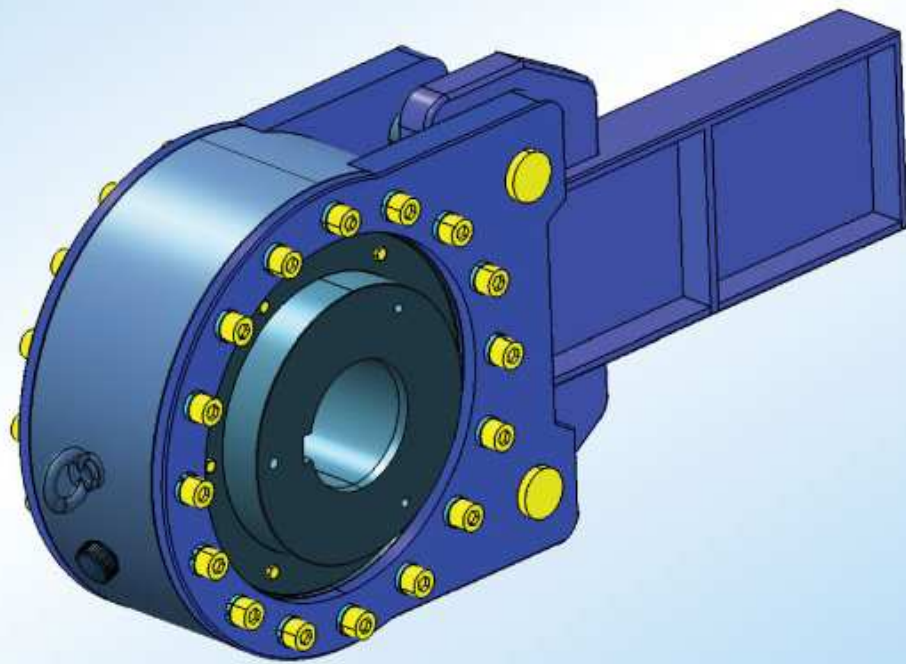


A ROBUST (ART) BACKSTOP SIBRE-SYZK ART BACKSTOP



SIBRE (Shenyang) Coupling and Backstop Co, LTD

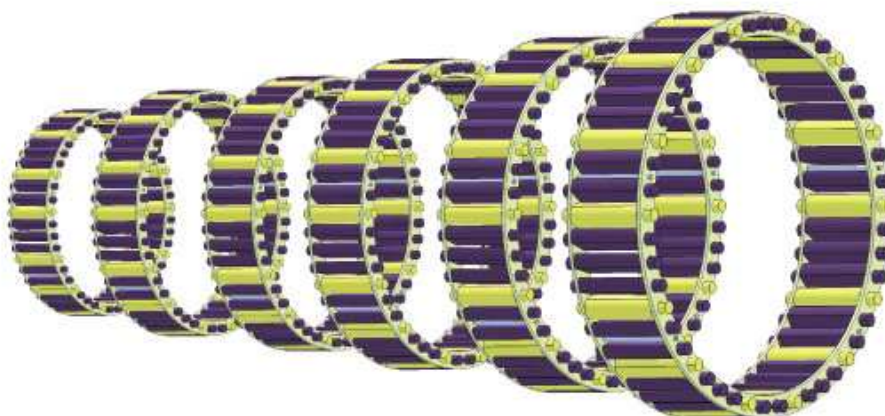


Introduction to SIBRE–SYZK:

SIBRE and SYZK have joined forces to form a new worldwide company.

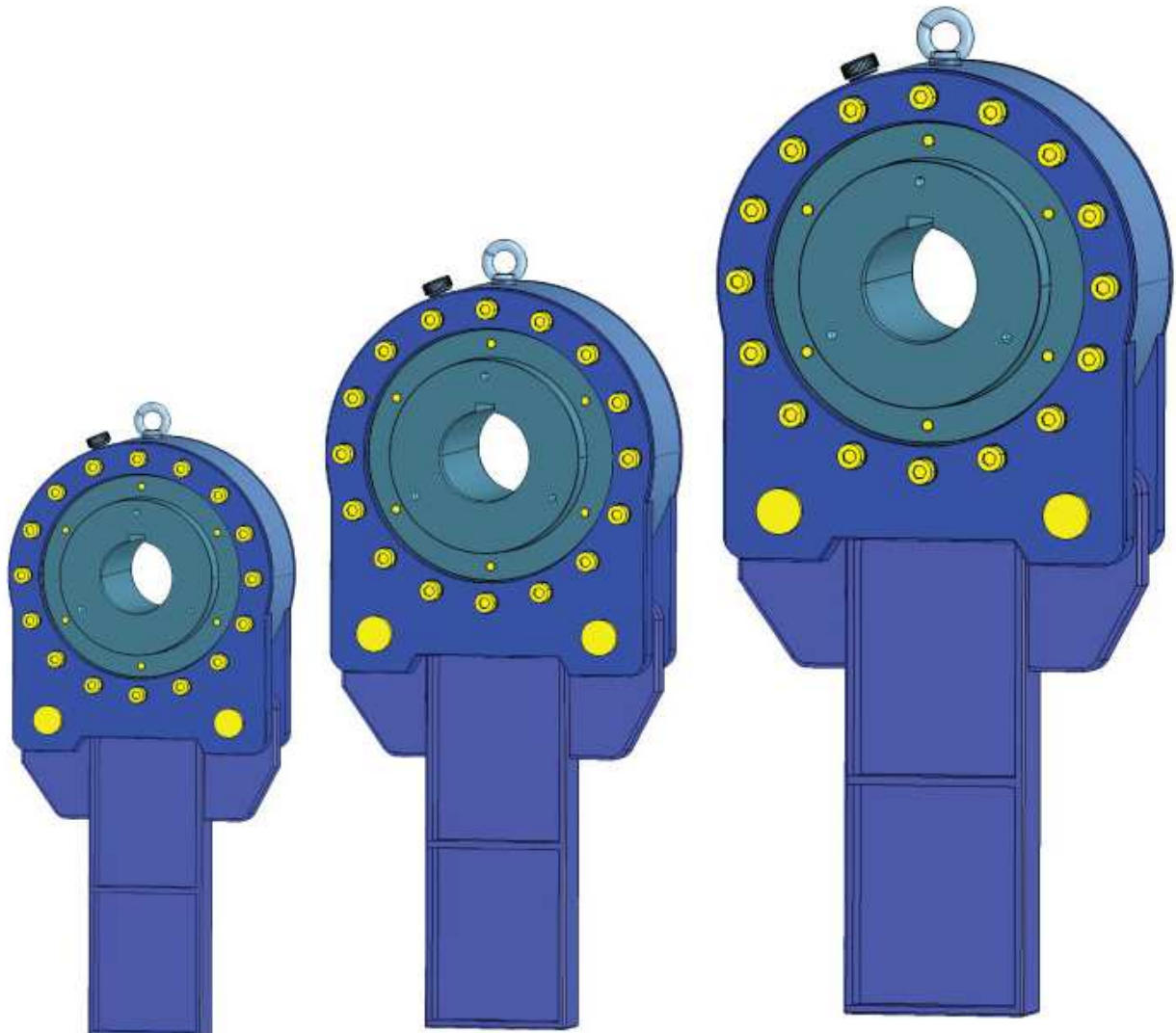
Founded in 1958, SIBRE Germany is a pioneer in the manufacture of industrial brakes. SYZK, established in 1992, is one of the earliest producers of backstops and couplings. Both are recognized leaders in their respective fields.

Together, SIBRE and SYZK combine German craftsmanship and precision with Chinese ingenuity. The global SIBRE–SYZK alliance provides quality products and outstanding service. With SIBRE–SYZK, you are sure to be safe.



Advantages:

1. Over 50 years of German brake expertise combined with almost 20 years of Chinese backstop experience.
2. Robust designs produced from modeling with CATIA (product lifecycle management software) and finite element analysis.
3. Precision testing and machining guarantees quality and consistency.
4. Superior material selection, heat treatment and surface hardening technology ensure resistance to wear and long service life.
5. High quality sealants prevent leakage.
6. Lubricant options provide maintenance flexibility.
7. The patented ARTC backstop with its unique cooling feature is designed to operate in high temperature environments.
8. SIBRE Germany's quality control system used throughout the production process guarantees reliability and an extended lifecycle.
9. SIBRE's global service network combined with a quality product ensures countless years of trouble-free operation.



Applications:

SIBRE–SYZK ART backstops prevent reversal of inclined conveyors and vertical bucket elevators. Backstops are normally installed on low–speed drive shafts to prevent system reversal as a result of gravity.

Backstops are used in:

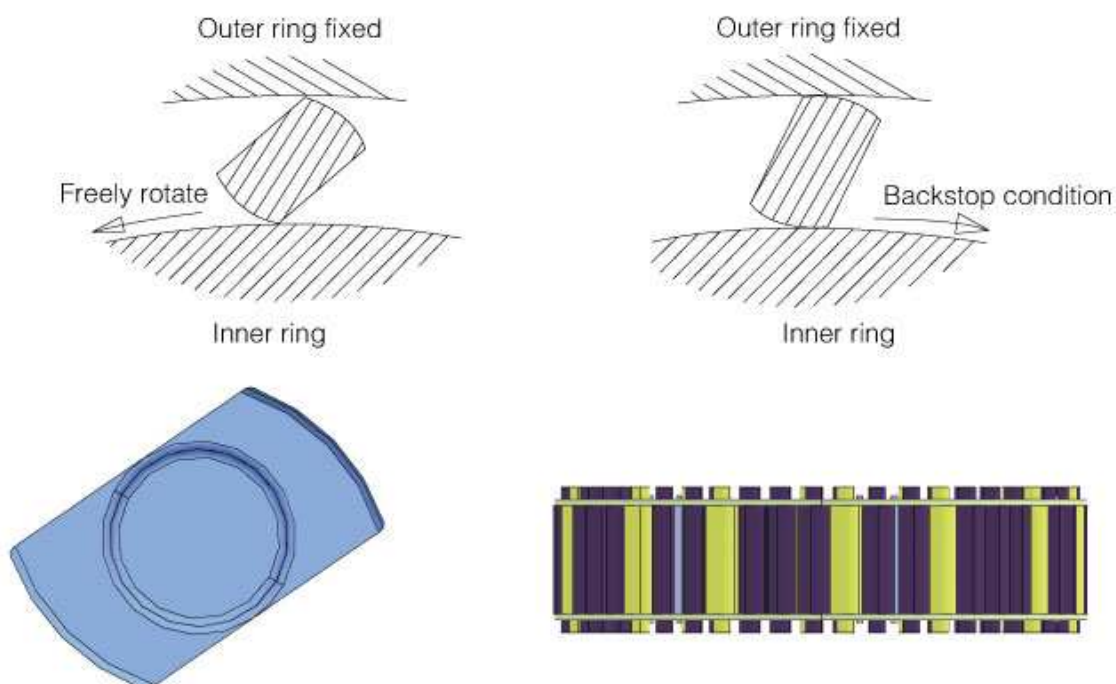
- ⊙ Belt conveyors
- ⊙ Bucket elevators
- ⊙ Scraper conveyors
- ⊙ Wind turbines
- ⊙ Rotary kilns
- ⊙ Other equipment that requires backstop action

Backstops are widely used in belt conveyor systems found in:

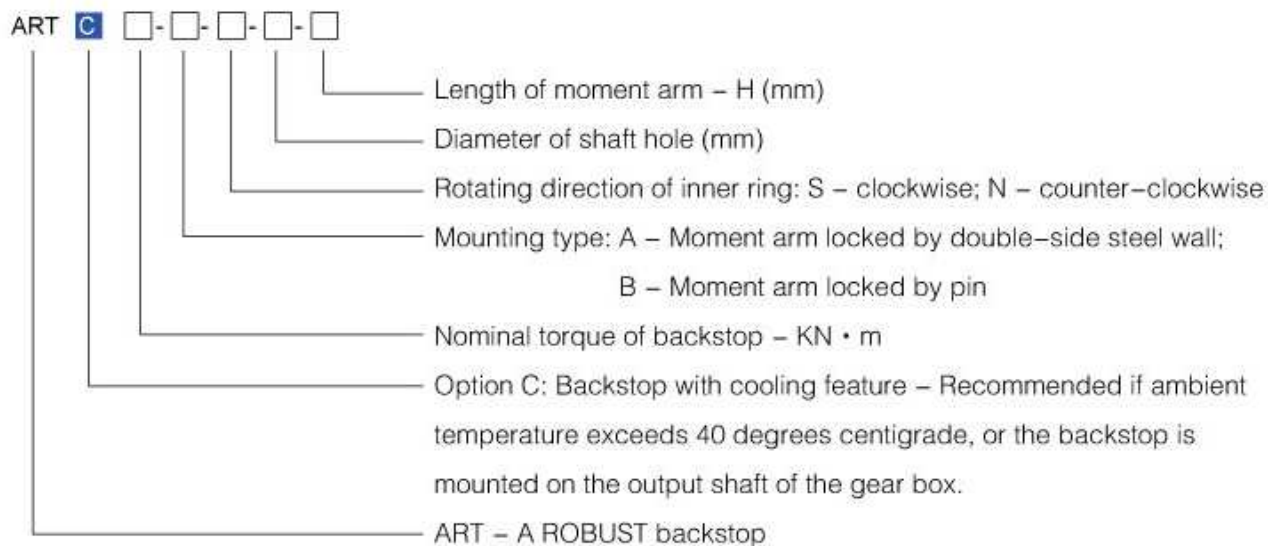
- ⊙ Coal mines
- ⊙ Cement plants
- ⊙ Iron mines
- ⊙ Nonferrous metal mines
- ⊙ Power plants
- ⊙ Petrochemical plants
- ⊙ Grain processing facilities
- ⊙ Building industry

Working Principle:

Cams are arranged between an outer ring and inner ring. When the inner ring rotates in the intended direction, Cams move freely with the outer ring and inner ring. When the inner ring rotates in the opposite direction, Cams driven by spring force, wedge between the outer ring and inner ring to afford backstop torque.



Type Description:



For instance:

ART 1000-A-S-500mm; ARTC 1000-A-S-500mm-2200mm

ARTC – A ROBUST backstop with cooling feature

ART and ARTC Engineering Data:

Backstop size	Rated Torque KN·m	Max RPM r/min	Max Bore d mm	Runing Resistance N·m	Max. Weight Kg
ART11	11	180	110	28	85
ART16	16	130	135	30	90
ART25	25	130	160	30	112
ART38	38	130	200	40	182
ART55	50	105	220	65	360
ART95	95	100	250	90	650
ART130	130	90	260	80	760
ART200	200	90	300	100	1100
ART280	280	90	320	120	1450
ART350	350	80	350	140	1930
ART420	420	80	400	190	2564
ART550	550	80	420	200	2960
ART750	750	80	450	220	3530
ART1000	1000	80	510	250	3900
ART1300	1300	60	540	320	5230
ART1800	1800	50	620	400	7010



ART Backstop Dimensions:

Backstop type	dimensions										
	A	B	C	D	E	F	H	h	L	ARTC	
										Lc	Dc
ART11	-	100	68	270	-	-	650	-	115	165	320
ART16	-	126	74	320	-	-	750	-	135	185	370
ART25	-	140	80	360	-	-	800	-	150	200	410
ART38	-	160	88	430	-	-	850	-	160	210	480
ART55	-	200	102	500	-	-	1000	-	240	290	560
ART95	-	250	120	600	-	-	1200	-	290	340	660
ART130	40	280	120	650	120	60	1100	80	290	340	710
ART200	45	320	130	780	135	60	1300	80	290	340	850
ART280	50	360	140	850	150	70	1500	100	320	380	920
ART350	55	400	140	930	160	70	1600	100	360	420	1000
ART420	55	450	150	990	180	80	1700	120	380	440	1060
ART550	60	450	150	1030	180	80	1800	120	450	510	1100
ART750	70	500	160	1090	210	100	2000	120	480	540	1170
ART1000	80	560	170	1100	230	110	2200	150	550	560	1300
ART1300	80	630	180	1300	230	110	2400	150	500	560	1400
ART1800	90	700	180	1450	250	120	2500	180	650	710	1550

Type Selection:

For example: ART 1000-A-S-500mm-2200mm; ARTC 1000-A-S-500mm-2200mm

(ARTC – ART backstop with cooling feature)

The ARTC backstop has two different dimensions compared to the ART backstop: Lc (maximum width) and Dc (maximum diameter)

Type Selection Guide:

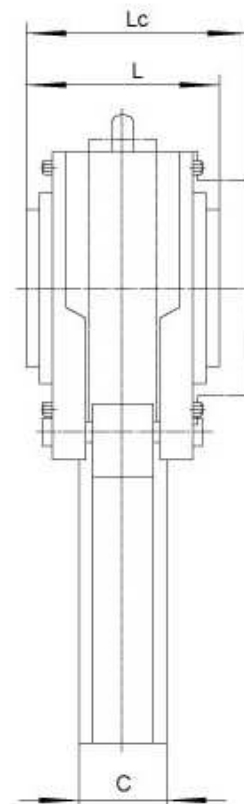
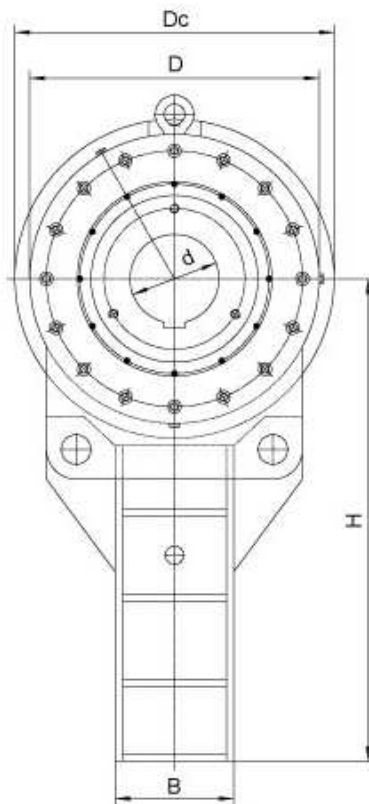
The type of backstop required is determined by nominal torque. Nominal backstop torque should be larger than the total required backstop torque.

Rotating shaft speed should be less than the maximum rotating speed of the inner ring.

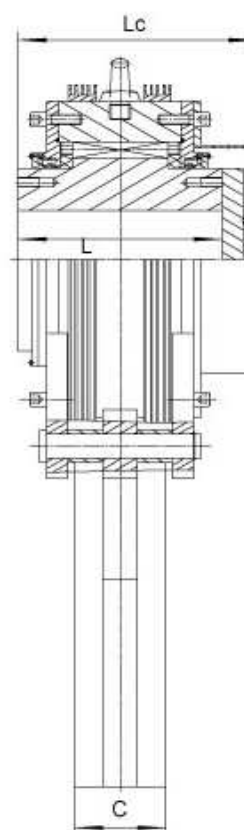
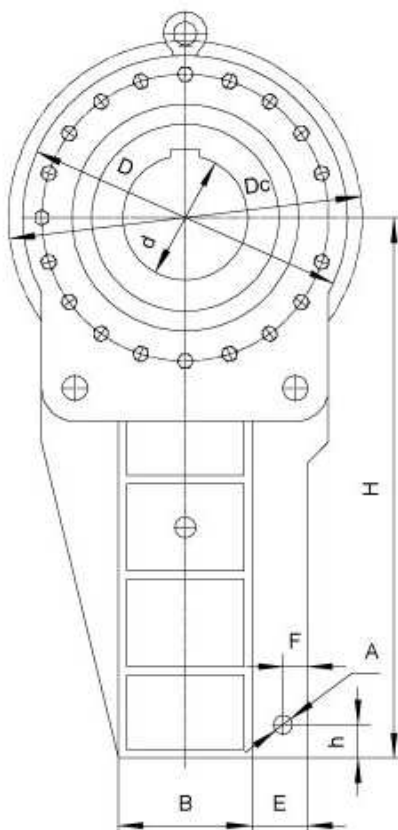
The rotating direction of the inner ring is indicated by S – clockwise; N – counter-clockwise.

There are two types of moment arms: one is locked by a double-side steel wall; the other moment arm is locked by a pin.

Type A: Moment arm locked by double side steel wall



Type B: Moment arm locked by pin



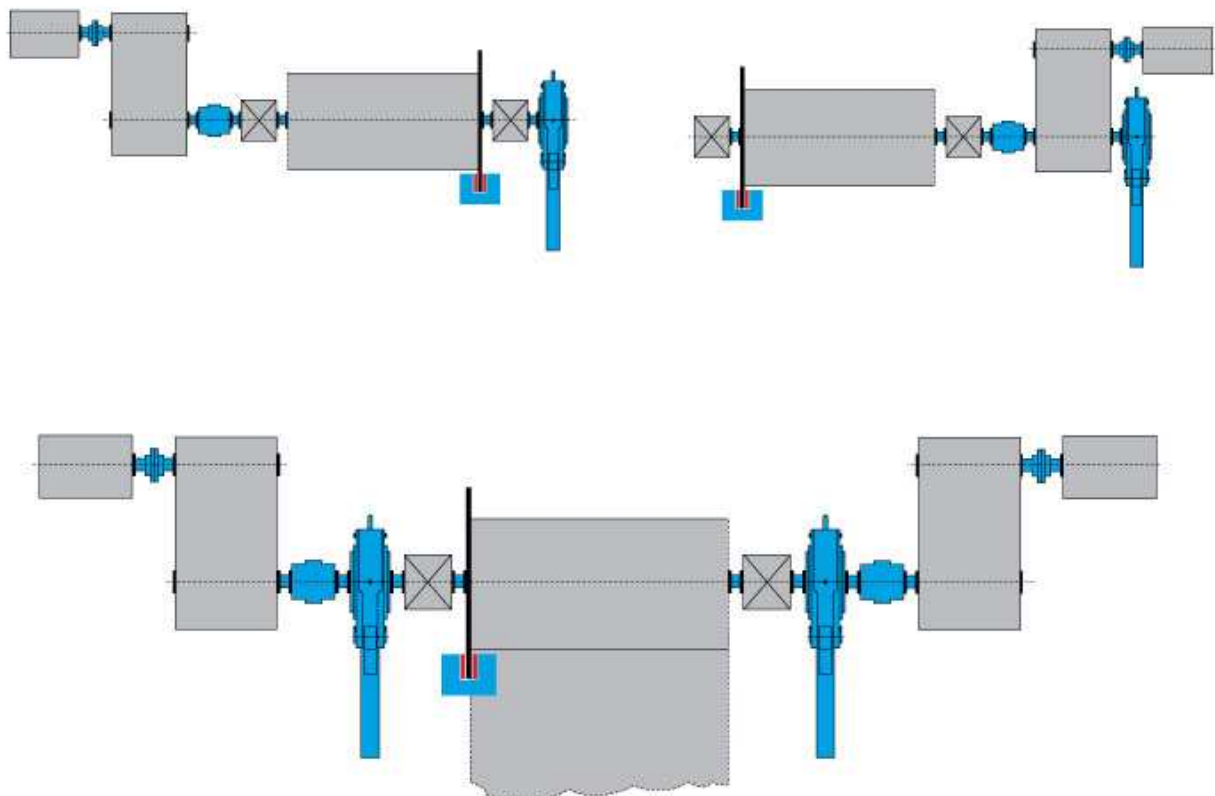
Mounting Position:

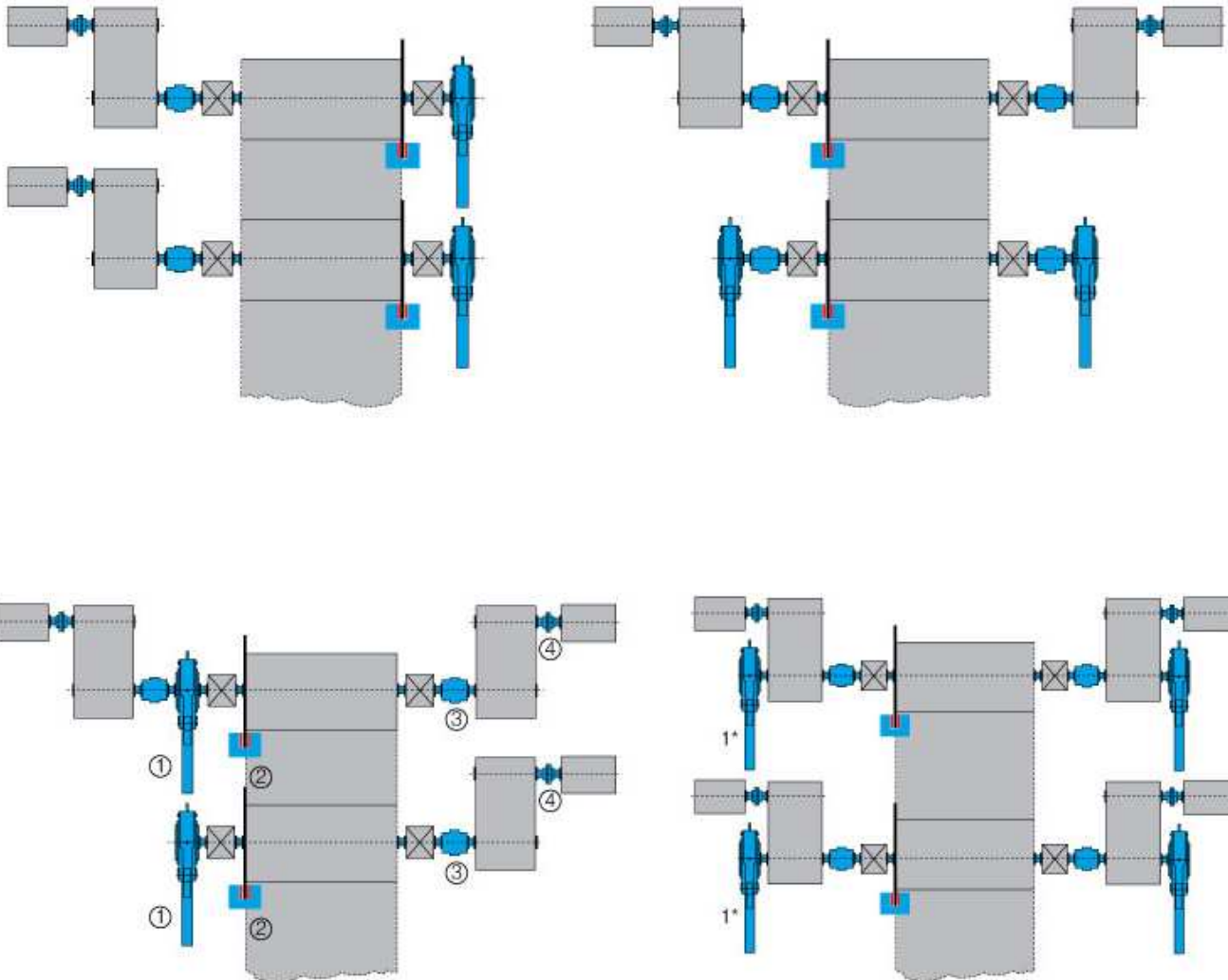
SIBRE recommends the backstop be mounted on the low speed drive shaft. When needed, backstop torque will act on the low speed drive shaft and take effect immediately before system reversal occurs. This will protect the gearbox.

If possible, it is best to mount the backstop between the roller and the gearbox. This way there is no load on the drive system when backstopping occurs. In addition, mounting the backstop on the low speed drive shaft allows easy access to maintain the backstop and change the motor, gearbox and high-speed coupling, when required.

If the backstop is mounted on the double extension shaft, SIBRE recommends using the ARTC backstop with the unique cooling feature due to possible high temperature situations.

Several typical layouts of backstop in the belt conveyor system:





SIBRE products are shown in blue.

Priority:

1. ART backstop, SIBRE recommends using ARTC backstop with the unique cooling feature.
2. SHI emergency brake
3. SIBRE recommends a low speed coupling such as ARC chain coupling, A-FLEX articulating multi-misalignment coupling or AGC crown gear coupling.
4. SIBRE recommends a high speed coupling such as AFC elastic spider coupling, APC elastic pin coupling or AGC crown gear coupling.

SIBRE also offers SHI, USB, TEXU and TE brakes used on the high speed shaft of belt conveyor systems.

Calculation for Type Selection:

1. Selection acc. driving power:

☉ Formula for selection acc. driving power

$$T_N \geq T_C = \frac{P \times 9550 \times f}{r}$$

T_N = Nominal torque of backstop

T_C = Calculating torque (maximum backstop torque produced by backstop)

P = Motor rated power(Kw)

f = Working factor or safety factor > 1.5 – 4

r = Rotating speed of shaft mounted with backstop (r/min)

Working factor or safety factor is determined by maximum stalling torque, angle of slope of the conveyor, quantity of backstops in the system and layout of backstops.

2. Selection acc. carrying capacity of conveyor:

☉ Formula for selection acc. carrying capacity of conveyor

$$T_N \geq T_C = \frac{9.8Q \times L \times D \times K}{3.6 \times V \times 2} \times f$$

T_N = Nominal torque of backstop

T_C = Calculating torque (maximum backstop torque produced by backstop)

Q = Carrying capacity of conveyor (ton/ hr)

L = Slope length (m)

D = Roller diameter (m)

V = Belt speed (m/s)

K = Slope factor

Slope K	5°	8°	10°	12°	14°	16°	18°	20°	25°	30°
Factor	0.0872	0.1392	0.1736	0.2079	0.2419	0.2756	0.309	0.342	0.4226	0.5

f = Working factor or safety factor > 1.5 – 4

Working factor or safety factor is determined by maximum stalling torque, angle of slope of the conveyor, quantity of backstops in the system and layout of the backstops.

3. Additional information:

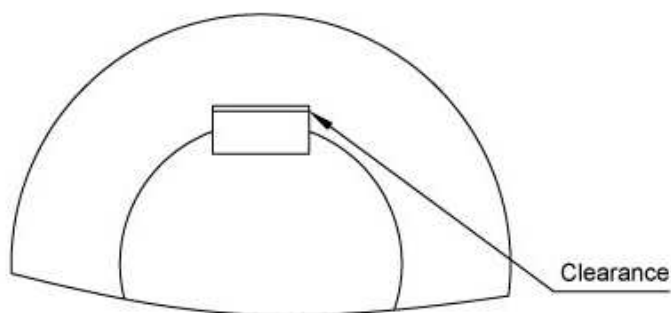
For more detailed calculations and other technical information, please contact SIBRE-SYZK .

Selection of Shaft:

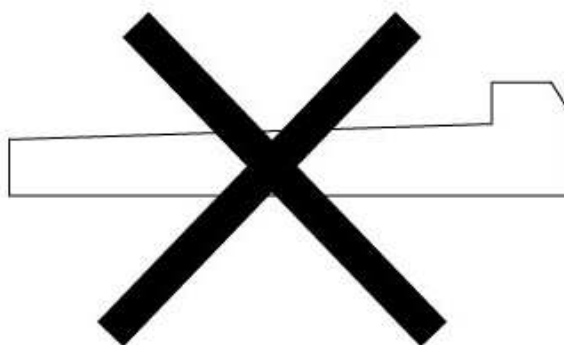
The shaft must be strong enough to withstand maximum backstop load. SIBRE customarily supplies acc. fitting tolerance of shaft hole and shaft to F7/h7 (ISO 286).

Selection of Key and Key Way:

It is important the key properly fits into the key way. There must be clearance between the surface of the key and the inner ring of the backstop. See illustration below.



Attention: A gib headed key cannot be used to connect the shaft and shaft hole. Doing this will deform the backstop inner ring and could cause the backstop to fail.



For detailed calculations, please contact SIBRE-SYZK.

Design of Moment Arm Lock:

The moment arm must be locked. This lock must be strong enough to withstand the shearing moment transmitted by the moment arm of the backstop. The shearing moment will be different depending on the length of the moment arm. The calculation to determine the lock is shown below.

$$F = \frac{1.5 \times T_N}{H1}$$

F= Shearing force on lock – N

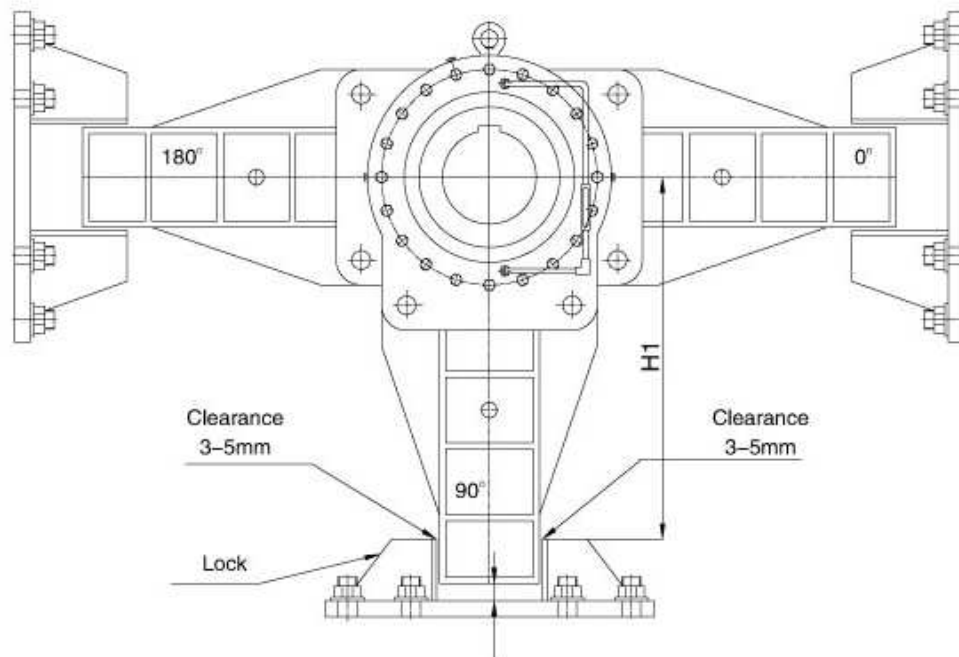
T_N= Nominal torque of backstop – Nm

H1= Distance between pressure point and center of inner ring – m

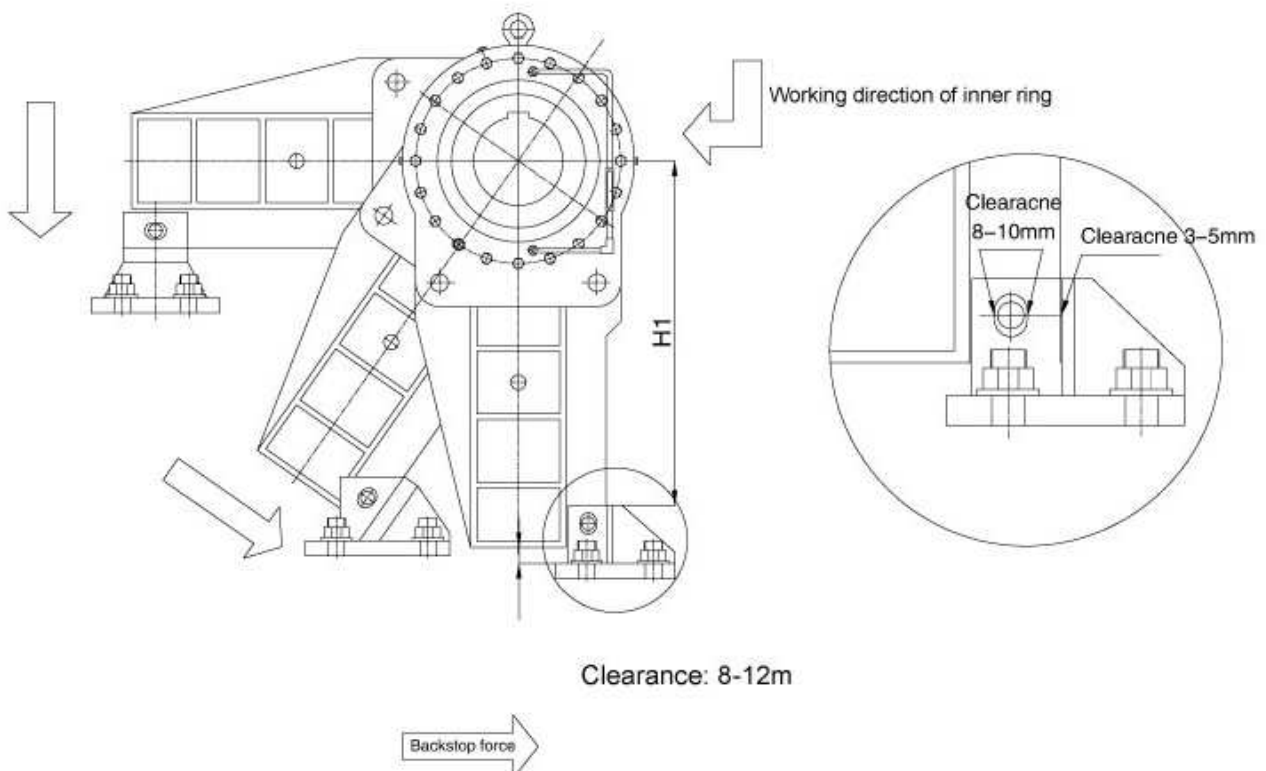
Attention:

1. There must be clearance between the moment arm and the lock.
2. SIBRE recommends protecting the moment arm and lock with a dust cover. A dust cover will prevent the accumulation of dirt and other foreign materials and ensure normal operation of the moment arm.
3. When the moment arm is locked by a pin, the pin opening on the lock should be an increasing circular bore. The direction of the increasing circular bore should be the same as the moment arm which will prevent the outer ring of the backstop from rotating. The diameter of the pin should be 8mm to 10mm less than the diameter of the pin opening. The pin will not be used during backstop activation. It only will function to prevent a reversal when the backstop is running in the intended direction.

Several layouts of lock(see right photos)



Clearance: 8-12mm



Clearance: 8-12mm



Installation and Maintenance Instructions:

Notice:

1. Check all parts in shipment against the packing list.
2. Ensure the rotating direction of the shaft is the same as the working direction of the inner ring of the backstop to prevent a serious accident.
3. Use a hoist to position the backstop when installing it.
4. Moment arm cannot be connected to the lock. (For example, the moment arm cannot be welded together with the lock.)
5. The drive shaft should be recessed 2mm to 3mm into the inner ring of the backstop. A shoulder ring can be used to fasten the backstop to the drive shaft.
6. The lock, shoulder ring, bolts and washers can be ordered along with the backstop.

Installation Steps:

1. Clean and de-burr the drive shaft extension. Ensure the backstop inner ring is clean.
2. Lubricate the drive shaft extension.
3. Hoist the backstop into position and drive the inner ring onto the drive shaft extension. Fasten the backstop in place with the shoulder ring. Note: Use only a mallet with a plastic head to drive the inner ring onto the drive shaft. Do not heat the inner ring to expand it during the installation process.
4. Rotate the moment arm to the installation angle and lock it in place.
5. If the backstop is lubricated with oil, mount the oil level indicator and filter after installation. The oil level indicator should be mounted vertically and the filter should be mounted on top of the backstop.



ART Low Speed Backstop

SYZK

Maintenance:

1. Backstops using grease for lubrication will be filled before delivery. If there is more than 6 months between production and installation, the grease will need to be topped off. Grease volume is 1/5 to 1/3 of total volume, not to exceed 1/2 of total volume. Do not use grease containing dangerous compounds such as lead, molybdenum disulfide, etc.
2. Backstops using oil will be filled prior to delivery. If there is more than 6 months between production and installation, the oil will need to be refilled using ATF– automatic transmission fluid. SIBRE recommends DEXRON, DEXRON–II, DEXRON–III or ATF–F.
3. Check the backstop if there is excessive noise or an abnormal temperature rise during operation.
4. Periodically check the bolts on the lock to ensure they are not loose.
5. The backstop operational temperature range is -40°C to 50°C . A cooling device is required for operating temperatures above 40°C . A sunshade should be installed for outdoor applications. For operations at temperatures in excess of 50°C , check the lubrication daily. Cease operating the backstop at temperatures in excess of 85°C . If the backstop is mounted on the gear box shaft extension, periodically check the gear box during high temperature operations.
6. Exposing the backstop to chlorine, carbon tetrachloride, potash, etc. will shorten the life of the backstop ring seal.



Please contact us if you want NJ(NYD) backstop



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