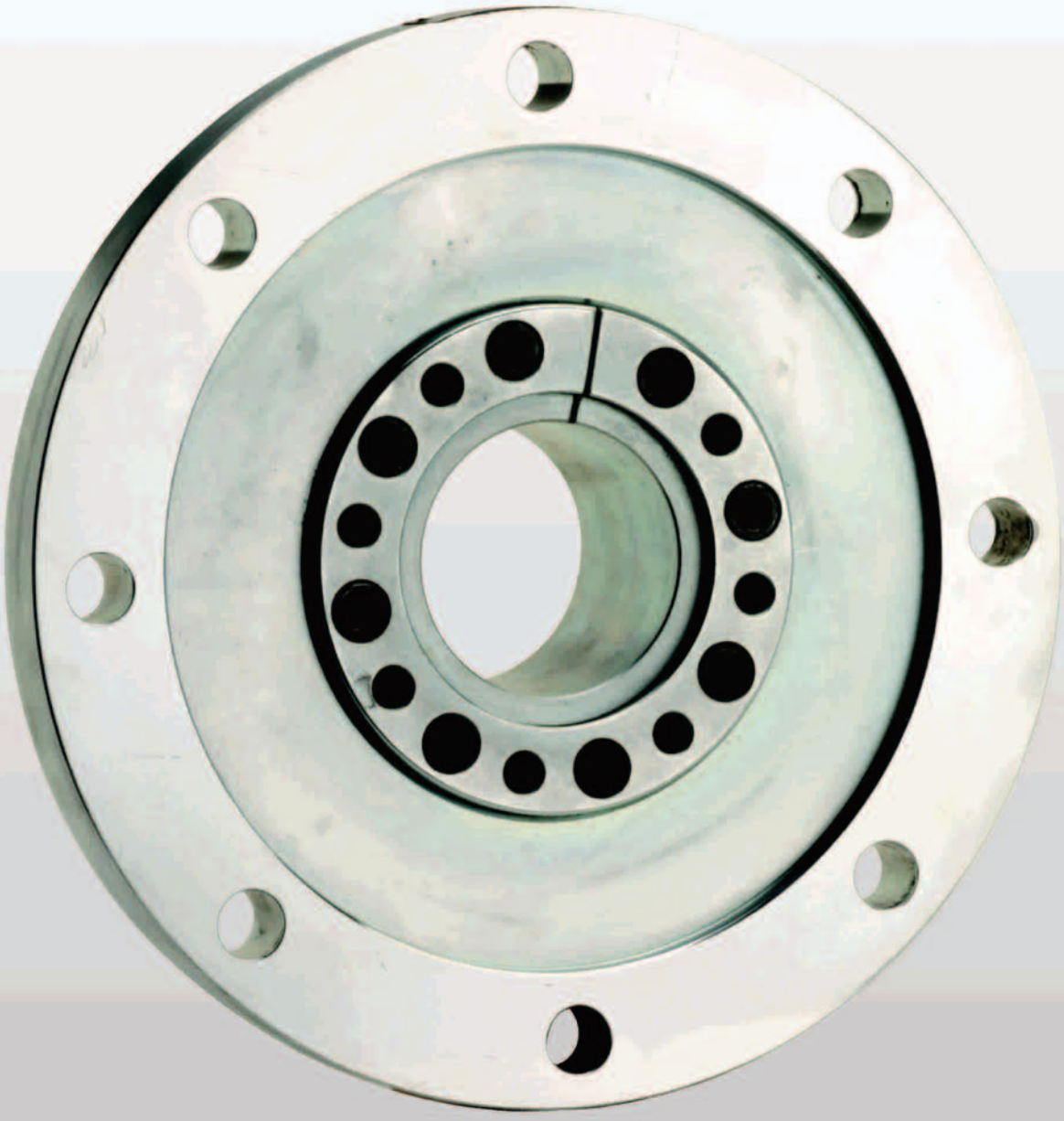
Voith Turbo

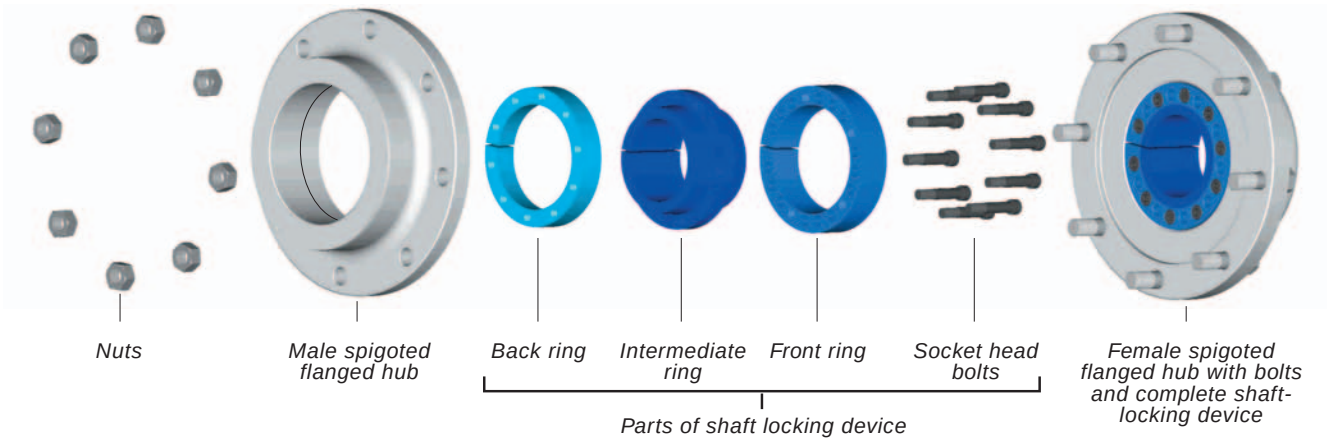
VOITH

Voith Rigid Flange Coupling



Keyless fitting and easy removal

No heat shrinking for installing or removing.
Used mainly for conveyor drive pulleys.



Voith rigid flange coupling exploded view.

Product description

Voith rigid flange couplings type 3 use shaft locking devices to create a mechanical shrink fit. Replacing conventional couplings, which are normally keyed or heat shrunk to the shafts. Removing the key, which has the highest stress areas of any shaft connection. Also removing the inconvenience of heat shrinking, especially improving ease of removal.

This product has been developed to connect the output shaft of a gearbox to the driven shaft of the application. This is accomplished in compact form, saving on installation space required.

The base plate, with the drive components mounted, forms a swing base, with a reaction support below or behind the motor, using the driven or conveyor pulley shaft as the pivot. The base plate, with the drive components mounted, forms a complete module that can be easily replaced by a standby unit, reducing maintenance downtime. (Note the 3D exploded view below shows the parts.)
No heating equipment is required for fitting or removal and reusability is achieved without damage to equipment, such as having to cut shafts off to remove equipment.

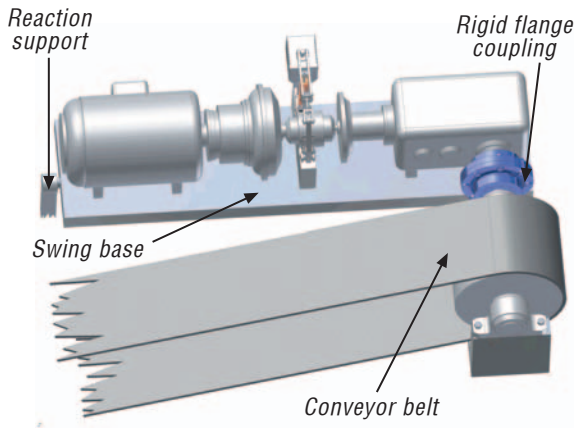
Shaft coupling is accomplished easily and without the use of keys or keyways, allowing a 30% smaller shaft diameter to be used. A mechanical shink fit is achieved through tensioned double tapers.

The coupling half is fitted onto the shaft by tightening the socket head bolts to the torque provided or to a reduced value if the full torque capacity of the coupling is not required.

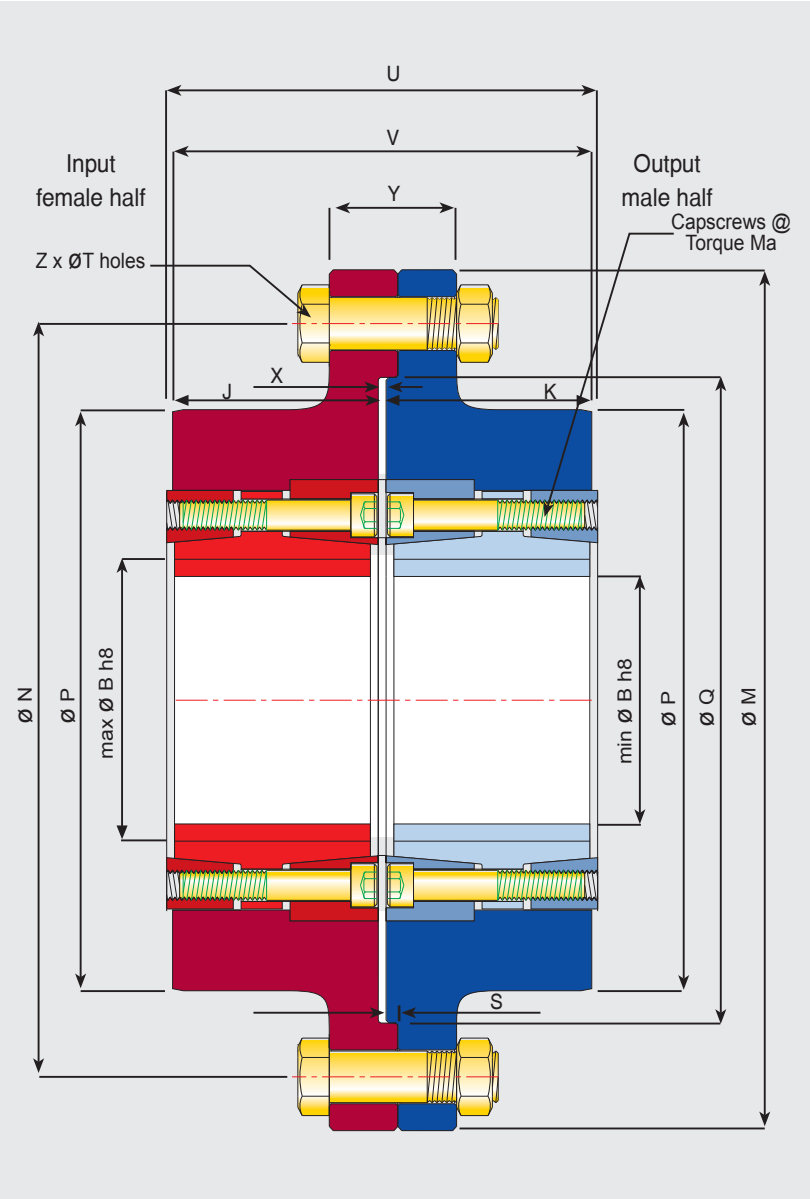
Quick bearing replacement is achieved by eliminating the need for the extraction pullers normally required for removal of the coupling halves as removal jacking threads are provided. Male and female spigots on the coupling flange faces facilitate location and support while inserting and removing the flange bolts and will not move until the last flange bolt is loosened. Corrosion will not occur on any of the located tapered faces due to high- pressure contact in these areas.

Application examples

- Conveyor pulley drives.
- Bucket wheel excavators.
- Various types of elevators.
- Escalators and moving walkways.
- Many other possibilities.



Typical application in 3D view.



Rigid flange coupling type 3 with shaft locking device type SLD 014.

Key benefits

- A stronger connection is achieved by eliminating traditional keyways.
- Saving on installation space.
- Reduces downtime.
- Flange dimension and bolt quantity. made to German RAG standard.
- Reusability without damage to equipment.
- 30% smaller shaft diameter can be used.
- Quick bearing replacement.
- Corrosion will not occur on tapered faces.

Components and working principle

Type 3M & 3F flanges bolt together to form the outer part of the coupling, which includes the male spigoted half and the matching female spigoted half, which can be used individually to mount, for example, brake disks or drums to shafts.

The shaft-locking device SLD 014 consists of three parts that bolt up to expand into each of the above halves and shrink onto the two shafts that are required to be coupled. They are tightened to the required torque provided, through socket-head bolts of grade 12.9, to achieve the torque capacity and resist the bending moments specified. All three rings have a split to provide a resistance-free fit. Removal jacking threads are provided for extraction. The inner ring is normally only split after final machining to the required bore size that can vary through the full size range listed. This means that special bore sizes can be accommodated.

Flange bolts are used to connect the flanges and allow the modular concept of changing a complete drive with ease.

Technical data and dimensions

Type3. M# / F# Size	Drive Torque max. (kNm)	Bending Moment max (kNm)	Dimensions in millimetres B	J	K	M	N	P	Q	S	T	U	V	X	Y	Z (qty)	Device SLD 014 Capscrews gr12.9 (qty x size x length)	Ma (Nm)	Mass (kg)
3F1-400 3M1-400	11,75 35,20	10,60	70 120	105	105	400	350	230	300	6	25	230	214	4	65	8	8 x M14 x 90	195	96,3 92,0
3F2-400 3M2-400	50,30 61,25	18,40	115 140	105	105	400	350	270	300	6	25	230	214	4	65	8	10 x M14 x 90	195	111,0 105,5
3F1-560 3M1-560	93,80 114,00	34,20	140 170	133	135	560	480	310	300	8	32	292	272	4	77	18	11 x M16 x 120	295	238,5 223,0
3F2-560 3M2-560	166,00 205,00	61,50	170 210	133	135	560	480	390	300	8	32	292	272	4	77	18	16 x M16 x 110	295	290,0 266,0
3F2-630 3M2-630	271,00 323,00	96,00	210 250	148	150	630	550	470	350	8	32	322	302	4	85	18	14 x M20 x 120	585	421,5 389,0
3F1-710 3M1-710	394,00 426,00	127,00	250 270	167	169	710	630	510	550	8	32	360	340	4	85	24	16 x M20 x 140	585	536,0 515,5
3F2-710 3M2-710	481,00 517,00	155,00	270 290	167	169	710	630	550	550	8	32	360	340	4	85	24	18 x M20 x 140	585	590,0 568,0

Voith rigid flange coupling type 3 - Coupling and uncoupling the flanges

The coupling flanges are coupled after the shaft locking devices are installed according to the instructions given below.

The flanges are coupled or uncoupled by fastening or removing the flange bolts after suitable rigging arrangements have been made to lift, support or remove the relevant masses related to the drive. Take care not to bump or damage the locating male and female spigots in the flanged halves of the coupling. Fitted bolts are not used as the location, concentricity and support is achieved by these spigots.

Shaft locking device SLD 014 - Installation and removal procedures

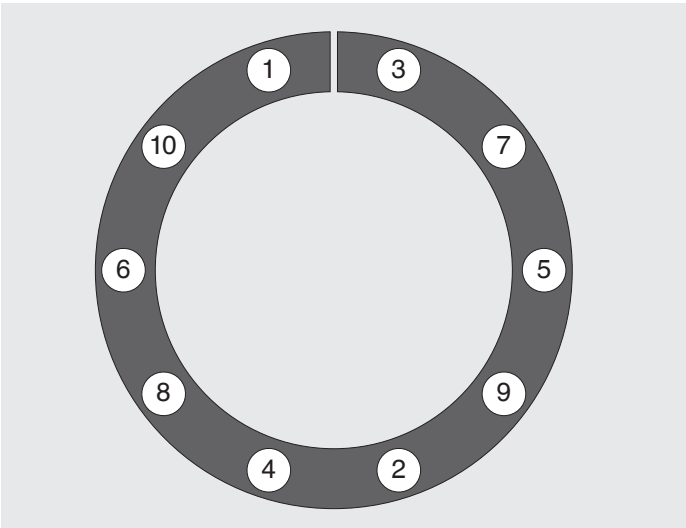
Installation procedure

1. Inspect shaft surfaces, sizes and corner finishes, removing any sharp edges or burrs.
2. If the locking device has been stripped for cleaning, check reassembly does not compromise intended removal sequence (Threaded holes must push on a solid surface).
3. Carefully clean hub and shaft contact surfaces and apply a light mineral or hydraulic oil film, wiping the shaft and inner diameter of the locking device before fitting.
4. Do not use any oil or grease with molybdenum disulphide, high-pressure or EP additives, as this will reduce the coefficient of friction required. Do not use copper-slip or any anti-seize compounds.
5. Slide the locking device into the hub bore and fit onto the shaft. Using at least three bolts in the jacking threads to stop the device from moving up against the internal tapers.
6. Tighten gradually and regularly in crossed sequence in predetermined torque steps as shown in the diagram.
For tightening torque refer to technical data on page 2.
7. The higher the required tightening torque or accuracy, the more the steps should be.
8. If alignment is crucial check with clock-gauge on face, starting the next sequence at the highest spot.
9. Repeat the same operation (6.) by tightening all the screws or bolts until the required tightening torque.
10. Check this torque by using a continuous circular sequence in a single last tightening round.
11. Protect the removal threads, if they exist, from the ingress of dirt and corrosion.

Removal procedure

1. This device is not self-releasing. Remove the clamping screws or bolts.
2. Clean the removal jacking threads, with a bottoming thread tap if necessary, to ensure no dirt or corrosion is left, to bind the thread of the removal bolts, blowing away any foreign matter before oiling lightly.
3. Dress the screw ends to a flat champhered front, making a smooth pushing surface, removing the manufactured rim of the thread start on the tip if not already provided. This champher takes care not to damage the thread starts.
4. Insert screws into all the removal threads and tighten them gradually, in steps, in crossed sequence to the tightening torque, if necessary or until the front ring is released.
5. Repeat the procedure (2,3 and 4) to remove the back ring.
6. If the locking device is to be re-used, check for damage and lubricate both screws and threads before reassembly with a light mineral or hydraulic oil film.
7. Do not use any oil or grease with molybdenum disulphide, high-pressure or EP additives, as this would reduce the coefficient of friction required. Do not use copper-slip or any anti seize compounds.

An example of a recommended tightening sequence for bolts.



Voith Turbo (Pty) Ltd
P O Box 13171, Witfield,
1467, Gauteng, South Africa
Tel: +27 11 418-4000
Fax: +27 11 418-4080
info@voith.co.za

VOITH
Engineered reliability.