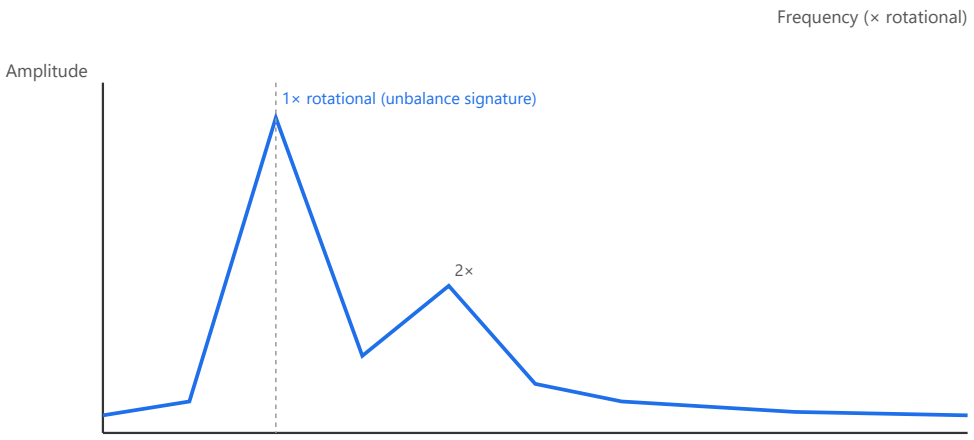
FM402 Inadequate Foundation Stiffness / Poor Grouting → Vibration

Chapter 4: Installation & Operation — Fault model & typical case

DOCUMENT	CHAPTER	RELATED Q&A	PUBLISHER
FM402	**Installation & Operation**	**4-49, 4-50**	**Kunshan Best Machinery Equipment Co., Ltd.**

Fault model + typical case. Mechanism, causes, symptoms, diagnosis, corrective actions and prevention are all anchored to the relevant entries of the Fan Engineering Q&A (see front matter for question references).



FM402 Poor Foundation Stiffness / Grouting → Vibration: a low natural frequency makes the set easy to excite and amplifies vibration; check the grout for voids and re-grout the base, including the shim contact points.

Failure Mechanism

An installation foundation with insufficient stiffness, or poor shimming / grouting (4-49 foundation requirements, 4-50 shims), gives the set a low natural frequency, so it is easily excited and amplifies vibration.

Common Causes

- Voiding of the foundation concrete
- Poor point contact of the shims

Failure Symptoms

- Large vibration of the whole foundation

Diagnosis & Evaluation

- Foundation vibration check and grouting inspection

Corrective Actions

- Re-grout and add / renew shims

Preventive Measures

- Foundation acceptance must include grouting compactness

Typical Failure Case (Summary)

- The high-temperature fan of the Huahong Cement 1000t/d line (FW6-2×29№21.5, airflow 220000m³/h, speed raised from 1050 to 1300r/min) had frequent abnormal vibration, which had once caused bearing damage and fracture of hold-down bolts. Inspection found that at the coupling end two hold-down bolts on the south side of the bearing housing had a vertical vibration of 0.21mm while the others were only 0.03mm; excavation of the hold-down bolts revealed loose concrete with lubricating oil seeping in the lower part of the second-stage grout, so the stiffness was inadequate. After re-grouting and fixing, the vibration fell to about 0.03mm and normal operation was restored.
- In 2023, centrifugal fan P06 of a data centre in Hangzhou vibrated at 5.2mm/s at 50Hz, exceeding the limit; laser alignment re-measurement found local voiding of the grout layer (150mm×120mm). After chiselling open the voided area, re-grouting and aligning again, the vibration fell to a compliant 2.1mm/s, taking 2 days.

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