Swing Clamps with Overload Protection Device
threaded-body type, single and double acting,
max. operating pressure 500 bar

Application
Hydraulic swing clamps are used for clamping of workpieces when it is essential to keep the clamping area free of straps and clamping components for unrestricted workpiece loading and unloading.

Version
The units are available in three standard sizes, and for each size three versions of standard clamping arms are available (see accessories, page 4). Mounting of these clamping arms at any angle within 360°. All units are equipped with piston rod wipers.

Materials
By nitrating piston and housing, wear is reduced and protection against corrosion increased.

Piston material: High alloy steel
Cylinder body: Free-cutting steel

Important notes
Operating conditions, tolerances and other data see data sheet A 0.100.

It is absolutely necessary to follow the instructions for venting of the spring area on data sheet G 0.110.

Swing direction
The units are available with clockwise and counterclockwise swing motion or without swing motion (0°).

Standard swing angles are 45°, 60°, and 90° ±2°.
Special angles on request.
Other variants, as e.g. versions with metallic wiper on request.

0°-Version
Use as pure pull-type cylinder with a piston which is secured against torsion and which allows eccentric load as per clamping force diagram.

Application example

Overload protection devise
An integrated mechanical overload protection device prevents damage to the swing mechanism when striking an object within the 90° rotation, clamping or unclamping alike, or in case of incorrect mounting of the clamping arm.

Option: metallic wiper
In addition to the FKM wiper all double-acting swing clamps can be equipped with a metallic wiper.
Part no.: Add only letter “M” to the part number of the swing clamp without metallic wiper.

Example of ordering:
Swing clamp 1893 101 with metallic wiper: 1893 101M
Dimensions
Technical Data

Oil volume / stroke [cm³] 3.2 10.0 27.7
Oil volume / return stroke [cm³] 8.8 27.7 74.8
Total stroke [mm] 18 22 24
Swing stroke [mm] 7 8 9
Clamping stroke [mm] 11 14 15
Operating pressure to swing min. [bar] 30 30 30
Max. oil flow rate* [cm³/s] 3.2 10.0 27.7
c [mm] 52 64 100
Ø d [mm] 20 32 50
Ø e [mm] 23.5 33.5 55.5
f [mm] 30 40 68
g [mm] M 18x1.5 M 28x1.5 M 45x1.5
h [mm] 112 152 182
Ø i f7 [mm] 42 55 85
Ø k H7 [mm] 42 55 85
l [mm] - - 80
m [mm] 91.1 124.1 142.1 (145-1)
n [mm] 24 29 41
o [mm] 53 66 96
Ø p / deep [mm] - - 8/9
Ø q max. [mm] 5 5 6
r [mm] M 45x1.5 M 60x1.5 M 90x2
s [mm] 41 46.5 64
t [mm] 9 10 12
Ø u [mm] 44 57 87
v [mm] 37 41.5 59
w [mm] 20 24 36
x [mm] 70 99 116
y [mm] 10.5 12.5 20.5
z [mm] 8 10 10
SW [mm] 46 55 95

Part no., single acting
Swing direction cw 1883102 1885102 1887102
Swing direction ccw 1883202 1885202 1887202

Part no., double acting
Swing direction cw 1893101 1895101 1897101
Swing direction ccw 1893201 1895201 1897201

Seal kit for external seals 0131524 0131526 0131528

Other swing angles:
Swing angle Part no.
90° 18XXX0X
60° 18XXX2X
45° 18XXX3X
0° 18XXX14X

◊ (145-1) for clamping arm 0354 004

* See page 3:
Max. oil flow rate

Option metallic wiper
for double-acting swing clamps
Part no.: 189XXXXM

Dimensions
Technical Data

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Swing direction ccw 1883202 1885202 1887202

Part no., double acting
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Swing direction ccw 1893201 1895201 1897201

Seal kit for external seals 0131524 0131526 0131528

Other swing angles:
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45° 18XXX3X
0° 18XXX14X

◊ (145-1) for clamping arm 0354 004

* See page 3:
Max. oil flow rate

Option metallic wiper
for double-acting swing clamps
Part no.: 189XXXXM

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◊ (145-1) for clamping arm 0354 004

* See page 3:
Max. oil flow rate

Option metallic wiper
for double-acting swing clamps
Part no.: 189XXXXM
Effective clamping force $F_{Sp}$ as function of operating pressure $p$

**Technical Data**

### Effective clamping force $F_{Sp}$ as function of operating pressure $p$

#### Size 1
**Single acting (1883 XXX)**
- Max. clamping arm length $e$ [mm]
- Effective clamping force $F_{Sp}$ [kN]

#### Size 2
**Single acting (1885 XXX)**
- Max. clamping arm length $e$ [mm]
- Effective clamping force $F_{Sp}$ [kN]

#### Size 3
**Single acting (1887 XXX)**
- Max. clamping arm length $e$ [mm]
- Effective clamping force $F_{Sp}$ [kN]

**Note:**
The clamping force of single-acting swing clamps is reduced by the opposite-directed spring return force. For this reason the clamping force is slightly lower than that of double-acting swing clamps.

### Important notes

1. **Danger of injury**
   - Hydraulic clamping elements can generate considerable forces.
   - Due to the 90° swing motion, the exact clamping and unclamping position cannot be determined in advance. Considerable injuries can be caused to fingers in the effective area of the clamping arm.
   - Remedy: protection device with electrical locking.

2. **Maximum oil flow rate**
   - In case of the maximum oil flow rate as per chart the shortest possible clamping time is 1 second. If the flow rate of the pump divided by the number of swing clamps is higher than the indicated value in the chart, the flow rate has to be throttled to avoid snipping out of the doubleacting swing clamps.
   - The flow control swivel banjo coupling 9208 129 on page C 2.9501.
   - Use only flow control check valves which allow oil return from the swing clamps without any impediments, as e.g. the flow-control swivel banjo coupling 9208 129 on page C 2.9501.
   - During unclamping the maximum oil flow rate can be 2.8 higher than the indicated value in the chart, because the piston area is correspondingly bigger.

3. **Unimpeded swing motion**
   - The swing motion must not be impeded and the clamping arm may only contact the workpiece after completion of the swing stroke.

4. **Clamping arm assembly**
   - In case of this threaded-body type the clamping arm can only be fixed, after firm screwing of the housing, since the final position cannot be determined in advance.
   - When tightening and untightening the fixing screw, the clamping arm has to be backed up to avoid the introduction of moments to the piston rod.

5. **Adjustment of contact bolt**
   - The contact bolt may only contact the workpiece after completion of the swing stroke.
   - When tightening and untightening the fixing screw, the clamping arm has to be backed up to avoid the introduction of moments to the piston rod.

6. **Special clamping arms**
   - When using special clamping arms with other lengths, the corresponding operating pressures as shown in the clamping force diagram must not be exceeded. If longer clamping arms will be used, not only the operating pressure but also the flow rate have to be reduced.

7. **Venting of spring area**
   - The spring area of single-acting swing clamps has to be vented to avoid problems in functioning. A sintered metal air filter avoids penetration of contaminations. If there is a possibility that cutting lubricants and coolants penetrate through the sintered metal air filter into the cylinder’s interior, a vent hose has to be connected and be placed in a protected position.

8. **Bleeding**
   - Air in the oil prolongs the clamping time considerably and leads to function problems. Therefore bleeding has to be effected during start up. The threaded-body swing clamp has no possibility for bleeding at the element itself. Remedy: plug the oil channels in the fixture body at the end. If required, loosen the plugs carefully and pump at low oil pressure until bubblefree oil comes out. Retighten the plugs.
Accessories

**Double clamping arm assembly, complete, with carrier, max. 500 bar**

Material: GGG-40

**Clamping arm, max. 300 bar**

Material: 42CrMo4

**Clamping arm assembly, complete, max. 200 bar**

Material: 42CrMo4

**Clamping strap assembly, complete, with carrier, max. 500 bar**

Material: GGG-40

**Carrier for special clamping strap**

Material: 42CrMo4

**Double clamping arm assembly, complete, with carrier, max. 500 bar**

Material: GGG-40

**Carrier, complete with threaded bolt and spring clamping elements**

Material: 42CrMo4

**Dimensions for special clamping arms**

<table>
<thead>
<tr>
<th>ø f c</th>
<th>ø h f</th>
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<th>ø d f</th>
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**Swing clamp**

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<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>Weight [kg]</th>
<th>Part no.</th>
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**With thread**

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**Without thread**

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* Stop surface for spring elements