

# Operation Manual

## Hydrodynamic couplings

according to  
**KWN 29000**



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## Safety and Information Symbols



**Caution!**

**Reference to explosion protection**



**Danger!**

**Danger of injury to personnel**



**Attention!**

**Follow instructions**

## 1. General and Safety

This Operation Manual (OM) is a constituent part of the scope of delivery of the coupling. The operation manual is valid for hydrodynamic couplings torque-control with delay chamber and flexible connection coupling.

This operation manual must always be kept available in the vicinity of the coupling. Only the observance of all instructions and information will guarantee trouble-free operation of the coupling within the specified parameters. The coupling must be used only under conditions specified in the specification sheets (specification leaflet). Any deviation from this requires prior consultation of the manufacturer as well as his approval.



The following general safety instructions must be observed at all times when working on the coupling:

- The coupling may only be serviced, repaired or operated by authorized and properly trained personnel.
- As a matter of principle, any work on the coupling may only be performed at a complete standstill. The motive power aggregate must be secured against accidental operation (for example, by interrupting energy supply).
- The motive power aggregate must be shut down immediately if changes are observed on the coupling during operation.
- The coupling must be secured against accidental contact and escape of oil by means of appropriate protective equipment.
- The protective equipment must allow the air to flow into the housing at hub height and to pass out at the external circumference in order to cool the hydrodynamic coupling.
- In addition, all generally approved regulations relating to operational safety and industrial medicine must be observed. (Working with Hydraulic oil)



Observe the following regulations on accident prevention:

VGB 1	" General regulations "
VGB 5	" Power-actuated means "
VGB 100	" Provisions relating to industrial medicine "
VGB 109	" First aid "
VGB 121	" Noise "

In addition, all generally approved regulations relating to operational safety and industrial medicine must be observed.

## Prevention of oil spill

To prevent oil spill or the spilling of large oil quantities, the following instructions are to be observed:

When changing, charging or removing oil, or when oil samples must be taken or repair works need to be carried out, ensure that no oil or oil emulsion leaks into the ground or surface water or into the sewage.

Before charging or recharging operating liquids check that the screw plug and fusible plug are screwed in.

After recharging, all above-mentioned components need to be checked for absolute oil tightness.

After putting the coupling into operation and after every 600 operating hours all screw plugs, fusible plug, parting lines as well as the housing and the areas, where shafts leave components, need to be checked visually for oil tightness.



The following environmental laws are to be observed:

AbfG	" Waste disposal act "
BlmSchG	" Law concerning the protection against Harmful effects on the environment through air pollution, noise, vibrations and similar factors "
WHG	" Law on water resource management "

## 2. Transport and Storage

To transport the coupling with a rope, screw a suitable eye bolt either into the threaded hole provided at the coupling circumference or into the holes after having removed the screws at the parting line, or attach a suitable transport aid.

When selecting the sling gear, observe the coupling weight. The sealed couplings are to be stored in closed rooms and protected against atmospheric impacts such as dirt, dust, moisture, chemical substances as well as against excessive heat and damage through mechanical loads. The relative air humidity should not exceed 70%.

Provided that the required conditions are observed, the sealing applied by Kupplungswerk Dresden offers adequate protection for 6 months.

If the coupling is stored for more than 6 months, further sealing is required every 6 months. For this purpose, remove the charging screw, charge with operating liquid and manually move the coupling. Then remove the operating liquid again and screw in charging screw.

Lubricate all polished external parts (hub holes). Special attention should be given to the area where the shafts leave the sealing rings. Here, the gap needs to be completely closed with grease in order to prevent the penetration of dust and moisture.

### 3. Technical Discription

This coupling type offers all advantages of a hydrodynamic coupling:

- almost load-free starting of prime movers
- time-delayed, slow starting of power-driven machines with great masses
- reduction of shock loads
- reduction of torsional vibrations
- limitation of transmittable torques

Hydrodynamic couplings may be operated in both directions of rotation. This hydrodynamic coupling version has been designed for mounting on the shaft journal of the machine; in this case, the highly flexible coupling serves to compensate for shaft displacements between the journal of the drive shaft and the journal of the power-driven machine.

#### 3.1. Design and Function

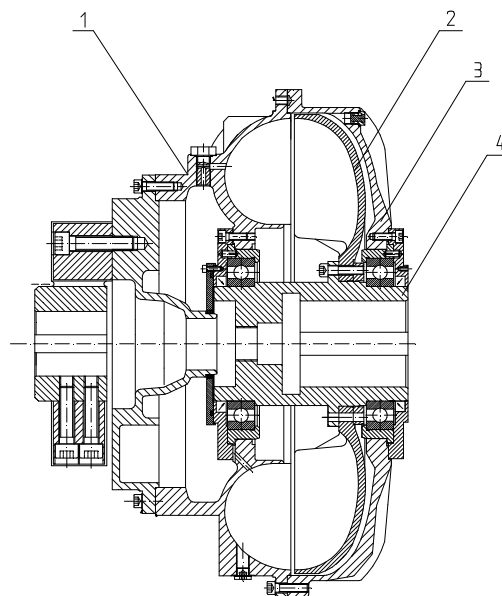


Fig. 1 Design (Example TK-NA 630 with high elastic coupling)

Hydrodynamic couplings, constantly filled with the same amount of liquids, operate according to the Föttinger principle and comprise of the following basic elements: impeller and turbine. A cover plate (3) is screwed to casing (1), which serves as an impeller, and both components together are referred to as the external housing of the coupling. The connection between turbine (2) and hub (4) provides for a high degree of torsional stiffness, The external housing is centrally guided on the hub by means of two anti-friction bearings.

The turbine and impeller have a specified number of radial blades which create a working area inside the coupling which is filled with oil. If one coupling half is made to rotate, the oil inside the coupling flows towards the coupling circumference in a diagonal direction as a result of the centrifugal force and rotation; there, the turning blades of the driven coupling half move the oil back to the centre of the coupling where it is re-introduced to the work cycle. In this work cycle the flow energy generated at the drive end is converted into mechanical energy at the driven end.

### 3.2. Operating liquid

The coupling is to be filled with hydraulic oil according to the manufacturer`s instructions. For the purpose of controlling or changing the hydraulic oil a mark can be applied to the external parting line which serves to document the position at wich the operating liquid spills from the charging hole when you tilt the hydrodynamic coupling after charging with oil. If you need to check the oil charge again, just tilt the coupling until the mark is reached.

Table 1

Kinematic Viscosity by 40 °C	27 – 60 cSt
Density by 20 °C	0,85 – 0,91 g/cm <sup>3</sup>
Flash point	>/= 170 °C
Solidification point	= - 25 °C ( in free area)
Water content	</= 0,1 %
Foaming tendency	low

### 3.3. Accessories

The following parts are supplied separately with the coupling.

- fixing screw or bolt with washer and retaining ring

We also supply mechanical or electronic temperature-control systems on demand.

## 4. Mounting

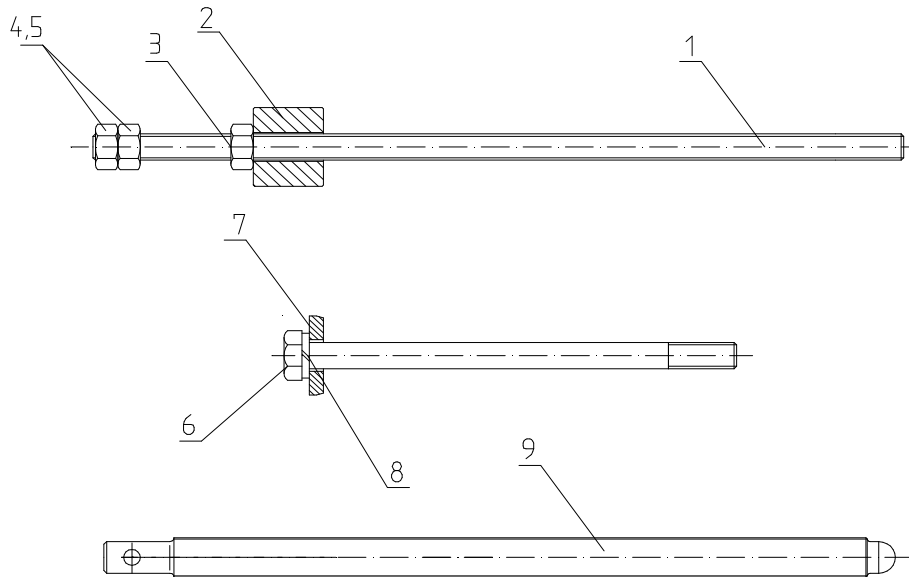


Fig. 2: Mounting, fastening and disassembly

### 4.1. Mounting of the hydrodynamic coupling

For mounting the hydrodynamic coupling use an appropriate fitting tool. A mechanical fitting tool can be supplied on demand.

As shown in the picture screw the fitting device, which comprises of fitting pin (1), compression bush (2) and hexagon nuts (3), (4) and (5), through the central coupling hole into the centring thread of the shaft end for seating the coupling. Then, the coupling is fitted with a hexagon nut (3).



It is recommended to use a lubricant to facilitate mounting.

To fasten the hydrodynamic coupling, use the supplied fastening elements consisting of hexagon screw (6), washer (7) and retaining ring (8).

After removal of the fitting elements, screw the fastening elements through the central coupling hole into the centring thread of the shaft end for seating the coupling as depicted in the figure.



For disassembly of the hydrodynamic coupling use an appropriate forcing-off device. A suitable forcing-off screw (9) can be supplied on demand.

As shown in the following pictures, first remove the fastening elements and then screw the forcing-off screw into the forcing-off thread of the central coupling hole and force off the shaft end.



**Attention! Take suitable measures to secure coupling against falling.**

#### 4.2. Alignment

Proper and careful alignment is essential to ensure a quiet-running drive and troublefree operation. Ensure to align the drive correctly in order to minimise load on the transmission shaft journal resulting from the reset force of the flexible coupling and to limit it to standard operational load. For this purpose, observe the mounting and alignment instructions for flexible couplings included in annex 2.

Both the prime mover and power-driven machine are to be mounted on one rigid torsion-proof foundation.

If you use steel constructions for mounting, ensure that they do not deflect under load.

#### 5. Commissioning and Operation



Check and, if required, retighten all screw connections prior to putting the coupling into operation.

In addition, check the alignment of the coupling again. Finally, install the required protection devices against accidental contact.

The motive power aggregate must be shut down immediately if changes are observed on the coupling during operation and eliminate the reason.

No special operation is required.

## 6. Maintenance

### 6.1. Maintenance after every 5000 operating hours

- Check operating liquid for quality; renem if required.



→ **Never mix different types of oil !**

### 6.2. Maintenance after every 15000 operating hours

Replace operating liquid.

### 6.3. Lubrication

Since the anti-friction bearings are lubricated through the operating liquid inside the coupling, further lubrication measures are not required.

### 6.4. Sort of oil and oil filling

Table 2

Manufacturer	Oil sort
Addinol	H 46 R/TL 36
BP Oil	HL 32/HL 22
Deutsche Shell	Shell Tellus Öl C 32
	Shell Tellus Öl 32
Wintershall AG	Wiolan HF 32
Mobil Oil AG	Mobilfluid 120
Deutsche Total GmbH	Total Azolla 32
ESSO AG	Torque Fluid N 45
DEA Mineralöl AG	Astron HLP 32

Table 3

size		274	355	400	450	500	560	630	710	800	900	1000
TK-N single flooded	min. capacity in litre	1,7	3,4	6,5	7,1	11,2	16,2	22	32	48	56	87
	max. capacity in litre	2,3	5,8	8,1	12	19	23	31	46	68	96	148
TK-N double flooded	min. capacity in litre	-	-	-	-	-	-	-	-	-	138	175
	max. capacity in litre	-	-	-	-	-	-	-	-	-	220	248

## 7. Spare Parts

Original spare parts are described by indicating their article number and associated item number and are available from the manufacturer.



## Declaration of Conformity

according to EU Directive 94/9/EC of 23. March 1994  
as well as legal regulations issued for their implementation.

The manufacturer, KWD Kupplungswerk Dresden GmbH  
Löbtauer St. 45  
D-01159 Dresden, Germany,

hereby declares, that the

Hydrodynamic couplings TK-N  
according to KWN 29000

described in this Operation Manual are devices in the sense of Article 1 (3) as well as Article 8, Paragraph (1) c) of the Directive 94/9/EC and are in compliance with the provisions of Directive 94/9/EC as well as the standards EN 1127-1: 1997, DIN EN 13463-1:2001, DIN EN 13463-5/-8 2003.

II 2 G IIB T3\*/T4\* ( $-30\text{ °C} \leq T_a \leq 50\text{ °C}$ )  
II 2 D 200°C\*/135°C\*

\* ... depends on the used fusible plug / Temperature Control System

signed: Dr.-Ing. C. Spensberger  
Managing Director  
Engineering

signed: Dipl.-Ing. F. Jerosch  
Manager  
Quality System