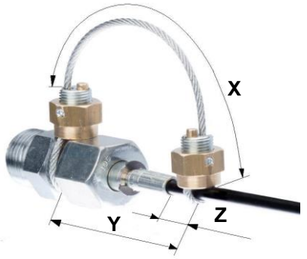
H) Installation/Positioning of the Cablelock AS2 Mini retaining system:
Before starting please read and consider the information on the cover page and in the standard BGI 5100 carefully! Avoid chafing on adjacent components!



Basic formula for the radius of tear-out:
X-Y = min. 15mm, max. 60mm

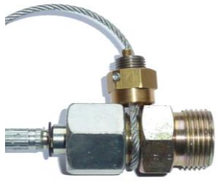
Position of the tensioner lock 'basic-speed':
Z = min. 10mm, max. 40mm

ATTENTION: If the hose is lead in a bend, NEVER install the tensioner locks 'basic' in the outer region of the bending radius!

a) Pre-install both cable slings according to the instructions on the inner side of this operating manual easily movable on the hose and the machine (not applicable for type AS2-L see below).
b) Compare the installation specification according to the formula and figure above (In case that the limits of the specifications given above cannot be kept, contact the manufacturer and consider the customer-specific version with special cable lengths).
c) Attach the Cablelocks on the appropriate fixation points (hose and machine) by tightening the buffer ferrules and secure them with the safety screws against unintended loosening.
The work steps mentioned above have to be performed according to the specifications on the inner side of this operating manual.

<u>Assembly examples (see also instructions above):</u>

Type AS2-M



Attention:
only use the shown fixation options if the tensioner locks are positioned in the inner region of the bending radius. Otherwise turn the tensioner locks around

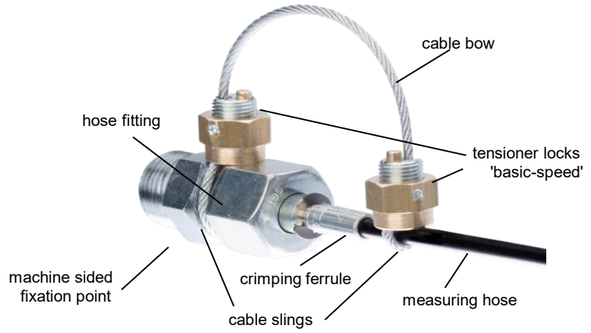
Type AS2-L

Further information on fitting collar assembly can be found at www.cablelock.de - Important information - <u>Fitting collar assembly information sheet</u>. Always ensure a form-locked connection.!

I) Storage/Maintenance/Care/Warranty/Manufacturer/Conformity:
- Cablelock AS retaining system should be stored in a dry and dust free area and they should NOT be dismounted completely* (see page 2).
- Cablelock AS2 protection devices are rust-protected, but NOT suitable for use in moist conditions! More information on this, see: www.cablelock.de - important information - exclusion of liability/corrosion
- Do not replace individual components. In case of damage or a retaining action (=hose tear-out) completely replace Cablelock.
- Before reuse (if there was no tear-out) check whether the retaining system and the cable are in a functional condition.
- Limited warranty in case of vibration load, see also the CE label safety catch information sheet at www.cablelock.de
- Check the retaining system regularly for damage and firm fixation (e.g. during the annual pressure inspection as required in DGUV-113-020). In case of excessive vibrations etc. shorten the checking intervals!
- If there are signs of corrosion or damage precautionary replace the retaining system!
- Manufacturer: Hydraulik Schmitz Siegen GmbH - Seelbacher Weg 17 - 57072 Siegen
- An EC declaration of conformity is available at www.schmitzsiegen.de.

Retaining system for high pressure hoses

Component overview:
(example type AS2-M)



A) Functional description:
The 'AS' retaining system prevents the hydraulic measuring hose from uncontrolled whipping into the surrounding area in case of a tear-out from the crimping ferrule. This is possible as the Cablelock 'basic-speed' tensioner lock is fixed to the hose, the fixation point and the cable (the fixation point consists of the crimping ferrule and the hose fitting).
The length of the cable has to be dimensioned in that way that there is a possibility for the hose to slip out of the crimping ferrule (to ensure a pressure release).

B) Sizes and dimensions of the different types :

for measuring hose *	for hose OD (install)	machine-fixpoint OD (install)**	machine-fixpoint OD (push over)**	length of cable bow measure 'SBL' approx.	Ident. length **	Ident No.	Ident. Letter ***
DN2 to DN4	4,5 to 8,5mm	7,5 to 11,5mm	12,5mm	75mm	190mm	CL-AS-2MA	2MA
DN2 to DN4	4,5 to 8,5mm	11,5 to 15,5mm	16,5mm	80mm	205mm	CL-AS-2MB	2MB
DN2 to DN4	4,5 to 8,5mm	15,5 to 19,5mm	20,5mm	85mm	225mm	CL-AS-2MC	2MC
DN2 to DN4	4,5 to 8,5mm	bracket hole - ID 6,2mm		80mm	180mm	CL-AS-2ML	2ML
max. operating pressure*** valid for all types: DN2 up to 630bar; DN3 up to 500bar; DN4 up to 450bar							
max. operating temperature valid for all types: types AS2-M: -30°C up to +150°C; type AS2-L: -30°C up to +100°C							
minimum bending radius valid for all types: DN2 BR min.20mm; DN3 BR min.35mm; DN4 BR min.40mm							
max. hose weight (measurement hoses): DN2 max. 0,02kg/m; DN3 max. 0,03kg/m; DN4 max. 0,05kg/m							

* Suitable for all common measuring hose assemblies. Please note that there is no standard for measuring hoses and fittings so far. Please contact the manufacturer if the installation length differs (see point F) of this operating manual = Positioning of the retaining system) - special lengths with a modified measure SBL are also available.
The basis are the common fitting lengths - Ready pressed: DN2 approx. L17mm; DN3 approx. L17mm; DN4 approx. L20mm.
** 'Ident. length' = total length of cable including the pressed limiter ferrule (in disassembled status).
*** All pressure specifications refer exclusively to applications using liquid media!

C) Application/Operating conditions/Safety Instructions:
Cablelock retaining systems are supposed to protect against uncontrolled whipping of hydraulic hose assemblies. The information and instructions in this operating manual must be followed carefully. Failure to comply can lead to failure of the retaining system an possibly to further risks due to whipping or flying parts of Cablelock! If the maximum operating pressure is exceeded, Cablelock retaining system does not ensure a sufficient protection. In accordance to the company standards reference retaining systems have been dynamically tested in quasi-static pressure tests with at least 150% of the maximum operating pressure and have been able to stop the end of the hose reliably. Protection by AS is only guaranteed if the minimum bending radius according to the table above is not exceeded. ⚠ Before installing Cablelock AS it has to be checked that the hose and machine can move safely with the protection. It has to be assured that no trapping during movement can occur. Keep away from children! A safety distance must be adhered to regardless of the attached safety catch (see point F)! The suitability in explosive environments or other special environments (Pharma, foods, radiation etc.) should be agreed with the manufacturer in each individual case. The retaining systems neither protect from the leaking fluid in case of the tear-out of the crimping ferrule, nor from any other fitting parts or the crimping ferrule tearing off in addition to the hose. Cablelock AS is designed for 4-5 assemblies/disassemblies; more frequent applications might damage components. It has to be ensured that the selected machine fixpoint contains enough stability. Residual risks may remain regardless of the safety catch; the file “possible residual risks”, which includes important information, is available at www.cablelock.de. Cablelock retaining systems are not suitable for use in moist conditions, see also point I). Cablelock retaining systems are not tested for gaseous media - see information in catalogue. It is also extremely important that the Cablelock locks are always sufficiently secured - see section D). The meanings of the terms used in these operating instructions are to be understood in the context of DIN EN ISO 8330. In the event of the hose being torn off, no part of the safety lock must strike any other components (otherwise the cables may become torn, etc.). Please do not use AS2 Mini if regularly strong movements of the hose can be expected in the area of the tensioner lock.

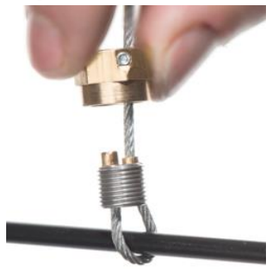
D) Installation tensioner lock 'basic-speed' - overall positioning see backside

PREPARATION:
The retaining systems AS2 Mini are delivered in a pre-assembled state. Please screw the clamping ferrule towards the middle of the retaining system in the beginning of the installation (see picture D1)).

D1) Place

- Push the basic screw towards the end of the cable so that the limiter ferrule fits completely into the blind hole of the basic screw.
- Place the opened preformed cable sling around the fixation point according to the figure on the left.

D2) Pre-installation

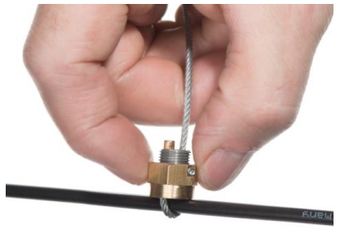


ATTENTION:
- Make sure that the limiter ferrule at the end of the cable always sits deep in the blind hole of the basic screw.
- Fixate the cable in the insert slot of the basic screw and place the second short limiter ferrule in the second blind hole of the basic screw.
- Make sure that the clamping ferrule points towards the basic screw with its chamfered side according to the figure on the left.

D3) Fastening

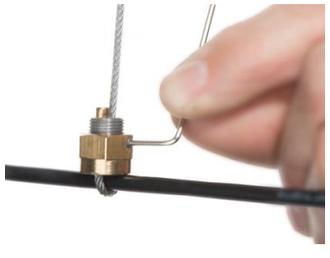
- Move the cable sling to the desired fastening position (please refer to D6) and also observe the back page of these operating instructions!).
- Screw the clamping ferrule onto the pre-mounted basic screw so far, that the sling can still be moved around the fixation point.
- ATTENTION: In case that the tightening of the clamping ferrule is difficult ALWAYS CHECK if the grub screws of the clamping ferrule are unscrewed far enough. Never unscrew them completely*.

D4) Tightening



- In case that the Cablelock tensioner lock is still slightly moveable, check if you chose the right fixation point again (see D6) and H)).
- Afterwards gently tighten the tensioner lock again by tightening the clamping ferrule (see D6) (with approx. 0,2Nm)
- Noises and the production of chips during assembly are harmless.
- The maximum clamping distance (the visible length of the external thread of the basic screw) is 8mm.
- If the desired fixation (see D6) cannot be reached, check again if the right Cablelock type was chosen according to the fixpoint diameter (obviously wrong type used).

D5) Secure



- After reaching the desired fixation (D6) you have to tighten the Cablelock tensioner lock with at least one of the safety screws of the clamping ferrule (M3 slightly, i.e. with maximum 0,05 Nm), so that the Cablelock tensioner lock cannot loosen itself.
- ATTENTION: Don't tighten the safety screws if they are located above the insert slot of the basic screw. In this case either tighten the safety screw on the opposite side or turn the clamping ferrule into another position and then you can tighten the safety screw.
- The installation of the Cablelock tensioner lock 'basic-speed' is finished.

*** Never unscrew the safety screws completely, just loosen them! They are secured against falling out by a notch at the end of the thread and they could drop out very easy.**

D6) Desired fixation during the tightening process

The Cablelock retaining system can achieve an extremely high resistance, which in most cases is not necessary or desirable. An adequate fixation of the hose-sided Cablelock is reached if the cable sling cannot be pushed into the axial direction of the hose by hand with average strength (tighten clamping ferrule with approx. 0,2Nm). It is explicitly pointed out that slight up to significant traces of installation can permanently show up on the outside surface of the hose. In case of excessive tightening or permanent strong hose movements the hose can even be damaged. In those cases of permanent strong hose movements in the area of the tensioner lock Cablelock AS2 Mini should not be used precautionary. **The manufacturer declines all liability for the abovementioned effects!** The machine-sided tensioner lock should build a form-locked connection. After this is ensured, tighten the clamping ferrule so that the cable sling sits tightly on the fixation point (tightening torque approx. 0,3Nm). Further tightening of the tensioner lock should be avoided.

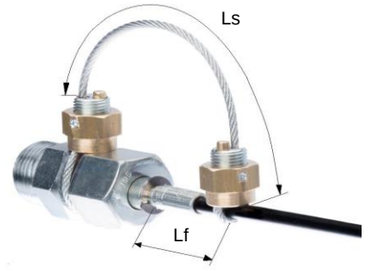
E) Disassembly of Cablelock tensioner lock 'basic'

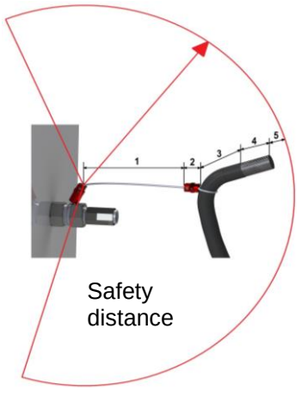
For disassembling the Cablelock tensioner lock please first loosen the safety screws *** and follow the steps in the installation manual from D1) to D4) in REVERSE order.

F) Safety distance

A safety distance must be adhered to regardless of the attached retention system! This safety distance must be determined by each user in accordance with the prevailing conditions in their circumstances, and a simple rule of thumb will be provided below. When additional information is required, please refer to our information sheet “03) Table safety distance” at www.cablelock.de - important information.

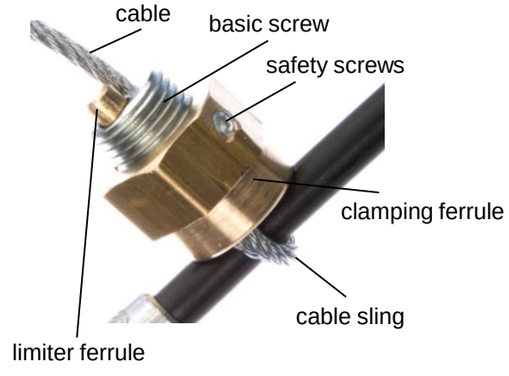
Rule of thumb for the safety distance:
minimum safety distance= (LS+LF)x1,2





"Ls": End of the clamping ferrule to the clamping ferrule installation point!
"Lf": End of the crimping ferrule to the middle of the cable see sketch on the right!

G) Component overview of the tensioner lock 'basic':



MATERIALS:
Clamping ferrules:
bright brass
Basic screw
galvanized steel
Cable:
galvanized steel
Safety screws:
galvanized steel
Limiter ferrules:
bright brass