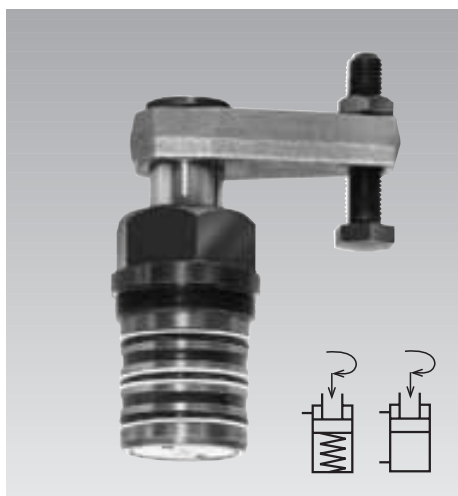




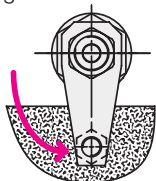
Threaded-Body Swing Clamp

single and double acting with overload protection device
max. operating pressure 500 bar



Application

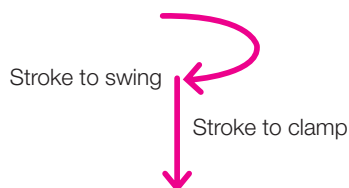
Hydraulic swing clamps are used for clamping of workpieces when it is essential to keep the clamping area free of straps and clamping components for unrestricted workpiece loading and unloading.



Clamping arms and strap type clamps are fastened to the piston rod by means of a taper shank and socket connection.

Function

This hydraulic clamping element is a pull-type cylinder where a part of the total stroke is used to swing the piston.



Overload protection device

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.

VITON® wiper
standard

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.

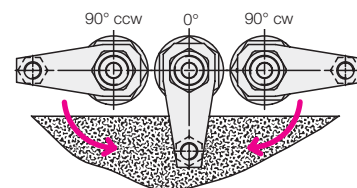
Piston material: High alloy steel
Cylinder body: Free-cutting steel

Important notes

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

Direction of rotation

The units are available with clockwise and counterclockwise rotation or without rotation (0°).



Standard angles of rotation are 45°, 60°, and 90° ± 2°.

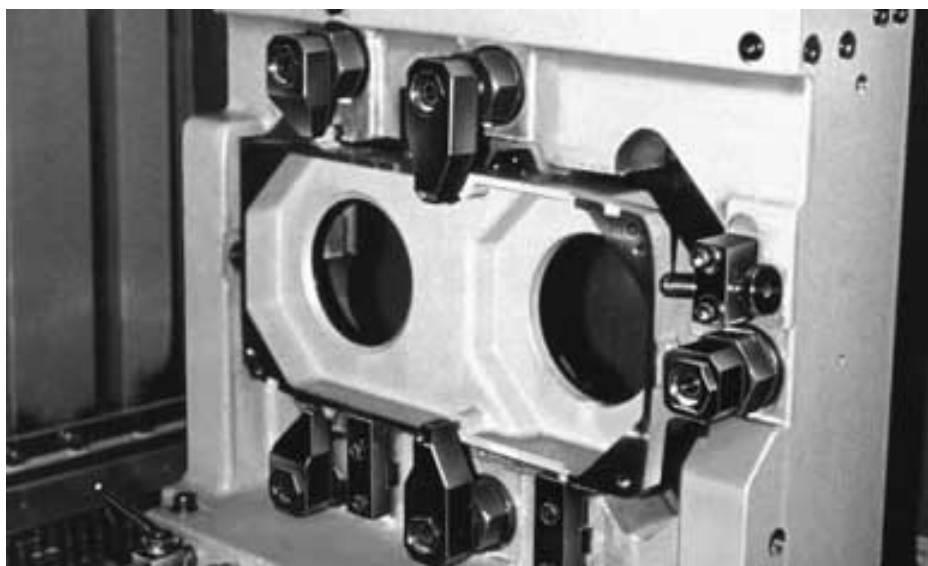
Special angles on request.

Other variants, as e.g. versions with metallic wiper on request.

0°-Version

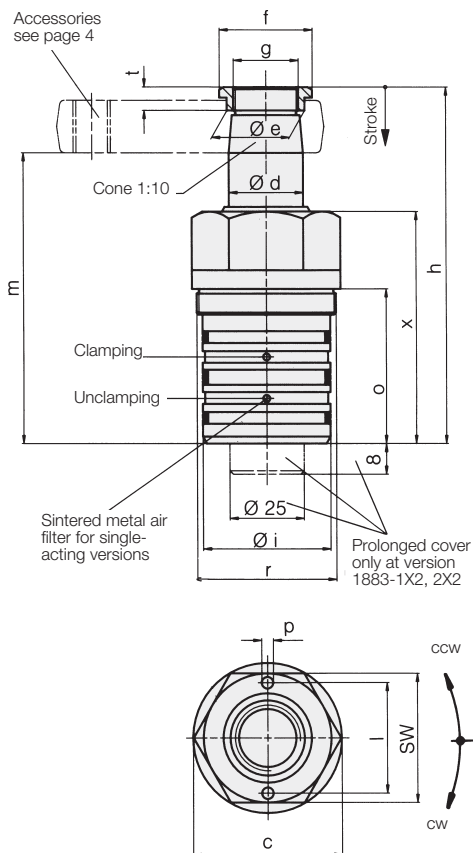
Use as pure pull-type cylinder with a piston which is secured against torsion and which allows eccentric load as per clamping force diagram.

Application example

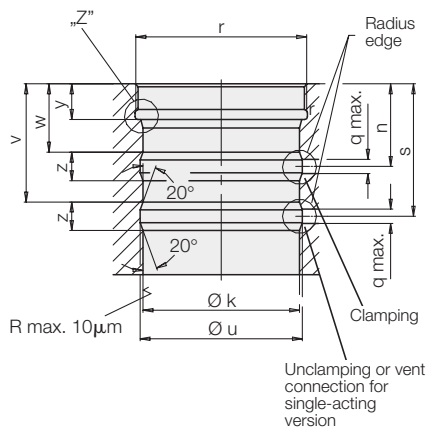




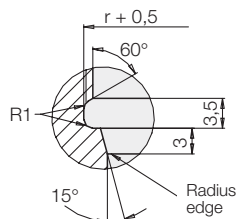
ROEMHELD



Manifold mounting hole



Detail „Z“



Oil to clamp	[cm ³]	3.2	10.0	27.7
Oil to return	[cm ³]	8.8	27.7	74.8
Total stroke	[mm]	18	22	24
Stroke to swing	[mm]	7	8	9
Stroke to clamp	[mm]	11	14	15
Operating pressure to swing min.	[bar]	30	30	30
Max. oil flow rate	[cm ³ /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

Clockwise rotation	1883-102	1885-102	1887-102
Counterclockwise rotation	1883-202	1885-202	1887-202

Part-no., double acting

Clockwise rotation	1893-101	1895-101	1897-101
Counterclockwise rotation	1893-201	1895-201	1897-201

Seal kit for external seals	0131-524	0131-526	0131-528
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Other angles of rotation

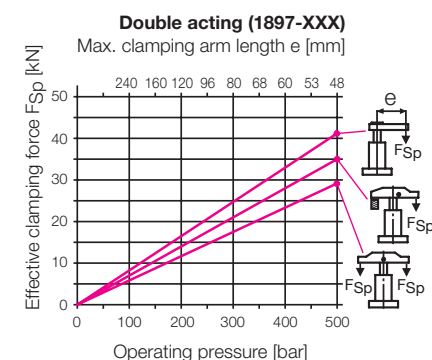
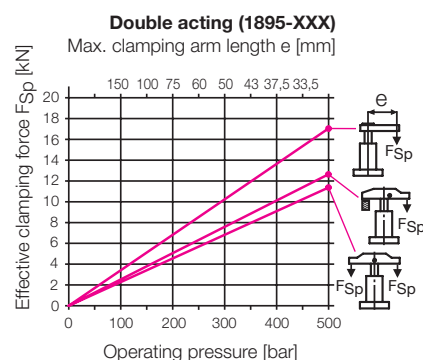
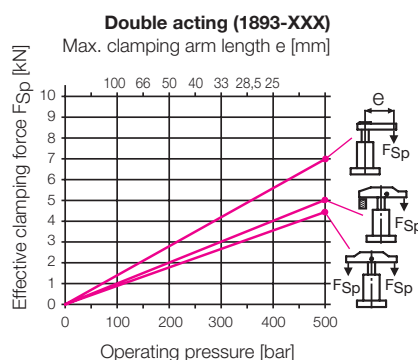
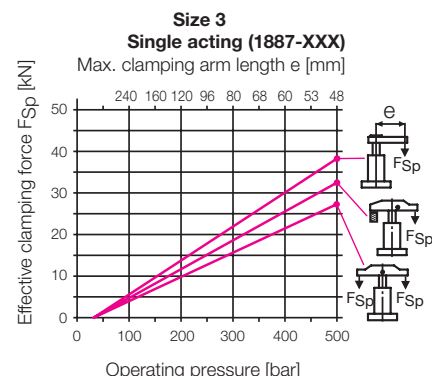
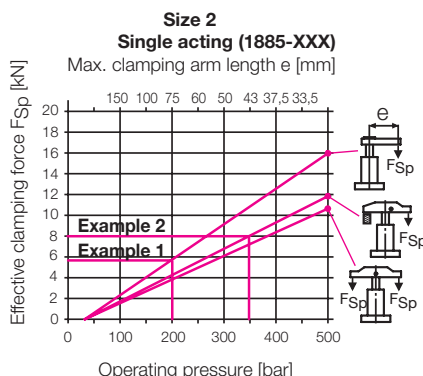
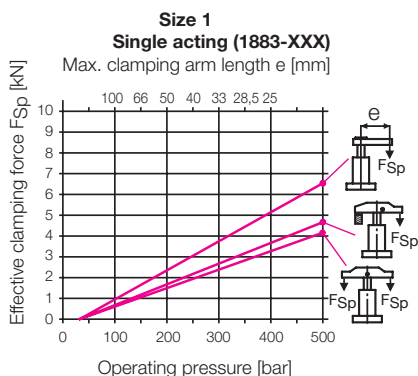
Angle of rotation	Part-no.
90°	18XX-X0X
60°	18XX-X2X
45°	18XX-X3X
0°	18XX-X4X

◇ (145-1) for clamping arm 0354-004

* See page 3:
Max. oil flow rate



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



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.

Example 1: 1885-102 single acting. An operating pressure p of 200 bar in connection with standard clamping arm 0354-003 of max. arm length $L = 75$ mm results in an effective clamping force F_{Sp} of 5.8 kN.

Example 2: 1885-102 single acting. For a desired effective clamping force F_{Sp} of 8 kN and use of a swing clamp 1885-102 with a standard clamping strap 0354-002 an operating pressure p of 345 bar is required.

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 have to be throttled to avoid snapping out of the overload protection device. In the case that the mounting position is not vertical and/or heavy clamping arms are used, the flow rate has to be further reduced, if required. Throttling has to be made in the oil supply line to the swing clamp to rule out a possible pressure intensification. 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 version the clamping arm can only be fixed, after the housing is firmly screwed in, 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 motion. When tightening and untightening the fixing screw, the clamping arm has to be backed up (see 4.).

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

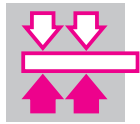
arms will be used, not only the operating pressure but also the flow rate have to be reduced (see 2.).

7. Bleeding of spring area

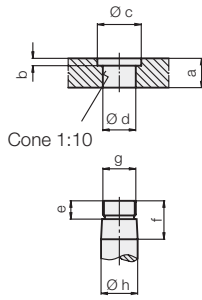
The spring area of single-acting swing clamps has to be bled to avoid problems in functioning. A sintered metal air filter avoids penetration of contaminations. If there is a possibility that cutting lubricants and coolants penetrate through the sintered metal air filter into the cylinder's interior, a vent hose has to be connected and be placed in a protected position (see data sheet A 0.110).

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 venting 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.



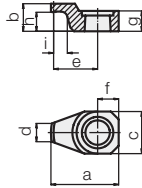
Dimensions for special clamping arms



Swing clamp

	a	b	Øc	Ød ^{+0.10} _{+0.05}	e	f	g	Øh ⁷
18X3-XXX	16	4	24	19.8	10	21	M 18x1.5	20
18X5-XXX	23	5	34	31.8	12	28	M 28x1.5	32
18X7-XXX	34	6	56	49.8	13	40	M 45x1.5	50

Clamping arm, max. 300 bar

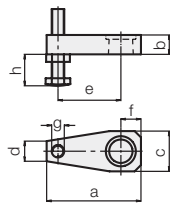


Swing clamp

	a	b	c	d	e	f	g	h	i	Weight [kg]	Part-no.
18X3-XXX	51.5	21	32	14	33.5	16	15.5	14.5	7	0.11	3548-238
18X5-XXX	76	28	46	25	50	23	22.5	19	7	0.30	3548-236
18X7-XXX	123	40	75	39	82.5	37.5	34	27	8	1.30	3548-302

Material: 42CrMo4

Clamping arm assembly, complete, max. 200 bar



with thread
without thread

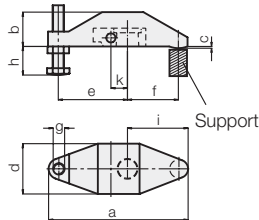
Swing clamp

	a	b	c	d	e	f	g	h max.	h min.	Weight [kg]	Part-no.
18X3-XXX	75	16	32	16	50	16	M10	64	6	0.2	0354-001
18X5-XXX	115	23	48	22	75	25	M16	79	9	0.7	0354-003
18X7-XXX	178	34	78	40	120	40	M20	98	12	2.55	0354-005

	a	b	c	d	f	Weight [kg]	Part-no.
18X3-XXX	75	16	32	16	16	0.18	3921-016
18X5-XXX	115	23	48	22	25	0.65	3921-017
18X7-XXX	178	34	78	40	40	2.3	3921-018

Material: 42CrMo4

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

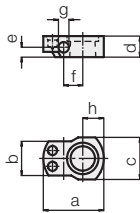


Swing clamp

	a	b	c	d	e	f	g	h max.	h min.	i	k	Weight [kg]	Part-no.
18X3-XXX	122	30	1.5	44	60	45	M10	64	6	53	14.5	0.57	0354-000
18X5-XXX	185	45	2	58.5	83	75	M16	79	9	87	21	1.58	0354-002
18X7-XXX	223	59	2.5	98	100	90	M20	98	12	105	33	4.75	0354-004

Material: GGG-40

Carrier for special clamping strap

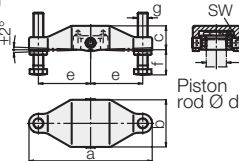


Swing clamp

	a ^{±0,1}	b	c	d	e	f	g ^{H7}	h	Weight [kg]	Part-no.
18X3-XXX	46	26	32	16	7.5	14.5	8	16	0.08	3542-093
18X5-XXX	59	32	40	23	13	21	10	22	0.16	3542-094
18X7-XXX	90	56	68	34	21	33	14	36	0.65	3542-096

Material: C 45

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

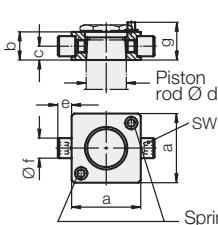


Swing clamp

	a	b	c	Ød	e	f min.	f max.	g	SW	Weight [kg]	Part-no.
18X3-XXX	138	59	28.5	20	60	10	64	M 10	5	0.83	0354-131
18X5-XXX	196	75	38	32	83	15	79	M 16	8	2.11	0354-132
18X7-XXX	236	105	56	50	100	19	98	M 20	8	5.24	0354-134

Material: GGG-40

Carrier, complete with threaded bolt and spring clamping elements



Swing clamp

	a	b	c	Ød	e	Øf ^{g6}	g*	SW	Part-no.
18X3-XXX	43	16	7.5	20	9	10	21.5	5	0354-141
18X5-XXX	55	23	11	32	11	16	29	8	0354-142
18X7-XXX	77	34	17	50	15	20	41	8	0354-144

* Stop surface for spring elements

Material: C 45