PLC Control Panel for Hydropower and Pumping Stations

POWER SYSTEM PROTECTION EQUIPMENT



PLC control panel for hydropower and pumping stations: a PLC-based local control unit (LCU) with I/O, interlocks, HMI and SCADA uplink, built to IEC 61439-2.

KEY FEATURES

- Unit LCU : turbine and generator start-stop, speed and excitation supervision, over-speed trip interface.
- Auxiliary LCU : oil pressure unit, cooling water, drainage and station service equipment.
- Pump unit LCU : start-stop, variable speed control, level and flow monitoring, duty rotation.
- Gate LCU : intake gate, flap valve and trash rack, with a start permissive back to the pump panel.
- Controller : industrial 32-bit PLC CPU, scan cycle 10 ms or faster.
- I/O : DI 16 to 128, DO 16 to 64, AI 8 to 32, AO 4 to 16, expandable.
- Communication : Modbus RTU and TCP, IEC 60870-5-104, Profinet, Ethernet.
- Enclosure : IP30 indoors, IP54 outdoors, built and verified as an IEC 61439-2 assembly.

COMPARISON: LOCAL CONTROL PANEL VS PLC CONTROL PANEL

Comparison Item	Ordinary Local Control Panel	PLC Control Panel
Core Control Element	Relay + physical button	Programmable logic controller
Control Mode	Simple local manual control	Manual/automatic intelligent control
Data Processing	No data acquisition and analysis	Real-time data collection, calculation and analysis
Communication Function	Basically no remote communication	Support multi-protocol remote networking monitoring
Function Expandability	Poor, difficult to modify logic	Strong, freely edit and expand control programs
Applicable Scene	Simple small equipment control	Hydropower stations, **pumping stations** and other large water conservancy projects

LCU FUNCTION MAP BY PANEL TYPE

Panel type	What it controls	Inputs it reads	Outputs and interlocks
Unit LCU (hydropower)	Turbine and generator start-stop sequence, load adjustment, synchronising	Speed, excitation state, winding and bearing temperature, shaft vibration, breaker position	Over-speed trip interface, grid synchronising release, accident interlock trip to the protection panel
Public auxiliary LCU	Oil pressure unit, cooling water, drainage, station service, gates	Pressure, flow, sump level, valve and pump position	Pump start permissive, drainage sequencing, gate interlock, standby changeover
Pump unit LCU	Start-stop and variable speed control of one pump set, duty rotation between sets	Upstream and downstream level, flow, pipeline pressure, motor winding temperature	Dry-run, overload and phase-loss interfaces to the motor protection relay, sequential starting
Gate and valve LCU	Intake gate, flap valve, trash rack, discharge valves	Gate position, limit switches, differential level across the rack	Pump start blocked until the gate is fully open, valve sequencing, flood and drainage scheduling

ORDERING INFORMATION

MOQ	LEAD TIME	TRADE TERMS	PAYMENT	WARRANTY
1 unit	7-15 working days	EXW / FOB / CIF / DDU	T/T, L/C, WU, PayPal	12 months