

Control Transformers for Panels — Sizing VA, Choosing 12 or 24 V, DIN-Rail versus Wall Mount

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Sizing a control transformer for refrigeration and automation panels: steady versus inrush VA, 12 V and 24 V secondaries, DIN-rail and wall-mount formats in stock (3–20 VA), fusing both sides and the earthing convention for control circuits.

Why a dedicated control transformer

Controllers, EEV drivers, sensors and pilot devices want a clean low-voltage supply that doesn't sag when contactors pull in and doesn't share a fuse with the loads it supervises. A control transformer provides galvanic separation from the 230 V side, a defined fault path, and — correctly sized — voltage stability through coil inrush. In refrigeration panels it typically feeds the electronic controller, the EEV driver and the probe/transmitter rail.

Sizing: steady VA plus inrush headroom

Sum the steady burden: controller + driver + transmitters + indicator lamps (data-sheet VA or W each).

Add the switched burden that must not dip the rail: relay and small-contactor coils at their inrush VA (several times holding VA).

Select the next standard size with ~25 % margin. For a SmartCella-class room: 3–6 VA suffices; a panel with an EVD driver and valve wants the 20 VA class — the stocked 230/24 V 20 VA DIN-rail (E2V-driver class) exists for exactly that load.

Stocked formats

Secondary | VA | Mount | Listing |

12 V | 3 VA | Wall | TRA12VDE01 |

12 V | 4 VA | DIN rail | TRADR4W012 |

12 V | 3 / 20 VA | Panel | TF1111111, TF111167 |

24 V | 3 VA | Wall | TRA2400001 |

24 V | 4 VA | DIN rail | TRADR4W024 |

24 V | 20 VA | DIN rail | TRADRBE240 |

12 V secondaries serve the 12 V controller families (e.g. Eliwell ICPlus 11I, 12 V); 24 V is the automation default (drivers, relays, sensors). Never run a 12 V controller from a 24 V rail "briefly" — electronics counts in milliseconds.

Protection and earthing

Primary fuse per the transformer's data (slow type at rated primary current class) — the panel's main MCB does not protect a 4 VA winding.

Secondary protection sized to the winding; a bolted fault on an unfused 20 VA secondary is a slow smoulder, not a trip.

Earthing convention: control circuits commonly earth one secondary pole (grounded control circuit) so a single earth fault blows the fuse instead of silently energising coils; follow the plant's existing convention consistently.

Separation: route 230 V and extra-low-voltage wiring apart; probes and stepper cables (see the EEV guide) do not share trunking with contactor wiring.

Diagnosing the rail

Controller reboots when the compressor starts !' measure secondary voltage during pull-in: a dip below the electronics' minimum means undersized VA or shared wiring runs. Warm transformer at idle is normal; smelling varnish is not — check for a shorted turn after nearby lightning events. When replacing, match secondary voltage and VA at least; stepping VA up one size is always acceptable, stepping voltage never is.

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