

	Automation & Electrical Department (SG)	Contents and Structure of Technical Documentation Instrumentation – General Requirements for New and Modernised Production Plants – Technical Annexes to Contracts
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This document defines the minimum requirements for the structure and contents of technical documentation provided by the Contractor.

Any deviation from the requirements included in this document must be approved by the Buyer.

The following table defines the structure and contents (components) of the technical documentation as required by Buyer:

No.	Description / component name
1.	General documentation
1.1	Table of contents
1.2	Technical description
1.3	Control system description, general diagram including all subsystems, fulfilled functions and interconnections (DCS, PLC, ESD, analytics, gas detection system, fire detection system, dedicated controllers, RIS, APC, etc.)
1.4	Legend and symbols
1.5	P&IDs
1.6	Explosion hazardous area classification protocol
1.7	Designer's declaration of conformity with Licensor / Provider of the basic documentation standards
2.	Field documentation
2.1	Instrument index containing all analog and digital measuring and control systems: switches, limit switches, pushbuttons, lamps, etc.
2.2	Index of instrumentation loop
2.3	Junction box wiring diagram
2.4	Cable list
2.5	Documentation of cabinets / local panels (assembly, wiring, equipment and material specifications)
2.6	Diagrams of power supply distribution to loads
2.7	Assembly drawings of electric shock protection and earthing system
2.8	Installation drawings
2.8.1	Instrumentation installation drawings (hook-up)
2.8.2	Hook-up drawings for primary lines including information about parameters, medium for pressure and leak test and other tests, if required
2.8.3	Assembly drawings for distribution of instrumentation air (air header of instrument air collecting pipes, instrument air supply devices, etc.)
2.8.4	Other assembly drawings (support, brackets, racks, etc.)
2.9	Layout drawings
2.9.1	Instrumentation layout drawings (equipment, junction boxes, local panels, etc.)
2.9.2	Layout drawings for cabinets in technical room
2.9.3	Layout drawings for control room equipment (monitors / screens, panels, system switchboards, tables, desks, etc. in the control room)
2.9.4	Main cable routing layout and cross sections
2.9.5	Cable routing layout and cross sections in control room
2.10	Specifications / collations
2.10.1	Specifications of instruments including calculation sheets for selection of orifice plates, valves, flowmeters, etc.

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2.10.2	Auxiliary devices and installation materials
2.11	Assumptions / guidelines for other scopes, i.e. civil, sanitary, mechanical, electrical
2.12	Manuals, procedures, calculations, certificates (for designed instruments / instrumentation equipment)
2.12.1	Operation manuals for instruments / instrumentation equipment
2.12.2	Vendor's recommendations for spare parts
2.12.3	Instruments / instrumentation equipment pre-commissioning and commissioning procedures
2.12.4	Calculation of parameters for intrinsically safe loops
2.12.5	As-is list of electrical equipment in explosion-proof execution
2.12.6	List of certificates of equipment in explosion-proof execution
2.12.7	List of manufacturers' declarations and statements of conformity for instrumentation and components in explosion-proof execution
2.12.8	Specification of pressure tested instruments
2.12.9	List of pressure test certificates issued by notified bodies
3.	Documentation of control, visualisation and protection systems
3.1	Programmable logic controllers (PLC) / systems: Emergency Shutdown System (ESD), gas detection system, fire detection system, dedicated controllers
3.1.2	Functional logic diagrams for interlock systems and other functions prepared on the basis of logic functors
3.1.3	Input / output list being a subset of the list in 2.1
3.1.4	Index of tags used for communication with external systems for example DCS (Modbus communications map)
3.1.5	MOS and POS tag name list
3.1.6	RFP for PLC controller (technical specification, general requirements, scope of supply)
3.1.7	Interlocks description and functioning of the system
3.1.8	Cause and effect diagram
3.1.9	Start-up procedures using local panels
3.1.10	Interlock check procedure according to the internal instruction of control and use of instrumentation interlock systems and IEC-EN 61511
3.1.11	Documentation for application software (configuration) according to a typical standard for PLC application
3.1.12	Documentation for hardware configuration (assembly, wiring, supply, connections, equipment and material specifications)
3.1.13	Vendor's documentation (operation manuals, system software, quality system certificates, TUV certificates , etc.)
3.2	Distributed Control Systems (DCS)
3.2.1	Single-line diagrams of measuring and control loops for typical structures, including connections with other systems
3.2.2	Functional block diagrams and description of complex measuring and control loops
3.2.3	Descriptions for all used typical measuring and control structures including tag-related list
3.2.4	RFP for the DCS system (technical specification, general requirements for DCS, scope of supply)
3.2.5	Documentation for application software (configuration) according to a typical standard for applicable DCS system
3.2.6	Documentation for DCS hardware configuration (assembly, wiring, supply, connections, equipment and material specifications)
3.2.7	Vendor's documentation (operation manuals, system software, quality system certificates, etc.)
3.3	Operator interface
3.3.1	Description and assumptions for operator stations (number of consoles, division of functions, instructions)
3.3.2	Design of synoptic images, libraries of used symbols

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3.3.3	Definitions of archive systems (tag list, sampling frequency, storage period, method of long-term archiving)
3.3.4	Definitions of shift reports, 24-hour reports, emergency reports, etc.
3.3.5	Connections with the RIS system
3.3.6	Description of dedicated consoles installed in the control room
3.3.7	Algorithms and description of the Advanced Process Control (APC)
3.3.8	Description of other dedicated subsystems
3.3.9	Operator's handbook for complicated measuring and control loops
3.3.10	Operator's handbook for the DCS - system and application parts including interconnections between the DCS and PLC
4.	Information technology infrastructure
4.1	Block diagram of the control system interconnections with internal and external subsystems
4.2	Diagram of required computer network and equipment specification
4.3	Hardware and software specification (hardware and basic configuration, operating systems, requirements for IP addressing and network names) for operator interfaces and subsystems
4.4	Interface between the control system and real time system (PI)
4.5	Hardware and software specification of external (in relations to the DCS) advanced control systems (APC, expert systems, etc.) and connections with the RIS system (PI)