FLUIDOMATTER

DRIVE SOLUTION FOR PA FAN DRIVES THROUGH FLUIDOMAT DELAYFIL FLUID COUPLINGS.

PA Fans are essentially employed in Thermal Power Plants and wherever boilers are used. These PA Fans have very large inertia, which is to be accelerated by squirrel cage motors of single cage or double cage designs.

Generally following acceleration time occurs for the fan to reach to full speed.

1250 KW - 19-23 seconds.
360 KW - 50-55 seconds.
190 KW - 90- 95 seconds.

These are very high acceleration time and the starting current kick of 600% sustains for 80 - 85 % period in a current value range of 600 to 500% and then decays to normal value in remaining 20 -15% time. This causes very large stresses on motor resulting into following:-

Large heating of motor during starting.

Cracking of cage bars.

The heat generated in the motor during acceleration is

I^2 X R X time

Where I is motor current and R is motor resistance. With large starting current sustaining for large time the heat generated is quite large because heat is proportional to Current Square.

High stresses on insulation and localized stresses.

Stresses on switch gears.

The above problem cause premature failures of motors by burning and insulation failures. Also the switch gear contacts life is affected adversely.

When the supply voltage is low or falls down because of heavy in rush of starting current, the motor and fan take much longer period to accelerate because the torque generated by motor falls down by square of voltage. Thus for 80% voltage the torque of motor falls down to $.8^2$ = .64 and thus acceleration time increases to $\frac{1}{.64}$ = 1.56 times.

With reduced voltage the above problems become more severe and risks of motor failures are increased multifold.

Fluidomat has provided effective and proven solution to the above problem by installing Fluidomat SMD delayfil fluid couplings. See following advantages.

The motor is started on no load and torque builds up gradually on coupling output as the motor speed increases. See fig.1.

This enables the motor to speed up to 85-90% speed corresponding to pull out torque of motor within a period of 2-3 seconds.

Pull out torque of motor is utilized for fan acceleration.

- Since the motor starting current value solely depends on motor speed (if voltage and frequency is constant) therefore with Fluidomat SMD coupling the motor starting current kick decays from 600% to 250-400% (depending on motor characteristics) value within 2-3 seconds. Then this current sustains till the fan has completed its acceleration upto 90-92% speed. Then the current decays further from 250-400% value to 100% (normal value) for the remaining acceleration from 90% speed to 100% speed. See figure 2.

- This is a tremendous advantage to the motor as the starting current kick of 600-700% decays to low value within 2-3 seconds (as against 16/45 seconds in direct coupling) and then sustains to lower current value.

- The total acceleration time of fan and motor reduces to 50-60% period as compared to the original time period when Fluidomat SMD- coupling is not used. This is possible because peak torque of motor is utilized for fan acceleration as against utilization of starting torque of motor when motor is coupled to fan directly.

- Since the motor is started on no load, therefore even at reduced voltages the motor remains safe and chances/risks of motor failure are greatly reduced.

- By typical calculation it is inferred that the heat generated in the motor during acceleration is reduced by 2.5 times when supply voltage is normal i.e 100% value and reduced by 7 times when supply voltage is 80% of normal value.

- With fast decay motor starting current and faster acceleration of fan the heating of motor and stresses on it and connected switch gears are greatly reduced.

Thus by using Fluidomat - SMD coupling your drive motor in PA Fans are very safe and save your losses of expensive motor repairs and down time.

Fluidomat - SMD couplings are already proven on PA Fan drives on various installations and supplies some of which are MPEB - Sarni MSEB - Paras, MSEB- Bhusawal and SAIL - Rourkela, HZL - Udaipur, HZL - Chanderia, HZL-Vizag, GHCL - Veraval, Birla Copper -Dahej, Indian Oil etc.

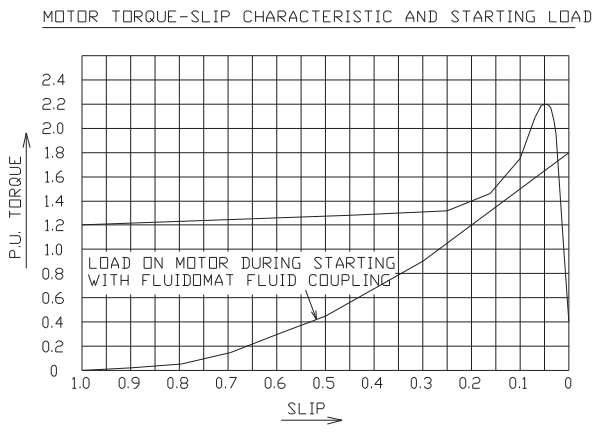

FIGURE NO: 1

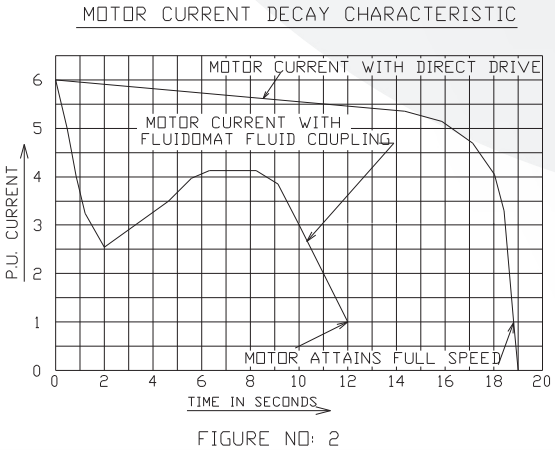

FIGURE NO: 2