

ISO 21940-31:2013-08 (E)

Mechanical vibration - Rotor balancing - Part 31: Susceptibility and sensitivity of machines to unbalance

| Contents | | Page |
|--|--|-------------|
| Foreword | | iv |
| Introduction | | vi |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 4 | Machine susceptibility classification | 1 |
| 4.1 | General | 1 |
| 4.2 | Type I: Low susceptibility | 2 |
| 4.3 | Type II: Moderate susceptibility | 2 |
| 4.4 | Type III: High susceptibility | 2 |
| 4.5 | Machine susceptibility correction factors | 2 |
| 5 | Modal sensitivity | 2 |
| 5.1 | General | 2 |
| 5.2 | Modal sensitivity ranges | 3 |
| 5.3 | Characteristics of modal sensitivity ranges | 3 |
| 5.4 | Values of modal sensitivity | 3 |
| 5.5 | Operating speed | 7 |
| 5.6 | Transient speed | 9 |
| 6 | Experimental determination of modal sensitivity near resonance speed under operational conditions | 10 |
| 6.1 | General | 10 |
| 6.2 | Nyquist diagram procedure | 10 |
| 6.3 | Bode diagram procedure | 10 |
| 7 | Numerical values for the local sensitivity | 11 |
| 8 | Experimental determination of the local sensitivity | 12 |
| 8.1 | General | 12 |
| 8.2 | Procedure | 12 |
| 9 | Damped unbalance sensitivity analysis | 13 |
| Annex A (informative) Explanations of terms | | 14 |
| Annex B (informative) Example of polar plot diagram procedure | | 16 |
| Annex C (informative) Examples of classification according to modal sensitivity | | 17 |
| Annex D (informative) Example of mathematical model applied unbalance | | 18 |
| Bibliography | | 19 |