

Engineering Standard

SAES-J-001

31 December 2003

Instrumentation Index

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Saudi Aramco DeskTop Standards

Table of Contents

1	Scope.....	2
2	Conflicts and Deviations.....	2
3	References.....	2
4	Document Index.....	2

1 Scope

This standard is a compilation of Saudi Aramco documents governing the design and installation of instrumentation and instrument systems. The documents are indexed according to document type.

2 Conflicts and Deviations

- 2.1 Any conflicts between this standard and other applicable Saudi Aramco Engineering Standards (SAESs), Materials System Specifications (SAMSSs), Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Process and Control Systems Department of Saudi Aramco, Dhahran.
- 2.2 Direct all requests to deviate from this standard in writing to the Company or Buyer Representative, who shall follow internal company procedure SAEP-302 and forward such requests to the Manager, Process and Control Systems Department of Saudi Aramco, Dhahran.

3 References

Since this standard is a compilation of Saudi Aramco documents, no references are cited here.

4 Document Index

4.1 Saudi Aramco Engineering Standards

<u>SAES-J-001</u>	<i>Instrumentation Index</i>
<u>SAES-J-002</u>	<i>Technically Acceptable Instruments</i>
<u>SAES-J-003</u>	<i>Instrumentation - Basic Design Criteria</i>
<u>SAES-J-004</u>	<i>Instrumentation Symbols and Identification</i>
<u>SAES-J-005</u>	<i>Instrumentation Drawings and Forms</i>
<u>SAES-J-100</u>	<i>Process Flow Metering</i>
<u>SAES-J-200</u>	<i>Pressure</i>
<u>SAES-J-300</u>	<i>Level</i>
<u>SAES-J-400</u>	<i>Temperature</i>
<u>SAES-J-502</u>	<i>Analyzer Shelters</i>
<u>SAES-J-505</u>	<i>Combustible Gas and Hydrogen Sulfide in Air Detection Systems</i>

<u>SAES-J-600</u>	<i>Pressure Relief Devices</i>
<u>SAES-J-601</u>	<i>Emergency Shutdown and Isolation Systems</i>
<u>SAES-J-602</u>	<i>Burner Management, Combustion and Waterside Control Systems for Watertube Boilers</i>
<u>SAES-J-603</u>	<i>Process Heaters Safety Systems</i>
<u>SAES-J-604</u>	<i>Protective and Condition Monitoring Equipment for Rotating Machinery</i>
<u>SAES-J-605</u>	<i>Surge Relief Protection Systems</i>
<u>SAES-J-700</u>	<i>Control Valves</i>
<u>SAES-J-801</u>	<i>Control Buildings</i>
<u>SAES-J-901</u>	<i>Instrument Air Supply Systems</i>
<u>SAES-J-902</u>	<i>Electrical Systems for Instrumentation</i>
<u>SAES-J-903</u>	<i>Intrinsically Safe Systems</i>
<u>SAES-J-904</u>	<i>Foundation Fieldbus (FF) Systems</i>

4.2 Saudi Aramco Materials System Specifications

<u>34-SAMSS-117</u>	<i>Turbine Flow Meters</i>
<u>34-SAMSS-118</u>	<i>Positive Displacement Meters</i>
<u>34-SAMSS-119</u>	<i>Bi-Directional Meter Prove</i>
<u>34-SAMSS-318</u>	<i>Automatic Tank Gauging Equipment</i>
<u>34-SAMSS-319</u>	<i>Radar Tank Gauging Equipment</i>
<u>34-SAMSS-511</u>	<i>Chromatographs</i>
<u>34-SAMSS-512</u>	<i>Oxygen Analyzers</i>
<u>34-SAMSS-514</u>	<i>Combustible Gas and Hydrogen Sulphide Monitors</i>
<u>34-SAMSS-515</u>	<i>Moisture Analyzers</i>
<u>34-SAMSS-517</u>	<i>Density Meters</i>
<u>34-SAMSS-525</u>	<i>Automatic Sampling Systems for Hydrocarbon Liquids</i>
<u>34-SAMSS-611</u>	<i>Safety Relief Valves Conventional and Balanced Types</i>
<u>34-SAMSS-612</u>	<i>Safety Relief Valves Pilot Operated Types</i>
<u>34-SAMSS-617</u>	<i>Flame Monitoring Systems</i>

<u>34-SAMSS-619</u>	<i>Burner Management Systems for Watertube Boilers</i>	
<u>34-SAMSS-621</u>	<i>ESD Systems - Hard-Wired - Solid-State (Nonprogrammable)</i>	
<u>34-SAMSS-622</u>	<i>ESD Systems - Electromagnetic Relay</i>	
<u>34-SAMSS-623</u>	<i>Programmable Controller Based ESD Systems</i>	
<u>34-SAMSS-625</u>	<i>Machinery Protection Systems</i>	
<u>34-SAMSS-634</u>	<i>Local ZV Shutdown Cabinets and Smart ZV Systems</i>	
<u>34-SAMSS-711</u>	<i>Control Valves - General Services</i>	
<u>34-SAMSS-716</u>	<i>Pneumatic Actuators On-Off Service</i>	
<u>34-SAMSS-717</u>	<i>Hydraulic Valve Actuators Systems</i>	
<u>34-SAMSS-718</u>	<i>Electric Motor Operated Valve Actuators</i>	
<u>34-SAMSS-815</u>	<i>Annunciators</i>	
<u>34-SAMSS-820</u>	<i>Instrument Control Cabinets - Indoor</i>	
<u>34-SAMSS-821</u>	<i>Instrument Control Cabinet - Outdoor</i>	
<u>34-SAMSS-830</u>	<i>Programmable Logic Controller</i>	
<u>34-SAMSS-831</u>	<i>Instrumentation for Packaged Units</i>	
<u>34-SAMSS-913</u>	<i>Instrumentation and Thermocouple Cable</i>	
4.3	Saudi Aramco Instrument Specification Sheets (ISS) and other Forms	
	<i>Note: The "M" suffix in Instrument Specification Sheet numbers indicates a metric-only form.</i>	
<u>2504-ENG</u>	<i>List of Nameplates for Instruments, Local Mounted Instruments</i>	
<u>2517-ENG</u>	<i>Pitot Tube Meter Data Sheet</i>	
<u>2616-ENG</u>	<i>Blank Form</i>	
<u>2773-ENG</u>	<i>ISS-Pressure Instruments</i>	
<u>2773-M-ENG</u>	<i>ISS-Pressure Instruments</i>	
<u>2775-ENG</u>	<i>ISS-Bulb Type Temp. Instruments</i>	
<u>2775-M-ENG</u>	<i>ISS-Bulb Type Temp. Instruments</i>	
<u>2777-ENG</u>	<i>ISS-Receiving Instruments</i>	
<u>2777-M-ENG</u>	<i>ISS-Receiving Instruments</i>	

<u>2778-ENG</u>	<i>ISS-Local Flow Instruments</i>	
<u>2778-M-ENG</u>	<i>ISS-Local Flow Instruments</i>	
<u>2780-ENG</u>	<i>ISS-Balanced Bridge Type Temperature Instruments</i>	
<u>2780-M-ENG</u>	<i>ISS-Balanced Bridge Type Temperature Instruments</i>	
2781-ENG	<i>Instrument Installation Schedule</i>	
2786-ENG	<i>ISS-Traps and Drainers</i>	
<u>2786-M-ENG</u>	<i>ISS-Traps and Drainers</i>	
<u>2787-ENG</u>	<i>ISS-Pressure Regulators</i>	
<u>2787-M-ENG</u>	<i>ISS-Pressure Regulators</i>	
<u>2788-ENG</u>	<i>ISS-Differential Type Level Instruments</i>	
<u>2788-M-ENG</u>	<i>ISS-Differential Type Level Instruments</i>	
<u>2790-ENG</u>	<i>ISS-Variable Area Flow Meters</i>	
<u>2790-M-ENG</u>	<i>ISS-Variable Area Flow Meters</i>	
2793-ENG	<i>ISS-Draft Gauges</i>	
<u>2793-M-ENG</u>	<i>ISS-Draft Gauges</i>	
<u>2794-ENG</u>	<i>ISS-Snap Acting Valves</i>	
<u>2794-M-ENG</u>	<i>ISS-Snap Acting Valves</i>	
<u>2799-ENG</u>	<i>Relief Valve Schedule</i>	
2799-M-ENG	<i>Relief Valve Schedule</i>	
3099-A-ENG	<i>Relief Valve Authorization and Test Report Record</i>	
<u>3175-ENG</u>	<i>Orifice Plate Details for RF Flanges</i>	
<u>3176-ENG</u>	<i>Orifice Plate Detail - Segmental</i>	
<u>3176-M-ENG</u>	<i>Orifice Plate Detail - Segmental</i>	
3176-A-ENG	<i>Orifice Plate Detail - Restriction</i>	
<u>3177-ENG</u>	<i>Orifice Plate Detail - Quadrant Edge</i>	
<u>3185-ENG</u>	<i>Instrument Material Summary Sheet</i>	
<u>3185-A-ENG</u>	<i>Instrument Material Summary Sheet</i>	
<u>3186-ENG</u>	<i>ISS-Vibration Switches</i>	
<u>3186-M-ENG</u>	<i>ISS-Vibration Switches</i>	

<u>3188-ENG</u>	<i>Meter Reading Tables</i>
<u>3188-M-ENG</u>	<i>Meter Reading Tables</i>
<u>3195-ENG</u>	<i>Piston Operated Valves</i>
<u>3195-M-ENG</u>	<i>Piston Operated Valves</i>
<u>6078-ENG</u>	<i>ISS-Flow Instruments</i>
<u>6078-M-ENG</u>	<i>ISS-Flow Instruments</i>
<u>6079-ENG</u>	<i>ISS-Level Switches</i>
<u>6079-M-ENG</u>	<i>ISS-Level Switches</i>
<u>6080-ENG</u>	<i>ISS-Filled System Type Temp. Switches</i>
<u>6080-M-ENG</u>	<i>ISS-Filled System Type Temp. Switches</i>
<u>6081-ENG</u>	<i>ISS-Thermocouple/RTD Switches</i>
<u>6081-M-ENG</u>	<i>ISS-Thermocouple/RTD Switch Specification Sheet</i>
<u>6239-ENG</u>	<i>ISS-General</i>
<u>8020-111-ENG</u>	<i>ISS-Flow Transmitters (Diff. Pressure Type)</i>
<u>8020-111-M-ENG</u>	<i>ISS-Flow Transmitters (Diff. Pressure Type)</i>
<u>8020-112-ENG</u>	<i>ISS-Flow Transmitters-Smart (Diff. Pressure)</i>
<u>8020-115-ENG</u>	<i>ISS-Metering Orifice Calculation, Conventional Units)</i>
<u>8020-115-M-ENG</u>	<i>ISS-Metering Orifice Calculation, SI Units</i>
<u>8020-116-ENG</u>	<i>ISS-Venturi Tube Specification and Calculation</i>
<u>8020-116-M-ENG</u>	<i>ISS-Venturi Tube Specification and Calculation (Metric)</i>
<u>8020-117-ENG</u>	<i>ISS-Turbine Meters</i>
<u>8020-117-M-ENG</u>	<i>ISS-Turbine Meters (Metric)</i>
<u>8020-118-ENG</u>	<i>ISS-Liquid Positive Displacement Meters</i>
<u>8020-119-ENG</u>	<i>ISS-Bi-directional Meter Prover</i>
<u>8020-124-ENG</u>	<i>ISS-Restriction Orifice Calculation and Specification</i>
<u>8020-124-M-ENG</u>	<i>ISS-Restriction Orifice Calculation and Specification</i>

<u>8020-200-ENG</u>	<i>ISS-Pressure Transmitters- Smart (Abs, Gage & DP)</i>	
<u>8020-212-ENG</u>	<i>ISS-Pressure and Differential Pressure Gauges</i>	
<u>8020-213-ENG</u>	<i>ISS-Pressure and D/P Switch</i>	
<u>8020-312-ENG</u>	<i>ISS-Level Gauge Glasses</i>	
<u>8020-314-ENG</u>	<i>ISS-Level Instruments</i>	
<u>8020-318-ENG</u>	<i>ISS-Automatic Tank Gauging Equipment</i>	
<u>8020-319-ENG</u>	<i>ISS-Radar Tank Gauging Equipment</i>	
<u>8020-320-ENG</u>	<i>ISS- Level Device: Time Domain Reflectometer</i>	
<u>8020-400-ENG</u>	<i>ISS-Temperature Transmitters - Smart</i>	
<u>8020-413-ENG</u>	<i>ISS-Mechanical Temperature Switches</i>	
<u>8020-415-ENG</u>	<i>ISS-Thermocouple (T/C) Assembly</i>	
<u>8020-415-M-ENG</u>	<i>ISS-Thermocouple (T/C) Assembly (Metric)</i>	
<u>8020-416-ENG</u>	<i>ISS-Resistance Temperature Detector (RTD)</i>	
<u>8020-418-ENG</u>	<i>ISS-Thermowell</i>	
<u>8020-418-M-ENG</u>	<i>ISS-Thermowell (Metric)</i>	
<u>8020-419-ENG</u>	<i>ISS-Temperature Monitor</i>	
<u>8020-419-M-ENG</u>	<i>ISS-Temperature Monitor</i>	
<u>8020-511-ENG</u>	<i>ISS-Chromatographs</i>	
<u>8020-512-ENG</u>	<i>ISS-Oxygen Analyzer</i>	
<u>8020-514-ENG</u>	<i>ISS-Combustible Gas and Hydrogen Sulfide Monitors</i>	
<u>8020-515-ENG</u>	<i>ISS-Moisture Analyzers</i>	
<u>8020-517-ENG</u>	<i>ISS-Density Meters for Gas and Liquid Service</i>	
<u>8020-525-ENG</u>	<i>ISS-Hydrocarbon Liquid Sampling Systems</i>	
<u>8020-605-ENG</u>	<i>ISS-Surge Relief Valves</i>	
<u>8020-611-ENG</u>	<i>ISS-Safety Relief Valves</i>	
<u>8020-611-M-ENG</u>	<i>ISS-Safety Relief Valves (Metric)</i>	
<u>8020-612-ENG</u>	<i>ISS-Safety Relief Valve-Pilot Operated Type</i>	
<u>8020-613-ENG</u>	<i>ISS-Pressure / Vacuum Relief Valves</i>	
<u>8020-614-ENG</u>	<i>ISS-Rupture Disks</i>	

<u>8020-617-ENG</u>	<i>ISS-Flame Monitoring Systems</i>
<u>8020-623-ENG</u>	<i>ISS-Programmable Controller Based ESD System</i>
<u>8020-625-ENG</u>	<i>ISS- Machinery Protection Systems</i>
<u>8020-634-ENG</u>	<i>ISS- Local ZV Controls</i>
<u>8020-711-ENG</u>	<i>ISS-Globe/Angle Control Valves</i>
<u>8020-712-ENG</u>	<i>ISS-Ball Control Valves</i>
<u>8020-713-ENG</u>	<i>ISS-Butterfly/Rotary Plug Control Valves</i>
<u>8020-716-ENG</u>	<i>ISS-Pneumatic Actuators (On-Off Service)</i>
<u>8020-717-ENG</u>	<i>ISS-Hydraulic Valve Actuators</i>
<u>8020-718-ENG</u>	<i>ISS-Electric Motor Operated Valve Actuators</i>
<u>8020-815-ENG</u>	<i>ISS-Annunciator</i>
<u>8020-825-ENG</u>	<i>ISS-Electro-Mechanical Relays</i>
<u>8020-827-ENG</u>	<i>ISS-Solenoid Operated Valves</i>
<u>8020-828-ENG</u>	<i>ISS-Transducers (Signal Conversion)</i>
<u>8020-830-ENG</u>	<i>ISS-Programmable Controller</i>
<u>8020-831-ENG</u>	<i>ISS-Instrumentation for Packaged Unit</i>
<u>8020-913-ENG</u>	<i>ISS-Instrumentation and Thermocouple Cable</i>
<u>8110-ENG</u>	<i>Logic Diagram</i>
<u>8111-ENG</u>	<i>Index Sheet-Instrument Loop Diagram (ILD)</i>
4.4 Saudi Aramco Standard Drawings	
<u>AD-036004</u>	<i>Orientation for Orifice Flanges</i>
<u>AB-036019</u>	<i>Thermowell Assembly and Detail</i>
<u>AB-036094</u>	<i>Orifice Plates, Standard</i>
<u>AA-036130</u>	<i>Elementary Diagram for Rotork 1600 Actuator</i>
<u>AA-036197</u>	<i>Straight Pipe Requirements for Orifices, Flow Nozzles and Venturi Tubes</i>
<u>AC-036413 Sh.1</u>	<i>Orifice Flange Assembly, Raised Face</i>
<u>AC-036413 Sh.2</u>	<i>Orifice Flange Assembly, Raised Face (Metric)</i>
<u>AB-036414 Sh.1</u>	<i>Orifice Flange Assembly, Ring Joint</i>
<u>AB-036414 Sh.2</u>	<i>Orifice Flange Assembly, Ring Joint (Metric)</i>
<u>AC-036456</u>	<i>Burner Safety System Natural Draft Furnaces</i>

<u>AD-036491</u>	<i>Symbols, In-line Instruments for Instrument Loop Diagrams</i>
<i>AB-036492 Sh.1</i>	<i>Symbols, Local Instruments for Instrument Loop Diagrams (Pneumatic & Electrical)</i>
<i>AB-036492 Sh.2</i>	<i>Symbols, Local Instruments for Instrument Loop Diagrams (Miscellaneous)</i>
<i>AB-036493</i>	<i>Symbols, Panel Instruments for Instrument Loop Diagrams</i>
<u>AC-036950</u>	<i>Symbols for Instrument</i>
4.5 Saudi Aramco Library Drawings	
<i>DD-950025 Sh.1</i>	<i>(AD-036031 Sh.1) Nameplate Details for Instrument Boards</i>
<i>DD-950025 Sh.2</i>	<i>(AD-036031 Sh.2) Nameplate Details for Instrument Boards (Metric)</i>
<u>DE-950026</u>	<i>(AE-036110) Siphon Instrument Service Detail</i>
<u>DA-950028</u>	<i>(AA-036270) Water Injection Wellhead Flow & Pressure Recorder Instr. Piping & Install. Details</i>
<u>DA-950032</u>	<i>(AA-036334) Logic Diagram Motor Operated Valve Control</i>
<i>DB-950035</i>	<i>(AB-036240) Cosasco Two-Inch Access Fitting Corrosion Monitoring Station</i>
<u>DB-950039</u>	<i>(AB-036460) Corrosometer Corrosion Probe Extension Cable Installation</i>
<u>DC-950040</u>	<i>(AC-036475) Pressure Indicators and Switches Locally Mounted Instrument Piping Details</i>
<u>DC-950041</u>	<i>(AC-036476) Pressure Indicators and Switches Panel or Wall Mounted Instrument Piping Details</i>
<u>DC-950042</u>	<i>(AC-036477) Instrument Piping Details Pressure Instruments Blind and Indicating Type</i>
<u>DC-950043</u>	<i>(AC-036561) Electrical Connections for Field-Mounted Instruments</i>
<u>DC-950045</u>	<i>(AC-036666) Instrument Standpipe</i>

<u>DB-950046</u>	<i>(AB-036690) Instrument Piping Details for Liquid Level Gauge Glasses</i>
<u>DB-950047</u>	<i>(AB-036691) Instrument Piping Details for Pneumatic Level Instruments</i>
<u>DB-950048</u>	<i>(AB-036692) Standard Instrument Piping Details for Electric Level Instruments (Up to Class 600 ANSI Rating)</i>
<u>DB-950050</u>	<i>(AB-036695) Standard Arrangement Drawing Local Shut-Down Cabinet (All Pneumatic)</i>
<u>DC-950051</u>	<i>(AC-036958) Instrument Piping Details for Level Instruments</i>
<u>DD-950053</u>	<i>(AD-036961) Field Mounting Details for Instruments</i>
<u>DB-950054</u>	<i>(AB-036962) Thermocouple Well Assemblies-Horizontal Process Lines Details</i>
<i>DB-950055 Sh.1</i>	<i>(AB-036965 Sh.1) Standard Straightening Vane and Pipe Spool Piece for Flow Meter Orifice Runs</i>
<i>DB-950055 Sh.2</i>	<i>(AB-036965 Sh.2) Standard Straightening Vane and Pipe Spool Piece for Flow Meter Orifice Runs (Metric)</i>
<u>DD-950056</u>	<i>(AD-036968) Thermocouple Installation Details of Heater Tube Skinpoint</i>
<u>DC-950057</u>	<i>(AC-036974) Royalty and Custody Transfer Metering Installation for Wet Gas</i>
<u>DD-950058</u>	<i>(AD-036111) Condensate or Seal Pot Detail</i>
<u>DC-950059</u>	<i>(AC-036231) Instrument Piping Details Flow Meter Installations Liquid Service (Non-Corrosive)</i>
<u>DC-950060</u>	<i>(AC-036232) Instrument Piping Details Flow Meter Installations Liquid Service (Corrosive)</i>
<u>DC-950061</u>	<i>(AC-036233) Instrument Piping Details Flow Meter Installations Gas and Vapor Service (Non-Corrosive)</i>
<u>DC-950062</u>	<i>(AC-036234) Instrument Piping Details Flow Meter Installations Gas and Vapor Service (Corrosive)</i>

[DC-950063](#)

*(AC-036235) Instrument Piping Details Flow
Meter Installations Steam Service (Up to ANSI
Class 1500 Rating)*

DB-950106 Sh.1

Smart ZV, Single Acting Actuator

DB-950106 Sh.2

Smart ZV, Double Acting Actuator

AB-950129 Sh.1

*Local Shutdown Cabinet, Conventional Double
Acting Actuator*

AB-950129 Sh.2

*Local Shutdown Cabinet, Conventional Spring
Return*

Revision Summary

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Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with editorial changes.