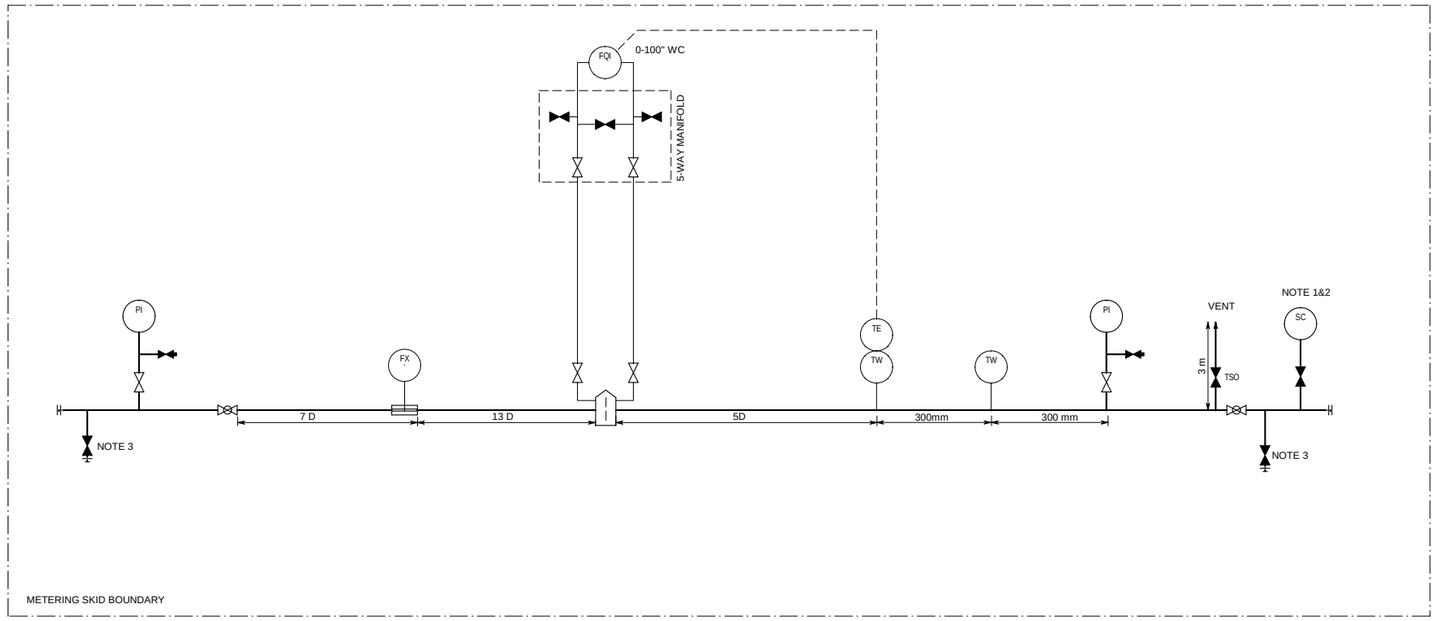



NOTES:

1. SAMPLE CONNECTION AS PER SA STANDARD DRAWING AC-036045
2. SAMPLE POINT TO BE USED FOR THE INSTALLATION OF A COMPOSITE SAMPLER OR FOR SPOT SAMPLING
3. VALVE NOT NEEDED WHEN A TOTAL SHUTDOWN OF THE METERING SYSTEM IS ACCEPTABLE

## LEGEND

PIPING MATERIAL SPECIFICATION SAES-L-005

PROCESS LINE

PER INSTR. SOCIETY OF AMERICA

INSTRUMENT AIR LINE

INSTRUMENT ELECTRICAL LINE

PER SAUDI ARAMCO CADD STDS.

INSTRUMENT ELECTRICAL LINE

INSTRUMENT AIR LINE

NOTE: TAG MARK WHICHEVER IS APPLICABLE PER SAES-J-004

REDUCER

SPECTACLE PLATE-OPEN

SPECTACLE PLATE-CLOSED

GATE VALVE

GLOBE VALVE

CHECK VALVE

PLUG VALVE

BALL VALVE

DOUBLE DISC GATE VALVE

ANGLE VALVE

RELIEF VALVE

MOTOR OPERATED VALVE

PISTON OPERATED VALVE

CONTROL VALVE

BALL TYPE CONTROL VALVE WITH POSITIONER

SOLENOID VALVE

VALVE NORMALLY CLOSED

ORIFICE METER

STRAIGHT. VANES

TSO -TIGHT SHUT OFF
S.C. - SAMPLE CONN.
-DRAIN TO PRESSURE SEWER
OWS -OILY WATER SEWER
D -DRAIN
V -VENT

INSTRUMENT DEFINITION & SYMBOLS SAES-J-004

| | |
|---|---|
| AO/AFO | -AIR TO CLOSE/ AIR FAILURE OPEN |
| AO/AFS | -AIR TO CLOSE/AIR FAILURE STEADY |
| AO/AFC | -AIR TO OPEN/ AIR FAILURE CLOSE |
| AO/AFS | -AIR TO OPEN/AIR FAILURE STEADY |
| AOV | -AIR OPERATED VALVE |
| AT | -ANALYZER TRANSMITTER |
| DT | -DENSITY TRANSMITTER |
| ESD | -EMER. SHUTDOWN SYSTEM |
| FC | - FLOW CONTROLLER |
| FV | -FLOW CONTROL VALVE |
| FCV | -FLOW CONTROL VALVE (SELF-ACTUATED) |
| FE | -FLOW ELEMENT |
| FG | -FLOW SIGHT GLASS |
| FHV | -FLOW MANUAL CONT. VALVE |
| FHT/I | -FLOW MANUAL TRANSDUCER |
| FIC | -FLOW INDICATOR CONTROLLER |
| FM | -FLOW METER |
| FO | -RESTRICTION ORIFICE |
| FQI | -FLOW TOTALIZER INDICATOR |
| FR | -FLOW RECORDER |
| FT | -FLOW TRANSMITTER |
| FY | -FLOW RELAY |
| HIC | -HAND INDICATOR CONTROLLER |
| HS | -HAND SWITCH |
| LA | -LEVEL ALARM |
| LV | -LEVEL CONTROL VALVE |
| LCV | -LEVEL CONTROL VALVE (SELF-ACTUATED) |
| LG | -LEVEL GAUGE GLASS |
| LIC | -LEVEL INDICATOR CONTROLLER |
| LI | -LEVEL INDICATOR |
| LR | -LEVEL RECORDER |
| LS | -LEVEL SWITCH |
| LT | -LEVEL TRANSMITTER |
| LTd | -LEVEL TRANSDUCER |
| ML | -MOTOR STATUS LIGHT |
| MOV | -MOTOR OPERATED VALVE |
| NA | -ANNUNCIATOR |
| PB | -PUSHBUTTON |
| PC | -PRESSURE CONTROLLER |
| PV | -PRESS. CONTROL VALVE |
| PCV | -PRESS. CONTROL VALVE (SELF ACTUATED) |
| PdC | -PRESS. DIFF. CONTROLLER |
| Pdi | -PRESS. DIFF. INDICATOR |
| PdIC | -PRESSURE DIFFERENTIAL INDICATOR CONTROLLER |
| PdIS | -PRESSURE DIFFERENTIAL INDICATOR SWITCH |
| PdT | -PRESS. DIFF. TRANSMITTER |
| PdTd | -PRESS. DIFF. TRANSDUCER |
| PG | -PRESSURE GAGE |
| PI | -PRESSURE INDICATOR |
| PIC | -PRESS. INDICATOR CONTROLLER |
| PR | -PRESSURE RECORDER |
| PS | -PRESSURE SWITCH |
| PT | -PRESSURE TRANSMITTER |
| PX | -PRESSURE POINT |
| PY | -PRESS. COMPUTATION MOD. |
| PZV | -PRESSURE RELIEF VALVE |
| RTD | -RESIST. TEMP. DETECTOR |
| SI | -SPEED INDICATOR |
| SS | -SPEED SWITCH |
| TC | -TEMP. CONTROLLER |
| TV | -TEMP. CONTROL VALVE |
| TCV | -TEMP. CONTROL VALVE (SELF-ACTUATED) |
| TE | -TEMP. ELEMENT |
| TG | -THERMOMETER |
| THS | -TEMP. HAND SWITCH |
| TI | -TEMP. INDICATOR |
| TR | -TEMP. RECORDER |
| TS | -TEMP. SWITCH |
| TT | -TEMP. TRANSMITTER |
| TTd | -TEMP. TRANSDUCER |
| TW | -THERMOWELL |

| | |
|---|---|
| VE | -VIBRATION ELEMENT |
| VS | -VIBRATION SWITCH |
| VT | -VIBRATION TRANSMITTER |
| XL | -PILOT LIGHT (NOT FOR MOTOR) |
| XS | -LIMIT SWITCH |
| ZV | -SAFETY SHUTDOWN VALVE |

DATA LOGGER POINT (F-FLOW P-PRESS. L-LEVEL T-TEMP. X-MISC. A-ALARM) (DCS)

LOCAL PANEL MOUNTED INSTR.

BOARD MOUNTED INSTRUMENT

STATUS LIGHTS R-RED, G-GREEN PILOT LIGHT (DO NOT USE FOR MOTOR STATUS) (PSL)

MOTOR STATUS PILOT LIGHT

LOCAL MOUNTED INSTRUMENT

MOUNTED BEHIND LOCAL PANEL

BACK MOUNTED (OR BACK OF PANEL)

ELECTRICAL SUPPLY REQUIRED

INSTRUMENT AIR SUPPLY REQUIRED

HIGH H

LOW L

TWO PEN RECORDER

FOUNDATION FIELDBUS INSTRUMENT

DISTRIBUTED CONTROL/SHARED DISPLAY SYMBOLS

(DCS) DISTRIBUTED CONTROL SYSTEM, OPERATOR ACCESSIBLE IN CONTROL ROOM

(DCS) DISTRIBUTED CONTROL SYSTEM, OPERATOR INACCESSIBLE IN CONTROL ROOM

(DCS) DISTRIBUTED CONTROL SYSTEM, OPERATOR INACCESSIBLE IN FIELD

DISTRIBUTED CONTROL INTERCONNECTING LOGIC CONTROLLER WITH BINARY OR SEQUENTIAL FUNCTIONS

(PLC) PROGRAMMABLE LOGIC CONTROLLER, NORMALLY INACCESSIBLE OR BEHIND THE PANEL DEVICE OR FUNCTIONS

(PLC) PROGRAMMABLE LOGIC CONTROLLER FUNCTION, CAN BE NORMALLY DISPLAYED ON CRT

LOCAL DCS OR AUXILIARY DCS LOCATION NORMALLY ACCESSIBLE TO OPERATOR

(PLC) PROGRAMMABLE LOGIC CONTROLLER I/O POINT NORMALLY INACCESSIBLE BY OPERATOR

## REFERENCE DRAWINGS

| | |
|---|---|
| LETTER IDENTIFICATION OF LINES | AE-036204 |
| PIPING SYMBOLS | AB-036227 |
| EQUIPMENT SYMBOLS | AB-036305 |
| INSTRUMENT SYMBOLS | AC-036950 |
| PIPING LAYOUT INDEX | |
| PLOT PLAN | |
| PROCESS FLOW DIAGRAM | |
| HYDROSTATIC TEST DIAGRAM | |
| DRAWING CONTROL FOR J.O. | |
| INSTRUMENT INSTALLATION SCHEDULES | |
| | |
| | |

## REVISION VALIDATION

THIS REVISION NO. 00 IS COVERED, FOR ALL APPROVAL AND CERTIFICATION REQUIREMENTS, PER SAEP-334, UNDER DRAWING COMPLETION CERTIFICATE NO:

768530-0810-002

| DESIGN CERTIFICATION (DESIGN AGENCY) | REVIEW FOR KEY DRAWINGS (SAUDI ARAMCO) ☒ REQUIRED | | OTHER |
|---|---|---|---|
| ENGG./DATE JDE July 28, 2010 | CERTIFIED BY/DATE JDE July 28, 2010 | CONST. AGENCY/DATE | OPERATIONS/DATE | BY/DATE WAB July 28, 2010 |

| REV.NO. | DATE | REVISION DESCRIPTION |
|---|---|---|

JOB ORDER/EWO NO. 10-00912

THIS REVISION IS NOT TO BE USED FOR CONSTRUCTION UNTIL CERTIFIED AND DATED

SAUDI ARABIAN OIL COMPANY

**PIPING & INSTRUMENTATION DIAGRAM** — DRAWING TYPE: PID

**SMALL METERING SKID (GAS)**

FIELD - MOUNTED FC

SPPID Template_Plant01 — SAUDI ARABIA

| PLANT NO. | INDEX | DRAWING NUMBER | SHT. NO. | REV. NO. |
|---|---|---|---|---|
| 990 | A | AB-036180 | 001 | 00 |

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