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Kraft Power is the North America Master Distributor for Transfluid Power Transmission & Associated Equipment.

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Constant Fill Fluid Couplings

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What is a Fluid Coupling?

A fluid coupling is a ***hydrokinetic transmission*** that performs like a centrifugal pump and a hydraulic turbine.

52 + Years

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What makes up a Fluid Coupling?

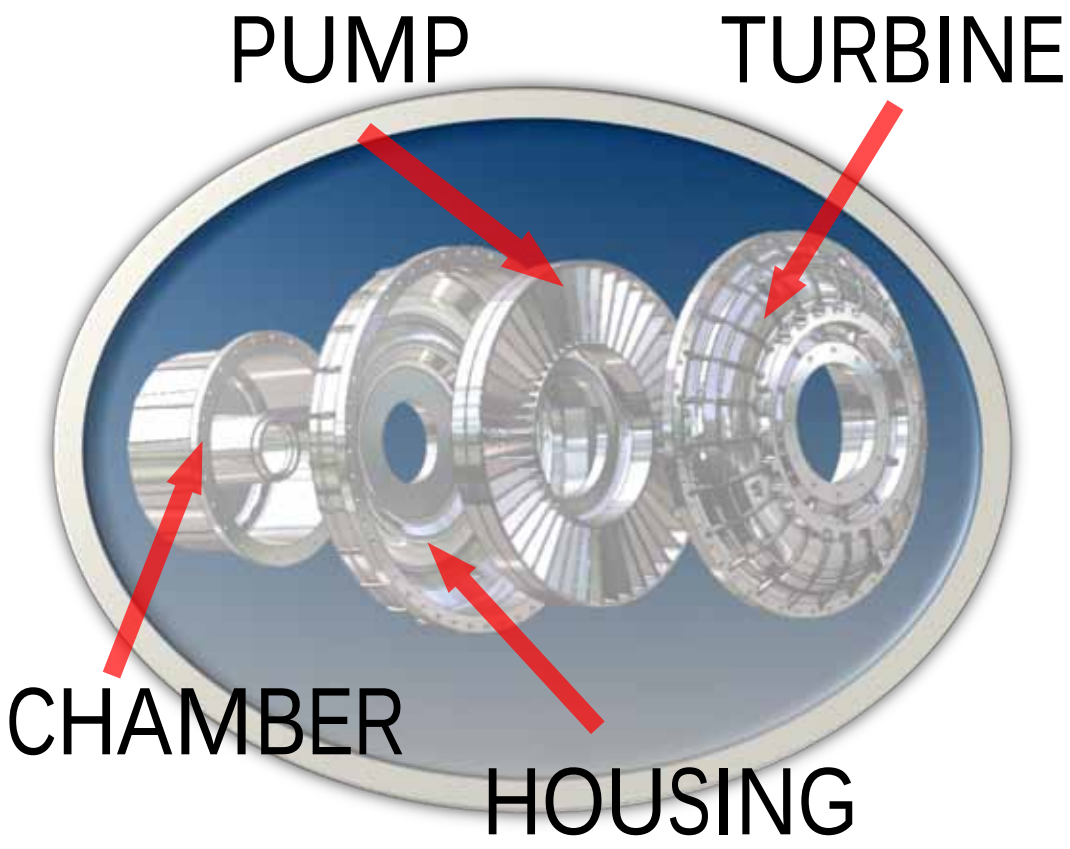
It's comprised of three main components:

Driving Impeller – input shaft (Pump)

Driven Impeller – output shaft (Turbine)

Housing

There's an option for a delay chamber for longer start time.



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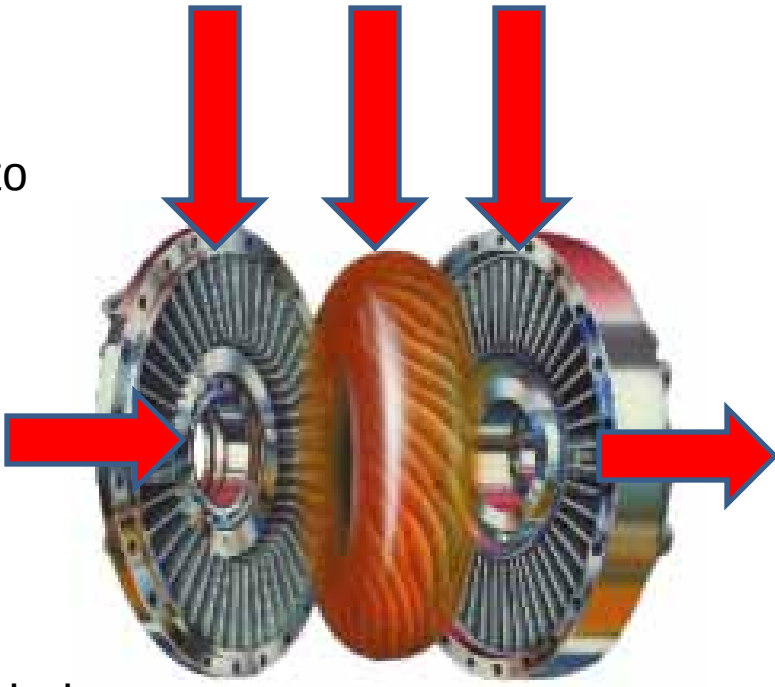
How does a Fluid Coupling work?

The input drive (e.g. electric motor or Diesel engine) is connected to the pump/impeller.

Mechanical energy is conveyed via the pump/impeller to the oil in the coupling

The oil moves by centrifugal force across the blades of the turbine towards the outside of the coupling.

The turbine absorbs the kinetic energy and develops a torque which is always equal to input torque, thus causing rotation of the output shaft.



The wear is practically zero since there are no mechanical connections. The efficiency is influenced only by the speed difference (slip) between pump and turbine, I.E. Fluid Level.

slip %=((input speed - out speed) / input speed) x 100

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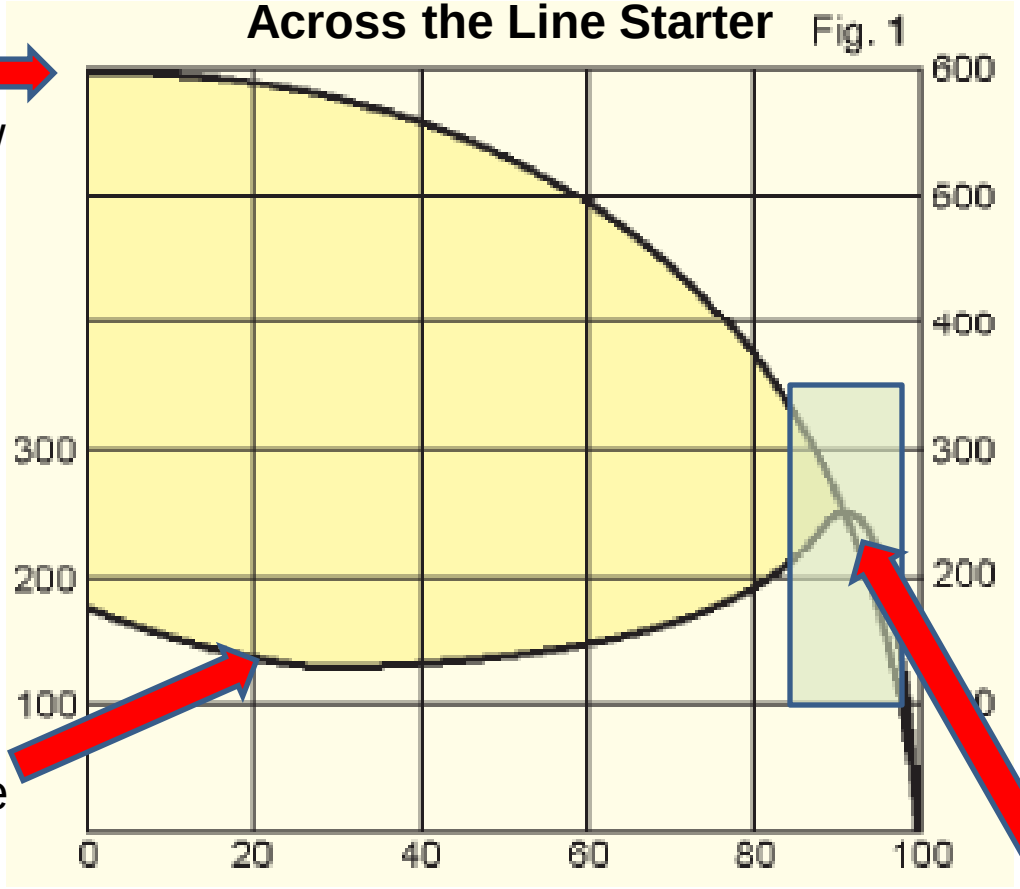
RPM

Performance Curve

Relationship between Torque and Current Across the Line Starter Fig. 1



Current Draw

Torque Curve

Motor reaches efficiency

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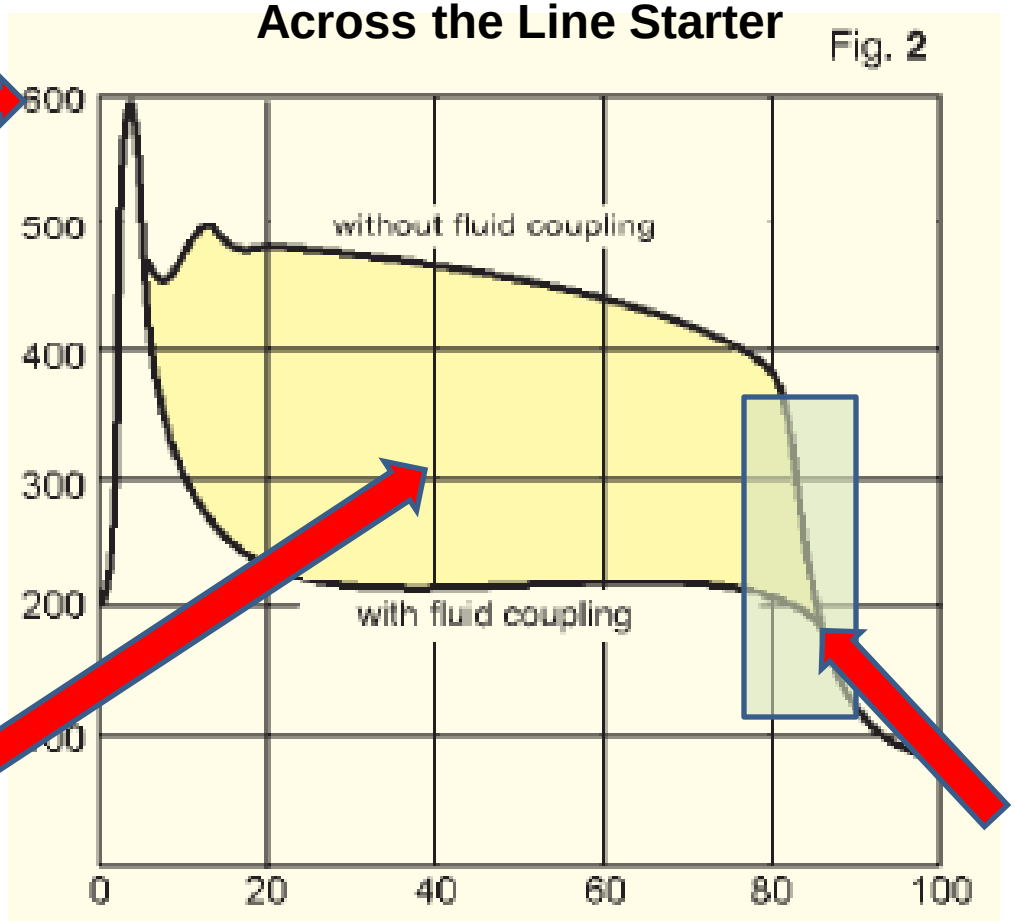
RPM

Performance Curve

Current Draw with and without a Fluid Coupling Across the Line Starter



Current Draw

Energy Lost

Motor reaches efficiency

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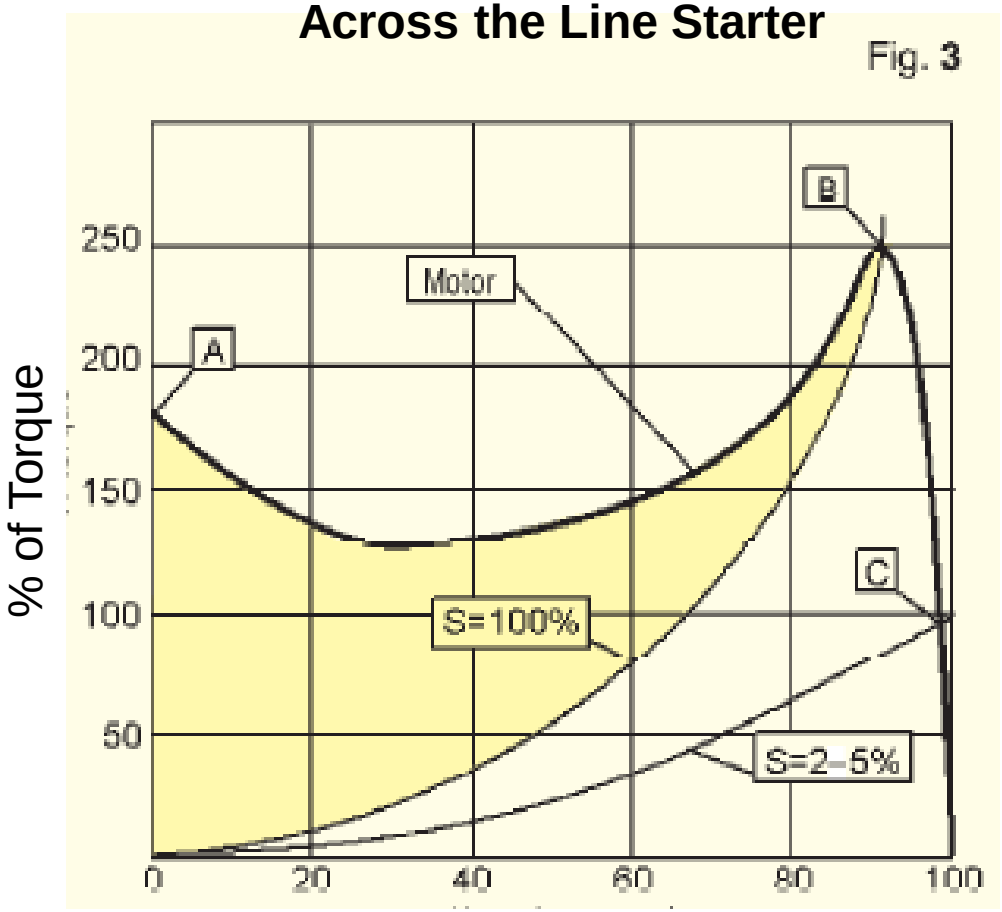
Performance Curve

Torque Curve with and without a Fluid Coupling Across the Line Starter



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Delay Fill Chamber Advantages

Improved start up time

Higher torque limitation

Lower current peaks

Better fluid cooling because of bigger surface to dissipate the generated heat

Three delay chamber types

K design without delay chamber

CK design with single delay chamber

CCK design with double delay chamber

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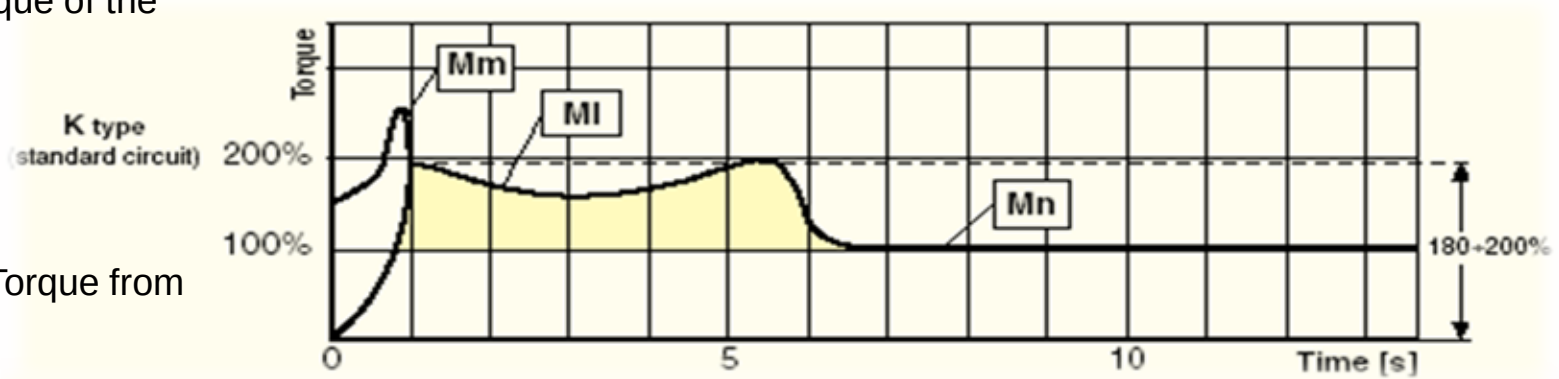
Fluid Coupling Curve Characteristics

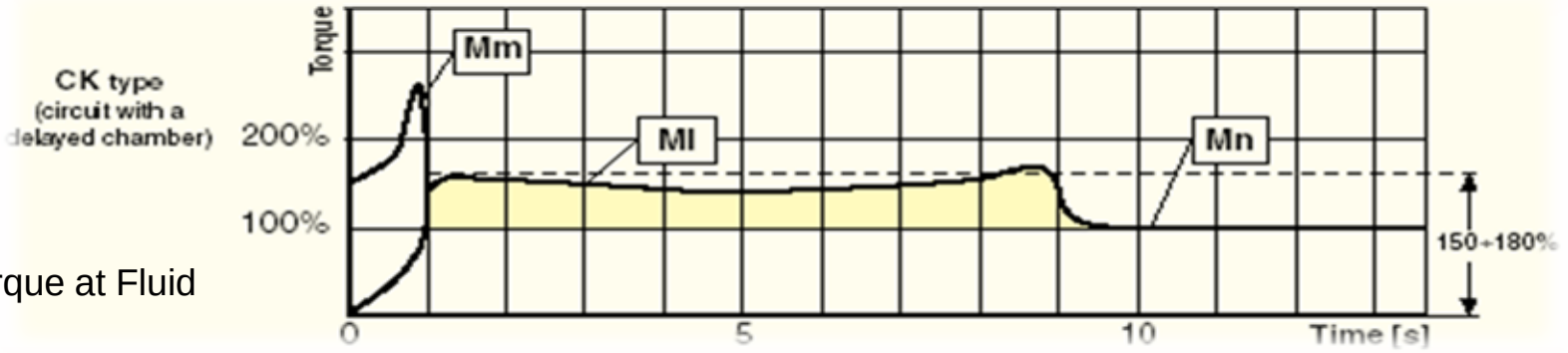
Mm = Starting Torque of the Electric Motor

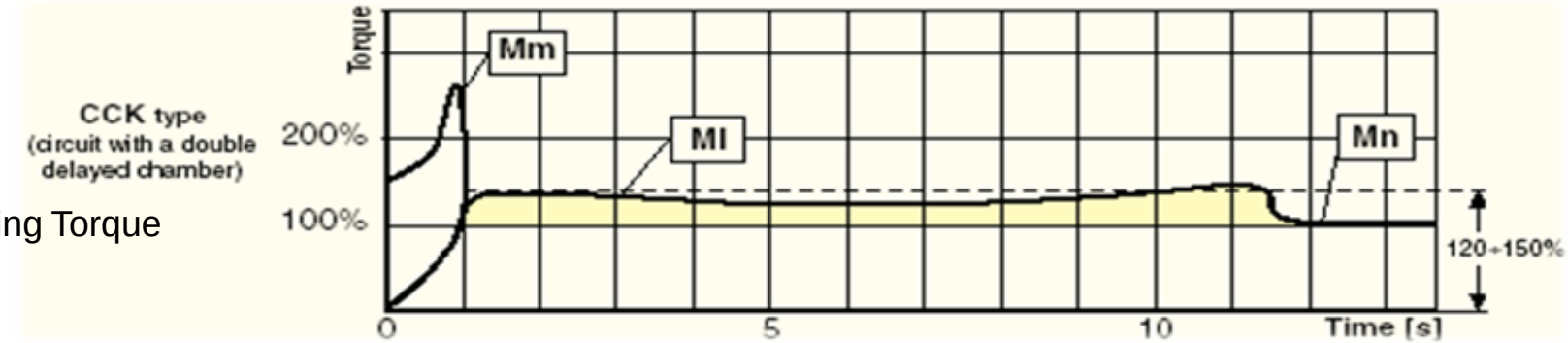
MI = Transmitted Torque from Fluid Coupling

Mn = Nominal Torque at Fluid Load

…… Accelerating Torque







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What makes a good soft-starter?

Key factors are **Starting torque** and **speed control** are key subjects in modern **process designs**. A good drive should meet the following requirements:

Allows the use of regular squirrel-cage motors

Unloaded motor starting

Load sharing with multiple drives, staggered motors start-up

Torque limitation during acceleration

Smooth increase of starting torque up to process “break away”

Easy handling and compact design

Low wear and maintenance

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Fluid Couplings vs. Soft-Starts?

Electronics must be installed in a controlled environment and are susceptible to environmental conditions.

Fluid Couplings excel in dirt, hot, humid, wet and dusty locations.

Electronic devices react to power supplied, over/under voltage, lightening, blackout and harmonics.

Fluid Couplings are independent, they are unaffected by power supplied.

Electronic devices usually require specially wound motors.

Fluid Couplings will use any motor.

Electronic devices have a manufacturing life cycle of 7 years, 7 years for parts.

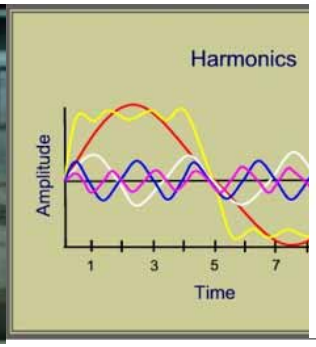
Fluid Couplings have barely changed in the past fifty years.

Electronic are extremely difficult to repair and require highly priced technician to repair .

Fluid Couplings are simple to repair and it can be done at most well equipped shops.

Drives designed with electronics, rigid and unforgiving to jams and shocks.

The super elastic effect of a fluid coupling prevents equipment damage from shocks, jams and overload.



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Fluid Coupling Advantages?

Very smooth start-ups

Reduction of motor current absorptions during the starting phase: the motor starts with low load.

Protection of the drive line from jams, overloads and vibrations increasing the drive-line life.

Use asynchronous squirrel cage motors instead of special motors for soft-starter or inverter devices.

Limited starting torque even below electric motor nominal torque.

Possibility to achieve a high number of starts.

Load balancing with multiple motor drive: fluid couplings easily adjust load speed to the motor speed.

High efficiency, Minimum maintenance

Load balancing in case of a multiple motor drive: fluid couplings easily adjust load speed to the motor speed

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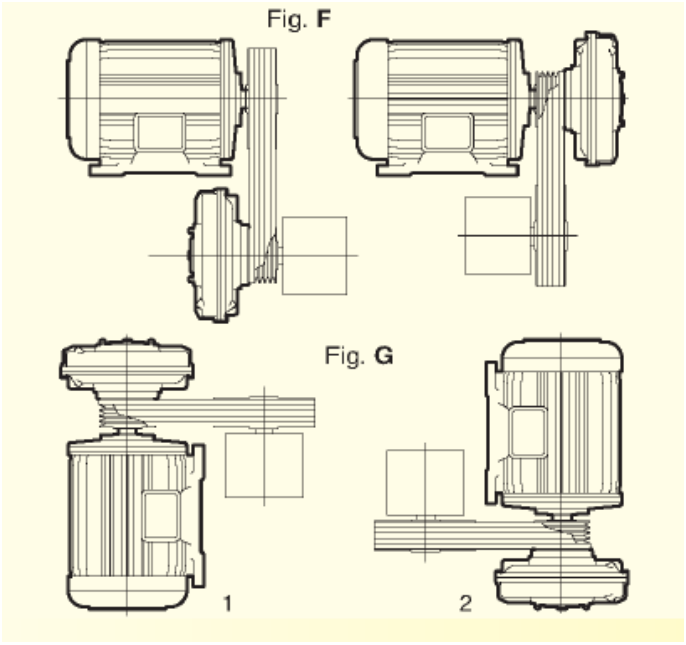
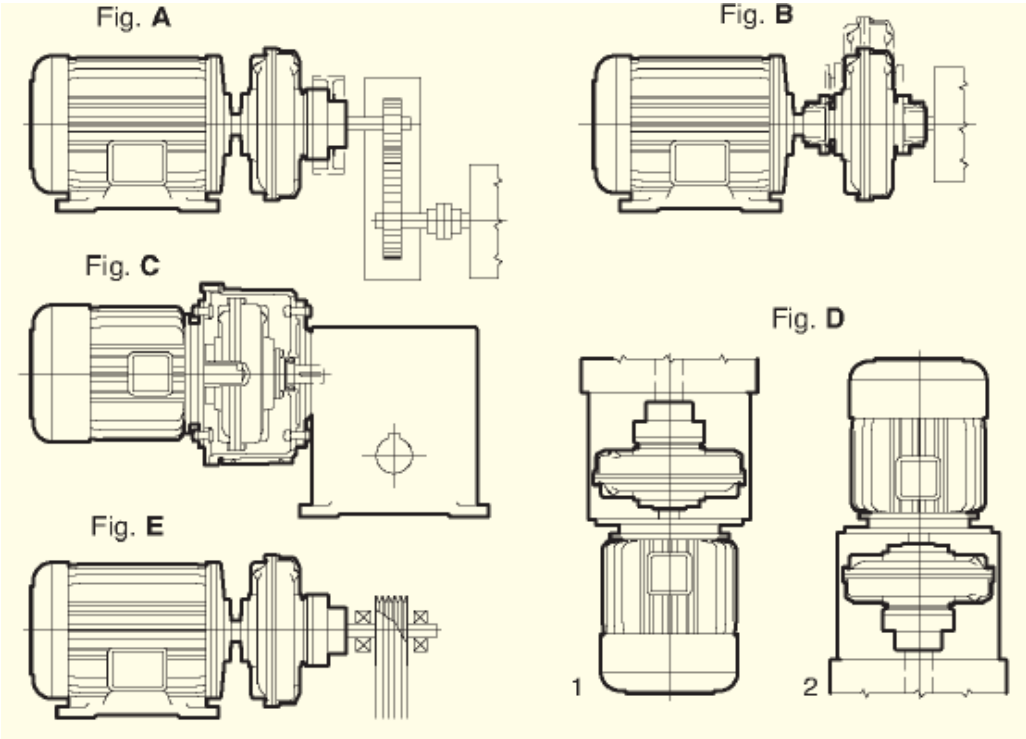
Fluid Couplings Mounting Configurations

V-Belt “Vertical &Horizontal”



Chain – “C”Face – Direct Mount “Vertical &Horizontal”



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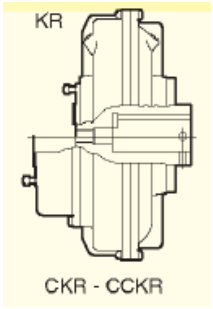
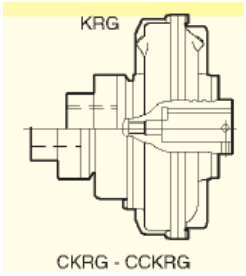
Fluid Couplings Configurations

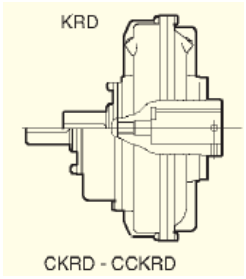
KR



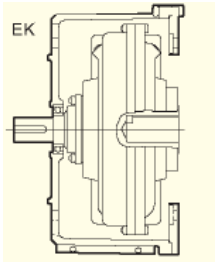
KRG



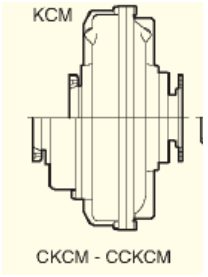
KRD



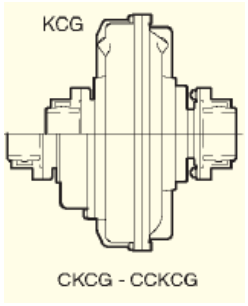
EK



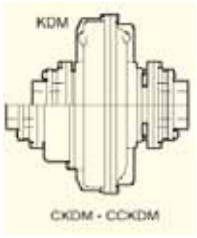
KCM



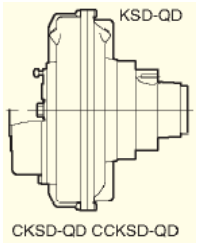
KCG



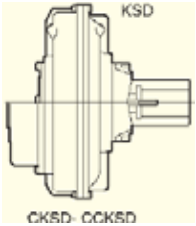
KDM



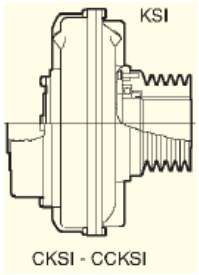
KSD -QD



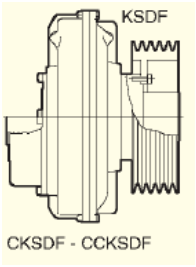
KSD



KSI



KSDF



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Sizing a Fluid Couplings

What do we need to size the Fluid Coupling?

The minimum is
- Horse Power
- RPM
- Application

Better with
- Locked Rotor Amp
- Locked Rotor Torque
- Full Load Torque

Best with
- All the above information
- Manufacturer
- Part Number

MOTOR		(1) 3600 rpm		1800 rpm		1200 rpm		900 rpm	
FRAME	SHAFT DIA mm (inch)	HP	COUPLING	HP	COUPLING	HP	COUPLING	HP	COUPLING
143T	22.225 (0.875)	1.5	6 K	1	6 K	0.75	7 K	0.5	7 K
145T		2		1.5 - 2		1		0.75	8 K
182T	28.575 (1.123)	3	7 K	3	7 K	1.5	8 K	1	
184T		5		5		2		1.5	9 K
213T	34.925 (1.375)	7.5		7.5	8 K	3		2	
215T		10 - 15		10		5	9 K	3	11 K
254	41.275 (1.625)	15 - 20	8K	15	9 K	7.5	11 K	5	13 K
256T		20 - 25		20		10		7.5	13 K
284T	47.625 (1.875)	-	-	25	11 K	15	12 K	10	
284TS	41.275 (1.625)	30	9K	-	-	-	-	-	-
286T	47.625 (1.825)	-	-	30	12 K	20	13 K	15	15 K
286TS	41.275 (1.625)	40	9K	-	-	-	-	-	-
324T	53.975 (2.125)	-	-	40	12 K	25	13 K	20	17 K
324TS	47.625 (1.875)	50	9K	-	-	-	-	-	-
326T	53.975 (2.125	-	-	50	13 K	30	15 K	25	17 K
364T	60.325 (2.375)			60		40		30	
365T				75	15 K	50		40	
404T	73.025 (2.875)			100		60	17 K	60	19 K
405T				125	17 K	75		60	
444T	85.725			150		100	19 K	75	

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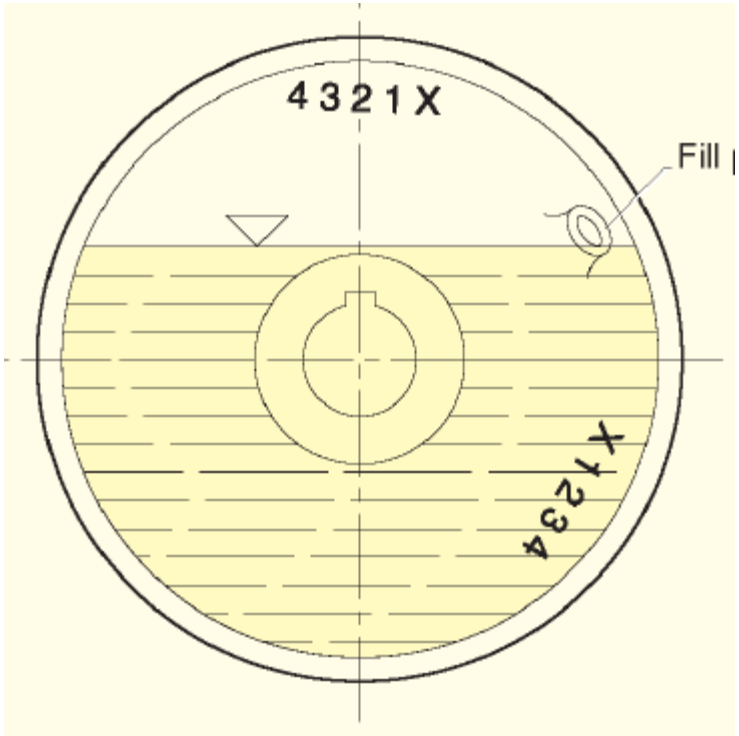
Filling the Fluid Couplings

For normal operating conditions, use only **ISO HM32 Hydraulic** (or the equivalent **SAE 10W non-detergent motor oil**). At low ambient temperatures (32ºF/0ºC), it is recommended to use **ISO FD 10** (or equivalent **SAE 5W**) oil.



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Various types of Fluid Couplings

KX SERIES

30HP - 1,600HP
1,000 RPM - 1,800 RPM

KX has a fusible plug that in case of intervention, releases the oil from the working circuit to a tank preventing oil leakage into the ambient

The bearings are greased for life and additionally protected by two double seals

Instead of oil, the coupling can work using treated water upon
request - **Water/glycole** mixture

KX fluid couplings with ATEX rules for gas and dust explosion protection

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KPTB
Variable Fill Fluid Coupling

Transfluid designed the KTB series variable fill fluid coupling to overcome difficulties experienced during ‘start up’ and ‘speed variation’ operation for medium or high powered machines, driven by electric motors or internal combustion engines.

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KSL
Variable Fill Fluid Coupling

Transfluid designed the KSL series variable fill fluid coupling to overcome difficulties experienced during ‘start up’ and ‘speed variation’ operation for medium or high powered machines, driven by electric motors or internal combustion engines.

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SKF FLUID COUPLING

FOR INTERNAL COMBUSTION ENGINES

UP 180HP

KPT FLUID COUPLING

FOR INTERNAL COMBUSTION ENGINES

UP 1,500HP

REMOTE START & STOPS

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Other Transfluid Products
Distributed by Kraft Power Corporation

Hydraulic or Air Actuated Power Take-off
Powers up to 1,100 HP
Remote engagement

Multi Pump Drive
Designed to “sandwich” between and engine and a PTO or Transmission , SAE standard
Drives Pulleys, Pumps, ETC

RBD Elastic Coupling
Designed for use with industrial engines in stationary applications such as generators, pumps, and compressor sets.

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For more info:

Call us at 800-394-0078

or email us at gainfo@kraftpower.com

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