

NORSOK STANDARD

FIELD INSTRUMENTATION

I-001
Rev. 3, April 2000

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FOREWORD

NORSOK (The competitive standing of the Norwegian offshore sector) is the industry initiative to add value, reduce cost and lead time and remove unnecessary activities in offshore field developments and operations.

The NORSOK standards are developed by the Norwegian petroleum industry as a part of the NORSOK initiative and are jointly issued by OLF (The Norwegian Oil Industry Association) and TBL (Federation of Norwegian Engineering Industries). NORSOK standards are administered by NTS (Norwegian Technology Standards Institution).

The purpose of this industry standard is to replace the individual oil company specifications for use in existing and future petroleum industry developments, subject to the individual company's review and application.

The NORSOK standards make extensive references to international standards. Where relevant, the contents of this standard will be used to provide input to the international standardisation process. Subject to implementation into international standards, this NORSOK standard will be withdrawn.

Annex A is informative and B is normative.

INTRODUCTION

The revision 3 of this standard has been updated for new data sheets in Annex B, replacing the earlier IFEA-IDAS data sheets. A new Annex C is included to advice on how to use each specific data sheet.

The main text in the standard is unchanged from Rev. 2.

1 SCOPE

The standard identifies the requirements to field instrumentation design.

Note: Requirements for installation are found in NORSOK standard Z-010 "Installation of Electrical, Instrumentation and Telecommunication" and requirements for control system interface are found in I-CR-002 "Safety and Automation System".

2 NORMATIVE REFERENCES

The following standards include provisions, which, through references in this text, constitute provisions of this NORSOK standard. Latest issue of the references shall be used unless otherwise agreed. Other recognised standards may be used provided it can be shown that they meet or exceed the requirements of the standards referenced below.

ANSI B16.10	Face-to-face and end-to-end dimensions of valves.
ANSI B16.36	Steel orifice flanges
ANSI/FCI 70-2	Control valve seat leakage.
ANSI/ASME B1.20.1	Pipe threads general purpose (imperial units)
ANSI/ASME	Performance Test Codes 19.3 - 1974, chapter 1, section 8-19 Thermowells.
ANSI B16.5	Pipe Flanges and Flanged Fittings
API RP 520	Sizing, Selection, and Installation Of Pressure-Relieving Devices in Refineries, Part I and II.
API RP 526	Flanged steel safety relief valves.
API RP 527	Seat Tightness of Pressure Relief Valves.
API RP 670	Vibration, axial position and bearing temperature system.
API RP 678	Accelerometer-based Vibration Monitoring System.
ASME VIII	Boiler and pressure vessel code - Section VIII, Div. 1.
BS 2915	Bursting Discs and Bursting Disc Devices
EN 50081-2	Electromagnetic compatibility generic emission standard
EN 50082-2	Electromagnetic compatibility generic immunity standard
EN 60534-2-1/2 /IEC 534-2	Industrial process control valves. Part 2, section 1 and 2.
EN 60584-1/2 /IEC 584-1	Thermocouples
EN 60751 /IEC 751	Resistance Temperature Detectors (RTD)
ISA 75.01	Flow equations for sizing control valves.
ISO 1000	SI Units and recommendation for the use of their multiples and of certain other units.
ISO 5167	Measurement of fluid flow by means of pressure differential devices - Part 1.
NAMUR	Normenarbeitsgemeinschaft für Mess- und Regelungstechnik in der Chemischen Industrie
NFPA 72E 3-3	Temperature Classification

NORSOK L-002	Piping Design, Layout and Stress Analysis
NORSOK L-CR-003	Piping Details (will be renumbered L-003)
NORSOK M-501	Surface Preparation and Protective Coating

3 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

Shall	Verbal form used to indicate requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted, unless accepted by all involved parties.
Should	Verbal form used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required.
May	Verbal form used to indicate a course of action permissible within the limits of the standard.
Can	Verbal form used for statements of possibility and capability, whether material, physical or casual.

The term instruments also include actuated valves and safety valves.

3.2 Abbreviations

GRP	Glass fibre Reinforced Plastic
HF	Hydrogen Fluoride
HVAC	Heating, Ventilation and Air Conditioning
IFEA	Industriens Forening for Elektroteknikk og Automasjon (The Association for Electrical Technology and Automation in Industry)
IR	Infra Red
LER	Local Equipment Room
NPT	National Pipe Thread
Pt	Platina
RTD	Resistance Temperature Detector
SI	System International
TE	Temperature Element
TI	Temperature Indicator
UV	Ultra Violet

3.3 Engineering Units

Pressure	bar, mbar, barg, bara
Level	mm, % for indication (for guidelines ref. Annex A)
Volume Flow	m ³ /h (Flowing condition), Sm ³ /h (Standard condition ref. ISO 1000)
Mass Flow	kg/h
Temperature	Deg C

For other physical properties, SI units shall be utilised as per ISO 1000.

4 FUNCTIONAL REQUIREMENTS

4.1 Instrument Supplies

Electrical supply to instrument panels in LERs: 230V a.c. 50 Hz (standard) or 24V d.c.

Electrical supply to field instruments: 24V d.c. (standard) or 230V a.c. 50Hz.

Electrical supply to instrument field panels: 24V d.c. (standard) or 230V a.c. 50 Hz.

Pneumatic ring main supply: Minimum 7 barg, maximum 10 barg.

Pneumatic instrument supply: 1.4 barg (standard) or as required.

Hydraulic ring main /instrument supply: Minimum 180 barg, maximum 210 barg.

Hydraulic supply for wellhead/downhole depending on reservoir pressure.

4.2 Signal Types

The following signal types shall be used:

Analogue input/output: 2 wire, 4 - 20 mA.

Digital input: Potentialfree contact.

Digital output: 24 VDC.

Signals between control systems and other panels shall be powered from platform control system.

Position: Proximity switches with NAMUR interface.

Pneumatic signals: 0.2 - 1.0 barg.

Instrument field bus/digital communication may be used if the concept demonstrates economical savings and requirements to time response are satisfied.

4.3 Instrument Design Principles

Instrument performance/accuracy shall be sufficient to fulfil process/unit performance requirements.

Variation of instrument types and ranges (e.g. thermowell lengths/transmitter ranges) shall be kept to a minimum.

Analogue instruments shall be used for switch functions.

Smart type instruments should be used. For each installation, the communication protocols shall be harmonised.

Galvanic isolation barriers shall be used for I/O signals. These barriers should have full smart signal transmission capability.

For simple local control purposes only, the field instruments including controllers may be of a pneumatic type.

Where local indicators are required, local indicators and transmitters shall be combined. Separate local indicators may only be installed if necessary for local operation.

Any arrangement of instruments shall allow for the removal of a sensor/detector head while maintaining the integrity of the other sensors, e.g. in addressable systems.

Instruments shall meet requirements to EN 50081-2 and EN 50082-2 regarding electromagnetic compatibility.

Flange connection for inline instruments shall follow piping class and specification ref. ANSI B16.5 Pipe Flanges and Flanged Fittings.

All in-line flow elements (when part of the process line) shall be flanged for removal from the process line.

Pressure vessel design (e.g. accumulators for on/off valves) shall follow NORSOK standard L-002 Piping Design, Layout and Stress Analysis.

The most frequently used measuring principles are specified in separate sections of this document. Other types may be used on special applications.

For field instruments not specifically dealt with in this standard, the design shall be based on recognised international standards where applicable.

4.4 Instrument Installation Design Principles

Pressure sensing instruments that can be clogged due to high viscosity fluids or hydrates or if the measurement can be affected by other factors, shall be equipped with chemical seals.

Pressure instruments shall have individual process isolation valves.

Combined solutions may be used when not causing operational disadvantage/safety reduction during service of instruments etc.

Each pressure instrument with process connection shall be fitted with instrument block /bleed manifold (2/5 - way valve).

Full functional independence between control and safety devices shall be assured, including vessel/pipeline connections (e.g. common pressure tap for control and safety devices shall not be used).

Use of combined manifolds for piping and instruments valves shall be evaluated. Combined manifolds should be used when instruments are direct mounted on or in the immediate vicinity of the pipe/vessel.

Package suppliers shall terminate hydraulic and pneumatic tubing at skid edge with bulkhead male connectors or unions.

Package suppliers shall terminate instrumentation cables in junction boxes at skid edge or at agreed termination point.

If safety and functional requirements are fulfilled, the following shall apply:

Field instrument process connection: 1/2 " NPT ref. ANSI/ASME B1.20.1.

Field instrument pneumatic connection: 1/4 " NPT

Field instrument hydraulic connection: 1/2" NPT

Field instrument cable entry: ISO threads - size depending on cable size.

4.5 Instrument Materials

Instrument materials defined in this section shall apply. However, instruments may be specified with superior materials due to service requirements (particularly for internals).

4.5.1 In-line Instruments

Control valves, safety valves and other in-line instruments;

- Body, bonnet, and bolts/nuts according to piping standard (Note).
- Internals according to vendor recommendation.

Note: Magnetic Flow Meter: SS Type 316 body with lining may be used. For operating temp. > 60 °C, body shall be painted according to NORSOK standard M-501 Surface Preparation and Protective Coating.

Orifice plates, temperature wells etc. according to piping standard, but minimum 316 stainless steel.

4.5.2 Off-line Instruments

Instrument process wetted parts, tubing, tube fittings and bulk material:

Piping Class Material	Material Requirements ^{1) 2)}	
	Tm <= 60 °C ³⁾	Tm > 60 °C ³⁾
Carbon Steel	SS Type 316	Titanium
SS Type 316	SS Type 316	N/A
SS Type 6Mo	Titanium	Titanium
SS Type 22Cr Duplex	SS Type 316	Titanium
Titanium	Titanium	Titanium
GRP	Titanium	Titanium

Note 1 Acceptable replacement materials are UNS N10276 (Hastelloy C-276), UNS N06022 (Hastelloy C-22) and UNS N06625 (Inconel 625). For seawater service, Inconel shall not be used above 15 °C and Hastelloy C shall not be used above 55 °C.

Note 2 Titanium shall not be used for HF acid or pure Methanol service.

Note 3 T_m = Material selection temperature

a) Instrument tubing, fittings etc. without heat tracing and/or insulation:

Instrument side of isolation valve:

If stagnant condition: T_m = Operating temp. of the line to which the instrument is connected reduced with 25 °C. Applicable for the operating temp above 25 °C.

If circulation: T_m = Operating temp. of the line to which the instrument is connected.

Off instrument side of isolation valve: T_m = Operating temp. of the line to which the instrument is connected.

b) Instrument tubing, fitting etc., with heat tracing and/or insulation:

T_m = Operating temp. of the line to which the instrument is connected, or max. heat tracing operation range, whichever is the highest.

4.5.3 Instrument Housing

Instrument housing shall be resistant to saline atmosphere.

4.6 Air Supply Design

For users requiring filtered ring main pressure air supply, two air filters with isolation valves shall be provided in parallel before a distribution manifold.

For users requiring filtered reduced air supply, two air filter regulators with isolation valves shall be provided before a distribution manifold. Each branch off shall be provided with a 1/2" isolation valve.

Minimum two spare branch off with valve and plug shall be provided for each manifold.

Air manifolds shall be provided with a drain isolation valve at lowest point.

Simplified air supply arrangements may be used for few and/or non critical consumers.

4.7 Instrument Installation Bulk Materials

The selected compression tube fitting make shall be used throughout the whole installation. The compression fittings shall have 2 seal rings (twin ferrules).

Pressure ratings for compression tubes, tube - and pipe fittings, instrument valves and manifolds shall comply with the corresponding process requirements.

Tubing shall be seamless and shall be in metric sizes.

Compression tube fitting threads: NPT

Standard tubing sizes:

Signal air, impulse tubing, instrument air supply to instruments and hydraulic supply (below 413 barg)	10 x 1.5 mm
" (max. 520 Barg):	10 x 2.0 mm
Instrument air supply	25 x 1.5 mm

The Supplier shall use the standard tubing sizes and shall evaluate and advice if other outside diameters is required for any reason.

4.8 Temperature Measurements

4.8.1 General

Temperature measurements shall be performed by Pt 100 elements (RTD - Resistance Temperature Device) in accordance with EN 60751.

For temperature measurements above 600 degrees C, thermocouple material Chromel Alumel, type K, in accordance with EN 60584-1/2 should be used.

Temperature transmitters shall be included within the sensor head except for motor winding temperature measurement and similar.

Temperature sensors not accessible during operation shall for the selected critical equipment be installed with backup.

Surface mounted temperature elements may be used if accuracy and response requirements are met.

4.8.2 Thermowells

Thermowells shall be of the flanged type, size 1.5". For tanks, vessels and piping with pressure class 2500 lb and above, the size shall be 2".

For non-critical utility service, thermowells of threaded type, NPT, can be accepted.

Thermowells shall not be longer than strictly necessary to obtain required accuracy and to avoid vibration "cracking".

Thermowell strength calculations shall be performed for process hydrocarbon systems according to ANSI/ASME Performance Test Codes 19.3. -1974, chapter 1, section 8-19 thermowells.

Thermowell inner diameter suitable for TE/TI elements of 6 mm should be used.

4.8.3 Temperature Gauges

Bi-metallic temperature gauges with 100 mm nominal head diameter should be used for local indication.

Temperature gauges with capillary tubing should not be used.

Manufacturer's standard ranges should be used.

4.9 Flow Measurements

4.9.1 General

Measuring principles and technology shall be selected according to application. Typical evaluation criteria are as follows:

- high accuracy requirements
- high range ability requirements
- low pressure-drop requirements
- dirty fluids
- large pipe sizes
- low flows
- straight pipe requirements

All flow elements shall be marked with flow direction.

4.9.2 Flow Orifice Plates, Nozzles and Venturi Tubes

Flow orifice plates, nozzles and venturi tubes shall be calculated, manufactured and installed according to ISO 5167.

Straight length requirements shall as a minimum satisfy the "0.5 additional uncertainty" requirements.

Welded neck orifice flanges to ANSI B16.36 with flange tapping is standard.

Temporarily installed spacers shall be clearly marked as such.

4.10 Pressure Measurement

4.10.1 General

If pulsating pressure is likely to occur, a pulsation dampener shall be used.

All pressure instruments shall withstand a pressure of minimum 130 % of upper range value without need for recalibration.

Differential pressure instruments shall be able to withstand full static (line) pressure on each of the inputs with the other at zero without need for recalibration.

Differential pressure instruments for low ranges equipped with capillaries and chemical seals should be avoided.

4.10.2 Pressure Gauges

Pressure gauges shall be of the heavy duty, safety type with blow-out back as defined in recognised standard.

Gauges with ranges from 0.6 barg, shall have bourdon type element and shall have liquid filled house/case.

The nominal house/case diameter should be 100 mm for pressure gauges and 160 mm for differential pressure gauges, both with bottom connection.

The manufacturer's standard ranges should be used.

4.11 Level Measurement

4.11.1 General

Direct vessel mounted instruments with non-moving parts should be used.

Measuring principles shall be selected according to application. Typical evaluation criteria are as follows:

- non moving parts
- density
- pressure
- accuracy
- temperature
- vessel geometry
- nozzle locations
- clogging

4.11.2 Local Level Indicators (Gauges)

Level indicators shall cover maximum and minimum operational levels including high/low trip points.

Gauges with magnetic indicators should be used for hydrocarbon service, except for interface (oil/water) application.

If reflex and transparent type gauges are used, they shall have forged steel column and toughened glass.

Level gauge glasses shall have flanged connections and shall be fitted with gauge valves with offset pattern and safety ball check valves.

If several level glasses are used, visible sections shall overlap by not less than 50 mm.

The installation shall be fitted with process isolation, drain and vent valves complying with NORSOK standard L-CR-003 Piping Details.

Simpler solutions may be used on small and non critical vessels.

4.12 Control Valves

4.12.1 Valve Requirements

Sizing of control valves shall be made in accordance with the IEC 534-2 / ISA 75.01 standards and/or the control valve Supplier's sizing computer program.

Globe valves should be used but depending on service conditions and application other types may be used.

The size of valves should be 1, 1.5, 2, 3, 4, 6, 8, 10 inch and higher.

All valves shall be equipped with integrated position indicators.

When requirements to max. allowable leakage rate has to be set, ANSI/FCI 70-2 shall be applied.

Face to face dimensions shall be according to ANSI B16.10.

Arrow indicating direction of the flow shall be permanently marked on each side of the valve body.

Self-acting control valves shall be used only when a sufficient differential pressure exists.

4.12.2 Actuator Requirements for Control Valves

Spring return pneumatic diaphragm/piston type actuators should be used.

Where service condition or valve design exclude the use of above mentioned principal, double acting pneumatic piston actuators should be applied. Hydraulic or electric actuators may be used for special applications.

By loss of signal/supply the valve shall take the position required.

Electro-pneumatic positioners should be used for remote control.

4.13 Solenoid Valves

Solenoid valves shall not be used for direct operation in pipes with process media.

Solenoid valves should be used in signal/impulse lines for air and hydraulic.

4.14 Pressure Relief Valves/Bursting Discs

All the pressure relief valves shall be sized in accordance with the information on the data sheet and the method outlined in API RP 520, part I and II, for sizing of pressure relief valves for hydrocarbon systems.

Flanged steel safety relief valves for hydrocarbon systems shall conform to API 526.

Relief valves for the process piping, excluding steam and air pressure piping shall be of the enclosed spring type.

All relief valves for hydrocarbon systems shall conform to ASME VIII.

Seat tightness of pressure relief valves shall conform to API 527.

The total effective flow area of the orifice(s) selected shall exceed the calculated area only by an amount as limited by standard orifice sizes available.

Before orifice sizes Q, R and T are implemented, the relief valve manufacturer shall critically evaluate these large sizes against process medium/conditions.

The number of relief valves shall be kept to a minimum in a multiple safety valve installation.

In a multiple safety valve installation, all orifices shall be equal.

Design, sizing and approval of relief valves for utility systems shall be done to a recognised international standard/institution.

Bursting discs shall be designed according to BS 2915 or equivalent.

4.15 On/Off Valve Actuators

4.15.1 General

At minimum supply pressure the actuator's torque/thrust shall be 25 % above maximum torque/thrust required at max. differential pressure across the valve.

The actuator shall be provided with a local indicator showing the valve position.

By loss of signal/supply the valve shall take the position required.

Devices for control of the speed in both directions shall be installed on the control unit. It shall not be possible to fully close the restrictors.

Electrical actuators may be used for non safety applications.

4.15.2 Shutdown/Blowdown Application

Hydraulic or pneumatic single-acting spring return operated actuators should be used for shut-down valves. Double-acting actuators may be used when this proves beneficial based on an evaluation including weight, space and price. Hydraulic actuators should be used.

Hydraulic accumulators shall be of the piston type, nitrogen charged, with piston position detection possibility.

The valve control accumulator units shall be installed close to the valve.

4.16 Choke Valves

Remote operated production choke valves should be provided with stepping actuator.

Each step for both directions shall be equal in length.

Manual operation in both directions shall be possible.

4.17 HVAC Actuators

Actuators for HVAC shut-off and fire dampers shall be of spring return type.

Pneumatic HVAC actuators shall be designed to operate properly between max. 12.5 barg and min 5.6 barg air supply pressure.

The spring force shall be selected to keep the blade(s) in proper alignment, ensure air tightness in closed position and prevent chattering.

Actuators for HVAC pressure control dampers shall be provided with positioners.

4.18 Vibration Field Instruments

Vibration/proximity probes for vibration detection shall conform to API RP 670 and API RP 678 as relevant.

4.19 Fire & Gas Detectors**4.19.1 General**

Sensors shall be unaffected by ambient conditions.

Fire and Gas detectors may be of the smart/addressable (e.g. field bus) type.

Detectors should have a self test system. This system should be automatically operated.

4.19.2 Smoke Detectors

Detectors shall not be sensitive to water vapour.

The application shall determine the detection principle to be used.

Detectors shall have local alarm indicators to visually indicate when detectors are in alarm mode.

Very early smoke detection system may be used for cabinets in LER's.

4.19.3 Heat Detector

Heat detectors shall not be installed unless no other detection principle can be utilised.

Heat detectors and settings shall be selected in accordance with NFPA 72E 3-3 Temperature classification.

4.19.4 Flame Detector

Detector shall be of the IR or combination IR/UV type.

The application shall determine the type to be used.

Sensors shall not be susceptible to spectral response variation when subjected to continuous operation.

4.19.5 Gas Detector

Line detectors (open path) shall be evaluated in combination with point detection.

IR detectors should be used.

Application shall determine if catalytic detectors should be used.

ANNEX A - LEVEL MEASUREMENT GUIDELINES (INFORMATIVE)

Vessel/Tank Type	Level Definition	Remarks
Horizontal vessels	0% = Inside bottom or lowest measurable level 100% = Inside top or highest measurable level or 300 mm to 700 mm above highest alarm (separator)	Due to sand/sediment the lower instrument nozzle will be located at an angle of 18-30 degrees to the vessel vertical centre. This means that instrument will begin to measure from approximately 5% height. This does not apply to radiation units.
Horizontal vessels with boot	0% = Lowest measurable level 100% = Highest measurable level	Normal operation for this vessel type are restricted to within the boot. The control system shall define 0% as inside vessel bottom.
Vertical vessels - scrubbers	0% = Lowest measurable level 100% = Highest measurable level ~ 10% above high high level	Operational range on scrubber are by nature small. Thus there is no point in covering the whole vessel height.
Tanks with flat bottom	0% = Lowest measurable level 100% = Tank overflow	Generally storage tanks. This does not apply to tanks where the transmitter has high high shutdown function.
Tanks with sloping bottom	0% = Lowest measurable level 100% = Tank overflow	Generally storage tanks. This does not apply to tanks where the transmitter has high shutdown function.

ANNEX B - INSTRUMENT AND PROCESS DATA SHEETS (NORMATIVE)

List of available instrument datasheets and corresponding process datasheets:

Instrument Data Sheet		Corresponding Process Data Sheet
F01	Turbine and positive displacement flowmeter	PR 4
F02	Ultrasonic flowmeter	PR 4
F03	Magnetic flowmeter	PR 4
F04	Variable area flowmeter	PR 4
F05	Mass flowmeter	PR 4
F06	Averaging pitot tube	PR 4
F07	Orifice plates and flanges	PR 7 or PR 4
F08	Venturi flow element	PR 4
F09	Vortex flowmeter	PR 4
P01	Pressure/diff. pressure instrument electric	PR 5
P02	Pressure/diff. pressure indicator	PR 5
T01	Thermowell	PR 4
T02	Temperature instrument electric	PR 5
T03	Temperature indicator	PR 5
L01	Level instrument magnetic	PR 6
L02	Level instrument ultrasonic/microwave	PR 6
L03	Level instrument displacerfloat	PR 6
L04	Level instrument capacitive/conductive	PR 6
L05	Level glass/gauge	PR 6
L06	Level switch vibrating fork	PR 6
L07	Level instrument nucleonic	PR 6
V01	Block (on-off) valve	PR 1
V02	Control valve	PR 2
V03	Safety/relief valve	PR 3
V04	Solenoid/pneumatic/hydraulic pilot valve	
V05	Rupture/bursting disc	PR 3
S01	Fire and gas detector	
X01	Miscellaneous instruments	
Process Data Sheet		
PR1	Block (on-off) valve	
PR2	Control valve	
PR3	Safety/relief valve	
PR4	Inline/flow instrument	
PR5	Pressure & temperature transmitter/indicator/switch	
PR6	Level instrument	
PR7	Restriction orifice plate	

NORSOK		INSTRUMENT DATASHEET F01					
		TURBINE AND POSITIVE DISPLACEMENT FLOWMETER					
Tag number	:	Flow range	:				
Service description	:						
P&ID	:	Area	:				
Line/equipment no.	:	P. O. Number	:				
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Press. loss at full range : 1.06 Complete assembly : 1.07 Complete Assembly Face-to-face dimension : 1.08 Mounting : 1.09 Weight : 1.10 Other :			5 FLOW STRAIGHTENER 5.01 Type : 5.02 Material : 5.03 Connection : 5.04 Other : 6 METER TUBE 6.01 Material : 6.02 Connection up/downstr. : 6.03 Up/downstream length : 6.04 Tube inner diameter : 6.05 Other : 7 STRAINER 7.01 Type : 7.02 Body/Mesh Material : 7.03 Connection : 7.04 Other : 8 TRANSMITTER 8.01 Manufacturer model no : 8.02 Mounting : 8.03 Max distance meter/trans : 8.04 Cable connection : 8.05 Cable entry : 8.06 Dimension : 8.07 Material : 8.08 Enclosure protection : 8.09 Ex. classification : 8.10 Protective coating : 8.11 Indicator : 8.12 Preamplifier : 8.13 Totalizer : 8.14 Output signal : 8.15 Communication : 8.16 Supply voltage : 8.17 Consumption : 8.18 Load limitation : 8.19 Other : 9 NOTES				
2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated Range : 2.02 Characteristic : 2.03 Meter Factor : 2.04 Accuracy : 2.05 Linearity : 2.06 Repeatability : 2.07 Min / Max range limits : 2.08 Other : 3 METER BODY : 3.01 Nominal size : 3.02 Manufacturer model no : 3.03 Process conn. size/type : 3.04 Pressure rating : 3.05 Face to face dimension : 3.06 Body inner diameter : 3.07 Sour service spec. : 3.08 Material, body : 3.09 Material, flange : 3.10 Protective coating/color : 3.11 Other : 4 INTERNAL 4.01 Type : 4.02 Material, shaft : 4.03 Material, support : 4.04 Material, rotor : 4.05 Material, bearing : 4.06 Material, pick-up : 4.07 No of pick-ups : 4.08 Other :							
Rev	Date	Issue/description	Prepared	Checked	Approved	Datasheet no.	Page

NORSOK		INSTRUMENT DATASHEET F02					
		ULTRASONIC FLOWMETER					
Tag number	:	Flow range	:				
Service description	:						
P&ID	:	Area	:				
Line/equipment no.	:	P. O. Number	:				
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Press. loss at full range : 1.06 Complete assembly : 1.07 Complete assembly Face-to-face dimension : 1.08 Mounting : 1.09 Weight : 1.10 Other :			5 FLOW STRAIGHTENER 5.01 Type : 5.02 Material : 5.03 Connection : 5.04 Other : 6 METER TUBE 6.01 Material : 6.02 Connection up/downstr. : 6.03 Up/downstream length : 6.04 Tube inner diameter : 6.05 Other : 7 TRANSMITTER 7.01 Manufacturer model no : 7.02 Mounting : 7.03 Max distance meter/trans : 7.04 Cable connection : 7.05 Cable entry : 7.06 No of cables connected : 7.07 Dimension : 7.08 Material : 7.09 Enclosure protection : 7.10 Ex. classification : 7.11 Protective coating : 7.12 Indicator : 7.13 Output signal : 7.14 Communication : 7.15 Supply voltage : 7.16 Consumption : 7.17 Load limitation : 7.18 Other : 8 NOTES				
2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated Range : 2.02 Characteristic : 2.03 Meter Factor : 2.04 Accuracy : 2.05 Linearity : 2.06 Repeatability : 2.07 Min / Max range limits : 2.08 Other : 3 METER BODY 3.01 Nominal size : 3.02 Manufacturer model no : 3.03 Process conn. size/type : 3.04 Pressure rating : 3.05 Face to face dimension : 3.06 Body inner diameter : 3.07 Sour service spec. : 3.08 Material, body : 3.09 Material, flange : 3.10 Protective coating/color : 3.11 Other : 4 TRANSDUCERS (SENSORS) 4.01 Type : 4.02 Number of transducers : 4.03 Wetted or non-wetted : 4.04 Mounting : 4.05 Transducers connection : 4.06 Transducer cable length : 4.07 Material, transducers : 4.08 Material, enclosure : 4.09 Enclosure protection : 4.10 Other :							
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NORSOK		INSTRUMENT DATASHEET F03					
		MAGNETIC FLOWMETER					
Tag number :		Flow range :					
Service description :							
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Mounting : 1.06 Weight : 1.07 Other : 2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated Range : 2.02 Characteristic : 2.03 Accuracy : 2.04 Linearity : 2.05 Repeatability : 2.06 Min / Max range limits : 2.07 Other : 3 METER BODY 3.01 Nominal Size : 3.02 Manufacturer model no : 3.03 Process conn. size/type : 3.04 Pressure rating : 3.05 Face to face dimension : 3.06 Body inner diameter : 3.07 Sour service spec. : 3.08 Material, body : 3.09 Material, flange : 3.10 Material, liner : 3.11 Material, coil cover : 3.12 Material, junction box : 3.13 Enclosure protection : 3.14 Ex. classification : 3.15 Material, electrodes : 3.16 Minimum conductivity : 3.17 Earth electrode : 3.18 Material, earth electrode : 3.19 Protective coating/color : 3.20 Other :			4 TRANSMITTER 4.01 Manufacturer model no : 4.02 Mounting : 4.03 Max distance meter/trans : 4.04 Cable connection : 4.05 Cable entry : 4.06 Dimension : 4.07 Material : 4.08 Enclosure protection : 4.09 Ex. classification : 4.10 Protective coating : 4.11 Indicator : 4.12 Output signal : 4.13 Communication : 4.14 Supply voltage : 4.15 Consumption : 4.16 Load limitation : 4.17 Other : 5 NOTES				
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NORSOK	INSTRUMENT DATASHEET F04 VARIABLE AREA FLOWMETER						
Tag number : Service description : P&ID : Line/equipment no. :	Flow range : Set/Alarm Point : Area : P. O. Number :						
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Press. loss at full range : 1.06 Mounting : 1.07 Weight : 1.08 Other : 2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated Range : 2.02 Characteristic : 2.03 Accuracy : 2.04 Repeatability : 2.05 Other : 3 METER BODY 3.01 Nominal size : 3.02 Manufacturer model no : 3.03 Process conn. size/type : 3.04 Pressure rating : 3.05 Face to face dimension : 3.06 Sour service spec. : 3.07 Material, tube (or body) : 3.08 Material, flange : 3.09 Material, float : 3.10 Material, internal stops : 3.11 Protective coating/color : 3.12 Other : 4 INDICATOR HOUSING 4.01 Material : 4.02 Dimensions : 4.03 Enclosure protection : 4.04 Markings and scale color : 4.05 Pointer color : 4.06 Scale length or deflection : 4.07 Glass type : 4.08 Protective coating/color : 4.09 Other :	5 TRANSMITTER 5.01 Included (yes or no) : 5.02 Manufacturer model no : 5.03 Cable connection : 5.04 Cable entry : 5.05 Ex. classification : 5.06 Output signal : 5.07 Communication : 5.08 Supply voltage : 5.09 Consumption : 5.10 Load limitation : 5.11 Other : 6 FLOW SWITCH 6.01 Included (yes or no) : 6.02 Manufacturer model no : 6.03 Cable connection : 6.04 Cable entry : 6.05 Ex. classification : 6.06 Reset; automatic or manual : 6.07 Deadband or differential : 6.08 Alarm at increase/decrease : 6.09 Contact configuration : 6.10 Contact material : 6.11 Contact rating : 6.12 Contact action on alarm : 6.13 Other : 7 NOTES						
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NORSOK		INSTRUMENT DATASHEET F05					
		MASS FLOWMETER					
Tag number :		Flow range :					
Service description :							
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Press. loss at full range : 1.06 Mounting : 1.07 Weight : 1.08 Other :			4 TRANSMITTER 4.01 Manufacturer model no : 4.02 Mounting : 4.03 Max distance meter/trans : 4.04 Cable connection : 4.05 Cable entry : 4.06 Dimension : 4.07 Material : 4.08 Enclosure protection : 4.09 Ex. classification : 4.10 Protective coating : 4.11 Indicator : 4.12 Output signal : 4.13 Communication : 4.14 Supply voltage : 4.15 Consumption : 4.16 Load limitation : 4.17 Other :				
2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated Range : 2.02 Characteristic : 2.03 Accuracy : 2.04 Linearity : 2.05 Repeatability : 2.06 Min / Max range limits : 2.07 Other :			5 NOTES				
3 METER BODY 3.01 Nominal size : 3.02 Manufacturer model no : 3.03 Process conn. size/type : 3.04 Pressure rating : 3.05 Face to face dimension : 3.06 Number of tube runs : 3.07 Tube inner diameter : 3.08 Material, tube : 3.09 Material, flange/connect. : 3.10 Sour service spec. : 3.11 Material, tube cover : 3.12 Enclosure protection : 3.13 Protective coating/color : 3.14 Other :							
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NORSOK		INSTRUMENT DATASHEET F06					
		AVERAGING PITOT TUBE					
Tag number	:	Flow range	:				
Service description	:						
P&ID	:	Area	:				
Line/equipment no.	:	P. O. Number	:				
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Complete assembly : 1.06 Mounting : 1.07 Weight : 1.08 Other :			4 CALCULATIONS 4.01 Calculation basis/method : 4.02 Diff. pressure range : 4.03 K-factor : 4.04 Press. loss at full range : 4.05 Maximum flow limit : 4.06 Other : 5 NOTES				
2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated Range : 2.02 Characteristic : 2.03 Accuracy : 2.04 Repeatability : 2.05 Other :							
3 ELEMENT / PROBE 3.01 Manufacturer model no : 3.02 Process conn. size/type : 3.03 Pressure rating : 3.04 Conn. size/type instrument : 3.05 Instrument valves included : 3.06 Instr. valves type/material : 3.07 Element dimension : 3.08 Element insertion length : 3.09 Material, element : 3.10 Material, connection : 3.11 Material, head : 3.12 End support required : 3.13 End support pipe hole size : 3.14 Material, end support : 3.15 Sour service spec. : 3.16 Retract mechanism : 3.17 Material, retract mech. : 3.18 Isolation valve type/size : 3.19 Material, isolation valve : 3.20 Head protective coating : 3.21 Other :							
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NORSOK		INSTRUMENT DATASHEET F07					
		ORIFICE PLATES AND FLANGES					
Tag number	:	Flow range	:				
Service description	:						
P&ID	:	Area	:				
Line/equipment no.	:	P. O. Number	:				
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Taps in flanges/fitting/carrier : 1.06 Tap size/type : 1.07 No. of taps : 1.08 Taps: Flange/corner/other : 1.09 Taps orientation : 1.10 Complete assembly : 1.11 Complete Assembly Face-to-face dimension : 1.12 Mounting : 1.13 Weight : 1.14 Other : 2 FLANGES 2.01 Included or by others : 2.02 Manufacturer : 2.03 Flange code or standard : 2.04 Size and pressure class : 2.05 Flange facing : 2.06 Material : 2.07 Material, bolts and nuts : 2.08 Gasket type and material : 2.09 Face to face dimension : 2.10 Process connection : 2.11 Inner diameter : 2.12 Protective coating/color : 2.13 Other : 3 QUICK CHANGE FITTING 3.01 Manufacturer : 3.02 Manufacturer model no : 3.03 Removal under line press. : 3.04 Face to face dimension : 3.05 Inner diameter : 3.06 Process conn., upstream : 3.07 Process conn., downstream : 3.08 Material, body : 3.09 Material, internals : 3.10 Material, seal : 3.11 Protective coating/color : 3.12 Other : 4 FLOW STRAIGHTENER 4.01 Type : 4.02 Material : 4.03 Connection : 4.04 Other :			5 METER TUBE 5.01 Material : 5.02 Connection up/downstr. : 5.03 Up/downstream length : 5.04 Tube inner diameter : 5.05 Other : 6 PLATE 6.01 Type : 6.02 Manufacturer : 6.03 Manufacturer model no : 6.04 Material : 6.05 With or without handle : 6.06 Plate outer diameter : 6.07 Plate thickness : 6.08 Vent / drain hole : 6.09 Bore concentric / other : 6.10 Bore dimension : 6.11 Other : 7 CARRIER 7.01 Part of fitting or plate : 7.02 Outer diameter : 7.03 Thickness : 7.04 Material : 7.05 Other : 8 CALCULATIONS 8.01 Calculation method/std. : 8.02 Diff. pressure range : 8.03 Beta factor : 8.04 Press. loss at full range : 8.05 Other : 9 NOTES				
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NORSOK		INSTRUMENT DATASHEET F08					
		VENTURI FLOW ELEMENT					
Tag number :		Flow range :					
Service description :							
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Tap size/type : 1.06 No. of taps : 1.07 Taps orientation : 1.08 Complete assembly : 1.09 Complete assembly Face-to-face dimension : 1.10 Mounting : 1.11 Weight : 1.12 Other :			3 FLOW STRAIGHTENER 3.01 Type : 3.02 Material : 3.03 Connection : 3.04 Other : 4 METER TUBE 4.01 Material : 4.02 Connection up/downstr. : 4.03 Up/downstream length : 4.04 Tube inner diameter : 4.05 Other : 5 CALCULATIONS 5.01 Calculation method/std. : 5.02 Diff. pressure range : 5.03 Beta factor : 5.04 Press. loss at full range : 5.05 Other : 6 NOTES				
2 VENTURI TUBE / BODY 2.01 Nominal size : 2.02 Manufacturer model no : 2.03 Process conn. size/type : 2.04 Pressure rating : 2.05 Face to face dimension : 2.06 Sour service spec. : 2.07 Material, tube (body) : 2.08 Material, flange : 2.09 Tube inner diameter : 2.10 Throat diameter : 2.11 Protective coating/color : 2.12 Other :							
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NORSOK	INSTRUMENT DATASHEET F09 VORTEX FLOWMETER	
Tag number : Service description : P&ID : Line/equipment no. : Flow range : Area : P. O. Number :		
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Press. loss at full range : 1.06 Mounting : 1.07 Weight : 1.08 Other : 2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated Range : 2.02 Characteristic : 2.03 Accuracy : 2.04 Linearity : 2.05 Repeatability : 2.06 Min / Max range limits : 2.07 Other : 3 METER BODY 3.01 Nominal Size : 3.02 Manufacturer model no : 3.03 Process conn. size/type : 3.04 Pressure rating : 3.05 Face to face dimension : 3.06 Body inner diameter : 3.07 Sour service spec. : 3.08 Material, body : 3.09 Material, flange : 3.10 Probe (bar) size : 3.11 Material, probe (bar) : 3.12 Material, probe gasket : 3.13 Material, sensor (pick-up) : 3.14 Material, neck : 3.15 Protective coating/color : 3.16 Other :	4 TRANSMITTER 4.01 Manufacturer model no : 4.02 Mounting : 4.03 Cable connection : 4.04 Cable entry : 4.05 Dimension : 4.06 Material : 4.07 Enclosure protection : 4.08 Ex. classification : 4.09 Protective coating : 4.10 Indicator : 4.11 Output signal : 4.12 Communication : 4.13 Supply voltage : 4.14 Consumption : 4.15 Load limitation : 4.16 Other : 5 NOTES	
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Prepared	Checked	Approved
Datasheet no.		Page

NORSOK		INSTRUMENT DATASHEET L01					
		LEVEL INSTRUMENT MAGNETIC					
Tag number	:	Level Range	:				
Service description	:	Set/Alarm Point	:				
P&ID	:	Area	:				
Line/equipment no.	:	P. O. Number	:				
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Duty : 1.05 Mounting : 1.06 Weight : 1.07 Other :			5 TRANSMITTER 5.01 Manufacturer model no : 5.02 Detector type : 5.03 Indicator : 5.04 Output signal : 5.05 Communication : 5.06 Supply voltage : 5.07 Consumption : 5.08 Load limitation : 5.09 Other :				
2 INSTRUMENT CHARACTERISTICS 2.01 Accuracy : 2.02 Repeatability : 2.03 Minimum density : 2.04 Other :			6 SWITCH 6.01 Manufacturer model no : 6.02 Reset; automatic or manual : 6.03 Deadband or differential : 6.04 Alarm at increase/decrease : 6.05 Contact configuration : 6.06 Contact material : 6.07 Contact rating : 6.08 Contact action on alarm : 6.09 Other :				
3 BODY / CHAMBER 3.01 Manufacturer model no : 3.02 Nominal size : 3.03 Pressure rating : 3.04 Material : 3.05 Protective coating/color : 3.06 Sour service spec. : 3.07 Process conn. size/type : 3.08 Connection orientation : 3.09 Connection distance : 3.10 Connection material : 3.11 Indicator type/material : 3.12 Indicator cover material : 3.13 Indicator visible length : 3.14 Float type : 3.15 Float stop included : 3.16 Float/float stop material : 3.17 Conn. size/type vent : 3.18 Conn. size/type drain : 3.19 Vent/drain valves included : 3.20 Valves size/type : 3.21 Valves material : 3.22 Support bracket(s) : 3.23 Other :			7 NOTES				
4 TRANSMITTER / SWITCH HOUSING 4.01 Mounting : 4.02 Dimension : 4.03 Material : 4.04 Cable connection : 4.05 Cable entry : 4.06 Enclosure protection : 4.07 Ex. classification : 4.08 Protective coating : 4.09 Other :							
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NORSOK		INSTRUMENT DATASHEET L02					
		LEVEL INSTRUMENT ULTRASONIC / MICROWAVE					
Tag number :		Level Range :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Process conn. size/type : 1.06 Connection press. rating : 1.07 Connection material : 1.08 Sour service spec. : 1.09 Mounting : 1.10 Weight : 1.11 Other : 2 INSTRUMENT CHARACTERISTICS 2.01 Accuracy : 2.02 Repeatability : 2.03 Min / max span : 2.04 Distance from connection point to zero level : 2.05 Other : 3 ULTRASONIC TRANSDUCER 3.01 Manufacturer model no : 3.02 Insertion length : 3.03 Blocking distance : 3.04 Material : 3.05 Mount. nozzle max height : 3.06 Other : 4 MICROWAVE TRANSDUCER 4.01 Manufacturer model no : 4.02 Antenna type : 4.03 Antenna material : 4.04 Insertion length : 4.05 Blocking distance : 4.06 Other wetted parts mater. : 4.07 Other : 5 HOUSING 5.01 Mounting : 5.02 Dimension : 5.03 Material : 5.04 Cable connection : 5.05 Cable entry : 5.06 Enclosure protection : 5.07 Ex. classification : 5.08 Protective coating : 5.09 Other :			6 TRANSMITTER 6.01 Manufacturer model no : 6.02 Indicator : 6.03 Output signal : 6.04 Communication : 6.05 Supply voltage : 6.06 Consumption : 6.07 Load limitation : 6.08 Other : 7 SWITCH 7.01 Manufacturer model no : 7.02 Set point adjustment : 7.03 Supply voltage : 7.04 Consumption : 7.05 Reset; automatic or manual : 7.06 Deadband or differential : 7.07 Alarm at increase/decrease : 7.08 Contact configuration : 7.09 Contact material : 7.10 Contact rating : 7.11 Contact action on alarm : 7.12 Other : 8 NOTES				
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NORSOK		INSTRUMENT DATASHEET L03					
		LEVEL INSTRUMENT DISPLACER / FLOAT					
Tag number :		Level Range :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Manufacturer model no : 1.04 Operating Temp. Limits : 1.05 Operating Press. Limit : 1.06 Duty : 1.07 Sour service spec. : 1.08 Mounting : 1.09 Weight : 1.10 Other :			6 TRANSMITTER / SWITCH HOUSING 6.01 Mounting : 6.02 Rotatable head : 6.03 Dimension : 6.04 Material : 6.05 Cable connection : 6.06 Cable entry : 6.07 Enclosure protection : 6.08 Ex. classification : 6.09 Protective coating : 6.10 Other :				
2 INSTRUMENT CHARACTERISTICS 2.01 Accuracy : 2.02 Repeatability : 2.03 Minimum density : 2.04 Other :			7 TRANSMITTER 7.01 Indicator : 7.02 Output signal : 7.03 Communication : 7.04 Supply voltage : 7.05 Consumption : 7.06 Load limitation : 7.07 Other :				
3 DISPLACER / FLOAT 3.01 Type : 3.02 Material : 3.03 Diameter : 3.04 Length : 3.05 Wire / arm material : 3.06 Other wetted parts mater. : 3.07 Distance from conn. point to displ./float zero point : 3.08 Other :			8 SWITCH 8.01 Set point adjustment : 8.02 Reset; automatic or manual : 8.03 Deadband or differential : 8.04 Alarm at increase/decrease : 8.05 Contact configuration : 8.06 Contact material : 8.07 Contact rating : 8.08 Contact action on alarm : 8.09 Other :				
4 CAGE / CHAMBER 4.01 Nominal size : 4.02 Material : 4.03 Process conn. size/type : 4.04 Connection orientation : 4.05 Connection distance : 4.06 Connection material : 4.07 Pressure rating : 4.08 Protective coating/color : 4.09 Conn. size/type vent : 4.10 Conn. size/type drain : 4.11 Vent/drain valves included : 4.12 Valves size/type : 4.13 Valves material : 4.14 Other :			9 NOTES				
5 DIRECT MOUNTED INSTRUMENT 5.01 Process conn. size/type : 5.02 Connection material : 5.03 Pressure rating : 5.04 Vessel intern. cage/support : 5.05 Other :							
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NORSOK		INSTRUMENT DATASHEET L04					
		LEVEL INSTRUMENT CAPACITIVE / CONDUCTIVE					
Tag number :		Level Range :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Mounting : 1.06 Weight : 1.07 Other : 2 INSTRUMENT CHARACTERISTICS 2.01 Accuracy : 2.02 Repeatability : 2.03 Min / max span : 2.04 Zero adjustment : 2.05 Other : 3 ELEMENT / SENSOR 3.01 Type : 3.02 Manufacturer model no : 3.03 Material, element (sensor) : 3.04 Location / Orientation : 3.05 Process conn. size/type : 3.06 Connection material : 3.07 Pressure rating : 3.08 Sour service spec. : 3.09 Conductivity limit : 3.10 Dielectric constant limit : 3.11 Insertion length : 3.12 Active length : 3.13 Other : 4 ELEMENT HOUSING 4.01 Dimension : 4.02 Material : 4.03 Cable connection : 4.04 Cable entry : 4.05 Enclosure protection : 4.06 Ex. classification : 4.07 Protective coating : 4.08 Other :			5 TRANSMITTER/SWITCH HOUSING 5.01 Mounting : 5.02 Max distance elem./transm. : 5.03 Dimension : 5.04 Material : 5.05 Cable connection : 5.06 Cable entry : 5.07 Enclosure protection : 5.08 Ex. classification : 5.09 Protective coating : 5.10 Other : 6 TRANSMITTER 6.01 Manufacturer model no : 6.02 Indicator : 6.03 Output signal : 6.04 Communication : 6.05 Supply voltage : 6.06 Consumption : 6.07 Load limitation : 6.08 Other : 7 SWITCH 7.01 Manufacturer model no : 7.02 Set point adjustment : 7.03 Supply voltage : 7.04 Consumption : 7.05 Reset; automatic or manual : 7.06 Deadband or differential : 7.07 Alarm at increase/decrease : 7.08 Contact configuration : 7.09 Contact material : 7.10 Contact rating : 7.11 Contact action on alarm : 7.12 Other : 8 NOTES				
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NORSOK		INSTRUMENT DATASHEET L05					
		LEVEL GLASS / GAUGE					
Tag number :		Level Range :					
Service description :							
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Manufacturer model no : 1.04 Operating Temp. Limits : 1.05 Operating Press. Limit : 1.06 Connection orientation : 1.07 Connection distance : 1.08 Sour service spec. : 1.09 Mounting : 1.10 Weight : 1.11 Other :			4 ACCESSORIES 4.01 Illuminator type : 4.02 Illuminator housing mater. : 4.03 Supply voltage : 4.04 Consumption : 4.05 Cable connection : 4.06 Cable entry : 4.07 Enclosure protection : 4.08 Ex. classification : 4.09 Support bracket(s) : 4.10 Glass protector : 4.11 Calibrated scale : 4.12 Other :				
2 COLUMN 2.01 Glass type : 2.02 Visible glass length : 2.03 Number of sections : 2.04 Length of each section : 2.05 Rotatable column : 2.06 Body (wetted) material : 2.07 Cover material : 2.08 Bolts/nuts material : 2.09 Gasket material : 2.10 Column conn. orientation : 2.11 Protective coating/color : 2.12 Other :			5 NOTES				
3 GAUGE VALVES 3.01 Type : 3.02 Offset pattern included : 3.03 Safety shut-off included : 3.04 Spherical union included : 3.05 Process conn. size/type : 3.06 Pressure rating : 3.07 Connection material : 3.08 Conn. size/type column : 3.09 Conn. size/type vent/drain : 3.10 Valve handle type/material : 3.11 Valve body material : 3.12 Valve trim material : 3.13 Valve packing material : 3.14 Other :							
Rev	Date	Issue/description	Prepared	Checked	Approved	Datasheet no.	Page

NORSOK		INSTRUMENT DATASHEET L06			
		LEVEL SWITCH VIBRATING FORK			
Tag number : Service description : P&ID : Line/equipment no. :					
Set/Alarm Point : Area : P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Manufacturer model no : 1.04 Operating Temp. Limits : 1.05 Operating Press. Limit : 1.06 Mounting : 1.07 Weight : 1.08 Other :			3 NOTES		
2 SWITCH 2.01 Repeatability : 2.02 Fork insertion length : 2.03 Fork material : 2.04 Sour service spec. : 2.05 Process conn. size/type : 2.06 Pressure rating : 2.07 Connection material : 2.08 Housing Dimension : 2.09 Housing Material : 2.10 Cable connection : 2.11 Cable entry : 2.12 Enclosure protection : 2.13 Ex. classification : 2.14 Protective coating : 2.15 Supply voltage : 2.16 Consumption : 2.17 Reset; automatic or manual : 2.18 Deadband or differential : 2.19 Alarm at increase/decrease : 2.20 Contact configuration : 2.21 Contact material : 2.22 Contact rating : 2.23 Contact action on alarm : 2.24 Other :					
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					Datasheet no.
					Page

NORSOK		INSTRUMENT DATASHEET L07					
		LEVEL INSTRUMENT NUCLEONIC					
Tag number :		Level Range :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Operating Temp. Limits : 1.04 Operating Press. Limit : 1.05 Duty : 1.06 Mounting : 1.07 Weight : 1.08 Other :			5 DETECTOR 5.01 Type : 5.02 Manufacturer model no : 5.03 Number of detectors : 5.04 Location / Orientation : 5.05 Active / total length : 5.06 Housing dimension : 5.07 Housing material : 5.08 Cable connection : 5.09 Cable entry : 5.10 Enclosure protection : 5.11 Ex. classification : 5.12 Protective coating : 5.13 Dip tube type : 5.14 Dip tube diameter/length : 5.15 Dip tube material : 5.16 Mounting brackets : 5.17 Material, mounting brackets : 5.18 Other :				
2 INSTRUMENT CHARACTERISTICS 2.01 Accuracy : 2.02 Repeatability : 2.03 Min / max span : 2.04 Zero adjustment : 2.05 Other :			6 TRANSMITTER 6.01 Manufacturer model no : 6.02 Indicator : 6.03 Output signal : 6.04 Communication : 6.05 Supply voltage : 6.06 Consumption : 6.07 Load limitation : 6.08 Other :				
3 SOURCE / CONTAINER 3.01 Type : 3.02 Manufacturer model no : 3.03 Source type / strength : 3.04 Source shipment container : 3.05 Certification (Approval) : 3.06 Number of sources : 3.07 Dose rate at housing surface : 3.08 Max dose rate at detector : 3.09 Housing dimension : 3.10 Housing material : 3.11 Location / Orientation : 3.12 Process conn. size/type : 3.13 Pressure rating : 3.14 Connection material : 3.15 Dip tube type : 3.16 Dip tube diameter/length : 3.17 Dip tube material : 3.18 Sour service spec. : 3.19 Mounting brackets : 3.20 Material, mounting brackets : 3.21 Other :			7 SWITCH 7.01 Manufacturer model no : 7.02 Set point adjustment : 7.03 Supply voltage : 7.04 Consumption : 7.05 Reset; automatic or manual : 7.06 Deadband or differential : 7.07 Alarm at increase/decrease : 7.08 Contact configuration : 7.09 Contact material : 7.10 Contact rating : 7.11 Contact action on alarm : 7.12 Other :				
4 TRANSMITTER / SWITCH HOUSING 4.01 Mounting : 4.02 Max distance from detector : 4.03 Dimension : 4.04 Material : 4.05 Cable connection : 4.06 Cable entry : 4.07 Enclosure protection : 4.08 Ex. classification : 4.09 Protective coating : 4.10 Other :			8 NOTES				
Rev	Date	Issue/description	Prepared	Checked	Approved	Datasheet no.	Page

NORSOK		INSTRUMENT DATASHEET P01					
		PRESSURE / DIFF. PRESSURE INSTRUMENT ELECTRIC					
Tag number :		Scale Range :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Manufacturer model no : 1.04 Operating Temp. Limits : 1.05 Mounting : 1.06 Weight : 1.07 Other :			5 TRANSMITTER 5.01 Indicator : 5.02 Output signal : 5.03 Communication : 5.04 Supply voltage : 5.05 Consumption : 5.06 Load limitation : 5.07 Other :				
2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated input range : 2.02 Characteristic : 2.03 Accuracy : 2.04 Repeatability : 2.05 Lower / upper range limits : 2.06 Min / max span : 2.07 Zero adjustment : 2.08 Overpressure protect. to : 2.09 Max static pressure : 2.10 Other :			6 SWITCH 6.01 Reset; automatic or manual : 6.02 Deadband or differential : 6.03 Alarm at increase/decrease : 6.04 Contact configuration : 6.05 Contact material : 6.06 Contact rating : 6.07 Contact action on alarm : 6.08 Other :				
3 ELEMENT / SENSOR 3.01 Type : 3.02 Material, element (sensor) : 3.03 Material, socket (inlet port) : 3.04 Material, sensor bolts/nuts : 3.05 Process conn. size/type : 3.06 Sour service spec. : 3.07 Other :			7 CHEMICAL SEAL 7.01 Type : 7.02 Material, upper/lower part : 7.03 Material, bolts / nuts : 7.04 Material, diaphragm : 7.05 Fill fluid : 7.06 Capillary length/diameter : 7.07 Material, capillary/armour : 7.08 Process conn. size/type : 7.09 Other :				
4 HOUSING 4.01 Dimension : 4.02 Material : 4.03 Cable connection : 4.04 Cable entry : 4.05 Enclosure protection : 4.06 Ex. classification : 4.07 Protective coating : 4.08 Other :			8 ACCESSORIES 8.01 Mounting bracket : 8.02 Material, mounting bracket : 8.03 Overpr. protection valve : 8.04 Material, overpr. prot. valve : 8.05 Pulsation damper : 8.06 Material, pulsation damper : 8.07 Other :				
			9 NOTES				
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NORSOK	INSTRUMENT DATASHEET P02 PRESSURE / DIFF. PRESSURE INDICATOR						
Tag number : Service description : P&ID : Line/equipment no. :	Scale Range : Area : P. O. Number :						
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Manufacturer model no : 1.04 Operating Temp. Limits : 1.05 Mounting : 1.06 Weight : 1.07 Other : 2 INSTRUMENT CHARACTERISTICS 2.01 Calibrated input range : 2.02 Characteristic : 2.03 Accuracy : 2.04 Repeatability : 2.05 Overpressure protect. to : 2.06 Max static pressure : 2.07 Other : 3 ELEMENT / SENSOR 3.01 Type : 3.02 Material, element (sensor) : 3.03 Material, socket (inlet port) : 3.04 Material, sensor bolts/nuts : 3.05 Process conn. size/type : 3.06 Position of connection : 3.07 Sour service spec. : 3.08 Other : 4 HOUSING 4.01 Nominal size : 4.02 Material : 4.03 Enclosure protection : 4.04 Markings and scale color : 4.05 Pointer color : 4.06 Scale length or deflection : 4.07 Glass type : 4.08 Fill fluid : 4.09 Blow-out protection : 4.10 Other :	5 CHEMICAL SEAL 5.01 Type : 5.02 Material, upper/lower part : 5.03 Material, bolts / nuts : 5.04 Material, diaphragm : 5.05 Fill fluid : 5.06 Capillary length/diameter : 5.07 Material, capillary/armour : 5.08 Process conn. size/type : 5.09 Other : 6 ACCESSORIES 6.01 Mounting bracket : 6.02 Material, mounting bracket : 6.03 Overpr. protection valve : 6.04 Material, overpr. prot. valve : 6.05 Pulsation damper : 6.06 Material, pulsation damper : 6.07 Other : 7 NOTES						
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NORSOK		PROCESS DATASHEET PR1					
		BLOCK (ON - OFF) VALVE					
Tag number :		Pipe class sheet :					
Service description :		Area :					
P&ID :		P.O. Number :					
Line/equipment no. :							
1 EQUIPMENT CONDITIONS							
1.01 Line Nominal Size/Schedule :							
1.02 Line Material :							
1.03 Flange Pressure Class :							
1.04 Flange Facing :							
1.05 Piping Design Temperature :							
1.06 Piping Design Pressure :							
1.07 Fluid :							
1.08 Phase :							
1.09 Corrosive Compounds :							
2 OPERATING CONDITIONS - Maximum							
		UNIT					
2.01 Flow rate :							
2.02 Temperature :							
2.03 Inlet Pressure :							
2.04 Pressure drop :							
3 SPECIAL CONDITIONS							
		UNIT					
3.01 Failure action :							
3.02 Opening/closing time :							
3.03 Maximum shut-off diff-pressure :							
4 NOTES							
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NORSOK		PROCESS DATASHEET PR2					
		CONTROL VALVE					
Tag number :		Pipe class sheet :					
Service description :		Area :					
P&ID :		P.O. Number :					
Line/equipment no. :							
1 EQUIPMENT CONDITIONS							
1.01 Line Nominal Size/Schedule :							
1.02 Line Material :							
1.03 Flange Size :							
1.04 Flange Pressure Class/Flange Facing :							
1.05 Piping Design Temperature :							
1.06 Piping Design Pressure :							
1.07 Fluid :							
1.08 Phase :							
1.09 Corrosive Compounds :							
1.10 Vapour molecular weight :							
1.11 Vapour specific heat ratio :							
1.12 Critical temperature :							
1.13 Critical pressure :							
2 OPERATING CONDITIONS - Minimum		UNIT					
2.01 Flow rate :							
2.02 Temperature :							
2.03 Inlet Pressure :							
2.04 Pressure drop :							
2.05 Density at T&P :							
2.06 Viscosity at T :							
2.07 Liquid vapour pressure at T :							
2.08 Vapour compressibility factor :							
3 OPERATING CONDITIONS - Normal		UNIT					
3.01 Flow rate :							
3.02 Temperature :							
3.03 Inlet Pressure :							
3.04 Pressure drop :							
3.05 Density at T&P :							
3.06 Viscosity at T :							
3.07 Liquid vapour pressure at T :							
3.08 Vapour compressibility factor :							
4 OPERATING CONDITIONS - Maximum		UNIT					
4.01 Flow rate :							
4.02 Temperature :							
4.03 Inlet Pressure :							
4.04 Pressure drop :							
4.05 Density at T&P :							
4.06 Viscosity at T :							
4.07 Liquid vapour pressure at T :							
4.08 Vapour compressibility factor :							
5 SPECIAL CONDITIONS							
5.01 Failure action :							
5.02 Opening/closing time :							
5.03 Maximum shut-off diff-pressure :							
6 NOTES							
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NORSOK Standard

NORSOK Standard

NORSOK		PROCESS DATASHEET PR5					
		PRESSURE & TEMPERATURE TRANSMITTER / INDICATOR / SWITCH					
Tag number :		Pipe Class Sheet :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 EQUIPMENT CONDITIONS							
1.01 Piping Design Temperature :							
1.02 Piping Design Pressure :							
1.03 Process Design Temperature :							
1.04 Process Design Pressure :							
1.05 Fluid :							
1.06 Phase :							
1.07 Corrosive Compounds :							
2 MINIMUM OPERATING CONDITIONS							
						UNIT	
2.01 Temperature :							
2.02 Pressure or Diff. Pressure :							
3 NORMAL OPERATING CONDITIONS							
						UNIT	
3.01 Temperature :							
3.02 Pressure or Diff. Pressure :							
4 MAXIMUM OPERATING CONDITIONS							
						UNIT	
4.01 Temperature :							
4.02 Pressure or Diff. Pressure :							
4.03 Static / Line Pressure :							
5 NOTES							
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NORSOK		PROCESS DATASHEET PR6					
		LEVEL INSTRUMENT					
Tag number :		Pipe Class Sheet :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 EQUIPMENT CONDITIONS							
1.01 Piping Design Temperature :							
1.02 Piping Design Pressure :							
1.03 Level reference or Zero Point :							
1.04 Fluid, upper :							
1.05 Fluid, lower :							
1.06 Dielectricity constant, Fluid upper :							
1.07 Dielectricity constant, Fluid lower :							
1.08 Conductivity constant, Fluid upper :							
1.09 Conductivity constant, Fluid lower :							
1.10 Corrosive Compounds :							
2 OPERATING CONDITIONS - Minimum Level						UNIT	
2.01 Temperature :							
2.02 Pressure :							
2.03 Density at T and P upper fluid :							
2.04 Density at T and P lower fluid :							
2.05 Level, upper :							
2.06 Level, lower (interface) :							
3 OPERATING CONDITIONS - Normal Level						UNIT	
3.01 Temperature :							
3.02 Pressure :							
3.03 Density at T and P upper fluid :							
3.04 Density at T and P lower fluid :							
3.05 Level, upper :							
3.06 Level, lower (interface) :							
4 OPERATING CONDITIONS - Maximum Level						UNIT	
4.01 Temperature :							
4.02 Pressure :							
4.03 Density at T and P upper fluid :							
4.04 Density at T and P lower fluid :							
4.05 Level, upper :							
4.06 Level, lower (interface) :							
5 NOTES							
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NORSOK Standard

NORSOK Standard

NORSOK		INSTRUMENT DATASHEET T01					
		THERMOWELL					
Tag. number : Service description : P&ID : Area : Line/equipment no. : P. O. Number :							
1 GENERAL 1.01 Type or construction : 1.02 Manufacturer : 1.03 Manufacturer model no : 1.04 Pressure rating : 1.05 Mounting : 1.06 Weight : 1.07 Other : 2 FLANGED TYPE 2.01 Flange code or standard : 2.02 Flange size : 2.03 Flange facing : 2.04 Flange material : 2.05 Other : 3 SCREWED TYPE 3.01 Hexagon nut size : 3.02 External thread size/type : 3.03 Other : 4 STEM 4.01 Type : 4.02 Material : 4.03 Diameter max/tip : 4.04 Max allowable stem diam. : 4.05 Insertion length "U" : 4.06 Thermowell total length : 4.07 Internal thread size/type : 4.08 Internal bore : 4.09 Tip thickness : 4.10 W/N frequency ratio : 4.11 Sour service spec. : 4.12 Material, plug and chain : 4.13 Other :			5 NOTES				
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NORSOK		INSTRUMENT DATASHEET T02					
		TEMPERATURE INSTRUMENT ELECTRIC					
Tag number :		Temperature Range :					
Service description :		Set/Alarm Point :					
P&ID :		Area :					
Line/equipment no. :		P. O. Number :					
1 GENERAL 1.01 Type : 1.02 Manufacturer : 1.03 Manufacturer model no : 1.04 Mounting : 1.05 Weight : 1.06 Other :			5 TRANSMITTER 5.01 Indicator : 5.02 Output signal : 5.03 Communication : 5.04 Supply voltage : 5.05 Consumption : 5.06 Load limitation : 5.07 Other :				
2 INSTRUMENT CHARACTERISTICS 2.01 Characteristic : 2.02 Accuracy : 2.03 Repeatability : 2.04 Min / max span : 2.05 Zero adjustment : 2.06 Other :			6 SWITCH 6.01 Reset; automatic or manual : 6.02 Deadband or differential : 6.03 Alarm at increase/decrease : 6.04 Contact configuration : 6.05 Contact material : 6.06 Contact rating : 6.07 Contact action on alarm : 6.08 Other :				
3 ELEMENT / SENSOR 3.01 Type : 3.02 Design standard : 3.03 Element operating limits : 3.04 Wire configuration : 3.05 Element diameter : 3.06 Insertion length : 3.07 Sensitive length : 3.08 Sheath material : 3.09 Connection size/type : 3.10 Connection material : 3.11 Other :			7 NOTES				
4 HOUSING 4.01 Mounting : 4.02 Dimension : 4.03 Material : 4.04 Cable connection : 4.05 Cable entry : 4.06 Enclosure protection : 4.07 Ex. classification : 4.08 Protective coating : 4.09 Other :							
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