

INSTRUMENT SYMBOLS

XXX - YYYY - ZZZZS

AREA/UNIT CODE(030 FOR GC-30)

INSTRUMENT IDENTIFICATION

TRAIN NUMBER 1,2,3 (COMMON=0)

SEQUENCE NUMBER

SUFFIX (OPTIONAL)

INSTRUMENTS ARE IDENTIFIED FOR LEVEL, FLOW, PRESSURE AND TEMPERATURE AS FOLLOWS :

(EXAMPLE FOR LEVEL)

LAHH LEVEL ALARM HIGH HIGH

LAH LEVEL ALARM HIGH

LAH1 FIRST HIGH LEVEL ALARM

LAH2 SECOND HIGH LEVEL ALARM

LIT LEVEL TRANSMITTER

LC LEVEL CONTROLLER

LI LEVEL INDICATOR

LG LEVEL GAUGE

LAL LEVEL ALARM LOW

LALL LEVEL ALARM LOW LOW

LOCALLY MOUNTED INSTRUMENT

INSTRUMENTS SHARING COMMON HOUSING

LEVEL SWITCH

LEVEL INDICATOR TRANSMITTER (DISPLACER TYPE)

LEVEL INDICATOR TRANSMITTER (DIFFERENTIAL PRESSURE TYPE)

LEVEL INDICATOR TRANSMITTER (RADAR TYPE)

LEVEL GAUGE

LEVEL DIFFERENTIAL GAUGE

VARIABLE AREA METER

PADDLE TYPE FLOW SWITCH

FLOW METER (ORIFICE PLATE)

RESTRICTION ORIFICE

SENIOR ORIFICE PLATE

CHEMICAL SEAL

FLOW METER (VENTURI, DALL OR FLOW NOZZLE)

FLOW METER (PITOT TUBE/ANNUBAR) NOT TO BE USED ON PIGGED LINES

VORTEX FLOW METER

DCS INDICATOR DETAIL FOR FIELD INSTRUMENT

FIELD TO DCS

FIELD-ESD-DCS

FIELD-PKG-DCS

DCS FUNCTION SYMBOLS

FUNCTION

FUNCTIONS:

☒ SQUARE ROOT

☒ ADD OR TOTALIZE

☒ SUBTRACT

☒ BIAS

☒ HIGH SELECT

☒ LOW SELECT

☒ MULTIPLY

☒ DIVIDE

☒ INTEGRAL FUNCTION

☒ SET POINT LIMITS

☒ OTHER FUNCTIONS AS PER I.S.A

DCS SYMBOLS

DCS VDU DISPLAYED INSTRUMENT IN CENTRAL CONTROL ROOM

DCS VDU NOT VISIBLE TO OPERATOR

SCADA SYMBOLS

REMOTE TERMINAL UNIT (SCADA)

SCADA FUNCTION NOT VISIBLE TO OPERATOR

ESD/PLC/SSLS/F&G SYMBOLS

ESD LOGIC (ACCESSIBLE TO OPERATOR)

ESD LOGIC (NOT ACCESSIBLE TO OPERATOR)

PROGRAMMABLE LOGIC CONTROLLER (PLC) (NORMALLY ACCESSIBLE TO OPERATOR)

PROGRAMMABLE LOGIC CONTROLLER (PLC) (NOT ACCESSIBLE TO OPERATOR)

SSLS LOGIC (NORMALLY ACCESSIBLE TO OPERATOR)

SSLS LOGIC (NOT ACCESSIBLE TO OPERATOR)

F&G LOGIC

ESD/SSLS SIGNAL TO CONTROL ELEMENT

ESD/SSLS SIGNAL FROM INITIATING DEVICE

X = 1) PLANT SHUTDOWN WITH DEPRESSURISATION

X = 2) PLANT SHUTDOWN WITHOUT DEPRESSURISATION

X = 3) PRODUCTION TRAIN SHUTDOWN

X = 4) LOCAL PROCESS ELEMENT AND RELATED SHUTDOWN

PNEUMATIC HAND SWITCHES

3 WAY SWITCH

4 WAY SWITCH

LOCAL & PACKAGED EQUIPMENT PANELS

PANEL OR SYSTEM INSTRUMENT IN AUXILIARY ROOM OR CONTROL ROOM

REAR OF PANEL OR BLIND INSTRUMENT SYSTEM IN AUXILIARY ROOM OR CONTROL ROOM

PILOT LAMP PANEL MOUNTED IN AUXILIARY ROOM OR CONTROL ROOM

PILOT LAMP LOCAL PANEL MOUNTED

INSTRUMENT LOCATED ON LOCAL PANEL - ONE OR TWO DIGIT NUMBER SHALL BE USED TO IDENTIFY SPECIFIED LOCAL PANEL

INSTRUMENT LOCATED REAR OF LOCAL PANEL - ONE OR TWO DIGIT NUMBER SHALL BE USED TO IDENTIFY SPECIFIED LOCAL PANEL

INSTRUMENT SIGNAL SYMBOLS

PNEUMATIC SIGNAL

HYDRAULIC SIGNAL

INSTRUMENT CAPILLARY TUBING

INSTRUMENT SIGNAL (ELECTRICAL)

DCS SOFTWARE OR FIRMWARE LINK

TELECOMMUNICATION /TELEMETRY (GMC LINE)

ELECTRO MAGNETIC (RADAR/RADIO/MICROWAVE)

ESD LOGIC SYMBOLS

INPUT TO LOGIC

OUTPUT FROM LOGIC

AIR VOLUME BOTTLE FOR ESDV & SBDV

SEE NOTE 12, 14

FOR SINGLE ACTING ACTUATOR

FOR DOUBLE ACTING ACTUATOR

MOTOR INSTRUMENTATION DETAILS

AS SHOWN IN P&ID

TYP.1

MOTOR INSTRUMENTATION DETAILS

AS SHOWN IN P&ID

TYP.2

INSTRUMENT IDENTIFICATION LETTERS

FIRST LETTER

SUCCEEDING LETTERS

MOTOR SIGNAL DETAILS OPERATING FROM DCS (TYPICAL 1) EXPANDED DETAIL

SEE NOTES 8,9,10,20,21,27

UL XXXXR LOCAL

UL XXXXA RUNNING

UL XXXXB STOPPED

UA XXXXA FAULT

UA XXXXB AVAILABLE

UA XXXXE EMERGENCY STOP

DIRP

EIRP

MCC

MOTOR STARTER

M

TEST/REMOTE SELECTOR SWITCH

TRIP

LOCAL/OFF/REMOTE SELECT

HS XXXXS SELECT

HS XXXXA START

HS XXXXB STOP

LOCAL/OFF/REMOTE SELECT

HS XXXXR1 STOP PUSH BUTTON (HSXXXB1)

HS XXXXA1 START PUSH BUTTON (HSXXXA1)

EMERGENCY STOP (HSXXXE1)

MOTOR SIGNAL DETAILS OPERATING FROM SSLS/PKG (TYPICAL 2) EXPANDED DETAIL

SEE NOTES 8,9,10,20,21,22,23,24,27

UL XXXXR LOCAL

UL XXXXA RUNNING

UL XXXXB STOPPED

UA XXXXA FAULT

UA XXXXB AVAILABLE

UA XXXXE EMERGENCY STOP

SSLS/PKG

EIRP

MCC

MOTOR STARTER

M

TEST/REMOTE SELECTOR SWITCH

TRIP

LOCAL/OFF/REMOTE SELECT

HS XXXXS SELECT

HS XXXXA AUTO

HS XXXXR MANUAL

HS XXXXA START

HS XXXXB STOP

LOCAL/OFF/REMOTE SELECT

HS XXXXR1 STOP PUSH BUTTON (HSXXXB1)

HS XXXXA1 START PUSH BUTTON (HSXXXA1)

EMERGENCY STOP (HSXXXE1)

GENERAL NOTES:

1. ALL EQUIPMENT ARE PREFIXED BY 530-, & INSTRUMENTS PREFIXED BY 030- WHICH IS NOT SHOWN ON THE P&ID'S OR P&ID'S.

2. INSTRUMENTS SYMBOLOGY IS IN ACCORDANCE WITH ANSI/ISA SECTION 5-1 & 5-2 & IS SHOWN ON DWG. 50489-530-020-PID-1105.001.

3. LOW POINT DRAIN & HIGH POINT VENT ARE INDICATED IN P&ID.

4. ALL INSTRUMENT NOZZLE CONNECTIONS ON EQUIPMENT ARE 300# CLASS MINIMUM.

5. ALL TEMPERATURE CONNECTIONS ON EQUIPMENT ARE 300# CLASS MINIMUM.

6. ALL CONTROL VALVES HAVE A BODY RATING OF 300# CLASS MINIMUM IRRESPECTIVE OF PIPING CLASS FOR SIZES UP TO AND INCLUDING 8" NOMINAL BORE. LARGER VALVES ARE LINE RATED.

7. ISOLATION VALVES ARE SHOWN ON ALL P&IDs. SINGLE ISOLATION VALVES FOR INSTRUMENT WHERE EVER APPLICABLE, REPRESENTED BY SINGLE ISOLATION VALVE WITH LETTER "S".

8. MOTOR CONTROLS & INDICATORS DUTY/SELECT SWITCH REQUIRED ONLY WHEN AUTO-START OF STANDBY MOTOR IS SHOWN ON RESPECTIVE P&ID DIAGRAM.

9. EACH MOTOR DOES NOT NECESSARILY HAVE ALL THESE FEATURES REFER TO P&ID'S FOR SPECIFICATION MOTOR APPLICATION DETAILS AND KOC-I-1001.

10. EITHER A MOTOR OPERATING FROM DCS OR SSLS OR PKG AS INDICATED IN THE RESPECTIVE P&ID'S.

11. DCS INSTRUMENTATION CAN ALSO BE TOTALISED & RECORDED.

12. SINGLE OR DOUBLE ACTING ACTUATOR TO BE SELECTED IN ACCORDANCE WITH REQUIRED SPEED AND TORQUE.

13. ALL TRANSMITTERS ARE SMART INDICATING TYPE TRANSMITTERS.

14. ACCUMULATOR IS SIZED FOR 3 FULL STROKES OF THE VALVE WITH A 50% SAFETY FACTOR.

15. LEVEL GAUGES IN DIRTY SERVICE (CRUDE, EFFLUENT WATER) FOR TANKS, SEPARATORS AND DESALTERS ARE MAGNETIC TYPE. ALL LEVEL GAUGES ARE ILLUMINATED TYPE SUITABLE FOR AREA CLASSIFICATION.

16. DELETED.

17. ALL PRESSURE GAUGES/TRANSMITTERS ON LOW TEMPERATURE CRUDE AND CHEMICAL SERVICE ARE DIAPHRAGM SEAL/MEMBRANE TYPE.

18. DELETED.

19. APPLICABLE ONLY IF MARKED ON RELEVANT P&ID.

20. START SIGNAL FROM ESD ARE MOMENTARY CLOSING CONTACTS FOR A MINIMUM DURATION OF 3 SECONDS.

21. STOP SIGNAL FROM ESD ARE MOMENTARY OPENING CONTACTS FOR A MINIMUM DURATION OF 3 SECONDS.

22. STOP COMMAND FROM CRUDE EXPORT PUMP, TV COMPRESSOR & DESALTER FEED HEATER PACKAGE ARE HARDWIRED & THE SAME ARE RECEIVED FROM CASE TO CASE BASIS.

23. TRIP COMMAND ARE HARDWIRED FROM PACKAGES.

24. MOTOR TYPICAL 2 APPLICABLE FOR MAIN MOTORS ONLY.

25. TAG NUMBER FOR HS/UA/UL FOR MOTORS HAS BEEN PROVIDED ON PID-1104.003.

26. REFER CLAUSE & EFFECT 50489-530-020-PHL-1009 AS REDUNDANT PUSH BUTTON FOR LEVEL-1 & LEVEL-2 SHUTDOWN HAS BEEN PROVIDED IN CONTROL ROOM.

27. DISCREPANCY ALARM IS CONFIGURED FOR ALL PUMPS. THE ALARMS ARE CONFIGURED FOR 10 SEC DELAY.

AS-BUILT

KOC APPROVAL

NAME / KOC No:

DESIGNATION :

GROUP / TEAM :

SIGNATURE :

DATE :

AS-BUILT

LARSEN & TOUBRO LIMITED

NAME : VAIBHAV VERMA

DESIGNATION : AGM

SIGNATURE :

DATE : 25-Sep-2018

DEPT/ DIVISION : ENGINEERING

REV.

DESCRIPTION

DRAWN

CHECKED

HOD

PEM

DATE

CONTRACTOR REVISION

KUWAIT OIL CO. K. S. C.

شركة نفط الكويت ش.م.ك.

ايسو 9001:2015

A Subsidiary of Kuwait Petroleum Corporation

CONTRACTOR DETAILS:-

LARSEN & TOUBRO LIMITED

FARIDABAD

PROJECT TITLE:-

NEW GATHERING CENTRE GC-30

IN NORTH KUWAIT

DOCUMENT TITLE:-

PIPING & INSTRUMENTATION DIAGRAM

STANDARD SYMBOL & NOMENCLATURE

PROJECT NO.

DRAWING NO.

CONTRACTOR DRG. NO.

REV.

KOC DRG. NO.

REV.

EF1902

50489-530-020-PID-1104.002

20

SHEET NO.

2 OF 3

COMPANY DRG. NO.

EF1902-530-DCO-PID-0105.001

REV.

SHEET NO.

A4

A1