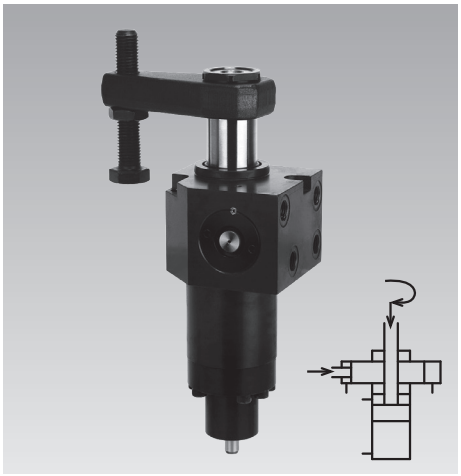
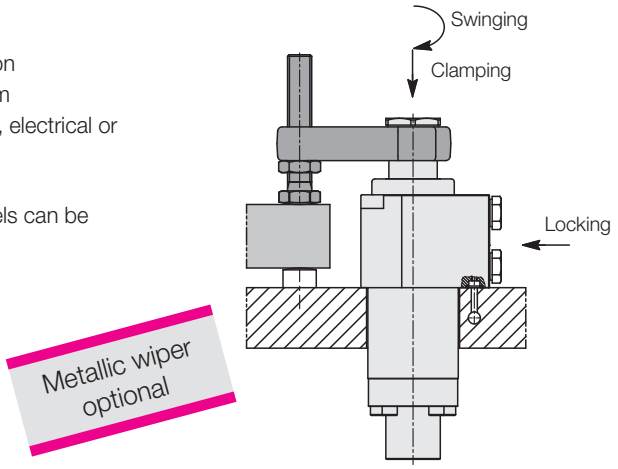
Swing Clamp with Fail-Safe Function

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



Advantages

- High process safety
- Fail-safe with fail-safe function
- Reinforced swing mechanism
- Optional position monitoring, electrical or pneumatic
- Compact design
- Pipe thread or drilled channels can be selected
- Standard FKM wiper
- Metallic wiper optional



Fail-safe function

The full clamping force is maintained both in the event of pressure drop and a complete pressure loss.
This is achieved by fail-safe clamping of the piston rod via a double-acting wedge-shaped piston, which is controlled separately.

Clamping: 1. Swinging and clamping
2. Locking

Unclamping: 1. Release locking
2. Unclamping and retracting

Conditions: Before depressurising, the locking pressure must be available at least for 3 seconds.

Application

Hydraulic swing clamps are used for clamping of workpieces; it is essential to keep the clamping points free from obstructions for unrestricted fixture loading and unloading.
This series is particularly suited for

- Pallet changing systems
- Transfer lines
- Workpiece loading with handling systems
- Automatic manufacturing systems
- Assembly lines
- Test systems for motors, gears, axes, etc.

Information on control and important notes

See page 4

Special features

Reinforced swing mechanism

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

Accessory – position monitoring

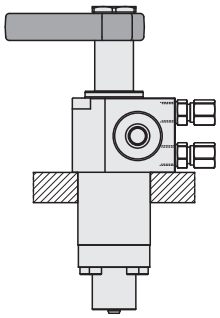
As an option, the swing clamps are available with an extended switch rod at the cylinder bottom. Here a control cam can be fixed to control the clamping and unclamping position. Pneumatic and electrical position monitorings are available as accessories.

Option: metallic wiper

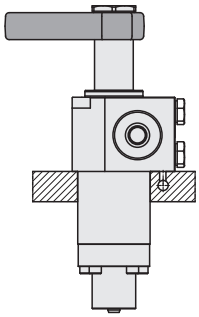
The optionally available metallic wiper protects the FKM wiper against mechanical damage.

Connecting possibilities

Pipe thread

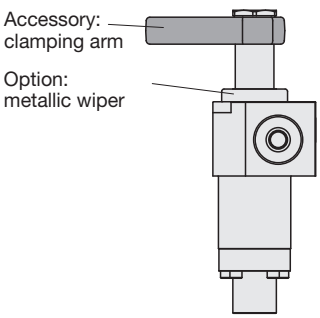


Drilled channels

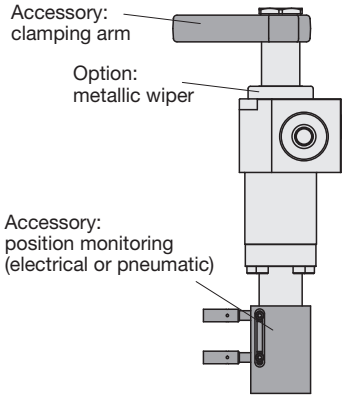


Versions

KDH, KDM: without switch rod

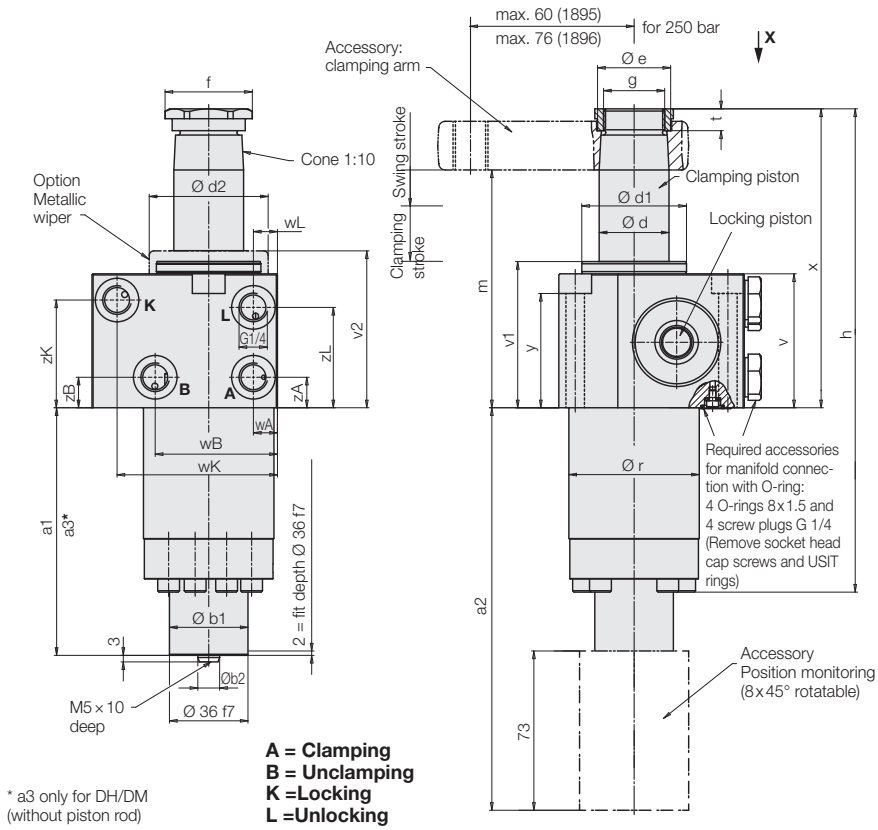


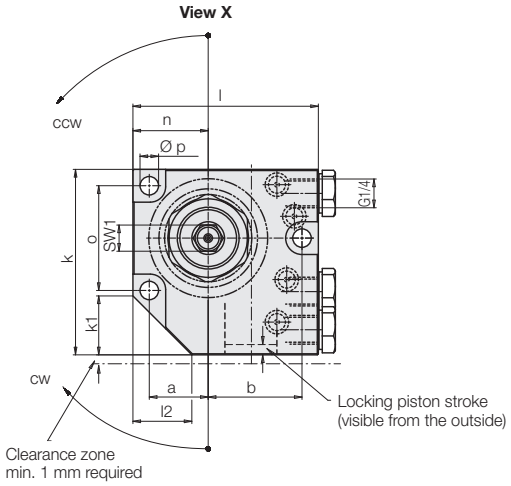
KMH, KMM: with switch rod



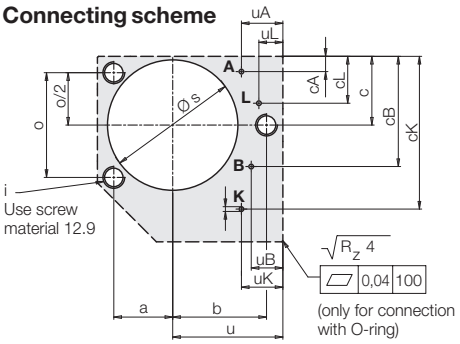
Operating conditions, tolerances and other data, see data sheet A 0.100.

Dimensions
Position Monitoring





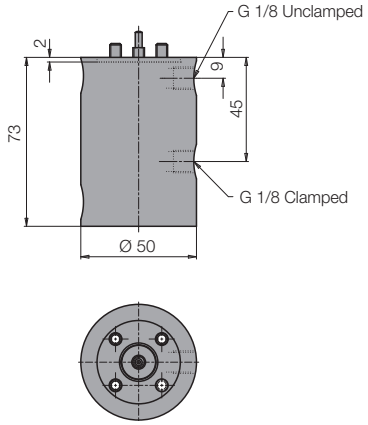
Connecting scheme



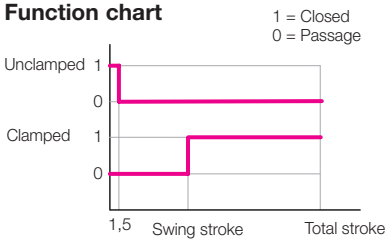
Ports A, B, K, L: max. Ø 6 mm

Accessory – position monitoring

Pneumatic position monitoring



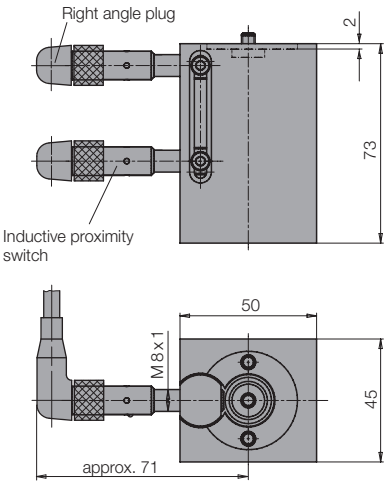
Function chart



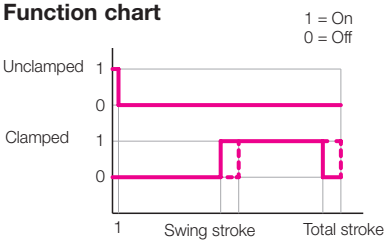
Part no.	for 1895	for 1896
	0353808	0353809

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

Electrical position monitoring



Function chart



Part no.	for 1895	for 1896
without switches	0353815	0353813
with standard switches	0353814	0353811

Technical data for proximity switches

Operating voltage	10 to 30 V DC
Residual ripple max.	15 %
Constant current max.	200 mA
Switching function	interlock
Output	PNP
Housing material	stainless steel
Code class	IP 67
Ambient temperature	–25 to +70 °C
Type of connection	Connector
Length of cable	5 m
LED function display	Yes
Protected against short circuits	Yes

Delivery

The position monitorings are not delivered mounted at the swing clamp.
The housings can be mounted rotated by 8 x 45°. Fixing screws and the 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. (spare part)	
proximity switch	**3829077**
Right angle plug	**3829088**

Further proximity switches, see data sheet B 1.552

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

Max. pull force 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]	M28 × 1.5	M35 × 1.5
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°		**1895304KXX35**	**1896304KXX36**
Counterclockwise rotation 90°		**1895404KXX35**	**1896404KXX36**
0 degrees		**1895444KXX35**	**1896444KXX36**

* Upper edge nut

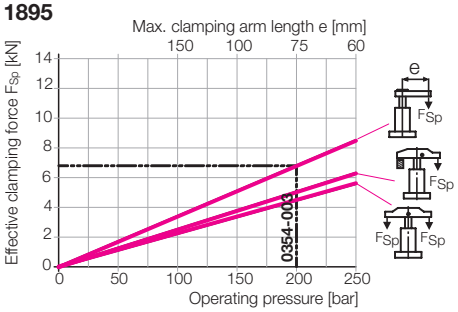
XX: Version **DH/DM = without/with metallic wiper without switch rod**
MH/MM = without/with metallic wiper with switch rod

Accessories	**Part no.**	**Part no.**
Metallic wiper, complete (spare part)	**0341100**	**0341101**
O-ring 8 x 1.5	**3000343**	**3000343**
Screw plug G 1/4	**3300821**	**3300821**
Spare nut / tightening torque	**3527015**/90 Nm	**3527048**/160 Nm

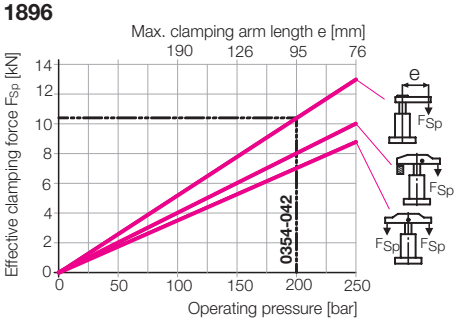
Operating conditions, tolerances and other data, see data sheet A 0.100.

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

1895



1896



Important note

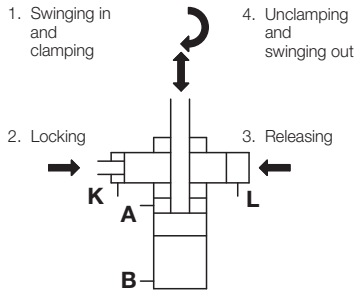
The clamping force diagrams are only valid, if "clamping" and "locking" are controlled separately (see page 4).

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

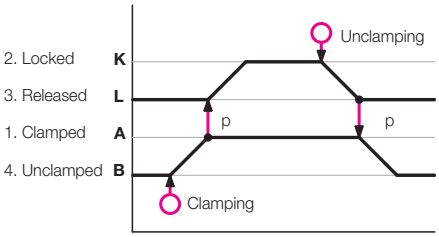
Key for available angles of rotation

Swing angle (±1°)	**Part no.**
90°	**189XX04KXXXX**
60°	**189XX24KXXXX**
45°	**189XX34KXXXX**

Function sequence



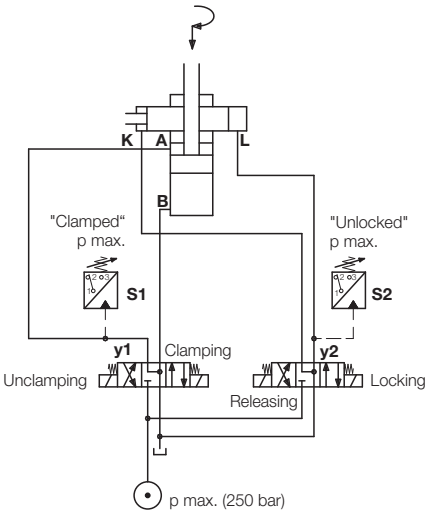
Function chart



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 "Releasing"
2. **Clamping**
   ➔ 1. y1 "Clamping"; y2 de-energised
   ➔ 2. S1 = pmax ➔ y2 "Locking"
3. **Depressurise (as required)**
   The locking pressure must be applied for at least 3 seconds before the pressure is released.
   ➔ y1 and y2 de-energised
4. **Unclamping**
   ➔ 1. y2 "Releasing"
   ➔ 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 absorb 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 loosening 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.