MITSOL OY - FEATURES IN FAULT DETECTION

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NATURE OF FAULT	SIGNAL	FEATURES
1. Unbalance	x, $x^{(1)}$	rms, p
2. Misalignment	x, $x^{(1)}$	rms, p
3. Bent shaft	x, $x^{(1)}$	rms, p
4. Damaged rolling element bearings	$x^{(2)}$, $x^{(3)}$, $x^{(4)}$, $x^{(a)}$, $a > 2$	rms, p, cf, k, l_p-norm
5. Mechanical looseness	x, $x^{(1)}$, $x^{(2)}$, $x^{(3)}$, $x^{(4)}$	rms, p
6. Damaged or worn gears	$x^{(2)}$, $x^{(3)}$, $x^{(4)}$	rms, p, l_p-norm
7. Oil whirl	$x^{(a)}$, $a < 0$, x, $x^{(1)}$	rms, p
8. Cavitation	$x^{(2)}$, $x^{(3)}$, $x^{(4)}$	rms, p, k, l_p-norm
9. Electrical problems	x, $x^{(1)}$, $x^{(2)}$	rms, p
10. Loose stator coils	$x^{(2)}$, $x^{(3)}$, $x^{(4)}$	rms, p
11. Resonance	x, $x^{(1)}$	rms, p
12. Poor lubrication	$x^{(2)}$, $x^{(3)}$, $x^{(4)}$	rms, p, l_p-norm
13. Roll surface defects	x, $x^{(1)}$, $x^{(2)}$	rms, p
14. Lime kiln: misalignment and damaged supporting rolls	$x^{(2)}$, $x^{(3)}$, $x^{(4)}$	p
	x displacement $x^{(1)}$ velocity $x^{(2)}$ acceleration $x^{(3)}$ jerk $x^{(4)}$ snap $x^{(a)}$ real number a is the order of derivative	rms root mean square p peak value cf crest factor k kurtosis Features e.g. for displacement: x_{rms}, x_p, x_{cf} and x_k $\|\|x\|\|_p$ l_p-norm for displacement