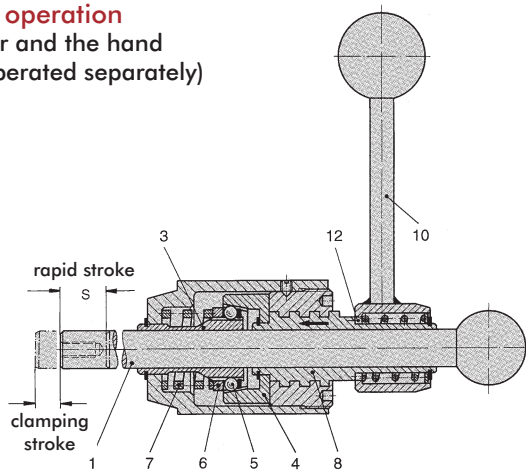


**Two-hand operation**  
(the plunger and the hand lever are operated separately)



DESTACO's variable stroke Straight Line clamps are used in applications where workpiece thicknesses and workpiece tolerances vary. These clamps are suitable for clamping between ribs and hollow spaces difficult to reach.

Compact design and different types of operation allow for application of the Straight Line clamps in fixtures for mass production as well as for single part production.

### Mounting types

- Foot base (FO Series)
- Flange mount (FL Series)
- Through hole mount (G Series)

### Type of operation

- Two hand operation
- The hand lever (10) and the plunger (1) are separate. The hand lever is connected to the clamping mechanism. The plunger can be removed from the clamp
- One-hand operation
- The hand lever (10) or the hand wheel (11) and the plunger (2) are linked. The plunger is retained within the clamp.

### Clamping operation

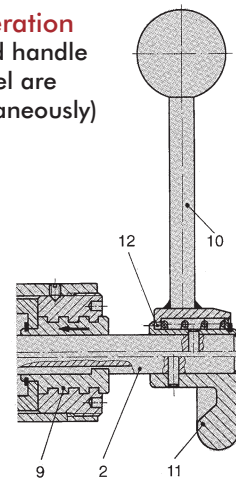
The plunger (1) or (2) which is guided within the clamp body contacts the workpiece. By rotating the hand lever (10) or the hand wheel (11) clock-wise the clamping stroke, S1 is engaged and the plunger is tightly gripped by the slotted clamping sleeve (3).

### Operating principle

The hand lever's (10) clock-wise rotation causes the threaded sleeve (8) and the conical sleeve (4) to which it is connected to move in the direction of the arrow shown in the drawing. The conical sleeve produces a force-locking connection between the slotted clamping sleeve (3) and the plunger by means of the ball bearings (5) located at the clamping sleeve's perimeter.

Due to the force-locking connection, the plunger rotates and produces the clamping stroke S1. The plungers rotation may be compensated for by means of a swivel hold-down piece.

**One-hand operation**  
(the plunger and handle lever/hand wheel are operated simultaneously)



The clamping strokes S1 specified in this catalog were measured with no opposing forces present while measurements were taken. When clamping this product against a workpiece, the clamping stroke S1 is reduced by the force-locking connection between the plunger and the workpiece. The straight-action clamp is unlocked by turning the hand lever or the hand wheel counter-clockwise. This method is used for both the one-hand and the two-hand operation types. This counter-clockwise rotation makes the conical sleeve (4) and the threaded sleeve (8) or (9) move backward. The pressure spring (7) pushes back the relieved ball bearings (5) via the pressure ring (6).

The force-locking connection between the slotted clamping sleeve and the plunger can be moved freely again. Straight Line clamps which are two-hand operated can also be applied to pull actions when the plunger is inserted in the clamp's housing in the opposite direction. On the one hand operated clamp, the rotation inducing the clamping stroke S1 is directly transmitted from the plunger (2) or the hand wheel to the threaded sleeve (9) via a groovespring connection. The clamping and unclamping operations are executed in the same way as described before.

### Handling

To change the position of the handle while in the clamped or the unclamped position, pull the hand lever off its spline (12) and set it in the desired position.

### Important

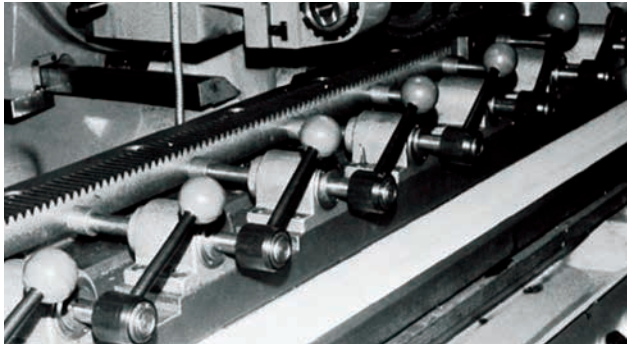
The holding forces specified in the catalog refer to the maximum load exerted on the clamp by counter-forces. For details concerning the clamping force FS exerted on the workpiece by the clamp and depending on the operation force FB (manual force), please see the chart on the next page.

The clamping force is proportional to the operation force. The achieved clamping force must not exceed the maximum holding force.

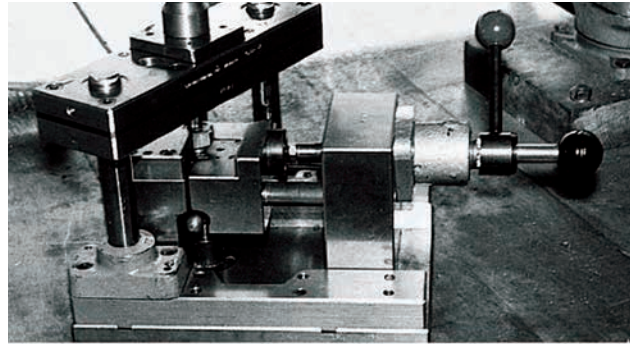
As the Straight Line clamps, with the exception of the F-160 model, are designed only for axial load, we recommend to use an additional radial support for the plunger in the event of side load.

# FO, FL, G SERIES

## Variable Stroke Straight Line Action Clamps | Technical Information



Model FO-161/60 on a milling machine



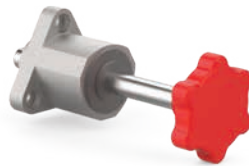
Model FL-160 with plunger 16/100 on a punching fixture

### Different Designs



#### FO Series

**Mounting type:** flange base foot mount  
**Operating method:** one-hand or two-hand operation



#### FL Series

**Mounting type:** front flange mount  
**Operating method:** one-hand or two-hand operation



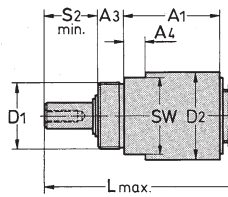
#### G Series

**Mounting type:** through hole mount  
**Operating method:** one-hand or two-hand operation

|                    |  | Operating method       |                    |                    | Model                                                     | Max. holding capacity | Clamping force $F_s$ with an operating force $F_B$ |            | Rapid stroke  | Max. clamping stroke | Weight       |  |
|--------------------|--|------------------------|--------------------|--------------------|-----------------------------------------------------------|-----------------------|----------------------------------------------------|------------|---------------|----------------------|--------------|--|
|                    |  | Two-hand operation     | One-hand operation | One-hand operation |                                                           |                       | FB                                                 | FS         |               |                      |              |  |
| Mounting type      |  | Plunger and hand lever | Hand lever         | Hand wheel         | <sup>1)</sup> Plunger order separately; see page MC-VSG-5 | [lbs.] N              | [lbs.] N                                           | [lbs.] N   | S [mm]        | S1 [mm]              | [lbs] Kg     |  |
| Foot mount         |  | •                      |                    | •                  | FO-082-40                                                 | [335] 1500            | [22] 100                                           | [100] 450  | 40            | 2,5                  | [0.72] 0,325 |  |
|                    |  | •                      |                    |                    | FO-120 <sup>1)</sup>                                      | [675] 3000            |                                                    | [425] 1900 | 100, 200, 300 | 3                    | [1.19] 0,540 |  |
|                    |  |                        | •                  |                    | FO-121-45                                                 | [675] 3000            |                                                    | [425] 1900 | 45            | 3                    | [1.47] 0,665 |  |
|                    |  |                        |                    | •                  | FO-122-45                                                 | [675] 3000            |                                                    | [100] 450  | 40            | 3                    | [1.34] 0,610 |  |
|                    |  | •                      |                    |                    | FO-160 <sup>1)</sup>                                      | [2020] 9000           |                                                    | [560] 2500 | 100, 200, 300 | 4                    | [2.73] 1,240 |  |
|                    |  |                        | •                  |                    | FO-161-60                                                 | [2020] 9000           |                                                    | [560] 2500 | 60            | 4                    | [3.40] 1,540 |  |
|                    |  |                        |                    | •                  | FO-162-60                                                 | [2020] 9000           |                                                    | [190] 850  | 60            | 4                    | [3.15] 1,430 |  |
|                    |  | •                      |                    |                    | FO-220 <sup>1)</sup>                                      | [4045] 18000          |                                                    | [675] 3000 | 100, 200, 300 | 4                    | [5.85] 2,655 |  |
| Flange mount       |  |                        | •                  |                    | FO-221-80                                                 | [4045] 18000          |                                                    | [675] 3000 | 80            | 4                    | [7.46] 3,385 |  |
|                    |  | •                      |                    |                    | FL-120 <sup>1)</sup>                                      | [675] 3000            |                                                    | [425] 1900 | 100, 200, 300 | 3                    | [1.07] 0,485 |  |
|                    |  |                        | •                  |                    | FL-121-45                                                 | [675] 3000            |                                                    | [425] 1900 | 45            | 3                    | [1.34] 0,610 |  |
|                    |  |                        |                    | •                  | FL-122-45                                                 | [675] 3000            |                                                    | [100] 450  | 40            | 3                    | [1.21] 0,550 |  |
|                    |  | •                      |                    |                    | FL-160 <sup>1)</sup>                                      | [2020] 9000           |                                                    | [560] 2500 | 100, 200, 300 | 4                    | [2.49] 1,130 |  |
|                    |  |                        | •                  |                    | FL-161-60                                                 | [2020] 9000           |                                                    | [560] 2500 | 60            | 4                    | [3.15] 1,430 |  |
| Through hole mount |  |                        |                    | •                  | FL-162-60                                                 | [2020] 9000           |                                                    | [190] 850  | 60            | 4                    | [2.92] 1,325 |  |
|                    |  |                        |                    | •                  | G-082-40                                                  | [335] 1500            |                                                    | [100] 450  | 40            | 2,5                  | [0.66] 0,300 |  |
|                    |  | •                      |                    |                    | G-120 <sup>1)</sup>                                       | [675] 3000            |                                                    | [425] 1900 | 100, 200, 300 | 3                    | [1.01] 0,470 |  |
|                    |  |                        | •                  |                    | G-121-45                                                  | [675] 3000            |                                                    | [425] 1900 | 45            | 3                    | [1.31] 0,595 |  |
|                    |  |                        |                    | •                  | G-122-45                                                  | [675] 3000            |                                                    | [100] 450  | 40            | 3                    | [1.18] 0,335 |  |

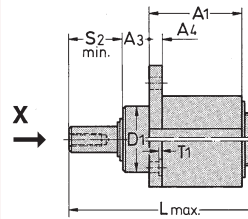
Two-hand operation (the plunger and the hand lever are operated separately)

### Through hole mount

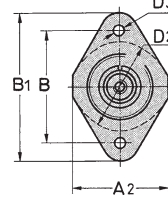


Part no. G-121/45

### Flange mount

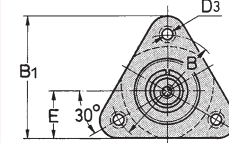


#### View "X"



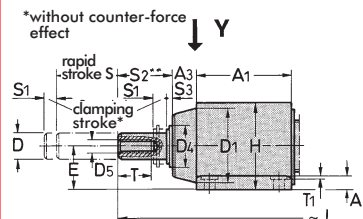
Part no. FL-120/--

#### View "X"

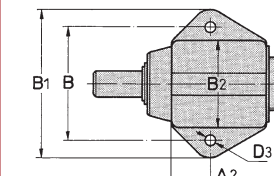


Part no. FL-160/--

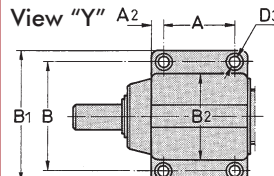
### Foot mount



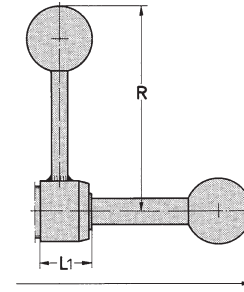
#### View "Y"



Part no. FO-120/--



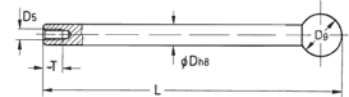
Part no. FO-160/--  
FO-220/--



### Accessories

(order separately)

### Plunger



| Part no.<br>Ø length | For rapid<br>stroke S | Weight<br>~ [lbs.] kg | For<br>clamps |
|----------------------|-----------------------|-----------------------|---------------|
| 12/100               | 100                   | [0.30] 0,135          | FO-120        |
| 12/200               | 200                   | [0.62] 0,280          | FL-120        |
| 12/300               | 300                   | [0.82] 0,370          | G-120         |
| 16/100               | 100                   | [0.88] 0,400          | FO-160        |
| 16/200               | 200                   | [1.10] 0,500          | FL-160        |
| 16/300*              | 300                   | [1.54] 0,700          |               |
| 22/100               | 100                   | [2.20] 1,000          |               |
| 22/200               | 200                   | [2.40] 1,090          | FO-220        |
| 22/300               | 300                   | [3.06] 1,390          |               |

\*400 and 500 mm lengths available upon request.

### Important

The Straight Line clamps are designed only for **axial load**. In case of side load, we recommend an additional radial support of the plunger.

| Mounting type      | Part no.<br>without<br>plunger | Available rapid<br>strokes S (order<br>plunger separately) | A  | A1 | A2 | A3 | A4  | A8  | B  | B1  | B2 | Dh8 | D1          | D2 | D3  | D4 |
|--------------------|--------------------------------|------------------------------------------------------------|----|----|----|----|-----|-----|----|-----|----|-----|-------------|----|-----|----|
| Foot mount         | FO-120                         | 100, 200, 300                                              | -  | 44 | 19 | 12 | 6,3 | 8,5 | 52 | 68  | 40 | 12  | 35          | -  | 6,5 | 20 |
|                    | FO-160                         | 100, 200, 300                                              | 40 | 62 | 11 | 12 | 12  | 10  | 70 | 90  | 52 | 16  | 46          | -  | 9   | 25 |
|                    | FO-220                         | 100, 200, 300                                              | 50 | 75 | 13 | 20 | 15  | 12  | 90 | 115 | 69 | 22  | 60          | -  | 11  | 36 |
| Flange mount       | FL-120                         | 100, 200, 300                                              | -  | 44 | 44 | 12 | 6   | 8,5 | 52 | 68  | -  | 12  | 30f7        | 40 | 6,5 | 20 |
|                    | FL-160                         | 100, 200, 300                                              | -  | 60 | -  | 14 | 14  | 10  | 68 | 73  | -  | 16  | 40f7        | 52 | 9   | 25 |
| Through hole mount | G-120                          | 100, 200, 300                                              | -  | 44 | -  | 12 | 10  | 8.5 | -  | -   | -  | 12  | M30<br>x1,5 | 40 | -   | 20 |

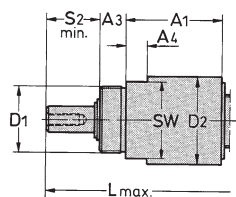
| Mounting type      | Part no.<br>without<br>plunger | D5  | D6 | E  | E1   | H  | L with rapid<br>strokes:<br>~ L |     |     | L1 | R   | S2  | S3  | SW | SW1 | T  | T1 | T3 |
|--------------------|--------------------------------|-----|----|----|------|----|---------------------------------|-----|-----|----|-----|-----|-----|----|-----|----|----|----|
| Foot mount         | FO-120                         | M6  | 30 | 20 | 12,5 | 42 | 100                             | 200 | 300 | 24 | 95  | 2,5 | 2,5 | -  | 11  | 12 | -  | 10 |
|                    | FO-160                         | M8  | 35 | 30 | 14,8 | 58 | 226                             | 326 | 426 | 33 | 130 | 3   | 3   | -  | 13  | 15 | 1  | 14 |
|                    | FO-220                         | M12 | 40 | 35 | 19,5 | 71 | 287                             | 387 | 487 | 35 | 197 | 3   | 3   | -  | 17  | 25 | 1  | 18 |
| Flange mount       | FL-120                         | M6  | 30 | -  | 12,5 | -  | 226                             | 326 | 426 | 24 | 95  | 2,5 | 2,5 | -  | 11  | 12 | -  | 10 |
|                    | FL-160                         | M8  | 35 | 28 | 14,8 | -  | 253                             | 353 | 453 | 33 | 130 | 3   | 3   | -  | 13  | 15 | 1  | 14 |
| Through hole mount | G-120                          | M6  | 30 | -  | 12,5 | -  | 226                             | 326 | 426 | 24 | 95  | 2,5 | 2,5 | 35 | 11  | 12 | -  | 12 |

# FO, FL, G SERIES

## Variable Stroke Straight Line Action Clamps | Technical Information | Dimensions

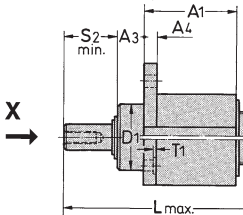
One-hand operation (the plunger and the hand wheel are operated simultaneously)

### Through hole mount

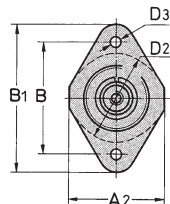


Part no. G-082/40  
G-122/45

### Flange mount

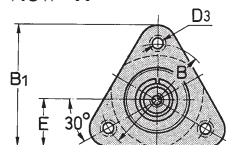


View "X"



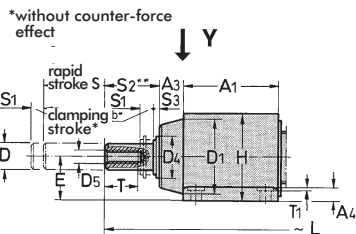
Part no. FL-122/45

View "X"

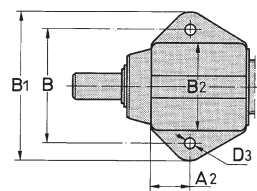


Part no. FL-162/60

### Foot mount

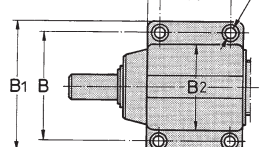


View "Y"

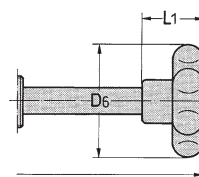


Part no. FO-082/40  
FO-122/45

View "Y"



Part no. FO-162/60



### Important

The Straight Line clamps are designed only for axial load. In case of side load, we recommend an additional radial support of the plunger.

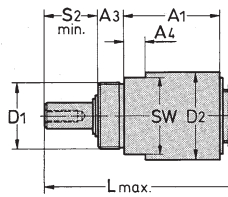
| Mounting type | Part no. with plunger | A  | A1 | A2   | A3 | A4  | A5  | B  | B1 | B2 | Dh8 | D1      | D2 | D3  | D4 |
|---------------|-----------------------|----|----|------|----|-----|-----|----|----|----|-----|---------|----|-----|----|
|               | FO-082-40             | –  | 37 | 15,3 | 10 | 5   | 6   | 44 | 56 | 35 | 8   | 30      | –  | 4,5 | 16 |
|               | FO-122-45             | –  | 44 | 19   | 12 | 6,3 | 8,5 | 52 | 68 | 40 | 12  | 35      | –  | 6,5 | 20 |
|               | FO-162-60             | 40 | 62 | 11   | 12 | 12  | 10  | 70 | 90 | 52 | 16  | 46      | –  | 9   | 25 |
|               | FL-122-45             | –  | 44 | 44   | 12 | 6   | 85  | 52 | 68 | –  | 12  | 30f7    | 40 | 6,5 | 20 |
|               | FL-162-60             | –  | 60 | –    | 14 | 14  | 10  | 68 | 73 | –  | 16  | 40f7    | 52 | 9   | 25 |
|               | G-082-40              | –  | 37 | –    | 10 | 8   | 6   | –  | –  | –  | 8   | M24x1,5 | 35 | –   | 16 |
|               | G-122-45              | –  | 44 | –    | 12 | 10  | 8,5 | –  | –  | –  | 12  | M30x1,5 | 40 | –   | 20 |

| Mounting type | Part no. with plunger | D5 | D6 | E  | E1   | H  | L   | L1 | S2 | S3  | SW | SW1 | T  | T1 | T3 |
|---------------|-----------------------|----|----|----|------|----|-----|----|----|-----|----|-----|----|----|----|
|               | FO-082-40             | M5 | 40 | 18 | 9,2  | 36 | 128 | 26 | 9  | 2,5 | –  | 8   | 8  | –  | 8  |
|               | FO-122-45             | M6 | 75 | 20 | 12,5 | 42 | 153 | 27 | 15 | 2,5 | –  | 11  | 12 | –  | 10 |
|               | FO-162-60             | M8 | 75 | 30 | 14,8 | 58 | 196 | 35 | 18 | 3   | –  | 13  | 15 | 1  | 14 |
|               | FL-122-45             | M6 | 52 | –  | 12,5 | –  | 153 | 27 | 15 | 2,5 | –  | 11  | 12 | –  | 10 |
|               | FL-162-60             | M8 | 75 | 28 | 14,8 | –  | 196 | 35 | 18 | 3   | –  | 13  | 15 | 1  | 14 |
|               | G-082-40              | M5 | 40 | –  | 9,2  | –  | 128 | 26 | 9  | 2,5 | 30 | 8   | 12 | –  | 8  |
|               | G-122-45              | M6 | 52 | –  | 12,5 | –  | 153 | 27 | 15 | 2,5 | 35 | 11  | 12 | –  | 10 |



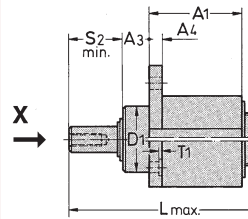
One-hand operation (the plunger and the hand lever are operated simultaneously)

### Through hole mount

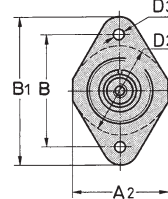


Part no. G-121/45

### Flange mount

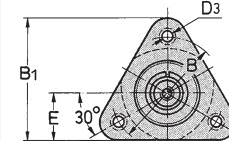


#### View "X"



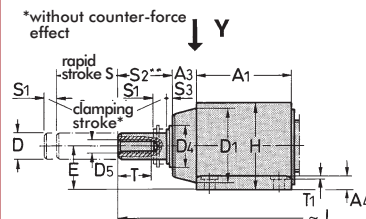
Part no. FL-121/45

#### View "X"

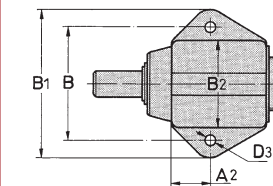


Part no. FL-161/60

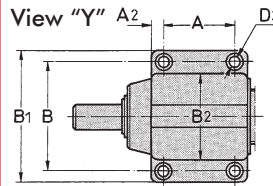
### Foot mount



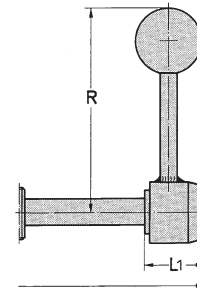
#### View "Y"



Part no. FO-121/45



Part no. FO-161/60  
FO-221/80



### Important

The Straight Line clamps are designed only for axial load. In case of side load, we recommend an additional radial support of the plunger.

| Mounting type      | Part no. with plunger | A  | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | A <sub>4</sub> | A <sub>5</sub> | B  | B <sub>1</sub> | B <sub>2</sub> | D <sub>h8</sub> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> |
|--------------------|-----------------------|----|----------------|----------------|----------------|----------------|----------------|----|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|
| Foot mount         | FO-121-45             | –  | 44             | 19             | 12             | 6,3            | 8,5            | 52 | 68             | 40             | 12              | 35             | –              | 6,5            | 20             |
|                    | FO-161-60             | 40 | 62             | 11             | 12             | 12             | 10             | 70 | 90             | 52             | 16              | 46             | –              | 9              | 25             |
|                    | FO-221-80             | 50 | 75             | 13             | 20             | 15             | 12             | 90 | 115            | 69             | 22              | 60             | –              | 11             | 36             |
| Flange mount       | FL-121-45             | –  | 44             | 44             | 12             | 6              | 8,5            | 52 | 68             | –              | 12              | 30f7           | 40             | 6,5            | 20             |
|                    | FL-161-60             | –  | 60             | –              | 14             | 14             | 10             | 68 | 73             | –              | 16              | 40f7           | 52             | 9              | 25             |
| Through hole mount | G-121-45              | –  | 44             | –              | 12             | 10             | 8,5            | –  | –              | –              | 12              | M30x1,5        | 40             | –              | 20             |

| Mounting type      | Part no. with plunger | D <sub>5</sub> | E  | E <sub>1</sub> | H  | L   | L <sub>1</sub> | R   | S <sub>2</sub> | S <sub>3</sub> | SW | SW <sub>1</sub> | T  | T <sub>1</sub> | T <sub>3</sub> |
|--------------------|-----------------------|----------------|----|----------------|----|-----|----------------|-----|----------------|----------------|----|-----------------|----|----------------|----------------|
| Foot mount         | FO-121-45             | M6             | 20 | 12,5           | 42 | 153 | 27             | 95  | 15             | 2,5            | –  | 11              | 12 | –              | 10             |
|                    | FO-161-60             | M8             | 30 | 14,8           | 58 | 196 | 35             | 130 | 18             | 3              | –  | 13              | 15 | 1              | 14             |
|                    | FO-221-80             | M12            | 35 | 19,5           | 71 | 245 | 40             | 197 | 20             | 3              | –  | 17              | 25 | 1              | 18             |
| Flange mount       | FL-121-45             | M6             | –  | 12,5           | –  | 153 | 27             | 95  | 15             | 2,5            | –  | 11              | 12 | –              | 10             |
|                    | FL-161-60             | M8             | 28 | 14,8           | –  | 196 | 35             | 130 | 18             | 3              | –  | 13              | 15 | 1              | 14             |
| Through hole mount | G-121-45              | M6             | –  | 12,5           | –  | 153 | 27             | 95  | 15             | 2,5            | 35 | 11              | 12 | –              | 10             |