

Motor Switching with TeSys — Pairing LC1D Contactors with LRD Overload Relays

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How to size a contactor by AC-3 rating and coil voltage, pick the thermal overload relay whose range brackets the motor current, and assemble the stocked TeSys LC1D/LC1K + LRD combinations with auxiliary contact blocks — plus the setting and test routine.

Contactor first: AC-3 and the coil

Size a contactor on its AC-3 rating (switching a running squirrel-cage motor) at your voltage — not AC-1. The stocked TeSys D ladder with 230 V coils: LC1D09 (9 A "H 4 kW/400 V), LC1D12, LC1D18, 4-pole LC1DT25/LC1DT32; miniature TeSys K for small loads (LC1K0610, 6 A). Coil code buys the control voltage (P7 = 230 V AC, M7 = 220 V AC; 24 V DC codes exist throughout the range) — the coil is the part you match to the control circuit, the poles to the power circuit. Auxiliary contact needs beyond the built-ins clip on front: LA1DN11 (1NO+1NC), LA1DN22, LADN31.

Overload second: the range brackets the current

A thermal overload relay protects the motor by modelling its heating; choose the range so the motor's nameplate full-load current sits inside it, ideally in the upper half. Stocked TeSys LRD points and the generic ranges around them:

Setting range | Listing |

1.6–2.5 A | LRD07 |

2.5–4 A | LRD08 |

4–6 A | LRD10 |

7–10 / 9–13 A | 7–10 A, 9–13 A |

12–18 / 16–24 / 23–32 A | 12–18 A, 16–24 A, 23–32 A |

30–40 / 37–50 A | 30–40 A, 37–50 A |

The LRD clips directly under its LC1D frame, feeding the motor terminals; its 95–96 NC contact breaks the contactor coil, 97–98 NO signals the trip. Trip class matters on hard-starting loads: Class 10 is standard; compressors and high-inertia fans may need Class 10A/20 per the machine documentation.

Assembly and setting routine

Mount contactor + overload as one block; torque power terminals to spec (loose lugs read as phase loss months later).

Wire the control circuit: stop chain !' overload NC !' coil; seal-in via the contactor's own NO for DOL latching.

Set the dial to the motor's measured/nameplate FLA — not maximum "to stop tripping".

Select manual or auto reset: manual on anything where unexpected restart is a hazard (that is: almost everything).

Commission: measure actual current all phases, confirm within setting, press the test button and prove the whole stop chain actually stops the machine.

Diagnosing trips honestly

An overload trip is data: measure the three phase currents first. Balanced and high !' mechanical load or low voltage; one phase missing !' upstream fuse/contact (single-phasing — the overload just saved the windings); trips only at start !' starting method or trip class mismatch; nuisance trips in a hot panel !' ambient compensation limits, ventilate the enclosure (see the panel fan guide). Replacing a tripped relay with a bigger range instead of an answer converts a protective trip into a rewind invoice. Contactor wear shows as chatter (coil supply dip), welded mains (undersized AC-3 or shorted load) and burned coil (overvoltage/jam) — all three are replace-and-fix-the-cause items; contactors are consumables by design, motors are not.

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