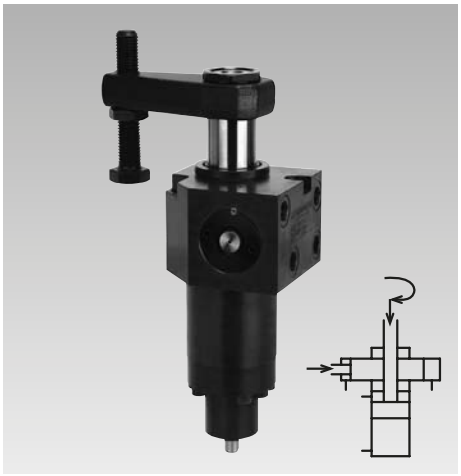
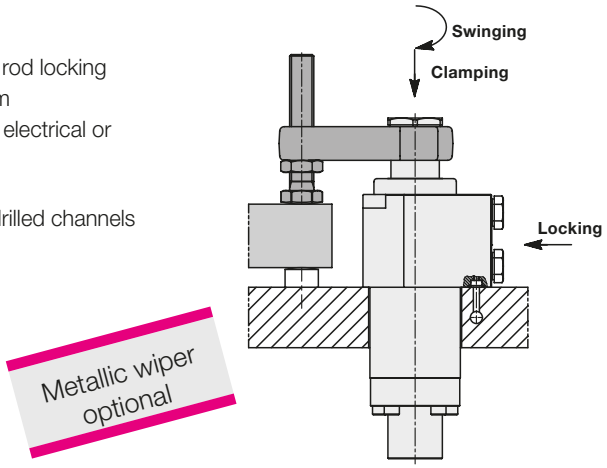
Swing Clamp with Piston Rod Locking

Top flange, reinforced swing mechanism, position monitoring optional, double acting, max. operating pressure 250 bar



Advantages

- High process safety
- Self-locking patented piston rod locking
- Reinforced swing mechanism
- Optional position monitoring electrical or pneumatic
- Compact design
- Alternatively pipe thread or drilled channels
- Standard FKM wiper
- 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 piston rod locking maintains the clamping force also after a pressure drop.

This series is particularly suited for

- Pallet changing systems
- Transfer lines
- Workpiece change with handling systems
- Automatic manufacturing systems
- Assembly lines
- Test systems for motors, gears, axis ...

Function

The hydraulic swing clamp is a pull-type cylinder where a part of the total stroke is used to swing the piston. The piston rod locking is made by a separately-controlled double-acting wedge-shaped piston.

Clamping: 1. Swinging and clamping
2. Locking

Unclamping: 1. Release locking
2. Unclamping and swinging back

Self-locking

The wedge-shaped piston is designed as a self-locking piston so that the swing clamp can be depressurised after clamping. The previously generated clamping force will be maintained.
Conditions: Before depressurising, the locking pressure must be available at least for 3 seconds.

Control and important notes

See page 4.

Special features

Self-locking piston rod locking

The patented piston rod locking is made by friction locking by a separately-controllable double-acting wedge-shaped piston with self-locking. In the case of a pressure drop or complete pressure reduction, the clamping force will be maintained.

Reinforced swing mechanism

The reinforced swing mechanism without overload protection device endures a collision with the workpiece during clamping up to a pressure of 100 bar.

Accessory - Position monitoring

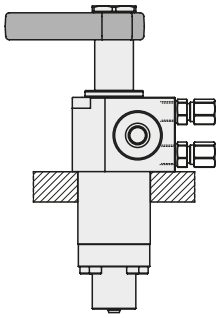
As an option, the swing clamps are available with an extended switch rod at the cylinder bottom. Here a control cam can be fixed to control the clamping and unclamping position. As accessories pneumatic and electrical position monitorings are available.

Option: metallic wiper

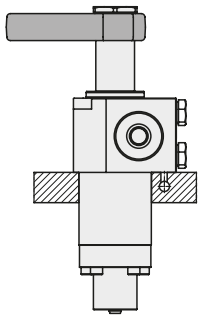
The optionally available metallic wiper protects the FKM wiper against mechanical damage.

Connecting possibilities

Pipe thread

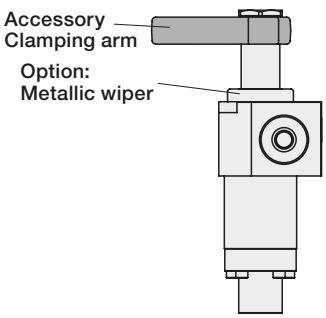


Drilled channels

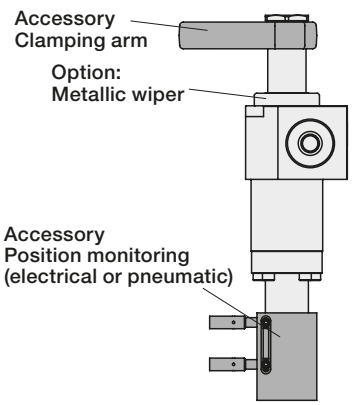


Versions

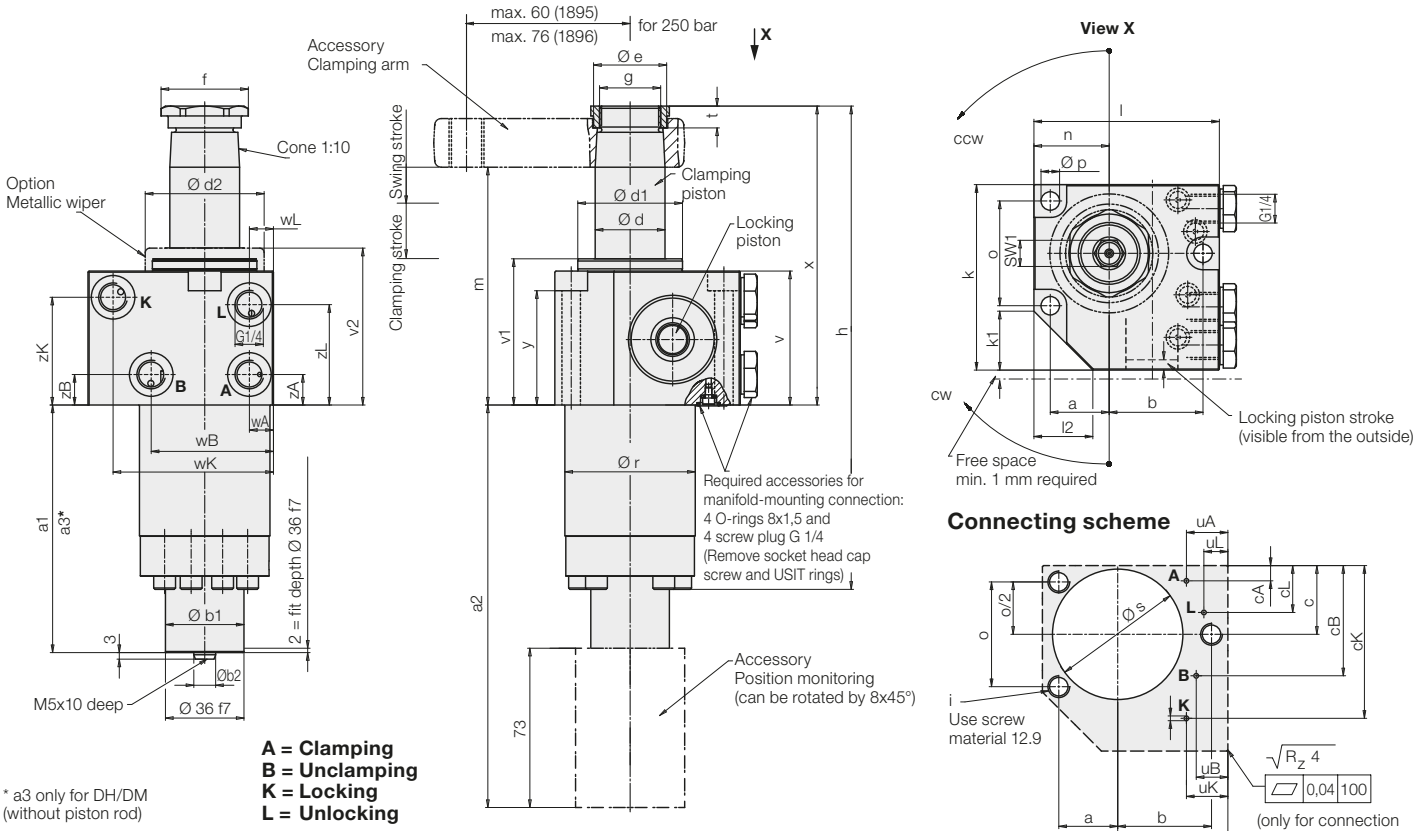
KDH, KDM: without switch rod



KMH, KMM: with switch rod



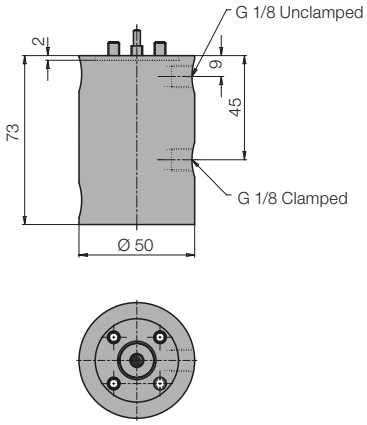
Dimensions
Position monitoring



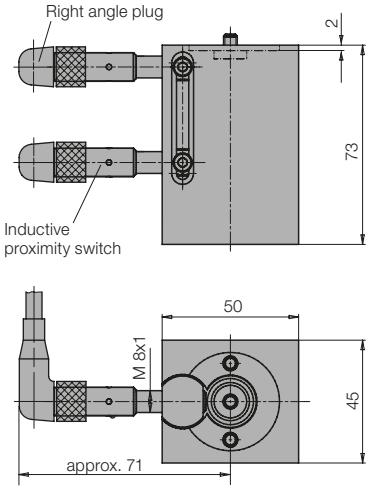
Ports A, B, K, L: max. Ø 6 mm

Accessory - Position monitoring

Pneumatic position monitoring



Electrical position monitoring

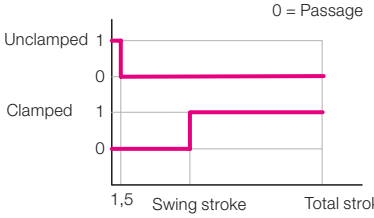


Technical data for proximity switches

Operating 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 type	Plug
Length of cable	5 m
LED Function display	Yes
Protected against short circuits	Yes

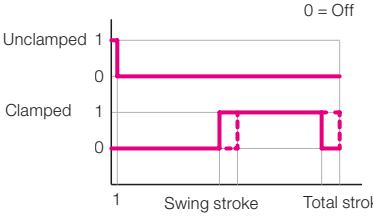
Function chart

1 = Closed
0 = Passage



Function chart

1 = On
0 = Off



Part no.	for 1895-	for 1896-
	0353-808	0353-809

Part no.	for 1895-	for 1896-
without switch	0353-815	0353-813
with standard switches	0353-814	0353-811

For the evaluation of the pneumatic position monitoring we recommend a differential pressure switch, which allows a parallel connection of max. 8 swing clamps.

Delivery

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

Part no. O-ring (spare part)	
Proximity switch	3829-077
Right angle plug	3829-088

Further proximity switches see data sheet B 1.552

Max. force to pull at 250 bar	[kN]	11.3	17.6
Effective clamping force	[kN]	see diagram	
Clamping stroke	[mm]	22	20
Swing stroke	[mm]	13	16
Total stroke	[mm]	35 $^{+0,4}_{-0,3}$	36 $^{+0,3}_{-0,2}$
Min. operating pressure	[bar]	30	30
Max. flow rate	[cm³/s]	20	36
Oil volume/max.stroke	[cm³]	18.4	29.8
Oil volume/max. return stroke	[cm³]	44.4	72.9
a	[mm]	27	37
a1 only MH/MM	[mm]	113.5	129
a2	[mm]	184.5	200
a3* only DH/DM	[mm]	103.5	116
b	[mm]	43	55
Ø b1	[mm]	36	45
Ø b2 f7	[mm]	10	12
c	[mm]	31.5	40.5
cA	[mm]	7	9.5
cB	[mm]	50.5	72
cK	[mm]	70	89.5
cL	[mm]	21.5	25
Ø d	[mm]	32	40
Ø d1	[mm]	48	60
Ø d2	[mm]	54.5	75
Ø e	[mm]	33.5	45
f	[mm]	40	55
g	[mm]	M 28x1.5	M 35x1.5
h	[mm]	221.5	253.8
i	[mm]	M 8	M 10
k	[mm]	85	110
k1	[mm]	27	35
l	[mm]	85	110
l2	[mm]	27	35
m ±1	[mm]	109.4	117.9
n	[mm]	34.5	47
o	[mm]	48	65
Ø p	[mm]	8.5	10.5
Ø r -0.1	[mm]	59.8	79.8
Ø s +1	[mm]	60	80
t	[mm]	10	11
u	[mm]	50.5	63
uA	[mm]	19	23
uB	[mm]	14.5	12.5
uK	[mm]	19	21
uL	[mm]	11	12.5
v	[mm]	61.4	66.4
v1	[mm]	67	72
v2	[mm]	71.9	76.9
wA	[mm]	11	13
wB	[mm]	56	66.5
wK	[mm]	66	89.5
wL	[mm]	11	13
x $^{+0,6}_{-0,5}$	[mm]	137	151
x max.*	[mm]	139	153.6
y	[mm]	52.4	55.4
zA	[mm]	14	12
zB	[mm]	14	55.5
zK	[mm]	50.4	55.5
zL	[mm]	46	41
SW1	[mm]	12	17
		Part no.	**Part no.**
Clockwise rotation 90°		**1895-304-KXX35**	**1896-304-KXX36**
Counterclockwise rotation 90°		**1895-404-KXX35**	**1896-404-KXX36**
0 degree		**1895-444-KXX35**	**1896-444-KXX36**

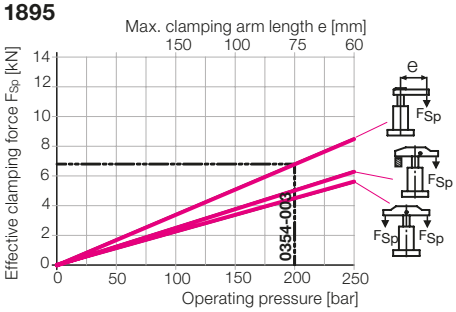
* Upper edge nut

XX: Version **DH/DM = without/with metallic wiper without switch rod**
MH/MM = without/with metallic wiper with switch rod

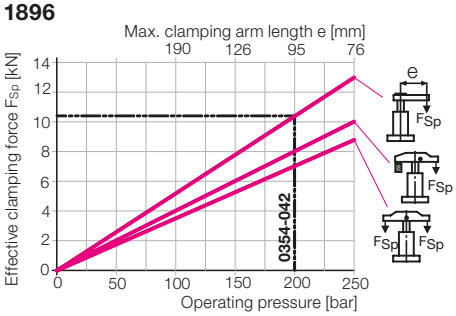
Accessory	**Part no.**	**Part no.**
Metallic wiper, complete (spare part)	**0341-100**	**0341-101**
O-ring 8x1.5	**3000-343**	**3000-343**
Screw plug G 1/4	**3610-006**	**3610-006**
Spare nut / tightening torque	**3527-015**/90 Nm	**3527-048**/160 Nm

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

1895



1896



Important note!

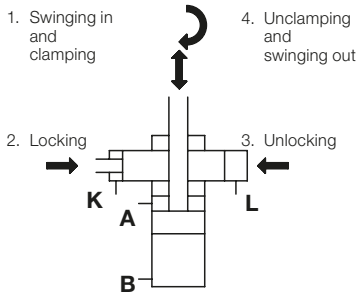
The clamping force diagrams are only valid, if "clamping" and "locking" are are controlled separately (see page 4).

Clamping arms, accessories and special clamping arms see data sheet B 1.881.

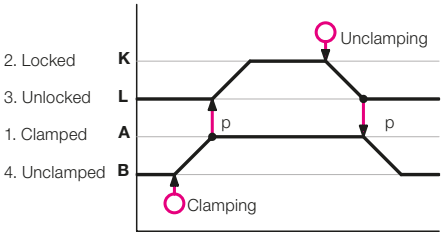
Key for available angles of rotation

Angle of rotation (±1°)	**Part no.**
90°	**189X-X04-KXXXX**
60°	**189X-X24-KXXXX**
45°	**189X-X34-KXXXX**

Function sequence



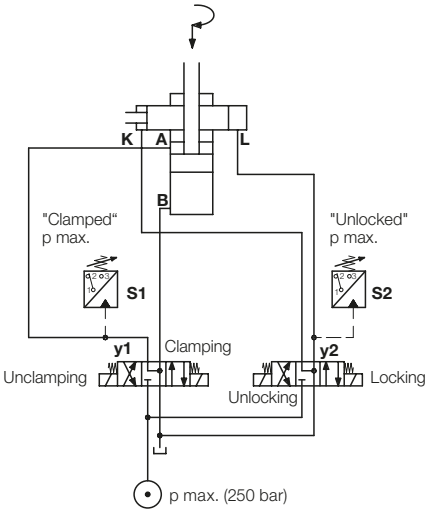
Function chart



Hydraulic control

The control is effected by two separate double-acting switching circuits.

Sequence control by pressure switches



Switching sequence

1. **Starting position**
   y1 and y2 de-energised or
   y1 "Unclamping"; y2 "Unlocking"
2. **Clamping**
   ➔ 1. y1 "Clamping"; y2 de-energised
   ➔ 2. S1 = pmax ➔ y2 "Locking"
3. **Depressurise (as required)**
   Before depressurising, the locking pressure must be available at least for 3 seconds.
   ➔ y1 and y2 de-energised
4. **Unclamping**
   ➔ 1. y2 "Unlocking"
   ➔ 2. S2 = pmax ➔ y1 "Unclamping"

Important notes

Swing clamps must only be used for clamping of workpieces in industrial applications and may only be operated with hydraulic oil. They can generate very high forces. The workpiece, the fixture or the machine must be in the position to compensate these forces.

In the effective area of piston rod and clamping arm there is the danger of crushing.

The manufacturer of the fixture or the machine is obliged to provide effective protection devices.

The swing clamp has no overload protection device. When mounting the clamping arm, the clamping arm or the hexagon socket in the piston have to be backed up for tightening and untightening the fixing nut.

During loading and unloading of the fixture and during clamping a collision with the clamping arm has to be avoided. Remedy: Mount position adaptor.

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