

Wieland-Werke AG

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Section B – Electrical engineering

Part 3: Crane systems

The following delivery specifications of Wieland-Werke AG form part of the contract.
Any deviating specifications are to be agreed upon between the supplier/contractor and Wieland, and documented.

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1 Feeding, power supply

- 1.1 Power for crane systems may be supplied only via power distribution boards (i.e. not from the supply for machine equipment). Specifications concerning mains power supply systems in our plants according to part 1, section 1.2.
- 1.2 The crane mains switch must be fitted on the side of the main power supply, in a position conveniently accessible from the plant building corridor, and must be lockable with at least 3 padlocks in the switched-off state. The crane mains switch must be provided with a sign “Crane mains switch crane/cranes ...”; in addition the identifier for the origin of the power supply line (electrical and location) shall be indicated.
- 1.3 In crane systems with three or more drive axes (e.g. lifting, lowering, trolley travel, crane travel), a “crane main switch” (with isolating switch function) must be installed, irrespective of the type of control (cab, floor, radio control). The isolating switch must be located directly in the cable run after the busbars and before the fuses. The isolating switch or an emergency stop button must be fitted in such a way that the crane can be switched off immediately upon stepping onto the crane girder platform, and can be secured with at least 3 padlocks in the switched-off state.
- 1.4 After switching off the “crane main switch”, the circuits for the lighting and power sockets must continue to be supplied with 230 V AC. In the case of cab operation, these circuits may only be operated via RCD (30 mA).
- 1.5 Double current collectors must generally be installed for the crane system power supply. The current collectors for the protective earth and neutral conductor rail must be designed in such a way that they cannot be interchanged with the phase current collectors.
- 1.6 The design of the conductor line systems (open or closed) must be agreed with our planning electrical department in accordance with the ambient conditions. (Preferred make Vahle).

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- 1.7 The protective earth conductor must be arranged closer to the place from which possible direct contact can take place than the phase conductors (e.g. if there is a maintenance catwalk above the conductor line then on top, otherwise beneath).
- 1.8 If an isolating separation is implemented between two busbars, the length of this neutral distance has to be longer than the distance between the two current collectors.
- 1.9 The protective earth conductor must be green/yellow, and the N conductor light blue, throughout the entire crane system installation. The protective earth and neutral conductor rails must have the same cross-section as the rails of the phase conductors L1, L2 and L3.

2 Control devices**2.1 Radio control systems**

In the Ulm and Vöhringen plants, only radio control systems made by HBC-Crailsheim may be used. The required circuit diagrams (sender layout and pin assignment of the receiver – HAN50D) and the frequency to be used for the radio control system will be provided by our planning electrical department and must be agreed with them in advance.

As a direction indicator, a north arrow (at least 30x30 cm – self-adhesive) must be attached to the underside of the crane (usually to a bridge girder).

- 2.2 Only reversing contactors with electrical and mechanical interlocking may be used. Contactors shall be designed for AC4 switching operation.
- 2.3 PLC systems may only be used following consultation with our planning electrical department.
- 2.4 For safety-related control systems, the requirements of EN ISO 13849-1 must be observed. Safety circuits (e.g. approach or collision safety devices or obstacle avoidance controls) must be designed in such a way that the safe state is maintained even after power failure and restoration (e.g. use of latching limit switches, ultrasound sensors – self-monitoring, memory relays, light barrier systems).
- 2.5 In the Ulm, Vöhringen and Villingen plants, an “emergency stop” chain (approx. 50 m intervals) which operates on the closed-circuit principle shall be installed for busbars over 100 m long. The cut-off must be contact-based; only approved emergency stop relays are to be used for this purpose (e.g. Pilz PNOZ). A drawing indicating the position of all switching elements, feed points, disconnection points, blocked points etc. must be displayed at the main switch.
- 2.6 For wire rope hoists, a connector for a control panel (DST3) for “rope change” must be fitted to the wire rope hoist following consultation with our planning electrical department.
- 2.7 Motor protection switches must not be used in main circuits. Melting fuses are to be installed as line fuses. Full motor protection via PTC thermistors can be provided following consultation with our planning electrical department.

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3 Installation notes

- 3.1 In general, it must be ensured that all components (in the switch cabinets and on the crane system itself → drive motors, limit switches, ...) are installed in such a way that they are easily accessible and can be easily replaced (disconnected, removed, ...)
- 3.2 The wiring of switch cabinets and the selection of cables must be carried out in accordance with the applicable VDE specifications.
- 3.3 The space reserve in the switch cabinets must be at least 20%.
- 3.4 Switch cabinet locks must always be double bitted (no square locks!)
- 3.5 It must be possible to open switch cabinet doors by at least 100 degrees.
- 3.6 All openings in switch cabinets and terminal boxes must be closed before handover to WWAG.
- 3.7 Execution of cable routes in accordance with Wieland delivery specifications part B / 1.3.
- 3.8 The space reserve in armoured steel conduits and steel installation ducts must be at least 50%.
- 3.9 Outside of the switch cabinet, wires and cables are to be exclusively installed professionally in armoured steel conduits or steel installation ducts.
- 3.10 Testing emergency limit switch hoist
The test switch for the "emergency limit switch" must have 3 positions (position left with spring-return = "bypass operating limit switch", centre position = 0, position right with spring-return = "bypass mains contactor") and is to be installed inside the switch cabinet (not in the radio control section or on the control panel!)
- 3.11 For control cables with more than twelve cores, at least 25% reserve cores must be provided.
- 3.12 Fastening the cables by means of cable ties or adhesive clamps is not permitted.

4 Use in the foundry area

- 4.1 Switch cabinets and terminal boxes must be provided in protection class IP65, sheet steel construction.
- 4.2 The roof on the front of the switch cabinet must protrude at least 5 cm so that no dirt can fall inside when the switch cabinet is opened.
- 4.3 Only closed steel cable duct systems with covers are to be used, preferably fire-resistant installation systems (Tehalit...)
- 4.4 When using DEMAG DH hoist units with safety brakes (additional brake when transporting molten material), for the electrical activation of the magnet the time delay must also be built in during lifting (consultation with planning electrical department).

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5 Device selection

5.1 The choice of devices must generally be agreed in advance with our planning electrical department. Unless specified otherwise, device approval in accordance with Wieland delivery specification part B / 1.5 applies.

5.2 When selecting electric motors, the actual application must be taken into account with regard to the protection class and the duty cycle. For guidance see e.g. the FEM classification for lifting equipment.

Ulm, Vöhringen, Villingen plants: Sliding rotor motors from the DEMAG product range are to be preferred.

Langenberg plant: Preferably ABUS ready-made components are to be used. Other components subject to consultation.

5.3 If drives with frequency control are used, the components (manufacturer, drives, frequency converter, ...) must be agreed in advance with our planning electrical department. (Preferably ABB, Siemens, SEW, Toshiba.)

5.4 For trailing cable systems, the following makes are to be used:
- DEMAG, Wampfler or Vahle
Types to be used subject to consultation with our planning electrical department!

5.5 For cable glands, PFLITSCH UNI ZUG or similar strain-relief systems are to be used. (Brass for metal and PVC for plastic enclosures!)
Normal cable glands and DIN cable glands with clamping nipple strain relief are not permitted.

5.6 Overload measurement, collective load counters and load indicators:
Types to be used subject to consultation with our planning electrical department.

5.7 Hoist limit switches (geared limit switches) generally 6-pole from the Stromag product range / series 51 (open or enclosed in a plastic enclosure subject to consultation with our planning electrical department).

5.8 If distance securing or collision protection is required for structural or safety reasons, then

Ulm plant: Safety light barriers from the PAULY product range or laser distance sensors made by Sick must be used.
Light barriers are generally provided by WWAG!

Langenberg plant: Preferably ABUS ready-made components are to be used.

Vöhringen plant and Villingen plant: Safety light barriers from the PAULY product range or laser distance sensors made by Sick or PIAB-Gigasense must be used.