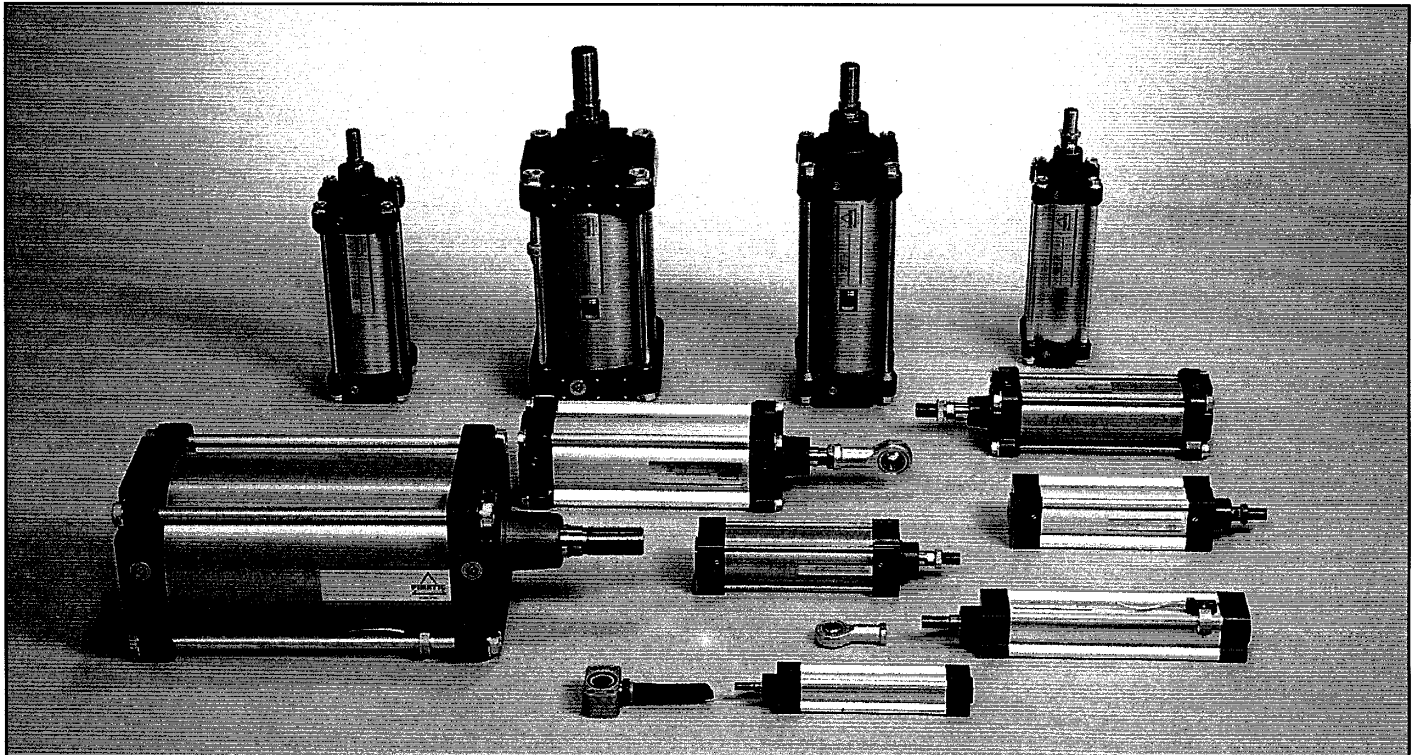




# PNEUMATICS

**CONTENTS:**

- |  |   |                           |
|--|---|---------------------------|
| 2. Selection   | 4. Cylinder thrusts, cushioning<br>and buckling strength diagrams | 8. Dimensions             |
| 3. Technical data, product range,<br>and ordering references | 5. Options and variants   | 13. Mounting combinations |
|  | 7. Mountings  | 14. Electrical sensors    |
|  |   | 15. Spare parts           |

**CHOICE CRITERIA:****1. Standards**

Built to conform to VDMA, ISO and CNOMO standards. International dimensioning ensures compatibility everywhere.

**2. Hygienic**

Clean-lined profile tube as standard in bore sizes 32 to 125 mm together with smooth end caps provides hygienic and easy to clean surfaces.

**3. Seals**

Nitrile rubber as standard; viton and other special seal materials available for various conditions.

**4. Mountings**

A comprehensive selection of mountings for fixed or articulated installation.

**5. Robust design**

Built-in tie rods construction as standard even in profile tube aluminium body. Lightweight but tough.

**6. Options**

In addition to standard construction options and special designs are available.

## TECHNICAL DATA:

### Cylindertype:

Double acting pneumatic cylinder with adjustable cushioning at both ends. Dimensions conform to ISO 6431, VDMA 24562 and CNOMO/NF E 49-003 standards.

### Magnetic piston:

Magnetic piston for touch-free position sensing as standard in bore sizes 32 to 125 mm, in larger bore sizes as an option.

### Pressure range:

0...1,0 MPa (0...10 bar)

### Operating medium:

Filtered air (40 µm) or neutral gases, lubricated or non lubricated. Lubricated air to be recommended in temperatures below +5°C or above + 50°C, or with piston velocity over 1 m/s, or when dew point is below +2°C. We recommend lubricated air also with P2020V seals.

### Temperature range:

-20...+80°C standard seals  
-15...+150°C viton seals P2020V-  
-15...+150°C viton+special grease P2020VE-

### Materials:

End caps, cylinder tube and piston: Aluminium, anodized. Round tubes hard anodized.  
Piston rod: Hard chromed steel (25 µm)  
Wear ring: Acetal plastic or PTFE  
Piston rod bearing: Acetal or PTFE coated  
Tie rods and nuts: Stainless or zinc coated steel  
Standard seals ø 32...63: Oil resistant nitrile rubber,  
Other seals: See page 5

### Sensors:

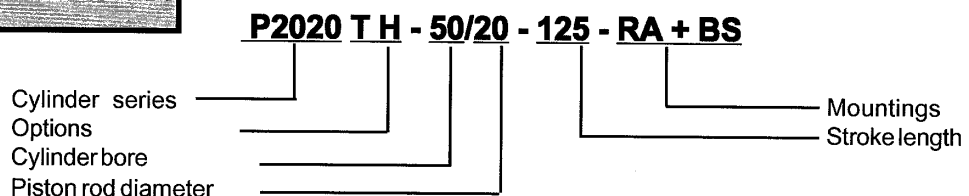
See page 14

## PRODUCT RANGE:

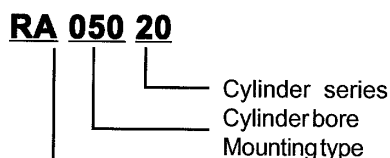
| Cylinder bore | Piston rod diameter | Standard stroke length |    |    |     |     |     |     |     |     |     |     | Weight (kg) |         |      |
|---------------|---------------------|------------------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|---------|------|
|               |                     | 25                     | 50 | 80 | 100 | 125 | 160 | 200 | 250 | 320 | 400 | 500 | 0-stroke    | /100 mm |      |
| 32            | 12                  | X                      | X  | X  | X   | X   | X   | X   | X   | X   |     |     |             | 0,50    | 0,30 |
| 40            | 16                  | X                      | X  | X  | X   | X   | X   | X   | X   | X   | X   |     |             | 0,75    | 0,39 |
| 50            | 20                  | X                      | X  | X  | X   | X   | X   | X   | X   | X   | X   | X   | X           | 1,21    | 0,60 |
| 63            | 20                  |                        | X  | X  | X   | X   | X   | X   | X   | X   | X   | X   | X           | 2,10    | 0,64 |
| 80            | 25                  |                        | X  | X  | X   | X   | X   | X   | X   | X   | X   | X   | X           | 2,80    | 0,96 |
| 100           | 25                  |                        | X  | X  | X   | X   | X   | X   | X   | X   | X   | X   | X           | 3,80    | 1,10 |
| 125           | 32                  |                        |    |    | X   | X   | X   | X   | X   | X   | X   | X   | X           | 6,30    | 1,60 |
| 160           | 40                  |                        |    |    | X   | X   | X   | X   | X   | X   | X   | X   | X           | 11,6    | 2,20 |
| 200           | 40                  |                        |    |    | X   | X   | X   | X   | X   | X   | X   | X   | X           | 16,0    | 2,50 |

x = standard strokes, non-standard strokes up to max. 3000 mm

## ORDERING REFERENCES:



### Separate mountings:



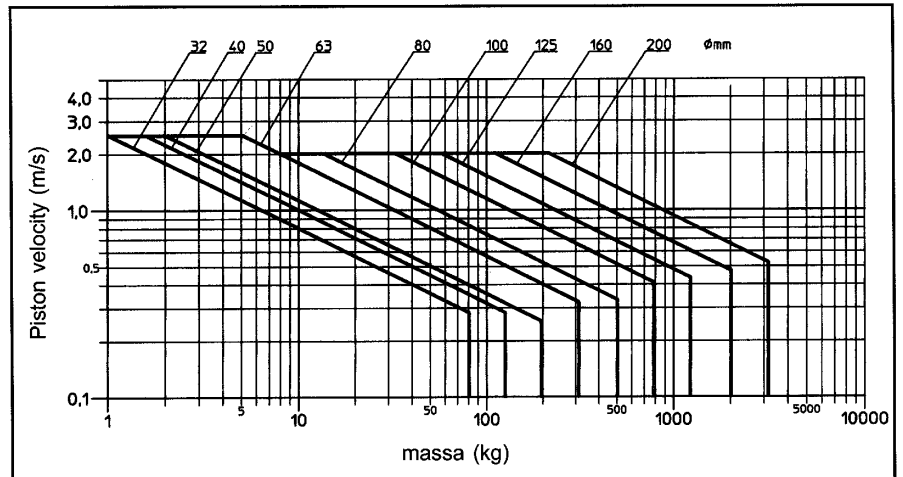
## CYLINDER AREAS AND THRUSTS:

| Cylinder bore | Piston rod diameter | Port | Area                   |                       | Thrust * [N] (p= 0,6 MPa) |       | Cushioning  |                         |
|---------------|---------------------|------|------------------------|-----------------------|---------------------------|-------|-------------|-------------------------|
|               |                     |      | out [cm <sup>2</sup> ] | in [cm <sup>2</sup> ] | out                       | in    | length [mm] | area [cm <sup>2</sup> ] |
| 32            | 12                  | G1/8 | 8,0                    | 6,9                   | 470                       | 410   | 22          | 6,0                     |
| 40            | 16                  | G1/4 | 12,6                   | 10,6                  | 750                       | 630   | 22          | 9,4                     |
| 50            | 20                  | G1/4 | 19,6                   | 16,5                  | 1170                      | 980   | 23          | 13,5                    |
| 63            | 20                  | G3/8 | 31,2                   | 28,1                  | 1860                      | 1650  | 23          | 25                      |
| 80            | 25                  | G3/8 | 50,3                   | 45,4                  | 3000                      | 2650  | 30          | 37,7                    |
| 100           | 25                  | G1/2 | 78,5                   | 73,5                  | 4700                      | 4300  | 32          | 66                      |
| 125           | 32                  | G1/2 | 123                    | 115                   | 7300                      | 6800  | 36          | 103                     |
| 160           | 40                  | G3/4 | 201                    | 188                   | 12000                     | 11100 | 37          | 175                     |
| 200           | 40                  | G3/4 | 314                    | 302                   | 18800                     | 18000 | 37          | 288                     |

\* Given theoretical cylinder thrusts at 0,6 MPa (6 bar) pressure.

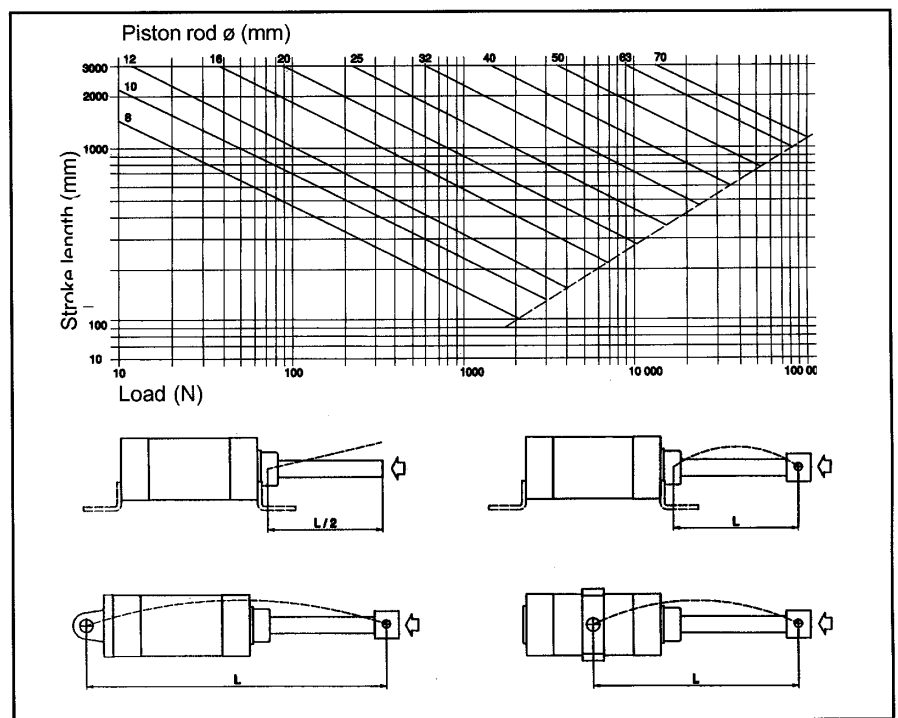
## CUSHIONING:

End cushioning protects the cylinder and machine from mechanical stress. The diagram shows maximum value of the mass to be cushioned as a function of piston velocity. Curves are calculated for a horizontal out-stroke at a pressure of 0,63 MPa (6.3 bar).



## BUCKLING STRENGTH:

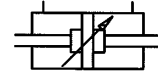
Diagram shows max load of cylinder as function of stroke length, with reliability of n=5. To determine maximum stroke length of a particular piston rod, draw a straight line from horizontal axis upwards until it cuts the diagram of piston rod diameter. Max stroke length can be read at vertical axis by the intersectional point. The effect of different mounting styles is described on the diagrams illustrated.



## OPTIONS:

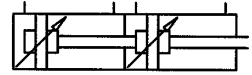
**P2021**  
Cylinder with double piston rod

Equal thrust out and in, better guiding of piston rod.  
(e.g. P2021-50/20-100)



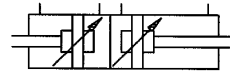
**P2022**  
Tandem cylinder

Cylinders have the same stroke length and a common piston rod, double thrust in and nearly double thrust out.  
(e.g. P2022-50/20-100)



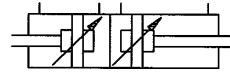
**P2023**  
Three-position cylinder, mounted rear to rear

Both cylinders have the same stroke length, which provides three different positions.  
(e.g. P2023-50/20-100)



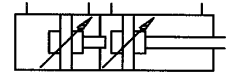
**P2023**  
Four-position cylinder, mounted rear to rear

Cylinders have different stroke lengths, which provides four different positions.  
(e.g. P2023-50/20-100-50)



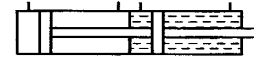
**P2028**  
Multiple position cylinder, mounted front to rear end

Cylinder consists of two or more cylinders joined together to provide more than two defined end positions.  
(e.g. P2028-50/20-100-160)



**P2007**  
Cylinder with oil cushioning

Oil cushioning gives even piston velocity regardless of variations of load. The cylinder can be equipped with fluid cistern and one throttle or two restrictor valves.



## SEAL OPTIONS:

**P2020T**  
Cylinder with non-lube seals, temperature range -20...+80°C

Standard for  $\varnothing$  80...20, option  $\varnothing$  32...63

Non-lube seals for heavy use and demanding circumstances, including PTFE lip seal and two-lip PTFE scraper for piston rod, and NBR lip seals with permanent lubrication for piston. Cushioning seals of polyurethane, O-rings of NBR.  
(e.g. P2020T-50/20-100)

**P2020V**  
Cylinder with seals for high temperatures, -15...+150°C

Viton seals for piston, piston rod and cushioning, and viton O-rings. In  $\varnothing$  80..200 mm piston rod seals like P2020T.  
(e.g. P2020V-50/20-100)



**P2020VE**  
Cylinder with non-lube seals for high temperatures, -15...+150°C

P2020V lubricated with special grease. Suitable specially for systems with no lubrication.  
(e.g. P2020VE-50/20-100)



**P2000N**  
Cylinder for liquid operating medium

Cylinder with no cushioning seals and with special piston rod seal for oil or water.  
(e.g. P2000N-50/20-100)



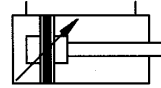
**NOTE !** In case of special applications contact our technical sales support.

## ACCESSORIES OPTIONS:

### P2020M

Cylinder with magnetic piston,  
 ø 160 and 200 mm

Cylinder with magnetic piston for touch-free position sensing, standard in bore sizes 32 to 125 mm.  
 (e.g. P2020M-160/40-100)



### P2020R

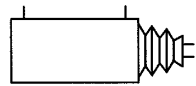
Cylinder with round tube,  
 ø 32...125 mm

Cylinders ø 32...125 can be delivered with round tube instead of standard profile tube. Round tube is standard in ø 160...200.  
 (e.g. P2020R-50/20-100)

### P2020P

Piston rod protected with gaiter

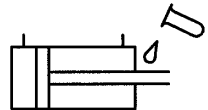
Piston rod protected with rubber gaiter. Note the piston rod extension, ask Pimatic for dimensions.  
 (e.g. P2020P-50/20-100)



### P2020H

Piston rod of stainless steel

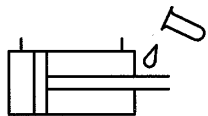
Piston rod of acid proof steel, chromed.  
 (e.g. P2020H-50/20-100)



### P2020K

Cylinder with outer parts in corrosion resistant material

Outer parts in aluminium or stainless steel.  
 (e.g. P2020K-50/20-100)



### P2020--drawing no.

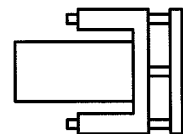
Special design

Special, made to customer design indicated with drawing number.  
 (e.g. P2020-50/20-100-32123)

## Further accessories available:

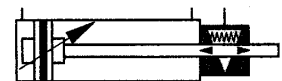
### External guides

Cylinder is equipped with external guides for non-rotating piston rod movement. U profile for cylinders ø 32...100 mm, H profile for cylinders ø 32...125 mm.



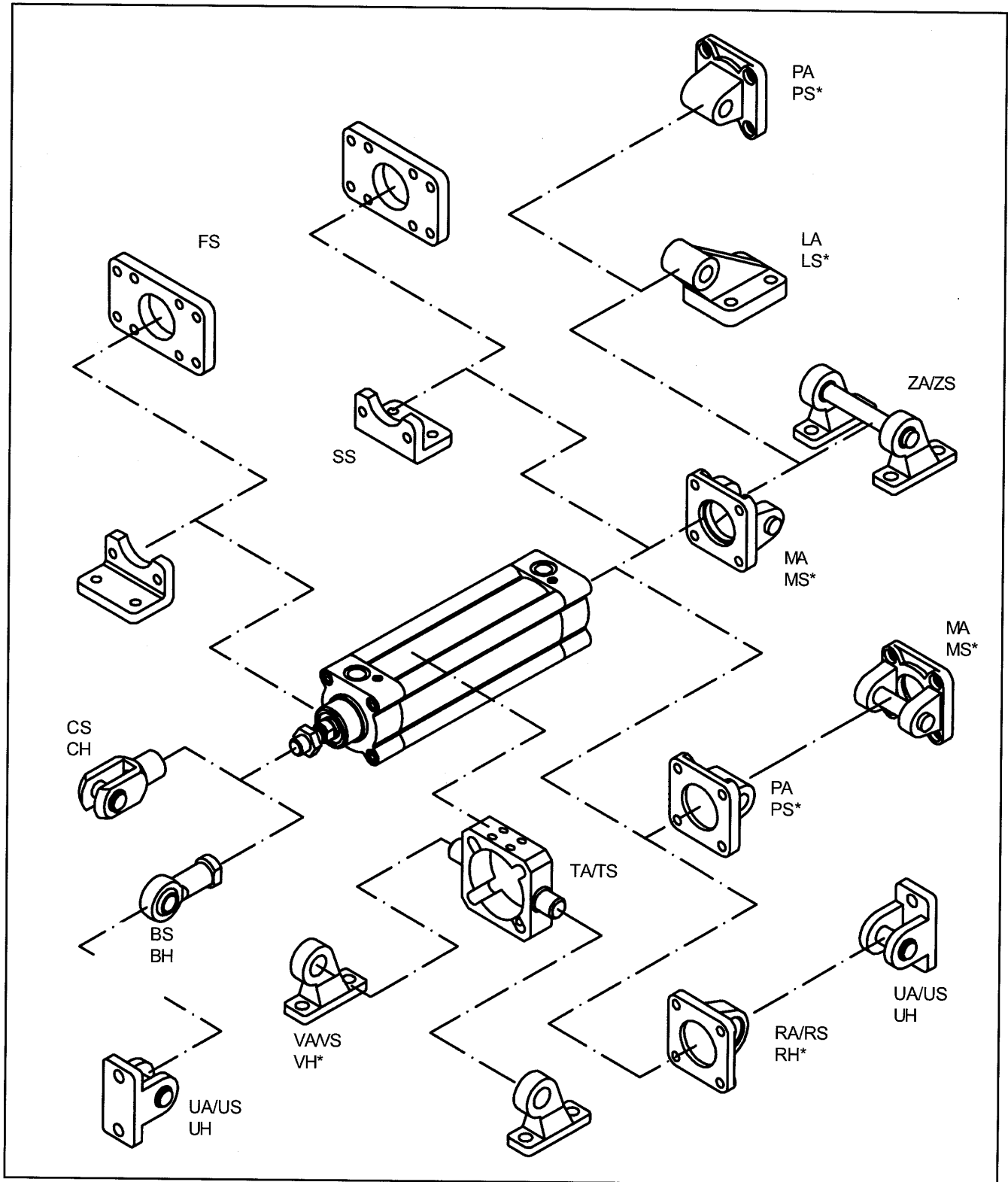
### Locking device

Cylinder is equipped with a passive locking cylinder mounted to the front end cap - locked by spring, opened by pressure. Also available an active device locked by pressure, and devices with sensor.



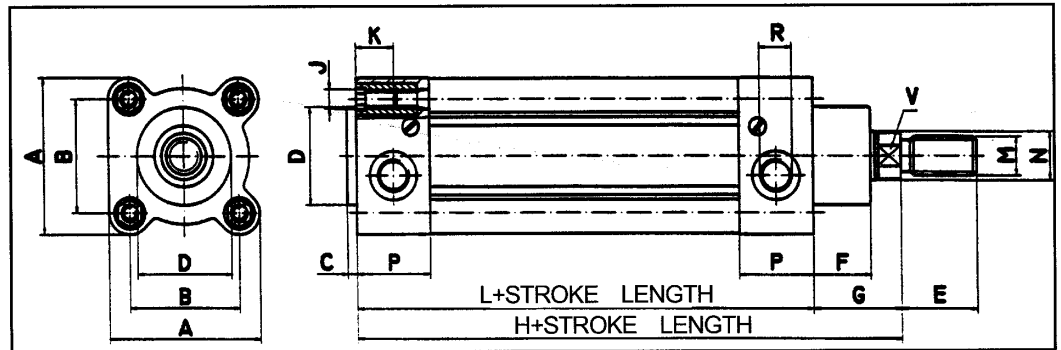
**MOUNTINGS:**

E.g. FS - first letter = mounting type,  
 -second letter = material (A -aluminium, S-steel, H-AISI 316)  
 Dimension tables and order references on pages 9...13.



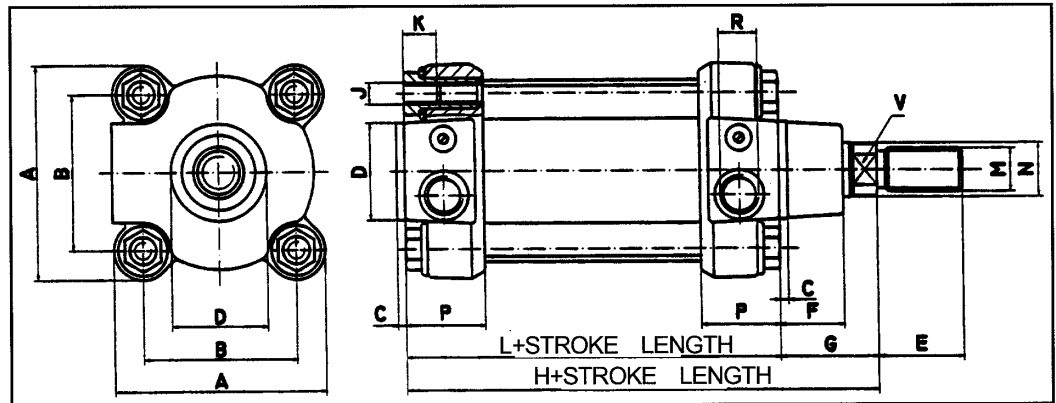
\*at special request

**Ø 32...63:**



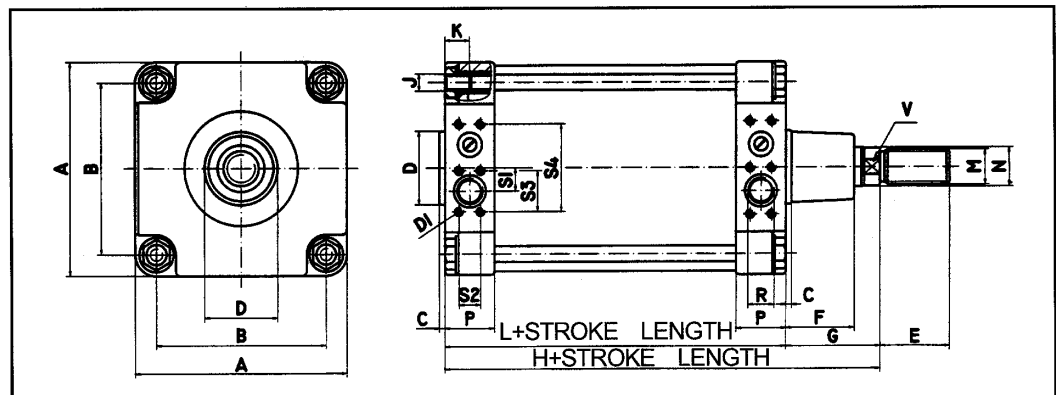
| Bore size | A    | B    | C   | D  | E  | F    | G  | H   | J  | K  | L   | M        | N  | P    | R    | V  |
|-----------|------|------|-----|----|----|------|----|-----|----|----|-----|----------|----|------|------|----|
| <b>32</b> | 45,5 | 32,5 | 3,5 | 30 | 22 | 17   | 26 | 120 | M6 | 16 | 94  | M10x1,25 | 12 | 27   | G1/8 | 10 |
| <b>40</b> | 52   | 38   | 3,5 | 35 | 24 | 20,5 | 30 | 135 | M6 | 16 | 105 | M12x1,25 | 16 | 27   | G1/4 | 13 |
| <b>50</b> | 64   | 46,5 | 4   | 40 | 32 | 24   | 37 | 143 | M8 | 16 | 106 | M16x1,5  | 20 | 31   | G1/4 | 17 |
| <b>63</b> | 74   | 56,5 | 4   | 45 | 32 | 24   | 37 | 158 | M8 | 16 | 121 | M16x1,5  | 20 | 32,5 | G3/8 | 17 |

**Ø 80...125:**



| Bore size  | A   | B   | C | D  | E  | F  | G  | H   | J   | K  | L   | M       | N  | P    | R    | V  |
|------------|-----|-----|---|----|----|----|----|-----|-----|----|-----|---------|----|------|------|----|
| <b>80</b>  | 99  | 72  | 4 | 45 | 40 | 30 | 46 | 174 | M10 | 16 | 128 | M20x1,5 | 25 | 37   | G3/8 | 21 |
| <b>100</b> | 116 | 89  | 4 | 55 | 40 | 35 | 51 | 189 | M10 | 16 | 138 | M20x1,5 | 25 | 42   | G1/2 | 21 |
| <b>125</b> | 141 | 110 | 6 | 60 | 54 | 50 | 65 | 225 | M12 | 20 | 160 | M27x2   | 32 | 48,5 | G1/2 | 27 |

**Ø 160...200:**



| Bore size  | A   | B   | C | D  | E  | F  | G  | H   | J   | K  | L   | M     | N  | P  | R    | V  | D1 | S1   | S2 | S3   | S4   |
|------------|-----|-----|---|----|----|----|----|-----|-----|----|-----|-------|----|----|------|----|----|------|----|------|------|
| <b>160</b> | 182 | 140 | 6 | 65 | 72 | 55 | 80 | 260 | M16 | 24 | 180 | M36x2 | 40 | 51 | G3/4 | 36 | M6 | 23,8 | 28 | 38   | 85,6 |
| <b>200</b> | 217 | 175 | 6 | 75 | 72 | 70 | 95 | 275 | M16 | 24 | 180 | M36x2 | 40 | 51 | G3/4 | 36 | M8 | 23,8 | 22 | 47,6 | 95,2 |
| <b>250</b> |     |     |   |    |    |    |    |     |     |    |     |       |    |    |      |    |    |      |    |      |      |
| <b>320</b> |     |     |   |    |    |    |    |     |     |    |     |       |    |    |      |    |    |      |    |      |      |



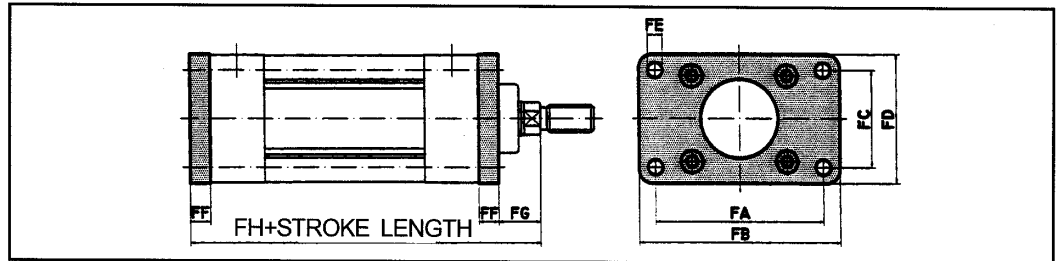
**MOUNTINGS:**

E.g. FS- first letter = mounting type,  
second letter = material (A -aluminium, S -steel)

**Flange mounting FS,**

Flange at front or rear end;  
steel with cataforesis surface  
finishing

E.g. FS 050 20

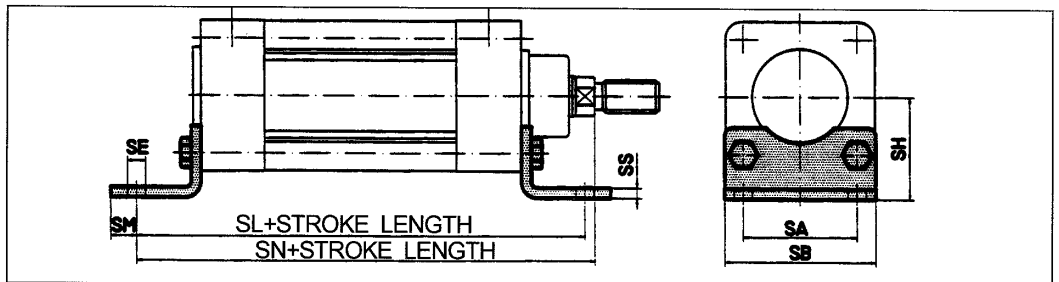


| Bore size | 32  | 40  | 50  | 63  | 80  | 100 | 125 | 160 | 200 | 250 | 320 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| FA        | 64  | 72  | 90  | 100 | 126 | 150 | 180 | 230 | 270 |     |     |
| FB        | 80  | 90  | 110 | 120 | 150 | 170 | 205 | 260 | 300 |     |     |
| FC        | 32  | 36  | 45  | 50  | 63  | 75  | 90  | 115 | 135 |     |     |
| FD        | 45  | 52  | 65  | 75  | 95  | 115 | 140 | 180 | 220 |     |     |
| FE        | 7   | 9   | 9   | 9   | 12  | 14  | 16  | 18  | 22  |     |     |
| FF        | 10  | 10  | 12  | 12  | 16  | 16  | 20  | 20  | 25  |     |     |
| FG        | 16  | 20  | 25  | 25  | 30  | 35  | 45  | 60  | 70  |     |     |
| FH        | 130 | 145 | 155 | 170 | 190 | 205 | 245 | 280 | 300 |     |     |

**Foot mounting SS,**

end angles;  
steel with cataforesis surface  
finishing

E.g. SS 080 20

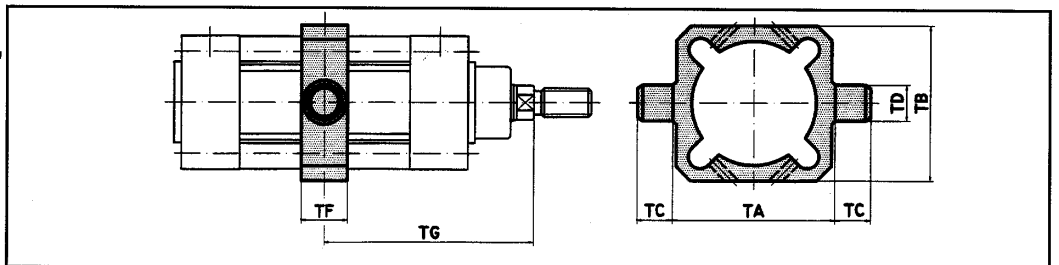


| Bore size | 32  | 40  | 50  | 63  | 80  | 100 | 125 | 160 | 200 | 250 | 320 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| SA        | 32  | 36  | 45  | 50  | 63  | 75  | 90  | 115 | 135 |     |     |
| SB        | 45  | 52  | 65  | 75  | 95  | 115 | 140 | 180 | 220 |     |     |
| SE        | 7   | 9   | 9   | 9   | 12  | 14  | 16  | 18  | 22  |     |     |
| SH        | 32  | 36  | 45  | 50  | 63  | 71  | 90  | 115 | 135 |     |     |
| SL        | 142 | 161 | 170 | 185 | 210 | 220 | 250 | 300 | 320 |     |     |
| SM        | 11  | 8   | 15  | 13  | 14  | 16  | 25  | 20  | 20  |     |     |
| SN        | 144 | 163 | 175 | 190 | 215 | 230 | 270 | 320 | 345 |     |     |
| SS        | 4   | 4   | 5   | 5   | 6   | 6   | 8   | 10  | 12  |     |     |

**Trunnion mounting TATS,**

material ø 32...125 aluminium,  
ø 125...200 (only for round tube)  
zinc plated steel

E.g. TA 100 20



| Bore size | 32 | 40 | 50 | 63 | 80  | 100 | 125 | 160 | 200 | 250 | 320 |
|-----------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| TA (h14)  | 50 | 63 | 75 | 90 | 110 | 132 | 160 | 200 | 250 |     |     |
| TB        | 57 | 59 | 72 | 86 | 106 | 127 | 155 | 190 | 240 |     |     |
| TC (h14)  | 12 | 16 | 16 | 20 | 20  | 25  | 25  | 32  | 32  |     |     |
| TD (e9)   | 12 | 16 | 16 | 20 | 20  | 25  | 25  | 32  | 32  |     |     |
| TF        | 18 | 20 | 20 | 26 | 26  | 32  | 32  | 40  | 40  |     |     |
| TGmin.    | 62 | 67 | 78 | 83 | 96  | 109 | 130 | 151 | 166 |     |     |

Adjustable in bore sizes 32...100 mm. Fixed in sizes 125...200 mm, dimension TG to be stated if not central.

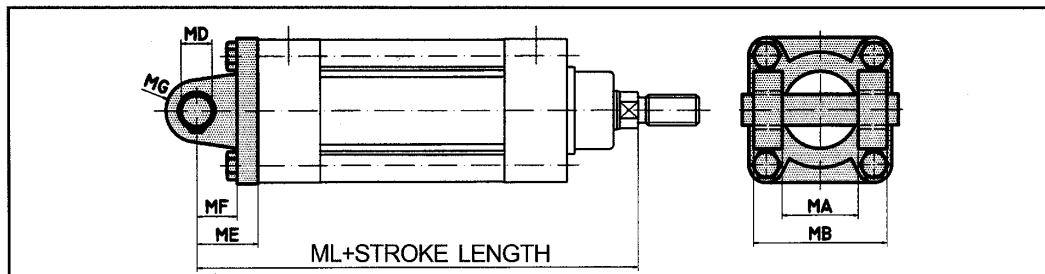
## MOUNTINGS:

E.g. MA - first letter = mounting type,  
second letter = material (A -aluminium, S -steel)

### Mounting MA,

rear clevis mounting;  
aluminium with cataforesis  
surface finishing and steel axle  
**E.g. MA 040 20**

At request also type **MS**  
in steel+cataforesis

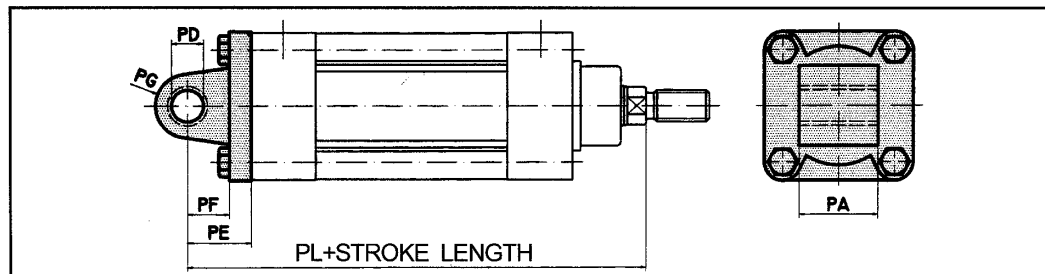


| Bore size      | 32  | 40  | 50  | 63  | 80  | 100 | 125 | 160 | 200 | 250 | 320 |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>MA</b>      | 26  | 28  | 32  | 40  | 50  | 60  | 70  | 90  | 90  |     |     |
| <b>MB</b>      | 45  | 52  | 60  | 70  | 90  | 110 | 130 | 170 | 170 |     |     |
| <b>MD (H9)</b> | 10  | 12  | 12  | 16  | 16  | 20  | 25  | 30  | 30  |     |     |
| <b>MG</b>      | 10  | 12  | 12  | 16  | 16  | 20  | 25  | 30  | 30  |     |     |
| <b>ME</b>      | 22  | 25  | 27  | 32  | 36  | 41  | 50  | 55  | 60  |     |     |
| <b>MF</b>      | 13  | 16  | 16  | 21  | 22  | 27  | 30  | 35  | 35  |     |     |
| <b>ML</b>      | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |     |     |

### Mounting PA,

rear eye mounting;  
aluminium with cataforesis  
surface finishing  
**E.g. PA 063 20**

At request also type **PS**  
in steel+cataforesis

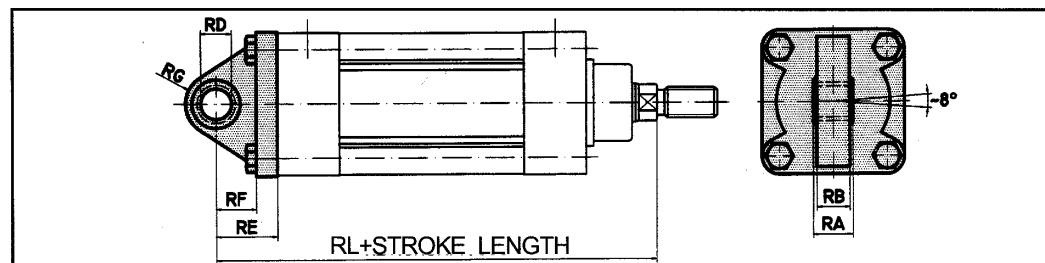


| Bore size      | 32  | 40  | 50  | 63  | 80  | 100 | 125 | 160 | 200 | 250 | 320 |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>PA</b>      | 26  | 28  | 32  | 40  | 50  | 60  | 70  | 90  | 90  |     |     |
| <b>PD (H9)</b> | 10  | 12  | 12  | 16  | 16  | 20  | 25  | 30  | 30  |     |     |
| <b>PG</b>      | 10  | 12  | 12  | 16  | 16  | 20  | 25  | 30  | 30  |     |     |
| <b>PE</b>      | 22  | 25  | 27  | 32  | 36  | 41  | 50  | 55  | 60  |     |     |
| <b>PF</b>      | 13  | 16  | 16  | 21  | 22  | 27  | 30  | 35  | 35  |     |     |
| <b>PL</b>      | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |     |     |

### Mounting RA/RS,

spherical rear bearing;  
ø 32...125 in aluminium,  
ø 160...200 in zinc plated steel  
**E.g. RA 100 20**

At request type **RS** in  
steel+cataforesis, ø 32...125



| Bore size      | 32  | 40  | 50  | 63  | 80  | 100 | 125 | 160 | 200 | 250 | 320 |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>RA</b>      | 14  | 16  | 16  | 21  | 21  | 25  | 31  | 37  | 37  |     |     |
| <b>RB</b>      | 12  | 14  | 14  | 17  | 17  | 20  | 25  | 30  | 30  |     |     |
| <b>RD (H9)</b> | 10  | 12  | 12  | 16  | 16  | 20  | 25  | 30  | 30  |     |     |
| <b>RG</b>      | 15  | 18  | 20  | 22  | 25  | 29  | 35  | 40  | 45  |     |     |
| <b>RE</b>      | 22  | 25  | 27  | 32  | 36  | 41  | 50  | 55  | 60  |     |     |
| <b>RF</b>      | 13  | 16  | 16  | 21  | 22  | 27  | 30  | 40  | 40  |     |     |
| <b>RL</b>      | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |     |     |

## MOUNTINGS for PISTON ROD:

E.g. BS- first letter = mounting type,  
second letter = material (A -aluminium, S -steel)

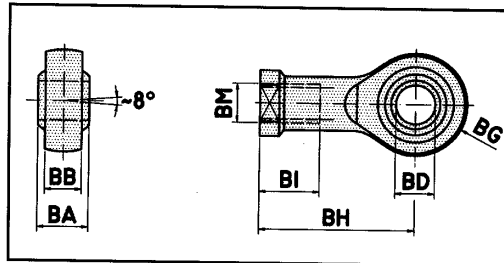
### Mounting BS,

piston rod end spherical bearing  
(ISO 8139);

zinc plated steel

E.g. BS 032 20

Also available in AISI 316, type BH



| Bore size       | 32       | 40       | 50      | 63      | 80      | 100     | 125   | 160   | 200   | 250 | 320 |
|-----------------|----------|----------|---------|---------|---------|---------|-------|-------|-------|-----|-----|
| <b>BA (h12)</b> | 14       | 16       | 21      | 21      | 25      | 25      | 37    | 43    | 43    |     |     |
| <b>BB</b>       | 10,5     | 12       | 15      | 15      | 18      | 18      | 25    | 30    | 30    |     |     |
| <b>BD (H9)</b>  | 10       | 12       | 16      | 16      | 20      | 20      | 30    | 35    | 35    |     |     |
| <b>BG max</b>   | 14       | 16       | 21      | 21      | 25      | 25      | 35    | 40    | 40    |     |     |
| <b>BH</b>       | 43       | 50       | 64      | 64      | 77      | 77      | 110   | 125   | 125   |     |     |
| <b>BI</b>       | 20       | 23       | 34      | 34      | 40      | 40      | 54    | 56    | 56    |     |     |
| <b>BM</b>       | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |     |     |

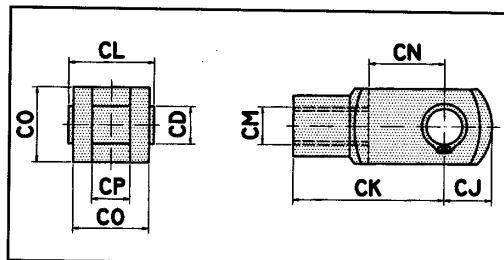
### Mounting CS,

Piston rod clevis assembly  
(ISO 8140);

zinc plated steel

E.g. CS 040 20

Also available in AISI 316, type CH



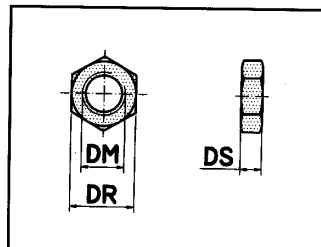
| Bore size      | 32       | 40       | 50      | 63      | 80      | 100     | 125   | 160   | 200   | 250 | 320 |
|----------------|----------|----------|---------|---------|---------|---------|-------|-------|-------|-----|-----|
| <b>CD (H9)</b> | 10       | 12       | 16      | 16      | 20      | 20      | 30    | 35    | 35    |     |     |
| <b>CJ max</b>  | 16       | 19       | 25      | 25      | 32      | 32      | 45    | 57    | 57    |     |     |
| <b>CK</b>      | 40       | 48       | 64      | 64      | 80      | 80      | 110   | 144   | 144   |     |     |
| <b>CL</b>      | 26       | 31       | 39      | 39      | 48      | 48      | 64    | 80    | 80    |     |     |
| <b>CM</b>      | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |     |     |
| <b>CO</b>      | 20       | 24       | 32      | 32      | 40      | 40      | 55    | 70    | 70    |     |     |
| <b>CN</b>      | 20       | 24       | 32      | 32      | 40      | 40      | 54    | 72    | 72    |     |     |
| <b>CP</b>      | 10       | 12       | 16      | 16      | 20      | 20      | 30    | 35    | 35    |     |     |

### Mounting DS,

Piston rod nut;  
zinc plated steel

E.g. DS 050 20

Also available in AISI 316, type DH



Piston rod nut DS is included in basic cylinder.

DS is also included in BS and CS, if mountings are ordered separately.

| Bore size | 32       | 40       | 50      | 63      | 80      | 100     | 125   | 160   | 200   | 250 | 320 |
|-----------|----------|----------|---------|---------|---------|---------|-------|-------|-------|-----|-----|
| <b>DM</b> | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |     |     |
| <b>DR</b> | 17       | 19       | 24      | 24      | 30      | 30      | 41    | 55    | 55    |     |     |
| <b>DS</b> | 5        | 6        | 8       | 8       | 10      | 10      | 12    | 18    | 18    |     |     |

**MOUNTINGS:**

E.g. LA-

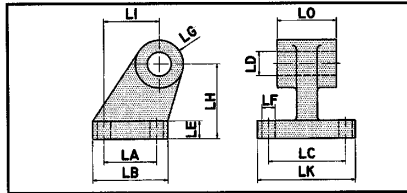
first letter = mounting type,  
second letter = material (A -aluminium, S -steel)

**Mounting LA,**

rear 90° hinge mounting (CETOP RP 107 P);  
(mounting for M),  
aluminium with cataforesis surface finishing

E.g. L1236

At request also type LS in steel+cataforesis



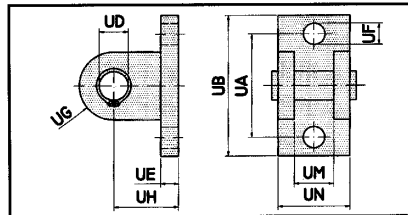
| Bore size | 32  | 40  | 50  | 63  | 80 | 100 | 125 | 160 | 200 | 250 | 320 |
|-----------|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|
| LA        | 18  | 22  | 30  | 35  | 40 | 50  |     |     |     |     |     |
| LB        | 31  | 35  | 45  | 50  | 60 | 70  |     |     |     |     |     |
| LC        | 38  | 41  | 50  | 52  | 66 | 76  |     |     |     |     |     |
| LD (H9)   | 10  | 12  | 12  | 16  | 16 | 20  |     |     |     |     |     |
| LE        | 8   | 10  | 12  | 12  | 14 | 15  |     |     |     |     |     |
| LF        | 6,5 | 6,5 | 8,5 | 8,5 | 11 | 11  |     |     |     |     |     |
| LG        | 10  | 11  | 13  | 15  | 15 | 18  |     |     |     |     |     |
| LH        | 32  | 36  | 45  | 50  | 63 | 71  |     |     |     |     |     |
| LI        | 21  | 24  | 33  | 37  | 47 | 55  |     |     |     |     |     |
| LK        | 51  | 54  | 65  | 67  | 86 | 96  |     |     |     |     |     |
| LO        | 26  | 28  | 32  | 40  | 50 | 60  |     |     |     |     |     |

**Mounting UA/US,**

clevis foot (mounting for R and B);  
material ø 32...125 aluminium,  
ø 160...200 mm zinc plated steel

E.g. UA 040 20

Available also type UH, AISI 316, for ø 32...125



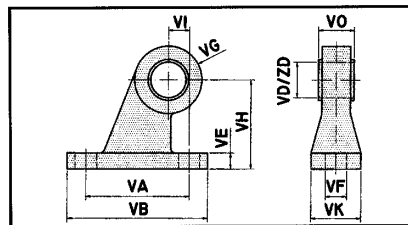
| Bore size | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 320 |
|-----------|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| UA        | 30 | 38 | 46 | 58 | 70 | 88  | 108 | 138 | 170 |     |     |
| UB        | 45 | 55 | 64 | 79 | 94 | 118 | 145 | 182 | 215 |     |     |
| UD        | 10 | 12 | 12 | 16 | 16 | 20  | 25  | 30  | 30  |     |     |
| UE        | 6  | 7  | 9  | 10 | 12 | 14  | 13  | 14  | 19  |     |     |
| UF        | 7  | 9  | 9  | 12 | 14 | 18  | 22  | 26  | 26  |     |     |
| UG        | 11 | 15 | 15 | 19 | 19 | 23  | 28  | 33  | 33  |     |     |
| UH        | 24 | 27 | 30 | 36 | 40 | 45  | 55  | 65  | 70  |     |     |
| UM        | 15 | 17 | 22 | 22 | 26 | 32  | 38  | 44  | 44  |     |     |
| UN        | 26 | 28 | 32 | 40 | 50 | 60  | 70  | 90  | 90  |     |     |

**Mounting VA/VS and ZA/ZS,**

brackets (V mounting for T)  
(Z mounting for M, P and R)  
material ø 32...100 aluminium,  
ø 125...200 zinc plated steel

E.g. VA 100 20 or ZS 160 20

Available at request type VH, AISI 316



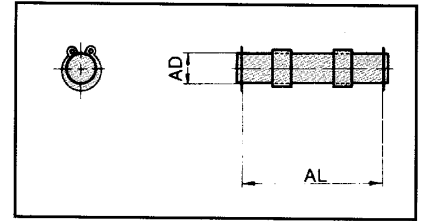
| Bore size | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 320 |
|-----------|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| VA        | 30 | 38 | 46 | 58 | 70 | 88  | 108 | 138 | 170 |     |     |
| VB        | 45 | 55 | 64 | 79 | 94 | 118 | 145 | 182 | 215 |     |     |
| VD (H9)   | 12 | 16 | 16 | 20 | 20 | 25  | 25  | 32  | 32  |     |     |
| ZD (H9)   | 10 | 12 | 12 | 16 | 16 | 20  | 25  | 30  | 30  |     |     |
| VE        | 6  | 7  | 7  | 9  | 11 | 11  | 13  | 18  | 18  |     |     |
| VF        | 7  | 9  | 9  | 12 | 14 | 18  | 22  | 26  | 26  |     |     |
| VG        | 11 | 15 | 15 | 19 | 19 | 23  | 28  | 33  | 33  |     |     |
| VH        | 32 | 36 | 45 | 50 | 63 | 71  | 90  | 115 | 135 |     |     |
| VI        | 7  | 9  | 10 | 12 | 14 | 17  | 21  | 25  | 25  |     |     |
| VK        | 16 | 18 | 25 | 25 | 34 | 40  | 45  | 60  | 60  |     |     |
| VO        | 12 | 16 | 16 | 20 | 20 | 25  | 25  | 30  | 30  |     |     |

## Pivot axle AS, dimensions in combinations

Pivot axle is included in mountings M and U, see dimension tables of the mountings.  
When bracket Z is combined with M, P, B or R, the pivot axle must be ordered separately.

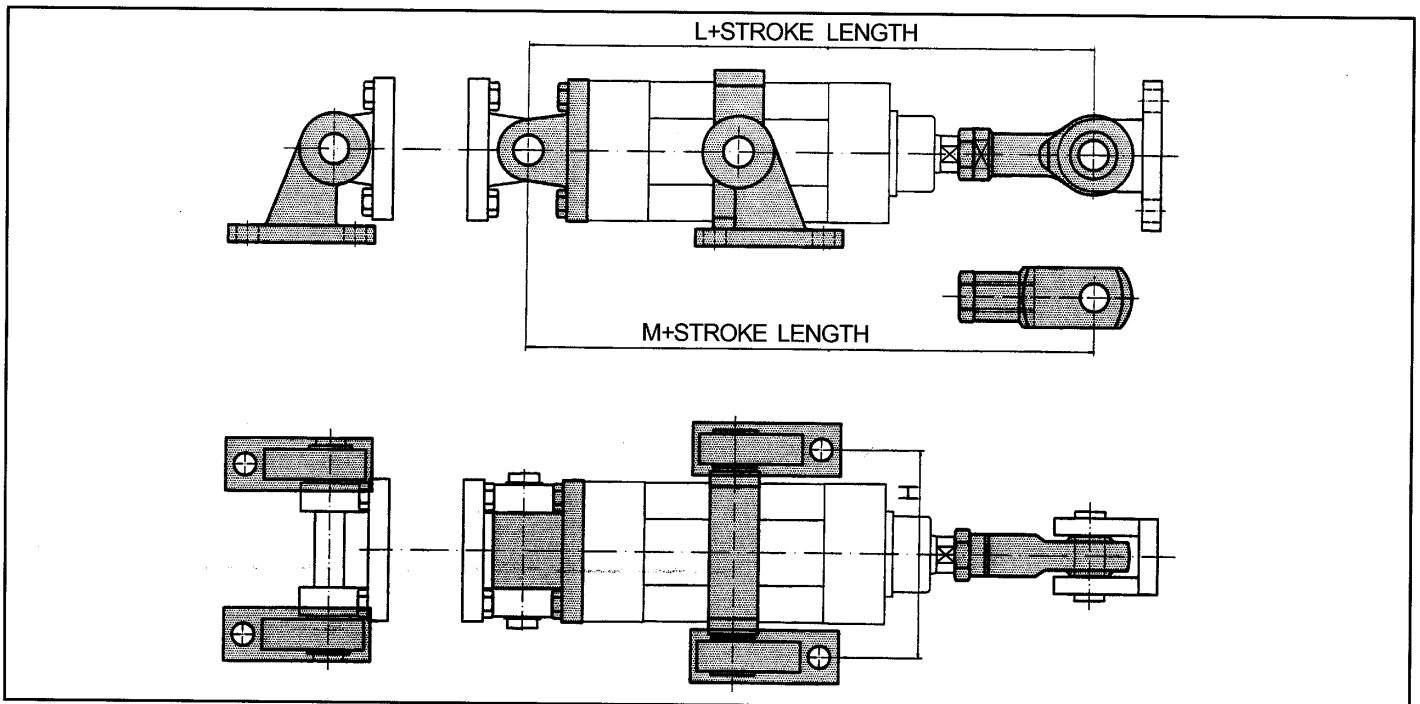
**E.g.** For combination M+Z, cylinder bore 32, the pivot axle is **AS 032 1066**  
(=dimension AD 10, dimension AL 66).

Also available in AISI 316, type **AH**.



| Bore size      | 32   | 40   | 50   | 63    | 80    | 100   | 125   | 160   | 200   |
|----------------|------|------|------|-------|-------|-------|-------|-------|-------|
| <b>B/R + Z</b> | 1035 | 1241 | 1252 | 1654  | 1668  | 2082  | 2590  | 30107 | 30107 |
| <b>P + Z</b>   | 1046 | 1253 | 1263 | 1673  | 1693  | 20115 | 25122 |       |       |
| <b>M + Z</b>   | 1066 | 1277 | 1291 | 16104 | 16133 | 20165 | 25182 | 30234 | 30234 |

## MOUNTING COMBINATIONS:



| Bore size     | 32  | 40  | 50  | 63  | 80  | 100 | 125 | 160 | 200 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>H</b>      | 62  | 80  | 92  | 112 | 132 | 160 | 187 | 232 | 282 |
| <b>L min.</b> | 190 | 216 | 242 | 262 | 297 | 317 | 397 | 458 | 478 |
| <b>M min.</b> | 187 | 214 | 242 | 262 | 300 | 320 | 397 | 477 | 497 |

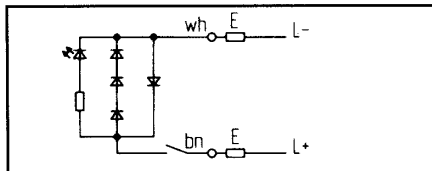
**SENSORS w. CABLE OR PLUG:**

**Reed-switch 102 157**

Normally open reed switch with varistor and LED-indication

|                        |                             |
|------------------------|-----------------------------|
| Voltage AC             | 10-250 V                    |
| Voltage DC             | 10-250V                     |
| Current (25°C)         | 0,5 A                       |
| Power max. (inductive) | 30 VA                       |
| Power max. (resistive) | 20 W                        |
| Switch time (ON/OFF)   | 1,0 / 0,5 ms                |
| Mechanical life time   | min. 10 <sup>6</sup> cycles |
| Switching resistance   | max. 150 mΩ                 |
| Protection degree      | IP 67 (DIN 40 050)          |
| Connection system      | fixed cable 5 m             |
| Temperature range      | -25...+75°C                 |

**Connection:**  
102 157



**MOUNTING TYPES**

Cylinders ø 32...63  
Cylinders ø 80...100  
Cylinders ø 125

|                           |                      |
|---------------------------|----------------------|
| <b>For profile tubes:</b> | <b>For tie rods:</b> |
| <b>351 070</b>            | <b>351 064</b>       |
| <b>351 071</b>            | <b>351 067</b>       |
| <b>351 072</b>            | <b>351 067</b>       |

**SENSORS w. PLUG, for tie rods:**

**Reed-switch 102 247**

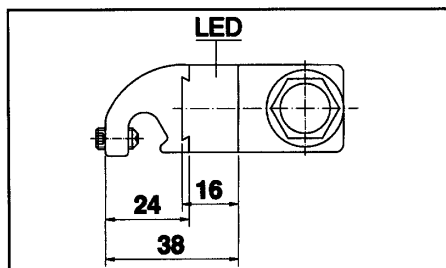
Normally open Reed-switch with varistor and LED-indication

|                       |                        |
|-----------------------|------------------------|
| Voltage AC/DC         | 10-230 V               |
| Current (25°C)        | 0,5 A                  |
| Power max.            | 20 W / 30 VA           |
| Switch time (ON/OFF)  | 10 / 0,8 ms            |
| Mechanical life time  | 10 <sup>7</sup> cycles |
| Protection degree     | IP 65                  |
| Connection system     | plug DIN 43650/B       |
| Operating temperature | -25 to +75°C           |

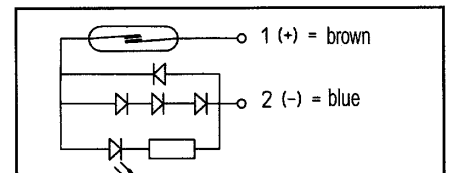
**Dimensions 102 247 / 351 028**

For bore sizes  
ø 32...100

**Mounting bracket**  
**351 028**



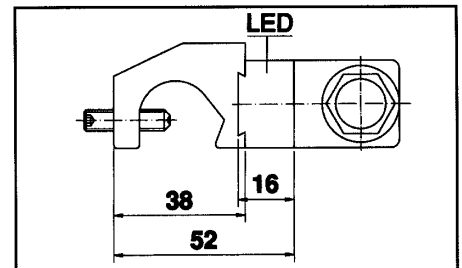
**Connection:**  
102 247



**Dimensions 102 247 / 351 019**

For bore sizes  
ø 125...200

**Mounting bracket**  
**351 019**

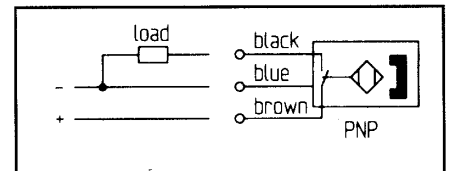


**PNP sensor 102 190, or 102 190 PG**

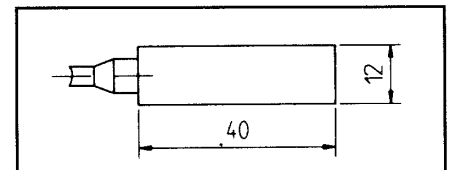
Normally open magnetoinductive sensor with PNP-output

|                      |   |
|----------------------|---|
| Voltage DC           | 10...30 V   |
| Current (25°C)       | 200 mA  |
| Power max.           | 6 W   |
| Switch time (ON/OFF) | 0,05 / 20 ms                                      |
| Life time            | min. 10 <sup>7</sup> cycles                       |
| Voltage drop         | max. 1,05 V                                       |
| Protection degree    | IP 67 (DIN 40 050)                                |
| Connection system    | fixed cable 5 m (102 190)<br>M8 plug (102 190 PG) |
| Temperature range    | -25...+75°C                                       |

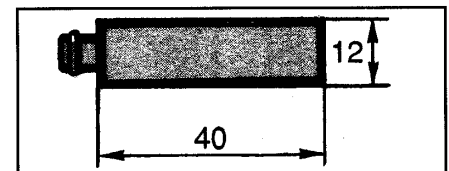
**Connection:**  
102 190



**Dimensioning:**  
102 157  
102 190

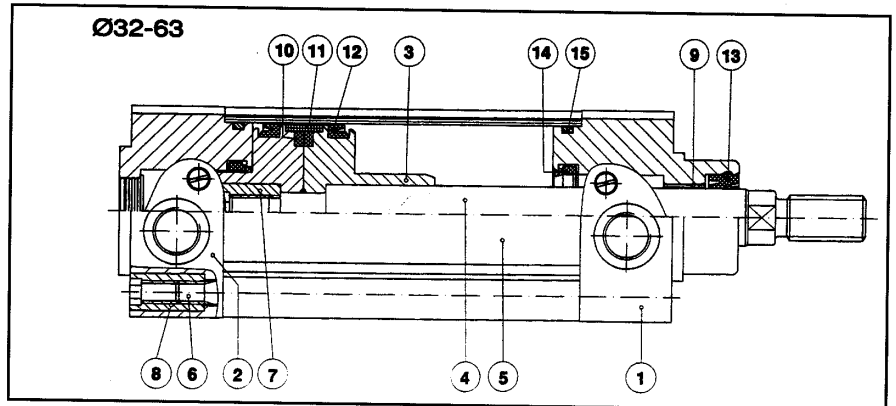


102 190 PG

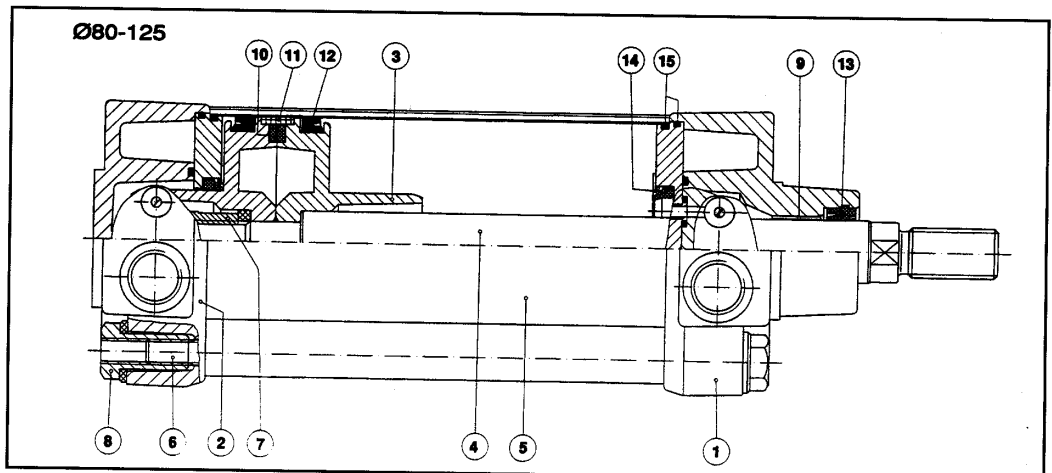


## SPARE PARTS for BORE SIZES 32...63 MM:

- 1. Seal kit (parts: 11, 12, 13, 14, 15)
- 2. Cylinder tube (part: 5)
- 3. Piston rod (part: 4)
- 4. Tie rod kit (part: 6, 8)
- 5. Front end cap complete (part: 1)
- 6. Rear end cap complete (part: 2)
- 7. Piston complete (part: 3, 7, 10)



## SPARE PARTS for BORE SIZES 80...125 MM:



## SPARE PARTS for BORE SIZES 160...200 MM:

