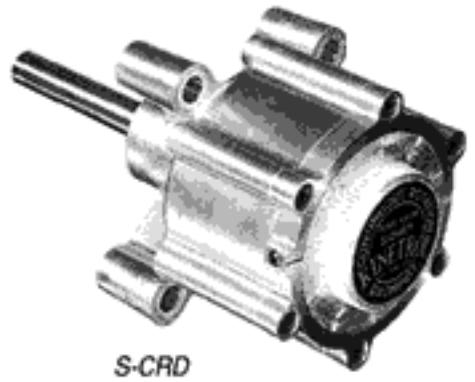
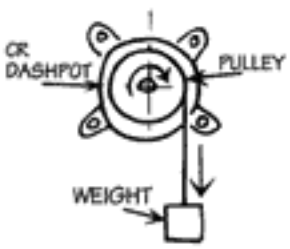
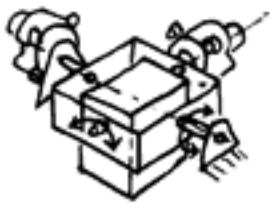
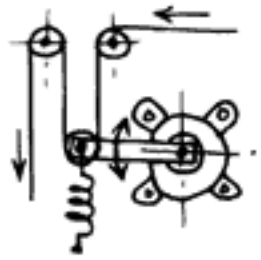
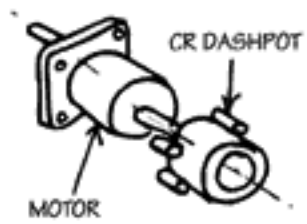
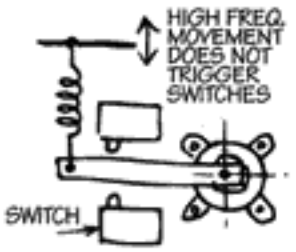
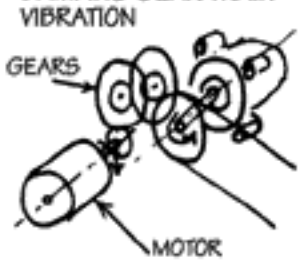
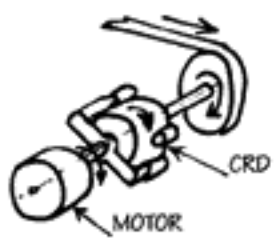
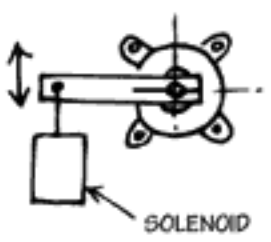
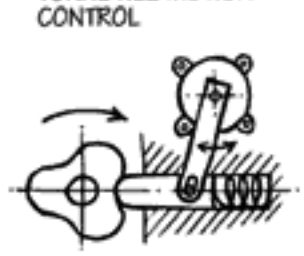
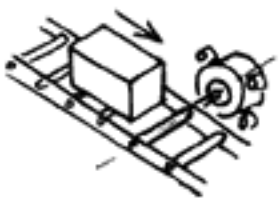
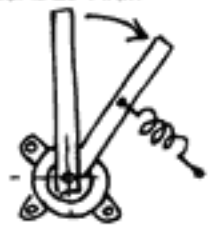
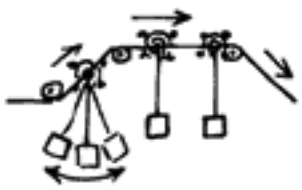
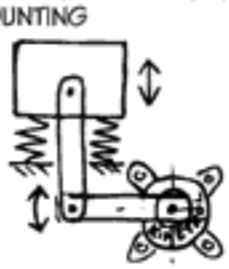
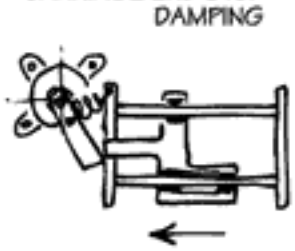
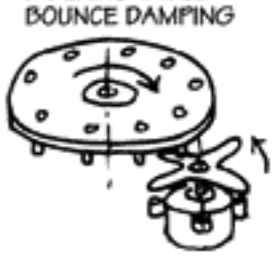
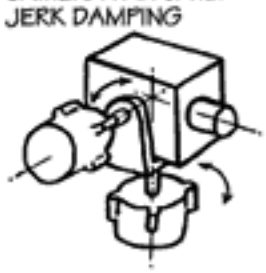
Applications

- **vibration damping**
- **speed control**
- **shock absorption**
- **slipping drives**
- **mechanical delays**



S-CRD

Sketches showing some application ideas

CONTROL OF DESCENT 	DAMPING GIMBALS 	TENSION ROLLER DAMPING 	STEPPING MOTOR DAMPING 	DAMPING UNBALANCED WEIGHTS 
VEHICLE LEVEL SENSOR 	DAMPING GEAR TRAIN VIBRATION 	DRIVING TAKE UP REEL 	SOLENOID DAMPING 	TURNSTILE MOTION CONTROL 
CONVEYOR ROLLER DAMPING 	DAMPING SPRING LOADED ARM 	HANGING CONVEYOR SWING DAMPING 	MANUAL CONTROL YOKE DAMPING 	PENDULUM SWING DAMPING 
DAMPING ANTI-VIBRATION MOUNTING 	DAMPING HIGH SPEED PAPER FEED 	CARRIAGE END STOP DAMPING 	INDEXING TABLE BOUNCE DAMPING 	CAMERA PAN & TILT JERK DAMPING 

The policy of Kinetrol is one of continuous improvement and the company reserves the right to alter the product as described and illustrated without notice. Whilst every effort is made to ensure that information presented is correct, Kinetrol will not be responsible for incorrect application of Kinetrol dashpots following the use of data given in this brochure.

Dashpots

ROTARY DASHPOTS

☐ **Kinetrol rotary dashpots**
Kinetrol rotary dashpots are precision fluid damping devices which give a smooth resistance to shaft rotation which increases with angular velocity. Two types of dashpot are available to suit a wide range of applications.

Vane dashpots
Vane dashpots give a restricted travel and high damping rate suitable for applications with reciprocating motions.

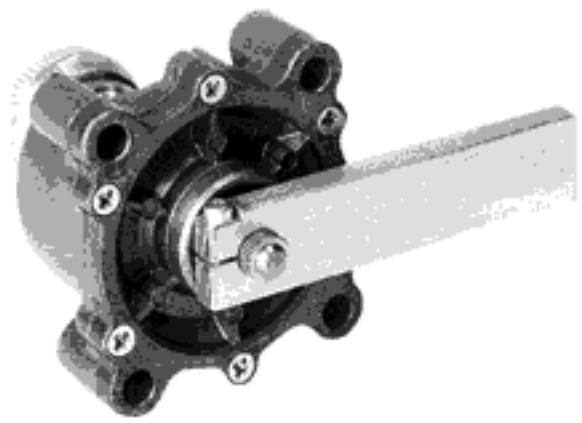
Continuous rotation dashpots
Continuous rotation dashpots give less damping rate but unlimited travel.

☐ **Silicone Fluid** (Polydimethyl Siloxane - DC200 or equivalent)
Silicone fluid is used as the damping medium because of its stable viscous properties. Dashpots are normally vacuum filled and sealed for life.

☐ **Rigorous 100% inspection**
Kinetrol's rigorous quality programme, approved to ISO 9002, ensures that each unit is manufactured to high standards. Every dashpot is tested to ensure that it gives the specified rate.

Certificate No. FM 22163

VANE DASHPOTS



Angle of travel:
60° (model KD)
215° (model LA)
240° (model LB)

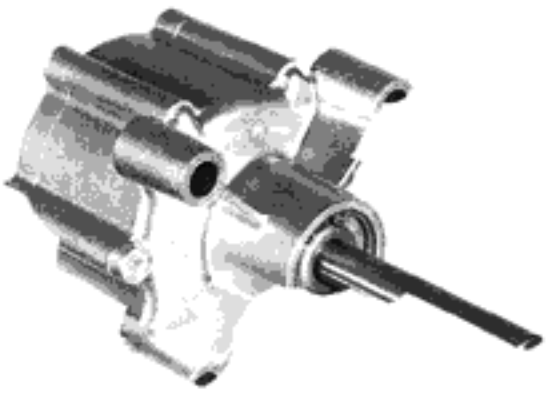
Maximum torque:
28 Nm (model KD)
40 Nm (model LA)
160 Nm (model LB)

Maximum rate:
450 Nm/rad/s (model KD)
300 Nm/rad/s (model LA)
400 Nm/rad/s (model LB)

Adjustable versions

The vane dashpot is a displacement damper. As the vane on the shaft rotates between fixed vanes on the body, silicone fluid is displaced through controlled clearances from one side of the vane to the other. Damping can be in both directions or valves can be fitted to give damping in one direction only. On the KD unit, shaft sealing is by a cylindrical rubber seal which is bonded both to the shaft and to the body to give a hermetic seal. The LA and LB dashpots use a lip seal.

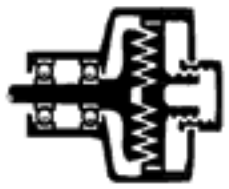
CONTINUOUS ROTATION DASHPOTS



Unlimited travel

Effective rate:
up to 20 Nm/rad/s (T-CRD)

Adjustable versions



Continuous rotation dashpots give viscous damping by shearing thin layers of silicone fluid between the concentric surfaces of a rotor and a fixed stator. Damping is normally in both directions. The shaft is sealed with a lip seal. Damping is adjusted by varying the effective thickness of the sheared layer of fluid by moving the stator relative to the rotor.

Dashpot Sizing

GENERAL NOTES

1. For calculation purposes the rotation speed of the dashpot is given in RADIANS per second (1 radian = 57.3°). The significance of a radian is that if, for example, a 1 metre radius lever rotates through 1 radian, the end of the lever moves 1 metre, a distance equal to the radius.

2. Damping RATE is defined here as TORQUE divided by ROTATION SPEED. Note that a dashpot with a high rate may not necessarily be working at a high torque. For example, a dashpot may have a rate of 100 Nm/rad/s; however, it may be rotated at 1/10 rad/s so that the damping torque produced is 10 Nm which is not numerically equal to the rate.

DASHPOT SELECTION

1. To select a suitable dashpot for an application, the suggested procedure is first to establish the RATE required. Most applications can be reduced to one of the cases shown opposite. The formula concerned will give the RATE.

2. Having established the rate required, the type of dashpot (vane or continuous rotation) must be selected. This usually depends on the angle of travel required.

3. It is recommended that initially an adjustable dashpot is used in an application. This allows the exact damping rate to be established. Subsequent units can then be supplied with fixed rates based on measurement of the adjustable unit as set on the application.

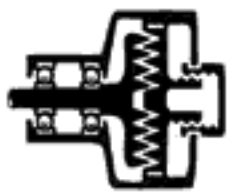
VANE DASHPOTS - (High rate, restricted travel)

1. Establish the rate from the formula for one of the cases opposite (or otherwise).

2. Check that the maximum shaft torque does not exceed the maximum allowable. Note that max. torque = RATE x max. speed of rotation.

3. For a vane dashpot the RATE does not vary much with speed and so can be used to specify the unit.

CONTINUOUS ROTATION DASHPOTS - (Lower rate, unlimited travel)



1. Establish the rate from the formula for one of the cases opposite (or otherwise).

2. Calculate the working speed w in radians/sec.

3. Calculate the working torque (RATE x working speed of rotation).

4. The rate of a CR dashpot is not constant. It varies with speed. This is because at the high shear rates used by this method of damping the viscosity of the fluid is not constant (Non-Newtonian). The performance of a CR dashpot is thus not specified by a single rate but is specified by a graph showing torque against speed of rotation.

5. To select a CR dashpot plot the required working torque against the speed on the graph given on the data sheet. The nearest curve above the point gives the selected dashpot.

TEMPERATURE EFFECTS

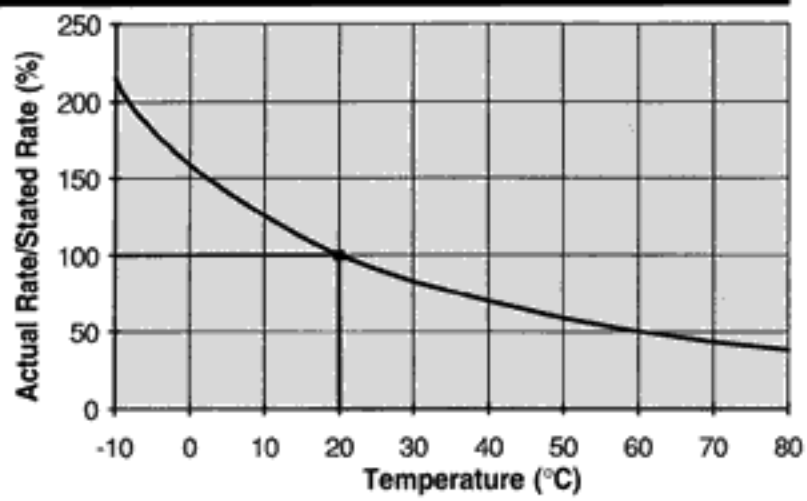
Damping rate is reduced by increases in fluid temperature (and increased by reduction in temperature). The graph opposite indicates the percentage change in damping rate with temperature, relative to the rate quoted at 20°C.

Dashpots compensated for temperature change, to keep damping rate constant, can be supplied to special order.

In addition to the effect of ambient temperature, heating of the dashpot above ambient is caused by the power absorbed by the damping action. Power dissipation limits are given for 20°C ambient. At temperatures above 20°C these power limits are derated by a factor:

$$(T_L - T_A)/(T_L - 20)$$

where T_L = Limit Temperature and T_A = Ambient Temperature.

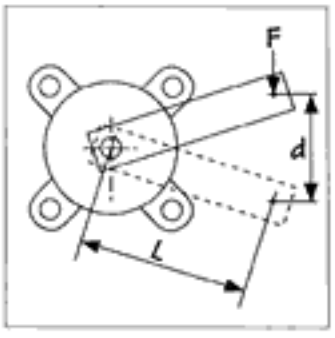


Calculating Required Damping Rates

METRIC UNITS

Given quantity and unit

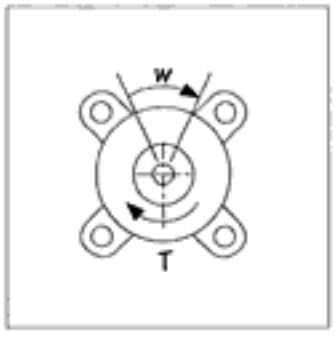
F N = force of weight on end of lever
L m = effective length of lever
d m = distance moved by end of lever
t s = time taken to move this distance
w rad/s = speed of rotation
T Nm = torque applied to shaft
M kg = mass
V m/s = velocity of mass
f Hz = frequency of vibration



1. Steady movement in a straight line.

Required rate:

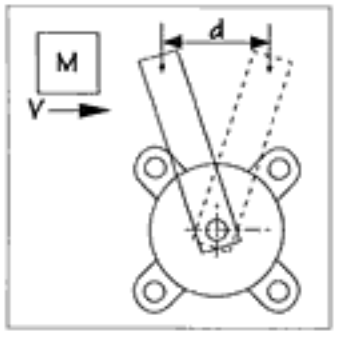
$$= \frac{FL^2t}{d} \quad \text{Nm/rad/s}$$



2. Steady rotation.

Required rate:

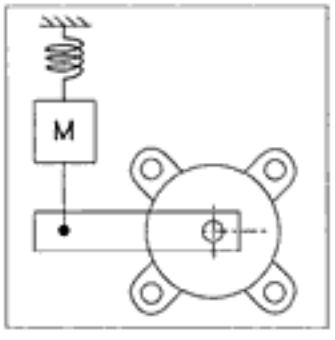
$$= \frac{T}{w} \quad \text{Nm/rad/s}$$



3. Deceleration of mass moving in a straight line.

Required rate:

$$= \frac{MVL^2}{d} \quad \text{Nm/rad/s}$$



4. Critical damping of vibrating mass.

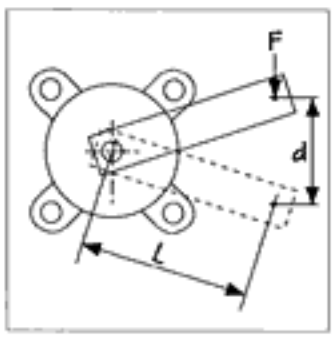
Required rate:

$$= \frac{MfL^2}{0.08} \quad \text{Nm/rad/s}$$

ENGLISH UNITS

Given quantity and unit

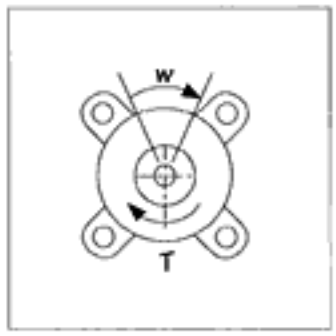
F lbf = force of weight on end of lever
L in = effective length of lever
d in = distance moved by end of lever
t s = time taken to move this distance
w rad/s = speed of rotation
T lbf.ins = torque applied to shaft
M lbf = mass
V in/s = velocity of mass
f Hz = frequency of vibration



1. Steady movement in a straight line.

Required rate:

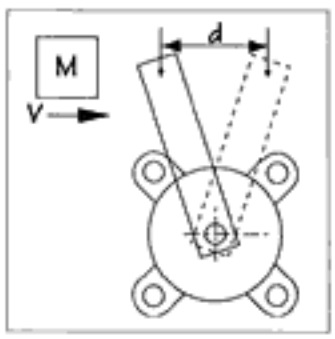
$$= \frac{FL^2t}{d} \quad \text{lbf.ins/rad/s}$$



2. Steady rotation.

Required rate:

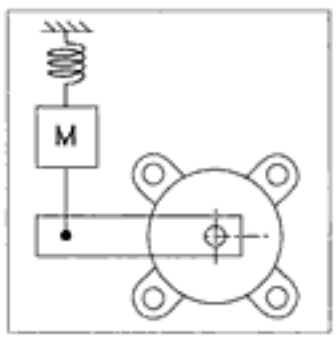
$$= \frac{T}{w} \quad \text{lbf.ins/rad/s}$$



3. Deceleration of mass moving in a straight line.

Required rate:

$$= \frac{MVL^2}{386d} \quad \text{lbf.ins/rad/s}$$



4. Critical damping of vibrating mass.

Required rate:

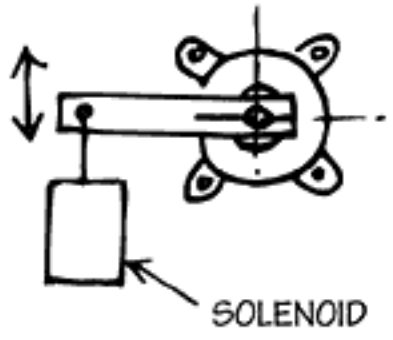
$$= \frac{MfL^2}{30.7} \quad \text{lbf.ins/rad/s}$$

CONVERSION FACTORS

1 rad = 57.3°
1 Nm = 8.85 lbf.ins
1 RPM = 0.1047 rad/s
1 lbf = 4.45 N
1 lbf.ins = 0.113 Nm
9.81N = 1 kgf = 1 kp

Sample Calculations

SOLENOID DAMPING



SOLENOID DAMPING

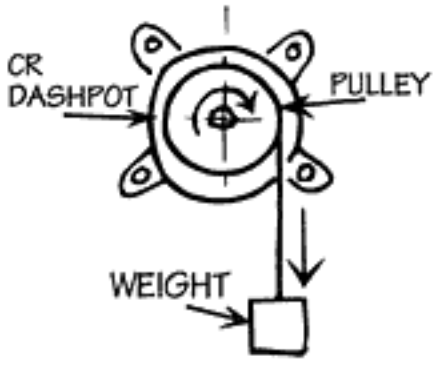
Solenoid force **F** = 10 N
Solenoid travel **d** = 25 mm = 0.025 m
Lever arm length **L** = 75 mm = 0.075 m
Travel time required **t** = 5 s

Use Formula 1: Rate = $\frac{FL^2t}{d} = \frac{10 \times 0.075^2 \times 5}{0.025}$

= 11.2 Nm/rad/s (99 lbf.ins/rad/s)

Conclusion: **Use KD – A2**

CONTROL OF DESCENT



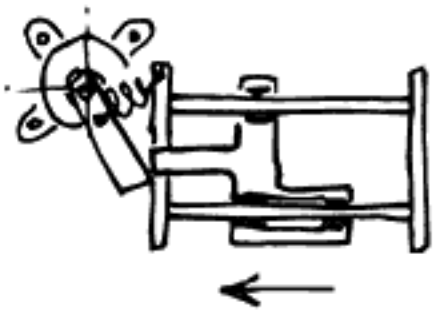
CONTROL OF DESCENT

Weight	= 1 kg	
Pulley radius	= 50 mm	= 0.050 m
Speed required, **V**	= 100 mm/s	= 0.1 m/s
Force **F**	= 1 x 9.81	= 9.81 N
Torque **T**	= 9.81 x 0.05	= 0.49 Nm
Speed of rotation **w**	= 0.1 m/s ÷ 0.05 m	= 2 rad/s

Use Formula 2: Rate = T/w = 0.49/2 = 0.245 Nm/rad/s
This is a CR dashpot application. Find point on the S – CRD graph for torque and speed.

Conclusion: **Use S – CRD – 30,000**

CARRIAGE END STOP DAMPING



CARRIAGE MECHANISM END STOP DAMPING

Carriage mass **M** = 10 kg
Velocity **V** = 1 m/s
Deceleration distance **d** = 50 mm = 0.050 m
Lever length **L** = 75 mm = 0.075 m

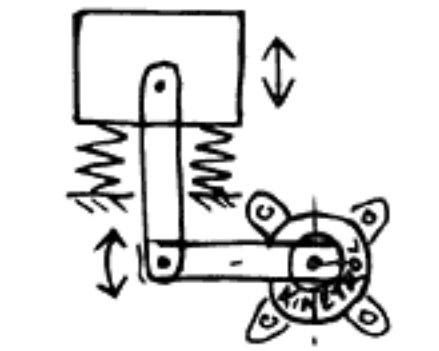
Use Formula 3: Rate = $\frac{MVL^2}{d} = \frac{10 \times 1 \times 0.075^2}{0.050}$

= 1.1 Nm/rad/s (9.7 lbf.ins/rad/s)

Check max. rotation speed = 1 m/s ÷ 0.075 m = 13.3 rad/s
Hence max. torque = 13.3 x 1.1 = 14.7 Nm (130 lbf.ins)

Conclusion: **Use KD – A1**

DAMPING ANTI-VIBRATION MOUNTING



DAMPING ANTI-VIBRATION MOUNTING

Mass **M** = 10 kg
Natural frequency **f** = 20 Hz
Lever length **L** = 100 mm = 0.10 m

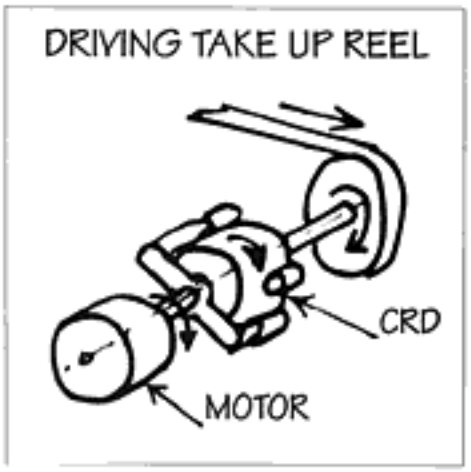
Use Formula 4: Rate = $\frac{MfL^2}{0.08} = \frac{10 \times 20 \times 0.1^2}{0.08}$

= 25 Nm/rad/s (220 lbf.ins/rad/s)

Conclusion: **Use KD – A3**

Special Applications

NOTES ON CONSTANT TENSION TAKE UP REEL DRIVE



A CR dashpot can be used as a slipping drive between a geared motor and a take up reel for winding tape or wire on to a reel. If sized correctly the tension in the tape can be maintained within reasonable limits for a ratio of maximum to minimum reel radius of up to 2.5. Difficulty sometimes arises because it is necessary to select the correct motor speed as well as dashpot rate.

Suggested Procedure

Given:
- Tape linear speed **V** m/s
- Required tension **f** N
- Minimum reel radius **a** m
- Maximum reel radius **b** m

Required motor speed **n** = 13 V/a rpm

Required damping rate **k** = $\frac{400\ f\ V}{n^2}$ Nm/rad/s

CR dashpot must give torque $\frac{0.4\ k\ V}{a}$

at a speed of 0.4 V/a rad/s.

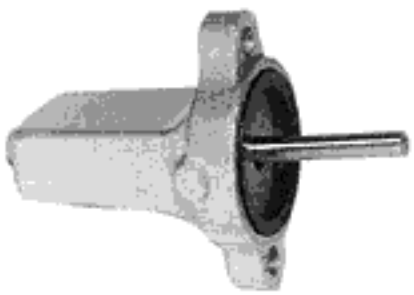
Check max. power dissipated = $k(0.1n - V/b)^2$ W

This must be less than 10W for S – CRD and 40W for T – CRD.

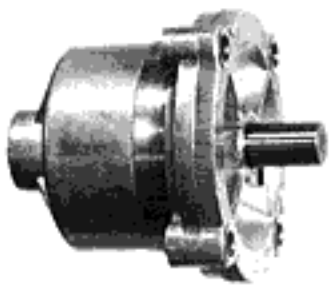
SPECIAL DASHPOTS

If required Kinetrol will engineer special dampers to your specification. Some examples of dashpots designed to suit customers applications are shown here.

1. Automotive Level Sensor (small angle vane dashpot). Pressure diecast - length 50 mm approx.



2. Photocopier carriage drive - CR dashpot. Pressure diecast - diameter 60 mm approx.



3. Aerospace application (120° travel vane dashpot). Light alloy body. Length 200 mm approx.

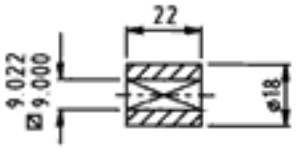
4. Aerospace Trim Control - CR dashpot. Light alloy body. Length 70 mm approx.

Model LA Dashpot

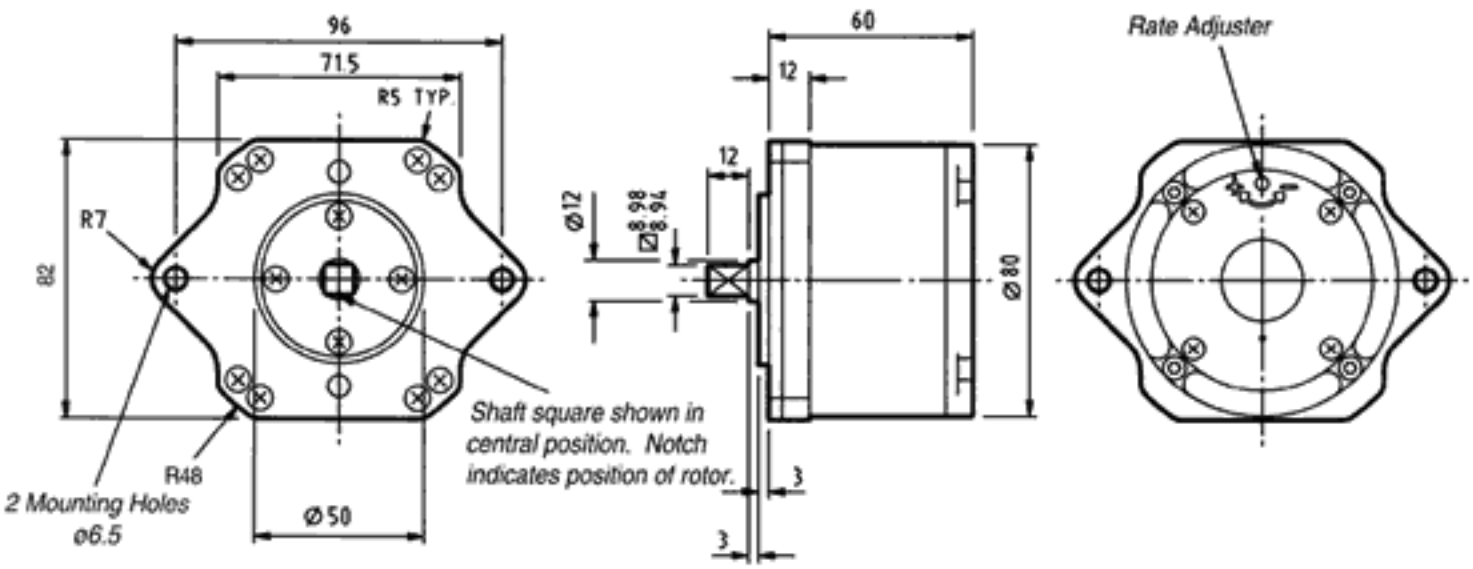
SPECIFICATION

Rate	Adjustable Max (LA4): 300 Nm/rad/s (2700 lbf.ins/rad/s)
Angle of travel	215° ± 5° External end stops must be provided
Max. safe torque	350 lbf.ins / 40 Nm Continuous power dissipation not to exceed 10W at 20°C ambient
Max. shaft end load	2 lbf / 10 N
Max. shaft side load	100 lbf / 450 N
Ambient temperature range	0°C to 60°C
Frictional torque	2 lbf.ins / 0.2 Nm typical
Shaft material	Stainless steel 441S49
Body material	Zinc alloy Ilzro 16
Weight:	3.6 lbs / 1.61 kg

British and Foreign Patents Applied For



STANDARD COUPLING



Dimensions in mm

RATES

An adjuster permits any damping rate to be obtained within one of the following ranges. This range must be specified when ordering the dashpot.

- ☐ **LA1:** 22 to 220 lbf.ins/rad/s / 2.5 to 25 Nm/rad/s
- ☐ **LA2:** 53 to 530 lbf.ins/rad/s / 6 to 60 Nm/rad/s
- ☐ **LA3:** 106 to 1060 lbf.ins/rad/s / 12 to 120 Nm/rad/s
- ☐ **LA4:** 266 to 2660 lbf.ins/rad/s / 30 to 300 Nm/rad/s

With adjuster set to maximum the rate may exceed stated maximum and with adjuster set to minimum the rate may be less than stated minimum.

OPTIONS

The following features may be specified for any model:-

Differential Rate (FC or FAC)
Gives a large resistance in one direction only and less than 1/10 resistance in the other. Specify free clockwise or free anticlockwise when viewed from shaft end.

Double Damping (DD)
Gives equal resistance in either direction.

Couplings
Steel couplings are available.

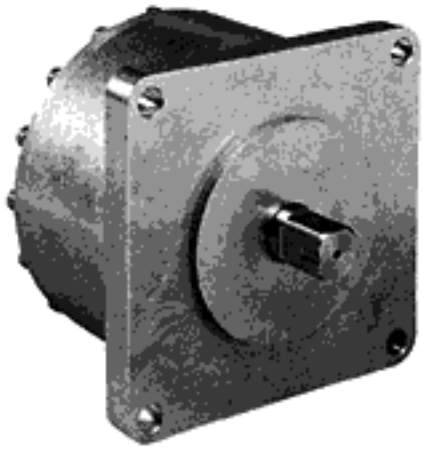
ORDERING CODES

LA1, 2, 3 or 4 – DD
LA1, 2, 3 or 4 – FC or FAC

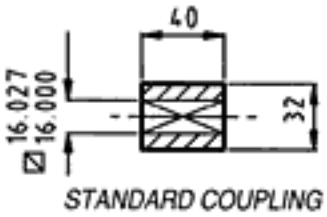
Model LB Dashpot

SPECIFICATION

Rate	Adjustable Max (LB4): 400 Nm/rad/s (3500 lbf.ins/rad/s)
Angle of travel	240° ± 5° External end stops must be provided
Max. safe torque	1400 lbf.ins / 160 Nm Continuous power dissipation not to exceed 80W at 20°C ambient
Max. shaft end load	5 lbf / 22 N
Max. shaft side load	200 lbf / 890 N
Ambient temperature range	0°C to 60°C
Frictional torque	5 lbf.ins / 0.5 Nm typical
Shaft material	Stainless steel 441S49
Body material	Zinc alloy Ilzro 16
Weight:	13.5 lbs / 6.14 kg

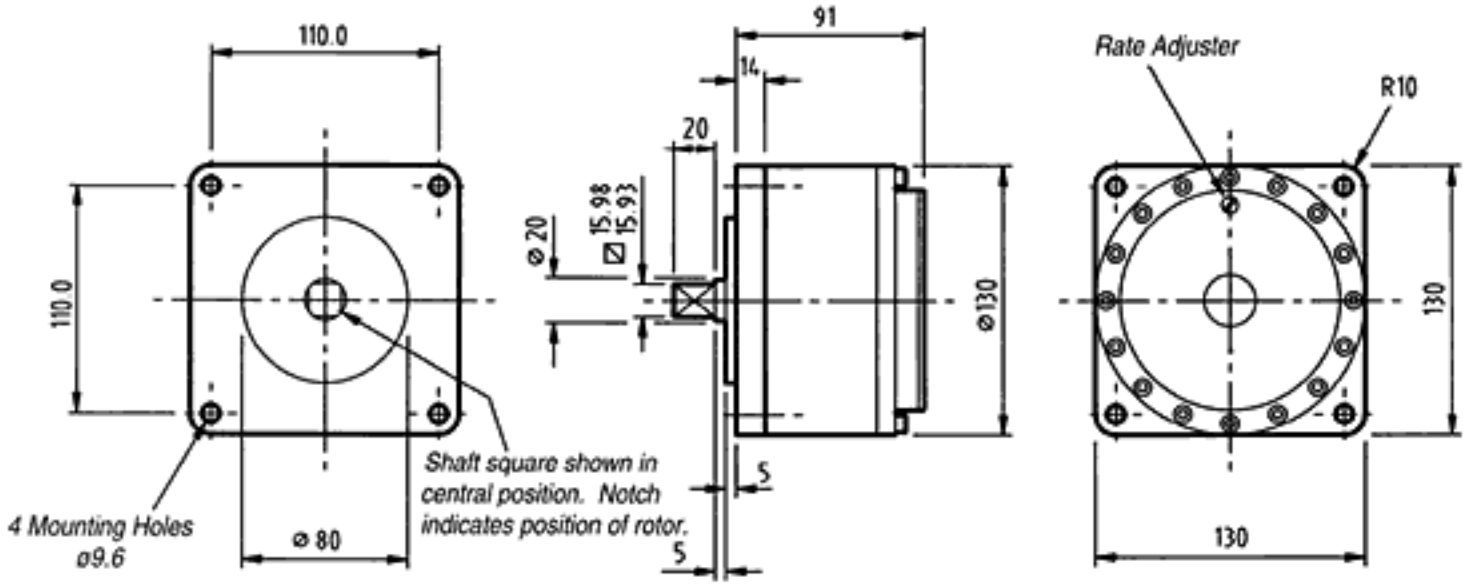


British and Foreign Patents Applied For



STANDARD COUPLING

Dimensions in mm



RATES

An adjuster permits any damping rate to be obtained within one of the following ranges. This range must be specified when ordering the dashpot.

- ☐ **LB1:** 35 to 350 lbf.ins/rad/s / 4 to 40 Nm/rad/s
- ☐ **LB2:** 71 to 710 lbf.ins/rad/s / 8 to 80 Nm/rad/s
- ☐ **LB3:** 150 to 1500 lbf.ins/rad/s / 17 to 170 Nm/rad/s
- ☐ **LB4:** 350 to 3500 lbf.ins/rad/s / 40 to 400 Nm/rad/s

With adjuster set to maximum the rate may exceed stated maximum and with adjuster set to minimum the rate may be less than stated minimum.

OPTIONS

The following features may be specified for any model:-

Differential Rate (FC or FAC)
Gives a large resistance in one direction only and less than 1/10 resistance in the other. Specify free clockwise or free anticlockwise when viewed from shaft end.

Double Damping (DD)
Gives equal resistance in either direction.

Couplings
Steel couplings are available.

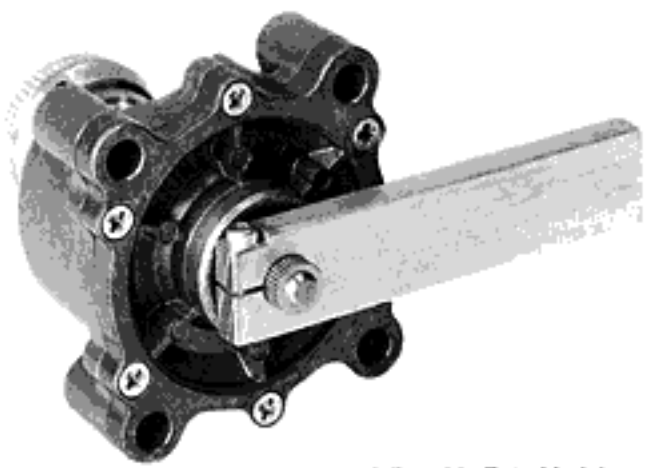
ORDERING CODES

LB1, 2, 3 or 4 – DD
LB1, 2, 3 or 4 – FC or FAC

Model KD Dashpot

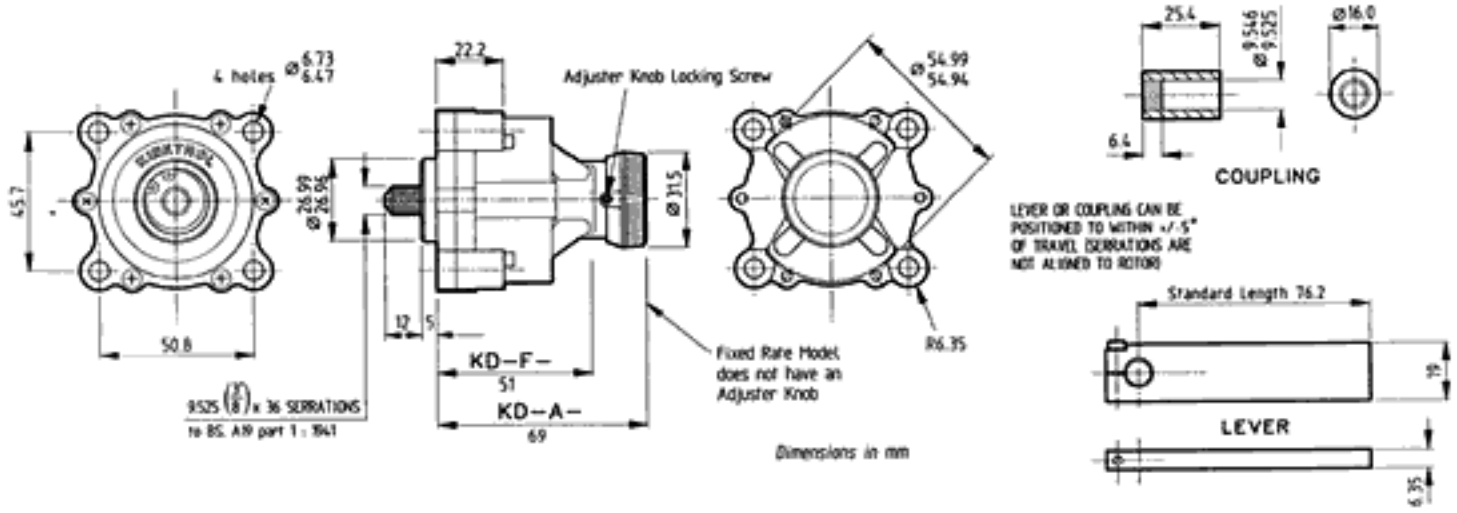
SPECIFICATION

Rate	
Fixed rate model KD – F	Any value (± 10%) between: min: 2.0 lbf.ins/rad/s 0.22 Nm/rad/s max: 4000 lbf.ins/rad/s 450 Nm/rad/s
Adjustable rate model	See below
Angle of travel	60° ± ½° External end stops must be provided
Max. safe torque	250 lbf.ins / 28 Nm. Continuous power dissipation not to exceed 10W at 20°C ambient.
Max. shaft end load	10 lbf / 45 N
Max. shaft side load	40 lbf / 178 N
Ambient temperature range	0°C to 40°C
Frictional torque	0.01 lbf.ins / 0.001 Nm typical
Shaft material	Stainless steel 431S29
Body material	Zinc alloy Mazak 3
Weight: KD – F	14.9 ozs / 423 g
KD – A	16.9 ozs / 478 g



Adjustable Rate Model

British and Foreign Patents



ADJUSTABLE RATE MODEL KD – A

Has an adjuster which permits any damping rate to be obtained within one of the following ranges. This range must be specified when ordering the dashpot.

- ☐ **A1:** 0.8 to 10 lbf.ins/rad/s / 0.09 to 1.13 Nm/rad/s
- ☐ **A2:** 10 to 100 lbf.ins/rad/s / 1.13 to 11.3 Nm/rad/s
- ☐ **A3:** 100 to 1100 lbf.ins/rad/s / 11.3 to 124 Nm/rad/s
- ☐ **A4:** 260 to 2600 lbf.ins/rad/s / 29 to 293 Nm/rad/s

ORDERING CODES

Fixed Rate Model	Adjustable Rate Model
KD – F (Rate) – DD	KD – A1, 2, 3 or 4 – DD
KD – F (Rate) – FC or FAC	KD – A1, 2, 3 or 4 – FC or FAC

OPTIONS

The following features may be specified for either model:-

Differential Rate (FC or FAC)

Gives a large resistance in one direction only and less than 1/10 resistance in the other. Specify free clockwise or free anticlockwise when viewed from shaft end. Internal valves in this type of dashpot give slight backlash. If application demands, very low backlash valve may be fitted - consult Kinetrol.

Double Damping (DD)

Gives equal resistance in either direction.
External end stops must be provided.

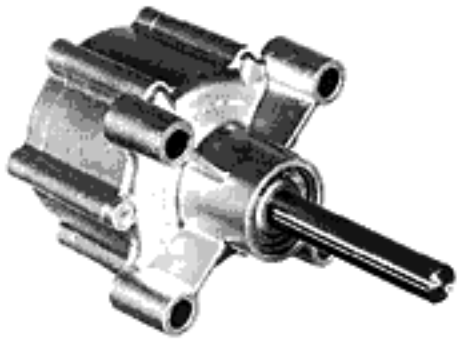
Levers and Couplings

Splined aluminium or steel levers and steel couplings are available.

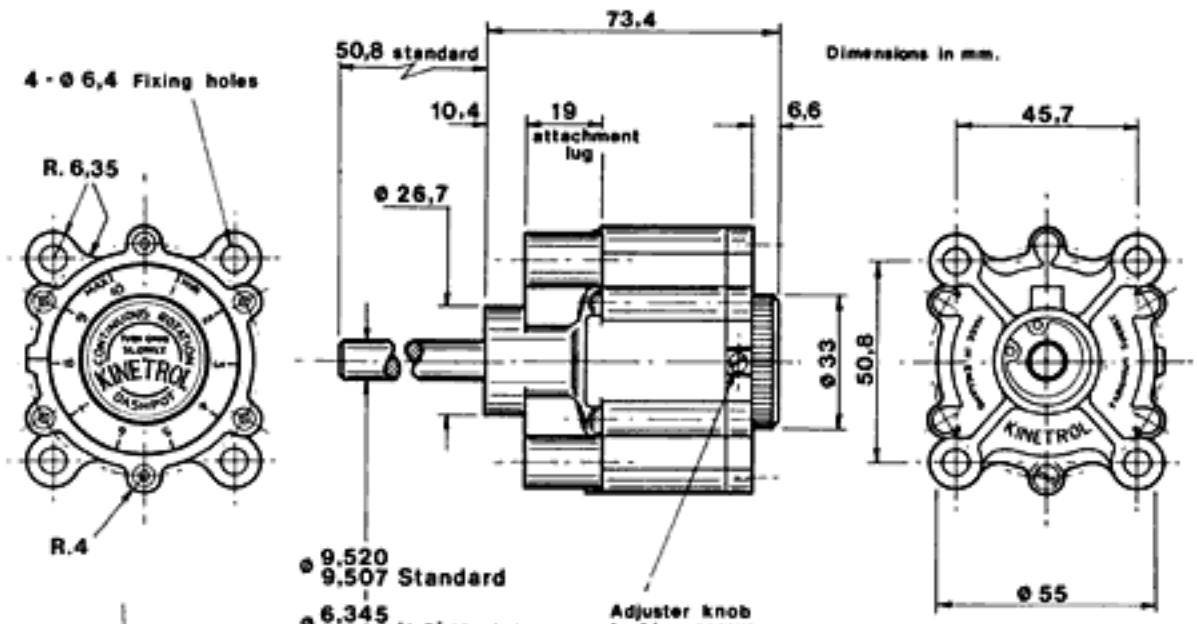
Model S – CRD CR Dashpot

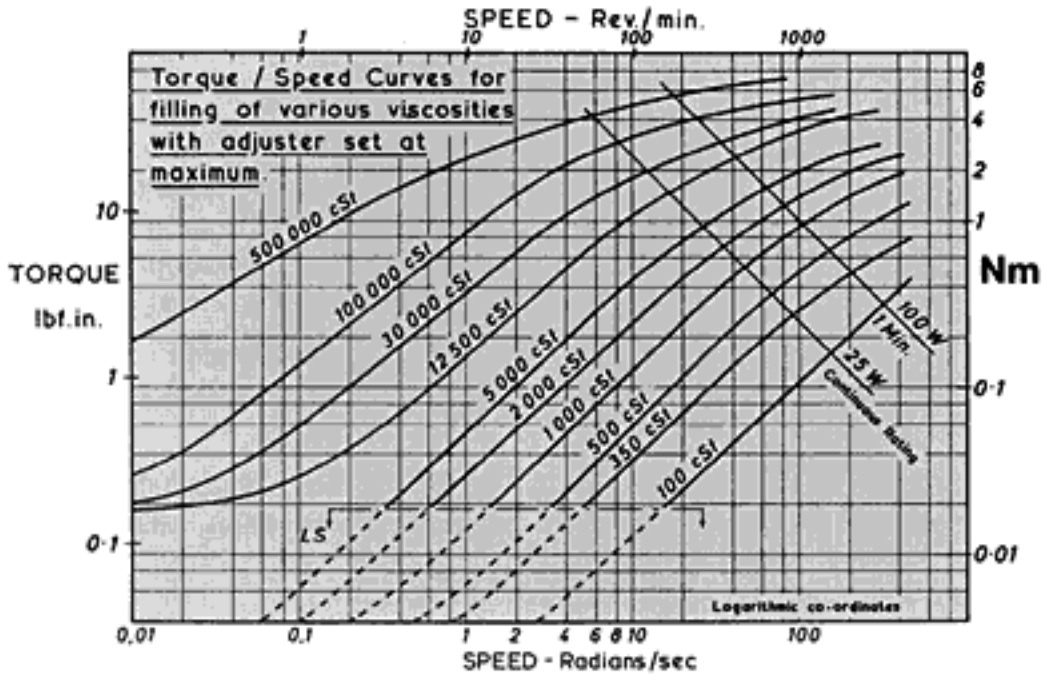
SPECIFICATION

Rate	Adjustable - see curves below (± 10%)
Max. shaft end load	20 lbf / 89 N
Max. shaft side load	26 lbf / 115 N
Ambient temperature range	0°C to 60°C
Frictional torque	0.13 lbf.ins / 0.015 Nm typical
Shaft material	Stainless steel 303S31
Body material	Zinc alloy Mazak 3
Weight	1.32 lbs / 619 g



British and Foreign Patents





This continuous rotation dashpot has an adjustable rate. Specification of a given silicone fluid filling provides maximum rates as shown by the curves opposite.

Adjustment allows the rate to be varied down to 1/10 of the maximum values, for any speed of rotation.

The adjuster knob, although marked for reference, is not normally calibrated.

The low stiction (0.025 lbf.ins / 0.003 Nm) model has a ¼" shaft. For this specifiy: 'S – CRD – LS – (Filling Viscosity)'.

VISCOSITIES AVAILABLE

100; 350; 500; 1,000; 2,000; 5,000; 12,500; 30,000; 100,000; 500,000 cSt.

ORDERING CODES

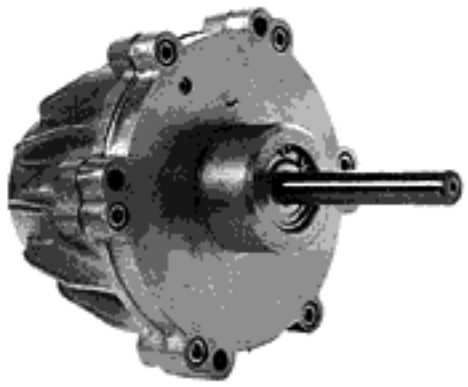
S – CRD – (Filling Viscosity)

Example: S – CRD – 30,000 has a 30,000 cSt filling.

Model T – CRD CR Dashpot

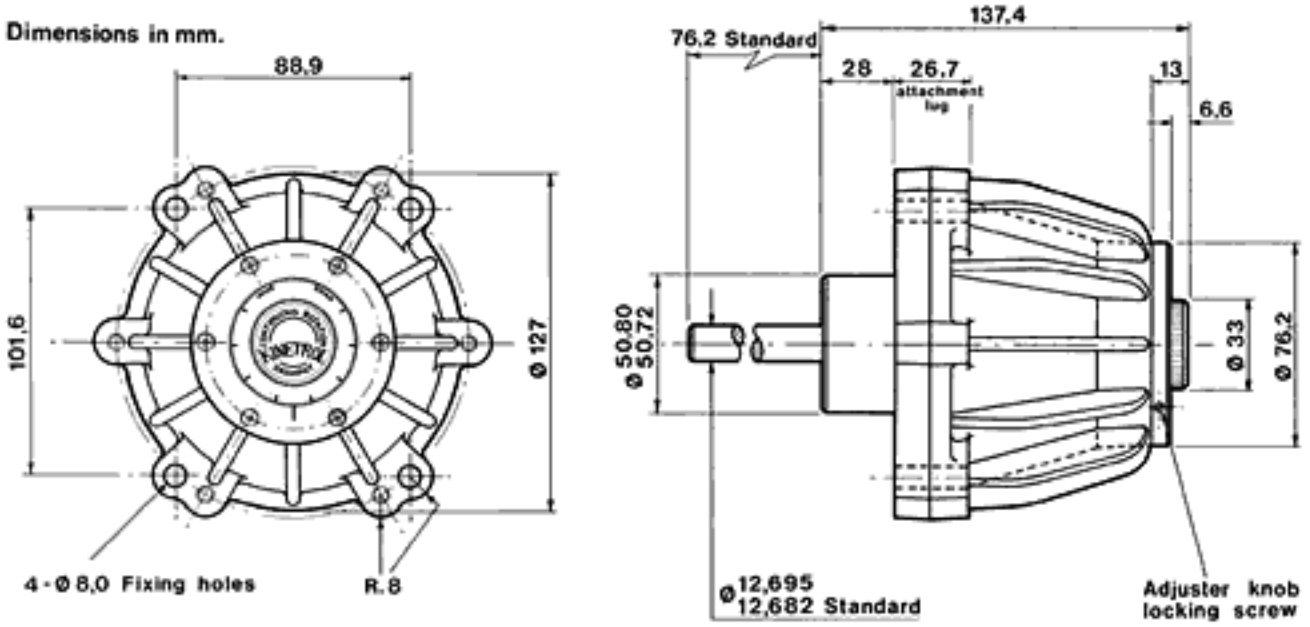
SPECIFICATION

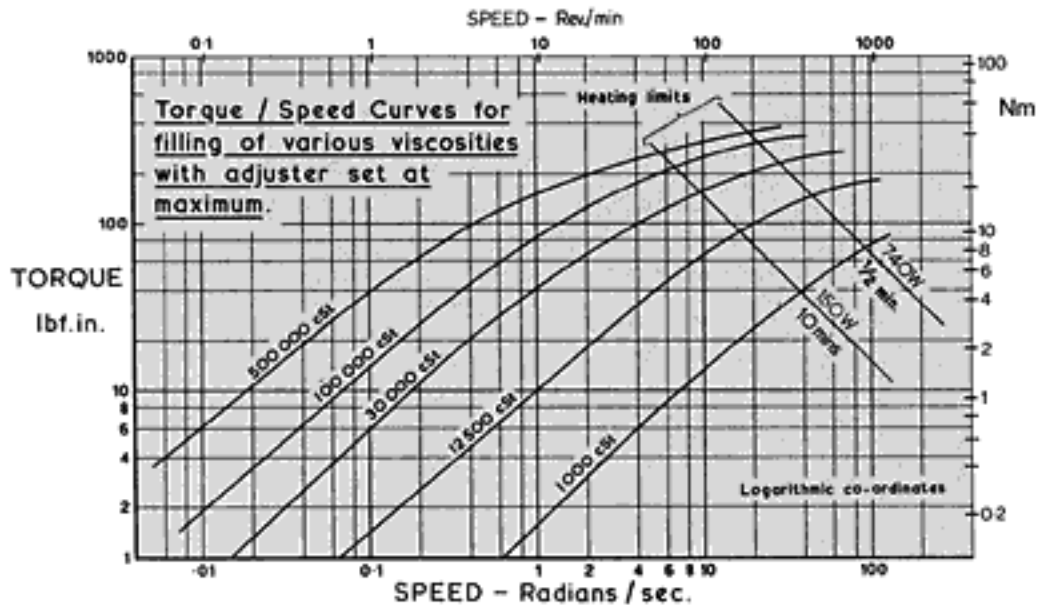
Rate	Adjustable - see curves below (±10%)
Max. shaft side load	41 lbf / 183 N
Ambient temperature range	0°C to 60°C
Frictional torque	0.5 lbf.ins / 0.056 Nm typical
Shaft material	High tensile steel 605M36(T)
Body material	Cast aluminium LM 4M
Weight	5.27 lbs / 2.39 kg



British and Foreign Patents

Dimensions in mm.





This continuous rotation dashpot has an adjustable rate. Specification of a given silicone fluid filling provides maximum rates as shown by the curves opposite.

Adjustment allows the rate to be varied down to 1/4 of the maximum values, for any speed of rotation.

The adjuster knob, although marked for reference, is not normally calibrated.

VISCOSITIES AVAILABLE

1,000; 12,500; 30,000; 100,000; 500,000 cSt.

ORDERING CODES

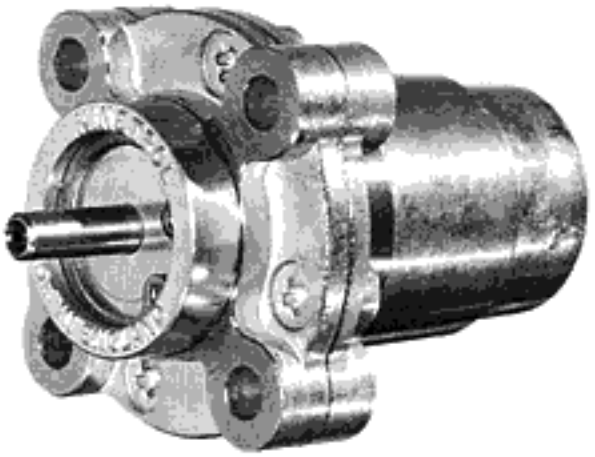
T – CRD – (Filling Viscosity)

Example: T – CRD – 100,000 has a 100,000 cSt filling.

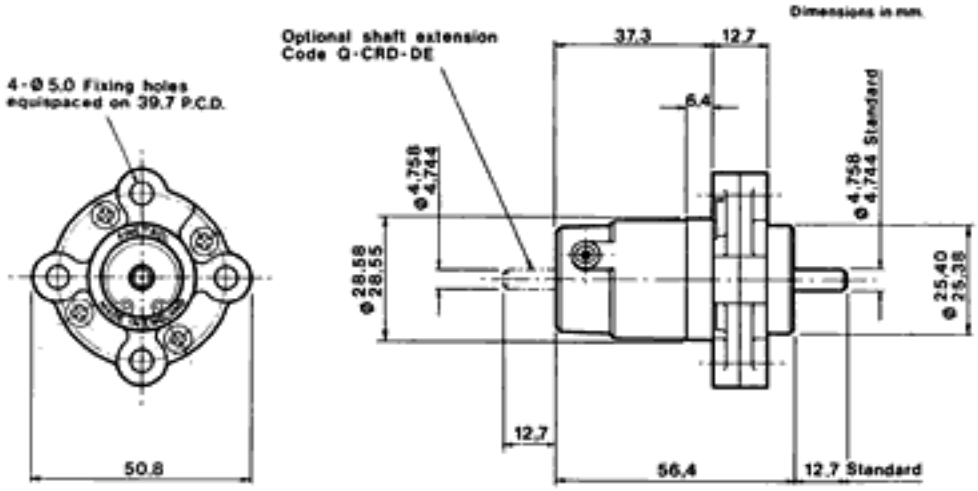
Model Q – CRD CR Dashpot

SPECIFICATION

Rate	Fixed - see curves below (±10%)
Max. shaft end load	20 lbf / 89 N
Max. shaft side load	5.2 lbf / 23 N
Ambient temperature range	0°C to 60°C
Frictional torque	0.025 lbf.ins / 0.003 Nm typical
Shaft material	Mild steel 220M07
Body material	Zinc alloy Mazak 3
Weight	7.5 ozs / 214 g



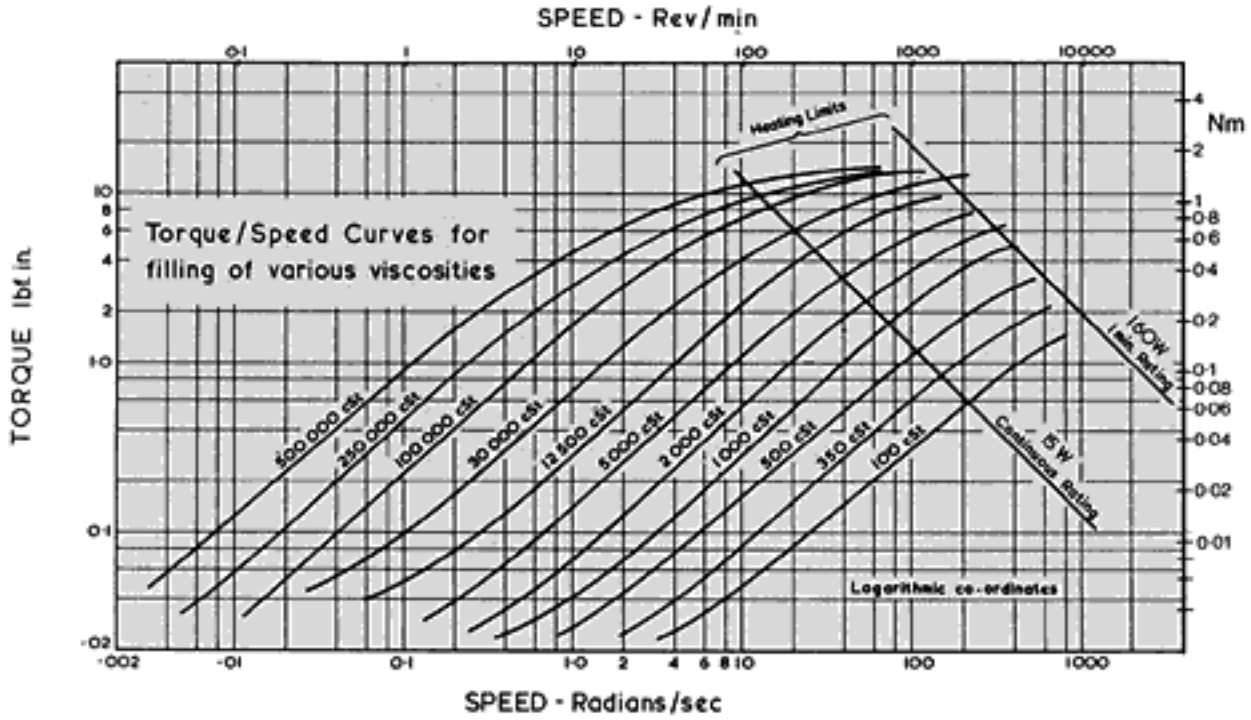
British and Foreign Patents



APPLICATIONS

This small continuous rotation dashpot has a fixed rate performance and is complementary to the larger adjustable rate models S – CRD and T – CRD. It proves to be economical where use of the other models may not be justified.

This dashpot is available with double ended shaft (code suffix '– DE'). In this version, due to the extra shaft seal, there is greater stiction torque (less than 0.025 lbf.ins/seal).



VISCOSITIES AVAILABLE

100; 350; 500; 1,000; 2,000; 5,000; 12,500; 30,000; 100,000; 250,000; 500,000 cSt.

ORDERING CODES

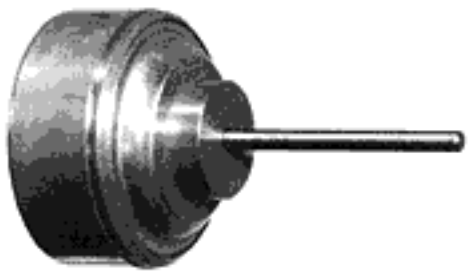
Q – CRD – (Filling Viscosity)

Example: Q – CRD – DE – 12,500 is double ended and has a 12,500 cSt filling.

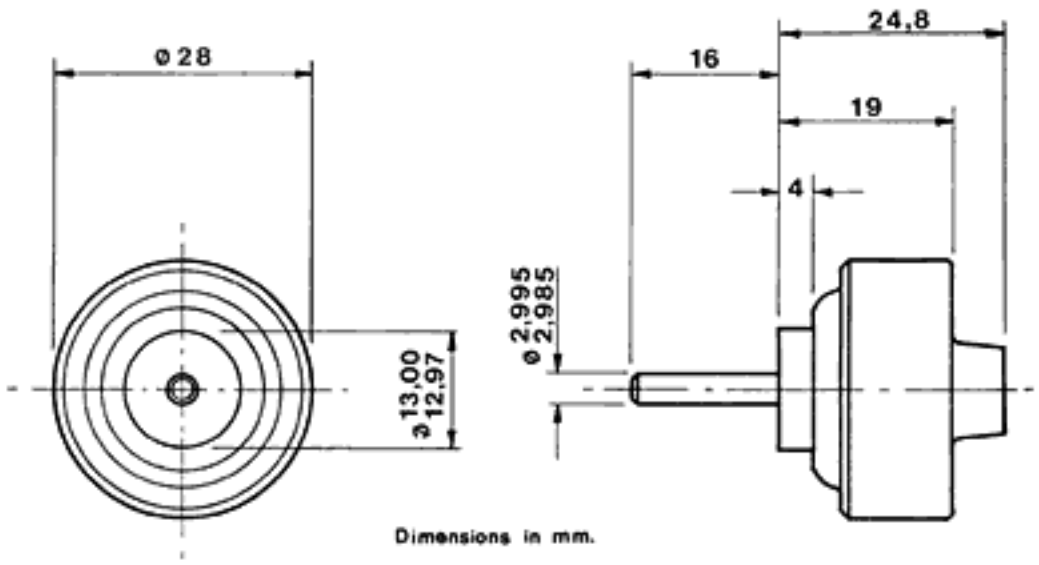
Model N – CRD CR Dashpot

SPECIFICATION

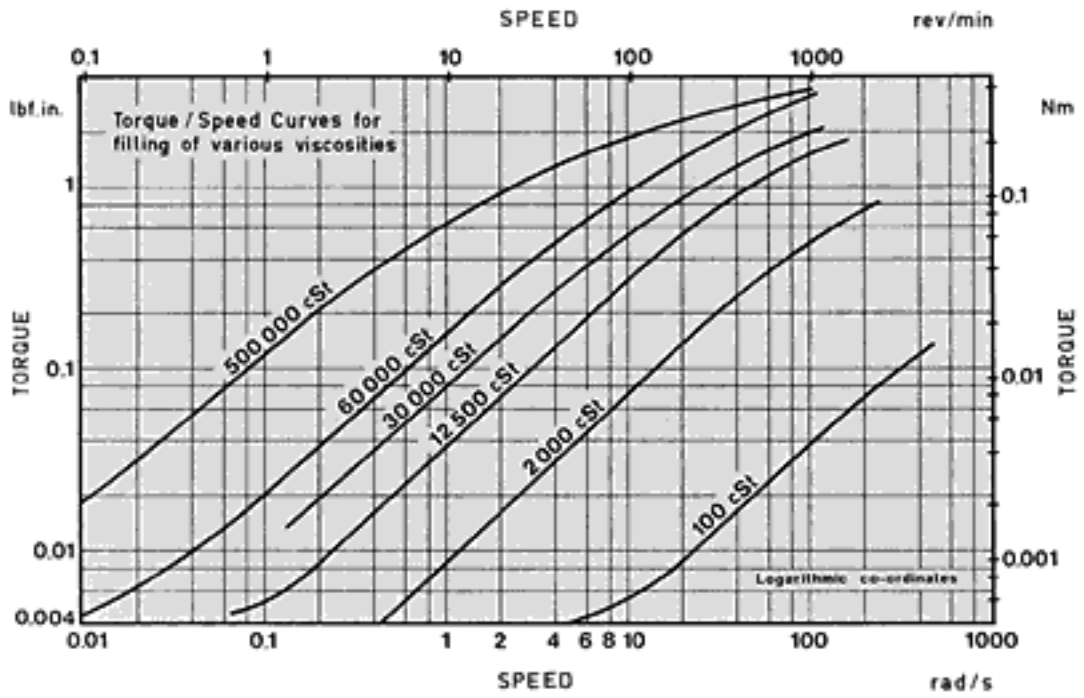
Rate	Fixed - see curves below (± 10%)
Max. shaft end load	3 lbf / 13 Nm
Max. shaft side load	2.2 lbf / 10 N
Ambient temperature range	0°C to 60°C
Frictional torque	0.015 lbf.ins / 0.002 Nm typical
Shaft material	Stainless steel 431S29
Body material	Zinc alloy Mazak 3
Weight	0.075 lbs / 34 g



British and Foreign Patents



Dimensions in mm.



APPLICATIONS

The N – CRD continuous rotation miniature dashpot is particularly suited to instrument and small precision machine applications. Pure viscous damping is produced by shear of a film of silicone fluid. The drum type rotor is supported at both ends by miniature ball races. Static friction is very low.

Dashpots can be supplied with various fixed rates which depend on the viscosity of the fluid filling. Viscosity should be specified when ordering to give the required characteristics. Performance curves for different viscosities are shown. Provision is made for temperature expansion of the fluid and no topping up is required during the life of the dashpot.

Typical applications include tension control for tape recorders, damping moving parts in small precision machines and detection of shaft rotation.

VISCOSITIES AVAILABLE

100; 2,000; 5,000; 12,500; 30,000; 60,000; 500,000 cSt.

ORDERING CODES

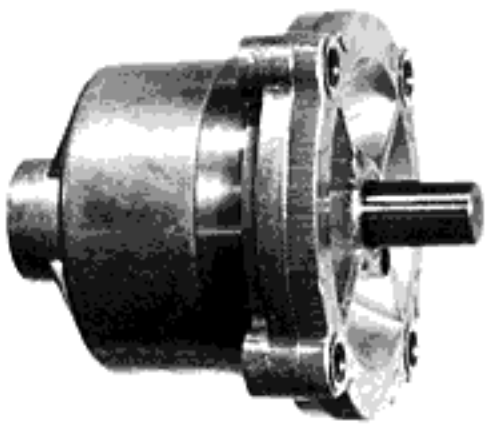
N – CRD – (Filling Viscosity)

Example: N – CRD – 60,000 has a 60,000 cSt filling.

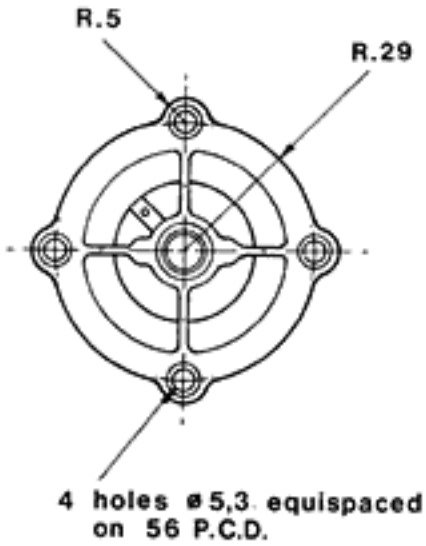
Model X – CRD CR Dashpot

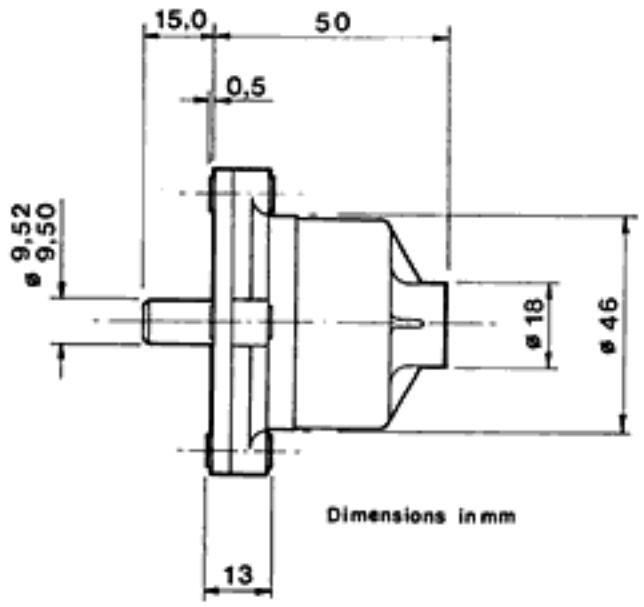
SPECIFICATION

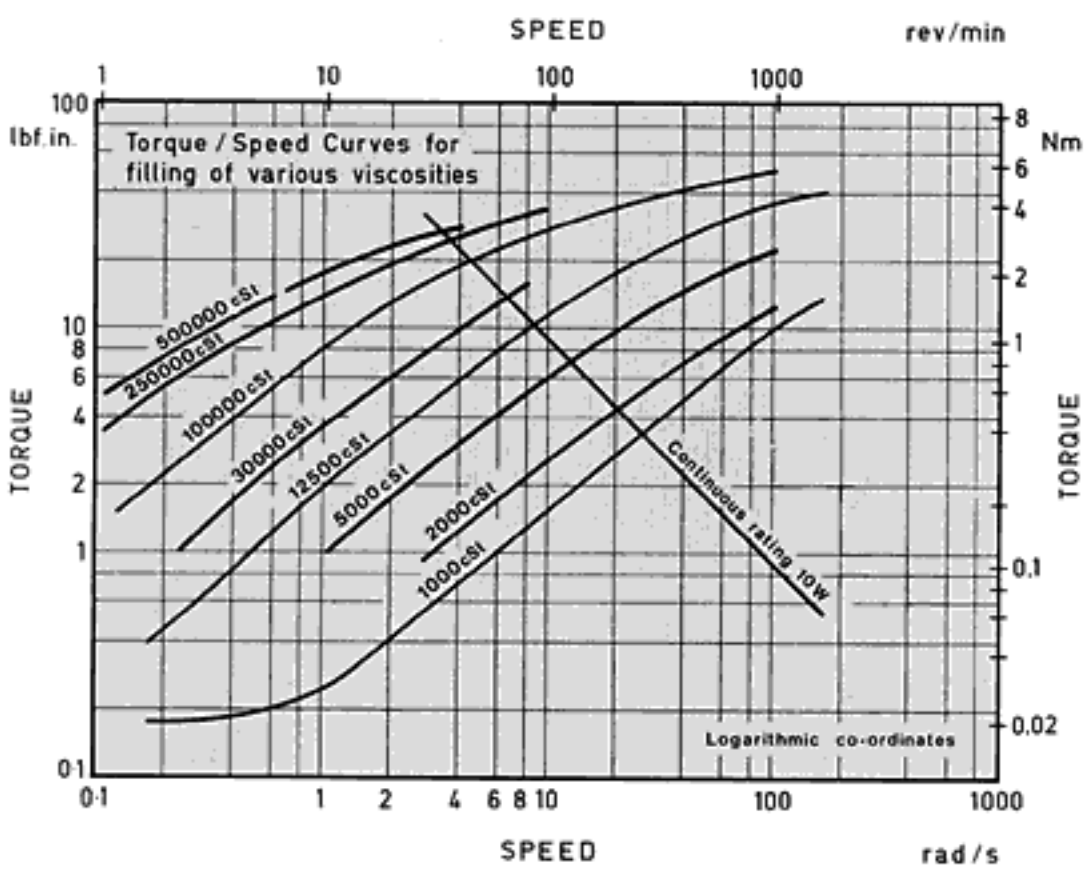
Rate	Fixed - see curves below (± 10%)
Ambient temperature range	0°C to 60°C
Frictional torque	0.3 lbf.ins / 0.034 Nm typical
Shaft material	Mild steel 080A15 (case hardened)
Body material	Zinc alloy Mazak 3
Weight	0.78 lbs / 355 g
Bearing	Single overhung anti-friction bush



British and Foreign Patents







APPLICATIONS

The X – CRD continuous rotation dashpot is value engineered to suit volume applications where unit cost is of paramount importance.

Viscous damping is produced by shear of a film of silicone fluid, using a drum type rotor. Static friction is higher than for other dashpots in the range but is not significant for most applications. The dashpot is designed to react pure torsion and therefore side or axial loads should be avoided.

Dashpots can be supplied with various fixed rates which depend on the viscosity of the fluid filling. Viscosity should be specified when ordering to give the required characteristics. Performance curves for different viscosities are shown. Provision is made for temperature expansion of the fluid and no topping up is required during the life of the dashpot. The shaft can be supplied unhardened if required.

Typical applications include damping moving parts in light machinery, e.g. copying machines, control of coil dereeling, control of descent.

VISCOSITIES AVAILABLE

1,000; 2,000; 5,000; 12,500; 30,000; 100,000; 250,000; 500,000 cSt.

ORDERING CODES

X – CRD – (Filling Viscosity)

Example: X – CRD – 12,500 has a 12,500 cSt filling.