drive with us

K - CK - CCK

FLUID COUPLINGS

TRANSFLUID

trasmissioni industriali
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Fluid couplings - 1805
1. DESCRIPTION
The TRANSFLUID coupling (K series) is a constant fill type, comprising of three main elements:
1 - driving impeller (pump) mounted on the input shaft.
2 - driven impeller (turbine) mounted on the output shaft.
3 - cover, flanged to the outer impeller, with an oil-tight seal.
The first two elements can work both as pump or turbine.

2. OPERATING CONDITIONS
The TRANSFLUID coupling is a hydrodynamic transmission. The impellers perform like a centrifugal pump and a hydraulic turbine. With an input drive to the pump (e.g. electric motor or Diesel engine) kinetic energy is transferred to the oil in the coupling. The oil is forced, by centrifugal force, across the blades of the pump towards the outside of the coupling. The turbine absorbs kinetic energy and generates a torque always equal to input torque, thus causing rotation of the output shaft. Since there are no mechanical connections, the wear is practically zero.
The efficiency is influenced only by the speed difference (slip) between pump and turbine.

The slip is essential for the correct operation of the coupling - there could not be torque transmission without slip! The formula for slip, from which the power loss can be deduced is as follows:

\[
\text{Slip} \% = \left(\frac{\text{input speed} - \text{output speed}}{\text{input speed}}\right) \times 100
\]

In normal conditions (standard duty), slip can vary from 1.5% (large power applications) to 6% (small power applications). TRANSFLUID couplings follow the laws of all centrifugal machines:
1 - transmitted torque is proportional to the square of input speed;
2 - transmitted power is proportional to the third power of input speed;
3 - transmitted power is proportional to the fifth power of circuit outside diameter.

---

1 - INNER IMPELLER
2 - OUTER IMPELLER
3 - COVER
4 - FLEX COUPLING
2.1 Transfluid coupling fitted on electric motors

Three phase asynchronous squirrel cage motors are able to supply maximum torque only, near synchronous speed. Direct starting is the system utilized the most. Figure 1 illustrates the relationship between torque and current. It can be seen that the absorbed current is proportional to the torque only between 85% and 100% of the asynchronous speed.

Any drive system using a Transfluid fluid coupling has the advantage of the motor starting essentially without load. Figure 2 compares the current demands of an electric motor when the load is directly attached verses the demand when a fluid coupling is mounted between the motor and load. The coloured area shows the energy that is lost, as heat, during start-up when a fluid coupling is not used. A Transfluid fluid coupling reduces the motor’s current peak during start-up and also reduces the current losses, increasing the lifetime of electric motors. Also at start-up, a fluid coupling allows more torque to pass to the load for acceleration than in drive systems without a fluid coupling.

With a motor connected directly to the load there are the following disadvantages:

- The difference between available torque and the torque required by the load is very low until the rotor has accelerated to between 80-85% of the synchronous speed.
- The absorbed current is high (up to 6 times the nominal current) throughout the starting phase causing overheating of the windings, overloads in the electrical lines and, in cases of frequent starts, major production costs.
- Over-dimensioned motors caused by the limitations indicated above.

To limit the absorbed current of the motor during the acceleration of the load, a (λ Δ) (wye - delta) starting system is frequently used which reduces the absorbed current by about 1/3 during starting. Unfortunately, during operation of the motor under the delta configuration, the available torque is also reduced by 1/3; and for machines with high inertias to accelerate, overdimensioning of the motor is still required. Finally, this system does not eliminate current peaks originating from the insertion or the commutation of the device.

Figure 3 shows two curves for a single fluid coupling and a characteristic curve of an electric motor. It is obvious from the stall curve of the fluid coupling (s = 100%) and the available motor torque, how much torque is available to accelerate the rotor of the motor (colored area). In about 1 second, the rotor of the motor accelerates passing from point A to point B. The acceleration of the load, however, is made gradually by the fluid coupling, utilizing the motor in optimal conditions, along the part of the curve between point B, 100% and point C, 2-5%. Point C is the typical point of operation during normal running.
STARTING TORQUE CHARACTERISTICS

2.2 CHARACTERISTIC CURVES

- MI: transmitted torque from fluid coupling
- Mm: starting torque of the electric motor
- Mn: nominal torque at full load
- ...: accelerating torque

**NOTE:** Above starting times are indicative only.
3. TRANSFLUID FLUID COUPLINGS WITH A DELAYED FILL CHAMBER

A low starting torque is achieved, with the standard circuit in a maximum oil fill condition because fluid couplings limit the starting torque to less than 200% of the nominal motor torque. It is possible to limit further the starting torque down to 160% of the nominal torque, by decreasing the oil fill: this, contrarily creates slip and working temperature increase in the fluid coupling.

The most convenient technical solution is to use fluid couplings with a delayed fill chamber, connected to the main circuit by calibrated bleed orifices. These externally adjustable valves, available from size 15CK (Fig. 4b), can be simply adjusted to vary starting time.

In a standstill position, the delayed fill chamber contains part of the filling oil, thus reducing the effective quantity in the working circuit (Fig. 4a) and a torque reduction is obtained, allowing the motor to quickly reach the steady running speed as if started without load.

During start-up, oil flows from the delayed fill chamber to the main circuit (Fig. 4b) in a quantity proportional to the rotating speed. As soon as the fluid coupling reaches the nominal speed, all oil flows into the main circuit (Fig. 4c) and torque is transmitted with a minimum slip.

With a simple delayed fill chamber, the ratio between starting and nominal torque may reach 150%. This ratio may be further reduced down to 120% with a double delayed fill chamber, which contains a higher oil quantity, to be progressively transferred into the main circuit during the starting phase.

This is ideal for very smooth start-ups with low torque absorptions, as typically required for machinery with large inertia values and for belt conveyors.

The advantages of the delayed fill chamber become more and more evident when the power to be transmitted increases.

The simple chamber is available from size 11CK, while the double chamber from size 15CCK.

3.1 SUMMARY OF THE ADVANTAGES GIVEN BY FLUID COUPLINGS

- very smooth start-ups
- reduction of current absorptions during the starting phase: the motor starts with very low load
- protection of the motor and the driven machine from jams and overloads
- utilization of asynchronous squirrel cage motors instead of special motors with soft starter devices
- higher duration and operating convenience of the whole drive train, thanks to the protection function achieved by the fluid coupling
- higher energy saving, thanks to current peak reduction
- limited starting torque down to 120% in the versions with a double delayed fill chamber
- same torque at input and output: the motor can supply the maximum torque even when load is jammed
- torsional vibration absorption for internal combustion engines, thanks to the presence of a fluid as a power transmission element
- possibility to achieve a high number of start-ups, also with an inversion of the rotation direction
- load balancing in case of a double motor drive: fluid couplings automatically adjust load speed to the motors speed
- high efficiency
- minimum maintenance
- Viton rotating seals
- cast iron and steel material with anticorrosion treatment
4. INSTALLATION

4.1 STANDARD MOUNTING
Driver inner impeller

Minimum possible inertia is added to the motor, and therefore free to accelerate more quickly.

During the starting phase, the outer impeller gradually reaches the steady running condition. For very long starting times, heat dissipation capacity is lower.

If a braking system is required, it is convenient and easy to install a brake drum or disc on the flex coupling.

In some cases, where the driven machine cannot be rotated by hand, maintenance procedures of oil checking and refilling, as well as alignment, become more difficult.

The delayed fill chamber, when present, is fitted on the driven side. The rotating speed of the said chamber gradually increases during start-up, thus leading to a longer starting time, assuming the bleed orifices diameters are not changed. If oil quantity is excessively reduced, the transmissible torque may be lower than the starting torque of the driven machine. In such a case, part of the oil remains inside the delayed chamber. This lack of oil in the fluid coupling may cause stalling.

The “switching pin” device might not work correctly on machines where, owing to irregular operating conditions, the driven side may suddenly stop or jam during the starting phase.

Flex coupling is protected by the placement of the fluid coupling before it, and therefore this configuration is fit for applications with frequent start-ups or inversions of the rotating sense.

4.2 REVERSE MOUNTING
Driver outer impeller

Higher inertia directly connected to the motor.

The outer impeller, being directly connected to the motor, reaches synchronous speed instantly. Ventilation is therefore maximum from the beginning.

The assembly of a brake disc or drum on KR fluid couplings is more difficult, expensive and leads to a longer axial length of the whole machine group.

The outer impeller and cover are connected to the motor, it is therefore possible to manually rotate the coupling to check alignment and oil level, and for refilling.

The delayed fill chamber is fitted on the driver side, and reaches the synchronous speed in a few seconds. Oil is therefore centrifuged into the main circuit gradually and completely.

Starting time is adjustable by replacing the calibrated bleed orifices. The starting phase, however is performed in a shorter time than in the configuration with an inner driver impeller.

The switching pin operation is always assured, where fitted, as the outer impeller, always rotates because it is mounted on the driver shaft.

In case of frequent start-ups or inversions of the rotating direction, the flex coupling is much more stressed.

If not expressly required by the customer or needed for the application being performed, the fluid coupling is supplied according to our “standard” mounting. Do specify in your request for quotation whether you need a “reverse” mounting.

NOTE: Starting from size 13K and 11CK included, a baffle ring is always fitted on the driver impeller, and therefore it is not recommended to mount a fluid coupling “reverse” if “standard” mounting, or viceversa.

In these cases contact TRANSFLUID for more detailed information.
5. VERSIONS

- **KRG-CKRG-CCKRG**
- **KRB-CKRB-CCKRB**
- **KRD-CKRD-CCKRD**
- **KRG3-CKRG3-CCKRG3**
- **KRM-CKRM-CCKRM**
- **EK**
- **KCG-CKCG-CCKCG**
- **KDM-CKDM-CCKDM**

**KRG** - coupling with elastic coupling.

**KRG version, with brake drum (..KRB) or disc (..KRBP).**

**KRD** - ..KR with output shaft. A flexible coupling has to be used; it is possible to place it (with a convenient housing) between the motor and a hollow shaft gearbox.

**KRG3-CCKRG3** - version with elastic coupling allowing removal of rubber elements without moving the machines.

**KRM-CCKRM** - coupling with clamp type, super elastic coupling.

**EK** - fluid coupling fitted with a bell housing, to be placed between a flanged electric motor and a hollow shaft gearbox.

**KCG-CKCG-CCKCG** - fluid coupling with gear couplings, also available with brake drum (..KCGB) or disc (..KCGBP).

**KDM-CKDM-CCKDM** - fluid coupling with disc couplings, also available with brake drum (..KDMB) or disc (..KDMBP).

**KDMB**

**KDMBP**

**KDMBP**

---

5.1 IN LINE

- **KRG-CKRG-CCKRG**
- **KRB-CKRB-CCKRB**
- **KRD-CKRD-CCKRD**

**KRG-CCKRG** - coupling with elastic coupling.

**KRB-CCKRB** - KRG version, with brake drum (..KRB) or disc (..KRBP).

**KRD-CCKRD** - ..KR with output shaft. A flexible coupling has to be used; it is possible to place it (with a convenient housing) between the motor and a hollow shaft gearbox.

**KRG3-CCKRG3** - version with elastic coupling allowing removal of rubber elements without moving the machines.

**KRM-CCKRM** - coupling with clamp type, super elastic coupling.

**EK** - fluid coupling fitted with a bell housing, to be placed between a flanged electric motor and a hollow shaft gearbox.

**KCG-CKCG-CCKCG** - fluid coupling with gear couplings, also available with brake drum (..KCGB) or disc (..KCGBP).

**KDM-CKDM-CCKDM** - fluid coupling with disc couplings, also available with brake drum (..KDMB) or disc (..KDMBP).

**KDMB**

**KDMBP**

---

N.B.: The ..KCG - ..KDM versions allow a radial disassembly without moving the motor or the driven machine.

5.1 PULLEY

- **KSD-CKSD-CCKSD**
- **KSI-CKSI**
- **KSDF-CKSDF-CCKSDF**

**KSD** - basic coupling foreseen for a flanged pulley, with simple (CK..) or double (CCK..) delayed fill chamber.

**KSI** - fluid coupling with an incorporated pulley, which is fitted from inside.

**KSDF-CKSDF-CCKSDF** - KSD coupling with flanged pulley, externally mounted and therefore to be easily disassembled.

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: The ..KCG - ..KDM versions allow a radial disassembly without moving the motor or the driven machine.
6 MOUNTING
6.1 IN LINE VERSIONS MOUNTING EXAMPLES

Fig. A Horizontal axis between the motor and the driven machine (KRG-CKRG-CCKRG and similar).

Fig. B It allows a radial disassembly without moving the motor and the driven machine (KCG-KDM and similar).

Fig. C Between a flanged electric motor and a hollow shaft gearbox by means of a bell housing (..KR EK).

Fig. D Vertical axis mounting between the electric motor and a gearbox or driven machine. In case of order, please specify mounting type 1 or 2.

Fig. E Between the motor and a supported pulley for high powers and heavy radial loads.

N.B. Version EK (Fig. C) also for vertical mounting (Fig. D 1-2)

6.2 PULLEY VERSIONS MOUNTING EXAMPLES

Fig. F Horizontal axis

Fig. G Vertical axis. When ordering, please specify mounting type 1 or 2.

7 SPECIAL VERSION
7.1 ATEX

It is possible to get the Transfluid fluid couplings with finished bores certified as equipment for intended use in hazardous zones according to directive 2014/34/UE (Atex). The selection of suitable Atex fluid coupling must consider an additional safety factor of 1.2 times the absorbed power (for instance, motor 132 kW @ 1500 rpm-absorbed power 120 kW x 1.2 = 144 kW power to be considered in the selection).

According to different categories, there is the suitable selected fluid coupling as per below table.

<table>
<thead>
<tr>
<th>Fluid coupling model</th>
<th>Category 3 Ex II 2 D or GT4</th>
<th>Category 2 Ex II 2 D or GT4</th>
<th>Category 1 M2 industrial ATEX E x L M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>...KRG</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>...KCG</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>...KDM</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>...KXD</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>...EK</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>...KBM</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>...KSD</td>
<td>●</td>
<td>●</td>
<td>(water)</td>
</tr>
</tbody>
</table>

Fluid fill Oil or Treated water Fire resistant oil Treated water only

In case of inquiry for Atex fluid coupling, you have to apply Transfluid providing the application form TF 6413 duly filled up. About KGG and KG couplings, please refer to catalogue 160 GB.

7.2 WATER FILL FLUID COUPLING

Transfluid has developed a version of water fill fluid coupling in order to meet the demands of environment friendly products as well as couplings suitable for working in hazardous zone and underground mines.

The water to be used is a mixture of water and glycole. The water fill couplings are available upon request on all design from size 13 upwards; they have the same overall dimensions of standard couplings series. A suffix “W” identifies the coupling suitable for treated water operation (e.g. 27 CKRGW)

7.3 LOW TEMPERATURE (below -20°C)

KDM - KCG - Special bearings
- Special seal fluid.
8 SELECTION
8.1 SELECTION CHART
The chart below may be used to select a unit size from the horsepower and input speed. If the selection point falls on a size limit line dividing one size from the other, it is advisable to select the larger size with a proportionally reduced oil fill.

Tab. A

GENERAL REFERENCE HORSE POWER CHART

THE CURVES SHOW LIMIT CAPACITY OF COUPLING
8.2 SELECTION TABLE
Fluid coupling for standard electric motors.

<table>
<thead>
<tr>
<th>MOTOR TYPE</th>
<th>SHAFT DIA.</th>
<th>3000 rpm kW HP COUPLING</th>
<th>1800 rpm kW HP COUPLING</th>
<th>1500 rpm kW HP COUPLING</th>
<th>1200 rpm kW HP COUPLING</th>
<th>1000 rpm kW HP COUPLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>19</td>
<td>0.75 1</td>
<td>0.75 1</td>
<td>0.75 1</td>
<td>0.75 1</td>
<td>0.75 1</td>
</tr>
<tr>
<td>90S</td>
<td>24</td>
<td>1.1 1.5</td>
<td>1.1 1.5</td>
<td>1.1 1.5</td>
<td>1.1 1.5</td>
<td>1.1 1.5</td>
</tr>
<tr>
<td>90L</td>
<td>28</td>
<td>1.5 2</td>
<td>1.5 2</td>
<td>1.5 2</td>
<td>1.5 2</td>
<td>1.5 2</td>
</tr>
<tr>
<td>100L</td>
<td>28</td>
<td>2.2 3</td>
<td>2.2 3</td>
<td>2.2 3</td>
<td>2.2 3</td>
<td>2.2 3</td>
</tr>
<tr>
<td>112M</td>
<td>28</td>
<td>4 5.5</td>
<td>4 5.5</td>
<td>4 5.5</td>
<td>4 5.5</td>
<td>4 5.5</td>
</tr>
<tr>
<td>132</td>
<td>38</td>
<td>5.5 7.5</td>
<td>5.5 7.5</td>
<td>5.5 7.5</td>
<td>5.5 7.5</td>
<td>5.5 7.5</td>
</tr>
<tr>
<td>132M</td>
<td>38</td>
<td>7.5 10</td>
<td>7.5 10</td>
<td>7.5 10</td>
<td>7.5 10</td>
<td>7.5 10</td>
</tr>
<tr>
<td>160M</td>
<td>42</td>
<td>11 15</td>
<td>11 15</td>
<td>11 15</td>
<td>11 15</td>
<td>11 15</td>
</tr>
<tr>
<td>160L</td>
<td>42</td>
<td>18.5 25</td>
<td>18.5 25</td>
<td>18.5 25</td>
<td>18.5 25</td>
<td>18.5 25</td>
</tr>
<tr>
<td>180M</td>
<td>48</td>
<td>22 30</td>
<td>22 30</td>
<td>22 30</td>
<td>22 30</td>
<td>22 30</td>
</tr>
<tr>
<td>180L</td>
<td>48</td>
<td>30 40</td>
<td>30 40</td>
<td>30 40</td>
<td>30 40</td>
<td>30 40</td>
</tr>
<tr>
<td>225S</td>
<td>60</td>
<td>45 60</td>
<td>45 60</td>
<td>45 60</td>
<td>45 60</td>
<td>45 60</td>
</tr>
<tr>
<td>225M</td>
<td>55(300) 60</td>
<td>55 75</td>
<td>55 75</td>
<td>55 75</td>
<td>55 75</td>
<td>55 75</td>
</tr>
<tr>
<td>250M</td>
<td>60 (3000) 65</td>
<td>75 100</td>
<td>75 100</td>
<td>75 100</td>
<td>75 100</td>
<td>75 100</td>
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<tr>
<td>280S</td>
<td>65 (3000) 75</td>
<td>90 125</td>
<td>90 125</td>
<td>90 125</td>
<td>90 125</td>
<td>90 125</td>
</tr>
<tr>
<td>280M</td>
<td>65 (3000) 75</td>
<td>110 150</td>
<td>110 150</td>
<td>110 150</td>
<td>110 150</td>
<td>110 150</td>
</tr>
<tr>
<td>315S</td>
<td>65 (3000) 80</td>
<td>132 180</td>
<td>132 180</td>
<td>132 180</td>
<td>132 180</td>
<td>132 180</td>
</tr>
<tr>
<td>315M</td>
<td>65 (3000) 80</td>
<td>160 220</td>
<td>160 220</td>
<td>160 220</td>
<td>160 220</td>
<td>160 220</td>
</tr>
<tr>
<td>355S</td>
<td>80 (3000) 100</td>
<td>200 270</td>
<td>200 270</td>
<td>200 270</td>
<td>200 270</td>
<td>200 270</td>
</tr>
<tr>
<td>355M</td>
<td>80 (3000) 100</td>
<td>250 340</td>
<td>250 340</td>
<td>250 340</td>
<td>250 340</td>
<td>250 340</td>
</tr>
</tbody>
</table>

NO - STANDARD MOTORS

(*) POWERS REFER TO MOTORS CONNECTED AT 440 V. 60 HZ
(1) SPECIAL VERSION, 24 HOURS SERVICE
(2) ONLY FOR KRM
NB: THE FLUID COUPLING SIZE IS TIED TO THE MOTOR SHAFT DIMENSIONS

Fluid couplings - 1805
### 8.3 PERFORMANCE CALCULATIONS

For frequent starts or high inertia acceleration, it is necessary to first carry out the following calculations. For this purpose it is necessary to know:

\[
\begin{align*}
\text{PM} & \quad \text{- input power} \quad \text{kW} \\
\text{Nm} & \quad \text{- input speed} \quad \text{rpm} \\
\text{PL} & \quad \text{- power absorbed by the load at rated speed} \quad \text{kW} \\
\text{nL} & \quad \text{- speed of driven machine} \quad \text{rpm} \\
\text{J} & \quad \text{- inertia of driven machine} \quad \text{kgm}^2 \\
\text{T} & \quad \text{- ambient temperature} \quad \text{°C}
\end{align*}
\]

For simplicity of calculation, ignore the heat dissipated during acceleration. Coupling temperature rise during start-up is given by:

\[
Q = \text{heat generated during acceleration (kcal)}
\]

\[
C = \text{total thermal capacity (metal and oil) of coupling selected from Tab. C (kcal/°C)}.
\]

\[
T = \text{ambient temperature (°C)}
\]

\[
Tf = \text{final temperature (°C)}
\]

\[
T = \text{ambient temperature (°C)}
\]

\[
T_a = \text{temperature rise during acceleration (°C)}
\]

\[
T_l = \text{temperature during steady running (°C)}
\]

\[
Q = \frac{n_u \cdot J_r}{9.55 \cdot M_a} \cdot \frac{n_u}{100 - S} + \frac{M_L \cdot t_a}{8} \quad (kcal)
\]

The final coupling temperature reached at the end of the acceleration cycle will be:

\[
T_f = T + T_a + T_l \quad (°C)
\]

where:

- \( T_f \) = final temperature (°C)
- \( T \) = ambient temperature (°C)
- \( T_a \) = temperature rise during acceleration (°C)
- \( T_l \) = temperature during steady running (°C)

\[
T_l = 2.4 \cdot \frac{P_L \cdot S}{K} \quad (°C)
\]

where:

- \( K \) = factor from Tab. D
- \( T_f \) must not exceed 150°C

\[
H_{\text{max}} = \frac{3600}{t_a + t_l}
\]

where \( t_l \) = minimum working time

\[
t_l = 10^3 \cdot \frac{Q}{ \left( \frac{t_a}{2} + T_l \right) \cdot K} \quad (sec)
\]

The preliminary selection will be made from the selection graph Tab. A depending upon input power and speed. Then check:

A) acceleration time
B) max allowable temperature
C) max working cycles per hour

A) **Acceleration time** \( t_a \):

\[
t_a = \frac{n_u \cdot J_r}{9.55 \cdot M_a} \quad (sec)
\]

where:

- \( n_u \) = coupling output speed (rpm)
- \( J_r \) = inertia of driven machine fedpered to coupling shaft (kgm²)
- \( M_a \) = acceleration torque (Nm)

\[
n_u = n_m \cdot \left( \frac{100 - S}{100} \right)
\]

where \( S \) is the percent slip derived from the characteristic curves of the coupling with respect to the absorbed torque \( M_L \).

If \( S \) is not known accurately, the following assumptions may be made for initial calculations:

- 4 up to size 13”
- 3 from size 15” up to size 19”
- 2 for all larger sizes.

\[
J_r = J \cdot \left( \frac{n_L}{n_u} \right)^2
\]

Note:

\[
J = \frac{PD^2}{4} \quad \text{or} \quad GD^2
\]

\[
M_a = 1.65 M_m \cdot M_L
\]

where:

- \( M_m = \frac{9550 \cdot P_m}{N_m} \) (Nominal Torque)
- \( M_L = \frac{9550 \cdot P_L}{N_u} \) (Absorbed Torque)

B) **Max allowable temperature.**

For simplicity of calculation, ignore the heat dissipated during acceleration. Coupling temperature rise during start-up is given by:

\[
T_a = \frac{Q}{C} \quad (°C)
\]

where:

- \( Q = \) heat generated during acceleration (kcal)
- \( C = \) total thermal capacity (metal and oil) of coupling selected from Tab. C (kcal/°C).

\[
Q = \frac{n_u \cdot J_r}{76.5 \cdot 10^6} \cdot \left( \frac{J_r \cdot n_u + M_L \cdot t_a}{8} \right) \quad (kcal)
\]

The final coupling temperature reached at the end of the acceleration cycle will be:

\[
T_f = T + T_a + T_l \quad (°C)
\]

where:

- \( T_f \) = final temperature (°C)
- \( T \) = ambient temperature (°C)
- \( T_a \) = temperature rise during acceleration (°C)
- \( T_l \) = temperature during steady running (°C)

\[
T_l = 2.4 \cdot \frac{P_L \cdot S}{K} \quad (°C)
\]

where:

- \( K \) = factor from Tab. D
- \( T_f \) must not exceed 150°C

C) **Max working cycles per hour**

In addition to the heat generated in the coupling by slip during steady running, heat is also generated (as calculated above) during the acceleration period. To allow time for this heat to be dissipated, one must not exceed the max allowable number of acceleration cycles per hour.

\[
H_{\text{max}} = \frac{3600}{t_a + t_l}
\]

where \( t_l \) = minimum working time

\[
t_l = 10^3 \cdot \frac{Q}{ \left( \frac{t_a}{2} + T_l \right) \cdot K} \quad (sec)
\]
8.4 CALCULATION EXAMPLE

Assuming:

- \( P_m = 20 \) kW
- \( n_m = 1450 \) giri/min
- \( P_L = 12 \) kW
- \( n_L = 700 \) giri/min
- \( J = 350 \) kgm²
- \( T = 25 \) °C

Transmission via belts. From selection graph on Tab. A, selected size is 12K.

A) Acceleration time

From curve Tf 5078-X (supplied on request) slip S = 4%

\[
\begin{align*}
\eta_u &= 1450 \cdot \left( \frac{100 - 4}{100} \right) = 1392 \text{ rpm} \\
J_r &= 350 \cdot \left( \frac{700}{1392} \right)^2 = 88.5 \text{ kgm}^2 \\
M_m &= \frac{9550 \cdot 20}{1450} = 131 \text{ Nm} \\
M_L &= \frac{9550 \cdot 12}{1392} = 82 \text{ Nm} \\
M_L &= 1.65 \cdot 131 - 82 = 134 \text{ Nm} \\
t_a &= \frac{1392 - 88.5}{9.55 \cdot 134} = 96 \text{ sec}
\end{align*}
\]

B) Max allowable temperature

\[
\begin{align*}
Q &= \frac{1392}{10^4} \cdot \left( \frac{88.5 \cdot 1392}{76.5} + \frac{82 \cdot 96}{8} \right) = 361 \text{ kcal} \\
C &= 4.2 \text{ kcal/°C (Tab.} \ C) \\
T_a &= \frac{361}{4.2} = 86 \text{ °C} \\
K &= 8.9 \text{ (Tab.} \ D) \\
T_L &= 2.4 \cdot \frac{12 - 4}{8.9} = 13 \text{ °C} \\
T_f &= 25 + 86 + 13 = 124 \text{ °C}
\end{align*}
\]

C) Max working cycles per hour

\[
\begin{align*}
t_L &= 10^3 \cdot \frac{361}{\left( \frac{86}{2} + 13 \right) \cdot 8.9} = 724 \text{ sec} \\
H &= \frac{3600}{96 + 724} = 4 \text{ starts per hour}
\end{align*}
\]
Fluid couplings - 1805

SERIES 7 ÷ 19 - KRG - KRB - KRBP - CK... - CCK...

9. DIMENSION

KRB
(with brake drum)

KRB
(with brake drum)

In case of installation on shafts without shoulders, please contact Transfluid

- D bores relative to taper bushes with a keyway according to ISO 773 - DIN 6885/1
- Cylindrical bore without taper bush with a keyway ISO 773 - DIN 6885/1
- Cylindrical bore without taper bush, with a reduced keyway (DIN 6885/2)
- Taper bush without keyway

For ...KRB - KRBP series specify X and Y or X1 and Y1 diameter

Example: 9KRB - D38 - Brake drum = 160x60

Dimensions

| D | J | J1 | A | B | B1 | C1 | C2 | E | F | G | H | I | K | L | P | Q | R | S | V | Z | Flex coupling | brake drum X - Y | brake drum X1 - Y1 | Weight kg (without oil) | Weight kg (with oil) | Oil max (l) | Oil max | D bore | D bore |
| 7 | 19 | 24 | 40 | 50 | 228 | 77 | 169 | 22 | 114 | 42 | 110 | 60 | 70 | M12 | 27 | 35 | M8 | M8 | 8.3 | 0.92 | 8.7 | 1.5 |
| 8 | 24 | 50 | 60 | 256 | 91 | 194 | 18 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 9 | 28 | 38 | 60 | 80 | 295 | 96 | 246 | 31 | 128 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11 | 28 | 38 | 60 | 80 | 325 | 107 | 68.5 | 301 | 27 | 55 | 132 | 195 | 80 | 85 | M20 | 27 | - | - | 16 | - | - | - | - |
| 12 | 28 | 38 | 60 | 80 | 372 | 122 | 75 | 322 | 24 | 145 | - | 224 | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | 28 | 38 | 60 | 80 | 398 | 137 | - | 285 | 345 | 28 | 177 | 70 | 170 | 100 | 84 | 85 | M16 | 16 | 20.5 | 27.7 | 3.35 |
| 15 | 50 | 55 | 60 | 85 | 140 | 460 | 151 | 87 | 137 | 343 | 411 | 461 | 35 | 208 | 85 | 269 | 110 | 120 | 80 | 70 | M10 | M12 |
| 17 | 48 | 55 | 60 | 85 | 140 | 500 | 170 | 87 | 137 | 343 | 411 | 461 | 35 | 208 | 85 | 269 | 110 | 120 | 80 | 70 | M10 | M12 |
| 19 | 48 | 55 | 60 | 85 | 140 | 500 | 170 | 87 | 137 | 343 | 411 | 461 | 35 | 208 | 85 | 269 | 110 | 120 | 80 | 70 | M10 | M12 |

Dimensions are subject to alternation without notice.
SERIES 7 ÷ 19 - KRD - CKRD - CCKRD

NB: The arrows ↔ indicate input and output in the standard versions.

- WHEN ORDERING, SPECIFY: SIZE - MODEL - D DIAMETER
- UPON REQUEST: BORE G MACHINED; G1 SPECIAL SHAFT
- G1 SHAFT WITH A KEYWAY ACCORDING TO ISO 773 - DIN 6885/1

<table>
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<th>C4 (CKRD)</th>
<th>C5 (CCKRD)</th>
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<th>L1</th>
<th>Weight kg (without oil)</th>
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Dimensions are subject to alteration without notice.
Fluid couplings - 1805

SERIES 21 ÷ 34 - KRG - KRB - KRBP - CK... - CCK...

NB: The arrows indicate input and output in the standard versions.

| Size | D  | J  | A  | B  | C1 | C2 | C3 | E  | F  | G  | H  | I  | K  | L  | P  | Q  | R  | S  | V  | Z  | Flex coupling | Brake drum X - Y | Brake disc X1 - Y1 | Weight kg (without oil) | Oil max l |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------|-----------------|-------------------|---------------------|-----------|
| 21   | **80 | 90 | 170 | 620 | 110 | 199 | 433 | 533 | 623 | 45 | 250 | 110 | 250 | 400 | 3 | 140 | 170 | M38 | 130 | M20 | M24 | BT60 | 400 - 150 | 560 - 30 | 630 - 30 | 710 - 30 | 795 - 30 | 129 | 139 | 147 | 19 | 23 | 31 |
| 24   | **80 | 90 | 170 | 714 | 229 | 433 | 533 | 623 | 21 | 468 | 568 | 658 | 56 | 110 | 199 | 433 | 533 | 623 | 45 | 250 | 110 | 250 | 400 | 3 | 140 | 170 | M38 | 130 | M20 | M24 | BT60 | 400 - 150 | 560 - 30 | 630 - 30 | 710 - 30 | 795 - 30 | 129 | 139 | 147 | 19 | 23 | 31 |
| 27   | 120 max | 210 max | 780 | 278 | 484 | 602 | 702 | 6 | 315 | 130 | 354 | 4 | 150 | 200 | 167 | M24 (for max bore) | 167 | M24 (for max bore) | 20 | BT80 | 500 - 190 | 710 - 30 | 795 - 30 | 228 | 246 | 265 | 42 | 31.2 | 61 |
| 29   | 135 max | 240 max | 860 | 290 | 131 | 231 | 513 | 631 | 731 | 18 | 350 | 537 | 4 | 150 | 200 | 167 | M24 (for max bore) | 167 | M24 (for max bore) | 20 | BT80 | 500 - 190 | 710 - 30 | 795 - 30 | 228 | 246 | 265 | 42 | 31.2 | 61 |
| 34   | 150 max | 285 max | 1000 | 368 | 638 | 749 | 849 | 19 | 480 | 140 | 395 | 5 | 170 | 220 | 200 | M36 (for max bore) | 18 | BT90 | 630 - 236 | 1000 - 30 | 472 | 482 | 496 | 82.5 | 92.5 | 101 |

- D Bores with a keyway according to ISO 773 - DIN 6885/1
- Standard dimensions with a keyway ISO 773 - DIN 6885/1
- Standard dimensions with reduced keyway (DIN 6885/2)
- When ordering, specify: size - model - d diameter for ...KRB or ...KRBP, specify x and y or x1 and y1 dimensions brake drum or disc
- Upon request, G finished bore
- Example: 19KRBP - D80 - Brake Disc 450 x 30

Dimensions are subject to alteration without notice.
SERIES 21 ÷ 34 - KRD - CKRD - CCKRD

NB: The arrows indicate input and output in the standard versions.

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<th>C5</th>
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<th>L1</th>
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<th>CKRD</th>
<th>CCKRD</th>
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<td>373</td>
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</table>

* Total length with D100
- UPON REQUEST G1, SPECIAL SHAFT DIAMETER

DIMENSIONS ARE SUBJECT TO ALTERATION WITHOUT NOTICE
The three pieces flexible coupling B3T, allows the removal of the elastic elements (rubber blocks), without removal of the electric motor; only with the BKR3 (with brake drum) coupling the electric motor must be removed by the value of "Y".

Y = axial displacement male part of the coupling B3T necessary for the removal of the elastic elements.

KRB3 (with brake drum)
COUPLING ALLOWING HIGHER MISALIGNMENTS AND THE REPLACEMENT OF THE ELASTIC ELEMENTS WITHOUT MOVING THE MACHINES

**TAPER BUSH VERSION**

- D Bores Relevant to Taper Bush with Keyway According to ISO 773 - DIN 6885/1
- Cylindrical Bores without Taper Bush with Keyway According to ISO 773 - DIN 6885/1

**Cylindrical Bore Version**

- Bores Relevant to Taper Bush with Keyway According to ISO 773 - DIN 6885/1
- Standard Dimensions with a Reduced Keyway (DIN 6885/2)

**When Ordering, Specify: Size - Serie D Diameter - Example: 13 CKRM-D 55**

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<th>B</th>
<th>C</th>
<th>C1</th>
<th>C2</th>
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<th>F</th>
<th>G</th>
<th>H</th>
<th>L</th>
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**In case of installation on shafts without shoulders, please contact Transfluid**

**NB:** The arrows indicate input and output in the standard versions.

Dimensions are subject to alteration without notice.
SERIES 11 ÷ 34 - KDM - CKDM - CCKDM

Fluid couplings - 1805

NB: The arrows ← indicate input and output in the standard versions.

Fluid coupling fitted with half disc couplings, without maintenance and prescribed for particular ambient conditions. To be radially disassembled without moving the machines.

Dimensions

<table>
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<th>Size</th>
<th>A</th>
<th>B</th>
<th>B1</th>
<th>B2</th>
<th>C</th>
<th>C1</th>
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<td>573</td>
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<td>768</td>
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<td>999</td>
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<td>679</td>
<td>163</td>
<td>228</td>
<td>1160</td>
<td>556</td>
</tr>
</tbody>
</table>

- WHEN ORDERING, SPECIFY: SIZE - MODEL
- FINISHED D-G BORES UPON REQUEST
EXAMPLE: 27 CKDM

Dimensions are subject to alteration without notice.
NB: The arrows ← indicate input and output in the standard versions.

ONLY FOR 27 - 29 ARE AVAILABLE HUBS FOR BRAKE DRUM/DISC WITH CENTRAL FLANGE

- WHEN ORDERING, SPECIFY: SIZE - MODEL
- D AND G1 FINISHED bores Upon request, and special 1 dimension
- FOR BRAKE DRUM OR DISC, SPECIFY DIMENSIONS X AND Y OR X1 AND Y1
EXAMPLE: 17KDMB - BRAKE DRUM 400 x 150

DIMENSIONS ARE SUBJECT TO ALTERATION WITHOUT NOTICE
Fluid couplings - 1805

SERIES 7 ÷ 46 - KCG - KGB - CKGBP - CCKCG... - CCKCG

NB: The arrows indicate input and output in the standard versions.

Fluid coupling fitted with half gear couplings, to be radially disassembled without moving the machines.

Brake drum or disc upon request

- UPON REQUEST
- (5) E.I. = EXPOSED INCH SCREWS
- (6) GEAR COUPLING WITH SPECIAL CALIBRATED BOLTS
  - WHEN ORDERING, SPECIFY: SIZE - MODEL
  - EXAMPLE: 21CKCG

Dimensions are subject to alteration without notice.
Fluid couplings - 1805

SERIES D34KBM - D46KBM - D34KDM - D34CKDM

FLUID COUPLING WITH DOUBLE CIRCUIT, FITTED WITH MAIN JOURNALS AND INPUT AND OUTPUT SHAFTS

D34KBM
D46KBM

SERIES A C F D-G L M N P
D34KBM 1000 1400 855 140 140 1120 257.5 170
D46KBM 1330 1900 1275 160 200 1550 312.5 170

WEIGHT Kg (Without oil) CENTER OF GRAVITY Kg mm MOMENT OF INERTIA J (WR2) Kg m²
810 162 952 710 26.19 64.25
2200 390 2514 955 91.25 183.7

KEYWAYS ACCORDING TO ISO 773 - DIN 6885/1

FLUID COUPLINGS FITTED WITH DOUBLE CIRCUIT, TO BE RADIALLY DISASSEMBLED WITHOUT MOVING THE MACHINES.

WITH HALF DISC COUPLINGS, WITHOUT MAINTENANCE

D34KDM

D34CKDM

WEIGHT Kg (without oil) CENTER OF GRAVITY Kg mm MOMENT OF INERTIA J (WR2) Kg m²
D34KDM 880 162 1022 512 26.06 65.53 0.955 0.955
D34CKDM 1014 194.5 194.5 532 26.06 67.99 0.955 0.955

NB: The arrows ← indicate input and output in the standard versions.

DIMENSIONS ARE SUBJECT TO ALTERATION WITHOUT NOTICE
Example for application

**NB:** The arrows ← → indicate input and output in the standard versions.

- CYLINDRICAL BORE WITH A KEYWAY ISO 773 - DIN 6885/1
- CYLINDRICAL BORE WITH A REDUCED KEYWAY (DIN 6885/2)
- **NOT STANDARD**
  WHEN ORDERING SPECIFY: SIZE - MODEL - DIAMETER D and G
  EXAMPLE: 8 EK-D28 - G 28

 DIMENSIONS ARE SUBJECT TO ALTERATION WITHOUT NOTICE
**CENTER OF GRAVITY**

- **Moments of Inertia**

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
<th>CENTER OF GRAVITY</th>
<th>MOMENT OF INERTIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>174 61.8 195</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
<td>0.006 0.019</td>
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<tr>
<td>9</td>
<td>137 63.9 178</td>
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<tr>
<td>10</td>
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<tr>
<td>11</td>
<td>186 69.4 190</td>
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</tr>
<tr>
<td>12</td>
<td>201 71.6 195</td>
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<td>0.072 0.189</td>
</tr>
<tr>
<td>13</td>
<td>212 73.2 198</td>
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<td>0.122 0.307</td>
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<tr>
<td>14</td>
<td>221 74.9 200</td>
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<td>0.236 0.591</td>
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<tr>
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<td>0.465 1.025</td>
</tr>
<tr>
<td>16</td>
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</tr>
<tr>
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<td>1.244 2.407</td>
</tr>
<tr>
<td>18</td>
<td>264 81.8 208</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
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<td>3.728 7.353</td>
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<tr>
<td>20</td>
<td>287 85.4 212</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
<td>4.750 9.807</td>
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<tr>
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<td>300 87.1 214</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
<td>11.950 27.295</td>
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<tr>
<td>22</td>
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<td>22.2 44.4</td>
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</table>

- **Fluid Couplings - 1805**

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
<th>CENTER OF GRAVITY</th>
<th>MOMENT OF INERTIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>1294 81.6 195</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
<td>0.370 0.740</td>
</tr>
<tr>
<td>33</td>
<td>1404 83.4 198</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
<td>0.570 1.140</td>
</tr>
<tr>
<td>34</td>
<td>1514 85.1 200</td>
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<td>0.770 1.540</td>
</tr>
<tr>
<td>35</td>
<td>1624 86.9 202</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
<td>0.970 1.940</td>
</tr>
<tr>
<td>36</td>
<td>1734 88.6 204</td>
<td>70.2 216 77.3 124 82.1 136 90.4 147 71.7 121.5 76.6 130 85.7 145</td>
<td>1.170 2.340</td>
</tr>
</tbody>
</table>

**Dimensions are subject to alteration without notice.**

- **Fluid Couplings - 1805**

- **Center of Gravity**

- **Moment of Inertia**

- **KRB**

- **CKR**

- **CCKR**

- **KCG**

- **CKCG**

- **Dimensions**

- **Moments of Inertia**

- **KDM**

- **CKDM**

- **CCKDM**

- **Moments of Inertia**

- **With brake drum**

- **With brake disc**

- **kgm²**

- **Weight**

- **kg**

- **Dimensions are subject to alteration without notice.**
SERIES 7 ÷ 27 - KSD - CKSD - CCKSD

Dimensions

| D | J | J1 | A | B | B1 | C | C1 | C2 | E | F | G | H | I | K | L | M | N | P | Q | R | S | T |
|---|---|----|---|---|----|---|----|----|---|---|---|---|---|---|----|----|---|---|---|---|---|---|---|
| 7 | 19 | 24 | 69 | 40 | 50 | 228 | 77 | 159 | 55 | 75 | 90 | 4 | M6 | 8 | 50 | 114 | 14 | M12 | 29 | 38 | M6 | M8 | 50 |
| 8 | 24 | 60 | 256 | 91 | 194 | 81 | 116 | 96 | 114 | 113 | 195 | 13 | 85 | 5 | 128 | 20 | M20 | 39 | 61 | M10 | M12 | 69 |
| 9 | 28 | 38 | 111 | 60 | 80 | 295 | 96 | 250 | 116 | 259 | 289.5 | 374 | 327 | 125 | 112 | 130 | 224 | 98 | 7 | 145 | 22 | M20 |
| 11 | 38 | 42 | 132 | 80 | 110 | 372 | 122 | 367 | 407 | 190 | 135 | 155 | 325 | 107 | 73.5 | 8 | 39 | 5 | 128 | 20 | M20 |
| 12 | 42 | 48 | 144 | 110 | 385 | 137 | 308 | 137 | 135 | 135 | 190 | 135 | 155 | 398 | 107 | 73.5 | 8 | 39 | 5 | 128 | 20 | M20 |
| 13 | 48 | 55 | 145 | 110 | 56.5 | 110 | 274 | 327 | 125 | 112 | 130 | 224 | 158 | 6 | 177 | 29 | M20 | 76 | M16 | 88 |
| 15 | 48 | 55 | 145 | 110 | 460 | 151 | 210 | 142 | 390 | 438 | 488 | 195 | 150 | 178 | 264 | 17 | 159 | 206 | 28 | M20 |
| 16 | 48 | 55 | 145 | 140 | 502 | 170 | 245 | 12 | 264 | 17 | 159 | 206 | 28 | M20 | 100 | M20 | 100 |
| 17 | 48 | 55 | 145 | 140 | 565 | 190 | 225 | 45 | 337 | 18 | 170 | 225 | M27 | 60 | M10 | 132 |

Dimensions are subject to alteration without notice.

NB: The arrows \( \leftrightarrow \) indicate input and output in the standard versions.

- **KSD**: Cylindrical bore without taper bush (see tab. below)
- **CKSD-CCKSD**: Cylindrical bore without taper bush (see tab. below)

In case of installation on shafts without shoulders, please contact Transfluid.
STANDARD PULLEYS

**KSI - CKSI - CCKSI**

<table>
<thead>
<tr>
<th>Size</th>
<th>D</th>
<th>U</th>
<th>Integral pulley</th>
</tr>
</thead>
<tbody>
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<td>19 - 24</td>
<td>11.5</td>
<td>80 - 90 - 100 - 90</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>26.5</td>
<td>90 - 100 - 90</td>
</tr>
<tr>
<td>8</td>
<td>19 - 24</td>
<td>26.5</td>
<td>90 - 100 - 90</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>26.5</td>
<td>90 - 100 - 90</td>
</tr>
</tbody>
</table>

**KSDF - CKSDF - CCKSDF**

- WHEN ORDERING, SPECIFY: SIZE - MODEL - D DIAMETER - DP - NUMBER AND TYPE OF GROOVES

**EXAMPLE:** 13 CKSDF - D55 - PULLEY DP. 250 - 5 SPC/C

DIMENSIONS ARE SUBJECT TO ALTERATION WITHOUT NOTICE
10. FILLING
Transfluid hydraulic couplings are supplied without oil. Standard filling: X for K series, 2 for CK series, and 3 for CCK series. The quantities are indicated on page 13 and 15 of this catalog. Suggested oil: ISO32 HM for normal operating temperatures. For temperatures down zero, ISO FD 10 (SAE 5W) and for temperatures lower than –20°C contact TRANSFLUID.

11. SAFETY DEVICES
FUSIBLE PLUG
In case of overloads, or when slip reaches very high values, oil temperature increases excessively, damaging oil seals and consequently allowing leakage. To avoid damage when used in severe applications, it is advisable to fit a fusible plug. Fluid couplings are supplied with a fusible plug at 140°C (109°C, 120°C or 198°C upon request).

SWITCHING PIN
Oil venting from fusible plug may be avoided with the installation of a switching pin. When the temperature reaches the melting point of the fusible ring element, a pin releases that intercepts a relay cam that can be used for an alarm or stopping the main motor. As for the fusible plug, 2 different fusible rings are available (see page 27).

11.1 SWITCHING PIN DEVICE
This device includes a percussion fusible plug installed on the taper plug. The percussion fusible plug is made of a threaded plug and a pin hold by a fusible ring coming out due to the centrifugal force when the foreseen melting temperature is reached. Such increase of temperature can be due to overload, machinery blockage or insufficient oil filling. The pin, moving by approx. 16 mm, intercepts the cam of the switch to operate an alarm or motor trip signal. After a possible intervention and removal of the producing reason, this device can be easily restored with the replacement of the percussion plug or even the fusible ring following the specific instructions included in the instruction manual.

ELECTRONIC OVERLOAD CONTROLLER
This device consists of a proximity sensors measuring the speed variation between the input and output of the fluid coupling and giving an alarm signal or stopping the motor in case the set threshold is overcome. With such a device, as well as with the infrared temperature controller, no further maintenance or repair intervention is necessary after the overload occupance, because the machinery can operate normally, once the cause of the inconvenience has been removed (see page 28).

INFRARED TEMPERATURE CONTROLLER
To measure the operating temperature, a device fitted with an infrared sensor is available. After conveniently positioning it by the fluid coupling, it allows a very precise non-contact temperature measurement. Temperature values are reported on a display that also allows the setting of 2 alarm thresholds, that can be used by the customer (see page 29).

- Lever switch standard supply 230 Vac
- Upon request: Atex version
- Switching pin available: see below tab

<table>
<thead>
<tr>
<th>DIM.</th>
<th>X</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>Ø</th>
<th>Y</th>
<th>Z</th>
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<tbody>
<tr>
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<td>115</td>
<td>128</td>
<td>-</td>
<td>148</td>
<td>24</td>
<td>262</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>124</td>
<td>137</td>
<td>167</td>
<td>232</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>143</td>
<td>156</td>
<td>228</td>
<td>287</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11***</td>
<td>150</td>
<td>163</td>
<td>236</td>
<td>300</td>
<td>15</td>
<td></td>
<td></td>
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<td>157</td>
<td>165</td>
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<td>323</td>
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<td></td>
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<tr>
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<td>187</td>
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<td>335</td>
<td>16</td>
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<td>209</td>
<td>222</td>
<td>417</td>
<td>400</td>
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<td></td>
</tr>
<tr>
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<td>217</td>
<td>229</td>
<td>457</td>
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<td>237</td>
<td>257</td>
<td>487</td>
<td>460</td>
<td>4</td>
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<tr>
<td>27</td>
<td>271</td>
<td>311</td>
<td>491</td>
<td>491</td>
<td>9</td>
<td></td>
<td></td>
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<td>29</td>
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<td>524</td>
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<td>346</td>
<td>404</td>
<td>564</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For Dia. 100 + 35 mm
** For Dia. 100 + 40 mm
*** Only for K.. (CK.. upon request)
REFERENCE DIMENSIONS

DIMENSIONS ARE SUBJECT TO ALTERATION WITHOUT NOTICE
11.2 OVERLOAD CONTROLLER (Fig. 6)

When load torque increases, slip also increases and output speed consequently decreases.

The said speed variation can be measured by means of a sensor sending a pulse train to the speed controller. If the rotating speed goes lower than the set threshold (see diagram) on the controller, a signal is given through the intervention of the inner relay.

The device has a “TC” timer with a blind time before starting (1 - 120 s) avoiding the alarm intervention during the starting phase, and another “T” timer (1 – 30 s) preventing from undesired relay intervention during sudden changes of torque.

The device also provides a speed proportional analogic output signal (0 – 10 V), that can be forwarded to a display or a signal transducer (4 – 20 mA).

Standard supply is 230 V ac, other supplies are available upon request: 115 V ac, 24 V ac or 24 V dc, to be specified with the order.

Atex version is available too.

CONTROLLER PANEL (Fig. 7)

TC  Blind time for starting

Set screw regulation up to 120 s

DS  Speed range regulation

Programmable DIP-SWITCH (5 positions), selecting relay status, roximity type, reset system, acceleration or deceleration.

Programming speed Dip-Switch with 8 positions allows to choose the most suitable speed range, according to the application being performed.

SV  Speed level (set point)

Set screw regulation with digits from 0 to 10. The value 10 corresponds to full range set with Dip-Switch.

R  Reset

Local manual reset is possible through R button, or remote reset by connecting a N.O. contact at pins 2-13.

SS  Threshold overtaking

(RED LED) It lights up every time that the set threshold (set point) is overtaken.

A  Alarm led

(RED LED) It lights up when alarm is ON and the inner relay is closed.

E  Enable

(YELLOW LED) It lights up when the device is enabled.

T  Delay time

Set screw regulation up to 30 s.

ON  Supply

(GREEN LED) It shows that the device is electrically supplied.

FOR FURTHER DETAILS, ASK FOR TF 5800-A.
11.3 INFRARED TEMPERATURE CONTROLLER

This is a non contact system used to check fluid coupling temperature. It is reliable and easily mounted. It has 2 adjustable thresholds with one logical alarm and one relay alarm.

The proximity sensor must be positioned near the fluid coupling outer impeller or cover, according to one of the layouts shown in Fig. 8. It is advised to place it in the A or C positions, as the air flow generated by the fluid coupling, during rotation, helps removal dirt particles that may lay on the sensor lens. The distance between the sensor and the fluid coupling must be about 15-20 mm (cooling fins do not disturb the correct operation of the sensor).

To avoid that the bright surface of the fluid coupling reflects light, and thus compromises a correct temperature reading, it is necessary to paint the surface, directly facing the sensor with a flat black colour (a stripe of 6-7 cm is sufficient). The sensor cable has a standard length of 90 cm. If required, a longer one may be used only if plaited and shielded as per type “K” thermocouples.

<table>
<thead>
<tr>
<th>SENSOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>0 + 200 °C</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-18 + 70 °C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.0001 °C</td>
</tr>
<tr>
<td>Dimensions</td>
<td>32.5 x 20 mm</td>
</tr>
<tr>
<td>Standard wire length</td>
<td>0.9 m</td>
</tr>
<tr>
<td>Body</td>
<td>ABS</td>
</tr>
<tr>
<td>Protection</td>
<td>IP 65</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTROLLER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>85...264 Vac / 48...63 Hz</td>
</tr>
<tr>
<td>Relay output OP1</td>
<td>No (2A - 250 V)</td>
</tr>
<tr>
<td>Logical output OP2</td>
<td>Not insulated</td>
</tr>
<tr>
<td>(5Vdc, ±10%, 30 mA max)</td>
<td></td>
</tr>
<tr>
<td>AL1 alarm (display)</td>
<td>Logic (OP2)</td>
</tr>
<tr>
<td>AL2 alarm (display)</td>
<td>Relay (OP1) (NO, 2A / 250Vac)</td>
</tr>
<tr>
<td>Pins protection</td>
<td>IP 20</td>
</tr>
<tr>
<td>Body protection</td>
<td>IP 30</td>
</tr>
<tr>
<td>Display protection</td>
<td>IP 65</td>
</tr>
<tr>
<td>Dimensions</td>
<td>1/32 DIN – 48x24x120 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>100 gr</td>
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</tbody>
</table>

* TO BE MADE LONGER WITH TWISTED AND SHIELDED WIRES FOR TYPE K THERMOCOUPLES (NOT SUPPLIED)
OTHER TRANSFLUID PRODUCTS
FOR ELECTRIC MOTOR APPLICATION

**FLUID COUPLING**
KSL SERIES
Start up and variable speed drive up to 4000 kW

**FLUID COUPLING**
KPT SERIES
Start up and variable speed drive up to 1700 kW

**FLEXIBLE COUPLING**
BM-B3M SERIES
Up to 33100 Nm

**DISC & DRUM BRAKE**
NBG/TFDS SERIES
Up to 19000 Nm

**PNEUMATIC CLUTCH**
TP SERIES
Up to 16800 Nm

**ELECTRIC MACHINES**
PERMANENT MAGNETS SYNCHRONOUS AC
Up to 100 kW
SALES NETWORK

EUROPE

AUSTRIA
ASC GMBH
4470 Enns

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transfrance@transfluid.it

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Queenborough Kent me11 5ee

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OY JENS S. AB
02271 Espoo

FINLAND (Diesel appl.)
TRANS-AUTO AB
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transfrance@transfluid.it

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Ph. +49 5921 7288808
Fax +49 5921 7288809
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