

VOITH

Great benefits of using BHS EconTors single diaphragm couplings



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Diaphragm couplings have become state of the art for systems requiring a very high level of reliability in the drive unit. A new technological standard for systems with very high speeds and high torques was achieved in the eighties when Voith Turbo BHS Getriebe GmbH developed the TwinTors double diaphragm coupling with twofold misalignment compensation. On the other hand, steel multi-disc or tooth couplings are still used for low and medium-speed ranges. With its BHS EconTors single diaphragm coupling, Voith is setting standards in this segment as well.

Voith has complemented its position as a system supplier of BHS gearboxes and couplings with the BHS EconTors single diaphragm coupling.

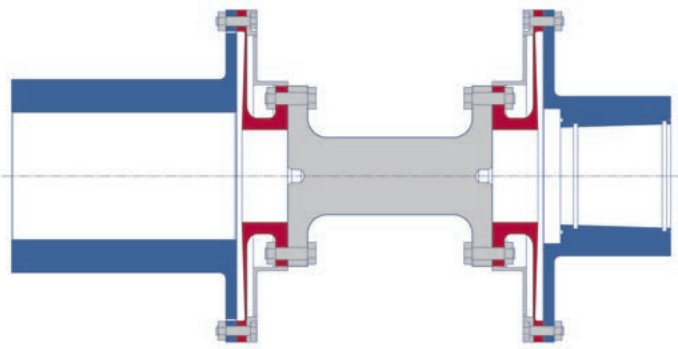
It provides a high-quality alternative to steel multi-disc or tooth couplings whilst offering a number of positive features (see Table 1). The 'big sister' of the two, the BHS TwinTors double diaphragm coupling, features minimal weight and a high compensating capacity, but often these features are not required and the EconTors alone is completely adequate (see Table 2).

The BHS EconTors single diaphragm coupling is ideal for a working range with speeds of up to 5000 revolutions per minute and can transfer torques of up to 1 000 000 Nm.

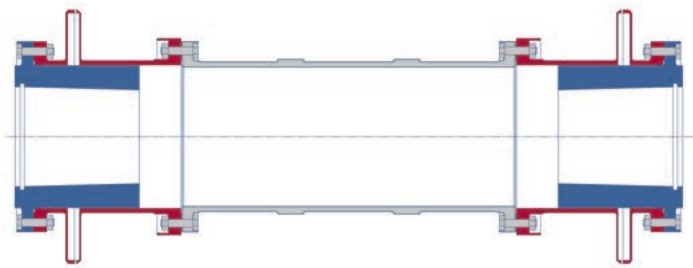
The BHS EconTors single diaphragm coupling is designed for all applications in which non-switching shaft couplings for compensating misalignment are required. Its range of applications therefore includes all types of systems that are fitted with electric motors, pumps, blowers, compressors, turbo compressors and turbines.

The EconTors provides the user with a technically sophisticated and durable coupling solution offering excellent value for money. It is made of high-strength tempered steel. The diaphragms allow 0.2 degrees of angular misalignment. The coupling is supplemented by an external coupling hub and a flanged intermediate sleeve which allows the required torsion properties to be set.

When developing of the BHS EconTors single diaphragm coupling, Voith was able to utilise the many years of expertise gained from its successful TwinTors series. The contours of the diaphragm are designed to achieve a uniform distribution of the stresses. The flanges are also specially designed to achieve the maximum usage of the surface area for transferring the power.



BHS EconTors single diaphragm coupling type MKS450-AAT



BHS TwinTors double diaphragm coupling type MKB400-IIS

Table 1: Benefits and drawbacks of various coupling types

Benefits / Drawbacks	TwinTors double diaphragm coupling	BHS EconTors single diaphragm coupling	Steel multi-disc coupling	Tooth coupling
Service life	++	++	0	+
Installation space / weight	++	0	0	++
Servicing requirement	++	++	+	0
Fatigue strength	++	++	0	N/A
Resistance to wear	++	++	0	0
Axial reset forces	++	++	+	0
Prevention of intrinsic vibrations	++	++	0	0
Low heat development	++	+	0	+
Low noise emissions	++	+	+	++
No lubrication required	++	++	++	0
Purchase price	0	+	++	++
Life cycle costs	++	++	0	0

Table 2: Specimen applications for BHS diaphragm couplings from Voith between an electric motor and a compressor

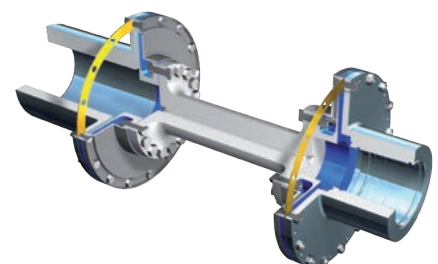
	Low speed range: BHS EconTors MKS315-AAS (single diaphragm coupling)	High speed range: BHS TwinTors MKB200-AIS (double diaphragm coupling)
Nominal speed Pn	3 578 rpm	12 180 rpm
Nominal torque Tn	10 142 Nm	2 521 Nm
Peak torque Tpeak	40 567 Nm	10 084 Nm
Service factor Ks	1.75 acc API671	1.75 acc API671
Axial misalignment KA max	± 2.5 mm	± 2.2 mm
Radial misalignment KR max	± 4.7 mm	± 1.8 mm
Angular misalignment KW max	± 0.15°	± 0.25°
Weight m	148.3 kg	22.2 kg
Length	1 800 mm	747 mm
Distance between shaft ends	1 400 mm	570 mm

Compared with steel multi-discs or tooth couplings, diaphragm couplings such as the TwinTors and EconTors from Voith score heavily thanks to their high torsion rigidity and that they are backlash-free and require no servicing. Like the TwinTors, the EconTors has a linear spring characteristic curve and comparatively low reset forces. This ensures that the system can operate in particularly stable and smooth conditions. In contrast, it is not possible to determine the precise axial reset forces for a tooth coupling. The few shoulders and steps on the contours of the diaphragm cause very little air disturbance and therefore keep noise emissions to a minimum.

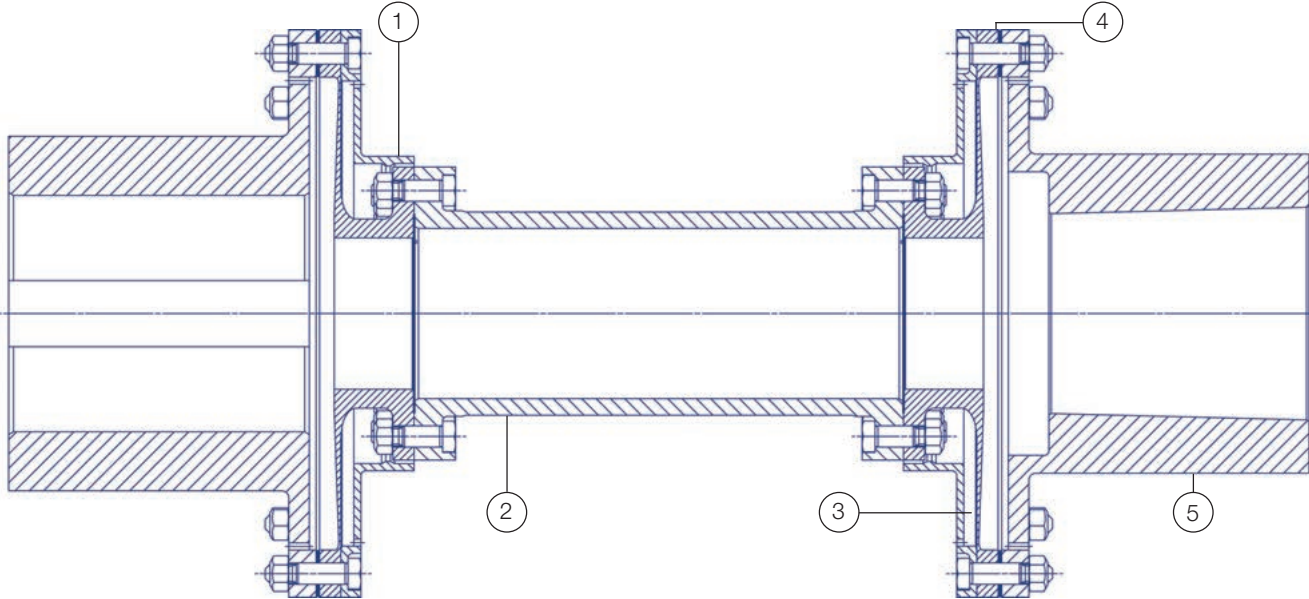
Its external screw connection means that the EconTors can also be used on large motor hubs. The EconTors, which has a shorter design than the BHS TwinTors double diaphragm coupling, can also be used in systems with a short shaft spacing.

Like all quality products from Voith, every BHS EconTors single diaphragm coupling is tested during production and before being shipped to the customer and is supplied with the appropriate certificates. The EconTors satisfies the requirements of API 671 and ISO 10441. It can also be designed and used in potentially explosive atmospheres in ATEX zones 1 and 2.

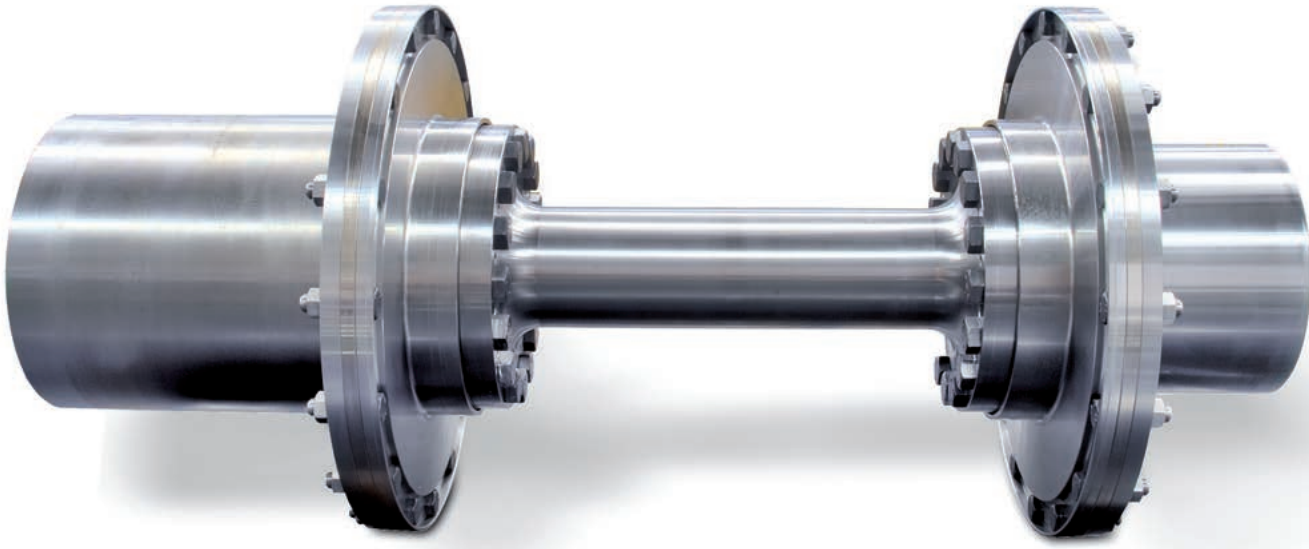
From the point of view of life cycle costs, the BHS EconTors single diaphragm coupling will be extremely attractive to quality-conscious original equipment manufacturers and users of systems operating at low to medium speeds.



Graphic 1: Main components of the BHS EconTors single diaphragm coupling



- 1 Coupling flange
- 2 Intermediate sleeve
- 3 Diaphragm disc
- 4 Shim
- 5 Coupling hub



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