

**CHINA** – TÜNKERS China  
Tünkers Machinery & Automation  
Technology Co., Ltd. Shanghai  
Building 4, No. 768 Chenxiang Road,  
Jiading District, Shanghai P.R. China,  
201802  
Tel.: +86 21 39171070  
info@tuenkers.com.cn  
Other Offices: Chengde, Chengdu,  
Beijing, Wuhan, Councangzhou

**INDONESIA** – DAB Technology Pte. Ltd.  
Ruko Easton JI. Gunung Pandaman,  
Blok A-09 Lippo  
Cikarang 17550  
Tel.: +62 21 2909 3145  
enquiry@dabtech.net

**INDIA** – TÜNKERS India  
Natesha Enterprises  
SR NO 89/90, Parth Sadan Lokmanya Colony,  
Kothrud, Pune-411038 Maharashtra  
Tel.: +91 020 25380540  
jayesh.keskar@tuenkers.com

**MALAYSIA** – DAB Technology Sdn. Bhd.  
No. 8, Jalan Meranti Puchong,  
D 25@Meranti Puchong,  
47120 Puchong, Selangor Darul Ehsan  
Tel.: +603 8066 9448  
enquiry@dabtech.net

**MOROCCO** – MAN Consulting  
CASABLANCA  
michel.landre@tuenkers.ma  
Tel.: +212 657 593 160

**RUSSIA – FINAROS**  
Ul. Marshala Govorova Str. 34  
RUS 198097 St. Petersburg  
Tel.: +7 911 192 8923  
aleksandra.gertsen@gmail.com

**RUSSIA – WEST-RU**  
Vyborgskaya Str. 6  
RUS 603123 Nizhny Novgorod  
Tel.: +7 831 220 0710  
k.semin@west-ru.ru  
www.west-ru.ru

**RUSSIA – BERGA MASKIN**  
SE-646 93 GNESTA  
Tél.: +46 158 311 12  
info@berga-maskin.se

**USA – TÜNKERS-Mastech**  
5985 Wall Street  
48312 Sterling Heights, MI.  
Tel.: +1 248-362-9555  
office@tuenkers.com

**UKRAINE** – Robotics engineering  
ul. Dzerzhinsky, 1, 08200 Irpin  
Tel.: +380 44 407-1616  
Iyevgen@robotics.kiev.ua

**USA – TÜNKERS-IBERICA, S.L.**  
Prat de la Ribera, 148  
08030 Sant Bot de Llobregat  
Tel.: +34 93 395 2827  
tuenkers@tuenkersiberica.com

**ROMANIA/SERBIA** – Buzauli 2C  
410249, Oradea, country Bihor  
Tel.: +40 359451966  
cristian.miclea@tuenkers.sk

**ROMANIA/SERBIA** – Buzauli 2C  
410249, Oradea, country Bihor  
Tel.: +40 359451966  
cristian.miclea@tuenkers.sk

**SOUTH KOREA** – JC Systems Co., LTD  
#405 Ace Highend 9Chn, Gasandigital 1Ro, 233  
153-803, Geumcheon-gu, Seoul  
Tel.: +82 (70) 7012-089  
j.scho@chol.com

**SOUTH AFRICA** – Demcon (Cape) cc  
PO Box 15237  
ZA-60110 Emerald Hill/Port Elizabeth  
Tel.: +27 41 4847411  
demcon@demcon.co.za

**POLAND** – TECHNIKA SPAWALNICA Sp. z o.o.  
ul. Babimojska 11  
60-161 POZNA  
Tel.: +48 61 862 81 61  
anna.jakubowska@techspaw.com.pl

**POLAND** – TECHNIKA SPAWALNICA Sp. z o.o.  
ul. Babimojska 11  
60-161 POZNA  
Tel.: +48 61 862 81 61  
anna.jakubowska@techspaw.com.pl

**POLAND** – TÜNKERS Slovakia s.r.o.  
ul. Ksiecia Adama  
Czarnosklego 7  
62-090 Krzyzskowo  
Tel.: +48 61 814 59 17  
jafostian.rozmiarrek@tuenkers.sk

**ITALIA** – TÜNKERS Italia  
1553955713 - Tehran  
No.36 Khorramshahr Ave.  
Mark 11  
D-07426 Königsee  
dieter.rauschbach@tuenkers.de

**JAPAN** – Tünkers Japan Office  
Fukuoka Jonan-ku  
Nagao 4-18-30-803  
Tel.: +81 814-0123 Fukuoka  
tomoo.kaku@tuenkers.de

**JAPAN** – Roemheid Halder Co., Ltd.  
Suideng Hokushin Bldg 8F  
Chuo-ku, Tokyo, 103-0014  
Tel.: +81 (0) 336699407  
amanuma@rohal.jp

**MEXICO** – TÜNKERS MEXICO  
Peiv. Benito N. 23  
Colonia San Francisco Ocotlan  
Coronango Puebla  
C. P. 72680  
Tel.: +52 222 485 0708  
christian.volkmann@expertmexico.com

**HUNGARY** – TÜNKERS Slovakia s.r.o.  
Roentgenova 26  
SR05101 Bratislava  
Tel.: +421 905 564 691  
jural.rampassek@tuenkers.sk

**HUNGARY** – TÜNKERS Slovakia s.r.o.  
Roentgenova 26  
SR05101 Bratislava  
Tel.: +421 905 564 691  
jural.rampassek@tuenkers.sk

**TURKEY** – Cava Makina  
Ines Sayayli Sitesi E 503  
34776 Umraniye / Istanbul  
Tel.: +90 216 3809280  
alp.vanara@cava.com.tr

**UK** – TÜNKERS-EXPERT UK Ltd.  
Unit 5, Ham Lane,  
Kingswinford,  
West Midlands.  
DVE 7JR  
Tel.: +44 (0) 1384 287690  
neal.judge@tuenkers.de

**UKRAINE** – Robotics engineering  
ul. Dzerzhinsky, 1, 08200 Irpin  
Tel.: +380 44 407-1616  
Iyevgen@robotics.kiev.ua

**THAILAND** – DAB Technology Co., Ltd.  
H20 424/15 Kanchanapisek Rd.,  
Dokma, Pravej,  
Bangkok 10250  
Tel.: +66 2739 9832  
enquiry@dabtech.net

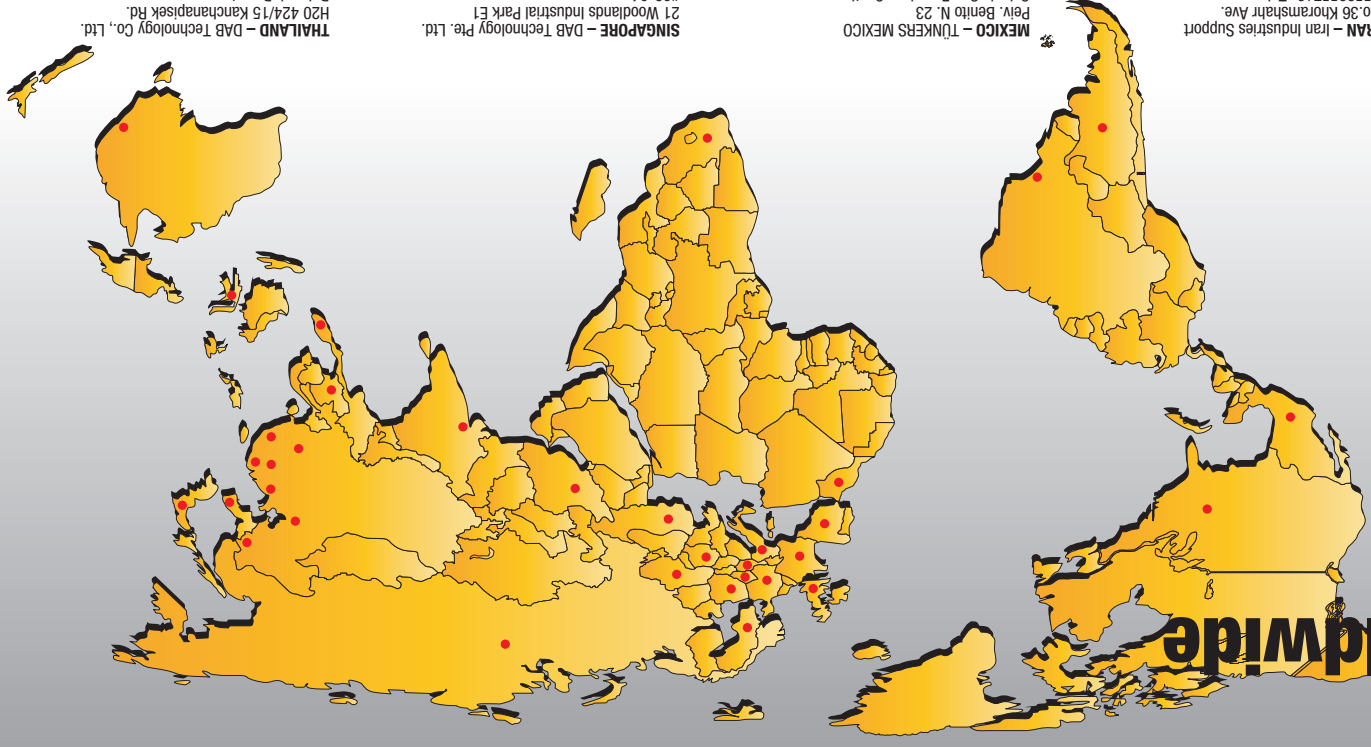
**TÜNKERS**  
Ingenuity in series.

**HELU**  
Schweißtechnik  
HELU GmbH  
Seehofstraße 56-58  
64653 Lorsch  
Germany  
Tel.: +49 2102 4517-0  
info@tuenkers.de  
www.tuenkers.de

**EXPERT**  
Indexing & Positioning  
EXPERT-TÜNKERS  
Seehofstraße 56-58  
64653 Lorsch  
Germany  
Tel.: +49 6251 592-0  
info@expert-tuenkers.de  
www.expert-tuenkers.de

**SOPAP**  
Automation.  
SOPAP Automation SAS  
Rue Henri Faure  
BP 11 09, 08090 TOURNES  
France  
Tel.: +33 3 24 52 94 64  
sopap@sopap.com

# At your service - worldwide



## Positioning

## Positioning - An Automation Module of the Tünkers Group



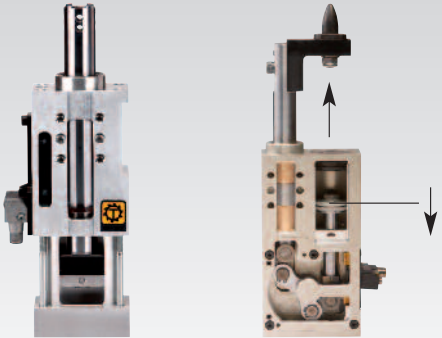


# Positioning

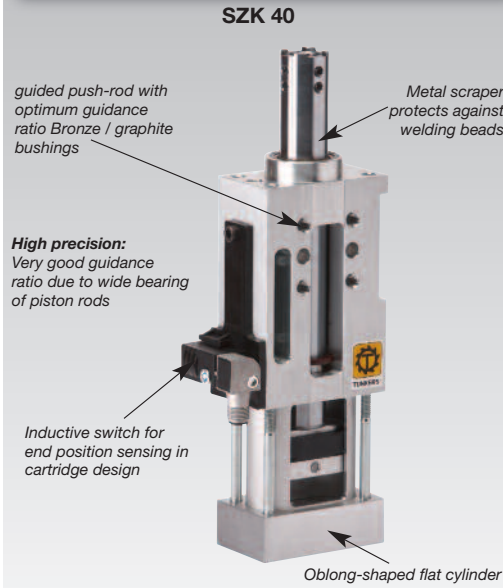
In highly automated body construction production runs 24 hours 7 days a week. In this process persons only carry out control functions. This can only be successful, if all components are in predefined positions, as the robot cannot see, it can only perform pre-programmed procedures. Here the Tünkers positioning product range comes into play. All pneumatic cylinders illustrated here have one characteristic in common: They ensure that a component is positioned in a defined position.

## Distinction between two operating principles

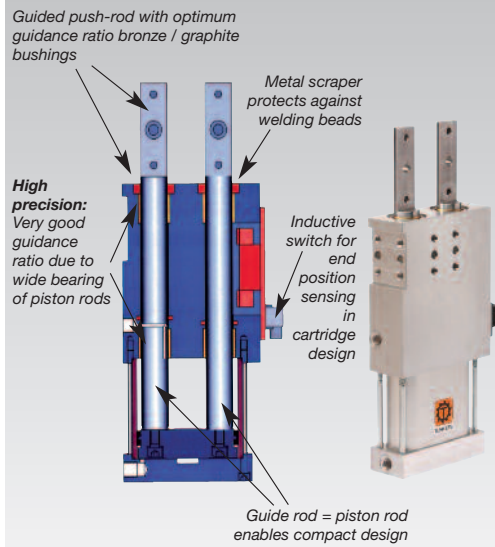
- Direct drive SZK Series**
- Cylinder is directly connected with tie rod
  - Tractive force = cylinder force
  - End position not locked
- Toggle-joint drive SZV Series**
- Cylinder acts as power reinforcement on push-rod by means of toggle-joint mechanism
  - Tractive force  $\approx 8 \times$  cylinder force (in end position) = high power density = compact design
  - Locked end position



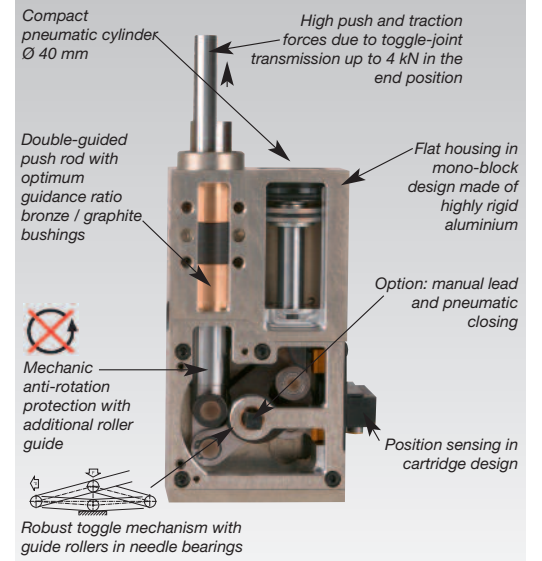
## Principle Structure of the SZK Standard Series



## Principle Structure of Double Piston Rod Version

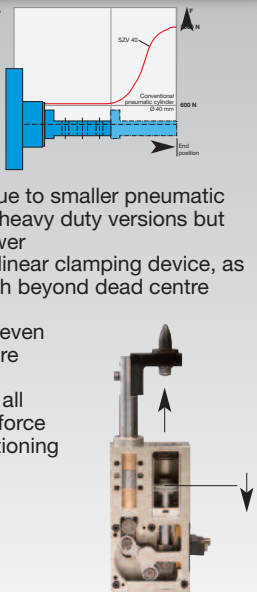


## Design principle SZV 40

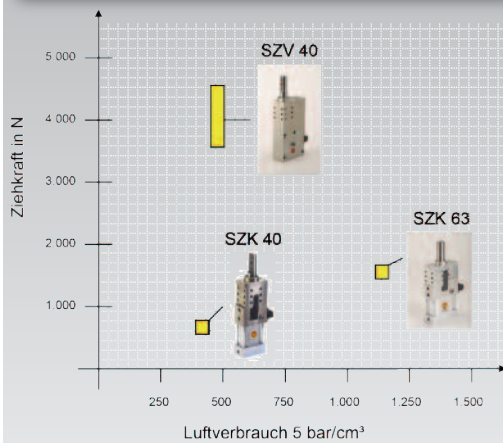


## Advantages Linear Cylinder

- The pneumatic cylinder operates the push rod by means of a toggle-joint.
- Result: higher pressure and tension in comparison to standard pressure cylinder forces.
- very compact design due to smaller pneumatic cylinders replacing the heavy duty versions but providing the same power
- may also be used as a linear clamping device, as the unit is equipped with beyond dead centre locked end position
- Position is maintained, even in the event of a pressure drop of the system
- This is an advantage in all cases where weight or force have effect on the positioning pins or contour blocks

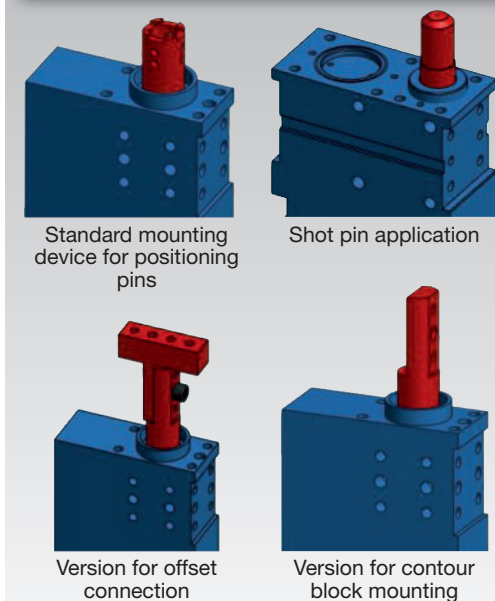


## Comparison of Retractable Locating Pin cylinders

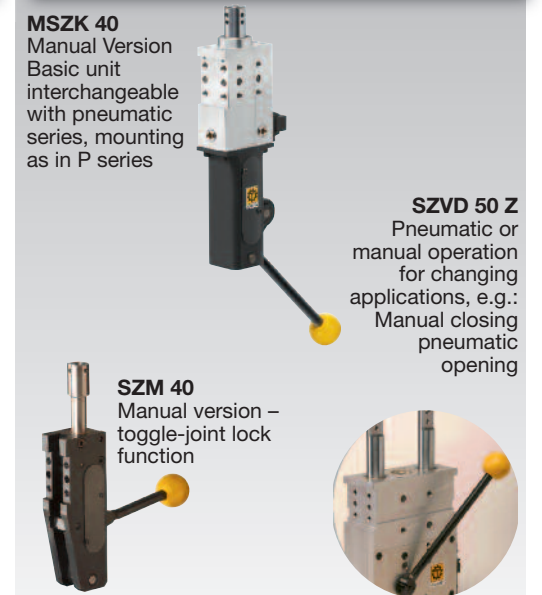


**Summary:** Linear toggle-joint cylinder SZV 40 with highest performance data and lowest air consumption

## Available piston rod versions



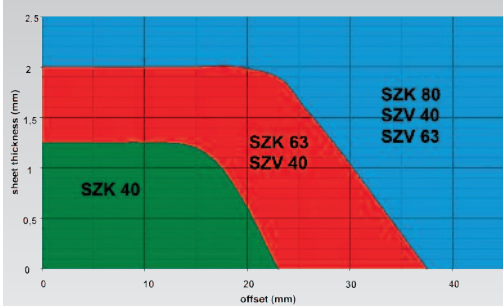
## Special series with lever



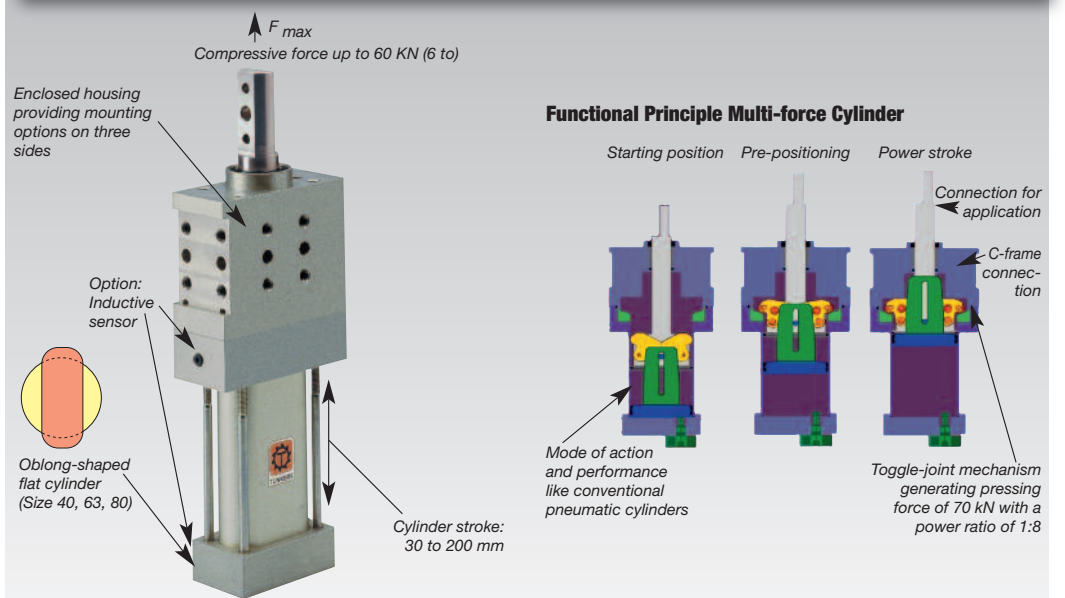
## Choice of an appropriate cylinder size

- A. Centering pin diameter**  
Although the diameter is not a direct dimension for the tractive force to be expected, it can reasonably be concluded that in smaller diameters less transverse forces and therefore tractive forces occur:
- Rule:  $\varnothing \leq 20 \text{ mm}$  Tractive forces  $\leq 20 \text{ kg}$   
 $\varnothing > 20 \text{ mm}$  Tractive forces  $\geq 20 \text{ kg}$
- B. Metal sheet thickness**  
In components with lower sheet thickness draft forces resulting from welding are lower than those in thicker metal sheets. For metal sheets of at least 1,5 mm, the respective larger cylinder series is recommended, also with regard to piston rod dimensioning,

## Choice retractable location pin based on pin diameter and sheet thickness



## Multi-force cylinder



## Shot pin

SA Series Integrated series



SAN Series Modular series with single locator



SAND Series Modular series with dual locator 50/80



### Characteristic features:

Shot pins in accordance with vehicle safety standard for location of linear and rotary movements as e. g. of rotary tables and positioning axes:

- **SA Series:** Compact series with integrated cylinder, guidance and sensing
- **SAN Series:** Modular series with separate guide housing and externally flanged standard cylinder
- with manual feed /with pneumatic drive
- Simple shot pin/with double shot pin

### Switch technology optionally:

- Single switch
- Double switch
- Mechanic roller plunger switch
- Inductive switch (T13)

## The Electric Retractable Locating Pin Cylinder

Power is provided by a 24 V DC motor, as in the case of the clamp. The motor moves the pin fixture by means of a trapezoidal threaded spindle, analogous to the electric clamp.





# Positioning

## Positioning - An Automation Module of the Tünkers Group



### SZK 30.8

- Retractable locating pin cylinder in aluminium design
- Precision design of anti-rotating piston rods
- Standard cylinder for robot grippers
- Various retractable locating pin connections available



	SZK 30.8
Piston rods Ø	30
Transverse force [N]	250
Compressive force [N]	350
Weight [kg]	1,3
Dimensions (l x b x t) [mm]	160 x 45 x 45

### SZK.../... .1/... .2

- Direct drive retractable locating pin cylinder
- Customer-specific mounting variations



	SZK 40	SZK 40.1	SZK 40.2	SZK 63	SZK 63.1	SZK 63.2
Stroke	40	60	120	40	60	120
Transverse force max. [N]	150	150	150	200	200	200
Corresponds to piston Ø [mm]	40	40	40	63	63	63
Weight ~ [kg]	1,8	2,4	1,8	2,4	2,3	3,1
Dimensions (l x b x t) [mm]	195 x 75 x 45	195 x 120 x 45	235 x 75 x 45	235 x 120 x 45	355 x 75 x 45	355 x 120 x 45

### SZK... Z

- Direct drive retractable locating pin cylinder
- With manual feed
- Various mounting options for retractable locating pins



	SZK 40 Z	SZK 40.1 Z	SZK 63 Z	SZK 63.1 Z
Stroke	40	60	40	60
Transverse force max. [N]	150	150	200	200
Corresponds to piston Ø [mm]	40	40	63	63
Weight ~ [kg]	2,4	2,7	3,2	3,5
Dimensions (l x b x t) [mm]	209 x 75 x 45	250 x 75 x 45	209 x 120 x 45	250 x 120 x 45

### MSZK 40/40.1

- Manual retractable locating pin cylinder
- 40 stroke
- with manual feed
- anti-rotation protection
- beyond dead centre lock



	MSZK 40	MSZK 40.1
Stroke	40	60
Transverse force max. [N]	150	150
Corresponds to piston Ø [mm]	40	40
Weight ~ [kg]	1,8	1,8
Dimensions (l x b x t) [mm]	254 x 75 x 45	294 x 75 x 45

### SZM 40

- manual retractable locating pin cylinder
- with manual feed
- anti-rotation protection
- beyond dead centre lock



	SZM 30.8
Stroke	40
Transverse force max. [N]	150
Corresponds to piston Ø [mm]	40
Weight ~ [kg]	1,8
Dimensions (l x b x t) [mm]	254 x 75 x 45

### SZKD...

- Direct drive linear cylinder with tandem piston rod
- Compact and robust basic structure for accurate lifting and pushing operations



	SZKD 40	SZKD 63.5	SZKD 80
Tractive force [kN]	0,4	1,4	1,3
Thrust force [kN]	0,6	1,4	1,3
Cylinder Ø [mm]	40	63	80
Weight [kg]	1,3	4,95	34
Dimensions (l x b x t) [mm]	147 x 68,5 x 43	283 x 120 x 45	240 x 224 x 80

### SZK 80/40 50 Stroke

- Retractable locating pin cylinder for large diameters and increased power requirement
- for centering pins of 20 - 50 mm



	SZK 80/40 50 Stroke
Lifting force [N]	3000
Tractive force [N]	2800
Max. permissible Transverse force [kg]	~ 25
Weight [kg]	~ 9,5
Dimensions (l x b x t) [mm]	253 x 120 x 120

### SA Series

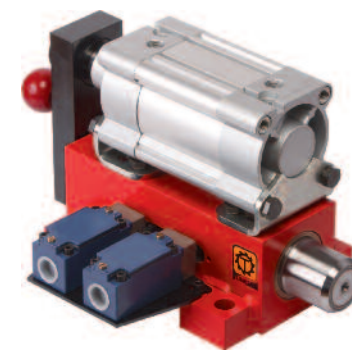
- Safety shot pins
- SA Series: Compact series with integrated cylinder, guidance and sensing for precise positioning e. g. of the Expert-Tünkers roller conveyor



	SA 80-50/50	SA 100-70/80
Cylinder Ø	50	70
Stroke	50	80
Weight ~ [kg]	6	12
Loading capacity static [kg]	2200	6000
Dimensions (l x b x t) [mm]	328 x 110 x 110	453 x 135 x 135

### SAN-Serie

- SAN Series: Modular series with separate guide housing and externally flanged standard cylinder in accordance with customer specifications:
- with manual feed / with pneumatic drive
- simple shot pin/ with double shot pin
- switch technology optionally



	SAN 40-25/50	SAN 50-25/25	SAN 80-50/25	SAN 80-50/50
Cylinder Ø	40	50	80	80
Stroke	50	25	25	50
Weight ~ [kg]	9	9	24	24
Loading capacity static [kg]	3000	8000	22000	22000
Dimensions (l x b x t) [mm]	241 x 201 x 124	205 x 197 x 119	230 x 229,5 x 205	230 x 229,5 x 205

### MZR...

- Pneumatic cylinder with mechanic power transmission multiplying the cylinder force in the end position by a factor of 8
- Base body and transmission mechanics made of steel
- Pneumatic drive with round cylinder
- Power transmission by means of wedge mechanics for defined power stroke



	MZR 40	MZR 63
Clamping force of power stroke at 6 bar	4 kN	10 kN
Power stroke [mm]	6	6
Clamping force of the power stroke at 6 bar	0,7 kN	1,75 kN
Piston Ø [mm]	40	63
Weight ~ [kg]	1,8	5
Dimensions (l x b x t) [mm]	130 + Stroke 172 + Hub x D63	172 + Hub x D99

### MZ 40-80

- Pneumatic cylinder with mechanic power transmission multiplying the cylinder force in the end position by a factor of 8
- Aluminium base body
- Transmission mechanics made of steel
- Pneumatic drive with flat cylinder
- Power transmission by means of wedge mechanics for defined power stroke



	MZ 40	MZ 63	MZ 80	MZ 100	MZ 140
Clamping force of power stroke [kN]	4	10	28	40	80
Power stroke [mm]	6	6	6	6	6
Clamping force [kN] at 6 bar	0,7	1,75	2,8	4,3	8,5
Kolben-Ø [mm]	40	63	80	100	140
Dimensions (l x b x t) [mm]	195 + Stroke 250 + Stroke 250 + Stroke 340 + Stroke 355 + Stroke 508 + Hub x 100 x 45 x 160 x 60 x 200 x 80 x 180 x 180 x 250 x 250				

### SZVD...

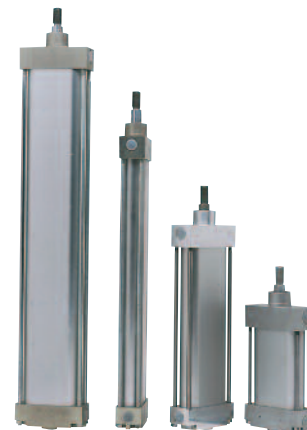
- Dual lift rods
- Optionally with manual feed
- Aluminium housing



	SZVD 32	SZVD 50
Tractive force [kN]	0,6	2,0
Thrust force [kN]	0,6	2,0
Cylinder Ø [mm]	32	50
Weight [kg]	2	7
Dimensions (l x b x t) [mm]	210 x 100 x 50	328 x 160 x 64

### ZF...

- Pneumatic cylinders with flat oval section.
- Anti-rotating piston rod.
- Suitable for all cases where the installation of usual round cylinders is not possible due to space conditions.



	ZF 40/16	ZF 50/18	ZF 63/20	ZF 80/25
Compressive force [N]	655	945	1400	2480
Tractive force [N]	555	845	1240	2230
Dimensions (l x b x t) [mm]	102 + stroke 80 x 40	110 + stroke 110 x 36	108 + stroke 120 x 44	130 + stroke 150 x 62

### 24V DC Series

- Electric stroke/ traction unit for retractable locating pin function or as feed unit for supports / contour blocks.
- Dual push rod as a precise, robust and anti-rotating guide element.
- Drive with conventional 24 V DC motor.
- Locked end position at the top / in the event of voltage drop also at the bottom due to self-locking drive spindle.



	ESZK 40	ESZK 63	ESZK 80	ESZKD 40	ESZKD 63	ESZKD80	ESZVD 50
Stroke	40	40	50	40	40	100	40
Transverse force max. [N]	150	200	800	80	400	800	400
Corresponds to piston Ø [mm]	40	63	80	40	63	60	50
Tractive force (N)	400	1300	1300	300	1300	1100	640
Compressive force (N)	400	1400	1400	400	1400	1000	700
Weight ~ [kg]	3,0	3,8	15,0	2,0	6,0	20,0	7
Dimensions (l x b x t) [mm]	270 x 75 x 50	270 x 120 x 75	300 x 120 x 120	240 x 75 x 50	290 x 125 x 75	320 x 225 x 80	276 x 160 x 64

### SZKT...

- Direct drive retractable locating pin cylinder in tandem design
- Forward stroke with single cylinder force
- Return stroke with double cylinder force to „tear away“



	SZKT 40	SZKT 63
Stroke	40	40
Transverse force max. [N]	150	200
Corresponds to piston Ø [mm]	40	63
Weight ~ [kg]	2,4	3,5
Dimensions (l x b x t) [mm]	209 x 75 x 45	250 x 120 x 45

### SZUQ...

- Round cylinder
- NAAMS hole pattern
- Square piston rod adapter



	SZUQ 63-75
Stroke	40
Transverse force max. [N]	150
Corresponds to piston Ø [mm]	40
Weight ~ [kg]	2,4
Dimensions (l x b x t) [mm]	253 x 120 x 120

### SZV...

- Linear unit with toggle-joint transmission
- Locked end position
- Option: manual feed



	SZV 40	SZV 60
Tractive force [kN]	0,36	0,80
Thrust force [kN]	0,45	0,88
Cylinder Ø [mm]	40	60
Weight [kg]	ca. 3,5	9,2
Dimensions (l x b x t) [mm]	313 x 115 x 45	425 x 175 x 80