ROEMHELD
HILMA ▪ STARK

Issue 4-19 E

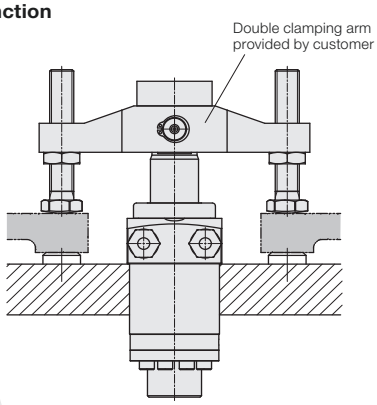
B 1.8802

Swing Clamps with Reinforced Swing Mechanism
top flange, position monitoring optional, double acting, pendulum eye/fork head, max. operating pressure 500/160 bar

Advantages
- Introduction of clamping force without side loads
- Compact design
- Double clamping arm facilitates multiple clamping of similar workpieces
- Pendulum eye for high clamping forces
- Fork head for simple clamping arms
- Alternatively pipe thread or drilled channels
- Reinforced swing mechanism
- FKM wiper standard
- Available with position monitoring

Connecting possibilities
- Pipe thread
- Drilled channels

Function

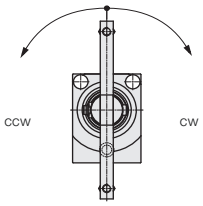


Metallic wiper optional

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.
The version with pendulum eye or fork head allows simultaneous clamping of two workpieces with half clamping force.

Function
The hydraulic swing clamp is a double-acting pull-type cylinder where a part of the total stroke is used to swing the piston.

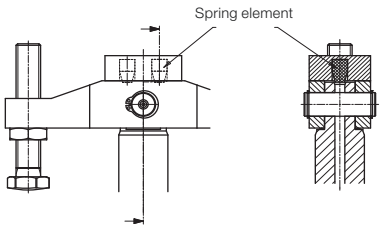
Swing direction
The swing clamps are available with clockwise or counterclockwise swing motion. Off-position is the extended piston position.



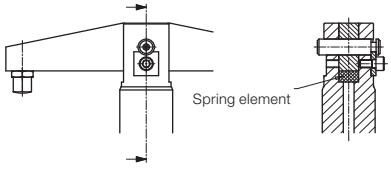
Process safety
To improve the process safety when using heavy double clamping arms the swing mechanism has been reinforced and an overload protection device has not been realised.
During clamping the reinforced swing mechanism endures a collision of the clamping arm with the workpiece up to a pressure of 100 bar.
All versions are also available with a switch rod at the cylinder bottom. The control cams are mounted at this rod to control the clamping and unclamping position with limit switches or pneumatically.
Adaptable position monitorings for inductive or pneumatic control are available as accessory (page 4).

Description
The piston end of this swing clamp is designed as pendulum eye or fork head. By means of a double clamping arm 2 workpieces can be clamped at the same time.
For both versions a springy element is required in order to maintain the double clamping arm in the unclamped position in horizontal position.

Pendulum eye
The sturdy pendulum eye can transmit high clamping forces up to a max. operating pressure of 500 bar. The double clamping arm has to be dimensioned according to the load.

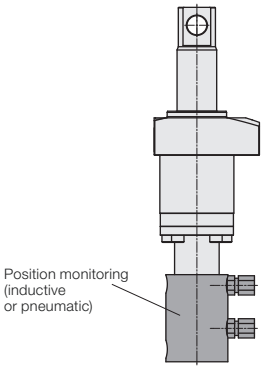


Fork head
The fork head allows a max. operating pressure of 160 bar. Advantageous is the fact that relatively simple clamping arms can be manufactured from flat materials.



Option - metal wiper
The optionally availabe metallic wiper protects the FKM wiper against mechanical damage due to big or hot swarfs.

Swing clamp with optional position monitoring (accessory)

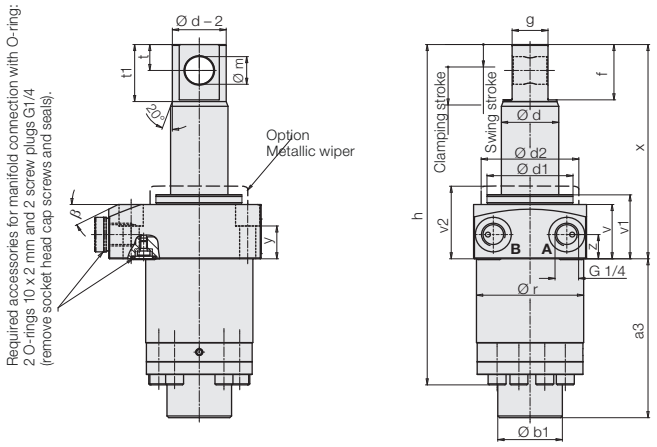


Important notes
Danger of injury
Hydraulic clamping elements generate high clamping forces. Considerable injuries can be caused to fingers in the effective area of the double clamping arm.
Remedy: mount protection devices.
Operating conditions, tolerances and other data see data sheet A 0.100.

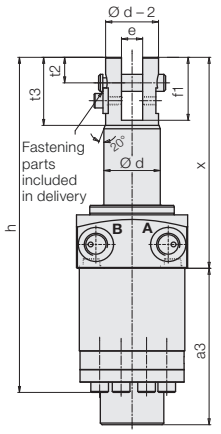
Clamping arm
Due to the missing overload protection device a collision with the clamping arm during loading and unloading of the fixture must be avoided.
Remedy: mount position adaptor.
The double clamping arm in clamping position should preferably be at right angles to the piston axis to avoid overload of the spring element.
Both contact bolts must only contact the workpiece after completion of the swing stroke.
Please consider: For a newly designed double clamping arm, the moment of inertia must be determined to calculate the admissible flow rate using the formula on page 3.

Dimensions
Code for part numbers

Pendulum eye 189X133X (500 bar)
without switch rod

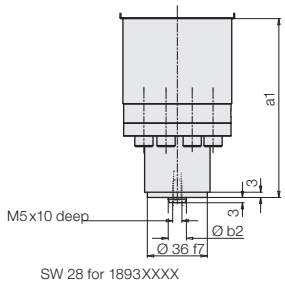


Fork head 189X153X (160 bar)

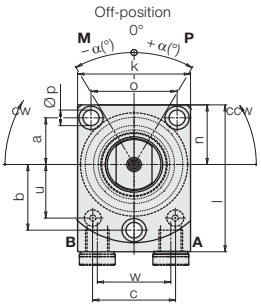


A = Clamping
B = Unclamping

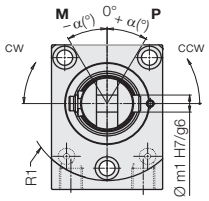
With switch rod 189X1X2X



Off-position

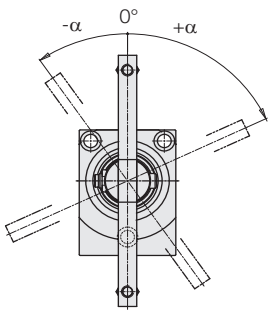


Off-position



Accessory: position monitoring see page 4.

Off-position
(unclamped extended position)
The fixing of the clamping arm with pendulum eye or fork head does not allow an adjustment of the off-position as possible in case of cone fixation. Therefore the desired off-position has to be indicated when placing the order.
The angle α can be selected in steps of 5°.



Code for part numbers

1 8 9 X 1 X X X X X X X

Piston rod Ø d
3 = 20 mm
5 = 32 mm

3 = Pendulum eye
5 = Fork head

2 = with switch rod
3 = without switch rod

0 = 90° clockwise swing motion
1 = 90° counterclockwise swing motion
2 = 75° clockwise swing motion
3 = 75° counterclockwise swing motion
4 = 60° clockwise swing motion
5 = 60° counterclockwise swing motion
6 = 45° clockwise swing motion
7 = 45° counterclockwise swing motion
8 = 30° clockwise swing motion
9 = 30° counterclockwise swing motion
Swing angle ± 1°

P (Plus) = +α
M (Minus) = –α
0 = α = 0°
see dimensional drawing

Angle α for off-position
00 up to 90: 0° up to max. 90° (graduation of 5°)

M = Metalic wiper, mounted

1. Example of ordering
Piston rod diameter = 20 mm,
pendulum eye,
without switch rod,
swing angle 90° clockwise,
off-position 0°,
metallic wiper mounted
Part no. 18931330000M

2. Example of ordering
Piston rod diameter = 32 mm,
fork head,
with switch rod,
swing angle 60° counterclockwise,
off-position –30°,
metallic wiper mounted
Part no. 18951525M30M

Technical data

		1893	1895
Clamping stroke	[mm]	25	22
Swing stroke	[mm]	9	13
Total stroke	[mm]	34	35
Operating pressure, min.	[bar]	30	30
Adm. flow rate	[cm³/s]	8	20
for moment of inertia	[kgm²]	0.00032	0.002295
Effective piston area			
Clamping	[cm²]	1.76	4.52
Unclamping	[cm²]	4.9	12.56
Oil volume/stroke	[cm³]	6	15.8
Oil volume/return stroke	[cm³]	16.7	44
β	[°]	12	27
a	[mm]	20	27
a1	[mm]	94	102
a3	[mm]	84	92
b	[mm]	30	38
Ø b1	[mm]	22	36
Ø b2 f7	[mm]	10	10
c	[mm]	32	46
Ø d	[mm]	20	32
Ø d1	[mm]	38	48
Ø d2	[mm]	42	54.5
e +0.1	[mm]	8	12
f	[mm]	20	32
f1	[mm]	26	37
g f7	[mm]	12	20
h	[mm]	182	197
k	[mm]	50	63
l	[mm]	70	85
Ø m H7	[mm]	10	16
Ø m1 H7	[mm]	6	10
n	[mm]	26.5	34.5
o	[mm]	37	48
Ø p	[mm]	6.6	9
Ø r −0.1	[mm]	44.8	59.8
R1	[mm]	36	45.3
t	[mm]	9	15
t1	[mm]	21	33
t2	[mm]	10	15
t3	[mm]	29	40
u	[mm]	26.5	31
v	[mm]	26.4	31.4
v1	[mm]	31	37
v2	[mm]	36	42
w	[mm]	28	41
x	[mm]	104.5	124
y	[mm]	18	19
z	[mm]	14	14
Accessories			
Metallic wiper, complete (customer assembly)		**0341107**	**0341100**
O-Ring 10 x 2		**3000347**	**3000347**
Screw plug G 1/4		**3610264**	**3610264**

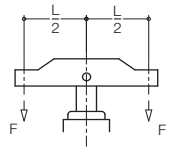
Admissible flow rate

The admissible flow rate indicated in the chart applies to the use of double clamping arms whose moment of inertia does not exceed the chart value.
The clamping time is thus approx. 0.8 seconds and the unclamping time approx. 2 seconds.
For new clamping arms with a different moment of inertia, the admissible flow rate can be calculated using the following formula:

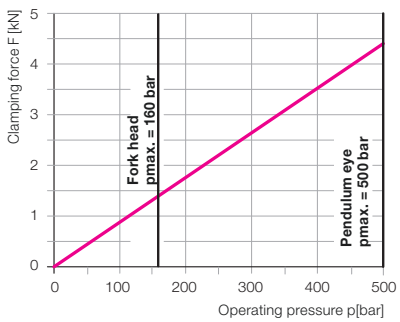
$$Q_2 = Q_1 \times \sqrt{\frac{J_1}{J_2}} \quad [cm^3/s]$$

Q_1 = Adm. flow rate (chart value)
Q_2 = Adm. flow rate with the moment of inertia of the new clamping arm J2
J_1 = Moment of inertia (chart value)
J_2 = Moment of inertia of the new clamping arm

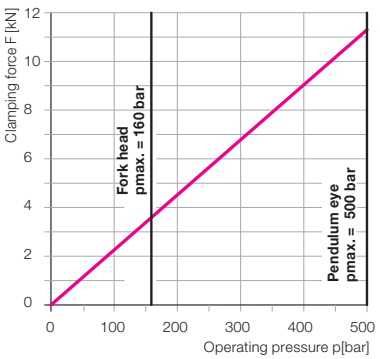
Clamping force F as a function of the operating pressure p



1893 1XXXX



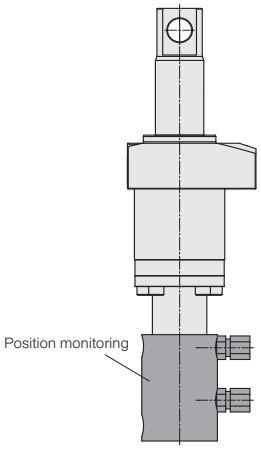
1895 1XXXX



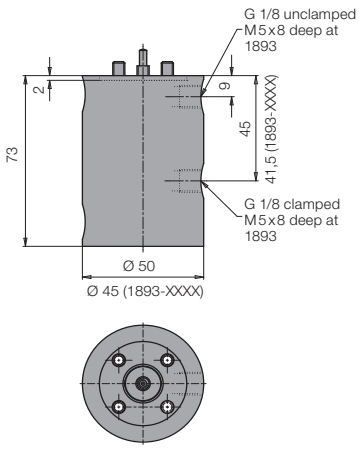
Accessory - Position Monitorings

Delivery

The position monitorings are not delivered mounted at the swing clamp.
Fixing screws and signal sleeve are included in the delivery.
Electrical position monitorings are delivered with 2 inductive proximity switches and 2 right angle plugs.
The housings can be mounted rotated by 2x180° (1893) or 8x45°.

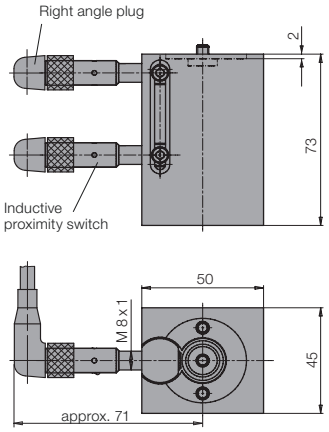


Pneumatic position monitoring



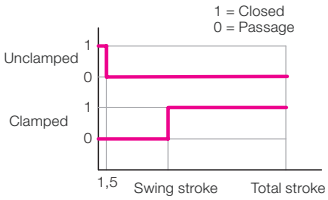
	for 1893	for 1895
Part no.	**0353867**	**0353808**

Electrical position monitoring

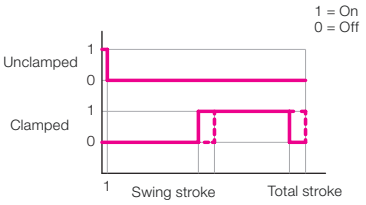


	for 1893	for 1895
Part no.	**0353868**	**0353814**

Function chart



Function chart



Technical data for proximity switches

Voltage	10…30 V DC
Residual ripple max.	15 %
Constant current max.	200 mA
Switching function	interlock
Output	PNP
Body material	stainless steel
Code class	IP 67
Environmental temperature	–25…+70°C
Connection	plug
Length of cable	5 m
LED function display	Yes
Protected against short circuits	Yes