switch on request.

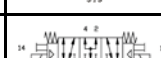
Valves series L1/L2 contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	L1		L2	
	L11	L12	L22	L23
Ports	G1/8“	G1/4“	G1/4“	G3/8“
Connection of external pressure supply port	M5	M5	G1/8“	G1/8“
Flow capacity [Nl/min]	1000	1000	1700	1700
Working pressure [MPa]	0,1 to 1,0 (vacuum to 2,1 MPa when external pilot supply is used)			
Pilot pressure range [MPa]	0,1 to 1,0			
Power input [W, VA]	3,35W for DC voltage, 10VA inrush and 7VA hold for AC voltage			
Response time for DC voltage [ms]	10 energize, 35 de-energize			
Response time for AC voltage [ms]	7 energize, 35 de-energize			
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +80			

Order codes

NL22 BA4 52 B G 000 61

Size	
NL11	series L1 thread G1/8“
NL12	series L1 thread G1/4“
NL22	series L2 thread G1/4“
NL23	series L2 thread G3/8“

Function	
BA4	
BB4	
BB5	
BB6	
BB7	

Coil type	
0	standard, typ 22 for AC voltage
B	standard, typ 22 for DC voltage
A	DIN 43650, form B

Options	
000	standard with turning manual override
17P	with non-locking manual override
14A	with external pilot supply
15Z	solenoid rotated by 180°
17G	low wattage coil 1,42W (only for DC voltage, max. pressure 0,8 MPa)

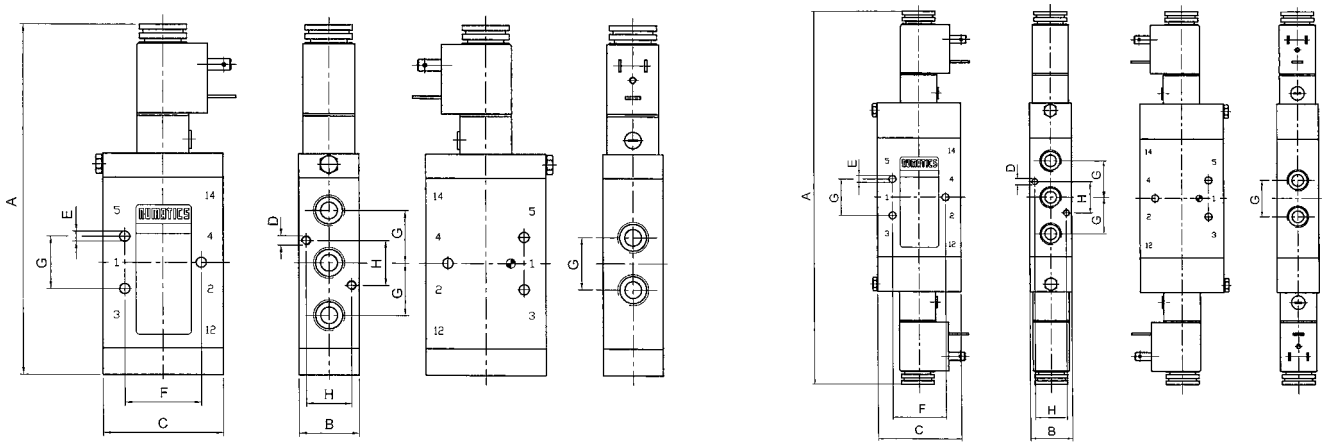
Other options are available - please contact our technical dept.

Voltage	
61	24 V DC ± 10%
40	230 V AC ± 10% 50-60 Hz
30	110 V AC ± 10% 50-60 Hz
20	24 V AC ± 10% 50-60 Hz

For dimensions see page 5-10.

For connectors for valves see pages 5-36 and 5-37.

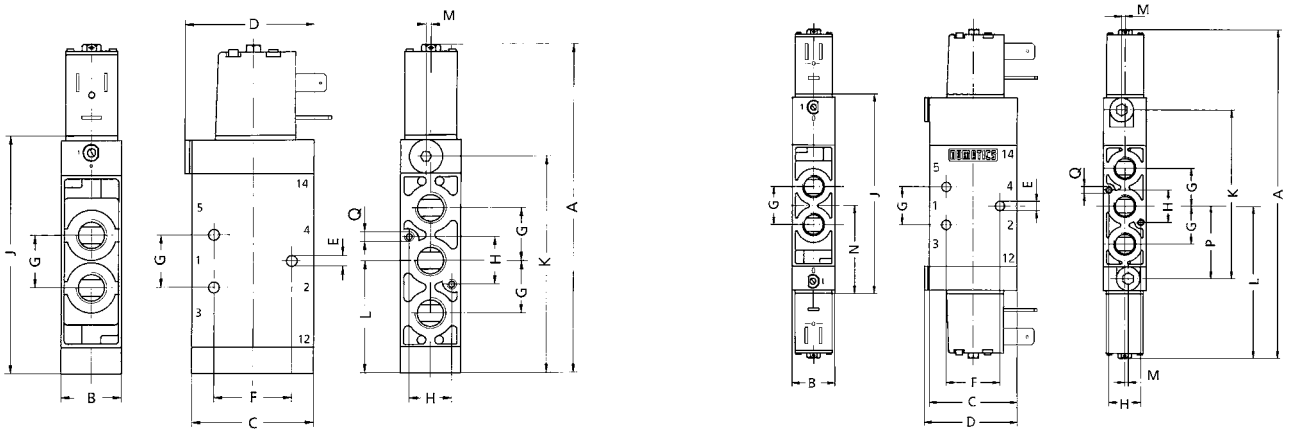
Dimensions of valve series L1/L2 with exchangeable coil



Series	Function	A	B	C	D	E	F	G	H	Weight [kg]
L1	BA4	133	22,2	41,1	M3, depth 12	3,3	24,4	18	18	0,27
L1	BB4	197,5	22,2	41,1	M3, depth 12	3,3	24,4	18	18	0,42
L1	BB5/6/7	208	22,2	41,1	M3, depth 12	3,3	24,4	18	18	0,44
L2	BA4	148	25,4	50,8	M4, depth 8	4,3	32,3	22,2	19	0,39
L2	BB4	214	25,4	50,8	M4, depth 8	4,3	32,3	22,2	19	0,55
L2	BB5/6/7	225,5	25,4	50,8	M4, depth 8	4,3	32,3	22,2	19	0,60

Notice: use fittings only to max. 14 mm wrench size with series L1, and only to max. 19 mm wrench size with series L2.

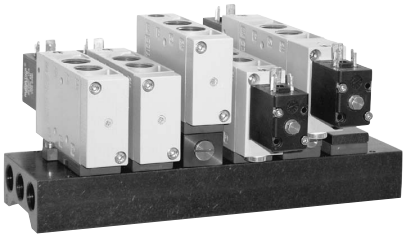
Dimensions of valve series L1/L2



Series	Function	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	Weight [kg]
L1	BA4	123,2	22,2	41,1	41,1	3,3	24,4	18	15,8	84,5	73,6	38	0	—	—	M3, depth 12	0,27
L1	BB4	179,4	22,2	41,1	41,1	3,3	24,4	18	15,8	103,6	81,7	85	0	46	36	M3, depth 12	0,42
L1	BB5/6/7	190	22,2	41,1	41,1	3,3	24,4	18	15,8	114	92,2	95	0	57	46	M3, depth 12	0,44
L2	BA4	136,6	25,4	50,8	54,5	4,3	32,3	22,2	19	99	89,7	47	2,1	—	—	M4, depth 7	0,39
L2	BB4	193,5	25,4	50,8	54,5	4,3	32,3	22,2	19	117,5	99	90,2	2,1	52,2	42,9	M4, depth 7	0,55
L2	BB5/6/7	206,6	25,4	50,8	54,5	4,3	32,3	22,2	19	130,6	111,9	103,3	2,1	65,3	56	M4, depth 7	0,60

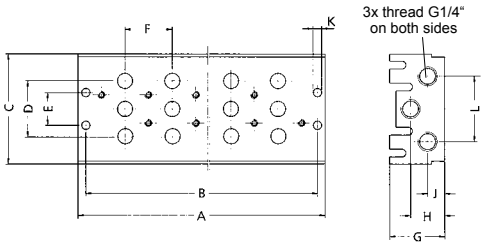
Notice: use fittings only to max. 14 mm wrench size with series L1, and only to max. 19 mm wrench size with series L2.

Series L1 / L2 valves manifold assembly



It is possible to mount series L valves on manifold with predefined number of position. It isn't possible to add another position to created assembly - it could be necessary to replace manifold or create another manifold. If there is possibility that more valves will be needed in future, we recommend to use manifold with more positions and use blank station plate for unused positions.
Any valve series L1/L2 may be used for manifold assembly (it doesn't matter if valve is single or double solenoid actuated or air actuated). But it is necessary to use adaptor, which must be mounted between valve and manifold (there is different adaptor for valve series L1 and L2). Valves mounted on manifold could be unmounted separately by unscrew of 2 bolts, which are accessible from top side (side with ports 2 and 4 of valves).

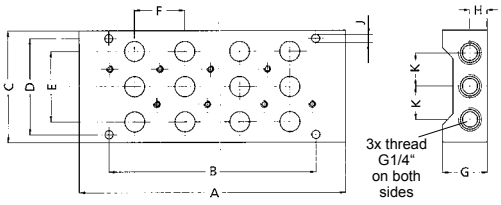
Manifolds for valves series L1



Order codes	Application
N239-311	Adaptor plate (1 plate per station)
N239-288	Blank station plate

Order codes	Number of positions	A	B	C	D	E	F	G	H	J	K	L	Weight [kg]
N106-540	2	88,5	78,5	70,6	36	21	30,5	35,5	22	11	5,3	42	0,41
N106-541	3	119	109	70,6	36	21	30,5	35,5	22	11	5,3	42	0,55
N106-542	4	149,5	139,5	70,6	36	21	30,5	35,5	22	11	5,3	42	0,69
N106-543	5	180	170	70,6	36	21	30,5	35,5	22	11	5,3	42	0,83
N106-544	6	210,5	200,5	70,6	36	21	30,5	35,5	22	11	5,3	42	0,97
N106-545	7	241	231	70,6	36	21	30,5	35,5	22	11	5,3	42	1,12
N106-546	8	271,5	261,5	70,6	36	21	30,5	35,5	22	11	5,3	42	1,26
N106-547	9	302	292	70,6	36	21	30,5	35,5	22	11	5,3	42	1,40
N106-548	10	332,5	322,5	70,6	36	21	30,5	35,5	22	11	5,3	42	1,54
N106-549	11	363	353	70,6	36	21	30,5	35,5	22	11	5,3	42	1,68
N106-550	12	393,5	383,5	70,6	36	21	30,5	35,5	22	11	5,3	42	1,82

Manifolds for valves series L2



Order codes	Application
N239-312	Adaptor plate (1 plate per station)
N239-471	Blank station plate
N10.6445	Valve isolating plate to lock port 1
N239-209	Sandwich speed control

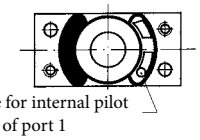
Order codes	Number of positions	A	B	C	D	E	F	G	H	J	K	Weight [kg]
N106-715	2	105,4	67	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	0,41
N106-716	3	137,4	99,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	0,54
N106-717	4	169,4	131,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	0,67
N106-718	5	201,4	163,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	0,80
N106-719	6	233,4	195,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	0,94
N106-720	7	265,4	255,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	1,06
N106-721	8	297,4	259,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	1,19
N106-722	9	329,4	291,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	1,32
N106-723	10	361,4	323,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	1,45
N106-724	11	393,4	355,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	1,58
N106-725	12	425,4	387,4	70,5	63,4	44,4	32	30,6	12,4	4,1	22,2	1,71

Conversion of internal to external air pilot supply of valve series L1 / L2

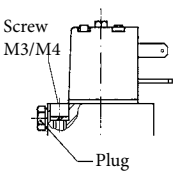
External air pilot supply is used, when air supply pressure is lower than 0,18 MPa (1,8 bar) as well as for vacuum and or if another medium than compressed air is used. It is necessary to order valve which is already prepared for this feature or change standard setting (when air pilot supply is drawn from valve supply port 1) in that cases.

When converting from internal to external pilot supply, please proceed as follows:
1) Unmount connector
2) Unscrew two M3 (for L1 series) or M4 (for L2 series) bolts, unmount solenoid mounting plate and insert gasket as shown in picture 2
3) Check proper gasket setting, re-mount and fasten solenoid mounting plate (torque approx. 1,5 Nm for L1 series and 2,3 Nm for L2 series), put on connector and fix it
4) Unscrew plug on side of valve and connect modified compressed air with pressure 1 to 10 bar

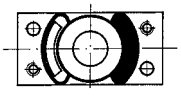
Picture 1
Position of gasket for internal pilot supply



Orifice for internal pilot supply of port 1



Picture 2
Position of gasket for external pilot supply



Coils for valve series L1/L2 with exchangeable coil

Standard coil type 22

Order codes	Voltage	Coil type*	Weight [kg]
N225-479	24V DC	B	0,054
N228-794	24V 50-60 Hz	0	0,054
N228-791	110V 50-60 Hz	0	0,054
N228-790	230V 50-60 Hz	0	0,054

*) See coil type in order code of valve on page 5-8

Coil DIN 43650, form B, type 22

Order codes	Voltage	Coil type*	Weight [kg]
N225-478	24V DC	A	0,054
N228-872	24V 50-60 Hz	A	0,054
N228-874	110V 50-60 Hz	A	0,054
N228-789	230V 50-60 Hz	A	0,054

*) See coil type in order code of valve on page 5-8

Standard coil type 22 with UL and CSA certificate

Order codes	Voltage	Coil type*	Weight [kg]
N225-506	24V DC, 48V 50-60 Hz	C	0,054
N228-793	110V 50-60 Hz, 60V DC	C	0,054

*) See coil type in order code of valve on page 5-8

Coil DIN 43650, form A, type 30

Order codes	Voltage	Coil type*	Weight [kg]
N225-354	24V DC	4	0,10
N228-772	24V 50-60 Hz	2	0,10
N228-773	110V 50-60 Hz, 60V DC	2	0,10
N228-774	230V 50-60 Hz, 110V DC	2	0,10
N225-355⁺	24V DC 48V 50-60 Hz	4	0,10
N228-775⁺	24V 50-60 Hz 12V DC	2	0,10
N228-776⁺	110V 50-60 Hz, 60V DC	2	0,10
N228-777⁺	230V 50-60 Hz, 110V DC	2	0,10

*) See coil type in order code of valve on page 5-8
⁺) These coils are for pressure up to 1,6 MPa when pilot pressure up to 1,6 MPa is used

Coils ISO 20401 / DESINA with M12 connector and LED

Order codes	Voltage	Coil type*	Weight [kg]
N225-477	24V DC (ISO 20401)	T	0,065
N225-482	24V DC (DESINA)	7	0,065

*) See coil type in order code of valve on page 5-8

Pilot valves for series L1/L2 with exchangeable coil

Order codes (up to 1,0 MPa)	Order codes (up to 1,6 MPa)	Coil type	Manual override	Weight [kg]
N219-468	N219-494	22	push/locking	0,030
N219-479	N219-495	22	push/non-locking	0,030
N219-467	N219-493	22	without	0,030
N219-218	N219-221	30	push/locking	0,065
N219-217	N219-220	30	push/non-locking	0,065
N219-216	N219-219	30	without	0,065

With push/locking manual override

With push/non-locking manual override

Without manual override

Spare exhaust protection nut

Order code	Weight [kg]
N125-1027	0,002

Coils for valve series L1/L2

Standard coil type 22

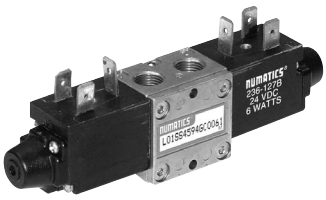
Order codes	Voltage	Coil type*	Weight [kg]
N226-749	24V DC	B	0,10
N237-568	24V 50-60 Hz	0	0,10
N237-569	110V 50-60 Hz	0	0,10
N237-570	230V 50-60 Hz	0	0,10

*) See coil type in order code of valve on page 5-9

Coil DIN 43650, form B, type 22

Order codes	Voltage	Coil type*	Weight [kg]
N226-891	24V DC	A	0,10
N237-696	24V 50-60 Hz	A	0,10
N237-697	110V 50-60 Hz	A	0,10
N237-698	230V 50-60 Hz	A	0,10

*) See coil type in order code of valve on page 5-9



Small, direct solenoid actuated valve 4/2 and 4/3 is due to it's compact dimensions suitable for applications, where isn't room for standard valves and where not high flow capacity is required. Valves can be used as standalone or they can be mounted on manifolds. Valves can be delivered with NPTF ports.

Valves series L01 contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	L01
Ports	G1/8“
Flow capacity [Nl/min]	200
Working pressure [MPa]	vacuum to 1,0
Power input [W, VA]	6W for DC voltage, 10VA inrush and 6VA hold for AC voltage
Response time for DC voltage [ms]	12 energize, 6 de-energize
Response time for AC voltage [ms]	8 energize, 10 de-energize, or 10/12 for 4/3 function
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +80

Order codes

NL01 SS459 4 G 000 61

Size	
NL01	series L01 thread G1/8“

Function	
SA459	
SA487*	
SS459	
SS487*	
SS559	
SS587*	
SS659	
SS687*	

*) with built-in speed control valve

Coil type	
2	standard, typ 22 for AC voltage
4	standard, typ 22 for DC voltage
0	type 22 for AC voltage with cable 0,45 m
B	type 22 for DC voltage with cable 0,45 m

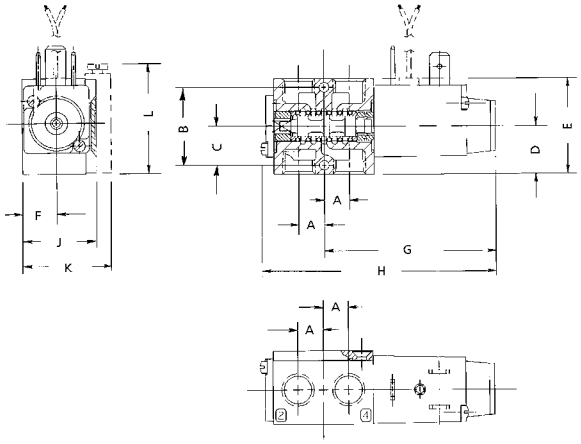
Options	
000	standard with non-locking manual override

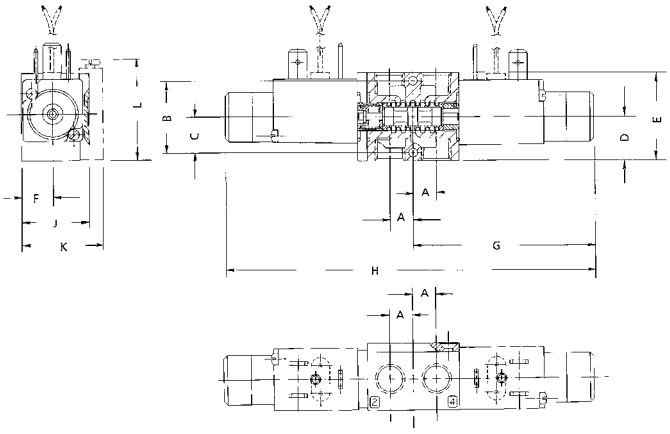
Other options are available - please contact our technical dept.

Voltage	
61	24 V DC ± 10%
40	230 V AC ± 10% 50-60 Hz
30	110 V AC ± 10% 50-60 Hz
20	24 V AC ± 10% 50-60 Hz

For connectors for valves see pages 5-36 and 5-37.

Dimensions of valve series L01

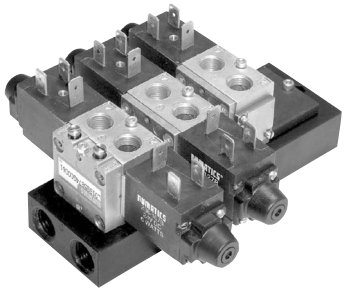


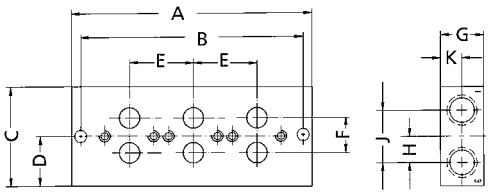


Function	A	B	C	D	E	F	G	H	J	K	L	Weight [kg]
SA459	7,9	24,6	12,5	15	30,2	10,7	53,8	73,6	22,9	—	—	0,17
SA487	7,9	24,6	12,5	15	30,2	10,7	53,8	73,6	22,9	27,4	34,3	0,21
SS459	7,9	24,6	12,5	15	30,2	10,7	53,8	107,7	22,9	—	—	0,23
SS487	7,9	24,6	12,5	15	30,2	10,7	53,8	107,7	22,9	27,4	34,3	0,27
SS559	7,9	24,6	12,5	15	30,2	10,7	53,8	107,7	22,9	—	—	0,24
SS587	7,9	24,6	12,5	15	30,2	10,7	53,8	107,7	22,9	27,4	34,3	0,28
SS659	7,9	24,6	12,5	15	30,2	10,7	53,8	107,7	22,9	—	—	0,24
SS687	7,9	24,6	12,5	15	30,2	10,7	53,8	107,7	22,9	27,4	34,3	0,28

Series L01 valves manifold assembly

It is possible to mount series L01 valves on manifold with predefined number of position. It isn't possible to add another position to created assembly - it could be necessary to replace manifold or create another manifold. If there is possibility that more valves will be needed in future, we recommend to use manifold with more positions and use blank station plate for unused positions. Any valve series L01 may be used for manifold assembly (it doesn't matter if valve is single or double solenoid actuated or air actuated). But it is necessary to use adaptor, which must be mounted between valve and manifold. Valves mounted on manifold could be unmounted separately by unscrew of 2 bolts., which are accessible from top side (side with ports 2 and 4 of valves).

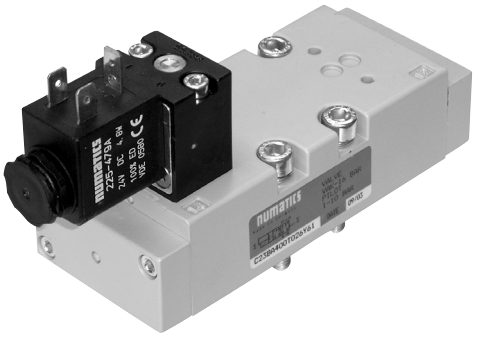




Order codes	Application
N239-582	Adaptor plate (1 plate per station)
N239-583	Blank station plate
N239-581	Sandwich speed control

Order codes	Number of positions	A	B	C	D	E	F	G	H	J	K	Weight [kg]
N106-833	2	72,2	64,3	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,12
N106-834	3	100	92,1	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,16
N106-835	4	127,8	119,9	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,20
N106-836	5	155,7	147,8	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,25
N106-837	6	184,3	175,6	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,29
N106-838	7	211,4	203,4	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,34
N106-839	8	239,2	231,3	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,38
N106-840	9	267	259,1	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,43
N106-841	10	294,9	286,9	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,47
N106-842	11	322,7	314,8	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,52
N106-843	12	350,5	342,6	42,9	21,3	27,9	15,7	19	11,4	23,1	9,5	0,56

Note: Inlet/outlet ports in manifold are G1/4" threaded and they are through the manifold (on both sides).



Series Compact is appear from classic ISO valves, but they are cheaper and off er higher flow capacity. Air pilot is used for valve actuating, so it is indirect actuated valve. Valves must be mounted on sub-bases with dimensions according to ISO standard. Coil can be turned so that it will serve the purpose. Various coil types are available for this valve. Valves can be use as standalone with individual base or they can be mounted on manifolds.

Valves series ISO 5599/1 Compact contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	ISO 1 Compact	ISO 2 Compact	ISO 3 Compact
Flow capacity [Nl/min]	1300	2200	4400
Working pressure [MPa]	0,1 to 1,6 MPa for standard coil, 0,1 to 1,0 MPa for low wattage coil (vacuum to 2,1 MPa when external air pilot supply is used)		
Pilot pressure range [MPa]	0,1 to 1,6 for standard coil, 0,1 to 1,0 low wattage coil		
Power input of standard coil [W, VA]	6,8W for DC voltage, 10,9VA inrush and 7,6VA hold for AC voltage		
Power input of low wattage coil [W, VA]	2,7W for DC voltage, 5,2VA inrush and 3,9VA hold for AC voltage		
Response time for DC voltage [ms]	20 energize, 32 de-energize		
Response time for AC voltage [ms]	15 energize, 36 de-energize		
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +80		

Order codes

NC23 BA4 00 4 0 17G 61

Size	
NC12	series ISO 1 Compact
NC23	series ISO 2 Compact
NC34	series ISO 3 Compact

Function	
BA4	
BW4*	
BB4	
BB5	
BB6	
BB7**	

*) For series ISO 1 Compact only
**) For series ISO 1 Compact and ISO 3 Compact only

Coil type	
2	standard, DIN 43650, form A for AC voltage
4	standard, DIN 43650, form A for DC voltage
T	ISO 20401 with M12 connector and LED for 24V DC
7	DESINA with M12 connector and LED for 24V DC
C	standard type 30 with UL and CSA approval

Options	
000	with locking manual override, 0,1 to 1,6 MPa
11M	without manual override 0,1 to 1,6 MPa
17P	with non-locking manual override, 0,1 to 1,6 MPa
17G	standard, with locking manual override, with low wattage coil, 0,1 to 1,0 MPa
26Y	with non-locking manual override, with low wattage coil, 0,1 to 1,0 MPa
26Z	without manual override, with low wattage coil, 0,1 to 1,0 MPa

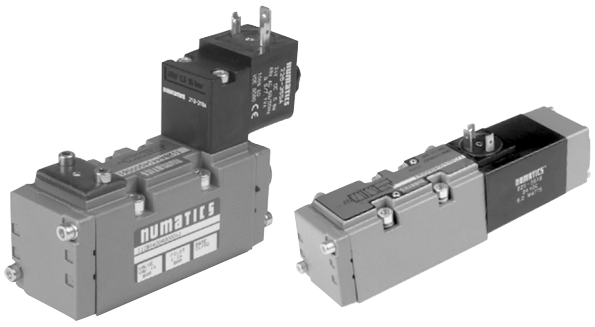
Other options are available - please contact our technical dept.

Voltage	
61	24 V DC ± 10%
40	230 V AC ± 10% 50-60 Hz
30	110 V AC ± 10% 50-60 Hz
20	24 V AC ± 10% 50-60 Hz

For dimensions see page 5-17.

For connectors for valves see pages 5-36 and 5-37

SOLENOID ACTUATED VALVES
SERIES ISO 5599/1



The most common type or direct or air pilot solenoid actuated valve, which is designed for use with sub-bases. Coil of air pilot actuated valve can be turned so that it will serve the purpose. Various coil types are available for this valve. Valves can be use as standalone with individual base or they can be mounted on manifolds. Valve can be delivered with position sensing switch on request.

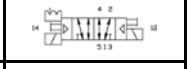
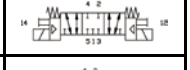
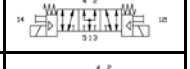
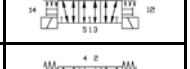
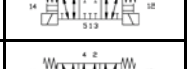
Valves series ISO 5599/1 contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	ISO 1	ISO 2	ISO 3
Flow capacity [Nl/min]	1200	1700	4400
Working pressure [MPa]	0,1 to 1,6 for standard coil, 0,1 to 1,0 for low wattage coil (vacuum to 2,1 MPa when external air pilot supply is used)		
Pilot pressure range [MPa]	0,1 to 1,6 for standard coil, 0,1 to 1,0 for low wattage coil		
Power input of standard coil of air pilot [W, VA]	6,8W for DC voltage, 10,9VA inrush and 7,6VA hold for AC voltage		
Power input of low wattage coil of air pilot [W, VA]	2,7W for DC voltage, 5,2VA inrush and 3,9VA hold for AC voltage		
Power input of coil of direct actuated valve [W, VA]	6W for DC voltage, 50VA inrush and 9,6VA hold for AC voltage		
Response time for DC voltage [ms]	20 energize, 32 de-energize, or 32/12 for direct actuated valves		
Response time for AC voltage [ms]	15 energize, 36 de-energize, or 18/30 for direct actuated valves		
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +80		

Order codes

NI23 BA4 00 4 0 44Q 61

Size	
NI12	series ISO 1
NI23	series ISO 2
NI34	series ISO 3

Function	
BA4	
BW4	
BB4	
BB5	
BB6	
BB7	
SA4	
SS4	
SS5	
SS6	
SS7	

Coil type	
2	standard, DIN 43650, form A for AC voltage
4	standard, DIN 43650, form A for DC voltage
T	ISO 20401 with M12 connector and LED for 24V DC
7	DESINA with M12 connector and LED for 24V DC
C	standard type 30 with UL and CSA approval

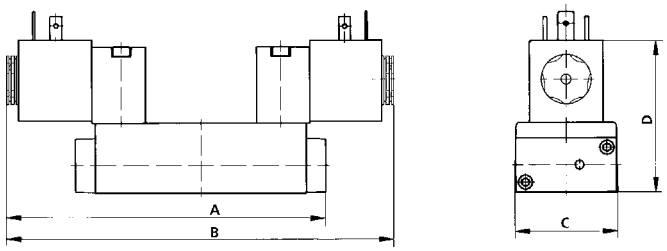
Options	
000	manual override in the cover
11M	without manual override (for BA/BB functions)
17P	indirectly acting non-locking manual override (for BA/BB functions)
18W	indirectly acting push/locking manual override (BA/BB functions)
26Y	indirectly acting non-locking manual override, low wattage (BA/BB functions)
44Q	indirectly acting locking manual override, low wattage (BA/BB functions)
26Z	with low wattage, without manual override (BA/BB series only)

Other options are available - please contact our technical dept.

Voltage	
61	24 V DC ± 10%
40	230 V AC ± 10% 50-60 Hz
30	110 V AC ± 10% 50-60 Hz
20	24 V AC ± 10% 50-60 Hz

For connectors for valves see pages 5-36 and 5-37.

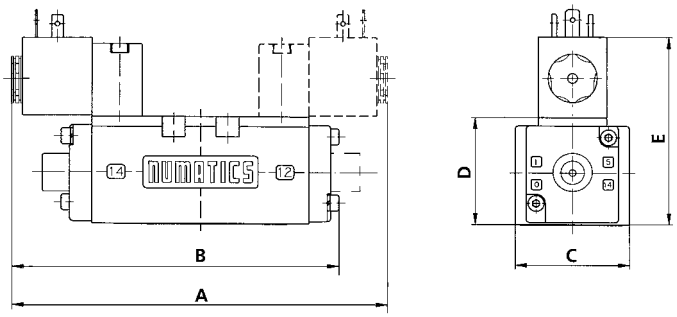
Dimensions of valve series ISO 5599/1 Compact



Series	Function	A	B	C	D	Weight [kg]
ISO 1 Compact	BA/BW	135	—	42	64,6	0,50
ISO 1 Compact	BB	—	166	42	64,6	0,60
ISO 2 Compact	BA/BW	148	—	50,8	67,5	0,70
ISO 2 Compact	BB	—	167	50,8	67,5	0,80
ISO 3 Compact	BA/BW	178	—	63,5	78	1,1
ISO 3 Compact	BB	—	194,7	63,5	78	1,26

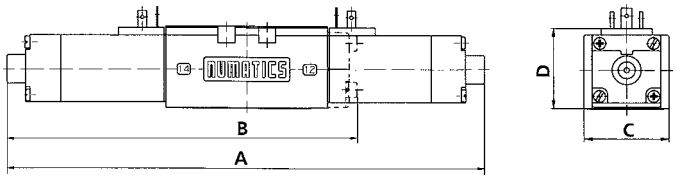
Dimensions of valve series ISO 5599/1

Air pilot solenoid actuated valves



Series	Function	A	B	C	D	E	Weight [kg]
ISO 1	BA/BW	—	143	42	48	83	0,70
ISO 1	BB	172	—	42	48	83	0,80
ISO 2	BA/BW	—	155	50	48	83	0,80
ISO 2	BB	183	—	50	48	83	1,00
ISO 3	BA/BW	—	180	63,5	60,5	97	1,60
ISO 3	BB	197	—	63,5	60,5	97	1,70

Direct solenoid actuated valves



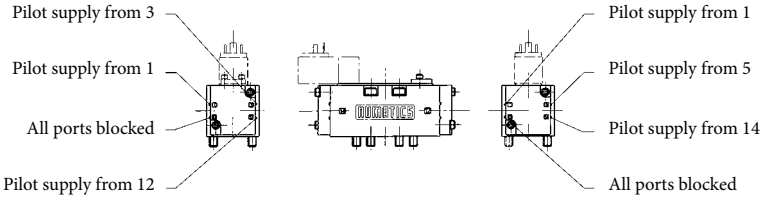
Series	Function	Voltage	A	B	C	D	Weight [kg]
ISO 1	SA	DC	—	200	42	48	0,80
ISO 1	SA	AC	—	180	42	48	0,80
ISO 1	SS	DC	280	—	42	48	1,00
ISO 1	SS	AC	240	—	42	48	1,00
ISO 2	SA	DC	—	208	50	48	1,00
ISO 2	SA	AC	—	188	50	48	1,00
ISO 2	SS	DC	288	—	50	48	1,20
ISO 2	SS	AC	248	—	50	48	1,20
ISO 3	SA	AC	—	234	63,5	60,5	1,70
ISO 3	SS	AC	305	—	63,5	60,5	1,70

Conversion of internal to external air pilot supply of valve series ISO 5599/1

External air pilot supply is used, when air supply pressure is lower than 0,1 MPa (1 bar) as well as for vacuum and or if another medium than compressed air is used. It is necessary to order valve which is already prepared for this feature or change standard setting (when air pilot supply is drawn from valve supply port 1) in that cases. If supply air is piped to ports 3 or 5, the valve must be converted too. Please find the correct orientation of gasket for your usage in the table below. This process is valid only for valves series ISO 5599/1.

When converting pilot supply, please proceed as follows:
1) Remove the end caps
2) Remove gasket and position it so that the tab points toward the appropriate port number
3) Check gasket installation and install end caps
4) If it is necessary, convert second side of valve too

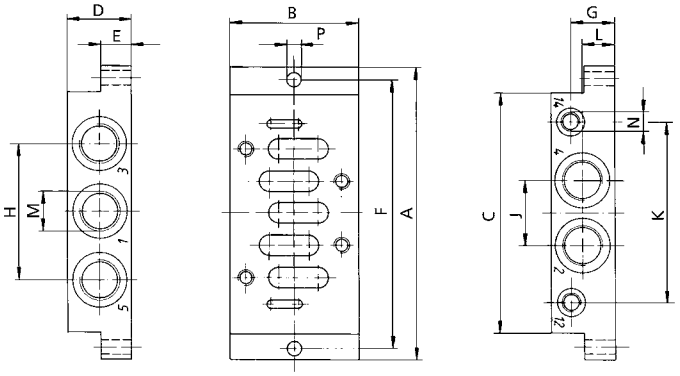
Picture shows the gasket tab orientation for various cases:



Single solenoid pilot		Gasket tab orientation	
		side 14	side 12
a	internal supply from port 1	1	0
b	internal supply from port 3	0	3
c	internal supply from port 5	5	0
d	external supply from port 12	14	0
e	external supply from port 14	0	12

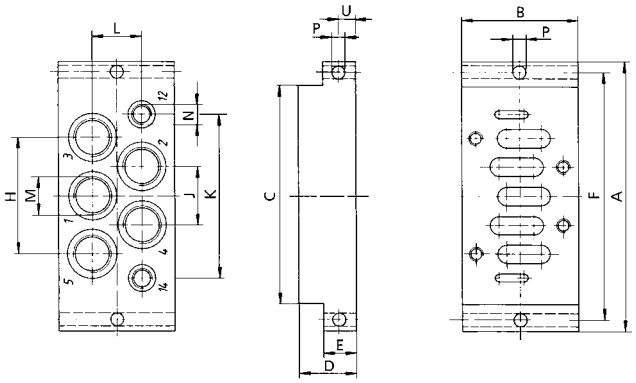
Double solenoid pilot		Gasket tab orientation	
		side 14	side 12
a	internal supply from port 1	1	1
b	internal supply from port 3	0	3
c	internal supply from port 5	5	0
d	external supply from port 12	14	0
e	external supply from port 14	0	12

Individual base VDMA 24345, form A, with side ports



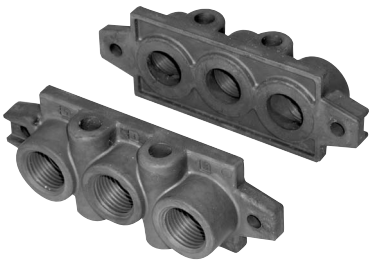
Order codes	Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Weight [kg]
N103-544	ISO 1	110	48	84	32	10	98	22	48	25	64	11	G1/4“	G1/8“	5,5	0,20
N103-549	ISO 2	124	57	95	40	13	112	31	56	28	73	15	G3/8“	G1/8“	6,6	0,30
N103-545	ISO 3	149	64	119	32	18	136	22	68	32	90	16	G1/2“	G1/8“	6,6	0,40

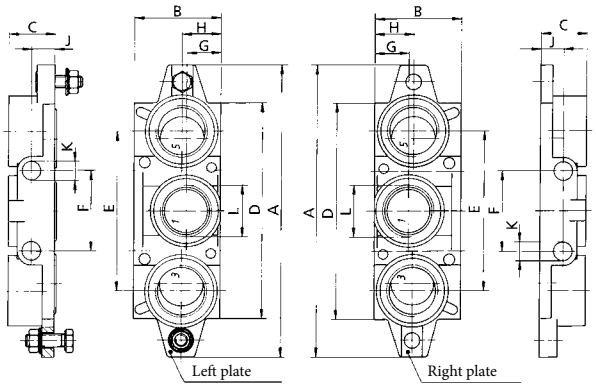
Individual base VDMA 24345, form B, with bottom ports



Order codes	Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Weight [kg]
N103-542	ISO 1	110	46	84	30	10	98	5	46	23	62	23	G1/4“	G1/8“	5,5	0,19
N103-557	ISO 2	124	56	95	35	13	112	6,5	56	26	74	27	G3/8“	G1/8“	6,6	0,32
N103-543	ISO 3	149	64	119	32	18	136	9	64	32	90	27	G1/2“	G1/8“	6,6	0,41

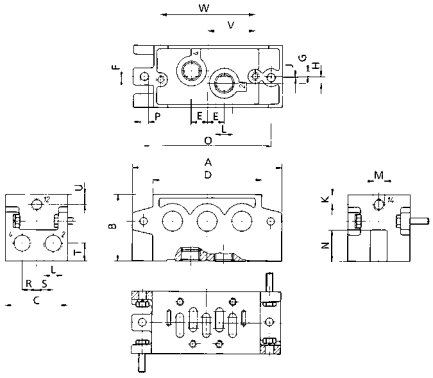
End plate kit VDMA 24345, form D for manifold blocks





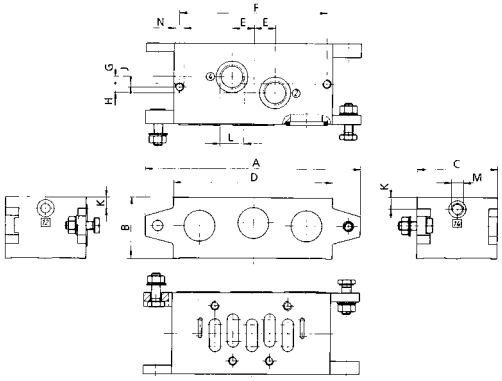
Order codes	Size	A	B	C	D	E	F	G	H	J	K	L	Weight [kg]
N239-257	ISO 1	110	46	22	85	56	28	22	25	11	7	G3/8“	0,30
N239-255	ISO 2	135	47	26	98,5	70	35	23	25	13	9	G1/2“	0,40
N239-259	ISO 3	190	56	30	140	104	52	22	25	15	21	G1“	0,70

Manifold block with side and bottom ports



Order codes	Size	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U	V	W	Weight [kg]
N239-241	ISO 1	110	50	43	84	13	3	1,5	7,5	1,2	10	G1/4“	G1/8“	23	95	5,4	9,5	12	13	10	35,5	71	0,40
N239-245	ISO 2	135	60	56	98,5	15	3	5	6	1	9	G3/8“	G1/8“	28	115	6,6	13	15	16	9	43	86	0,60
N239-249	ISO 3	190	66	71	140	19	3	6	8	1,3	9,5	G1/2“	G1/8“	32	168	8,6	16,5	19	18	9,5	65	130	1,20

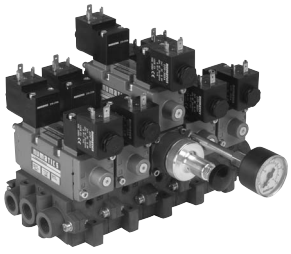
Manifold block VDMA 24345, form C,with bottom ports



Order codes	Size	A	B	C	D	E	F	G	H	J	K	L	M	N	Weight [kg]
N239-239	ISO 1	110	44	43	85	13	71	1,5	7,5	3	9	G1/4“	G1/8“	M5	0,30
N239-243	ISO 2	135	45	56	98,5	15	86	5	6	3	9	G3/8“	G1/8“	M6	0,40
N239-247	ISO 3	190	54	71	140	19	130	6	8	3	10	G1/2“	G1/8“	M8	0,80

Other accessories

The another accessories for valve series ISO 5599/1 Compact and ISO 5599/1 is available too. For full range catalogue please contact our sales dept. Available are for example the following components:



Pressure regulators with various functions and for various pressures

Adapter plates to mount the respective ISO valves

Valve isolating plate to lock port 1

Sandwich speed control

Non-return plates for port 1

Blank station plates

Coils for valve series ISO 5599/1 Compact and ISO 5599/1

Coils DIN 43650, form A, type 30

Order codes	Voltage	Coil type*	Weight [kg]
N225-354	24V DC	4	0,10
N228-772	24V 50-60 Hz	2	0,10
N228-773	110V 50-60 Hz, 60V DC	2	0,10
N228-774	230V 50-60 Hz, 110V DC	2	0,10
N225-355⁺	24V DC 48V 50-60 Hz	4	0,10
N228-775⁺	24V 50-60 Hz 12V DC	2	0,10
N228-776⁺	110V 50-60 Hz, 60V DC	2	0,10
N228-777⁺	230V 50-60 Hz, 110V DC	2	0,10

Coils are for pressure up to 1,0 MPa
*) See coil type in order code of valve on page 5-15, 5-16
⁺) These coils are for pressure up to 1,6 MPa when pilot pressure up to 1,6 MPa is used

Coils DIN 43650, form A, type 30 with UL and CSA cert.

Order codes	Voltage	Coil type*	Weight [kg]
N225-480	24V DC	C	0,10
N228-792	110V 50-60 Hz	C	0,10

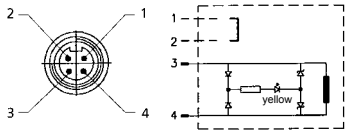
Coils are for pressure up to 1,0 MPa
*) See coil type in order code of valve on page 5-15, 5-16

Coils ISO 20401 / DESINA with M12 connector and LED, type 30

Order codes	Voltage	Coil type*	Weight [kg]
N225-485	24V DC (ISO 20401)	T	0,11
N225-486⁺	24V DC (ISO 20401)	T	0,11
N225-483	24V DC (DESINA)	7	0,11
N225-484⁺	24V DC (DESINA)	7	0,11

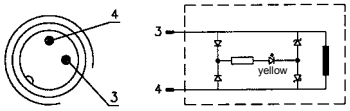
Coils are for pressure up to 1,0 MPa
*) See coil type in order code of valve on page 5-15, 5-16
⁺) These coils are for pressure up to 1,6 MPa when pilot pressure up to 1,6 MPa is used

Wiring of M12 connector DESINA



DESINA

Wiring of M12 connector ISO 20401



Pilot valves for series ISO 5599/1 and ISO 5599/1 Compact with coil type 30

Order codes (up to 1,0 MPa)	Order codes (up to 1,6 MPa)	Coil type	Manual override	Weight [kg]
N219-218	N219-221	30	push/locking	0,065
N219-217	N219-220	30	push/non-locking	0,065
N219-216	N219-219	30	without	0,065

Spare exhaust protection nut

Order codes	Weight [kg]
N125-1027	0,002

Series 2002 valves are one of the most state-of-the-art. Well-proven spool and sleeve assembly as well as rubber packed spool versions are available. Valves must be mounted on sub-base and they can be used as standalone or in manifolds. If manifold mounting is used, then electrical signals may be wired separately to each coil or centrally by multipol connector or by electronic control system (BUS controlling).

Valves series 2002 contains spool and sleeve assembly, which guarantee long lifetime of valve, or rubber gaskets.

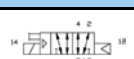
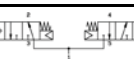
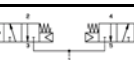
Series	2002 with spool and sleeve assembly	2002 with rubber packed sleeve
Flow capacity [Nl/min]	200	250
Working pressure [MPa]	vacuum to 1,0 for 5/2 and 5/3 valves; 0 to 1,0 for 3/2 valves, vacuum only in ports 3 and 5	
Pilot pressure range [MPa]	0,25 to 0,7⁺	
Standard coil power input [W]	0,75	
Response time for DC voltage [ms]	13/6*/8** energize, 13/-*/22** de-energize; 11/10 for 3/2 valve	
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +50	

*) Values are valid for double solenoid pilot 5/2 valves (function BB4) **) Values are valid for 5/3 valves (function BB5/6/7)
⁺) For rubber packed spool version, the pilot pressure must be at least as high or higher than operating pressure

Order codes

N02 D BW4 Z3 M K 000 61

Type	
N02	spool and sleeve assembly, manifold with plug-in
NR2	rubber packed spool, manifold with plug-in
ND2	spool and sleeve assembly, individual base or manifold with external wiring
NF2	rubber packed spool, individual base or manifold with external wiring

Function	
BW4	
BB4	
BB5	
BB6	
BBA	
BBC	
BBD	

Manifold mounting	
11	manifold with external wiring
41	individual base with side ports and external wiring
Z3	manifold with side ports, single solenoid pilot (single Z-board)
Z4	manifold with side ports, double solenoid pilot (double Z-board)

Ports in bases	
G	G threads
K	push-in fittings

Voltage	
60	12 V DC ± 10%
61	24 V DC ± 10%

Options	
000	with non-locking manual override
11B	with locking manual override
14A	with external pilot supply

Coil type	
3	2 pin connector with LED for manifolds with external wiring
B	hard wire cable 0,3m (ext. wiring)
D	90° plug-in with LED (ext. wiring)
M	plug-in, LED, sourcing for manifolds with plug-in

Port size in bases	
1	1/8“
C*	M5
D	push-in fittings for 4/2 tube
F	push-in fittings for 6/4 tube

*) Valid only for ND2 and NF2 types

For dimensions see pages 5-26 and 5-27.

For order codes of completely assembled manifolds see page 2-25

Series 2005 valves, which belongs to modular and state-of-the art series 2000, offers high flow with small dimensions. Valves are mounted on manifold sub-bases with side and bottom ports. Electrical signals are wired centrally by multipol connector, or by electronic control system (BUS controlling). Speed control valve and pressure regulator are available for mounting between valve and base.

5/2 and 5/3 valves series 2005 contains spool and sleeve assembly, which guarantee long lifetime of valve, 3/2 valves contains rubber gaskets.

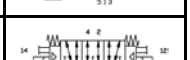
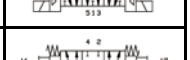
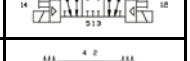
Series	2005
Flow capacity [Nl/min]	560
Working pressure [MPa]	vacuum to 1,0
Pilot pressure range [MPa]	0,18 to 0,82
Standard coil power input [W/VA]	1 for DC voltage, 4,2 for AC voltage
Response time for DC voltage [ms]	14/13* energize, 16 de-energize
Response time for AC voltage [ms]	14/13* energize, 16 de-energize
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +50

*) Values are valid for double solenoid pilot 5/2 valves (function BB4)

Order codes

N05F BB4 Z6 M L 000 61

Type	
N051	series 2005 with 1/8“ ports
N05F	series 2005 with push-in fi ttings for 6/4 tube
N05H	series 2005 with push-in fi ttings for 8/6 tube

Function	
BA4	
BB4	
BB5	
BB6	
BB7	
BBA	
BBD	

*)Ribbon cable feature must be used for manifold assemblies that exceed 16 solenoids.

Manifold mounting	
Z1	manifold with side and bottom ports, single solenoid pilot (single Z-board)
Z2	manifold with side and bottom ports, double solenoid pilot (double Z-board)
Z5	Z1 with sandwich speed control
Z6	Z2 with sandwich speed control
R1*	Z1 with ribbon cable
R2*	Z2 with ribbon cable
R5*	Z5 with ribbon cable
R6*	Z6 with ribbon cable

Ports in bases	
G	G1/8“
L	push-in fittings
N	NPTF1/8“

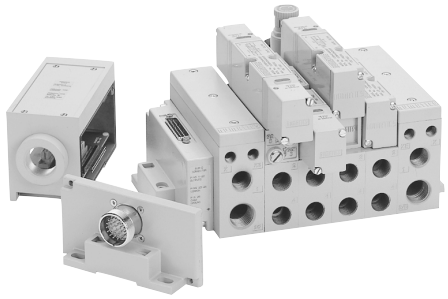
Voltage	
20	24 V AC ± 10% 50-60 Hz
30	120 V AC ± 10% 50-60 Hz
60	12 V DC ± 10%
61	24 V DC ± 10%

Options	
000	with non-locking manual override
11B	with locking manual override
11M	without manual override

Coil type	
K	plug-in, AC voltage with LED
M	plug-in, DC voltage with LED

A For dimensions see page 5-27.

For order codes of completely assembled manifolds see page 2-25



Series 2012 valves, belongs to modular and state-of-the art series 2000. Valves are mounted on manifold sub-bases with side and bottom ports. Electrical signals are wired centrally by multipol connector, or by electronic control system (BUS controlling). Speed control valve and pressure regulator are available for mounting between valve and base.

Valves series 2012 contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	2012
Flow capacity [Nl/min]	1200
Working pressure [MPa]	vacuum to 1,0
Pilot pressure range [MPa]	0,18 to 0,82
Standard coil power input [W/VA]	2,5 for DC voltage, 4,2 for AC voltage
Response time for DC voltage [ms]	10 energize, 20 de-energize
Response time for DC voltage [ms]	10 energize, 20 de-energize
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +50

Order codes

N12H BB4 Z6 M L 11M 61

Type	
N122	series 2012 with 1/4“ ports
N123	series 2012 with 3/8“ ports
N12H	series 2012 with push-in fittings for 8/6 tube
N12K	series 2012 with push-in fittings for 10/8 tube

Function	
BA4	
BB4	
BB5	
BB6	
BB7	

*)Ribbon cable feature must be used for manifold assemblies that exceed 16 solenoids.

Manifold mounting	
Z1	manifold with side and bottom ports, single solenoid pilot (single Z-board)
Z2	manifold with side and bottom ports, double solenoid pilot (double Z-board)
Z5	Z1 with sandwich speed control
Z6	Z2 with sandwich speed control
3A	individual base with side ports
3C	3A with sandwich speed control
R1*	Z1 with ribbon cable
R2*	Z2 with ribbon cable
R5*	Z5 with ribbon cable
R6*	Z6 with ribbon cable

Ports in bases	
G	G threads
L	push-in fittings
N	NPTF threads

Voltage	
20	24 V AC ± 10% 50-60 Hz
30	120 V AC ± 10% 50-60 Hz
60	12 V DC ± 10%
61	24 V DC ± 10%

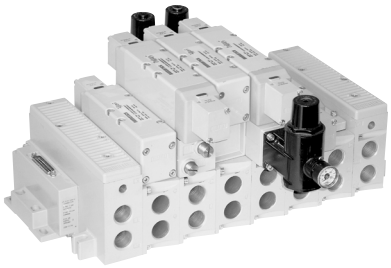
Options	
000	with non-locking manual override
11B	with locking manual override
11M	without manual override
14X	external pilot supply

Coil type	
K	plug-in, AC voltage with LED
M	plug-in, DC voltage with LED

A For dimensions see page 5-28.

For order codes of completely assembled manifolds see page 2-25

SOLENOID ACTUATED VALVES
SERIES 2035



Series 2035 valves, belongs to modular and state-of-the art series 2000. This series has big flow capacity and is suitable for large diameter cylinders applications. Valves are mounted on manifold sub-bases with side and bottom ports. Electrical signals are wired centrally by multipol connector, or by electronic control system (BUS controlling). Speed control valve and pressure regulator are available for mounting between valve and base.

Valves series 2035 contains spool and sleeve assembly, which guarantee long lifetime of valve.

Series	2035
Flow capacity [Nl/min]	3500
Working pressure [MPa]	vacuum to 1,0
Pilot pressure range [MPa]	0,18 to 0,82
Standard coil power input [W/VA]	2,5 for DC voltage, 4,2 for AC voltage
Response time for DC voltage [ms]	21 energize, 70 de-energize
Response time for AC voltage [ms]	15 energize, 75 de-energize
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +50

Order codes

N354 BB4 Z6 M G 11B 61

Type	
N353	series 2035 with 3/8“ ports
N354	series 2035 with 1/2“ ports

Function	
BA4	
BB4	
BB5	
BB6	

Manifold mounting	
Z1	manifold for single solenoid pilot valve
Z2	manifold for double solenoid pilot valve
Z5	Z1 with sandwich speed control
Z6	Z2 with sandwich speed control
R1*	Z1 with ribbon cable
R2*	Z2 with ribbon cable
R5*	Z5 with ribbon cable
R6*	Z6 with ribbon cable

*)Ribbon cable feature must be used for manifold assemblies that exceed 16 solenoids.

Ports in bases	
G	G threads
N	NPTF threads

Voltage	
20	24 V AC ± 10% 50-60 Hz
30	120 V AC ± 10% 50-60 Hz
60	12 V DC ± 10%
61	24 V DC ± 10%

Options	
000	with non-locking manual override
11B	with locking manual override
11M	without manual override

Coil type	
K	AC voltage with LED
M	DC voltage with LED

A For dimensions see page 5-29.

For order codes of completely assembled manifolds see page 2-25

Completely assembled manifolds of series 2002 valves

Order codes

NAKJ 6 F 0000 HL DMW

Type	
NAK0	manifold without plug-in, externally wired
NAKF	manifold with plug-in, terminal strip, max. 16 coils
NAKJ	manifold with plug-in, 25 pin SUB-D connector, max. 22 coils
NAKC	manifold with plug-in, with G2-1 BUS electronic system*, max. 24 coils

*) For details about BUS systems please contact our technical dept.

Series	
6	series 2002

Number of positions**		
A = 1	I = 9	Q = 17
B = 2	J = 10	R = 18
C = 3	K = 11	S = 19
D = 4	L = 12	T = 20
E = 5	M = 13	U = 21
F = 6	N = 14	V = 22
G = 7	O = 15	W = 23
H = 8	P = 16	X = 24

**) See max. number of coils according to manifold type

End plate port size	
HL	push-in fittings for 8/6 tube

Options	
STD	without options
DRM	DIN rail mounting
MUF	end plates with muffler
DMW	Din rail and end plates with muffler

It is necessary to mention order code of completely assembled manifold, order codes of used valves and order code of BUS system (if used).
Example: see example below for valve series 2005/2012

Completely assembled manifolds of series 2005, 2012 and 2035

Order codes

NAKJ E F 0000 JL DMW

Type*	
NAKF	manifold with plug-in, terminal strip, max. 16 coils
NAKT	manifold with plug-in, terminal strip, max. 32 coils
NAKJ	manifold with plug-in, 25 pin SUB-D connector, max. 22 coils
NAKM	manifold with plug-in, 37 pin SUB-D connector, max. 32 coils
NAKP	manifold with plug-in, 12 pin round connector, max. 8 coils
NAKR	manifold with plug-in, 26 pin round connector, max. 22 coils
NAKS	manifold with plug-in, 26+12 pin round connector, max. 32 coils
NAKC	manifold with plug-in, with G2-2 BUS electronic system*, max. 32 coils

*) All types are with internal wiring

**) For details about BUS systems please contact our technical dept.

Series	
E	series 2005
G	series 2012
B	series 2035

Number of positions**		
A = 1	L = 12	W = 23
B = 2	M = 13	X = 24
C = 3	N = 14	Y = 25
D = 4	O = 15	Z = 26
E = 5	P = 16	2 = 27
F = 6	Q = 17	3 = 28
G = 7	R = 18	4 = 29
H = 8	S = 19	5 = 30
I = 9	T = 20	6 = 31
J = 10	U = 21	7 = 32
K = 11	V = 22	

**) See max. number of coils according to manifold type

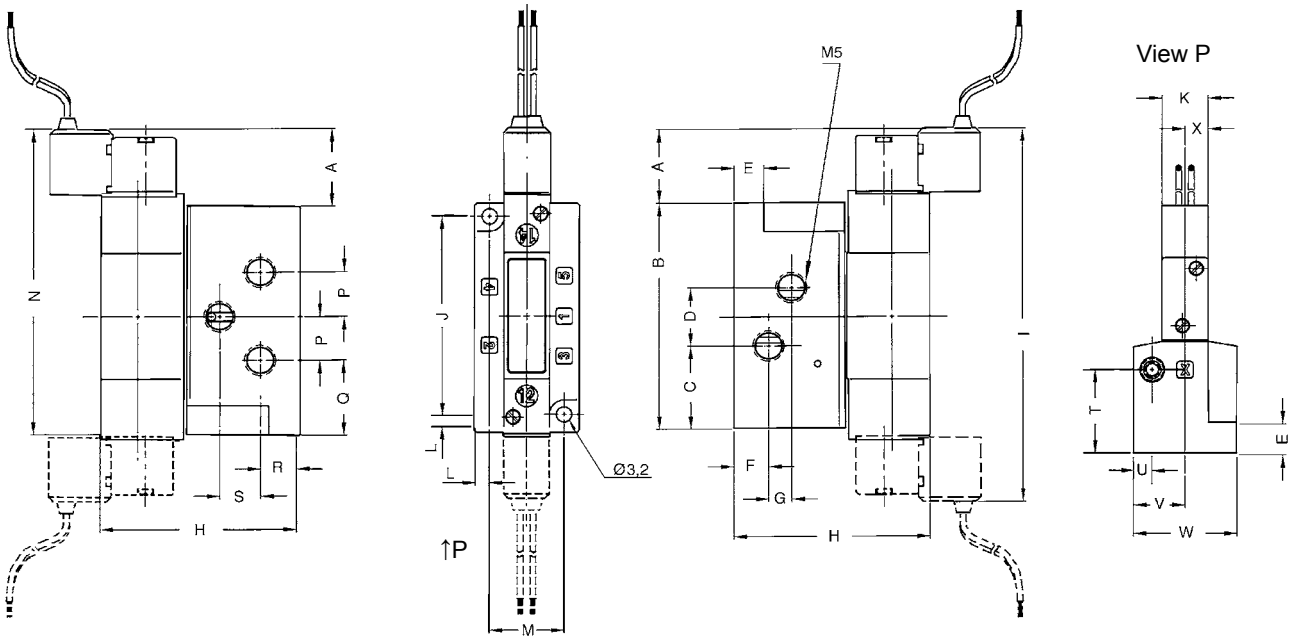
End plate port size	
3G	series 2005: G3/8“ series 2012:G3/8“ for port 1, G1/2“ for ports 3 and 5
4G	series 2035: G1/2“
KL	series 2005: push-in fittings for 10/8 tube series 2012: push-in fittings for 10/8 tube for port 1, 14/12 for ports 3 and 5
HL	series 2012:push-in fittings for 8/6 tube for port 1, 12/10 for ports 3 and 5

Options	
STD	without options
DRM	DIN rail mounting
MUF	end plates with muffler
DMW	Din rail and end plates with mufler
14X	STD with external air pilot supply
A06	end plate with ports on left side only, mounting plate on right side only

It is necessary to mention order code of completely assembled manifold, order codes of used valves and order code of BUS system (if used).
Example: assembly of 2 valves N05FBB4Z2ML00061 and 4 valves N05FBA4Z1ML00061, 6 valve stations, manifold with plug-in with 25 pin SUB-D connector, ports are with push-in fi ttings, manifold with integrated muffler and DIN rail mounting, has order code:
NAKJEF0000HLDMW
stations 1,2 = N05FBB4Z2ML00061
stations 3,4,5,6 = N05FBA4Z1ML00061,assembled

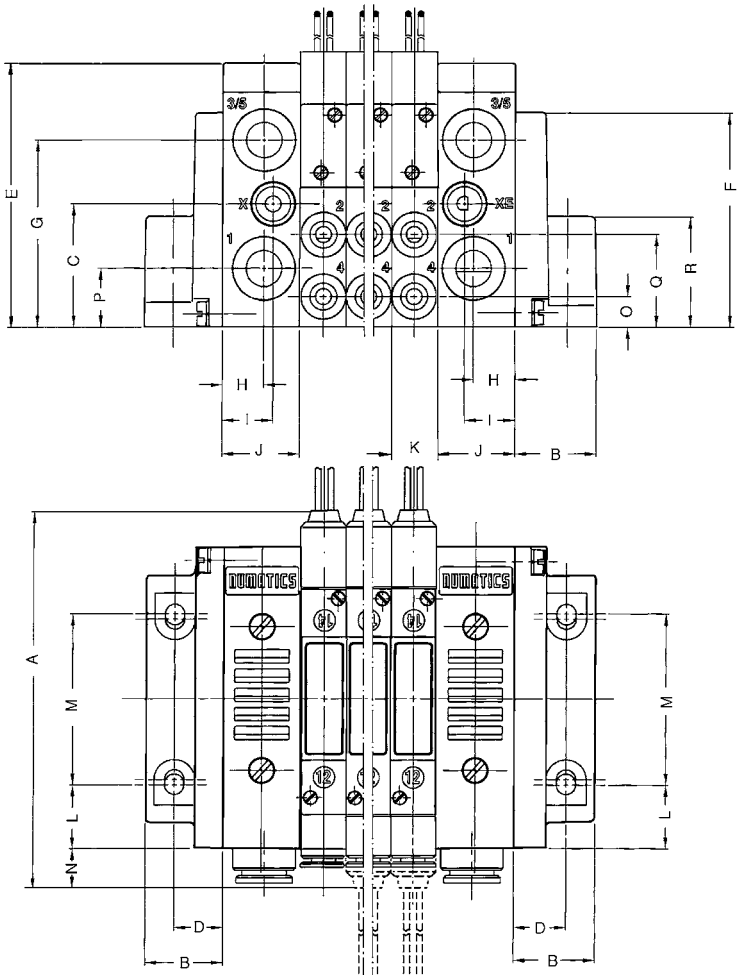
For connectors for valves see pages 5-36 and 5-37.

Dimensions of valve series 2002 - valves with individual base



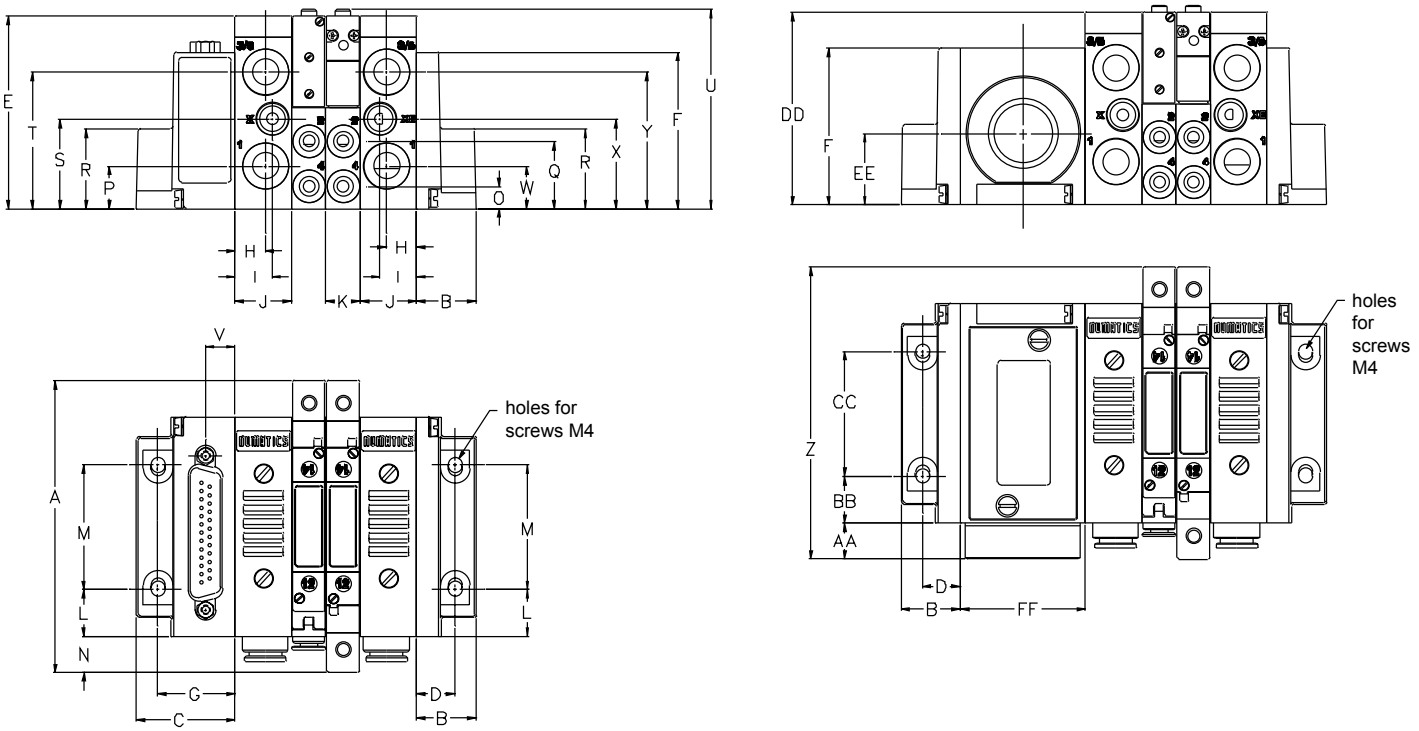
A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
16	49,3	20,6	8,1	6,6	7,9	6,4	42,7	81,3	43,2	9,9	3	16,3	66,5	7,6	17,3	9,4	7,9	18,3	4,1	11,2	22,4	5

Dimensions of valve series 2002 - manifold mounting with external wiring



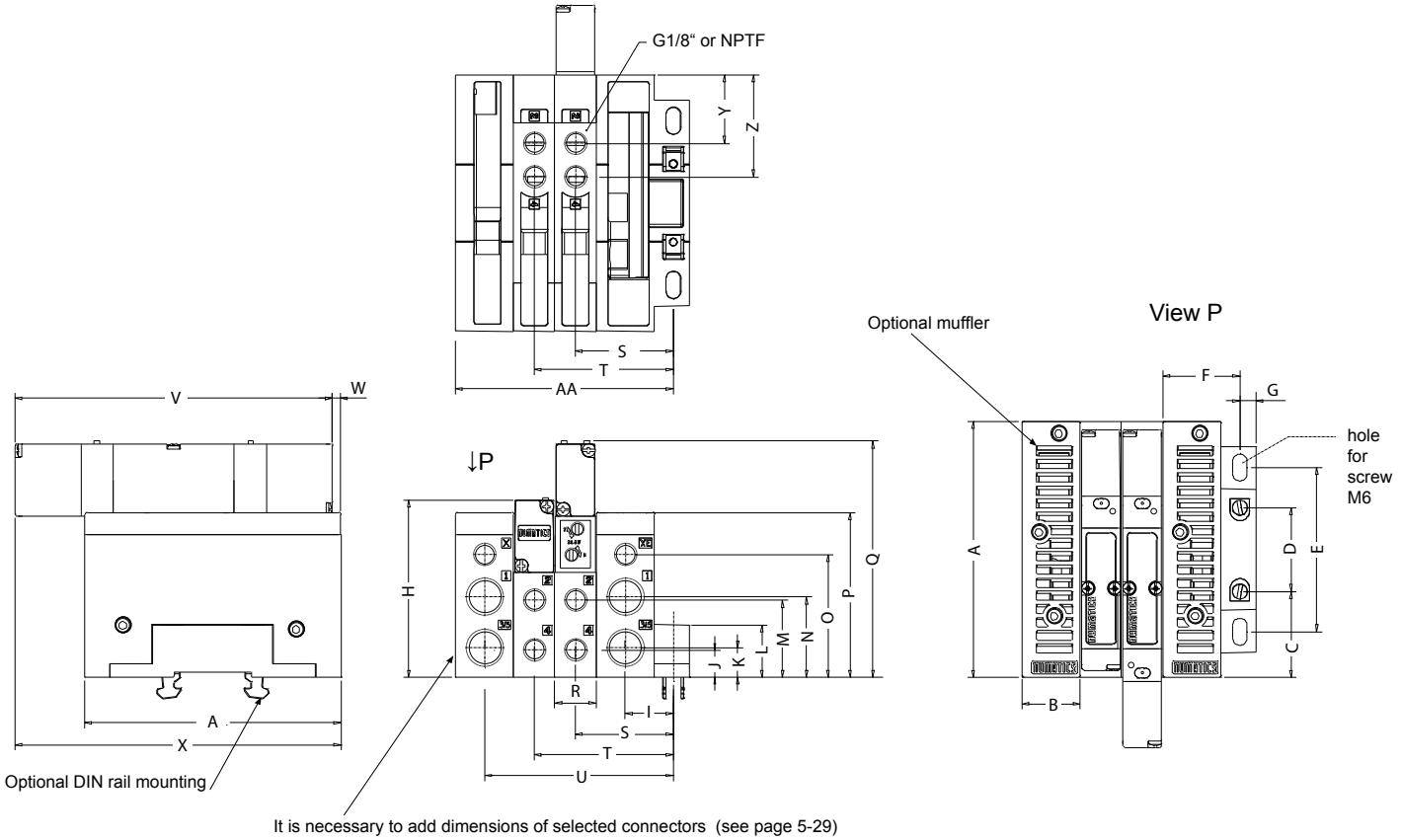
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
81,3	18	27,4	11,9	58,7	47,8	41,7	9,4	11,4	17,3	10,5	14,2	38,1	11,2	6,9	13	20,6	24,4	27,4

Dimensions of valve series 2002 - manifold mounting with internal wiring (plug-in)



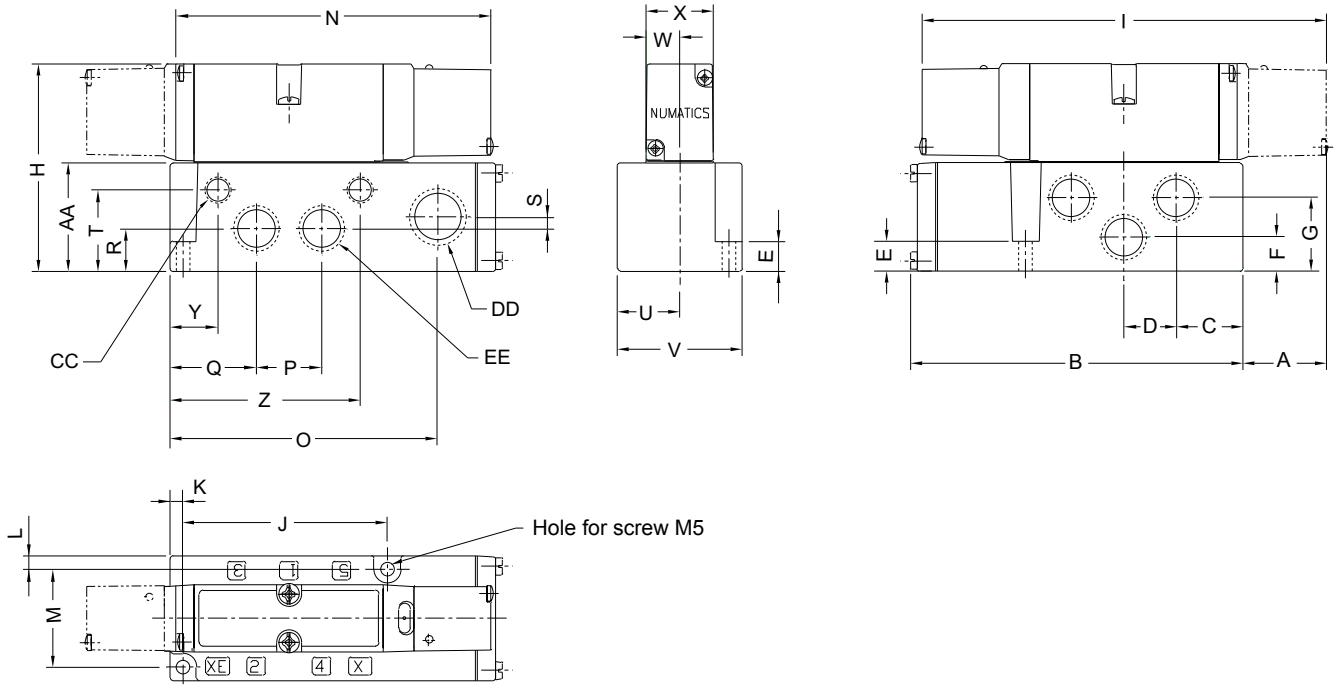
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
89,2	18	30	11,7	58,7	47,8	26,3	9,4	11,4	17,3	10,5	14,2	38,1	11,2	6,9	13	20,6	24,4	27,4	41,7	61	9,1	13	27,4	41,7	88,9	10,9	14,2	38,1	58,7	21,6	38,1

Dimensions of valve series 2005 - manifold mounting



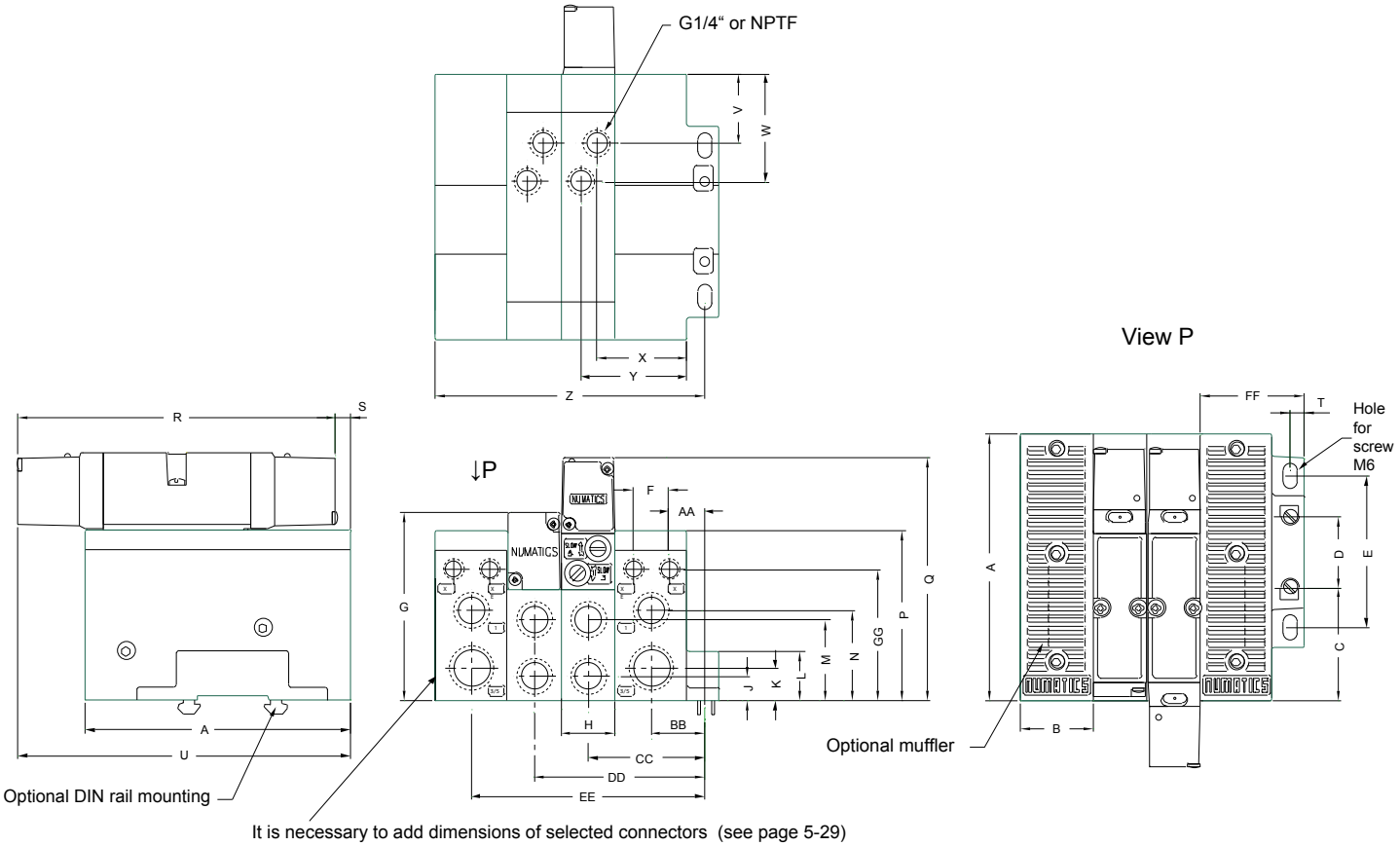
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
118,1	26,9	41,1	35,6	75,8	35,6	8,6	82,3	22,9	12,5	13,5	24,4	35,6	37	56,4	75,9	109,5	19	46,7	66,5	90,4	146,6	3,8	150,4	31,5	47	100,6

Dimensions of valve series 2012 - valves with individual base



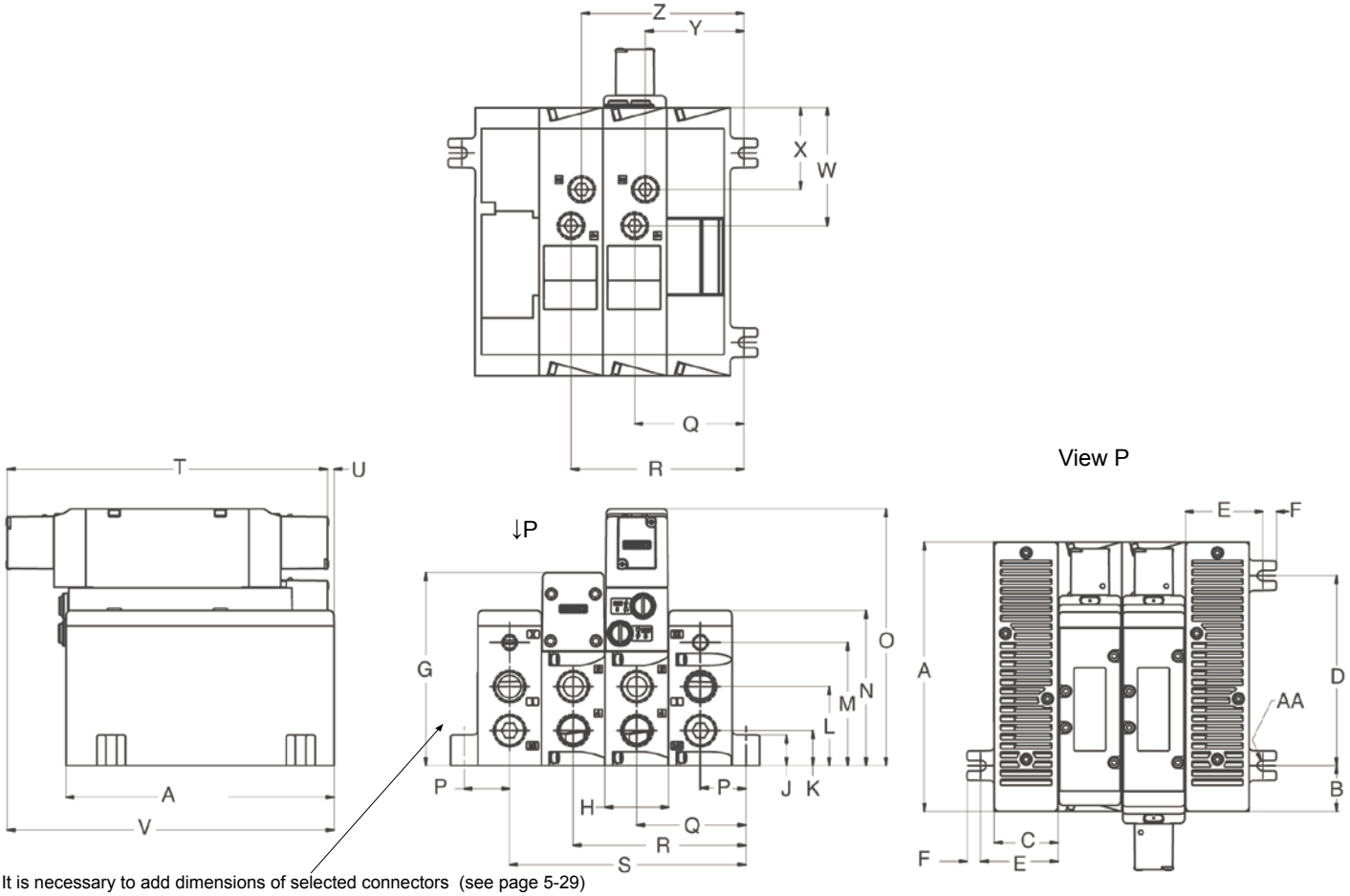
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD
32,3	130,6	26,2	20,6	11,7	13,5	29	81,5	159	80,3	5,1	5,3	38,4	127	105,2	25,4	33,8	16,5	4,6	31,8	24,6	49	13,2	26,4	17,7	74,7	42,4	3/8“	1/8“	1/2“

Dimensions of valve series 2012 - manifold mounting



A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG
133,3	36,1	54,9	38,1	76,8	18	94,2	26,9	11,9	16	24,6	40,4	45	85,1	121,9	159	7,6	7,4	166,6	36,1	53,8	45,2	53,3	134,6	17,8	26,7	58,2	85,1	115,6	52,1	65,3

Dimensions of valve series 2035 - manifold mounting

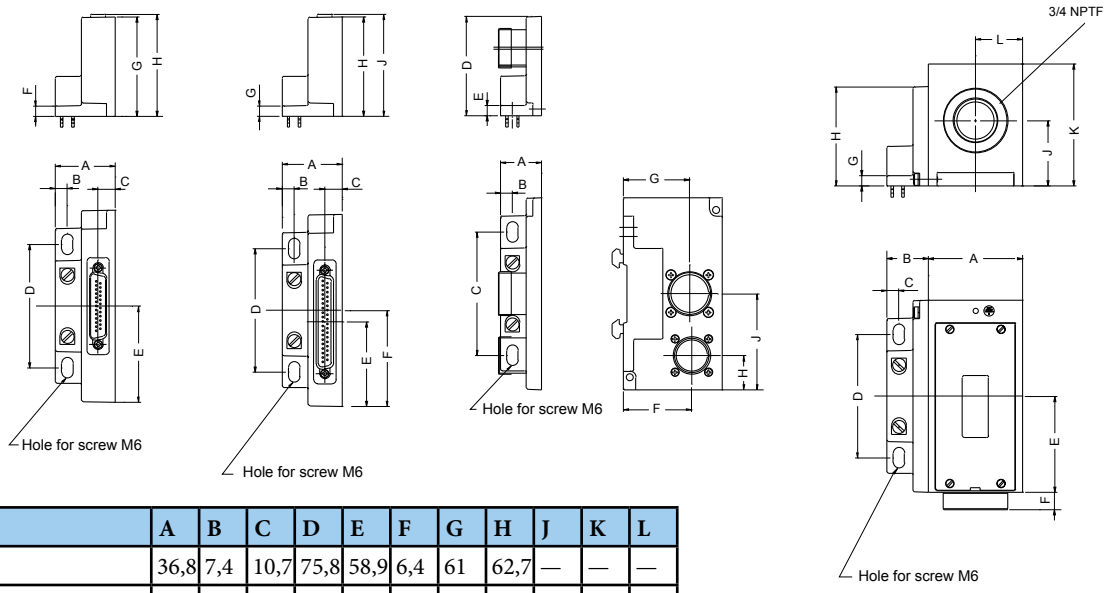


It is necessary to add dimensions of selected connectors (see page 5-29)

A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
177	30	42	125	51	9	127	42	20	23	52	81	102	169	30	72	114	156	211,3	4,4	215,6	78	54	65	72	3,5

Dimensions of connector plates for manifold assembly of valve series 2005,2012 and 2035

NAKJ **NAKM** **NAKP / NAKR / NAKS** **NAKF / NAKT**



Type	A	B	C	D	E	F	G	H	J	K	L
NAKJ...	36,8	7,4	10,7	75,8	58,9	6,4	61	62,7	—	—	—
NAKM..	36,8	7,4	10,7	75,8	51,8	58,9	6,4	61	62,7	—	—
NAKP... / NAKR... / NAKS...	25,4	7,4	75,8	61	6,4	42,2	40,9	20,8	58,9	—	—
NAKF.... / NAKT...	57,9	25,4	7,4	75,8	58,9	10,9	6,4	61	40,1	74,9	29

SOLENOID ACTUATED VALVES SERIES K

New 3/2 valve series, which successively replace valves series NAF. Product manufacture qualities are of course kept and new improvements as lower wattage, compact shape and not least also innovated design similar to valves series J are added. Valves are solenoid pilot actuated. Valves are offered with port threads G1/8“, G1/4“, G3/8“ and G1/2“.

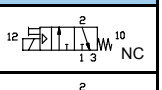
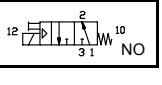
This valve series contains rubber gaskets.

Series	K11	K22	K33	K34
Ports	G1/8“	G1/4“	G3/8“	G1/2“
Connection of external pressure supply port	M4	M4	M5	M5
Flow capacity [Nl/min]	1000	1750	3700	4900
Working pressure [MPa]	0,18 to 1,0			
Pilot pressure range [MPa]	0,18 to 1,0			
Power input [W, VA]	2,5W for DC voltage, 3VA for AC voltage			
Response time for DC voltage [ms]	11 energize, 8 de-energize	11 energize, 9 de-energize	17 energize, 19 de-energize	17 energize, 19 de-energize
Response time for AC voltage [ms]	11 energize, 8 de-energize	11 energize, 9 de-energize	17 energize, 19 de-energize	17 energize, 19 de-energize
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +50			

Order codes

NK22 BAN 52 C G 60S 61

Size	
NK11	series K11 Thread G1/8“
NK22	series K22 thread G1/4“
NK33	series K33 thread G3/8“
NK34	series K34 thread G1/2“

Function	
BAN	 NC
BAP	 NO

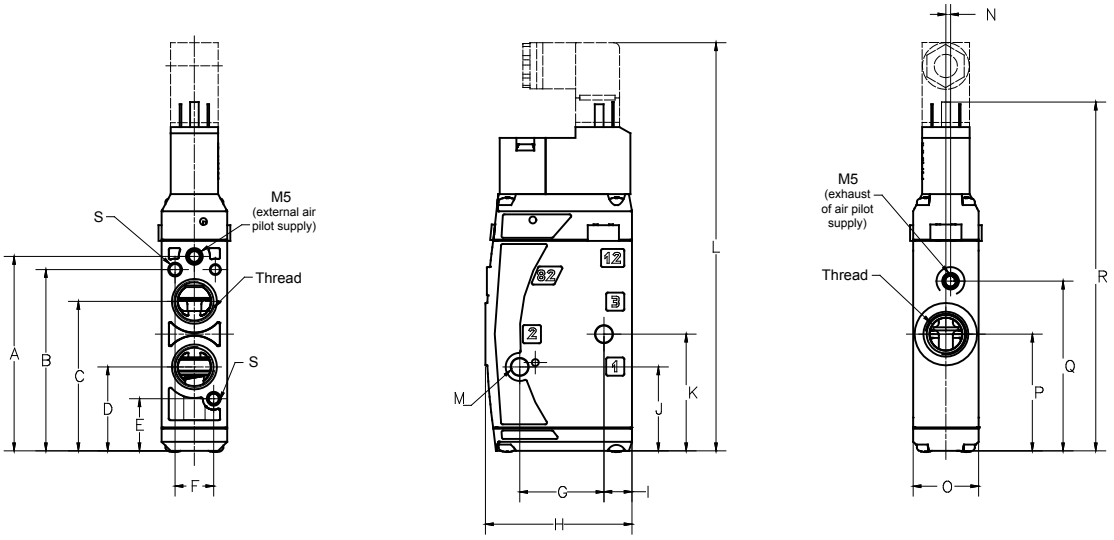
Coil type	
C	standard, for connector to DIN EN 175301-803 (formerly DIN 43650), type C, 8 mm pin size

Options	
60S	standard with non-locking manual override, 0,18 to 1,0 MPa
67W	solenoid with locking manual override, 0,18 to 1,0 MPa
000	low wattage coil 1W, with non-locking manual override, max. pressure 0,8 MPa
14A	option 000 with external pilot supply
67Y	option 60S with external pilot supply
68J	coil without manual override, 0,18 to 1,0 MPa

Voltage	
61	24 V DC ± 10%
40*	230 V AC ± 10% 50-60 Hz
30*	110 V AC ± 10% 50-60 Hz

*) This voltage is not available for coil for pressure up to 1,6 MPa

Dimensions of valve series K



Series	Thread	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	Weight [kg]
K11	G1/8“	50,1	44,4	36,1	19,9	11,6	10	25	47	11	20	28	120	4,7	2	16	28	45	103,6	M3	0,132
K22	G1/4“	62,3	58,1	47,9	26,9	16,7	12,4	27	47	9	26,9	37,4	133	5,8	1,5	21	37,4	54,4	116	M4	0,182
K33	G3/8“	86,7	79,2	622	34,2	17,2	18	35,5	68	16	34,2	79,2	162	6,9	5	30	49,7	77,2	144,3	M5	0,404
K34	G1/2“	86,7	79,2	62,2	34,2	17,2	18	35,5	68	16	34,2	79,2	162	6,9	5	30	49,7	77,2	144,3	M5	0,404

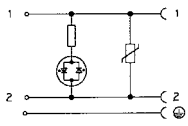
Coils for valve series K

Standard coils DIN EN 175301-803, form C, type 8

Order codes	Voltage	Type	Options (see options in order code of valve)	Weight [kg]
N236-570	24V DC	2,5 W, 1,0 MPa	60S	0,04
N237-1177	120V 50-60 Hz	3 VA, 1,0 MPa	60S	0,04
N237-1178	230V 50-60 Hz	3 VA, 1,0 MPa	60S	0,04
N236-575	24V DC	1 W, 0,8 MPa	000	0,04
N237-1182	120V 50-60 Hz	1,5 VA, 0,8 MPa	000	0,04
N237-1183	230V 50-60 Hz	1,5 VA, 0,8 MPa	000	0,04
N236-437	24V DC	2,5 W, 1,6 MPa	66V	0,04

Connector DIN EN 175301-803, form C, type 8 with cable grommet PG9

Order codes	Type	Voltage [V]	Wiring	Colour	Weight [kg]
N230-802	standard	up to 250	—	black	0,01
N230-803	with red LED and varistor	24	b	transparent	0,01
N230-804	with red LED and varistor	110 to 130	b	transparent	0,01



Wiring b

Conversion of internal to external air pilot supply of valve series K

External air pilot supply is used, when air supply pressure is lower than 0,18 MPa (1,8 bar) as well as for vacuum and or if another medium than compressed air is used. It is necessary to order valve which is already prepared for this feature or change standard setting (when air pilot supply is drawn from valve supply port 1) in that cases.

Picture 1
Position of gasket for internal pilot supply

Picture 2
Position of gasket for external pilot supply

When converting from internal to external pilot supply, please proceed as follows:
1) Unmount connector
2) Unscrew two screws, unmount solenoid, unscrew four screws of valve cap, take off the gasket and insert gasket as shown on picture 2
3) Check proper gasket settings, re-mount and fix the valve cap and then also solenoid and connector
4) The same operation must be proceed when valve is double solenoid
5) Connect modified compressed air supply with pressure 1 to 10 bars into the port marked 12 or 14, you can mount silencers into ports marked 82 and 8

SOLENOID ACTUATED VALVES
SERIES NAF

Series of poppet seat valves 2/2 and 3/2 with indirect actuating offers all functions which you need. Normally open as well as normally closed versions are available. Due to construction, these valves are reliable and offers maximal flow capacity.

This valve series contains rubber gaskets.

Ports	G1/8“	G1/4“	G3/8“	G1/2“	G3/4“	G1“	G1 1/2“
Flow capacity [Nl/min]	580	1100	1500	5400	6500	13500	35000
Working pressure [MPa]*	0,15 to 1,0	0,16 to 1,0	0,16 to 1,0	0,2 to 1,0	0,2 to 1,0	0,22 to 1,0	0,25 to 1,0
Power input for DC coils [W]	3,5			11			
Power input for AC coils [VA]	7,8 inrush, 5 hold			16 inrush, 10 hold			
Response time energize / de-energize [ms] NC	15 / 20	20 / 23	20 / 23	17 / 27	17 / 27	20 / 32	47 / 22
Response time energize / de-energize [ms] NO	15 / 20	15 / 20	15 / 20	30 / 22	30 / 22	28 / 23	55 / 20
Temperature range [°C]	medium temperature max. 60, ambient temperature -5 to +50						
Coil type	type 22	type 22	type 22	type A	type A	type A	type A

*) For vacuum, the NAG series is available - please contact our technical or sales dept. for more information.

Order codes

NAF25 100G 61

Size	
NAF25	series NAF

Function, port size		
000G	G1/8“	NC
010G	G1/8“	NO
100G	G1/4“	NC
110G	G1/4“	NO
200G	G3/8“	NC
210G	G3/8“	NO
300G	G1/2“	NC
310G	G1/2“	NO
320G	G1/2“	NC
400G	G3/4“	NC
410G	G3/4“	NO
420G	G3/4“	NC

Function, port size		
450G	G1“	NC
460G	G1“	NO
470G	G1“	NC
610G	G1 1/2“	NC
650G	G1 1/2“	NO
670G	G1 1/2“	NC

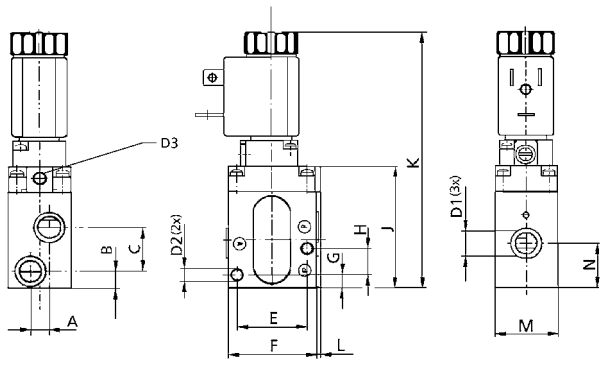
Voltage	
61	24 V DC ± 10%
40	230 V AC ± 10% 50-60 Hz
30	110 V AC ± 10% 50-60 Hz
20	24 V AC ± 10% 50-60 Hz

For connectors for valves see pages 5-36 and 5-37.

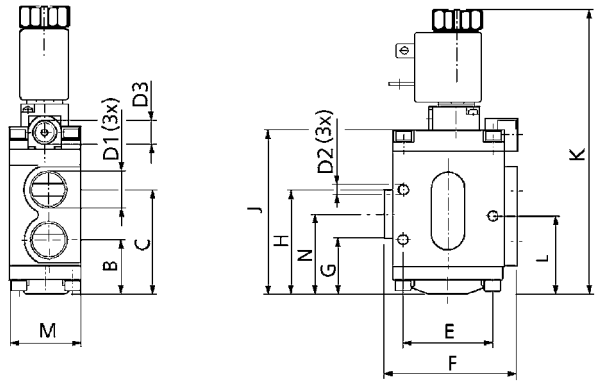
For vacuum, the NAG series is available - please contact our technical or sales dept. for more information.

Dimensions of valve series NAF

Port size G1/8“

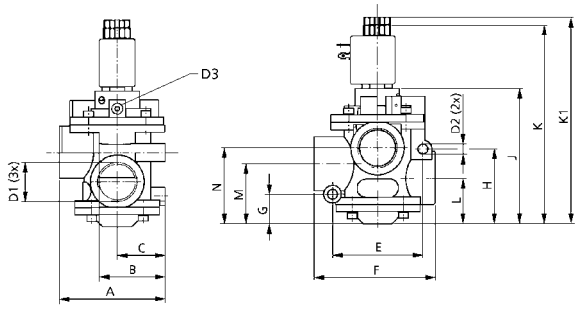


Port size G1/4“ and G3/8“

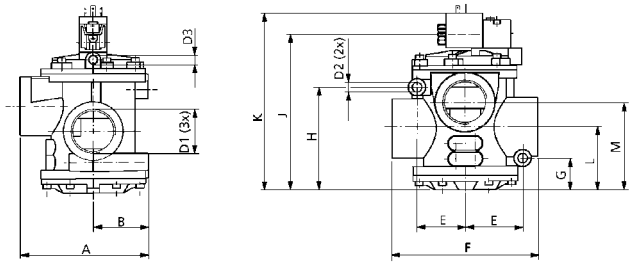


Port size	A	B	C	D1	D2	D3	E	F	G	H	J	K	L	M	N	Weight [kg]
G1/8“	7,5	7	17,5	G1/8“	4,5	G1/8“	28	36	5,3	10,5	48,5	102	1,9	25	17,8	0,25
G1/4“	—	24	47	G1/4“	4,5	G1/8“	40	60	25	47	74	129	35,5	32	36	0,58
G3/8“	—	24	47	G3/8“	4,5	G1/8“	40	60	25	47	74	129	35,5	32	36	0,56

Port size G1/2“ to G1“



Port size G1 1/2“



Port size	A	B	C	D1	D2	D3	E	F	G	H	J	K	K1	L	M	N	Weight [kg]
G1/2“	75	47	35	G1/2“	6,4	G1/8“	63	78,5	21	54,5	100	150	154	30	41	50,5	1,19
G3/4“	75	47	35	G3/4“	6,4	G1/8“	63	78,5	21	54,5	100	150	154	30	41	50,5	1,13
G1“	89	55	40	G1“	8,4	G1/8“	76	101	25,5	62,5	115	167	174	38	51	64	1,62
G1 1/2	138	59	—	G1 1/2“	10,8	G1/8“	51	158	34	113	170	192,5	—	68	96	—	2,27

Coils for valve series NAF

Order codes	Port size	Voltage	Connector type	Weight [kg]
NDA0051	G1/8“ to G3/8“	24V DC	type 22	0,06
NDA0106	G1/8“ to G3/8“	24V 50-60 Hz	type 22	0,06
NDA0108	G1/8“ to G3/8“	110V 50-60 Hz	type 22	0,06
NDA0124	G1/8“ to G3/8“	230V 50-60 Hz	type 22	0,06
NDB0502	G1/2“ to G1 1/2“	24V DC	type A	0,10
NDB0507	G1/2“ to G1 1/2“	24V 50-60 Hz	type A	0,10
NDB0509	G1/2“ to G1 1/2“	110V 50-60 Hz	type A	0,10
NDB0510	G1/2“ to G1 1/2“	230V 50-60 Hz	type A	0,10

SOLENOID ACTUATED VALVES
SERIES C13P

Small, direct actuated valve 3/2 normally closed, or with 2/2 function. Valve can be used as standalone or can be mounted together with other valves as manifold mounting. This manifold can be expanded at any time with no further parts - valves are mounted side by side. Valve is available for pressure up to 1,0 MPa as well as up to 1,6 MPa.

This valve series contains rubber gaskets.

Series	C13P
Ports	G1/8“ *
Flow capacity [Nl/min]	55
Working pressure [MPa]	vacuum to 1,0; or up to 1,6 according to type (see order code)
Power input for coil up to 1,0 MPa [W, VA]	2,7W for DC voltage, 5VA inrush and 4VA hold for AC voltage
Power input for coil up to 1,6 MPa [W, VA]	6,6W for DC voltage, 10,9VA inrush and 7,6VA hold for AC voltage
Temperature range [°C]	medium temperature max. 50, ambient temperature -20 to +80

*)Port 3 is covered by exhaust protection screw in standard. If you need to use port 3 for any other purposes than to exhaust into atmosphere, the metal nut (has to be ordered separately) must be used instead of exhaust protection screw. Then internal thread M5 in port 3 will be accessible.

Order codes

NC13P 1 2 0 1 0 3B 00 61

Number of valves	
NC13P	1 valve
NC23P	2 valves*
NC33P	3 valves*
NC43P	4 valves*
NC53P	5 valves*
NC63P	6 valves*
NC73P	7 valves*
NC83P	8 valves*
NC93P	9 valves*
NCA3P	10 valves*
NCB3P	11 valves*
NCC3P	12 valves*

*) Valves will be assembled as manifold mounting. This assembly can be disassembled or expanded at any time.

Coil type	
2	DIN 43650, form A, type 30, for pressure up to 1,0 MPa
1	DIN 43650, form A, type 30, for pressure up to 1,6 MPa

Options	
0	without manual override
1	with non-locking manual override
2	with locking manual override

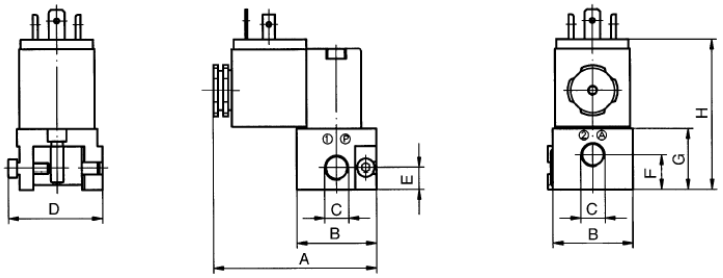
Function	
2B	
3B	

Voltage	
61	24 V DC ± 10%
40	230 V AC ± 10% 50-60 Hz
30	110 V AC ± 10% 50-60 Hz
20	24 V AC ± 10% 50-60 Hz

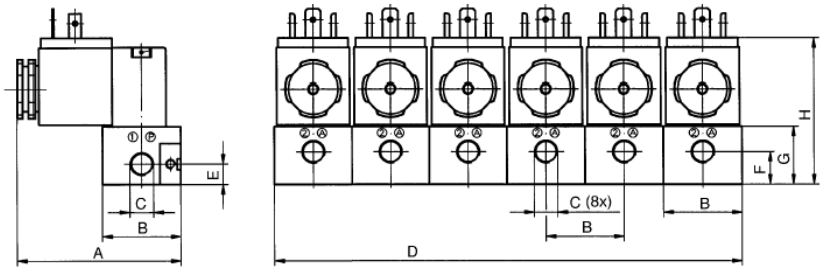
For connectors for valves see pages 5-36 and 5-37.

Dimensions of valve series C13P

Individual valve



Manifold assembly



Number of valves	A	B	C	D	E	F	G	H	Weight [kg]
1 valve	66	32	G1/8“	38	8,5	13,5	24	59,5	0,27
2 valves	66	32	G1/8“	64	8,5	13,5	24	59,5	0,54
3 valves	66	32	G1/8“	96	8,5	13,5	24	59,5	0,81
4 valves	66	32	G1/8“	128	8,5	13,5	24	59,5	1,08
5 valves	66	32	G1/8“	160	8,5	13,5	24	59,5	1,35
6 valves	66	32	G1/8“	192	8,5	13,5	24	59,5	1,62
7 valves	66	32	G1/8“	224	8,5	13,5	24	59,5	1,89
8 valves	66	32	G1/8“	256	8,5	13,5	24	59,5	2,16
9 valves	66	32	G1/8“	288	8,5	13,5	24	59,5	2,43
10 valves	66	32	G1/8“	320	8,5	13,5	24	59,5	2,70
11 valves	66	32	G1/8“	352	8,5	13,5	24	59,5	2,97
12 valves	66	32	G1/8“	384	8,5	13,5	24	59,5	3,24

Coils for valve series C13P

Coil DIN 43650, form A, type 30

Order codes	Voltage	Coil type*	Weight [kg]
N225-354	24V DC	2	0,10
N228-772	24V 50-60 Hz	2	0,10
N228-773	110V 50-60 Hz, 60V DC	2	0,10
N228-774	230V 50-60 Hz, 110V DC	2	0,10
N225-355+	24V DC 48V 50-60 Hz	1	0,10
N228-775+	24V 50-60 Hz 12V DC	1	0,10
N228-776+	110V 50-60 Hz, 60V DC	1	0,10
N228-777+	230V 50-60 Hz, 110V DC	1	0,10

Coils are for pressure up to 1,0 MPa
*) See coil type in order code of valve on page 5-34
+) These coils are for pressure up to 1,6 MPa when pilot pressure up to 1,6 MPa is used

Spare exhaust protection nut

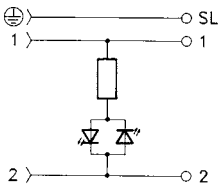
Order code	Weight [kg]
N125-1027	0,002

Standard conncector type 22 with cable grommet PG9

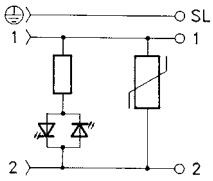
Order codes	Type	Voltage [V]	Wiring	Colour	Weight [kg]
N230-363	standard	up to 250	—	grey	0,02
N230-364	standard	up to 250	—	black	0,02
N230-391	with red LED	10 to 50	a	transparent	0,02
N230-392	with red LED and varistor	10 to 30	b	transparent	0,02
N230-393	with red LED	70 to 250	a	transparent	0,02
N230-394	with red LED and varistor	70 to 250	b	transparent	0,02
N230-401	with green LED	10 to 50	a	transparent	0,02
N230-400	with green LED and varistor	10 to 30	b	transparent	0,02
N230-402	with green LED	70 to 250	a	transparent	0,02
N230-403	with green LED and varistor	70 to 250	b	transparent	0,02

Wiring

Wiring a



Wiring b



Connector DIN 43650, form A, type 30 with cable grommet PG9

Order codes	Type	Voltage [V]	Wiring	Colour	Weight [kg]
N230-592	standard	up to 250	—	grey	0,02
N230-593	standard	up to 250	—	black	0,02
N230-582	with red LED	10 to 50	a	transparent	0,02
N230-567	with red LED and varistor	10 to 30	b	transparent	0,02
N230-584	with red LED	70 to 250	a	transparent	0,02
N230-585	with red LED and varistor	70 to 250	b	transparent	0,02
N230-586	with green LED	10 to 50	a	transparent	0,02
N230-587	with green LED and varistor	10 to 30	b	transparent	0,02
N230-588	with green LED	70 to 250	a	transparent	0,02
N230-589	with green LED and varistor	70 to 250	b	transparent	0,02

Connector DIN 43650, form B, type 22 with cable grommet PG9

Order codes	Type	Voltage [V]	Wiring	Colour	Weight [kg]
N230-467	standard	up to 250	—	grey	0,02
N230-468	standard	up to 250	—	black	0,02
N230-469	with yellow LED	10 to 50	a	transparent	0,02
N230-470	with yellow LED and varistor	10 to 30	b	transparent	0,02
N230-471	with yellow LED	70 to 250	a	transparent	0,02
N230-472	with yellow LED and varistor	70 to 250	b	transparent	0,02

Connector DIN EN 175301-803, form C, type 8 with cable grommet PG9

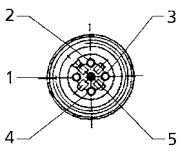
Order codes	Type	Voltage [V]	Wiring	Colour	Weight [kg]
N230-802	standard	up to 250	—	black	0,01
N230-803	with red LED and varistor	24	b	transparent	0,01
N230-804	with red LED and varistor	110 to 130	b	transparent	0,01

Connector M12

Order codes	Type	Weight [kg]
N230-957	straight	0,03
N230-956	elbow	0,03

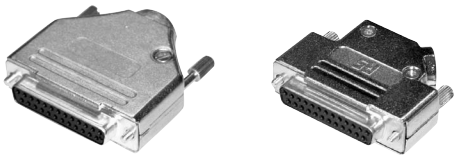
Pin	Meaning	Colour
2	RxD/TxD-N	green
4	RxD/TxD-P	red
5	shielding	

Pins 1 and 3 are not connected.



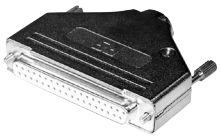
Connector 25 pin SUB-D

Order codes	Type
N230-733	straight cable outlet
N230-945	side cable outlet



Connector 37 pin SUB-D

Order codes	Type
N230-952	straight cable outlet



Connector 12 pin, round

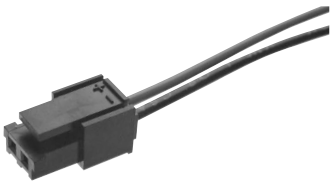
Order codes	Type
N230-960	straight cable outlet

Connector 26 pin, round

Order codes	Type
N230-742K	straight cable outlet

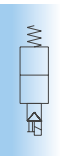
Plug connector with cable for valve series 2002

Order codes	Type
N230-443	straight, cable 0,3 m
N230-476	straight, cable 1,7 m
N230-486	straight, cable 3,0 m



All connectors may delivered with connected cable. Cable length may be arbitrary.

Wide range of connectors for electronic BUS systems is available on request



MECHANICALLY AND PNEUMATICALLY ACTUATED VALVES - CONTENTS

Manually actuated 3/2, 4/2, 5/2, 4/3 and 5/3 function valves

Mechanically actuated 3/2 and 5/2 function valves

Foot actuated 3/2, 4/2 and 5/2 function valves

Pneumatically actuated 3/2, 5/2 and 5/3 function valves

MANUALLY ACTUATED VALVES SERIES MVMB AND MVMC FOR PANEL MOUNTING

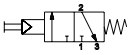
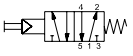
The new valve series, which replaces the old valve series for panel mounting with replaceable actuators. basic usable features are kept and brings some improvements such as bigger flow capacity, better accessibility and not least also better comfort during mounting and changing of actuators. Bigger actuators also brings the better user comfort during the actuating. The valves can be mounted into the panel with hole dia. 25 mm, or by using holes on the valve body. The big variability allows also changing of actuator anytime during operation - just turn off/on 2 screws on the side of valve and actuator is unlocked/locked.

This valve series contains rubber gaskets.

Series	MVMC 210	MVMB 220 3	MVMB 220 4
Ports	G1/8“	G1/4“	G1/4“ (G1/8“ for exhaust ports 3 and 5)
The way of actuation	direct	indirect (with pilot valve)	indirect (with pilot valve)
Actuating force at 0,6 MPa [N]	30	20	20
Flow capacity [Nl/min]	1050	1000	1000
Working pressure [MPa]	0 to 0,99	0,15 to 0,8	0,15 to 0,8
Weight [kg]	0,155	0,21	0,18
Temperature range [°C]	ambient temperature -5 to +60		

Order codes of valves

PMVM B2203

Function		
C2103		Series MVMC, thread G1/8“, 3/2 normally closed and opened
B2203		Series MVMB, thread G1/4“ 3/2 normally closed
B2204		Series MVMB, thread G1/4“ 5/2

Valve PMVMC2103 can be connected as normally open or normally closed. The air supply should be connected to the port marked NC or NO.

Order codes of actuators

PMVM BPPR

Function	
BPPB	push button black
BPPR	push button red
BPPG	push button green
BPBB	mushroom push button black
BPBR	mushroom push button red
BPBG	mushroom push button green
BEB	twist to release mushroom push button red
BTB	selector switch black
BLB	extended selector switch black
CR1	roller lever (only for PMVMC2103 valve)

BPPx

BPBx

BEB

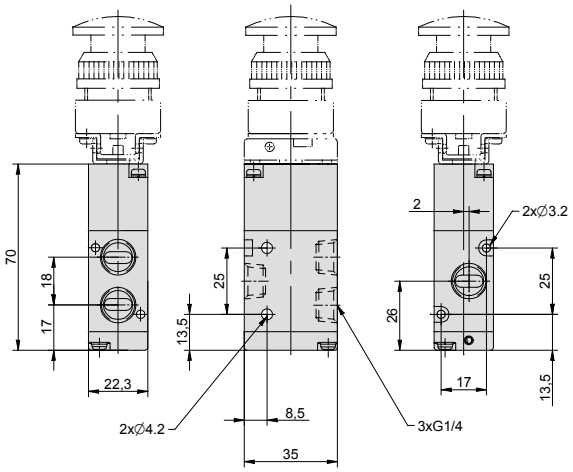
BTB

BLB

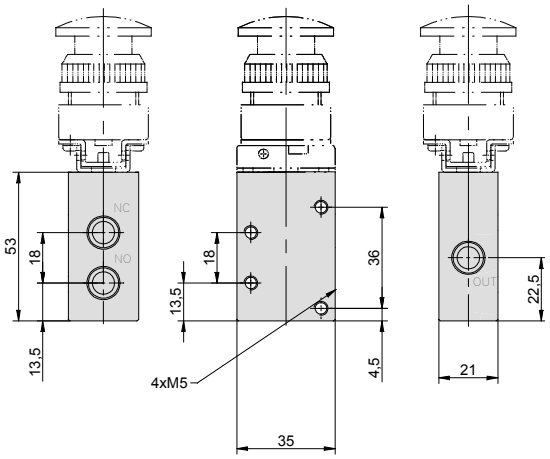
CR1

Dimensions

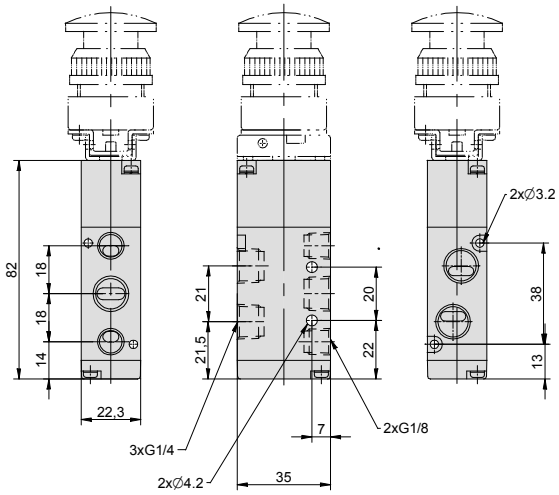
Type MVMB2203



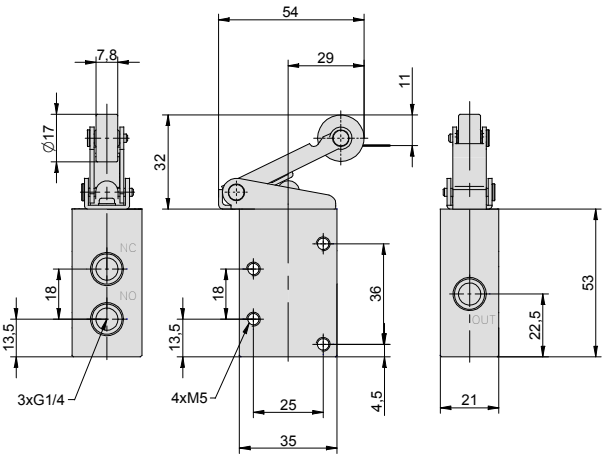
Type MVMC2103



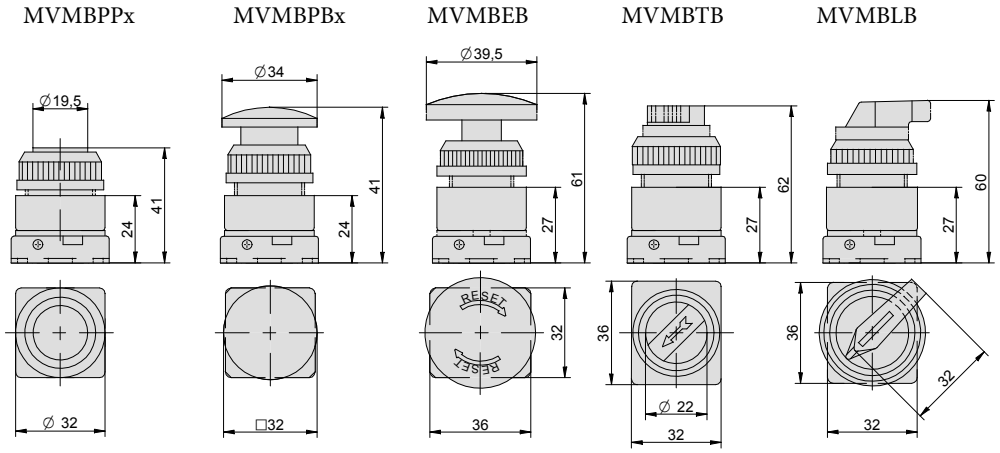
Type MVMB2204



Type MVMC2103 with PMVMCR1 roller lever actuator



Actuators



MANUALLY ACTUATED VALVES
SERIES MVHB WITH VERTICAL LEVER

Valves are available with or without detent as well as functions 5/2 and 5/3 with closed or exhausted centre. Valves can be mounted by using the holes on the valve body, type MVHB 220 can be also mounted into the panel with hole dia. 18,5 mm.

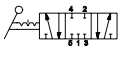
This valve series contains rubber gaskets.

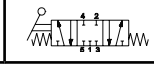
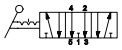
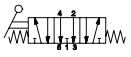
Series	MVHB 220	MVHB 500
Ports	G1/4“ (G1/8“ for exhaust ports 3 and 5)	G1/2“
Flow capacity [Nl/min]	1000, or 890 for 5/3 function	2270 for 5/2 and 5/3 function
Working pressure [MPa]	0 to 0,99	0 to 1,2
Weight [kg]	0,193, or 0,234 for 5/3 function	0,519, or 0,560 for 5/3 function
Temperature range [°C]	ambient temperature -5 to +60	

Order codes

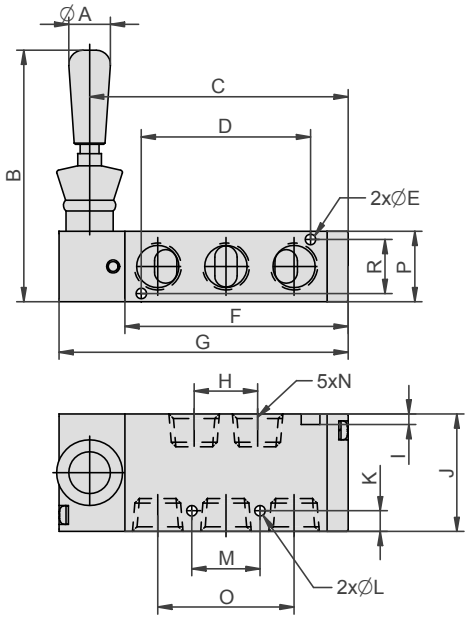
PMVHB 220 4TV SPM

Size	
220	series MVHB 220, thread G1/4“
500	series MVHB 500, thread G1/2“

Function		
M		5/2 with detent
SPM		5/2 without detent
CM		5/3 with detent, closed centre

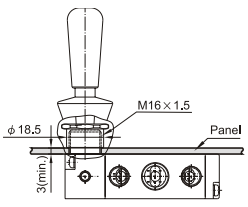
Function		
CSPM		5/3 without detent, closed centre
RM		5/3 with detent, exhausted centre
RSPM		5/3 without detent, exhausted centre

Dimensions



Series	Function	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R
220	M	18	95	67	—	—	57	77	21	—	35	7	4,2	20	G1/4“	36	22,3	—
	SPM	18	95	67	—	—	57	77	21	—	35	7	4,2	20	G1/4“	36	22,3	—
	CM, RM	18	95	74,5	—	—	59	85	21	—	35	7	4,2	20	G1/4“	36	22,3	—
	CSPM, RSPM	18	95	86,5	—	—	71	97	21	—	35	7	4,2	20	G1/4“	36	22,3	—
500	M	18	107	110	72	4,5	95	123	27	4,5	50	8,8	4,5	29	G1/2“	58	30	23
	SPM	18	107	129	72	4,5	114	142	27	4,5	50	8,8	4,5	29	G1/2“	58	30	23
	CM, RM	18	107	110	72	4,5	95	123	27	4,5	50	8,8	4,5	29	G1/2“	58	30	23
	CSPM, RSPM	18	107	129	72	4,5	114	142	27	4,5	50	8,8	4,5	29	G1/2“	58	30	23

Valves series MVHB 220 can be mounted into the panel or by holes in the valve body. Valves series MVHB 500 can be mounted only by holes in the valve body.



Valves are available with or without detent as well as functions 5/2 and 5/3 with closed or exhausted centre.

This valve series contains rubber gaskets.

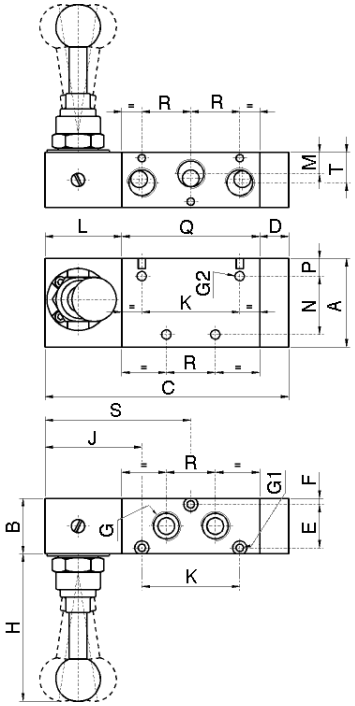
Type	Z22 5/2	Z22 5/3
Ports	G1/4“	
Flow capacity [Nl/min]	1000	
Working pressure [MPa]	0 to 1,0	
Temperature range [°C]	-10 to +60	
Working medium	modified compressed air	
Weight [kg]	0,31	0,38

Order codes

Type	5/2
Without detent	NZ22 VA45 2OG0 0000
With detent	NZ22 VD45 2OG0 0000

Type	5/3
Without detent, exhausted centre	NZ22 VA55 2OG0 0000
With detent, exhausted centre	NZ22 VD55 2OG0 0000
Without detent, closed centre	NZ22 VA65 2OG0 0000
With detent, closed centre	NZ22 VD65 2OG0 0000

Dimensions



Type	A	B	C	D	E	F	G	G1	G2	H	J	K	L
NZ22 Vx45 ...	40	25	109,5	13	19,6	2,7	G1/4“	3,3	4,2	67	43,5	44	34,5
NZ22 VAx5 ...	40	25	132,5	36	19,6	2,7	G1/4“	3,3	4,2	67	43,5	44	34,5
NZ22 VDx5 ...	40	25	109,5	13	19,6	2,7	G1/4“	3,3	4,2	67	43,5	44	34,5

Type	M	N	P	Q	R	S	T
NZ22 Vx45 ...	9,8	26,3	8	62	22	65,5	13,8
NZ22 VAx5 ...	9,8	26,3	8	62	22	65,5	13,8
NZ22 VDx5 ...	9,8	26,3	8	62	22	65,5	13,8

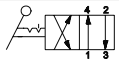
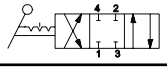
Valves are available with functions 4/2 and 4/3 with centre closed position, with detent positions.

This valve series contains rubber gaskets.

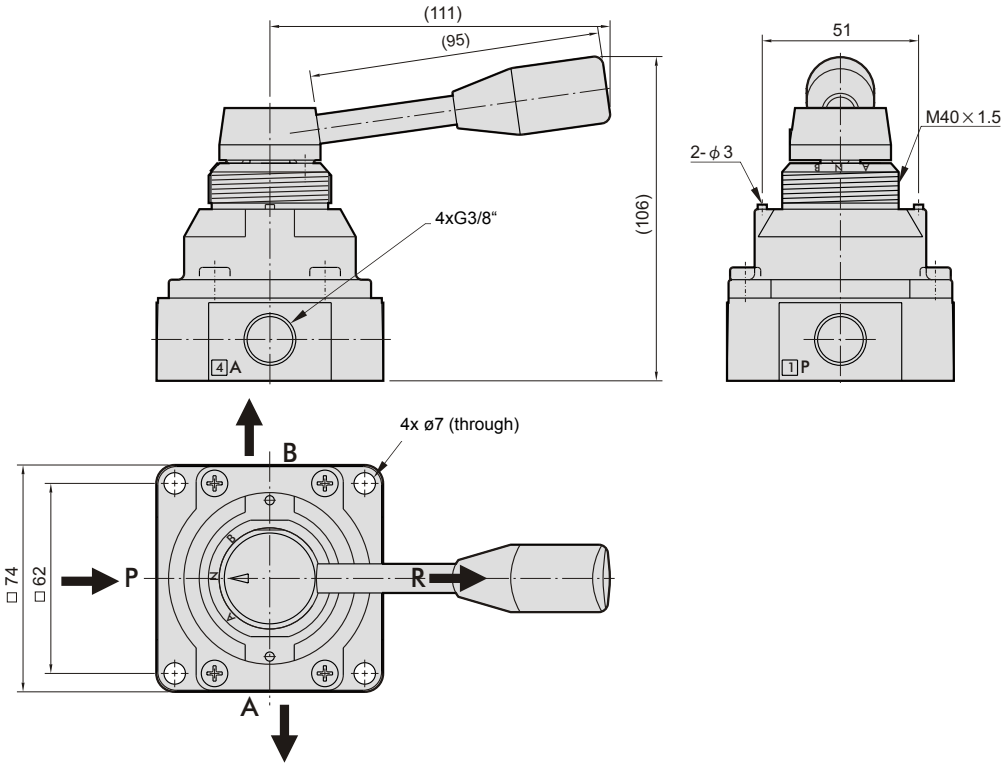
Series	MVHC 300
Ports	G3/8“
Flow capacity [Nl/min]	1100
Working pressure [MPa]	0 to 0,99
Weight [kg]	0,420
Temperature range [°C]	ambient temperature -5 to +60

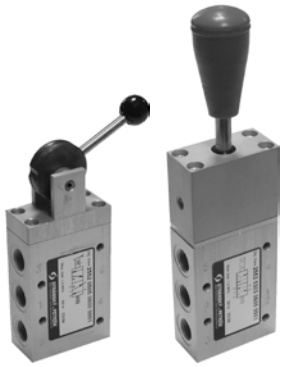
Order codes

PMVHC 302 4H

Function		
302		4/2
300		4/3 closed centre

Dimensions





Lever valves are actuated by 120° lever turning. Both positions are detent. Draw bar valves are actuated by pressing the draw bar. Return to starting position is by pulling of draw bar. If the draw bar is during pulling out rotated to right, the force which is need for overcome the detent will be lower. Draw bar valves can be produced from stainless steel on request.

This valve series contains rubber gaskets.

Ports	G1/4“
Flow capacity [Nl/min]	800
Working pressure [MPa]	0,2 to 1,0
The way of actuation	direct
Temperature range [°C]	-20 to +80
Working medium	modified compressed air
Weight [kg]	0,26 for 3/2 function, 0,32 for 5/2 function

Order codes

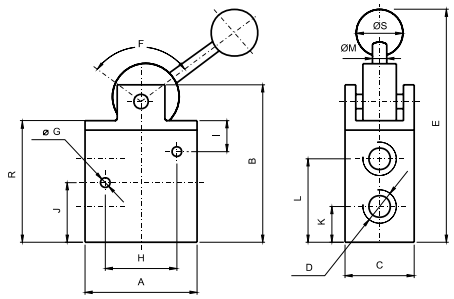
Ports	G1/4“
Lever valve 3/2	2532 0505 0600 0001
Lever valve 5/2	2552 0505 0600 0001

Ports	G1/4“	G1/4“ stainless steel
Draw bar valve 3/2	2532 0303 0600 0001	2532 0303 0600 0002
Draw bar valve 5/2	2552 0303 0600 0001	2552 0303 0600 0002

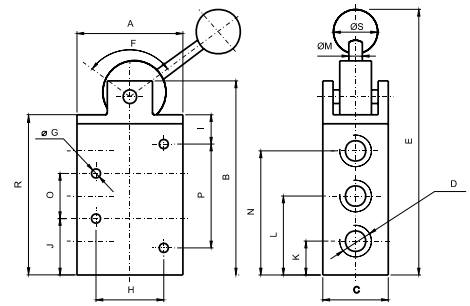
Dimensions

Lever valve series

Type 3/2



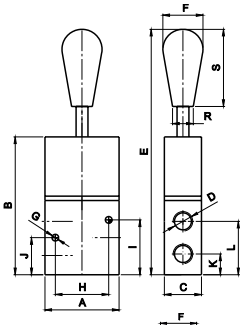
Type 5/2



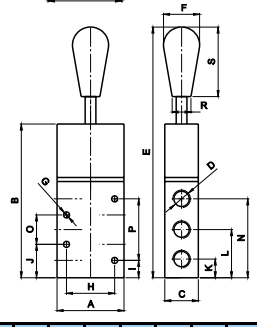
Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S
3/2	50	85	25	G1/4“	127	120	4,5	36	23	25	14	36	5	–	–	–	60	16
5/2	50	107	25	G1/4“	149	120	4,5	36	23	25	14	36	5	58	22	46	82	16

Draw bar valve series

Type 3/2

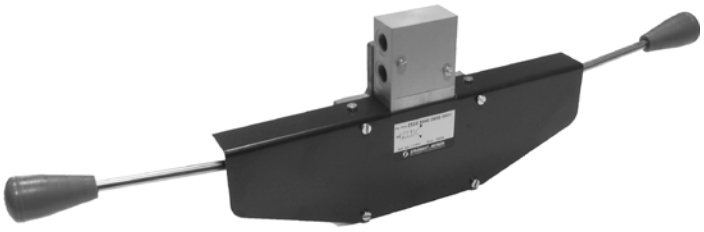


Type 5/2



Type	A	B	C	D	E	F	G	H	I	J	K	L	N	O	P	R	S
3/2	50	93	25	G1/4“	166	27	4,5	36	37	25	14	36	–	–	–	14	52
5/2	50	115	25	G1/4“	188	27	4,5	36	13	25	14	36	59	22	46	14	52

MANUALLY ACTUATED TWO HAND SAFETY VALVES



This safety valve is used in applications, where controlling by two hands at a time is necessary due to safety reasons (presses and etc.). Valve is actuated only when both levers are pressed together. If one lever will be pressed permanently, valve will not be actuated when the second lever will be pressed.

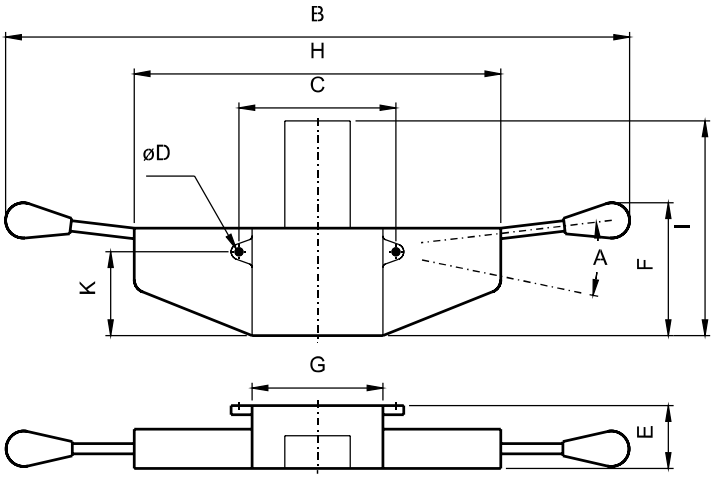
This valve series contains rubber gaskets.

Ports	G1/4“
Flow capacity [Nl/min]	800
Working pressure [MPa]	0,2 to 1,0
The way of actuation	direct
Temperature range [°C]	-20 to +80
Working medium	modified compressed air
Weight [kg]	1,28 for 3/2 function, 1,34 for 5/2 function

Order codes

Ports	G1/4“
Type 3/2 	2532 5090 0600 0001
Type 5/2 	2552 5090 0600 0001

Dimensions



Type	A	B	C	D	E	F	G	H	I	K
3/2	22	530	118	5,4	48	106	100	280	138	35
5/2	22	530	118	5,4	48	106	100	280	160	35

This valve is actuated by pressing down the stem at the axis direction. This valve is not replacement for roller lever valves, which are actuated by rolling the can from the side.

This valve series contains rubber gaskets.

Ports	G1/8“	G1/4“
Flow capacity [Nl/min]	500	800
Working pressure [MPa]	vacuum to 1,0	
Temperature range [°C]	-20 to +60	
Actuating force [N]	36	
Working medium	modified compressed air	
Weight [kg]	0,08 (3/2), 0,12 (5/2)	0,12 (3/2), 0,16 (5/2)

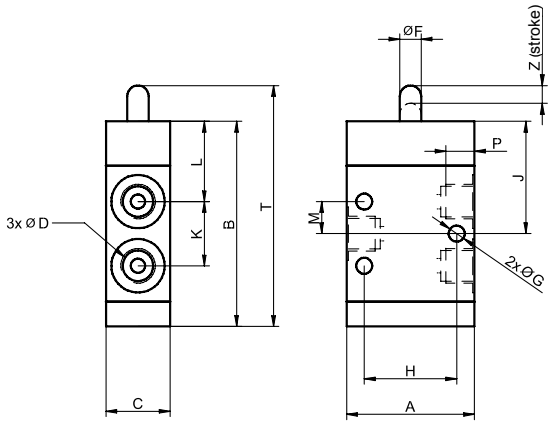
Order codes

Ports	G1/8“	G1/4“
Valve 3/2*	2532 3090 0400 0001	2532 3090 0600 0001
Valve 5/2	2552 3090 0400 0001	2552 3090 0600 0001

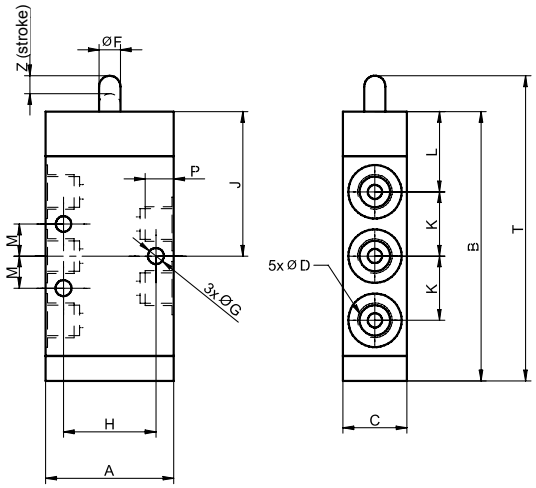
*) 3/2 valves can be used as normally opened as well as normally closed.

Dimensions

Valve 3/2



Valve 5/2



D-Ports	A	B	C	F	G	H	J	K	L	M	P	T	Z
G1/8“	36	58	18	6	4,5	26	32	18	23	9	8	68	5
G1/4“	40	65	20	6	4,5	26	35	22	24	11	9	75	5

D-Ports	A	B	C	F	G	H	J	K	L	M	P	T	Z
G1/8“	36	78	18	6	4,5	26	41	18	23	9	8	86	5
G1/4“	40	87	20	6	4,5	26	46	22	24	11	9	97	5

MECHANICALLY ACTUATED ROLLER LEVER VALVES

Valves are actuated by rolling the cam from the one or another side of the valve body. There are 3/2 normally closed and open and 5/2 valves available.

This valve series contains rubber gaskets.

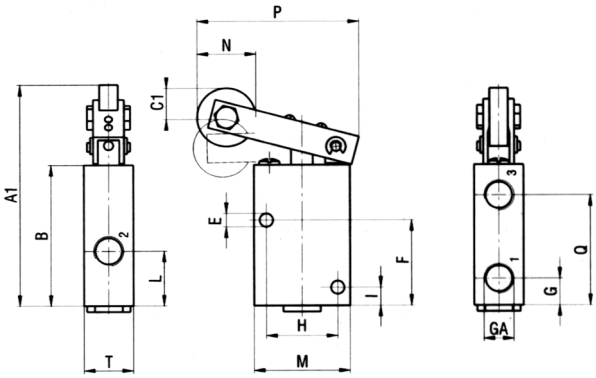
Ports	G1/8“	G1/4“
Flow capacity [Nl/min]	740 (3/2 NO), 815 (3/2 NC), 540 (5/2)	950 (3/2 NO i NC), 970 (5/2)
Working pressure [MPa]	0 to 1,0	
Temperature range [°C]	-5 to +70	
Actuating force [N]	23 (3/2), 15 (5/2)	35 (3/2), 24 (5/2)
Working medium	modified compressed air	
Weight [kg]	0,10 (3/2), 0,13 (5/2)	0,22 (3/2 i 5/2)

Order codes

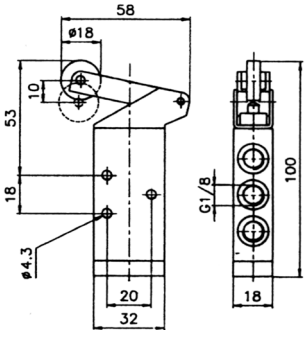
Ports	G1/8“	G1/4“
Valve 3/2 NC (normally closed) 	2532 2090 0400 0001	2532 2090 0600 0001
Valve 3/2 NO (normally open) 	2532 2090 0400 0003	2532 2090 0600 0003
Valve 5/2 	2552 2090 0400 0001	2552 2090 0600 0001

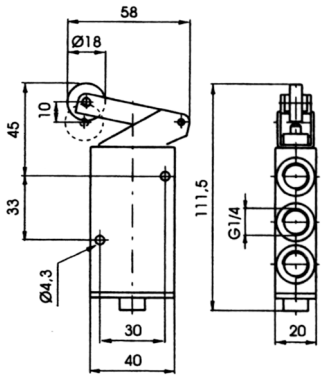
Dimensions

Valve 3/2



Valve 5/2

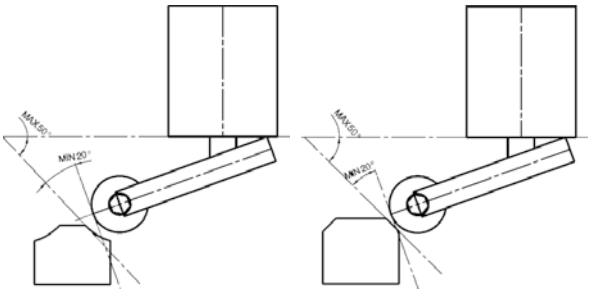




GA-Ports	A1	B	C1 min-max	E	F	G	H	I	L*	M	N	P	Q	T
G1/8“	72	46	5,5-10	4,3	28	8,8	23	6	23(18)	31	19	53	36	16
G1/4“	92	60	7,5-13,5	5,3	35	11,5	30	8	30(25,5)	40	26	69	46	20

*) Values before brackets are valid for NO version, values in brackets are valid for NC version.

Recommended actuations



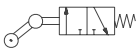
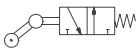
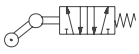
MECHANICALLY ACTUATED ROLLER LEVER VALVES WITH IDLE RETURN

Valves are actuated by rolling the cam from the one or another side of the valve body. The cam must go over the roller and release it. During the cam return, the roller will not activate the valve. Those valves are used in pneumatic controlled circuits and everywhere where only one signal about movement is necessary. There are 3/2 normally closed and open and 5/2 valves available.

This valve series contains rubber gaskets.

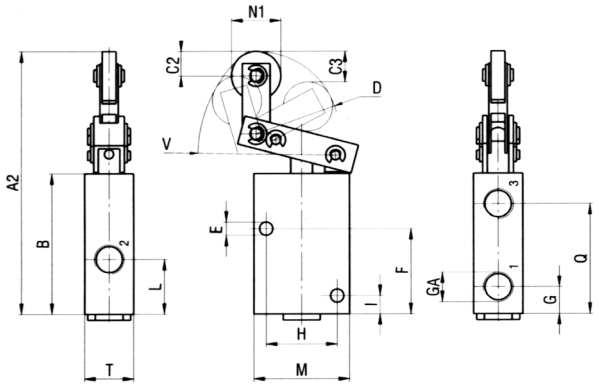
Ports	G1/8“	G1/4“
Flow capacity [Nl/min]	740 (3/2 NO), 815 (3/2 NC), 540 (5/2)	950 (3/2 NO i NC), 970 (5/2)
Working pressure [MPa]	0 to 1,0	
Temperature range [°C]	-5 to +70	
Actuating force [N]	30 (3/2), 15 (5/2)	53 (3/2), 24 (5/2)
Working medium	modified compressed air	
Weight [kg]	0,10 (3/2), 0,13 (5/2)	0,20 (3/2), 0,21 (5/2)

Order codes

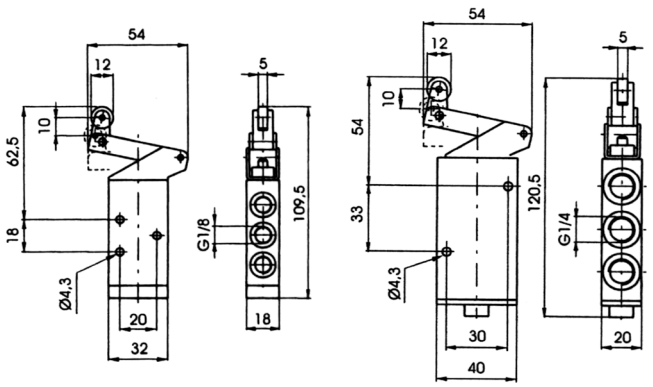
Ports	G1/8“	G1/4“
Valve 3/2 NC (normally closed) 	2532 2190 0400 0001	2532 2190 0600 0001
Valve 3/2 NO (normally open) 	2532 2190 0400 0003	2532 2190 0600 0003
Valve 5/2 	2552 2190 0400 0001	2552 2190 0600 0001

Dimensions

Valve 3/2



Valve 5/2



GA-Ports	A2	B	C2 min-max	C3	D	E	F	G	H	I	L*	M	N1	Q	T
G1/8“	88	46	5-8	10	27	4,3	28	8,8	23	6	23(18)	31	19	36	16
G1/4“	111	60	5-8	12	35	5,3	35	11,5	30	8	30(25,5)	40	26	46	20

*) Values before brackets are valid for NO version, values in brackets are valid for NC version.

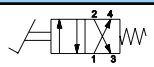
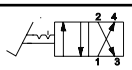
Valves without protecting cover are available with 4/2 function with or without detent.

This valve series contains rubber gaskets.

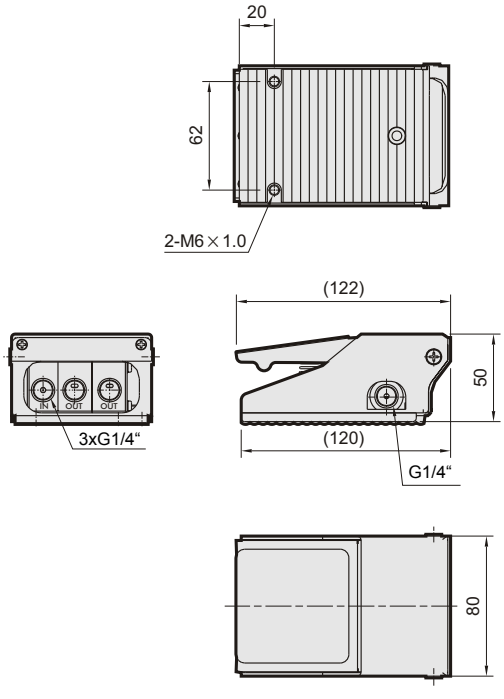
Series	MVFA 240
Ports	G1/4“
Flow capacity [Nl/min]	440
Working pressure [MPa]	0,2 to 0,7
Weight [kg]	0,774
Temperature range [°C]	ambient temperature -5 to +60

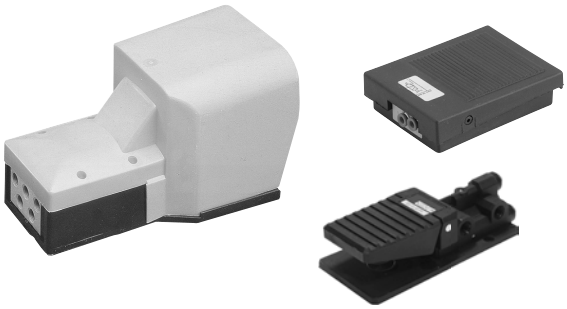
Order codes

PMVFA 240

Function		
240		4/2 without detent
240L		4/2 with detent

Dimensions





Valves are available with or without protecting cap. Protecting cap protect foot pedal to unwanted activating. Valves with protecting cap are available with or without detent in activated position. Valves without protecting cap are available only without detent.

This valve series contains rubber gaskets.

Type	3/2 without protecting cover	5/2 without protecting cover	5/2 with protecting cover
Ports	tube 4/2	tube 6/4; G1/8“ for exhausts (3,5)	G1/4“
Flow capacity [Nl/min]	100	540	600
Working pressure [MPa]	0,2 to 1,0		
Temperature range [°C]	-20 to +60		
Working medium	modified compressed air		
Weight [kg]	0,18	0,18	1,10

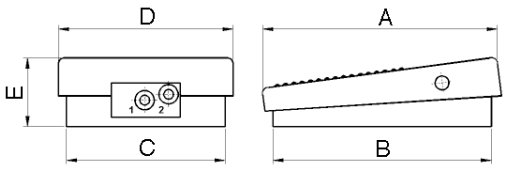
Order codes

Type	Order codes
Type 3/2 without protection cover, for tube 4/2	NZFD FA30 0OL0 0000
Type 5/2 without protection cover, for tube 6/4, exhaust ports G1/8“	2552 4090 3200 0001

Type	Order codes
Type 5/2 with protection cover, thread G1/4“	NZF2 FA40 0OG0 0000
Type 5/2 with protection cover with detent, thread G1/4“	NZF2 FD40 0OG0 0000

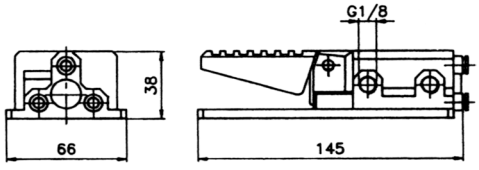
Dimensions

Type 3/2 without protecting cover

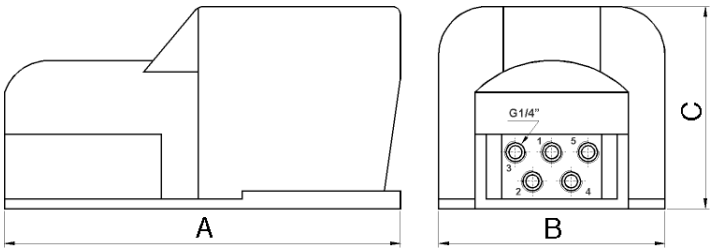


A	B	C	D	E
104	95	76	69	31

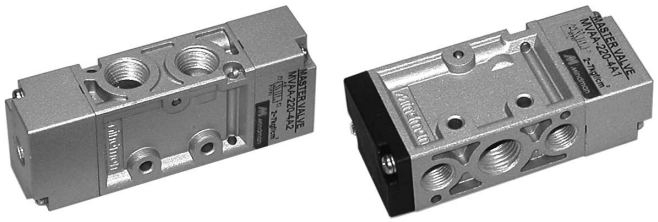
Type 5/2 without protecting cover



Type 5/2 with protecting cover



A	B	C
245	140	145



All functions like 3/2 normally close and open, 5/2 monostable and bistable and 5/3 with centre closed position are available.

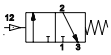
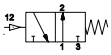
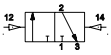
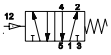
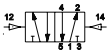
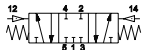
This valve series contains rubber gaskets.

Series	MVAA 220	MVAA 460
Ports	G1/4“ (G1/8“ for exhaust ports 3, 5 and for pilot)	G1/2“ (G1/8“ for pilot)
Flow capacity [Nl/min]	1000	2780
Working pressure [MPa]	0 to 0,8	
Pilot pressure [MPa]	0,2 to 0,7	
Weight [kg]	function 3A1: 0,122; 3A2: 0,134; 4A1: 0,106; 4A2: 0,134; 4A2C:0,179	function 4A1: 0,275; 4A2: 0.338; 4A2C: 0,500
Temperature range [°C]	ambient temperature -5 to +50	

Order codes

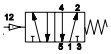
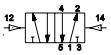
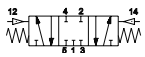
PMVAA 220 4A1

Size	
220	series MVAA 220, thread G1/4“

Function		
3A1C		3/2 normally closed
3A1O		3/2 normally open
3A2		3/2 bistable
4A1		5/2 monostable
4A2		5/2 bistable
4A2C		5/3 centre closed position

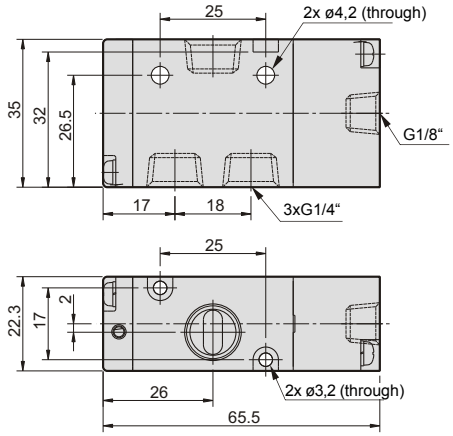
PMVAA 460 4A2

Size	
460	series MVAA 460, thread G1/2“

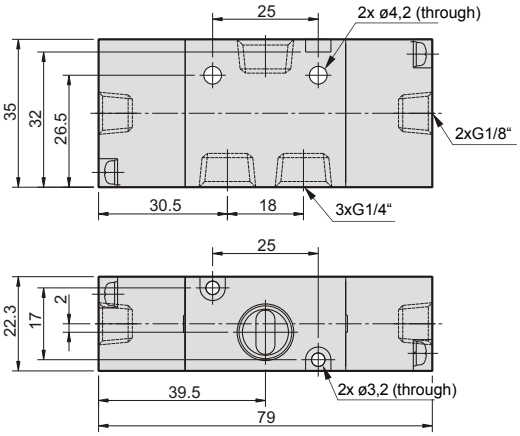
Function		
4A1		5/2 monostable
4A2		5/2 bistable
4A2C		5/3 centre closed position

Dimensions

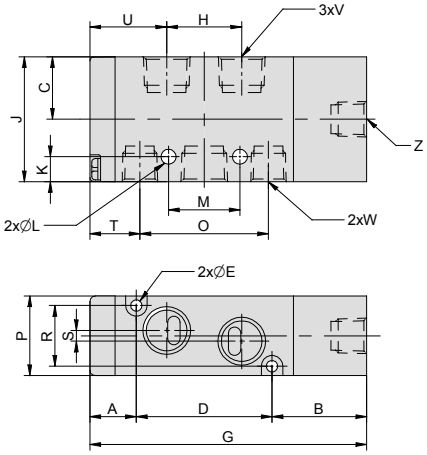
Type MVAA2203A1C and MVAA2203A1O:



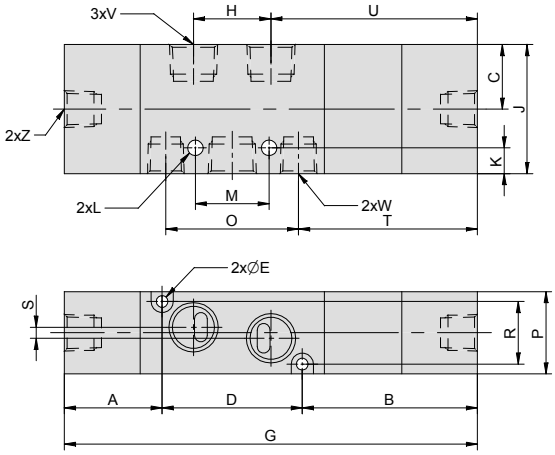
Type MVAA2203A2:



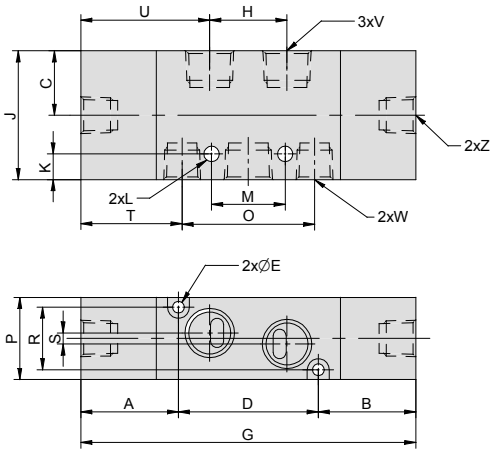
Type MVAA2204A1 and MVAA4604A1:



Type MVAA2204A2C and MVAA4604A2C:



Type MVAA2204A2 and MVAA4604A2:

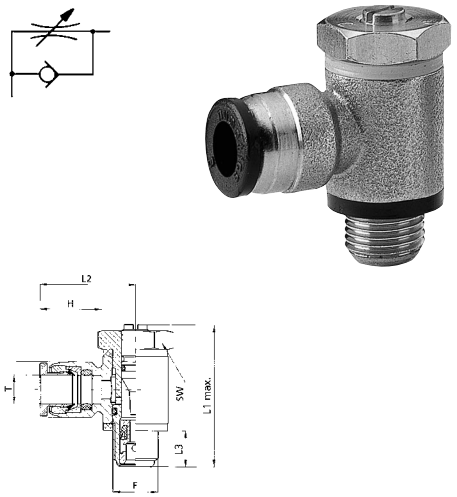


Series	Function	A	B	C	D	E	G	H	J	K	L	M
220	4A1	13	26,5	17,5	38	3,2	77,5	21	35	7	4,2	20
	4A2	26,5	26,5	17,5	38	3,2	91	21	35	7	4,2	20
	4A2C	26,5	47,5	17,5	38	3,2	112	21	35	7	4,2	20
460	4A1	15	31	6,2	72	4,5	118	27	46,4	7	4,5	29
	4A2	31	31	6,2	72	4,5	134	27	46,4	7	4,5	29
	4A2C	57,7	57,7	6,2	72	4,5	187,4	28	46,4	7	4,5	29

Series	Function	O	P	R	S	T	U	V	W	Z
220	4A1	36	22,3	17	3	14	21,5	G1/4“	G1/8“	G1/8“
	4A2	36	22,3	17	3	27,5	35	G1/4“	G1/8“	G1/8“
	4A2C	36	22,3	17	3	28,5	56	G1/4“	G1/8“	G1/8“
460	4A1	58	30	23	5	22	37	G1/2“	G1/2“	G1/8“
	4A2	58	30	23	5	38	53,5	G1/2“	G1/2“	G1/8“
	4A2C	58	30	23	4,5	64,5	79,7	G1/2“	G1/2“	G1/8“

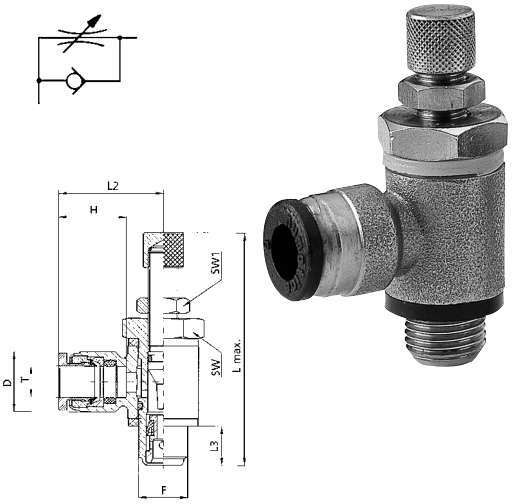
Unidirectional flow control valve - push-in, for cylinder use, for screw driver setting

Order codes	T - For tube	F - Thread	D	H	L1 max.	L2	L3	SW
N135C-004-005	4 / 2	M5	10	12,5	24,5	19	5,5	8
N135C-004-000	4 / 2	G1/8“	10	12,5	30	20,2	7	14
N135C-006-005	6 / 4	M5	12	13	24,5	20,6	5,5	8
N135C-006-000	6 / 4	G1/8“	12	13,5	30	20,6	7	14
N135C-006-001	6 / 4	G1/4“	12	13,5	36,5	22,6	9	17
N135C-008-000	8 / 6	G1/8“	15	16	30	23,8	7	14
N135C-008-001	8 / 6	G1/4“	15	16	35,6	25,8	9	17
N135C-008-002	8 / 6	G3/8“	15	16	41	30	9	19
N135C-010-001	10 / 8	G1/4“	18	17	36,5	27,1	9	17
N135C-010-002	10 / 8	G3/8“	18	17	41	31	9	19
N135C-012-001	12 / 10	G1/4“	20	19	36,5	31,5	9	17



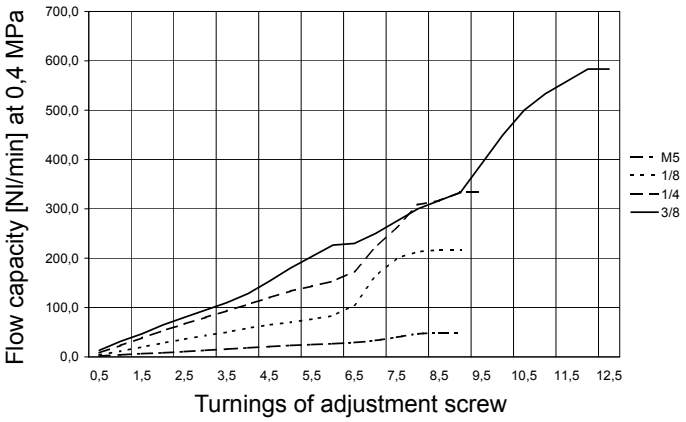
Unidirectional flow control valve - push-in, for cylinder use, with control knob setting

Order codes	T - For tube	F - Thread	D	H	L max.	L2	L3	SW	SW1
N136C-004-005	4 / 2	M5	10	12,5	35	19	5,5	8	6
N136C-004-000	4 / 2	G1/8“	10	12,5	45	20,2	7	14	9
N136C-006-005	6 / 4	M5	12	13	35	20,6	5,5	8	6
N136C-006-000	6 / 4	G1/8“	12	13,5	45	20,6	7	14	9
N136C-006-001	6 / 4	G1/4“	12	13,5	52	22,6	9	17	9
N136C-008-000	8 / 6	G1/8“	15	16	45	23,8	7	14	9
N136C-008-001	8 / 6	G1/4“	15	16	52	25,8	9	17	9
N136C-008-002	8 / 6	G3/8“	15	16	58	30	9	19	11
N136C-010-001	10 / 8	G1/4“	18	17	52	27,1	9	17	9
N136C-010-002	10 / 8	G3/8“	18	17	58	31	9	19	11
N136C-012-001	12 / 10	G1/4“	20	19	52	31,5	9	17	9



Working pressure	0,2 to 1,0 MPa
Temperature range	-20°C to +80°C
Working medium	modified compressed air

Flow capacity



Unidirectional flow control valve - plastic, push-in, for cylinder use, with control knob setting

∅ mm	Thread	Order codes
4	M5	P136C-004-005
4	G1/8“	P136C-004-000
4	G1/4“	P136C-004-001
6	M5	P136C-006-005
6	G1/8“	P136C-006-000
6	G1/4“	P136C-006-001
6	G3/8“	P136C-006-002
8	G1/8“	P136C-008-000
8	G1/4“	P136C-008-001
8	G3/8“	P136C-008-002
8	G1/2“	P136C-008-003
10	G1/4“	P136C-010-001
10	G3/8“	P136C-010-002

∅ mm	Thread	Order codes
10	G1/2“	P136C-010-003
12	G1/4“	P136C-012-001
12	G3/8“	P136C-012-002
12	G1/2“	P136C-012-003

Unidirectional flow control valve - internal/external threads, for cylinder use, for screw driver setting

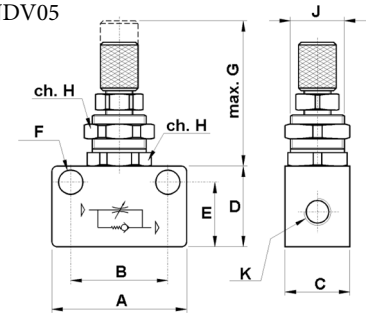
Order codes	Thread
N0FCRG	M5
N1FCRG	G1/8“
N2FCRG	G1/4“
N3FCRG	G3/8“
N4FCRG	G1/2“

Unidirectional flow control valve - dural, with internal threads, with control knob setting

Thread	Order codes	Max. flow* 1→2	Max. flow* 2→1
M5	NDRV05B	60	130
G1/8“	NDRV10	60	450
G1/4“	NDRV25	300	600
G3/8“	NDRV37	600	1100
G1/2“	NDRV50	600	1400
G3/4“	NDRV75B	4400	4400
G1“	NDRV100B	4400	4400

*) Max. flow at primary pressure 0,6 MPa and pressure difference 0,1 MPa

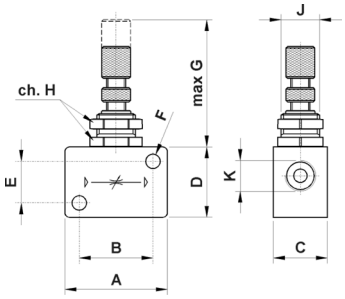
NDRV05B, NDV05



Bidirectional flow control valve - dural, with internal threads, with control knob setting

Thread	Order codes	Max. flow* 1→2	Max. flow* 2→1
M5	NDV05	60	130
G1/8“	NDV10	60	450
G1/4“	NDV25	300	600
G3/8“	NDV37	600	1100
G1/2“	NDV50	600	1400

*) Max. flow at primary pressure 0,6 MPa and pressure difference 0,1 MPa



NDRV10, NDV10 and bigger

A	B	C	D	E	F	G	H	J	K
25	18	12	15	12	4,5	27	11	M10x0,75	M5
32	23	16,8	22	13	4,5	35	15	M12x0,75	G1/8“
40	30	22	32	22	4,5	35	15	M12x0,75	G1/4“
56	43	27	42	27	6,5	43	24	M18x1	G3/8“
56	43	27	42	27	65	43	24	M18x1	G1/2“
94	76	34	68	65	7	75	32	M22x1,5	G3/4“
94	76	40	68	95	7	77	32	M22x1,5	G1“

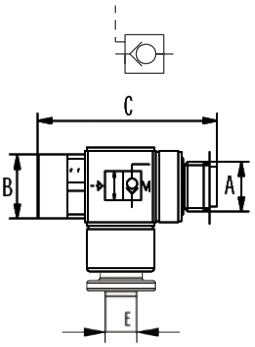
Unidirectional flow control valve - plastic, push-in, with control knob setting

For tube ∅ mm	Order codes
4	P139C-004-000
6	P139C-006-000
8	P139C-008-000
10	P139C-010-000
12	P139C-012-000

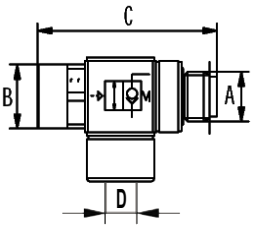
Working pressure	0,2 to 1,0 MPa
Temperature range	-20°C to +60°C
Working medium	modified compressed air

Non-return valve, controlled, elbow, push-in or internal threaded

Order codes	E - For tube	A - Thread	B (OK)	C	Max. tightening torque [Nm]	Pilot port thread
NCPPG-004-000	4 / 2	G1/8“	13	41	10	M5
NCPPG-006-000	6 / 4	G1/8“	13	41	10	M5
NCPPG-006-001	6 / 4	G1/4“	17	48	12	M5
NCPPG-008-000	8 / 6	G1/8“	13	41	10	M5
NCPPG-008-001	8 / 6	G1/4“	17	48	12	M5
NCPPG-008-002	8 / 6	G3/8“	22	55	20	M5
NCPPG-010-001	10 / 8	G1/4“	17	48	12	M5
NCPPG-010-002	10 / 8	G3/8“	22	55	20	M5

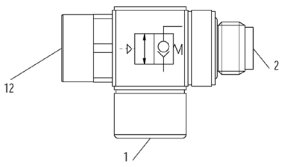


Order codes	D - Thread	A - Thread	B (OK)	C	Max. tightening torque [Nm]	Pilot port thread
NCPGG-000-000	G1/8“	G1/8“	13	41	10	M5
NCPGG-001-001	G1/4“	G1/4“	17	48	12	M5
NCPGG-002-002	G3/8“	G3/8“	22	55	20	M5
NCPGG-003-003	G1/2“	G1/2“	27	65,5	30	M5



Flow capacity

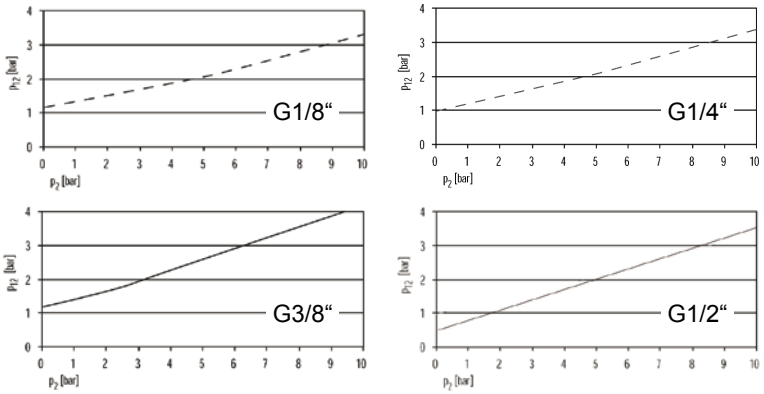
Thread	Flow capacity	
	1→2	2→1
G1/8“	289	128
G1/4“	676	617
G3/8“	1156	1168
G1/2“	1910	1888



Flow at p_1=0,5 MPa, p_2=0,6 MPa and p_{12}=0,6 MPa

Working pressure	0,1 to 1,0 MPa
Temperature range	-10°C to +70°C
Working medium	modified compressed air

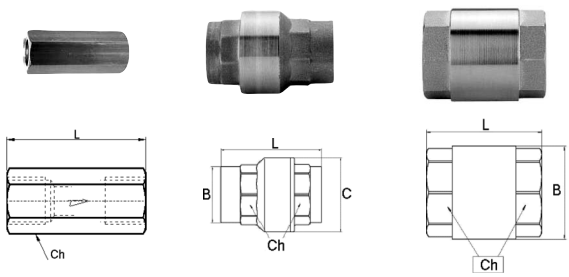
Min. signal pressure p_{12}



Non-return valve, uncontrolled

Order codes	Internal thread	L	B	C	Ch	Flow capacity [Nl/min]
NRV05	M5	25	—	—	8	100
NRV10	G1/8“	34	—	—	13	500
NRV25	G1/4“	39	—	—	16	900
NRV37	G3/8“	47	21,5	26,5	22	4290
NRV50	G1/2“	44,5	28	—	25	4290
NRV75	G3/4“	47,5	34,5	—	31	5720
NRV100	G1“	56	42	—	38	10340

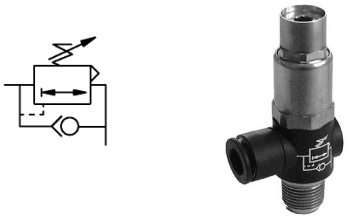
NRV05 to NRV25 | NRV37 | NRV50 to NRV100

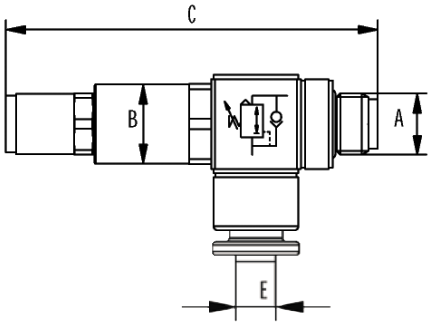


Working pressure	0,2 to 1,0 MPa (NRV05 to NRV25) 0 to 4,0 MPa (NRV37 to NRV75), 0 to 2,5 MPa (NRV100)
Temperature range	-10°C to +60°C (NRV05 to NRV25) -10°C to +100°C (NRV37 to NRV100)
Working medium	modified compressed air

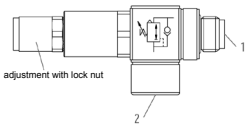
Unidirectional pressure regulators with push-in fitting

Order codes	E - For tube	A - Thread	B (OK)	C max.
NPRPG-004-000	4 / 2	G1/8“	17	73
NPRPG-006-000	6 / 4	G1/8“	17	73
NPRPG-006-001	6 / 4	G1/4“	17	81
NPRPG-008-000	8 / 6	G1/8“	17	73
NPRPG-008-001	8 / 6	G1/4“	17	81
NPRPG-008-002	8 / 6	G3/8“	22	88
NPRPG-010-001	10 / 8	G1/4“	17	81
NPRPG-010-002	10 / 12	G3/8“	22	88

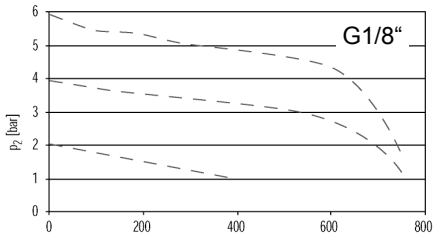


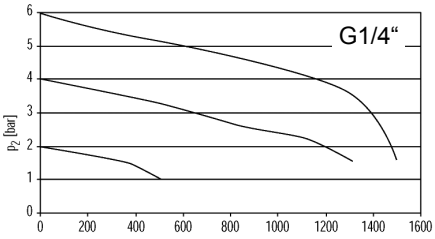


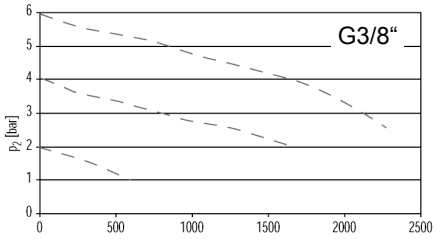
Primary pressure	0,1 to 1,6 MPa
Secondary pressure	0,1 to 0,8 MPa
Temperature range	-10°C to +70°C
Working medium	modified compressed air



Flow capacity 1→2 at p_1=0,7 MPa

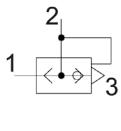




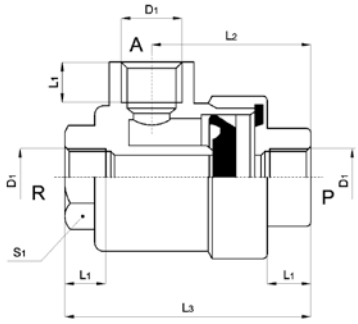


Quick exhaust valve

Order codes	D1 - Thread	L1	L2	L3	S1	Spare parts kit order code
NSEV05C	M5	5	16	25	10	NSEV05C-RK
NSEV10C	G1/8“	7,5	27	42	15	NSEV10C-RK
NSEV25C	G1/4“	11	35	54	19	NSEV25C-RK
NSEV37C	G3/8“	11	35	54	19	NSEV37C-RK
NSEV50C	G1/2“	14	45	72	26	NSEV50C-RK
NSEV75C	G3/4“	16,3	53	87	32	NSEV75C-RK
NSEV100C	G1“	18	70	108	46	NSEV100C-RK



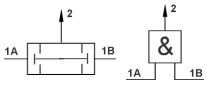
Spare parts kit:



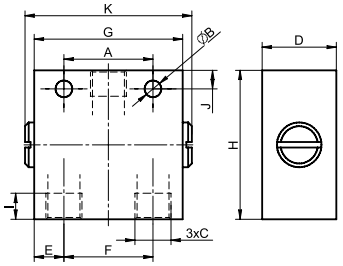
Working pressure	0,1 to 1,0 MPa
Temperature range	-20°C to +70°C
Working medium	modified compressed air

Logical gate AND (production)

Order codes	C-Thread	A	B	D	E	F	G	H	I	J	K	Weight [kg]
2760 0100 0400 0000	G1/8“	24	4,5	20	8	24	40	35	7	5	45	0,12

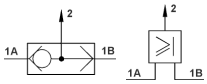


Working pressure	0,2 to 1,0 MPa
Temperature range	-20°C to +80°C
Working medium	modified compressed air

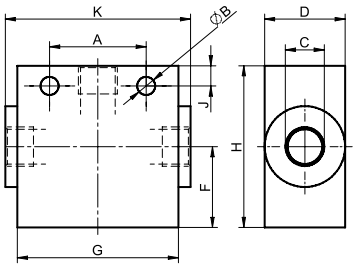


Logical gate OR (sum)

Order codes	C-Thread	A	B	D	F	G	H	I	J	K	Weight [kg]
2760 0200 0400 0000	G1/8“	24	4,5	20	20	40	40	7	5	45	0,12



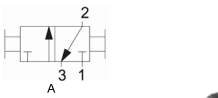
Working pressure	0,2 to 1,0 MPa
Temperature range	-20°C to +80°C
Working medium	modified compressed air

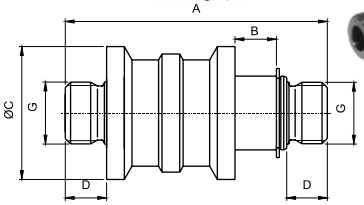


Manually operated slide valves with external threads

Order codes	G - Thread	A	B	C	D	Weight [kg]
2740 3200 1006 0600	G1/4“	71	10	24	10	0,09
2740 3200 1008 0800	G3/8“	87	12	34	10	0,20
2740 3200 1010 1000	G1/2“	89	14	45	14	0,26

Working pressure, temperature and medium see below

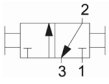


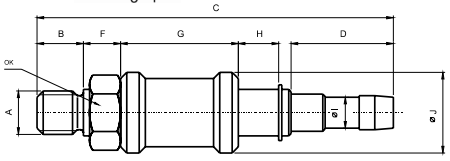


Manually operated slide valves with external thread and tube socket

Order codes	A - Thread	B	C	D	F	G	H	I	J	OK	Weight [kg]
2740 3200 2006 3300	G1/4“	10	77	21	6	27	10	8	24	17	0,08

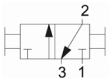
Working pressure, temperature and medium see below

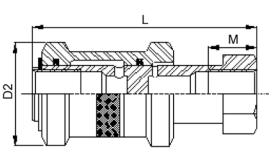




Manually operated slide valves with internal threads

Order codes	G - Thread	Js	D2	M	L	OK	Flow capacity [Nl/min]
N530-000	G1/8“	4	25	12	48	14	700
N530-001	G1/4“	7	35	12	58	19	1100
N530-002	G3/8“	10	38	12	68	22	1500
N530-003	G1/2“	15	48	15	88	27	2200

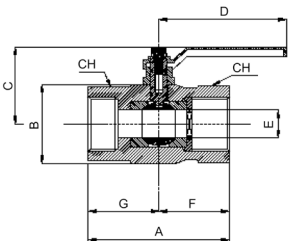




Working pressure	0 to 1,0 MPa (2740...), 0 to 1,6 MPa (N530)
Temperature range	-10°C to +80°C
Working medium	modified compressed air

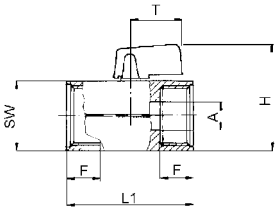
Standard ball valve

Order codes	Thread	A	B	C	D	E	F	G	CH
NKHI25	G1/4“	51	25,5	40	80	10	25,5	25,5	18
NKHI37	G3/8“	60	25,5	40	80	10	30	30	21
NKHI50	G1/2“	75	32,5	50	89	15	37,5	37,5	25
NKHI75	G3/4“	80	42	59	113	20	40	40	31
NKHI100	G1“	90	49,5	63	113	25	45	45	40
NKHI125	G1 1/4“	110	59,5	77	138	32	55	55	49
NKHI150	G1 1/2“	120	72	91	158	40	60	60	54
NKHI200	G2“	140	86	97	158	50	70	70	68,5



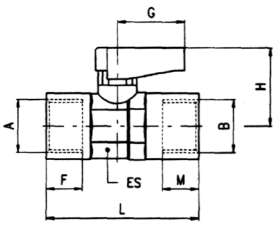
Medium ball valve

Order codes	Thread	A	F	H	L1	SW	T
NKMI10	G1/8“	6	9	38	39	21	22
NKMI25	G1/4“	8	9	38	39	21	22
NKMI37	G3/8“	8	9	38	42	21	22
NKMI50	G1/2“	10	10,5	42	47	25	22
NKMI75	G3/4“	12	10,5	46	54	30	22



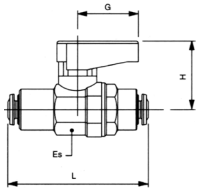
Small ball valve

Order codes	Thread A,B	ES	F	M	L	G	H
NKMI10-01	G1/8“	14-15	7,4	7,4	36	19	21
NKMI25-01	G1/4“	14-15	11	11	43	19	21
NKMI37-01	G3/8“	18-19	11,4	11,4	47	19	22
NKMI50-01	G1/2“	22-23	15	15	59	26	30,5
NKMI75-01	G3/4“	28-30	16,3	16,3	67	26	33



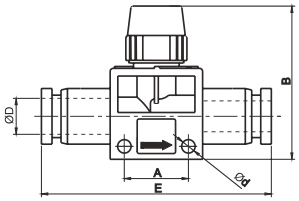
Small ball valve with push-in fittings

Order codes	For tube	Es	L	G	H
NKMI-004	4 / 2	15	44	19	21
NKMI-006	6 / 4	15	48	19	21
NKMI-008	8 / 6	15	48	19	21



Plastic ball valve with push-in fittings and mounting holes

Order codes	For tube D	A	B	d	E
P140-006-000	6 / 4	16,5	41,5	4,2	51,6
P140-008-000	8 / 6	16,5	41,5	4,2	52,6
P140-010-000	10 / 8	21,5	46	4,2	64,1
P140-012-000	12 / 9, 12 / 10	21,5	46	4,2	64,4



Working pressure	0 to 1,5 MPa (NKMI), 0 to 2,5 MPa (NKHI) 0 to 1,0 MPa (P140)
Temperature range	-10°C to +90°C (up to +60°C with push-in fittings)
Working medium	modified compressed air, oil, water

Series MACP, MACC and MAR

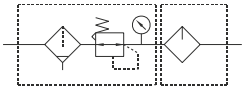
Series FlexiBlok®

Series HF50

Accessories

FRL AIR PREPARATION UNIT
SERIES MACP

The new FRL unit series is interest for its robust metal construction inclusive metal bowls with level indicator at first sight. Countersunk gauge isn't predisposed to damage. These accessible units with good flow capacity and 40 µm filter element will find exercise in and many application, where isn't necessary to use elements of modular series FlexiBlok.



Port thread	G1/4“	G3/8“	G1/2“
Primary pressure [MPa]	0,1 to 1,5		
Secondary pressure [MPa]	0,1 to 0,85		
Test pressure [MPa]	2,0		
Temperature range [°C]	-5 to +60		
Filter element [µm]	40		
Oil bowl capacity [l]	0,2		
Min. lubricator flow [Nl/min]	30	65	80
Weight [kg]	1,52		
Supply contain	gauge, bracket (elbow)		

Order codes

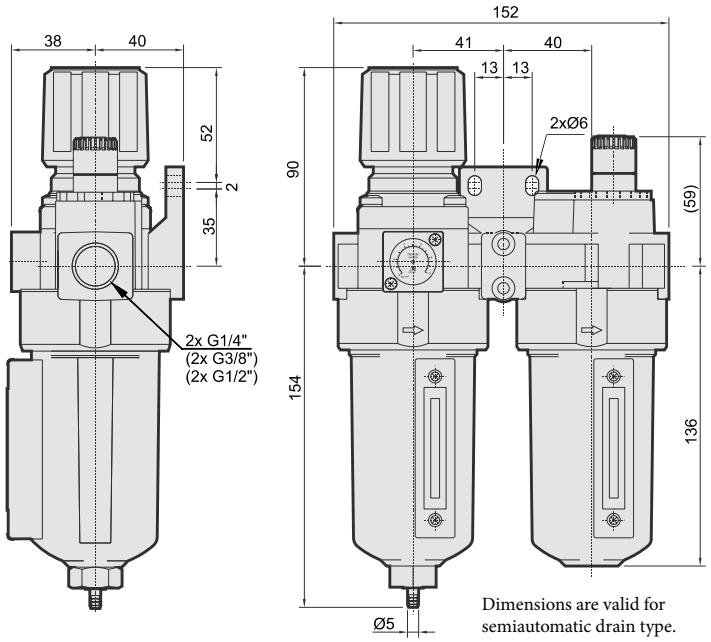
PMACP401-8A – BSP

Port size	
8A	G1/4“
10A	G3/8“
15A	G1/2“

Condensation draining	
–	semiautomatic
D	automatic

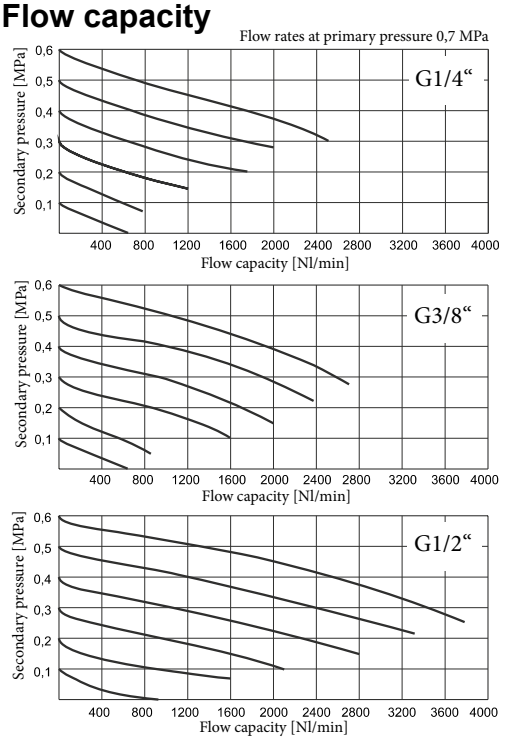
Automatic drain is also available separately incl. filter bowl with order code PMACP401-D

Dimensions

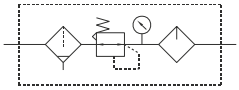


Dimensions are valid for semiautomatic drain type.

Flow capacity



This compact unit is full-featured FRL unit which consist of filter, regulator and lubricator. Is is effectively designed to reach good parameters at all-in-one design. This accessible unit will can be used everywhere, where is necessary to save the place.



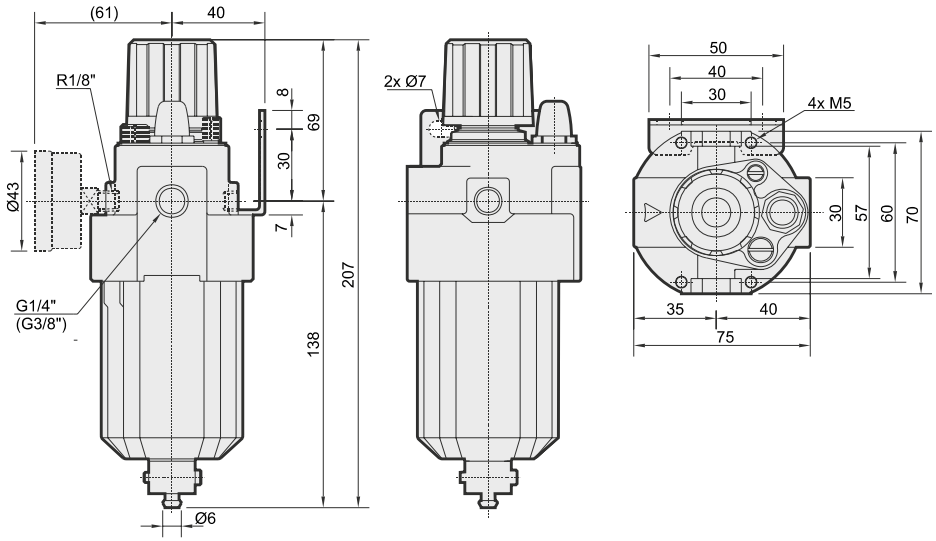
Port thread	G1/4“	G3/8“
Primary pressure [MPa]	0,1 to 1,5	
Secondary pressure [MPa]	0,1 to 0,99	
Test pressure [MPa]	1,5	
Temperature range [°C]	-5 to +60	
Filter element [µm]	5	
Oil bowl capacity [l]	0,05	
Min. lubricator flow [Nl/min]	50	60
Weight [kg]	0,66	
Supply contain	gauge, bracket (elbow)	

Order codes

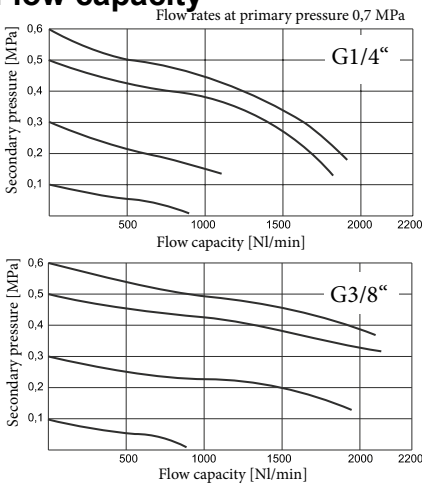
PMACC300-8A-BSP

Port size	
8A	G1/4“
10A	G3/8“

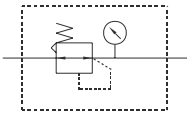
Dimensions



Flow capacity



Pressure regulators are used for reduce of pressure to working pressure, which is automatically hold on selected value. By using of optimal pressure, the longer lifetime of pneumatic components can be reach as well as save resources necessary for production of compressed air.



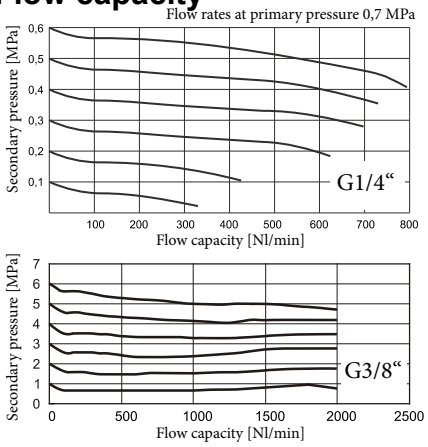
Port size	G1/4“	G3/8“
Primary pressure [MPa]	0,05 to 0,99	0,05 to 0,99
Secondary pressure [MPa]	0,05 to 0,85	0,05 to 0,85
Test pressure [MPa]	1,5	1,5
Temperature range [°C]	-5 to +60	-5 to +60
Weight [kg]	0,25	0,32
Supply contain	gauge, bracket (elbow)	gauge, bracket (elbow)

Order codes

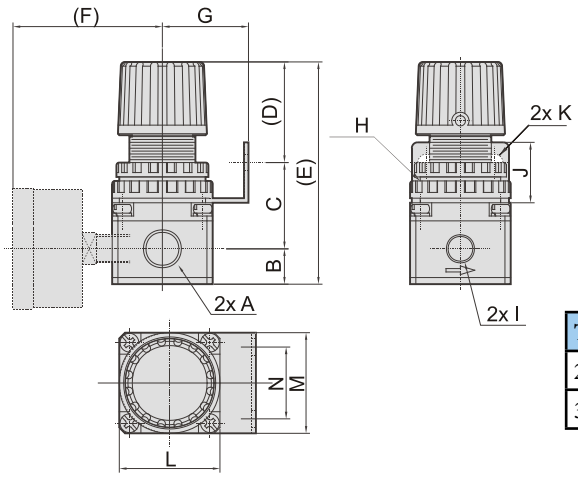
PMAR200-8A-BSP

Type - thread size	
200-8A	G1/4“
300-10A	G3/8“

Flow capacity



Dimensions



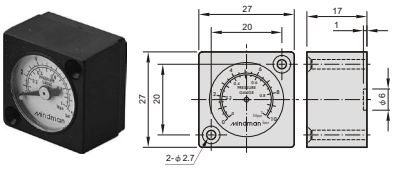
Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N
200-8A	G1/4“	12,3	30	35,7	78	45	30	M30x1	R1/8“	21	5,8	35	35	25
300-10A	G3/8“	30	28,5	42,5	101	60	35	M42x1,5	R1/8“	23	6,5	43	53	32

Spare gauges

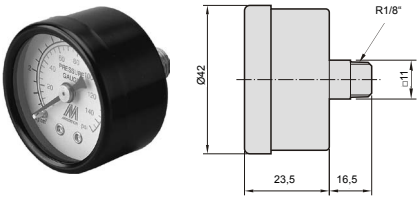
Order codes	PPG-20	PPG-40
Scale	bar / MPa	kg/cm² / PSI
Range [kg/cm²]	0 to 10	
Diameter [mm]	—	40
Accuracy	JIS class 4	
Temperature range [°C]	-5 to +60	

Order codes:

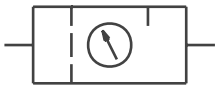
PPG-20
Gauge for FRL units series MACP



PPG-40
Gauge for compact FRL units series MACC and regulator series MAR



Made with lightweight but sturdy aluminium castings, FlexiBlock® FRL series offers unsurpassed performance and durability. Each modular FlexiBlock® component connects directly using just one O-ring seal and 2 button-head screws. This eliminates leakage, keeps flow integrity intact and mounting costs down. No special brackets or inserts needed. Available in 14, 22, 32 and 42 mm series. The range of components contains shutoff valves, filters, regulators, diverter blocks, lubricators and solenoid softstart/quick exhaust valves.



Order codes

NM22 G 02 VFRLX – AC

Series	
NM14	series 14, bowl capacity 0,04 l
NM22	series 22, bowl capacity 0,11 l
NM32	series 32, bowl capacity 0,25 l
NM42	series 42, bowl capacity 0,25 l

Thread	
G	thread G
—	thread NPTF
R	thread R

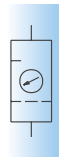
Port size	
01	1/8“ (series 14)
02	1/4“ (series 14 and 22)
03	3/8“ (series 22)
04	1/2“ (series 22 and 32)
06	3/4“ (series 32 and 42)
08	1“ (series 42)

Assembly content*	
V	shut off valve
F	particulate filter (5 µm element)
FF	particulate filter (5 µm element) and coalescing filter (0,3 µm element) (2 modules)
C	coalescing filter (0,3 µm element) with regulator
R	regulator 0-0,9 MPa with gauge
P	particulate filter (5 µm element) with regulator
L	lubricator
D	diverter plate
X	empty position

Options	
A	automatic drain (series 22,32 and 42)
M	metal bowls
C	CircleVision™ bowls (series 22,32 and 42)
D	prefilter for coalescing filter

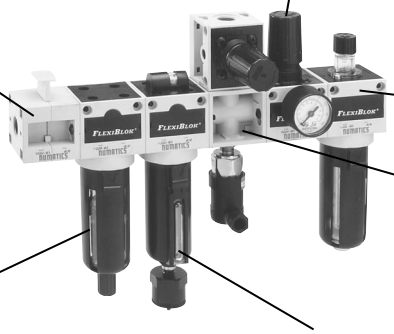
*) Standard combinations consist of particulate filter with regulator and lubricator - code PLXXX

Order code has always 5 characters of assembly content. If your assembly will consist of less than 5 modules, please add code with X (see above)



Shut off valve
Is an easy and inexpensive way to add shut off capability to an air preparation unit. The 2 positions enable oil refilling with a soft start function.

Regulator
Regulators are used to reduce pressure to a required working pressure. Standard with locking adjustment knob.



Lubricator
Is designed to inject oil aerosols into the airstream of a pneumatic circuit. Function starts at very low flow rate of 55 Nl/min.

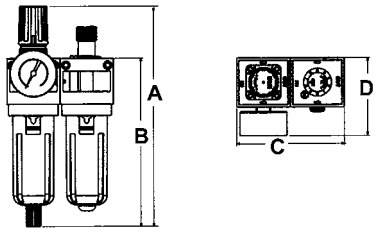
Diverter plate
Designed to give FlexiBlok® components total versatility, the diverter block mounts directly inline with the FRL combination. Additional components can be manifold mounted in X and Y direction.

Particulate filter
Water is removed mechanically by the Turbo-Flo™ deflector which causes the air to move in a swirling motion. This filter removes also liquid, rust, pipe scale, and debris from air lines.

Coalescing filter
Removes water and oil aerosols down to 0.1 µm and vapor. Pressure difference indicator warns when filter should be changed.

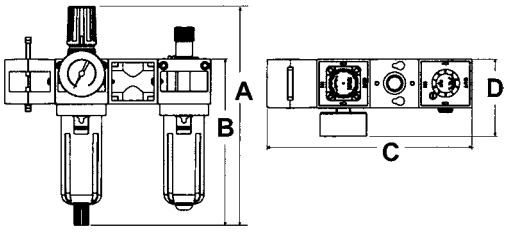
Dimensions and order codes of selected standard combinations of modules FLEXIBLOK®

Particulate filter regulator and lubricator combination



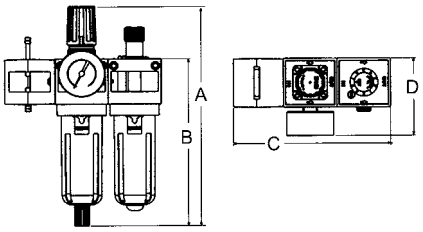
Order codes of combination	Thread	Individual module order codes		Flow capacity [Nl/min]	Weight [kg]	Possible options	Dimensions			
		Particular filter regulator	Lubricator				A	B	C	D
NM14G01PLXXX	G1/8“	NP14BG01G	NL14LG01	520	0,64	M	200	148	86	79
NM14G02PLXXX	G1/4“	NP14BG02G	NL14LG02	520	0,64	M	200	148	86	79
NM22G02PLXXX	G1/4“	NP22BG02G	NL22LG02	1133	0,74	A, C, M	252	194	120	87
NM22G03PLXXX	G3/8“	NP22BG03G	NL22LG03	1982	0,74	A, C, M	252	194	120	87
NM22G04PLXXX	G1/2“	NP22BG04G	NL22LG04	2124	0,74	A, C, M	252	194	120	87
NM32G04PLXXX	G1/2“	NP32BG04G	NL32LG04	3115	1,48	A, C, M	309	232	152	104
NM32G06PLXXX	G3/4“	NP32BG06G	NL32LG06	3682	1,48	A, C, M	309	232	152	104
NM42G06PLXXX	G3/4“	NP42BG06G	NL42LG06	6960	3,96	A, C, M	442	320	222	135
NM42G08PLXXX	G1“	NP42BG08G	NL42LG08	6960	3,96	A, C, M	442	320	222	135

Shut off valve, particulate filter regulator, diverter plate and lubricator combination



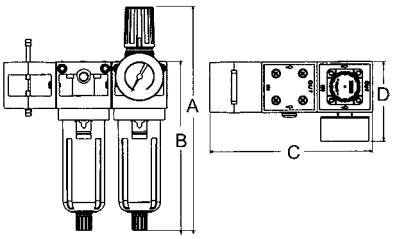
Order codes of combination	Thread	Individual module order codes				Flow capacity [Nl/min]	Weight [kg]	Possible options	Dimensions			
		Shut off valve	Particular filter regulator	Diverter plate	Lubricator				A	B	C	D
NM14G01VPDLX	G1/8“	NVS14G01	NP14BG01G	NDK14G02	L14LG01	520	1,13	M	200	148	171	79
NM14G02VPDLX	G1/4“	NVS14G02	NP14BG02G	NDK14G02	L14LG02	520	1,13	M	200	148	171	79
NM22G02VPDLX	G1/4“	NVS22G02	NP22BG02G	NDK22G03	L22LG02	1133	1,03	A, C, M	252	194	215	87
NM22G03VPDLX	G3/8“	NVS22G03	NP22BG03G	NDK22G03	L22LG03	1982	1,03	A, C, M	252	194	215	87
NM22G04VPDLX	G1/2“	NVS22G04	NP22BG04G	NDK22G03	L22LG04	2124	1,03	A, C, M	252	194	215	87
NM32G04VPDLX	G1/2“	NVS32G04	NP32BG04G	NDK32G04	L32LG04	3115	2,21	A, C, M	309	232	285	104
NM32G06VPDLX	G3/4“	NVS32G06	NP32BG06G	NDK32G04	L32LG06	3682	2,21	A, C, M	309	232	285	104
NM42G06VPDLX	G3/4“	NVS42G06	NP42BG06G	NDK42G06	L42LG06	6960	7,19	A, C, M	442	320	406	135
NM42G08VPDLX	G1“	NVS42G08	NP42BG08G	NDK42G08	L42LG08	6960	7,19	A, C, M	442	320	406	135

Shut off valve, particulate filter regulator and lubricator combination



Order codes of combination	Thread	Individual module order codes			Flow capacity [Nl/min]	Weight [kg]	Possible options	Dimensions			
		Shut off valve	Particular filter regulator	Lubricator				A	B	C	D
NM14G01VPLXX	G1/8“	NVS14G01	NP14BG01G	NL14LG01	520	0,93	M	200	148	128	79
NM14G02VPLXX	G1/4“	NVS14G02	NP14BG02G	NL14LG02	520	0,93	M	200	148	128	79
NM22G02VPLXX	G1/4“	NVS22G02	NP22BG02G	NL22LG02	1133	0,89	A, C, M	252	194	177	87
NM22G03VPLXX	G3/8“	NVS22G03	NP22BG03G	NL22LG03	1982	0,89	A, C, M	252	194	177	87
NM22G04VPLXX	G1/2“	NVS22G04	NP22BG04G	NL22LG04	2124	0,89	A, C, M	252	194	177	87
NM32G04VPLXX	G1/2“	NVS32G04	NP32BG04G	NL32LG04	3115	1,78	A, C, M	309	232	210	104
NM32G06VPLXX	G3/4“	NVS32G06	NP32BG06G	NL32LG06	3682	1,78	A, C, M	309	232	210	104
NM42G06VPLXX	G3/4“	NVS42G06	NP42BG06G	NL42LG06	6960	6,21	A, C, M	442	320	305	135
NM42G08VPLXX	G1“	NVS42G08	NP42BG08G	NL42LG08	6960	6,21	A, C, M	442	320	305	135

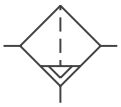
Shut off valve, particulate filter and coalescing filter regulator combination



Order codes of combination	Thread	Individual module order codes			Flow capacity [Nl/min]	Weight [kg]	Possible options	Dimensions			
		Shut off valve	Particular filter	Coalescing filter regulator				A	B	C	D
NM14G01VFCXX	G1/8“	NVS14G01	NF14BG01	NC14DG01G	360	0,95	M	200	148	128	79
NM14G02VFCXX	G1/4“	NVS14G02	NF14BG02	NC14DG02G	360	0,95	M	200	148	128	79
NM22G02VFCXX	G1/4“	NVS22G02	NF22BG02	NC22DG02G	1050	0,89	A, C, M	252	194	177	87
NM22G03VFCXX	G3/8“	NVS22G03	NF22BG03	NC22DG03G	1050	0,89	A, C, M	252	194	177	87
NM22G04VFCXX	G1/2“	NVS22G04	NF22BG04	NC22DG04G	1050	0,89	A, C, M	252	194	177	87
NM32G04VFCXX	G1/2“	NVS32G04	NF32BG04	NC32DG04G	1557	1,79	A, C, M	309	232	210	104
NM32G06VFCXX	G3/4“	NVS32G06	NF32BG06	NC32DG06G	1557	1,79	A, C, M	309	232	210	104
NM42G06VFCXX	G3/4“	NVS42G06	NF42BG06	NC42DG06G	4400	6,21	A, C, M	442	320	305	135
NM42G08VFCXX	G1“	NVS42G08	NF42BG08	NC42DG08G	4400	6,21	A, C, M	442	320	305	135

For dimensions of other combinations contact our technical dept., or you can get them if you add dimensions of all modules which you will use (see next pages).

Primary air particulate filters are designed to separate liquid, water, rust, pipe scale, and debris from air lines. They should be installed upstream of the regulator and/or lubricator to prevent contamination from reaching other components.



Series bowl type	14 polycar-bonate	14 metal	22 polycar-bonate	22 metal	22 Circle-Vision™	32 polycar-bonate	32 metal	32 Circle-Vision™	42 polycar-bonate	42 metal	42 Circle-Vision™
Flow capacity at 0,7 MPa (Δp=0,03 MPa) [Nl/min]	780 (G1/8“) 950 (G1/4“)		1275 (G1/4“), 1700 (G3/8“) 1980 (G1/2“)			2970 (G1/2“) 3115 (G3/4“)			7200 (G3/4“) 7800 (G1“)		
Temperature range [˚C]	+4 to +50	+4 to +50	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +65
Max. pressure [MPa]	1,0	1,4	1,0	1,4	1,7	1,0	1,4	1,7	1,0	1,4	1,7
Weight [kg]	0,28	0,30	0,30	0,57	0,39	0,59	1,14	0,77	1,68	2,18	1,88

Order codes

NF22 B G 03 AC

Filter element	
NF14	series 14, bowl capacity 0,04 l
NF22	series 22, bowl capacity 0,11 l
NF32	series 32, bowl capacity 0,25 l
NF42	series 42, bowl capacity 0,25 l

Filter element	
B	5 µm (standard)
A	40 µm

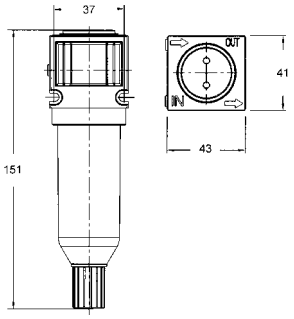
Thread	
G	thread G
—	thread NPTF
R	thread R

Port size	
01	1/8“ (series 14)
02	1/4“ (series 14 and 22)
03	3/8“ (series 22)
04	1/2“ (series 22 and 32)
06	3/4“ (series 32 and 42)
08	1“ (series 42)

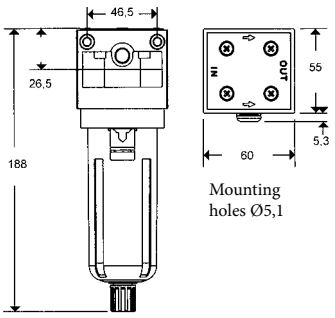
Options	
A	automatic drain (series 22,32 and 42)
M	metal bowls
C	CircleVision™ bowl (series 22,32 and 42)
U	pressure difference indicator

Dimensions

Series 14

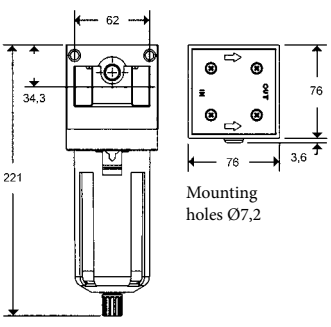


Series 22



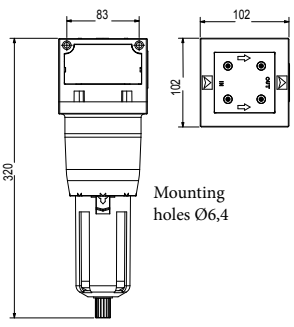
Mounting holes Ø5,1

Series 32



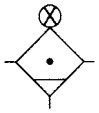
Mounting holes Ø7,2

Series 42



Mounting holes Ø6,4

The coalescing filter is utilized when either clean air is required or longer component life is desired. This type of filter removes water and oil aerosols. It works differently than the particulate filter; dirty air enters the element from the centre and passes through a field of glass fibers which cause the aerosols to form into droplets which are heavier than the surrounding air. The droplets grow larger as they pass through the element and gravity causes the oil drops to drain to the sump of the bowl. By removing the harmful oil varnishes and contaminant that attack seals and gaskets, the valve or cylinder is much less likely to stick. To maximize the life of a coalescing filter it should always be used after a 5 micron particulate filter or with the optional prefilter.



Series bowl type	14 polycar-bonate	14 metal	22 polycar-bonate	22 metal	22 Circle-Vision™	32 polycar-bonate	32 metal	32 Circle-Vision™	42 polycar-bonate	42 metal	42 Circle-Vision™
Flow capacity at 0,7 MPa (Δp=0,03 MPa) [Nl/min] *	530 (C), 360 (D), 142 (E), 285 (F)		1430 (C), 1050 (D), 510 (E), 720 (F)			1982 (C), 1356 (D), 708 (E), 1224 (F)			5630 (C), 4900 (D), 4170 (E), 4700 (F)		
Temperature range [˚C]	+4 to +50	+4 to +50	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +65
Max. pressure [MPa]	1,0	1,4	1,0	1,4	1,7	1,0	1,4	1,7	1,0	1,4	1,7
Weight [kg]	0,28	0,30	0,30	0,57	0,39	0,59	1,14	0,77	1,68	2,18	1,88

*) Flow capacity values are valid for mentioned filter elements

Order codes

NF32 D G 04 DM

Filter element	
NF14	series 14, bowl capacity 0,04 l
NF22	series 22, bowl capacity 0,11 l
NF32	series 32, bowl capacity 0,25 l
NF42	series 42, bowl capacity 0,25 l

Filter element*	
C	0,7 µm (blue)
D	0,3 µm (green) standard
E	0,01 µm (red)
F	vapor adsorber (white)

*) For recommended uses of filter elements see page 8-12

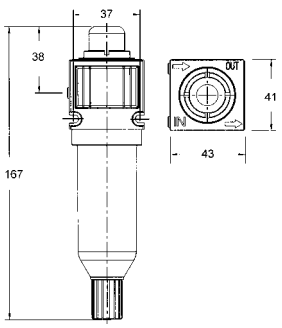
Thread	
G	thread G
—	thread NPTF
R	thread R

Port size	
01	1/8“ (series 14)
02	1/4“ (series 14 and 22)
03	3/8“ (series 22)
04	1/2“ (series 22 and 32)
06	3/4“ (series 32 and 42)
08	1“ (series 42)

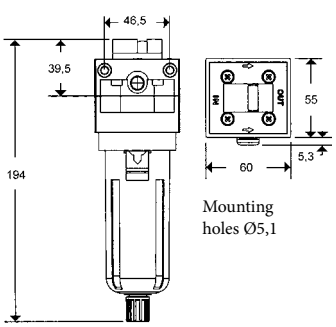
Options	
A	automatic drain (series 22,32 and 42)
D	3 µm internal prefilter
M	metal bowls
C	CircleVision™ bowls (series 22,32 and 42)

Dimensions

Series 14

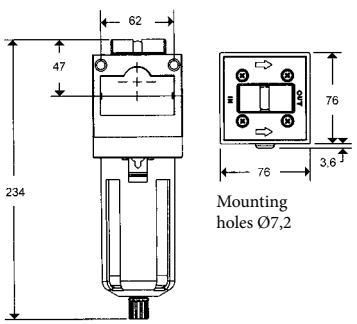


Series 22



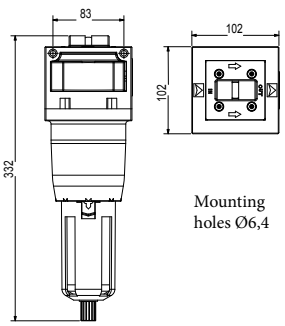
Mounting holes Ø5,1

Series 32



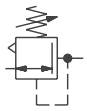
Mounting holes Ø7,2

Series 42



Mounting holes Ø6,4

Regulators are used to reduce pressure to a required working pressure. Utilizing optimum pressure can save companies both component life and a hundreds or even thousands of EUR in compressed air costs.



Series	14	22	32	42
Flow capacity at 0,6 MPa (Δp=25%) [Nl/min]	520 (G1/8“, G1/4“)	1841 (G1/4“) 2124 (G3/8“, G1/2“)	4390 (G1/2“, G3/4“)	8430 (G3/4“, G1“)
Flow capacity at 0,4 MPa (Δp=25%) [Nl/min]	390 (G1/8“, G1/4“)	1416 (G1/4“) 1982 (G3/8“, G1/2“)	4106 (G1/2“, G3/4“)	4320 (G3/4“, G1“)
Temperature range [˚C]	+4 to +50	+4 to +50	+4 to +50	+4 to +50
Max. pressure [MPa]	1,7	1,4	1,4	1,7
Output pressure [MPa]	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9
Weight [kg]	0,30	0,31	0,62	1,95

Order codes

NR22 R G 03 GL

Series	
NR14	series 14
NR22	series 22
NR32	series 32
NR42	series 42

Type	
R	relieving (standard)
N	non-relieving

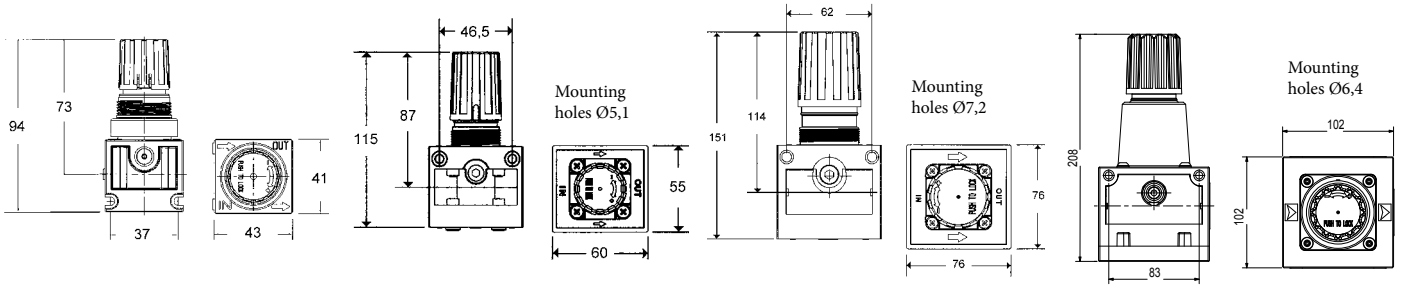
Thread	
G	thread G
—	thread NPTF
R	thread R

Port size	
01	1/8“ (series 14)
02	1/4“ (series 14 and 22)
03	3/8“ (series 22)
04	1/2“ (series 22 and 32)
06	3/4“ (series 32 and 42)
08	1“ (series 42)

Options	
G	with gauge
H	0-1,4 MPa output (series 22,32 and 42)
I	0-0,17 MPa output
L	0-0,4 MPa output
P	panel mount nut incl. (series 14,22 and 32)

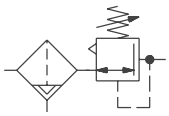
Dimensions

Series 14 | Series 22 | Series 32 | Series 42



Regulators series 14 and 22 has R1/8“ gauge port, series 32 and 42 has R1/4“ gauge port.

The integral part of the particulate filter/regulator ('piggyback') is a two station component designed to filter and regulate compressed air when cost and space are of primary concern.



Series bowl type	14 polycar-bonate	14 metal	22 polycar-bonate	22 metal	22 Circle-Vision™	32 polycar-bonate	32 metal	32 Circle-Vision™	42 polycar-bonate	42 metal	42 Circle-Vision™
Flow capacity at 0,6 MPa (Δp=25%) [Nl/min]	520 (G1/8", G1/4")		1841 (G1/4") 2124 (G3/8", G1/2")			3682 (G1/2", G3/4")			7980 (G3/4", G1")		
Flow capacity at 0,4 MPa (Δp=25%) [Nl/min]	390 (G1/8", G1/4")		1416 (G1/4") 1982 (G3/8", G1/2")			3257 (G1/2", G3/4")			4140 (G3/4", G1")		
Temperature range [°C]	+4 to +50	+4 to +50	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +50
Max. pressure [MPa]	1,0	1,4	1,0	1,4	1,7	1,0	1,4	1,7	1,0	1,4	1,7
Output pressure [MPa]	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9
Weight [kg]	0,34	0,37	0,41	0,68	0,55	0,82	1,34	1,06	2,29	2,79	2,49

Order codes

NP14 B G 02 GM

Series	
NP14	series 14, bowl capacity 0,04 l
NP22	series 22, bowl capacity 0,11 l
NP32	series 32, bowl capacity 0,25 l
NP42	series 42, bowl capacity 0,25 l

Filter element	
B	5 µm

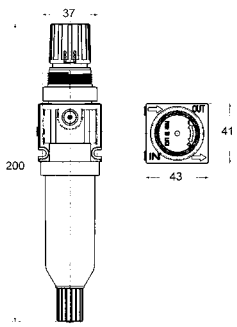
Thread	
G	thread G
—	thread NPTF
R	thread R

Port size	
01	1/8" (series 14)
02	1/4" (series 14 and 22)
03	3/8" (series 22)
04	1/2" (series 22 and 32)
06	3/4" (series 32 and 42)
08	1" (series 42)

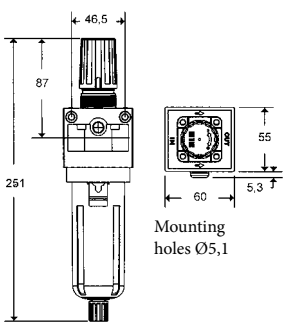
Options	
A	automatic drain (series 22,32,42)
M	metal bowls
C	CircleVision™ bowls (series 22,32 and 42)
G	with gauge
H	0-1,4 MPa output (only with metal bowl)
I	0-0,17 MPa output
L	0-0,4 MPa output
P	panel mount nut incl. (series 14,22 and 32)

Dimensions

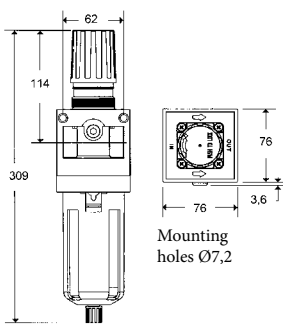
Series 14



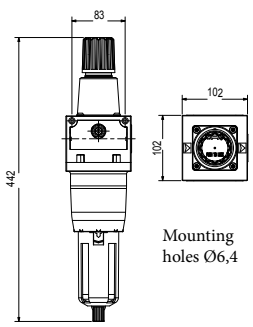
Series 22



Series 32

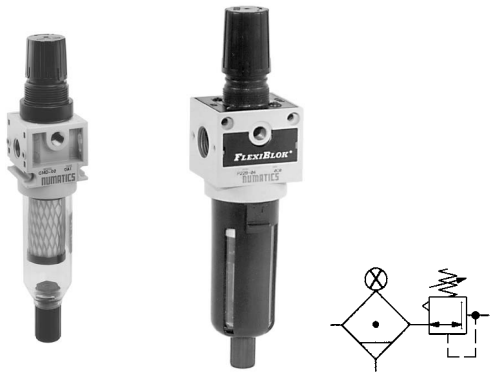


Series 42



Particulate filters with egulators series 14 and 22 has R1/8" gauge port, series 32 and 42 has R1/4" gauge port.

COALESCING FILTER WITH REGULATOR
SERIES FLEXIBLOK®



The coalescing filter regulator is a two station point of use air preparation system designed to provide superior filtration and regulation in one compact housing. It combines a multiple support cartridge style borosilicate glass element with a pilot balanced regulator to assure the maximum performance of downstream components.

Recommended uses of filter elements:

C grade element - identified by its blue drain layer, removes over 99.9% of 0.7 µm and larger particles. For large amounts of water, rust, pipe scale, and liquid hydrocarbons. Excellent for environments that have severe contamination. Can be used for lubricated or 'dry' systems. Ideal for mainline filtration of plant air.

D grade element - identified by its green drain layer, removes over 99.9% of 0.3 µm and larger particles. It suits excellent for cylinders or valves - especially when the circuit is being run without lubrication ('dry'). Excellent filter for desiccant or regenerative style dryers.

E grade element - identified by its red drain layer, removes over 99.9% of 0.01 µm and larger particles. This filter provides oil-free air for instrumentation, blow moulding, food and drug packaging, electronics applications, and other applications requiring max. contamination removal.

F grade element - identified by its white drain layer, is an adsorbing filter that utilizes activated carbon to capture hydrobarbon vapour and deodorize compressed air. Typically it is used to protect worker environments, food and drug applications, breathing air, and instrumentation for analytical instruments. Life expectancy is approximately 3 months at rated flow. Adsorbers must be preceded by a coalescing filter.

Prefilter Option - Suffix 'D' - Models using the C, D, or E grade elements can be equipped with an optional 3 micron internal prefilter. The prefilter provides additional protection for the fine borosilicate fibers. Ideal for the removal of high levels of solid contamination.

Series **bowl type**	**14** polycarbonate	**14** metal	**22** polycarbonate	**22** metal	**22** Circle-Vision™	**32** polycarbonate	**32** metal	**32** Circle-Vision™	**42** polycarbonate	**42** metal	**42** Circle-Vision™
Flow capacity at 0,7 MPa (Δp=0,01 MPa) [Nl/min] *	530 (C), 360 (D), 142 (E), 285 (F)		1430 (C), 1050 (D), 510 (E), 720 (F)			2549 (C), 1557 (D), 793 (E), 1557 (F)			5060 (C), 4400 (D), 3750 (E), 4220 (F)		
Flow capacity at 0,4 MPa (Δp=0,01 MPa) [Nl/min] *	370 (C), 252 (D), 100 (E), 200 (F)		1130 (C), 720 (D), 360 (E), 650 (F)			1982 (C), 1133 (D), 680 (E), 1133 (F)			3010 (C), 2540 (D), 2160 (E), 2440 (F)		
Temperature range [°C]	+4 to +50	+4 to +50	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +50
Max. pressure [MPa]	1,0	1,4	1,0	1,4	1,4	1,0	1,4	1,4	1,0	1,4	1,4
Output pressure [MPa]	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9	0 to 0,9
Weight [kg]	0,35	0,38	0,42	0,73	0,55	0,67	1,16	0,87	2,29	2,79	2,49

*) Flow capacity values are valid for mentioned filter elements

Order codes

NC22 D G 03 GM

Series	
NC14	series 14, bowl capacity 0,04 l
NC22	series 22, bowl capacity 0,11 l
NC32	series 32, bowl capacity 0,25 l
NC42	series 42, bowl capacity 0,25 l

Filter element*	
C	0,7 µm (blue)
D	0,3 µm (green) standard
E	0,01 µm (red)
F	vapour adsorber (white)

*) Recommended uses of filter elements see above

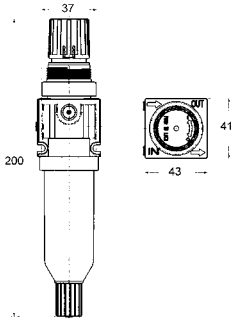
Thread	
G	thread G
—	thread NPTF
R	thread R

Port size	
01	1/8" (series 14)
02	1/4" (series 14 and 22)
03	3/8" (series 22)
04	1/2" (series 22 and 32)
06	3/4" (series 32 and 42)
08	1" (series 42)

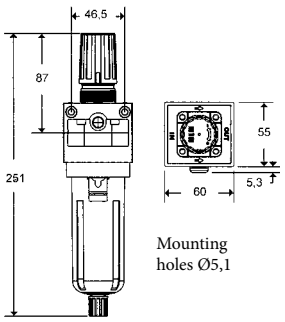
Options	
A	automatic drain (series 22,32,42)
M	metal bowls
C	CircleVision™ bowl (series 22,32 and 42)
G	with gauge
D	3 µm prefilter
H	0-1,4 MPa output (only with metal bowl)
I	0-0,17 MPa output
L	0-0,4 MPa output
P	panel mount nut incl. (series 14,22 and 32)

Dimensions

Series 14

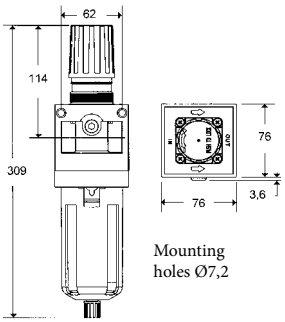


Series 22



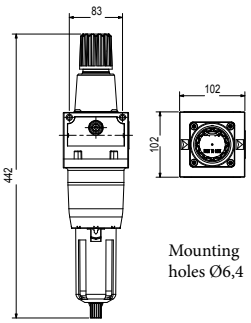
Mounting holes Ø5,1

Series 32



Mounting holes Ø7,2

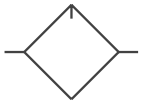
Series 42



Mounting holes Ø6,4

Coalescing filters with egulators series 14 and 22 has R1/8" gauge port, series 32 and 42 has R1/4" gauge port.

Usually mounted third in the FRL Series, the lubricator is designed to inject oil aerosols into the airstream of a pneumatic circuit.



Series bowl type	14 polycar-bonate	14 metal	22 polycar-bonate	22 metal	22 Circle-Vision™	32 polycar-bonate	32 metal	32 Circle-Vision™	42 polycar-bonate	42 metal	42 Circle-Vision™
Flow capacity at 0,7 MPa (Δp=0,03 MPa) [Nl/min]	860 (G1/8“) 860 (G1/4“)		1133 (G1/4“), 1982 (G3/8“), 2832 (G1/2“)			3115 (G1/2“) 4248 (G3/4“)			6960 (G3/4“, G1“)		
Temperature range [˚C]	+4 to +50	+4 to +50	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +65	+4 to +50	+4 to +50	+4 to +50
Max. pressure [MPa]	1,0	1,7	1,0	1,4	1,7	1,0	1,4	1,7	1,0	1,4	1,4
Weight [kg]	0,27	0,3	0,3	0,58	0,4	0,65	1,16	0,83	1,68	2,18	1,88

Order codes

NL14 L G 01 M

Series	
NL14	series 14, bowl capacity 0,04 l
NL22	series 22, bowl capacity 0,11 l
NL32	series 32, bowl capacity 0,25 l
NL42	series 42, bowl capacity 0,25 l

Type	
L	standard

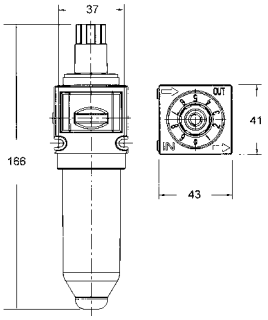
Thread	
G	thread G
—	thread NPTF
R	thread R

Port size	
01	1/8“ (series 14)
02	1/4“ (series 14 and 22)
03	3/8“ (series 22)
04	1/2“ (series 22 and 32)
06	3/4“ (series 32 and 42)
08	1“ (series 42)

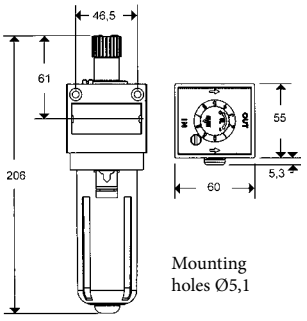
Options	
M	metal bowls
C	CircleVision™ bowl (series 22,43 and 42)

Dimensions

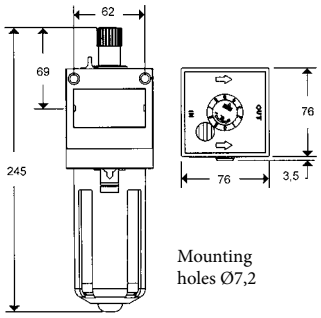
Series 14



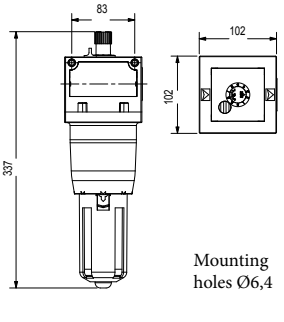
Series 22



Series 32

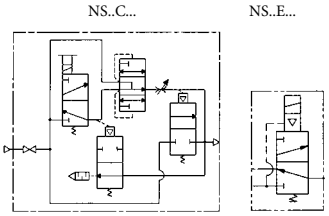


Series 42



SOLENOID SOFT START AND/OR QUICK EXHAUST VALVE SERIES FLEXIBLOK®

STRÁNSKÝ A PETRŽÍK



The NS22C and NS32C valves combine the gradual filling feature of an auto pilot soft start with the added features of a solenoid quick exhaust valve. Upon energizing the solenoid, pilot pressure is applied to the top of the spool, shifting the spool downward and closing the exhaust port. Pilot pressure is also applied to the shuttle valve, opening it, and allowing supply air to be metered downstream through the metering valve. When downstream pressure reaches approximately 60 % of supply pressure, the spool opens the main valve, allowing gull flow. When the solenoid is de-energized pilot pressure is removed, causing the spool to retract and opening the exhaust port. Downstream pressure then exhausts through the exhaust port. The shuttle valve also reseats, cutting off supply pressure.
The NS22E and NS32E solenoid quick exhaust Valves are high flow, high exhaust, normally closed, 3-ported, 2-position directional control shut-off valves which increases safety for machine operators. When the solenoid is energized, inlet air is applied to the top of the spool. The spool shifts downward, sealing the exhaust port and pushing down and opening the main valve, allowing full flow downstream. When the solenoid is de-energized, air is cut from the spool, allowing the springs to retract and the spool and main valve to return to their normally closed positions, thus rapidly exhausting all downstream air. The bottom exhaust port is tapped to allow for muffler installation.

Series	22	32
Flow capacity 1→2 [Nl/min]	1963 (G1/4“), 2817 (G3/8“), 3562 (G1/2“)	5143 (G1/2“), 6350 (G3/4“)
Flow capacity 2→3 [Nl/min]	1177 (G1/4“), 1354 (G3/8“), 1295 (G1/2“)	2954 (G1/2“), 3082 (G3/4“)
Temperature range [˚C]	+4 to +50	+4 to +50
Max. pressure [MPa]	1,0	1,0
Min. primary pressure [MPa]	0,4 (NS22C), 0,25 (NS22E)	0,4 (NS32C), 0,25 (NS32E)
Weight [kg]	0,43 (NS22C), 0,53 (NS22E)	0,71 (NS32C), 0,79 (NS32E)

Order codes

NS22 C G 04 B K 0 GPM

Series	
NS22	series 22
NS32	series 32

Type	
C	solenoid slow start and quick exhaust valve
E	solenoid quick exhaust valve

Thread	
G	thread G
—	thread NPTF
R	thread R

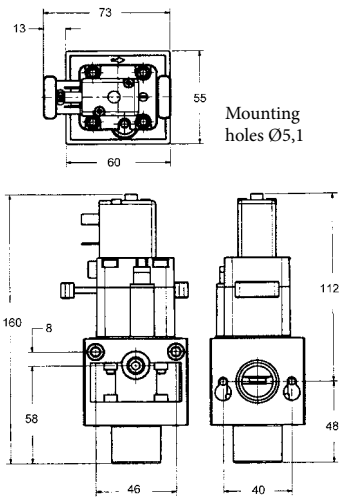
Port size	
02	1/4“ (series 22)
03	3/8“ (series 22)
04	1/2“ (series 22 and 32)
06	3/4“ (series 32)

Voltage	
E	110 V 50-60 Hz
F	230 V 50-60 Hz
J	24 V 50-60 Hz
K	24 V DC

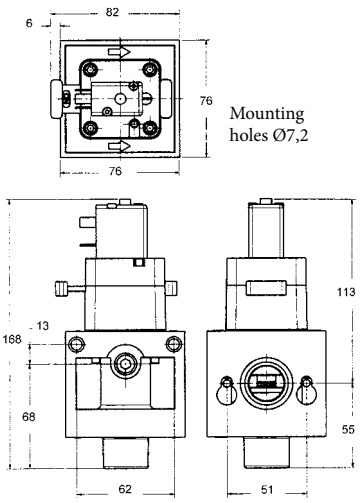
Options	
G	with gauge
P	with connector type 22
M	with silencer
N	without manual override

Dimensions

Series 22



Series 32



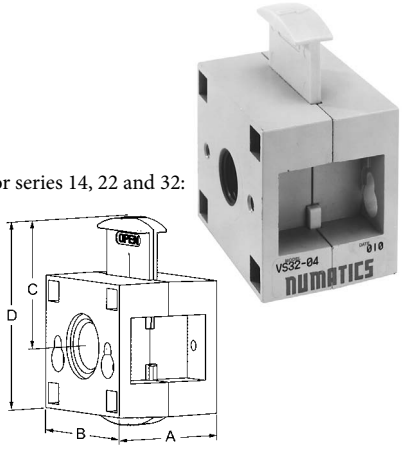
Note:
Components of series 14 can be connected to NS22C and SN22E too via adatter plate (order code NAP14-22). Assembly then could look like this:

Valves series 22 has R1/8“ gauge port, series 32 has R1/4“ gauge port.
Port for silencer is NPTF 1/2“ for both versions.

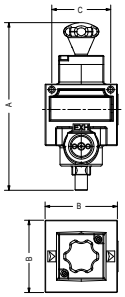
Shut off valve series FLEXIBLOK®

Order codes	Series	Thread	Max. pressure	A	B	C	D
NVS14G01	14	G1/8“	1,4 MPa	41,5	40,5	41	76
NVS14G02	14	G1/4“	1,4 MPa	41,5	40,5	41	76
NVS22G02	22	G1/4“	1,4 MPa	50	55	47	79
NVS22G03	22	G3/8“	1,4 MPa	50	55	47	79
NVS22G04	22	G1/2“	1,4 MPa	50	55	47	79
NVS32G04	32	G1/2“	1,4 MPa	57	76	65	107
NVS32G06	32	G3/4“	1,4 MPa	57	76	65	107
NVS42G06	42	G3/4“	1,4 MPa	236	102	83	—
NVS42G08	42	G1“	1,4 MPa	236	102	83	—

For series 14, 22 and 32:



Series 42:

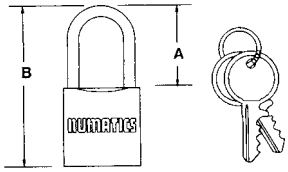


Shut off valve is an easy and inexpensive way to add shut off capability to an FRL. The valve includes a lockout feature designed for a padlock to prevent unauthorized downstream pressurization during maintenance. The shut off valve is usually mounted first in the assembly.
Max. inlet pressure: 14 bar.

Padlock for shut off valve series FLEXIBLOK®

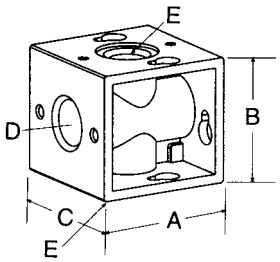
Order codes	Series	Width	Height
NVB-1	22, 32	38	80

Order codes	Series	A	B
NVSL01	14	16	67
NVSL02	22, 32	38	80



Diverter block series FLEXIBLOK®

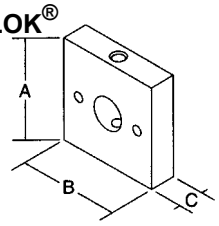
Order codes	Series	Max. pressure	A	B	C	D	E
NDK14G02	14	1,4 MPa	44	39	41	G1/4“	G1/8“
NDK22G03	22	1,4 MPa	55	51	55	G1/2“	G3/8“
NDK32G04	32	1,4 MPa	76	69	76	G3/4“	G1/2“
NDK42G06*	42	1,7 MPa	102	87	102	G3/4“	G3/4“
NDK42G08*	42	1,7 MPa	102	87	102	G1“	G1“



*) Diverter blocks series 42 has thread R1/8“ in front for pressure switch connecting (not shown).

Diverter plate for pressure switch series FLEXIBLOK®

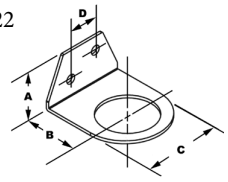
Order codes	Series	Thread	Max. pressure	A	B	C
NHK14G01	14	G1/8“	1,4 MPa	38	38	19
NHK22G01	22	G1/8“	1,4 MPa	51	51	19
NHK32G01	32	G1/8“	1,4 MPa	76	76	19



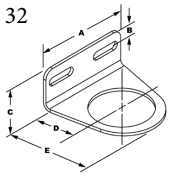
Mounting bracket with panel mount nut for components (regulator, filter with regulator) series FLEXIBLOK®

Order codes	Series	A	B	C	D	E
NPK12	14	27	30	44	16	—
NPK22	22	27	30	44	16	—
NPK32P	32	70	10	30	38	68

Series 14 and 22

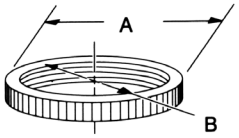


Series 32



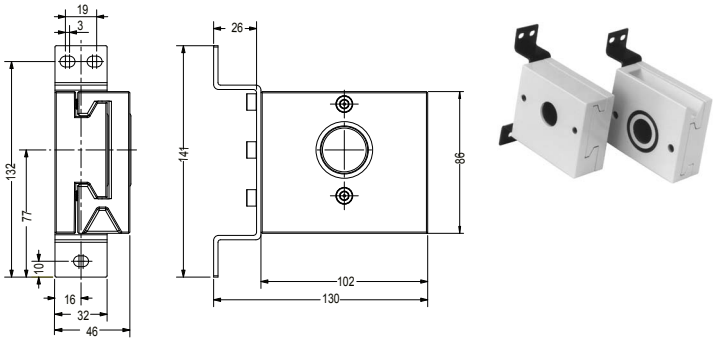
Panel mount nut for series FLEXIBLOK®

Order codes	Series	Hole diameter	A	B
NPN12	14	32	37	28
NPN22	22	33	38	30
NPN32	32	45	52	40



End plate for series FLEXIBLOK® 42

Order codes	Series	Thread	Max. pressure
NMK42ABG06	42	G3/4“	1,7 MPa
NKM42ABG08	42	G1“	1,7 MPa



Gauges with rear connection

Order codes	Series	Connection	Scale	Range [bar]	Diameter
N214-151	14, 22	R1/8“	bar/PSI	0 - 2,5	40
N214-152	14, 22	R1/8“	bar/PSI	0 - 4	40
N214-153	14, 22	R1/8“	bar/PSI	0 - 10	40
N214-259	32, 42	R1/4“	bar/PSI	0 - 10	40
N214-154	14, 22	R1/8“	bar/PSI	0 - 16	40
N214-155	14, 22	R1/8“	bar/PSI	0 - 1	50
N214-156	14, 22	R1/8“	bar/PSI	0 - 2,5	50
N214-157	14, 22	R1/8“	bar/PSI	0 - 4	50
N214-158	14, 22	R1/8“	bar/PSI	0 - 10	50
N214-159	14, 22	R1/8“	bar/PSI	0 - 16	50
N214-149	32, 42	R1/4“	bar/PSI	0 - 4	50
N214-148	32, 42	R1/4“	bar/PSI	0 - 10	50
N214-147	32, 42	R1/4“	bar/PSI	0 - 16	50
N214-150	32, 42	R1/4“	bar/PSI	0 - 21	50

Panel mounting gauge

Order codes	Connection	Scale	Range [bar]	Diameter	Panel hole diameter
N214-254	R1/8“	bar/MPa	0 - 10	50	50

Condensate drain valves for filters series FLEXIBLOK®

Standard drain valve

Order codes	Series
NDKF02	14, 22, 32, 42

Delivered when ordered without drain option. Easy operation: simply turn the drain counter-clockwise to expel bowl contents.

Automatic float drain valve

Order codes	Series
NAKF02	22, 32, 42

The auto float drain is installed into the bottom of the filter bowl. As the liquid level inside the bowl increases, the tire-like float lifts, allowing the liquid to drain. This drain should not be used in applications exceeding 1,2 MPa.

Spare bowls for series FLEXIBLOK®

Order codes	Series	Material	Note
NBKF12	14	polycarbonate	filters, coalescing filters, their combination with regulator
NBKF22	22	polycarbonate with guard	
NBKF32	32, 42		
NBKF12M	14	metal	
NBKF22M	22	metal with sight glass	
NBKF32M	32, 42		
NBKF22C	22	CircleVision™	
NBKF32C	32, 42		
NBKL12	14	polycarbonate	lubricator
NBKL22	22	polycarbonate with guard	
NBKL32	32, 42		
NBKL12M	14	metal	
NBKL22M	22	metal with sight glass	
NBKL32M	32, 42		
NBKL22C	22	CircleVision™	
NBKL32C	32, 42		

Filter and lubricator bowls are made from polycarbonate with guard (except series 14) in standard. Optionally, the ***metal bowls*** with sight glass (for series 22, 32 and 42) or without sight glass (for series 14) can be delivered. Sight glass is from one side only. Bowl can be equipped with standard or automatic drain or button head fill for lubricators. These bowls should be used, if danger of shock, damage and consequently pressure drop or environment pollution may occur.

Third option is ***CircleVision***™ bowl. The CircleVision™ sight bowl utilizes a dual bowl configuration to eliminate the bowl guard or sight glass. This allows the strength and security of an interior metal bowl to be used with the exterior convenience of the polycarbonate. Water condensation and contaminant in filter bowls can be seen for 360° around unit from up to 10 m away. This lowers maintenance costs by allowing easy detection of units that require service. Bowl can be equipped with standard or automatic drain or button head fill for lubricators.
These bowls should be used, if danger of shock, damage and consequently pressure drop or environment pollution may occur.

Spare parts for series FLEXIBLOK®

Particular filter FLEXIBLOK®

Description	Order codes	Series	Note
Filter element	NEKF12B	14	5 µm
	NEKF22B	22	5 µm
	NEKF32B	32	5 µm
	NEKF42B	32	5 µm
Repair kit	NRKF12	14	incl. Turbo-Flo, element retainer, quiet zone baffle, deflector retainer
	NRKF22	22	
	NRKF32	32	
	NRKF42B	42	

Coalescing filter FLEXIBLOK®

Description	Order codes	Series	Note
Filter element	NEKFxxC	14,22,32, 42	0,7 µm (C)
	NEKFxxD	14,22,32, 42	0,3 µm (D)
	NEKFxxE	14,22,32, 42	0,01 µm (E)
	NEKFxxF	14,22,32, 42	adsorber (F)

Please change „xx“ with series number, for example filter element 0,3 µm (D) for series 22 has order code NEKF22D.
If you need filter element for coalescing filter equipped with prefilter, please add character D by order code (e.g. NEKF14CD).

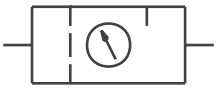
Particular/coalescing filter with regulator FLEXIBLOK®

Description	Order codes	Series	Note
Repair kit	NRKC14	14	cage kit incl. bonnet and adjustment knob
	NRKC22	22	
	NRKC32	32	
	NRKC42	42	
Diaphragm repair kit for relieving regulators	NRKR14R	14	incl. diaphragm and inner valve
	NRKR22R	22	
	NRKR32R	32	
	NRKR42R	42	
Diaphragm repair kit for non-relieving regulators	NRKR14N	14	incl. diaphragm and inner valve
	NRKR22N	22	
	NRKR32N	32	
	NRKR42N	42	

Lubricator FLEXIBLOK®

Description	Order codes	Series	Note
Repair kit	NRKL12T	14, 22, 32, 42	incl. adjustment knob and adjustment assembly

HF50 series offers rugged design and maximal flow capacity. Elements of this series has flow capacity up to 10.000 Nl/min. Elements can be assembled as standard combination or can be delivered separately.



Order codes

N50 G 08 FRL – AGR

Series	
N50	series HF50

Thread	
G	thread G
—	thread NPTF

Port size	
02	1/4“
03	3/8“
04	1/2“
06	3/4“
08	1“
10	1 1/4“
12	1 1/2“

Assembly content*	
F	filter (5 µm element)
R	regulator with output range 0-0,9 MPa
L	lubricator
X	(empty)

*) standard combinations consist of filter, regulator and lubricator - code FRL

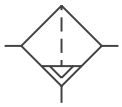
Order code has always 3 characters for assembly content. If your assembly will consist of less than 3 modules, please add code with X (e.g. FRX)

Options	
A	automatic drain
B	40 µm filter element
G	gauge
H	regulator output range 0-1,7 MPa
N	non-relieving regulator
J	lubricator bowl size 1,9 l (for port size 3/4“ and bigger)
F	lubricator button head fill
R	modules screwed together (standard)

Assembly of filter, pressure regulator with gauge and lubricator

Order codes of combination	Thread	Individual module order codes			Flow capacity [Nl/min]	Weight [kg]	Possible options
		Particular filter	Regulator	Lubricator			
N50G02FRL-GR	G1/4“	NF50BG02	NR50RG02-G	NL50LG02	1415	2,66	A, B, F, G, H, N
N50G03FRL-GR	G3/8“	NF50BG03	NR50RG03-G	NL50LG03	1982	2,66	A, B, F, G, H, N
N50G04FRL-GR	G1/2“	NF50BG04	NR50RG04-G	NL50LG04	2973	4,06	A, B, F, G, H, N
N50G06FRL-GR	G3/4“	NF50BG06	NR50RG06-G	NL50LG06	5267	7,62	A, B, F, G, H, J, N
N50G08FRL-GR	G1“	NF50BG08	NR50RG08-G	NL50LG08	7362	7,62	A, B, F, G, H, J, N
N50G10FRL-GR	G1 1/4“	NF50BG10	NR50RG10-G	NL50LG10	7787	9,92	A, B, F, G, H, J, N
N50G12FRL-GR	G1 1/2“	NF50BG12	NR50RG12-G	NL50LG12	7787	9,92	A, B, F, G, H, J, N

Primary air filters are designed to separate liquid, water, rust, pipe scale and debris from air lines. They should be installed upstream of the regulator and/or lubricator to prevent contamination from reaching other components. Water is removed mechanically by the deflector which causes the air to move in a swirling motion. The condensed water droplets are then centrifugally impounded upon the inner diameter of the bowl and fall down past the quiet zone baffle to the water sump. Dry air passes through the sintered element utilizing depth filtration and removes debris down to specified micron size.



Port size	**1/4“**	**1/4“**	**3/8“**	**3/8“**	**1/2“**	**1/2“**	**3/4“**	**3/4“**	**1“**	**1“**	**1 1/4“**	**1 1/4“**	**1 1/2“**	**1 1/2“**
filter element	**40 µm**	**5 µm**	**40 µm**	**5 µm**	**40 µm**	**5 µm**	**40 µm**	**5 µm**	**40 µm**	**5 µm**	**40 µm**	**5 µm**	**40 µm**	**5 µm**
Flow capacity at 0,7 MPa (Δp=0,035 MPa) [Nl/min]	1416	1416	1983	1983	2831	2831	7365	5270	9915	7365	10765	7790	10765	7790
Temperature range [˚C]	+4 to +65													
Max. pressure [MPa]	1,7													
Weight [kg]	0,82	0,82	0,82	0,82	1,27	1,27	2,90	2,90	2,90	2,90	3,20	3,20	3,20	3,20
Bowl capacity [l]	0,15	0,15	0,15	0,15	0,25	0,25	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45

Order codes

NF50 B G 08 A

Series	
NF50	series HF50

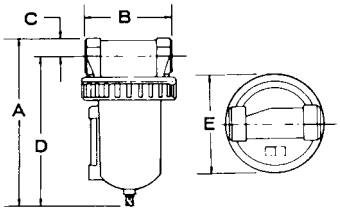
Filter element	
B	5 µm (standard)
A	40 µm

Thread	
G	thread G
—	thread NPTF

Port size	
02	1/4“
03	3/8“
04	1/2“
06	3/4“
08	1“
10	1 1/4“
12	1 1/2“

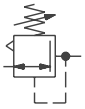
Options	
A	automatic drain

Dimensions



Port size	**A**	**B**	**C**	**D**	**E**
1/4“	151	64	13	140	74
3/8“	151	64	13	140	74
1/2“	164	84	15	159	97
3/4“	224	116	24	200	126
1“	224	116	24	200	126
1 1/4“	242	132	33	210	126
1 1/2“	242	132	33	210	126

Regulators are used to reduce pressure to a working pressure. Utilizing optimum pressure can save companies both component life and many money in compressed air cost.
Regulators consist of a diaphragm which floats between a main spring and a valve. By turning the adjustment handle clockwise, the main spring is forced onto the rubber diaphragm which, in turn, is pressed onto the valve stem. When the spring pressure becomes greater than the air pressure in the control chamber below the diaphragm, the valve is forced down and flow begins. As flow continues, the pressure begins to build and air, via the aspirator tube, fills the control chamber and forces the diaphragm upward. As forces balance, the small spring under the valve piston causes the valve to close. The cycle continues in a balances process of reducing or increasing flow based upon the downstream pressure.



Port size	1/4“	3/8“	1/2“	3/4“	1“	1 1/4“	1 1/2“
Flow capacity at 0,6 MPa (Δp=25%) [Nl/min]	2549	2832	5664	11185	11185	11185	11185
Flow capacity at 0,4 MPa (Δp=25%) [Nl/min]	2266	2549	5098	10900	10900	10900	10900
Temperature range [˚C]	+4 to +45						
Max. pressure [MPa]	2,0						
Weight [kg]	0,82	0,82	1,27	2,80	2,80	3,30	3,30

Order codes

NR50 R G 06 G

Series	
NR50	series HF50

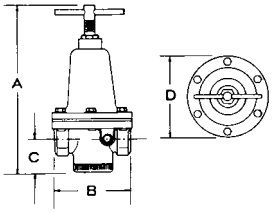
Type	
R	relieving (standard)
N	non-relieving

Thread	
G	thread G
—	thread NPTF

Port size	
02	1/4“
03	3/8“
04	1/2“
06	3/4“
08	1“
10	1 1/4“
12	1 1/2“

Options	
G	with gauge
H	0-1,7 MPa output range

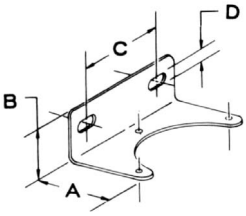
Dimensions



Gauge port R1/4“.

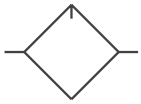
Port size	A	B	C	D
1/4“	157	70	35	76
3/8“	157	70	35	76
1/2“	172	95	37	91
3/4“	265	113	48	119
1“	265	113	48	119
1 1/4“	275	132	49	208
1 1/2“	275	132	49	208

Mounting bracket



Order codes	Thread	A	B	C	D
NPK50A	1/4“, 3/8“	57	30	48	7
NPK50B	1/2“	57	30	48	7
NPK50	3/4“ to 1 1/2“	75	44	83	8

Usually mounted third in the FRL Series, the lubricator is designed to inject oil aerosols into the airstream of a pneumatic circuit. As air flows from the regulator, some air is diverted from the main orifice and is allowed to flow through the fill under pressure bleed assembly and pressurize the bowl. This forces oil up the siphon tube and into the integral valve/sight dome. The oil film then drops through the valve and into the atomization chamber at a rate that is automatically proportional to the air flow. This virtually eliminates the need for readjustment.



Port size	1/4“	3/8“	1/2“	3/4“	1“	1 1/4“	1 1/2“
Flow capacity at 0,7 MPa (Δp=25%) [Nl/min]	1700	2549	3682	8500	9205	14160	16145
Temperature range [˚C]	+4 to +65						
Max. pressure [MPa]	1,7						
Weight [kg]*	1,00	1,00	1,50	1,90 (3,30)	1,90 (3,30)	3,40 (4,50)	3,40 (4,50)
Bowl capacity [l]	0,15	0,15	0,25	0,45 (1,9)	0,45 (1,9)	0,45 (1,9)	0,45 (1,9)

Values in brackets are valid for 1,9 l capacity bowl.

Order codes

NL50 L G 06 F

Series	
NL50	series HF50

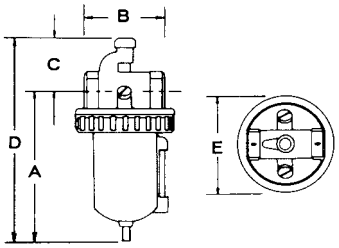
Bowl capacity	
L	standard
J	1,9 liters for port size G3/4“ and bigger

Thread	
G	thread G
—	thread NPTF

Port size	
02	1/4“
03	3/8“
04	1/2“
06	3/4“
08	1“
10	1 1/4“
12	1 1/2“

Options	
F	button head fill

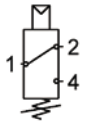
Dimensions



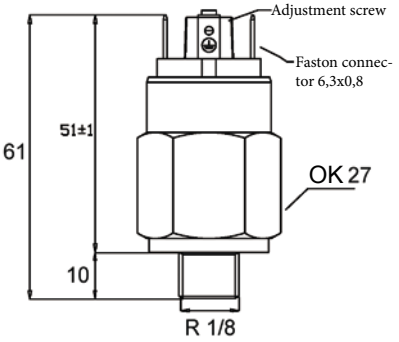
Port size	A	B	C	D	D*	E
1/4“	120	64	56	179	—	74
3/8“	120	64	56	179	—	74
1/2“	141	83	59	202	—	96
3/4“	184	103	67	251	321	126
1“	184	103	67	251	321	126
1 1/4“	194	122	72	266	337	126
1 1/2“	194	122	72	266	337	126

Dimensions D* are valid for 1,9 l capacity bowl.

Pressure switch PS27 with hysteresis

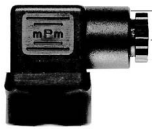


Description	Value
Housing material	brass (u NPS2720234 passivated steel)
Diaphragm	EPDM
Working medium	air, water, brake liquid, ethylene glycol,ammonia and other
Electric contacts	silver plated
Max. switched voltage [V]	250, 50-60 Hz
Max. switched current [A]	6 for ohmic load, 1 for inductive load
Max. fluid temperature [˚C]	120
Anticipated min. cycles	1 million
Enclosure rating	IP00 without connector IP65 with connector
Hysteresis	10 to 30% of setting value
Weight [kg]	0,12



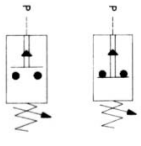
Order codes	Thread	Pressure [MPa]	Tolerance at 20˚C [MPa]	Max. static pressure [MPa]
NPS2721231	R1/8“	0,02 to 0,15	± 0,02	8,0
NPS2721232	R1/8“	0,1 to 0,5	± 0,03	8,0
NPS2721233	R1/8“	0,1 to 1,6	± 0,05	8,0
NPS2720234	R1/8“	2,0 to 5,0	± 0,2	30,0

Konektor pro přepínač typ PS27

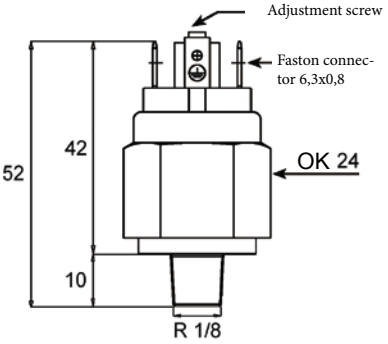


Order codes	Krytí
NPCPS2765	IP65

Pressure switch PS31



Description	Value
Housing material	brass (u NPS3120234 passivated steel)
Diaphragm	FKM (Viton®)
Working medium	air, water,mineral hydraulic oil and other
Electric contacts	silver plated
Max. switched voltage [V]	250, 50-60 Hz
Max. switched current [A]	2 for ohmic load, 0,5 for inductive load
Max. fluid temperature [˚C]	120
Anticipated min. cycles	1 million
Enclosure rating	IP00 without connector IP54 resp. IP65 with connector
Weight [kg]	0,07



Order codes type NO - normally open	Order codes type NC - normally closed	Thread	Pressure [MPa]	Tolerance at 20˚C [MPa]	Max. static pressure [MPa]
NPS3121231	NPS3111231	R1/8“	0,01 to 0,10	± 0,01	8,0
NPS3121232	NPS3111232	R1/8“	0,1 to 0,5	± 0,03	8,0
NPS3121233	NPS3111233	R1/8“	0,1 to 1,6	± 0,05	8,0
NPS3120234	NPS3110234	R1/8“	2,0 to 5,0	± 0,2	30,0

Connector for switch PS31

Order codes	Enclosure rating
NPCPS3165	IP65

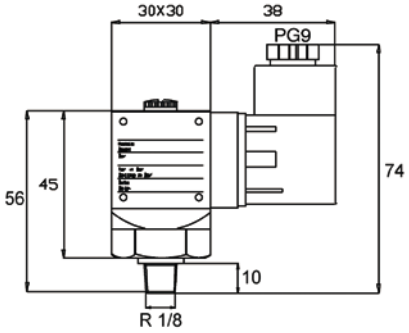
Protection cap for switch PS31

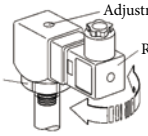
Order codes	Enclosure rating
NPCPS3154	IP54

Swivel pressure switch PS24 with hysteresis

Description	Value
Housing material	body: anodized dural, threaded fitting: passivated steel
Diaphragm	EPDM
Working medium	air, water, brake liquid, ethylene glycol,ammonia and other
Max. switched voltage [V]	250, 50-60 Hz
Max. switched current [A]	5 for ohmic load, 1 for inductive load
Max. fluid temperature [˚C]	120
Anticipated min. cycles	1 million
Enclosure rating	IP65 with connector (connector is included)
Hysteresis	10 to 30% of setting value
Weight [kg]	0,18

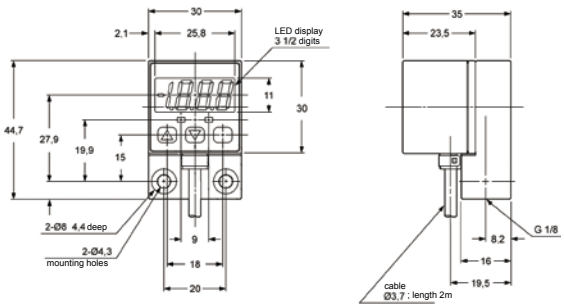
Order codes	Thread	Pressure [MPa]	Tolerance at 20˚C [MPa]	Max. static pressure [MPa]
NPS2420231	R1/8“	0,02 to 0,10	± 0,01	10,0
NPS2420232	R1/8“	0,1 to 0,5	± 0,03	10,0
NPS2420233	R1/8“	0,1 to 1,6	± 0,05	15,0
NPS2420234	R1/8“	1,0 to 5,0	± 0,2	15,0





Digital pressure switch DPS with internal thread G1/8“

Description	Value
Pressure range [MPa]	0.05 to 1,00
Working medium	non-corosive gas
Supply voltage [V]	12 to 24, DC (+ 10%, -15%)
Current consumption [mA]	up to 50
Comparative output	PNP, current max. 100 mA, voltage max. 30V DC, residual voltage 2V (at 100mA)
Operation indicator	orange LED for comparative output 1, green LED for comparative output 2
Analog voltage output	output voltage 1 to 5 V, zero point 1V ±5% F.S., span 4V ±5% F.S., linearity ±1% F.S., output impedance app. 1 kΩ
Selectable units	MPa, bar, PSI, kgf/cm^2
Hysteresis	1 digit (2 digits when using PSI units), repeatability ±0,2% F.S. ±1digit
Time response [ms]	less than 2,5
Short circuit protection	integrated
Display	3 1/2 digits, red LED, sampling cycle 4x per sec.
Enclosure rating	IP40
Ambient temperature [°C]	-10 to +50 (no dew condensation or icing)
Ambient humidity [%]	35 to 85
Materials	body: ABS, PPS (containing glass fibers), display: acrylic, port fitting: diecast zinc alloy
Weight [kg]	0,12



Order codes	Thread	Pressure [MPa]
NDPSG180P	G1/8“	0,05 to 1.00

Pneumatic oil

This oil is used for lubrication of compressed air in pneumatic systems for fail-safe operation. It is specially blended oil with good features such as foamless, no aggression to sealing, balanced viscosity gives you an advantage. Oil is atomized into the compressed air in lubricators.

Temperature range: -20˚C to +80˚C

Order codes	Package volume
2995 0101 0000 0000	1 liter
2995 0102 0000 0000	2 liters
2995 0103 0000 0000	3 liters
2995 0105 0000 0000	5 liters
2995 0110 0000 0000	10 liters

Grease SAP-FML2A for pneumatic components

This grease is used for renovation or creation of permanent fat filling with very long lifetime for using with non-lubricated air. All pneumatic items are greased with this grease by default. Grease has very good water resistance, good stability, excellent mechanical stability and is oxidation resistant.

Temperature range: -30˚C to +120˚C

Order codes	Package content
2995 1004 0000 0000	400 g

Grease for pneumatic components for high temperature usage

This grease is used for renovation or creation of permanent fat filling with very long lifetime for using in high temperatures up to 200°C.

Temperature range: -40˚C to +200˚C

Order codes	Package content
2995 1104 0000 0000	400 g
2995 1110 0000 0000	1000 g

Grease with PTFE-Teflon for guides

It is plastic grease filled with PTFE-Teflon, which is used for greasing of various sliding and guiding surfaces on stressed places of machines. This grease is not used for greasing of internal parts of pneumatic items. For lubricating of internal parts of pneumatic components please use pneumatic oil or grease for pneumatic components.

Temperature range: -30˚C to +140˚C

Order codes	Package content
2995 5004 0000 0000	400 g

We can offer more units for air preparation, than this catalogue contain. There are units which aren't used so often or units for special purposes. For example:

- stainless steel units
- pilot operated regulators G1/4“ to G2 1/2“
- precision regulators
- precision regulators with high flow capacity
- pilot operated regulators
- electropneumatic proportional regulators
- full range of coalescing filters to get cleanness up to 99,99% and to remove moisture
- air dryers

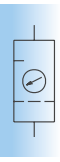
Please ask our technical dept. for details of for catalogues.


Coalescing filters series Delta™

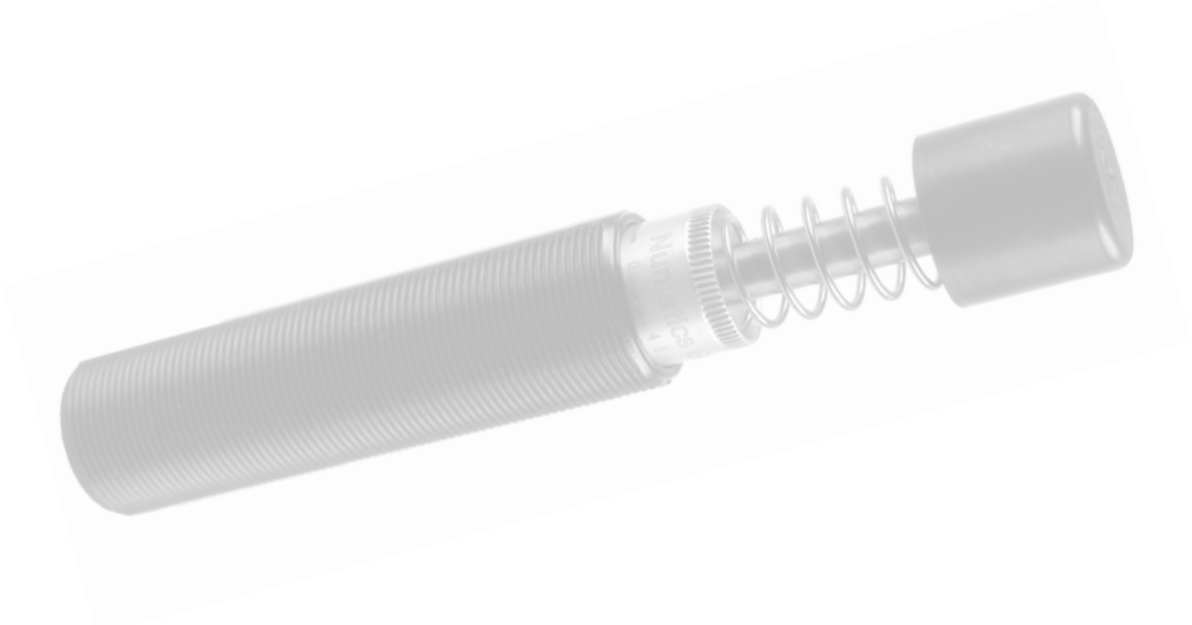
Series Delta™ is whole range of filters, which ensure such a quality of compressed air, which your application needs. It is used for air preparation on air compressors, supply lines and in front of critical applications.
Series Delta™ consist of the following units:

- water separator G1/4“ to G3“
- coalescing filter 3 µm G1/4“ to G3“
- coalescing filter 1 µm G1/4“ to G3“
- coalescing filter 0,3 µm G1/4“ to G3“
- coalescing filter 0,01 µm G1/4“ to G3“
- adsorbing filter 0,3 µm G1/4“ to G3“

Filters has metal bowls and could be equipped with differential pressure gauges as well as automatic drain and electronic filter control.
If you are interested in series Delta™ please contact our technical dept. and ask for full range catalogue.

HYDRAULIC SHOCK ABSORBER - CONTENTS



HYDRAULIC SHOCK ABSORBER SERIES NC - M8 TO M12

Series	NC-E	NC-S	NC-P
Type	adjustable	self-compensating	self-compensating
Characteristics	linear	linear	progressive
Impact speed [ms^{-1}]	0,2 to 3,5	0,2 to 5,0	0,2 to 5,0
Temperature range [°C]	-20 to +80		

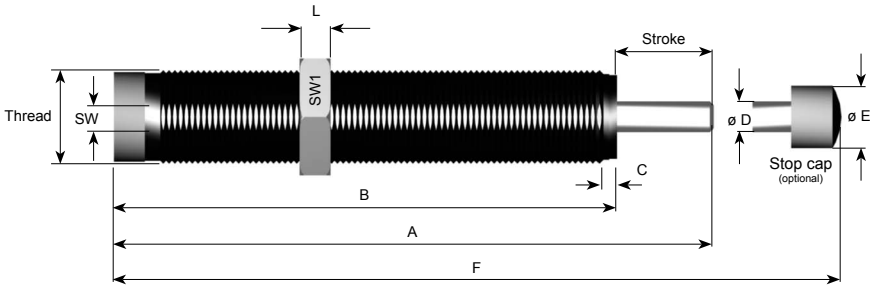
Type	0,1	0,15	0,2
Spring return force [N]	2,5 to 6	3,6 to 8	3,5 to 7
Weight [kg]	0,01	0,02	0,36
Max. tightening torque [Nm]	2	6	10

Order codes

Order code consist of **series description, type** (1. part - see table) and **hardness selection** (2. part - see table), eventually indication of shock absorber with stop cap. If you need the shock absorber with stop cap, add **„-A“** after complete order code. The stop cap couldn't be mounted additionally as accessories, because by mounting of stop cap the stroke of shock absorber will be smaller. That is why the stop cap must be ordered together with shock absorber to ensure that piston rod will be extended for stop cap.
Example 1: self-compensating progressive shock absorber M10x1 type 0,15 with hardness 3 has order code NC-P0,15-3
Example 2: adjustable shock absorber M12x1 type 0,2 with stop cap has order code NC-E0,2-1-A

Order code (1. part)	Thread	Stroke	Energy absorption			Effective mass - hardness / order code (2. part)			
			constant load[Nm/ stroke]	emergency load [Nm/stroke]	total energy [Nm/hod]	...-1 (soft)	...-2 (medium)	...-3 (hard)	...-4 (very hard)
NC-S0,1-...	M8x1	7	4	6	14 400	0,65 to 2	1,3 to 5,5	1,7 to 50	—
NC-P0,1-...	M8x1	7	4	6	14 400	0,3 to 0,9	0,65 to 2,0	1,8 to 8	—
NC-E0,15-...	M10x1	10	15	22,5	24 000	1 to 500	—	—	—
NC-S0,15-...	M10x1	10	15	22,5	24 000	1,6 to 7,5	6,1 to 71	61 to 252	232 to 750
NC-P0,15-...	M10x1	10	15	22,5	24 000	1 to 2,2	2 to 7,5	6,1 to 71	—
NC-E0,2-...	M12x1	12	22	33	35 200	9 to 800	—	—	—
NC-P0,2-...	M12x1	12	22	33	35 200	2 to 11	10 to 107	104 to 360	343 to 1100
NC-S0,2-...	M12x1	12	22	33	35 200	1,5 to 2,8	2 to 21	17 to 92	—

Dimensions



Type	Thread	A	B	C	D	E	F	L	SW	SW1
0,1	M8x1	51	44	2,5	2,5	6	57	3	3	11
0,15	M10x1	59,5	49,5	2,5	3	6	65,5	3	3	13
0,2	M12x1	77	65	2,5	4	10	83	4	3	14

Series	NC-E	NC-S	NC-P
Type	adjustable	self-compensating	self-compensating
Characteristics	linear	linear	progressive
Impact speed [ms^{-1}]	0,08 to 6,0	0,08 to 6,0	0,3 to 8,0
Temperature range [°C]	-20 to +80		

Type	0,25	0,35	0,5x19	1,0	1,0x40
Spring return force [N]	13 to 23	13 to 23	12 to 23	15 to 31	11 to 20
Weight [kg]	0,05	0,07	0,14	0,29	0,39
Max. tightening torque [Nm]	20	20	25	30	30

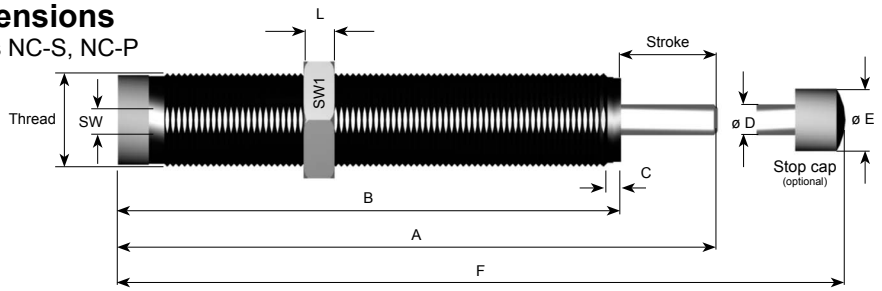
Order codes

Order code consist of **series description, type** (1. part - see table) and **hardness selection** (2. part - see table), eventually indication of shock absorber with stop cap. If you need the shock absorber with stop cap, add **„-A"** after complete order code. The stop cap couldn't be mounted additionally as accessories, because by mounting of stop cap the stroke of shock absorber will be smaller. That is why the stop cap must be ordered together with shock absorber to ensure that piston rod will be extended for stop cap.
Example 1: self-compensating progressive shock absorber M16x1,5 type 0,35 with hardness 3 has order code NC-P0,35-3
Example 2: adjustable shock absorber M14x1 type 0,25 with stop cap has order code NC-E0,25-1-A

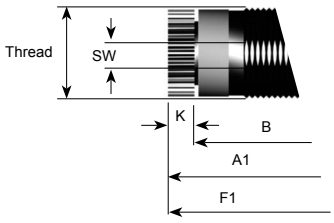
Order code (1. part)	Thread	Stroke	Energy absorption			Effective mass - hardness / order code (2. part)				
			constant load[Nm/stroke]	emergency load [Nm/stroke]	total energy [Nm/hod]	...-0 (very soft)	...-1 (soft)	...-2 (medium)	...-3 (hard)	...-4 (very hard)
NC-E0,25-...	M14x1	14	30	48	50 000	—	1,6 to 1500	—	—	—
NC-S0,25-...	M14x1	14	30	48	50 000	0,9 to 8	3,5 to 17	9,9 to 76	62 to 252	250 to 950
NC-P0,25-...	M14x1	14	30	48	50 000	—	0,8 to 3,7	3 to 26	21 to 165	—
NC-E0,35-...	M16x1	14	35	50	52 500	—	6,5 to 1750	—	—	—
NC-S0,35-...	M16x1	14	35	50	52 500	1,9 to 4,5	4 to 25	22 to 90	85 to 428	420 to 1320
NC-P0,35-...	M16x1	14	35	50	52 500	—	1,1 to 6,4	5 to 28	25 to 280	—
NC-E0,5x19-...	M20x1	19	100	160	76 500	—	9 to 4500	—	—	—
NC-S0,5x19-...	M20x1	19	100	160	76 500	2,6 to 10,6	10 to 86	40 to 209	170 to 800	680 to 4050
NC-P0,5x19-...	M20x1	19	100	160	76 500	—	2,6 to 12,5	10 to 89	69 to 555	—
NC-E1,0-...	M24x1,5	25	220	352	105 600	—	22 to 11000	—	—	—
NC-S1,0-...	M24x1,5	25	220	352	105 600	6 to 29	24 to 120	70 to 460	440 to 2050	1760 to 10800
NC-P1,0-...	M24x1,5	25	220	352	105 600	—	6 to 27,5	21 to 195	150 to 1200	—
NC-E1,0x40-...	M24x1,5	40	390	624	175 600	—	38 to 18000	—	—	—
NC-S1,0x40-...	M24x1,5	40	390	624	175 600	15 to 103	44 to 216	135 to 962	780 to 3600	3100 to 19500
NC-P1,0x40-...	M24x1,5	40	390	624	175 600	—	10 to 48	39 to 340	270 to 2150	—

Dimensions

Series NC-S, NC-P



Series NC-E



Type	Thread	A	A1	B	C	D	E	F	F1	K	L	SW	SW1
0,25	M14x1	91	96	77	2,5	4	10	100	105	4,5	5	13	17
0,35	M16x1	91	96	77	2,5	4	10	104	105	4,5	6	14	24
0,5x19	M20x1	107	113	88	2,5	6	12	117	123	6	6	18	24
1,0	M24x1,5	133	141	108	3,5	8	16	146	154	8	8	23	30
1,0x40	M24x1,5	170	178	130	3,5	8	16	183	191	8	8	23	30

Series	NC-E	NC-S	NC-P
Type	adjustable	self-compensating	self-compensating
Characteristics	linear	linear	progressive
Impact speed [ms^{-1}]	0,02 to 6,0	0,1 to 6,0	0,4 to 8,0
Temperature range [°C]	-20 to +80		

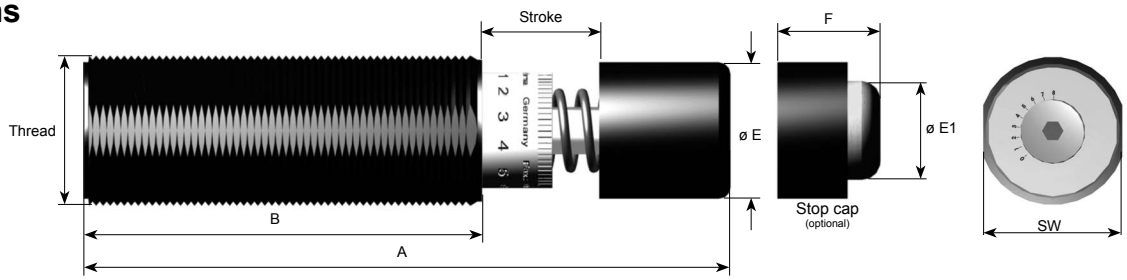
Type	1,25x1	1,25x2	1,5x1	1,5x2	1,5x3
Spring return force [N]	30 to 50	23 to 50	50 to 70	35 to 70	35 to 80
Weight [kg]	0,45	0,45	0,95	1,1	1,2
Max. tightening torque [Nm]	40	40	40	40	40

Order codes

Order code consist of series **description, type** (1. part - see table) and **hardness selection** (2. part - see table), eventually indication of shock absorber with stop cap. If you need the shock absorber with stop cap, add **„-A“** after complete order code. The stop cap couldn't be mounted additionally as accessories, because by mounting of stop cap the stroke of shock absorber will be smaller. That is why the stop cap must be ordered together with shock absorber to ensure that piston rod will be extended for stop cap.
Example 1: self-compensating progressive shock absorber M45x2 type 1,5x2 with hardness 3 has order code NC-P1,5x2-3
Example 2: adjustable shock absorber M32x1,5 type 1,25x1 with stop cap has order code NC-E1,25x1-1-A

Order code (1. part)	Thread	Stroke	Energy absorption			Effective mass - hardness / order code (2. part)				
			constant load[Nm/stroke]	emergency load [Nm/stroke]	total energy [Nm/hod]	...-0 (very soft)	...-1 (soft)	...-2 (medium)	...-3 (hard)	...-4 (very hard)
NC-E1,25x1-...	M32x1,5	25	300	480	120 000	10 to 100	60 to 2950	800 to 89000	—	—
NC-S1,25x1-...	M32x1,5	25	300	480	120 000	7 to 32	28 to 130	80 to 590	440 to 2050	2000 to 12500
NC-P1,25x1-...	M32x1,5	25	300	480	120 000	—	7 to 35	30 to 260	207 to 1650	—
NC-E1,25x2-...	M32x1,5	50	500	800	300 000	15 to 160	100 to 4000	800 to 120000	—	—
NC-S1,25x2-...	M32x1,5	50	500	800	300 000	13 to 60	56 to 240	160 to 1200	1000 to 4200	4000 to 25000
NC-P1,25x2-...	M32x1,5	50	500	800	300 000	—	7 to 35	30 to 260	207 to 1650	—
NC-E1,5x1-...	M45x2	25	25	870	261 000	30 to 250	150 to 21000	6200 to 240000	—	—
NC-S1,5x1-...	M45x2	25	25	870	261 000	24 to 114	98 to 480	280 to 2100	1740 to 8200	6960 to 43500
NC-P1,5x1-...	M45x2	25	25	870	261 000	—	24 to 108	85 to 770	600 to 4800	—
NC-E1,5x2-...	M45x2	50	50	1 350	340 000	45 to 130	300 to 26000	10800 to 330000	—	—
NC-S1,5x2-...	M45x2	50	50	1 350	340 000	35 to 170	160 to 680	440 to 2900	2700 to 12700	10800 to 67500
NC-P1,5x2-...	M45x2	50	50	1 350	340 000	—	37 to 160	130 to 1200	940 to 7500	—
NC-E1,5x3-...	M45x2	75	75	2 100	420 000	70 to 670	450 to 27600	16800 to 500000	—	—
NC-S1,5x3-...	M45x2	75	75	2 100	420 000	40 to 270	240 to 1100	670 to 5000	4200 to 19500	16800 to 105000
NC-P1,5x3-...	M45x2	75	75	2 100	420 000	—	58 to 260	200 to 1850	1450 to 11600	—

Dimensions



Type	Thread	A	B	E	E1	F	SW
1,25x1	M32x1.5	138	85	29	21	16	30
1,25x2	M32x1.5	188	110	29	21	16	30
1,5x1	M45x2	146	89	39,6	31	25	41
1,5x2	M45x2	196	114	39,6	31	25	41
1,5x3	M45x2	246	139	39,6	31	25	41

Series	NC-E	NC-S	NC-P
Type	adjustable	self-compensating	self-compensating
Characteristics	linear	linear	progressive
Impact speed [ms^{-1}]	0,02 to 6,0	0,1 to 6,0	0,4 to 8,0
Temperature range [°C]	-20 to +80		

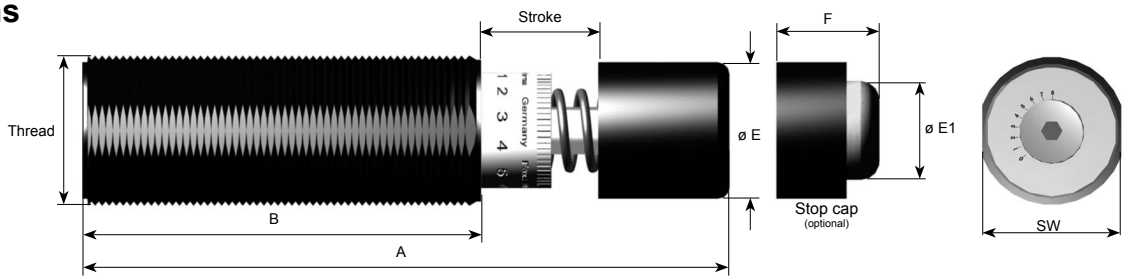
Type	2,0x1	2,0x2	2,0x4	2,0x6
Spring return force [N]	50 to 130	40 to 130	45 to 130	35 to 130
Weight [kg]	2,0	3,0	3,9	4,8
Max. tightening torque [Nm]	40	40	40	40

Order codes

Order code consist of **series description, type** (1. part - see table) and **hardness selection** (2. part - see table), eventually indication of shock absorber with stop cap. If you need the shock absorber with stop cap, add **„-A"** after complete order code. The stop cap couldn't be mounted additionally as accessories, because by mounting of stop cap the stroke of shock absorber will be smaller. That is why the stop cap must be ordered together with shock absorber to ensure that piston rod will be extended for stop cap.
Example 1: self-compensating progressive shock absorber M62x2 type 2,0x2 with hardness 3 has order code NC-P2,0x2-3
Example 2: adjustable shock absorber M62x2 type 2,0x1 with stop cap has order code NC-E2,0x1-1-A

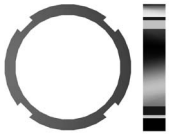
Order code (1. part)	Thread	Stroke	Energy absorption			Effective mass - hardness / order code (2. part)				
			constant load[Nm/stroke]	emergency load [Nm/stroke]	total energy [Nm/hod]	...-0 (very soft)	...-1 (soft)	...-2 (medium)	...-3 (hard)	...-4 (very hard)
NC-E2,0x1-...	M62x2	25	1 500	2 400	150 000	60 to 480	300 to 41150	12000 to 470000	—	—
NC-S2,0x1-...	M62x2	25	1 500	2 400	150 000	31 to 197	170 to 830	480 to 3700	3000 to 14100	12000 to 75000
NC-P2,0x1-...	M62x2	25	1 500	2 400	150 000	—	31 to 187	150 to 1330	1030 to 8300	—
NC-E2,0x2-...	M62x2	50	2 500	4 000	250 000	80 to 800	500 to 63700	14000 to 600000	—	—
NC-S2,0x2-...	M62x2	50	2 500	4 000	250 000	52 to 330	280 to 1385	800 to 6150	5000 to 23500	20000 to 125000
NC-P2,0x2-...	M62x2	50	2 500	4 000	250 000	—	52 to 310	250 to 2200	1730 to 13800	
NC-E2,0x4-...	M62x2	100	5 000	8 000	350 000	160 to 1600	1000 to 62500	40000 to 1000000	—	—
NC-S2,0x4-...	M62x2	100	5 000	8 000	350 000	104 to 650	565 to 2770	1600 to 12350	10000 to 47200	40000 to 250000
NC-P2,0x4-...	M62x2	100	5 000	8 000	350 000	—	100 to 625	490 to 4400	3460 to 27700	—
NC-E2,0x6-...	M62x2	150	8 000	12 800	400 000	250 to 2400	1250 to 105000	64000 to 1000000	—	—
NC-S2,0x6-...	M62x2	150	8 000	12 800	400 000	160 to 1050	905 to 4430	2560 to 19750	16000 to 75500	64000 to 400000
NC-P2,0x6-...	M62x2	150	8 000	12 800	400 000	—	160 to 1000	790 to 7100	5530 to 44000	—

Dimensions



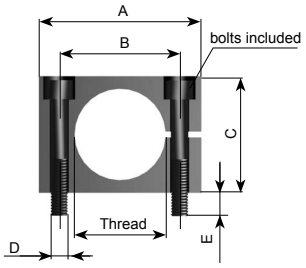
Type	Thread	A	B	E	E1	F	SW
2,0x1	M62x2	186	104	59,6	45	25	60
2,0x2	M62x2	236	129	596	45	25	60
2,0x4	M62x2	336	179	596	45	25	60
2,0x6	M62x2	453	246	59,6	45	25	60

Nut for series NC M8 to M62



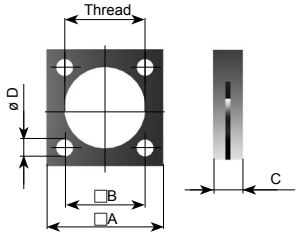
Thread	Order codes	Thread	Order codes	Thread	Order codes	Thread	Order codes	Thread	Order codes
M8x1	NU-14012	M12x1	NU-17012	M16x1	NU-22152	M24x1,5	NU-21232	M45x2	NU-S24012
M10x1	NU-15012	M14x1	NU-21052	M20x1	NU-21152	M32x1,5	NU-S23012	M62x2	NU-S25012

Rectangular flange for series NC M10 to M24



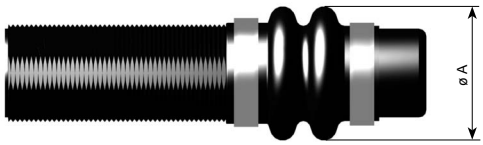
Order codes	Thread	A	B	C	D	E	Width
NU-15013	M10x1	38	25,4	25	4,5	—	12
NU-17013	M12x1	38	25,4	25	4,5	—	12
NU-S21053	M14x1	32	20	20	M5	5	12
NU-S22153	M16x1	40	28	28	M6	6	20
NU-S21153	M20x1	40	28	28	M6	6	20
NU-S21233	M24x1,5	46	33	32	M6	6	25

Square flange for series NC M32 to M62



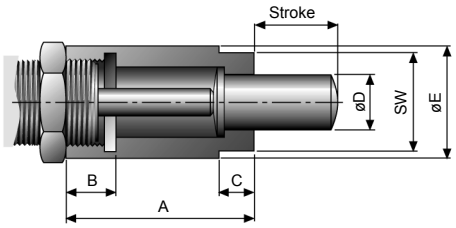
Order codes	Thread	A	B	C	D
NU-S23014	M32x1,5	44	32	12	6,6
NU-S24014	M45x2	56	43	15	9
NU-S25014	M62x2	80	60	20	11

Bellow for series NC M32 to M62



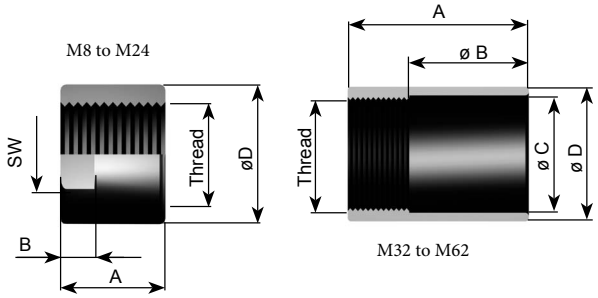
Order codes	Thread	A
NU-S23117	M32x1,5	65
NU-S24117	M45x2	80
NU-S25117	M62x2	90

Adapter for side forces for series NC M10 to M24



Order codes	Thread	A	B	C	D	E	SW
NU-15319	M10x1	20,5	7	5	7	14	13
NU-17019	M12x1	23	7	5	9	15	14
NU-S21019	M14x1	32	10	6	9	18	15
NU-S22119	M16x1	33	10	5	12	20	17
NU-S21119	M20x1	42	16	8	12	24	22
NU-S21219	M24x1,5	53,5	14,5	10	16	29	27

Stop limit nut for series NC M8 to M62



Order codes	Thread	A	B	C	D	SW
NU-14018	M8x1	12	—	—	11	—
NU-15018	M10x1	15	—	—	14	—
NU-17018	M12x1	20	—	—	16	—
NU-21058	M14x1	20	6	—	18	15
NU-22158	M16x1	25	8	—	21	19
NU-21158	M20x1	35	8	—	25	22
NU-21238	M24x1,5	38	10	—	34	30
NU-S23018	M32x1,5	44	32	12	6,6	—
NU-S24018	M45x2	56	43	15	9	—
NU-S25018	M62x2	80	60	20	11	—

Hydraulic speed control is suitable for applications, where constant speed of feed is necessary, e.g. for feed during drilling, where feed speed balances due to variable material resistance when pneumatic cylinder is used only. The advantage is continual speed setting and maintanance-free operation.

Series	NU-V
Speed range [m/min]	0,015 to 15 or 12 to 40, continual speed setting
Temperature range [°C]	-20 to +80

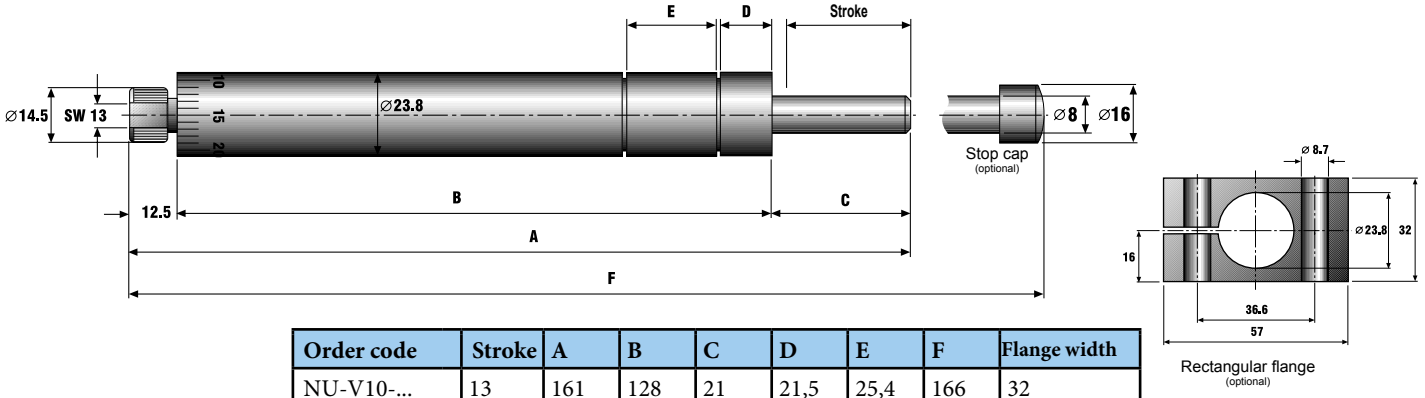
Order codes

Order code consist of **series description, type** (1. part - see table) and **speed range** (2. part - see table), eventually indication of speed control with stop cap. If you need the speed control with stop cap, add **„-A"** after complete order code. The stop cap couldn't be mounted additionally as accessories, because by mounting of stop cap the stroke of speed control will be smaller. That is why the stop cap must be ordered together with speed control to ensure that piston rod will be extended for stop cap.
Example: speed control for speed range 0,015 to 15 with stroke 100 mm has order code NU-V50-2

Order codes (1. part)	Stroke	External force		Speed range - order codes (2. part)		Spring return force [N]	Weight [kg]
		min [N]	max [N]	...-1 [m/min]	...-2 [m/min]		
NU-V10-...	13	25	3700	12 to 40	0,015 to 15	12 to 28	0,35
NU-V20-...	25	25	3700	12 to 40	0,015 to 15	12 to 28	0,45
NU-V30-...	50	35	3700	12 to 40	0,015 to 15	15 to 32	0,55
NU-V40-...	75	45	3700	12 to 40	0,015 to 15	15 to 32	0,65
NU-V50-...	100	45	3700	12 to 40	0,015 to 15	15 to 32	0,80
NU-V60-...	125	45	3700	12 to 40	0,015 to 15	16 to 40	0,97
NU-V70-...	150	45	3700	12 to 40	0,015 to 15	16 to 40	1,05

Accessories	NU-V10 to NU-V30	NU-V40 to NU-V70
Rectangular flange	NU-82013	NU-82043

Dimensions



Order code	Stroke	A	B	C	D	E	F	Flange width
NU-V10-...	13	161	128	21	21,5	25,4	166	32
NU-V20-...	25	202	157	33	19,1	25,4	207	32
NU-V30-...	50	278	208	58	14,6	25,4	283	32
NU-V40-...	75	351	256	83	14,6	25,4	356	51
NU-V50-...	100	417	298	106	14,6	25,4	422	51
NU-V60-...	125	524	380	131	14,6	25,4	529	51
NU-V70-...	150	584	415	156	14,6	25,4	589	51

FITTINGS, TUBES AND ACCESSORIES - CONTENTS

Straight*

∅ mm	Thread	Order codes
4	M5	N104-004-005
4	G1/8“	N102-004-000
4	G1/4“	N102-004-001
6	M5	N104-006-005
6	G1/8“	N102-006-000
6	G1/4“	N102-006-001
8	G1/8“	N102-008-000
8	G1/4“	N102-008-001
8	G3/8“	N102-008-002
10	G1/4“	N102-010-001
10	G3/8“	N102-010-002
10	G1/2“	N102-010-003
12	G1/4“	N102-012-001
12	G3/8“	N102-012-002
12	G1/2“	N102-012-003

Straight with internal thread

∅ mm	Thread	Order codes
4	M5	N105-004-005
4	G1/8“	N105-004-000
6	G1/8“	N105-006-000
6	G1/4“	N105-006-001
8	G1/8“	N105-008-000
8	G1/4“	N105-008-001
10	G1/4“	N105-010-001
10	G3/8“	N105-010-002
12	G1/4“	N105-012-001
12	G3/8“	N105-012-002
12	G1/2“	N105-012-003

Bulkhead fitting

∅ mm	Thread	Order codes
4	M11	N101-004-000
6	M13	N101-006-000
8	M16	N101-008-000
10	M19	N101-010-000
12	M22	N101-012-000

Plug

∅ mm	Order codes
4	N118-004-000
6	N118-006-000
8	N118-008-000
10	N118-010-000
12	N118-012-000

Swivel elbow*

∅ mm	Thread	Order codes
4	M5	N108-004-005
4	G1/8“	N108-004-000
4	G1/4“	N108-004-001
6	M5	N108-006-005
6	G1/8“	N108-006-000
6	G1/4“	N108-006-001
8	G1/8“	N108-008-000
8	G1/4“	N108-008-001
8	G3/8“	N108-008-002
8	G1/2“	N108-008-003+
10	G1/8“	N108-010-000
10	G1/4“	N108-010-001
10	G3/8“	N108-010-002
10	G1/2“	N108-010-003
12	G1/4“	N108-012-001
12	G3/8“	N108-012-002
12	G1/2“	N108-012-003

Long swivel elbow*

∅ mm	Thread	Order codes
4	G1/8“	N108E-004-000
4	G1/4“	N108E-004-001
6	G1/8“	N108E-006-000
6	G1/4“	N108E-006-001
8	G1/8“	N108E-008-000
8	G1/4“	N108E-008-001
8	G3/8“	N108E-008-002
10	G1/4“	N108E-010-001
10	G3/8“	N108E-010-002

Adapter*

∅ mm	Thread	Order codes
4	M5	N120-004-005
4	G1/8“	N120-004-000
4	G1/4“	N120-004-001
6	M5	N120-006-005
6	G1/8“	N120-006-000
6	G1/4“	N120-006-001
8	G1/8“	N120-008-000
8	G1/4“	N120-008-001
8	G3/8“	N120-008-002
10	G1/4“	N120-010-001
10	G3/8“	N120-010-002
10	G1/2“	N120-010-003
12	G1/4“	N120-012-001
12	G3/8“	N120-012-002
12	G1/2“	N120-012-003

1 port banjo

∅ mm	Thread	Order codes
4	M5	N122-004-005
4	G1/8“	N122-004-000
6	M5	N122-006-005
6	G1/8“	N122-006-000
6	G1/4“	N122-006-001
8	G1/8“	N122-008-000
8	G1/4“	N122-008-001
8	G3/8“	N122-008-002
10	G1/4“	N122-010-001
10	G3/8“	N122-010-002
12	G1/4“	N122-012-001
12	G3/8“	N122-012-002+

2 ports banjo

∅ mm	Thread	Order codes
4	M5	N123-004-005
4	G1/8“	N123-004-000
6	M5	N123-006-005
6	G1/8“	N123-006-000
6	G1/4“	N123-006-001
8	G1/8“	N123-008-000
8	G1/4“	N123-008-001
8	G3/8“	N123-008-002
10	G1/4“	N123-010-001
10	G3/8“	N123-010-002
12	G1/4“	N123-012-001

Single banjo bolt incl. sealing rings

Thread	Order codes
M5	N124-000-005
G1/8“	N124-000-000
G1/4“	N124-000-001
G3/8“	N124-000-002

Double banjo bolt incl. sealing rings

Thread	Order codes
G1/8“	N125-000-000
G1/4“	N125-000-001
G3/8“	N125-000-002

*) Fitting include mounted sealing ring
+) This item could have another design and/or colour

Straight connector

∅ mm	∅ mm	Order codes
4	4	N100-004-000
4	6	N100-004-006+
6	6	N100-006-000
6	8	N100-006-008+
8	8	N100-008-000
10	10	N100-010-000
12	12	N100-012-000

Elbow connector

∅ mm	Order codes
4	N106-004-000
6	N106-006-000
8	N106-008-000
10	N106-010-000
12	N106-012-000

X connector

∅ mm	Order codes
4	N117-004-000
6	N117-006-000
8	N117-008-000
10	N117-010-000
12	N117-012-000

Straight connector for 2 fittings

∅ mm	Order codes
4	N119-004-000
6	N119-006-000
8	N119-008-000
10	N119-010-000
12	N119-012-000

Reducer

D1 ∅ mm	D2 ∅ mm	Order codes
6	4	N121-006-000
8	4	N121-008-000
8	6	N121-008-002
10	6	N121-010-002
10	8	N121-010-003
12	6	N121-012-002
12	8	N121-012-003
12	10	N121-012-004

T connector

∅ mm	Order codes
4	N110-004-000
6	N110-006-000
8	N110-008-000
10	N110-010-000
12	N110-012-000

T fitting with side thread*

∅ mm	Thread	Order codes
4	M5	N115-004-005+
4	G1/8“	N115-004-000
6	M5	N115-006-005+
6	G1/8“	N115-006-000
6	G1/4“	N115-006-001
8	G1/8“	N115-008-000
8	G1/4“	N115-008-001
8	G3/8“	N115-008-002
10	G1/4“	N115-010-001
10	G3/8“	N115-010-002
10	G1/2“	N115-010-003
12	G1/4“	N115-012-001
12	G3/8“	N115-012-002
12	G1/2“	N115-012-003

T fitting with bottom thread*

∅ mm	Thread	Order codes
4	M5	N113-004-005+
4	G1/8“	N113-004-000
6	M5	N113-006-005+
6	G1/8“	N113-006-000
6	G1/4“	N113-006-001
8	G1/8“	N113-008-000
8	G1/4“	N113-008-001
8	G3/8“	N113-008-002
10	G1/4“	N113-010-001
10	G3/8“	N113-010-002
10	G1/2“	N113-010-003
12	G1/4“	N113-012-001
12	G3/8“	N113-012-002
12	G1/2“	N113-012-003

Y connector

∅ mm	Order codes
4	N131-004-000
6	N131-006-000
8	N131-008-000+

Y fitting

∅ mm	Thread	Order codes
4	M5	N132-004-005
4	R1/8“	N132-004-000
6	R1/8“	N132-006-000

*) Fitting include mounted sealing ring
+) This item could have another design and/or colour

Straight*

∅ mm	Thread	Order codes
4	M5	P102-004-005
4	G1/8“	P102-004-000
4	G1/4“	P102-004-001
6	M5	P102-006-005
6	G1/8“	P102-006-000
6	G1/4“	P102-006-001
6	G3/8“	P102-006-002
6	G1/2“	P102-006-003
8	G1/8“	P102-008-000
8	G1/4“	P102-008-001
8	G3/8“	P102-008-002
8	G1/2“	P102-008-003
10	G1/8“	P102-010-000
10	G1/4“	P102-010-001
10	G3/8“	P102-010-002
10	G1/2“	P102-010-003
12	G1/4“	P102-012-001
12	G3/8“	P102-012-002
12	G1/2“	P102-012-003

Swivel elbow*

∅ mm	Thread	Order codes
4	M5	P108-004-005
4	G1/8“	P108-004-000
4	G1/4“	P108-004-001
6	M5	P108-006-005
6	G1/8“	P108-006-000
6	G1/4“	P108-006-001
6	G3/8“	P108-006-002
6	G1/2“	P108-006-003
8	G1/8“	P108-008-000
8	G1/4“	P108-008-001
8	G3/8“	P108-008-002
8	G1/2“	P108-008-003
10	G1/8“	P108-010-000
10	G1/4“	P108-010-001
10	G3/8“	P108-010-002
10	G1/2“	P108-010-003
12	G1/4“	P108-012-001
12	G3/8“	P108-012-002
12	G1/2“	P108-012-003

Swivel elbow with internal thread

∅ mm	Thread	Order codes
4	M5	P109-004-005
4	G1/8“	P109-004-000
4	G1/4“	P109-004-001
6	M5	P109-006-005
6	G1/8“	P109-006-000
6	G1/4“	P109-006-001
6	G3/8“	P109-006-002
6	G1/2“	P109-006-003
8	G1/8“	P109-008-000
8	G1/4“	P109-008-001
8	G3/8“	P109-008-002
8	G1/2“	P109-008-003
10	G1/8“	P109-010-000
10	G1/4“	P109-010-001
10	G3/8“	P109-010-002
10	G1/2“	P109-010-003
12	G1/4“	P109-012-001
12	G3/8“	P109-012-002
12	G1/2“	P109-012-003

Straight with internal thread

∅ mm	Thread	Order codes
4	M5	P105-004-005
4	G1/8“	P105-004-000
4	G1/4“	P105-004-001
6	M5	P105-006-005
6	G1/8“	P105-006-000
6	G1/4“	P105-006-001
6	G3/8“	P105-006-002
6	G1/2“	P105-006-003
8	G1/8“	P105-008-000
8	G1/4“	P105-008-001
8	G3/8“	P105-008-002
8	G1/2“	P105-008-003
10	G1/8“	P105-010-000
10	G1/4“	P105-010-001
10	G3/8“	P105-010-002
10	G1/2“	P105-010-003
12	G1/4“	P105-012-001
12	G3/8“	P105-012-002
12	G1/2“	P105-012-003

Long swivel elbow*

∅ mm	Thread	Order codes
4	M5	P108E-004-005
4	G1/8“	P108E-004-000
4	G1/4“	P108E-004-001
6	M5	P108E-006-005
6	G1/8“	P108E-006-000
6	G1/4“	P108E-006-001
6	G3/8“	P108E-006-002
6	G1/2“	P108E-006-003
8	G1/8“	P108E-008-000
8	G1/4“	P108E-008-001
8	G3/8“	P108E-008-002
8	G1/2“	P108E-008-003
10	G1/8“	P108E-010-000
10	G1/4“	P108E-010-001
10	G3/8“	P108E-010-002
10	G1/2“	P108E-010-003
12	G1/4“	P108E-012-001
12	G3/8“	P108E-012-002
12	G1/2“	P108E-012-003

Swivel elbow 45° *

∅ mm	Thread	Order codes
4	G1/8“	P127-004-000
4	G1/4“	P127-004-001
6	G1/8“	P127-006-000
6	G1/4“	P127-006-001
6	G3/8“	P127-006-002
6	G1/2“	P127-006-003
8	G1/8“	P127-008-000
8	G1/4“	P127-008-001
8	G3/8“	P127-008-002
8	G1/2“	P127-008-003
10	G1/8“	P127-010-000
10	G1/4“	P127-010-001
10	G3/8“	P127-010-002
10	G1/2“	P127-010-003
12	G1/4“	P127-012-001
12	G3/8“	P127-012-002
12	G1/2“	P127-012-003

Bulkhead fitting

∅ mm	Thread	Order codes
4	M12	P101-004-000
6	M14	P101-006-000
8	M16	P101-008-000
10	M18	P101-010-000
12	M22	P101-012-000

*) Fitting include mounted sealing ring

Swivel single port banjo*

∅ mm	Thread	Order codes
4	M5	P137-004-005
4	G1/8“	P137-004-000
4	G1/4“	P137-004-001
6	M5	P137-006-005
6	G1/8“	P137-006-000
6	G1/4“	P137-006-001
6	G3/8“	P137-006-002
8	G1/8“	P137-008-000
8	G1/4“	P137-008-001
8	G3/8“	P137-008-002
8	G1/2“	P137-008-003
10	G1/8“	P137-010-000
10	G1/4“	P137-010-001
10	G3/8“	P137-010-002
10	G1/2“	P137-010-003
12	G3/8“	P137-012-002
12	G1/2“	P137-012-003

Y fitting*

∅ mm	Thread	Order codes
4	M5	P132-004-005
4	G1/8“	P132-004-000
4	G1/4“	P132-004-001
6	M5	P132-006-005
6	G1/8“	P132-006-000
6	G1/4“	P132-006-001
6	G3/8“	P132-006-002
6	G1/2“	P132-006-003
8	G1/8“	P132-008-000
8	G1/4“	P132-008-001
8	G3/8“	P132-008-002
8	G1/2“	P132-008-003
10	G1/8“	P132-010-000
10	G1/4“	P132-010-001
10	G3/8“	P132-010-002
10	G1/2“	P132-010-003
12	G1/4“	P132-012-001
12	G3/8“	P132-012-002
12	G1/2“	P132-012-003

Reducer

D1 ∅ mm	D2 ∅ mm	Order codes
6	4	P121-006-004
8	4	P121-008-004
8	6	P121-008-006
10	6	P121-010-006
10	8	P121-010-008
12	8	P121-012-008
12	10	P121-012-010

T fitting with side thread*

∅ mm	Thread	Order codes
4	M5	P115-004-005
4	G1/8“	P115-004-000
4	G1/4“	P115-004-001
6	M5	P115-006-005
6	G1/8“	P115-006-000
6	G1/4“	P115-006-001
6	G3/8“	P115-006-002
6	G1/2“	P115-006-003
8	G1/8“	P115-008-000
8	G1/4“	P115-008-001
8	G3/8“	P115-008-002
8	G1/2“	P115-008-003
10	G1/8“	P115-010-000
10	G1/4“	P115-010-001
10	G3/8“	P115-010-002
10	G1/2“	P115-010-003
12	G1/4“	P115-012-001
12	G3/8“	P115-012-002
12	G1/2“	P115-012-003

T fitting with bottom thread*

∅ mm	Thread	Order codes
4	M5	P113-004-005
4	G1/8“	P113-004-000
4	G1/4“	P113-004-001
6	M5	P113-006-005
6	G1/8“	P113-006-000
6	G1/4“	P113-006-001
6	G3/8“	P113-006-002
6	G1/2“	P113-006-003
8	G1/8“	P113-008-000
8	G1/4“	P113-008-001
8	G3/8“	P113-008-002
8	G1/2“	P113-008-003
10	G1/8“	P113-010-000
10	G1/4“	P113-010-001
10	G3/8“	P113-010-002
10	G1/2“	P113-010-003
12	G1/4“	P113-012-001
12	G3/8“	P113-012-002
12	G1/2“	P113-012-003

X connector

∅ mm	Order codes
4	P117-004
6	P117-006
8	P117-008
10	P117-010
12	P117-012

T connector

∅ mm	Order codes
4	P110-004-000
6	P110-006-000
8	P110-008-000
10	P110-010-000
12	P110-012-000

T connector reduced

D1 ∅ mm	D2 ∅ mm	Order codes
2x 6	4	P110-006-004
2x 8	4	P110-008-004
2x 8	6	P110-008-006
2x 10	6	P110-010-006
2x 10	8	P110-010-008
2x 12	8	P110-012-008
2x 12	10	P110-012-010

Distributor connector reduced

Inlet D1 ∅ mm	Outlet D2 ∅ mm	Order codes
6	3x 4	P193-006-004
8	3x 4	P193-008-004
8	3x 6	P193-008-006
10	3x 6	P193-010-006
10	3x 8	P193-010-008

Distributor fitting*

Inlet ∅ mm	Thread	Outlet ∅ mm	Order codes
6	G1/8“	3x 4	P194-006-004
8	G1/4“	3x 4	P194-008-004
8	G1/4“	3x 6	P194-008-006
10	G3/8“	3x 8	P194-010-008

Distributor connector

∅ mm	Order codes
4	P193-004-000
6	P193-006-000
8	P193-008-000

*) Fitting include mounted sealing ring

PUSH-IN FITTINGS - PLASTIC / PUSH-ON FITTINGS - NICKEL PLATED BRASS

Straight connector

∅ mm	Order codes
4	P100-004-000
6	P100-006-000
8	P100-008-000
10	P100-010-000
12	P100-012-000

Straight connector reduced

∅ mm	∅ mm	Order codes
6	4	P100-006-004
8	4	P100-008-004
8	6	P100-008-006
10	8	P100-010-008
12	10	P100-012-000

Elbow connector

∅ mm	Order codes
4	P106-004-000
6	P106-006-000
8	P106-008-000
10	P106-010-000
12	P106-012-000

Y connector

∅ mm	Order codes
4	P131-004-000
6	P131-006-000
8	P131-008-000
10	P131-010-000
12	P131-012-000

Y connector reduced

D1 ∅ mm	D2 ∅ mm	Order codes
6	2x 4	P131-006-004
8	2x 4	P131-008-004
8	2x 6	P131-008-006
10	2x 6	P131-010-006
10	2x 8	P131-010-008
12	2x 8	P131-012-008
12	2x 10	P131-012-010

Plug

∅ mm	Order codes
4	P118-004
6	P118-006
8	P118-008
10	P118-010
12	P118-012

Straight

∅ mm	Thread	Order codes
4/2	M5	N341-004-005
4/2	G1/8“	N341-004-000
6/4	M5	N341-006-005
6/4	G1/8“	N341-006-000
6/4	G1/4“	N341-006-001
6/4	G3/8“	N341-006-002
8/6	G1/8“	N341-008-000
8/6	G1/4“	N341-008-001
8/6	G3/8“	N341-008-002
8/6	G1/2“	N341-008-003+
10/8	G1/8“	N341-010-000
10/8	G1/4“	N341-010-001
10/8	G3/8“	N341-010-002
10/8	G1/2“	N341-010-003+
12/9	G3/8“	N341-912-002+
12/9	G1/2“	N341-912-003+
12/9	G3/4“	N341-912-006+
12/9	G1“	N341-912-007+
12/10	G3/8“	N341-012-002
15/12	G1/2“	N341-015-003+
15/12	G3/4“	N341-015-006+
15/12	G1“	N341-015-007+

Straight with tube guard

∅ mm	Thread	Order codes
6/4	G1/8“	N180-006-000
6/4	G1/4“	N180-006-001
6/4	G3/8“	N180-006-002
6/4	G1/2“	N180-006-003
8/6	G1/8“	N180-008-000
8/6	G1/4“	N180-008-001
8/6	G3/8“	N180-008-002
8/6	G1/2“	N180-008-003
10/8	G1/8“	N180-010-000
10/8	G1/4“	N180-010-001
10/8	G3/8“	N180-010-002
10/8	G1/2“	N180-010-003
12/10	G3/8“	N180-012-002
12/10	G1/2“	N180-012-003

Bulkhead fitting

∅ mm	Thread	Order codes
4/2	M7x0,5	N345-004-000
6/4	M10x1	N345-006-000
8/6	M12x1	N345-008-000
10/8	M14x1	N345-010-000

Elbow connector

∅ mm	Order codes
4/2	N348-004-000
6/4	N348-006-000
8/6	N348-008-000
10/8	N348-010-000

Elbow with internal thread

∅ mm	Thread	Order codes
4/2	G1/8“	N347-004-000
6/4	G1/8“	N347-006-000
6/4	G1/4“	N347-006-001
8/6	G1/8“	N347-008-000
8/6	G1/4“	N347-008-001

X connector

∅ mm	Order codes
4/2	N354-004-000
6/4	N354-006-000
8/6	N354-008-000
10/8	N354-010-000

Swivel elbow

∅ mm	Thread	Order codes
6/4	G1/8“	N349-006-000
6/4	G1/4“	N349-006-001
8/6	G1/8“	N349-008-000
8/6	G1/4“	N349-008-001
10/8	G1/4“	N349-010-001

Push-on nut

∅ mm	Order codes
4/2	N368-004-000
6/4	N368-006-000
8/6	N368-008-000
10/8	N368-010-000
12/10	N368-012-000

+) This item could have another design and/or colour and material. Sealing ring isn't included - it has to be ordered separately.

Single banjo bolt incl. sealing rings

Thread	Order codes
M5	N324-005
G1/8“	N324-000
G1/4“	N324-001
G3/8“	N324-002⁺
G1/2“	N324-003⁺

Double banjo bolt incl. sealing rings

Thread	Order codes
G1/8“	N325-000
G1/4“	N325-001
G3/8“	N325-002⁺
G1/2“	N325-003⁺

Triple banjo bolt w/o sealing rings

Thread	Order codes
G1/8“	N326-000⁺
G1/4“	N326-001⁺
G3/8“	N326-002⁺
G1/2“	N326-003⁺

1 port banjo

∅ mm	Thread	Order codes
6/4	M5	N355-006-005
6/4	G1/8“	N355-006-000
6/4	G1/4“	N355-006-001
8/6	G1/8“	N355-008-000
8/6	G1/4“	N355-008-001
8/6	G3/8“	N355-008-002⁺
8/6	G1/2“	N355-008-003⁺
10/8	G1/4“	N355-010-001
10/8	G3/8“	N355-010-002⁺
10/8	G1/2“	N355-010-003⁺
12/9	G3/8“	N355-912-002⁺
12/9	G1/2“	N355-912-003⁺

2 ports banjo

∅ mm	Thread	Order codes
6/4	G1/8“	N356-006-000
6/4	G1/4“	N356-006-001
8/6	G1/8“	N356-008-000
8/6	G1/4“	N356-008-001
8/6	G3/8“	N356-008-002⁺
10/8	G1/4“	N356-010-001
10/8	G3/8“	N356-010-002⁺
12/9	G3/8“	N356-912-002⁺

T connector

∅ mm	Order codes
4/2	N353-004-000
6/4	N353-006-000
8/6	N353-008-000
10/8	N353-010-000
12/9	N353-912-000⁺

Straight with internal thread

∅ mm	Thread	Order codes
4/2	G1/8“	N343-004-000
6/4	G1/8“	N343-006-000
6/4	G1/4“	N343-006-001
8/6	G1/8“	N343-008-000
8/6	G1/4“	N343-008-001
8/6	G3/8“	N343-008-002
10/8	G1/8“	N343-010-000
10/8	G1/4“	N343-010-001
10/8	G3/8“	N343-010-002

Straight connector

∅ mm	∅ mm	Order codes
4/2	4/2	N344-004-000
6/4	6/4	N344-006-000
6/4	8/6	N344-006-008⁺
8/6	8/6	N344-008-000
8/6	10/8	N344-008-010⁺
10/8	10/8	N344-010-000
10/8	12/9	N344-010-912⁺
12/9	12/9	N344-912-000⁺
12/10	12/10	N344-012-000
15/12	15/12	N344-015-000⁺

Straight with external thread

∅ mm	Thread	Order codes
4	G1/8“	N460-004-000⁺
4	G1/4“	N460-004-001⁺
6	G1/8“	N460-006-000
6	G1/4“	N460-006-001⁺
7	G1/8“	N460-007-000
7	G1/4“	N460-007-001
8	G1/8“	N460-008-000
8	G1/4“	N460-008-001
8	G3/8“	N460-008-002⁺
8	G1/2“	N460-008-003⁺
9	G1/8“	N460-009-000
9	G1/4“	N460-009-001
9	G3/8“	N460-009-002
10	G3/8“	N460-010-002⁺
10	G1/2“	N460-010-003⁺
12	G1/4“	N460-012-001
12	G3/8“	N460-012-002
12	G1/2“	N460-012-003
14	G3/8“	N460-014-002
17	G3/8“	N460-017-002
17	G1/2“	N460-017-003

Straight with internal thread

∅ mm	Thread	Order codes
6	G1/8“	N455-006-000
7	G1/8“	N455-007-000
7	G1/4“	N455-007-001
8	G1/8“	N455-008-000
8	G1/4“	N455-008-001
9	G1/4“	N455-009-001⁺
9	G3/8“	N455-009-002⁺
10	G3/8“	N455-010-002⁺
12	G3/8“	N455-012-002
12	G1/2“	N455-012-003

Elbow with external thread

∅ mm	Thread	Order codes
6	R1/8“	N491-006-000
6	R1/4“	N491-006-001
7	R1/8“	N491-007-000
7	R1/4“	N491-007-001

⁺) This item could have another design and/or colour and material. Sealing ring isn't included - it has to be ordered separately.

Reducer

External thread	Internal thread	Order codes
G1/8“	M5	N449-000-005
G1/4“	M5	N449-001-005+
G1/4“	G1/8“	N449-001-000
G3/8“	G1/8“	N449-002-000
G3/8“	G1/4“	N449-002-001
G1/2“	G1/8“	N449-003-000
G1/2“	G1/4“	N449-003-001
G1/2“	G3/8“	N449-003-002
G3/4“	G3/8“	N449-006-002
G3/4“	G1/2“	N449-006-003
G1“	G3/8“	N449-007-002+
G1“	G1/2“	N449-007-003+
G1“	G3/4“	N449-007-006

Enlarging reducer

External thread	Internal thread	Order codes
M5	G1/8“	N445-005-000
G1/8“	G1/4“	N445-000-001
G1/8“	G3/8“	N445-000-002
G1/4“	G3/8“	N445-001-002
G1/4“	G1/2“	N445-001-003
G3/8“	G1/2“	N445-002-003

Plastic sealing ring

Thread	Order codes
M5	3910 2002 1000 0030
G1/8“	3910 2004 1000 0030
G1/4“	3910 2006 1000 0030
G3/8“	3910 2008 1000 0030
G1/2“	3910 2010 1000 0030

Aluminium sealing ring

Thread	Order codes
M5	3910 2002 0000 0022
G1/8“	3910 2004 0000 0022
G1/4“	3910 2006 0000 0022
G3/8“	3910 2008 0000 0022
G1/2“	3910 2010 0000 0022
G3/4“	3910 2012 0000 0022
G1“	3910 2014 0000 0022

Teflon thread tape

Dimensions	Order codes
10mm x0,1mm length 10m	3910 2210 0110 0035

Plug with internal hexagon socket incl. sealing ring

Thread	Order codes
M5	N411-005
G1/8“	N411-000
G1/4“	N411-001
G3/8“	N411-002
G1/2“	N411-003
G3/4“	N411-006+
G1“	N411-007+

Plug with internal hexagon socket

Thread	Order codes
R1/8“	N412-000
R1/4“	N412-001
R3/8“	N412-002
R1/2“	N412-003
R3/4“	N412-006
R1“	N412-007

Plug with internal thread

Thread	Order codes
G1/8“	N453-000
G1/4“	N453-001
G3/8“	N453-002
G1/2“	N453-003

Hexagonal nut

Thread	Order codes
G1/8“	N489-000
G1/4“	N489-001
G3/8“	N489-002
G1/2“	N489-003

Prolonging fitting

Thread	Délka	Order codes
R1/8“	36	N447-000-036
R1/4“	43	N447-001-043
R3/8“	40	N447-002-040
R1/2“	50	N447-003-050

+) This item could have another design and/or colour and material. Sealing ring isn‘t included - it has to be ordered separately.

L coupling internal / external threads

External thread	Internal thread	Order codes
M5	M5	N458-005-005
R1/8“	G1/8“	N458-000-000
R1/4“	G1/4“	N458-001-001
R3/8“	G3/8“	N458-002-002
R1/2“	G1/2“	N458-003-003
R3/4“	G3/4“	N458-006-006
R1“	G1“	N458-007-007

L coupling 2x external threads

Thread	Order codes
G1/8“	N459-000-000
G1/4“	N459-001-001
G3/8“	N459-002-002
G1/2“	N459-003-003
G3/4“	N459-006-006
G1“	N459-007-007

L coupling 2x internal threads

Thread	Order codes
G1/8“	N456-000
G1/4“	N456-001
G3/8“	N456-002
G1/2“	N456-003
G3/4“	N456-006
G1“	N456-007

T connector 3x internal threads

Thread	Order codes
G1/8“	N461-000
G1/4“	N461-001
G3/8“	N461-002
G1/2“	N461-003
G3/4“	N461-006

T connector 1x external, 2x internal threads

External thread	Internal thread	Order codes
M5	M5	N462-005-005
R1/8“	G1/8“	N462-000-000
R1/4“	G1/4“	N462-001-001
R3/8“	G3/8“	N462-002-002
R1/2“	G1/2“	N462-003-003
G3/4“	G3/4“	N462-006-006+
G1“	G1“	N462-007-007+

T connector 3x external threads

Thread	Order codes
G1/8“	N464-000
G1/4“	N464-001
G3/8“	N464-002
G1/2“	N464-003

T connector 1x external, 2x internal threads

External thread	Internal thread	Order codes
R1/8“	G1/8“	N466-000-000
R1/4“	G1/4“	N466-001-001
R3/8“	G3/8“	N466-002-002
R1/2“	G1/2“	N466-003-003

T connector 2x external, 1x internal threads

External thread	Internal thread	Order codes
R1/8“	G1/8“	N465-000-000
R1/4“	G1/4“	N465-001-001
R3/8“	G3/8“	N465-002-002
R1/2“	G1/2“	N465-003-003

T connector 2x external, 1x internal threads

External thread	Internal thread	Order codes
R1/8“	G1/8“	N463-000-000
R1/4“	G1/4“	N463-001-001
R3/8“	G3/8“	N463-002-002
R1/2“	G1/2“	N463-003-003

X connector

Thread	Order codes
G1/8“	N457-000
G1/4“	N457-001
G3/8“	N457-002
G1/2“	N457-003

X connector 1x external, 3x internal threads

External thread	Internal thread	Order codes
R1/8“	G1/8“	N485-000-000
R1/4“	G1/4“	N485-001-001
R3/8“	G3/8“	N485-002-002
R1/2“	G1/2“	N485-003-003

Y connector 3x internal threads

Thread	Order codes
G1/8“	N498A-000
G1/4“	N498A-001
G3/8“	N498A-002
G1/2“	N498A-003

Y connector 1x external, 2x internal threads

External thread	Internal thread	Order codes
R1/8“	G1/8“	N498-000-000
R1/4“	G1/4“	N498-001-001
R3/8“	G3/8“	N498-002-002
R1/2“	G1/2“	N498-003-003

Double nipple

Thread	Order codes
M5	N442-005-005+
G1/8“	N442-000-000
G1/4“	N442-001-001
G3/8“	N442-002-002
G1/2“	N442-003-003
G3/4“	N442-006-006+

Reduced double nipple

Thread	Thread	Order codes
M5	G1/8“	N443-005-000+
G1/8“	G1/4“	N443-000-001
G1/4“	G3/8“	N443-001-002
G1/4“	G1/2“	N443-001-003
G3/8“	G1/2“	N443-002-003

Coupling

Thread	Order codes
M5	N450-005-005+
G1/8“	N450-000-000
G1/4“	N450-001-001
G3/8“	N450-002-002
G1/2“	N450-003-003
G3/4“	N450-006-006+

Reduced coupling

Thread	Thread	Order codes
G1/4“	G1/8“	N451-001-000
G3/8“	G1/8“	N451-002-000
G3/8“	G1/4“	N451-002-001
G1/2“	G1/8“	N451-003-000
G1/2“	G1/4“	N451-003-001
G1/2“	G3/8“	N451-003-002

Bulkhead fitting

Thread	Order codes
M5	N446-005
G1/8“	N446-000
G1/4“	N446-001
G3/8“	N446-002
G1/2“	N446-003

Square distribution block

Thread	Order codes
4x G1/8“	3920 0404 0000 0020
4x G1/4“	3920 0406 0000 0020
4x G3/8“	3920 0408 0000 0020
4x G1/2“	3920 0410 0000 0020

Rectangular distribution block

Inlet thread	Outlet thread	Order codes
1x G1/4“	3x G1/8“	3921 0106 0304 0020
1x G1/4“	4x G1/8“	3921 0106 0404 0020
2x G1/4“	5x G1/8“	3921 0206 0504 0020
2x G1/4“	6x G1/8“	3921 0206 0604 0020
1x G3/8“	3x G1/4“	3921 0108 0306 0020
1x G3/8“	4x G1/4“	3921 0108 0406 0020
2x G3/8“	5x G1/4“	3921 0208 0506 0020
2x G3/8“	6x G1/4“	3921 0208 0606 0020
1x G1/2“	3x G3/8“	3921 0110 0308 0020
1x G1/2“	4x G3/8“	3921 0110 0408 0020
2x G1/2“	5x G3/8“	3921 0210 0508 0020
2x G1/2“	6x G3/8“	3921 0210 0608 0020
1x G3/4“	3x G1/2“	3921 0112 0310 0020
1x G3/4“	4x G1/2“	3921 0112 0410 0020
2x G3/4“	5x G1/2“	3921 0212 0510 0020
2x G3/4“	6x G1/2“	3921 0212 0610 0020

Blow gun

Thread	Order codes
G1/4“	3910 3010 0600 0010

+) This item could have another design and/or material. Sealing ring isn't included - it has to be ordered separately.

Sintered plastic PE silencer

Thread	Order codes
M5	NSE05K
G1/8“	NSE10K
G1/4“	NSE25K
G3/8“	NSE37K
G1/2“	NSE50K
G3/4“	NSE75K
G1“	NSE100K

Push-in sint. plastic PE silencer

∅ mm	Order codes
4	NSE04KP
6	NSE06KP
8	NSE08KP
10	NSE10KP
12	NSE12KP

Sintered bronze/brass silencer

Thread	Order codes
M5	NSE05S
G1/8“	NSE10S
G1/4“	NSE25S
G3/8“	NSE37S
G1/2“	NSE50S
G3/4“	NSE75S
G1“	NSE100S

Sintered bronze silencer

Thread	Order codes
G1/8“	NU010051
G1/4“	NU010052
G3/8“	NU010053
G1/2“	NU010054
G3/4“	NU010055
G1“	NU010056

Sintered bronze low profile silencer

Thread	Order codes
G1/8“	NSF10B
G1/4“	NSF25B
G3/8“	NSF37B
G1/2“	NSF50B
G3/4“	NSF75B
G1“	NSF100B

Sintered bronze short silencer

Thread	Order codes
M5	NSFG05S
G1/8“	NSFG10S
G1/4“	NSFG25S
G3/8“	NSFG37S
G1/2“	NSFG50S
G3/4“	NSFG75S
G1“	NSFG100S

High flow silencer up to 1 MPa

R1/8“-2“

R3“-6“

Thread	Order codes
G1/8“	NSE10HB
G1/4“	NSE25HB
G3/8“	NSE37HB
G1/2“	NSE50HB
G3/4“	NSE75HB
G1“	NSE100HB
G1 1/4“	NSE125HB
G1 1/2“	NSE150HB
G2“	NSE200HB
G3“	NSE300HB
G4“	NSE400HB
G6“	NSE600HB

High flow silencer up to 4 MPa

R1/8“-2“

R3“-6“

Thread	Order codes
G1/8“	NSE10HP
G1/4“	NSE25HP
G3/8“	NSE37HP
G1/2“	NSE50HP
G3/4“	NSE75HP
G1“	NSE100HP
G1 1/4“	NSE125HP
G1 1/2“	NSE150HP
G2“	NSE200HP
G3“	NSE300HP
G4“	NSE400HP
G6“	NSE600HP

Silencer with speed control

Thread	Order codes
G1/8“	NSE10RM
G1/4“	NSE25RM
G3/8“	NSE37RM
G1/2“	NSE50RM
G3/4“	NSE75RM
G1“	NSE100RM

Plastic tube cutter

Max. tube diameter ∅ D	Order codes
12	N125-468

Plastic tube cutter

Max. tube diameter ∅ D	Order codes
12	NTCM468
25	NTCM468-25

Multiple tube holder

For tube ∅ D	No. of tube positi-ons	Order codes
4	8	3095 1004 0000 0000
6	8	3095 1006 0000 0000
8	7	3095 1008 0000 0000
10	6	3095 1010 0000 0000
12	5	3095 1012 0000 0000

Particular holders are detachable, each holder has mounting hole for fixing by screw.

Tubing strap

Size	Order codes
4,8 x 178	3095 2000 4801 7800
4,8 x 250	3095 2000 4802 5000

Spiral wrap

Diameter	Order codes
15 to 80	3095 2500 1500 8000

Tube clamp

Diameter	Order codes
8 to 12	3910 1000 8012 0000
10 to 16	3910 1001 0016 0000
12 to 20	3910 1001 2020 0000
16 to 25	3910 1001 6025 0000
25 to 40	3910 1002 5040 0000
32 to 50	3910 1003 2050 0000
50 to 70	3910 1005 0070 0000
70 to 90	3910 1007 0090 0000
90 to 110	3910 1009 0110 0000
110 to 130	3910 1011 0130 0000
130 to 150	3910 1013 0150 0000
140 to 160	3910 1014 0160 0000

Tube PU polyurethan

External diameter ∅ D mm	Internal diameter ∅ d mm	Min. bending radius	Max. pressure at 20˚C	Order codes
4	2	13	2,5 MPa	3020 0004 0200 0010
6	4	20	1,6 MPa	3020 0006 0400 0010
8	6	30	1,1 MPa	3020 0008 0600 0010
10	8	40	0,9 MPa	3020 0010 0800 0010
12	9	50	1,1 MPa	3020 0012 0900 0010

Tempe-rature	Max. pressure
30˚C	83%
40˚C	72%
50˚C	64%
60˚C	47%

Standard tube colour is blue. Optionally, some diameters can be delivered with the following colour: transparent, yellow, black, green, red, white.
Temperature range: -40°C to +60°C
Max. pressure for higher temperatures is percentually related to 20°C.

Tube PTFE teflon

External diameter ∅ D mm	Internal diameter ∅ d mm	Min. bending radius	Max. pressure at 20˚C	Order codes
4	2	20	2,5 MPa	3030 0004 0200 0015
6	4	40	1,8 MPa	3030 0006 0400 0015
8	6	60	1,4 MPa	3030 0008 0600 0015
10	8	100	1,2 MPa	3030 0010 0800 0015
12	10	120	1,0 MPa	3030 0012 1000 0015

Tempe-rature	Max. pressure
50˚C	50%
100˚C	35%
150˚C	30%
200˚C	10%

Standard tube colour is transparent.
Temperature range: -20°C to +200°C
Max. pressure for higher temperatures is percentually related to 20°C.

Tube PA6 polyamid

External diameter ∅ D mm	Internal diameter ∅ d mm	Min. bending radius	Max. pressure at 20˚C	Order codes
4	2	25	4,9 MPa	3010 0004 0200 0010
6	4	35	3,0 MPa	3010 0006 0400 0010
8	6	45	2,1 MPa	3010 0008 0600 0010
10	8	60	1,7 MPa	3010 0010 0800 0010
12	9	150	1,9 MPa	3010 0012 0900 0020
12	10	70	1,3 MPa	3010 0012 1000 0010
15	12	180	1,9 MPa	3010 0015 1200 0020

Tempe-rature	Max. pressure
30˚C	83%
40˚C	72%
50˚C	64%
60˚C	57%
70˚C	52%
80˚C	47%

Standard tube colour is blue (black for tubes 12/9 and 15/12). Optionally, some diameters can be delivered with the following colour: transparent, yellow, black, green, red, white.
Temperature range: -10°C to +80°C
Max. pressure for higher temperatures is percentually related to 20°C.

Spiral tube PA6 polyamid

External diameter ∅ D mm	Internal diameter ∅ d mm	Spiral diameter	Max. pressure at 20˚C	Order codes
6	4	72	3,0 MPa	3010 1006 0400 0010
8	6	96	2,1 MPa	3010 1008 0600 0010
10	8	120	1,7 MPa	3010 1010 0800 0010
12	10	144	1,3 MPa	3010 1012 1000 0010

The length of spiral tubes is in extended status. Working length is at least 1/2 of length (we recommend 0,3 to 0,4 multiple) in extended status. Maximal available length is 30m in extended status.

Tempe-rature	Max. pressure
30˚C	83%
40˚C	72%
50˚C	64%
60˚C	57%
70˚C	52%
80˚C	47%

Standard tube colour is blue.
Temperature range: -10°C to +80°C
Max. pressure for higher temperatures is percentually related to 20°C.
We recommend to use straight push-on fittings with tube guard for use with spiral tube.

Protecting metal hose

External diameter ∅ D mm	Internal diameter ∅ D mm	Suitable for tube diameter ∅ D/d mm	Order codes
10	8	6/4	3080 0006 0000 0000
13	10	8/9	3080 0008 0000 0000
16	13	10/8	3080 0010 0000 0000
19	16	12/10 and 12/9	3080 0012 0000 0000
21	18	15/12	3080 0015 0000 0000

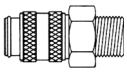
Protecting metal hoses are used when external effects could damage plastic tubes, for example:
- protection against welding sparks
- protection against chips during machining
- protection against wring, etc.

Material: zinc plated steel

Quick coupling type 21

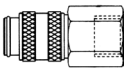
- Flow capacity 844 Nl/min at 0,6 MPa and Δp=0,1 MPa
- Cross section Js5 (20 mm²)
- Max. pressure 3,5 MPa

Body with external thread



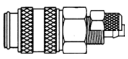
Thread	Order codes
G1/8“	3930 0211 0104 0000
G1/4“	3930 0211 0106 0000
G3/8“	3930 0211 0108 0000

Body with internal thread



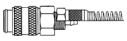
Thread	Order codes
G1/8“	3930 0211 0204 0000
G1/4“	3930 0211 0206 0000
G3/8“	3930 0211 0208 0000

Body with push-on fitting



∅ mm	Order codes
6/4	3930 0211 1032 0000
8/6	3930 0211 1033 0000

Body with push-on fitting with tube guard

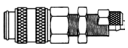


∅ mm	Order codes
6/4	3930 0211 1232 0000
8/6	3930 0211 1233 0000

Bulkhead body with tube socket

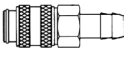
∅ mm	Order codes
4	3930 0211 2174 0000
6	3930 0211 2176 0000
8	3930 0211 2178 0000

Bulkhead body with push-on fitting



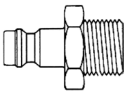
∅ mm	Order codes
6/4	3930 0211 1132 0000
8/6	3930 0211 1133 0000

Body with tube socket



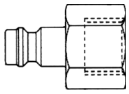
∅ mm	Order codes
4	3930 0211 2074 0000
6	3930 0211 2076 0000
8	3930 0211 2078 0000
9	3930 0211 2079 0000
10	3930 0211 2080 0000

Plug with external thread



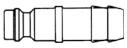
Thread	Order codes
G1/8“	3930 0212 0104 0000
G1/4“	3930 0212 0106 0000
G3/8“	3930 0212 0108 0000

Plug with internal thread



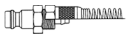
Thread	Order codes
G1/8“	3930 0212 0204 0000
G1/4“	3930 0212 0206 0000
G3/8“	3930 0212 0208 0000

Plug with tube socket



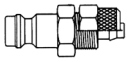
∅ mm	Order codes
4	3930 0212 2074 0000
6	3930 0212 2076 0000
8	3930 0212 2078 0000
9	3930 0212 2079 0000
10	3930 0212 2080 0000

Plug with push-on fitting with tube guard



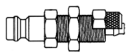
∅ mm	Order codes
6/4	3930 0212 1232 0000
8/6	3930 0212 1233 0000

Plug with push-on fitting



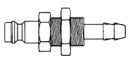
∅ mm	Order codes
6/4	3930 0212 1032 0000
8/6	3930 0212 1033 0000

Bulkhead plug with push-on fitting



∅ mm	Order codes
6/4	3930 0212 1132 0000
8/6	3930 0212 1133 0000

Bulkhead plug with tube socket

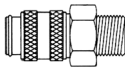


∅ mm	Order codes
4	3930 0212 2174 0000
6	3930 0212 2176 0000
8	3930 0212 2178 0000
9	3930 0212 2179 0000
10	3930 0212 2180 0000

Quick coupling type 26

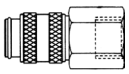
- Flow capacity 1476 Nl/min at 0,6 MPa and Δp=0,1 MPa
- Cross section Js7,2 (48 mm²)
- Max. pressure 3,5 MPa

Body with external thread



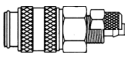
Thread	Order codes
G1/8“	3930 0261 0104 0000
G1/4“	3930 0261 0106 0000
G3/8“	3930 0261 0108 0000
G1/2“	3930 0261 0110 0000

Body with internal thread



Thread	Order codes
G1/4“	3930 0261 0206 0000
G3/8“	3930 0261 0208 0000
G1/2“	3930 0261 0210 0000

Body with push-on fitting

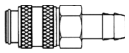


∅ mm	Order codes
8/6	3930 0261 1033 0000
10/8	3930 0261 1034 0000
12/9	3930 0261 1035 0000

Body with push-on fitting with tube guard

∅ mm	Order codes
8/6	3930 0261 1233 0000
10/8	3930 0261 1234 0000
12/9	3930 0261 1235 0000

Body with tube socket

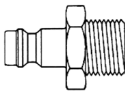


∅ mm	Order codes
6	3930 0261 2076 0000
8	3930 0261 2078 0000
9	3930 0261 2079 0000
10	3930 0261 2080 0000
13	3930 0261 2083 0000

Plug with tube socket with non-return valve

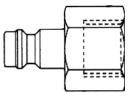
∅ mm	Order codes
6	3930 0262 3076 0000
8	3930 0262 3078 0000
9	3930 0262 3079 0000
10	3930 0262 3080 0000
13	3930 0262 3083 0000

Plug with external thread



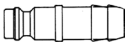
Thread	Order codes
G1/8“	3930 0262 0104 0000
G1/4“	3930 0262 0106 0000
G3/8“	3930 0262 0108 0000
G1/2“	3930 0262 0110 0000

Plug with internal thread



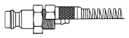
Thread	Order codes
G1/8“	3930 0262 0204 0000
G1/4“	3930 0262 0206 0000
G3/8“	3930 0262 0208 0000
G1/2“	3930 0262 0210 0000

Plug with tube socket



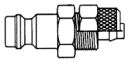
∅ mm	Order codes
4	3930 0262 2074 0000
6	3930 0262 2076 0000
8	3930 0262 2078 0000
9	3930 0262 2079 0000
10	3930 0262 2080 0000
13	3930 0262 2083 0000

Plug with push-on fitting with tube guard



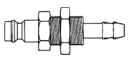
∅ mm	Order codes
6/4	3930 0262 1232 0000
8/6	3930 0262 1233 0000
10/8	3930 0262 1234 0000
12/9	3930 0262 1235 0000

Plug with push-on fitting



∅ mm	Order codes
6/4	3930 0262 1032 0000
8/6	3930 0262 1033 0000
10/8	3930 0262 1034 0000
12/9	3930 0262 1035 0000

Bulkhead plug with tube socket

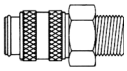


∅ mm	Order codes
6	3930 0262 2176 0000
8	3930 0262 2178 0000
10	3930 0262 2180 0000

Quick coupling type 27

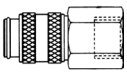
- Flow capacity 5166 Nl/min at 0,6 MPa and Δp=0,1 MPa
- Cross section Js10 (80 mm²)
- Max. pressure 3,5 MPa

Body with external thread



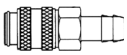
Thread	Order codes
R1/4“	3930 0271 0156 0000
R3/8“	3930 0271 0158 0000
R1/2“	3930 0271 0160 0000
R3/4“	3930 0271 0162 0000

Body with internal thread



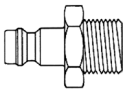
Thread	Order codes
R1/4“	3930 0271 0256 0000
R3/8“	3930 0271 0258 0000
R1/2“	3930 0271 0260 0000
R3/4“	3930 0271 0262 0000

Body with tube socket



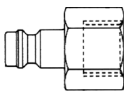
∅ mm	Order codes
6	3930 0271 2076 0000
8	3930 0271 2078 0000
9	3930 0271 2079 0000
10	3930 0271 2080 0000
13	3930 0271 2083 0000
16	3930 0271 2086 0000
19	3930 0271 2089 0000

Plug with external thread



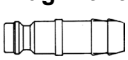
Thread	Order codes
R1/4“	3930 0272 0156 0000
R3/8“	3930 0272 0158 0000
R1/2“	3930 0272 0160 0000
R3/4“	3930 0272 0162 0000

Plug with internal thread



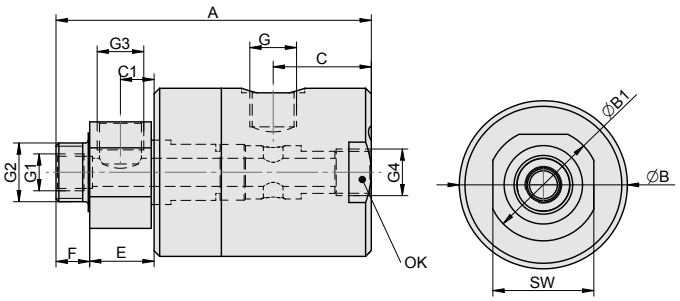
Thread	Order codes
R1/4“	3930 0272 0256 0000
R3/8“	3930 0272 0258 0000
R1/2“	3930 0272 0260 0000
R3/4“	3930 0272 0262 0000

Plug with tube socket



∅ mm	Order codes
6	3930 0272 2076 0000
8	3930 0272 2078 0000
9	3930 0272 2079 0000
10	3930 0272 2080 0000
13	3930 0272 2083 0000
16	3930 0272 2086 0000
19	3930 0272 2089 0000

Rotary coupling



Working pressure	0,6 MPa
Min. pressure	0 MPa
Max. pressure	1,0 MPa
Temperature range	-20˚C to +80˚C
Working medium	modified compressed air
Cross section	DN 6 for G 1/8“, DN 12 for G 3/8“
Working revolutions	0 to 120 rpm, both directions

Materials

- body: dural, hard anodized
- shaft: stainless steel 1.4021
- gaskets: NBR

Type	A	B	B1	C	C1	E	F	G	G1	G2	G3	G4	OK	SW	Weight	Order codes
straight with branch	81,5	45	30	22,5	9,5	18,5	12	G1/8“	M8	G1/4“	G1/8“	G1/8“	—	27	0,35	2770 0300 0600 0001
	109,5	60	40	32	12	23	12	G3/8“	G1/4“	G1/2“	G3/8“	G3/8“	56	36	0,90	2770 0300 1000 0001
elbow with branch	72	45	30	12,5	9,5	18,5	12	G1/8“	M8	G1/4“	G1/8“	—	—	27	0,31	2770 0200 0600 0001
	99,5	60	40	24	12	23	12	G3/8“	G1/4“	G1/2“	G3/8“	—	—	36	0,78	2770 0200 1000 0001
elbow	72	45	30	12,5	—	18,5	12	G1/8“	—	G1/4“	—	—	—	27	0,32	2770 0100 0600 0001
	91,5	60	40	24	—	15	12	G3/8“	—	G1/2“	—	—	—	36	0,83	2770 0100 1000 0001

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CERTIFIKAČNÍ ORGÁN CSQ-CERT

PŘI ČESKÉ SPOLEČNOSTI PRO JAKOST

akreditovaný podle ČSN EN 45012:1998 Českým institutem pro akreditaci, o.p.s. a vedený pod registračním číslem 3081

vydává

CERTIFIKÁT

shody systému managementu jakosti s požadavky

ČSN EN ISO 9001:2001

společnosti

STRÁNSKÝ A PETRŽÍK, PNEUMATICKÉ VÁLCE, spol. s r.o.

Bílá Třemešná čp. 388, 544 72, okres Trutnov

IČ: 25252062

Kód OKEČ: **DK**

Předmět certifikace:

Výroba pneumatických válců a příslušenství
Výroba jednoúčelových strojů a zařízení

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Vedoucí certifikačního orgánu: Ing. Pavel Ryšánek

CERTIFIKAČNÍ ORGÁN CSQ-CERT č. 3081

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ČSJ

STRÁNSKÝ A PETRŽÍK

Stránský a Petržík,
Pneumatické válce spol. s r.o.
544 72 Bílá Třemešná 388
Czech Republic

Phone: (+420) 499 628 600
Cell phone gateway: (+420) 737 249 570
Fax: (+420) 499 628 601

http://www.stranskyapetrzik.cz
e-mail: info@stranskyapetrzik.cz

Company reg. №: 25 25 20 62
VAT №: CZ 25 25 20 62