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Introduction

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 18991

Oil and gas industries including lower carbon energy — Drilling and production equipment — Top drive systems

ICS: 75.180.10

ISO/TC 67/SC 4

Secretariat: **ANSI**

Voting begins on:
2025-12-05

Voting terminates on:
2026-02-27

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 4, *Drilling, production and injection equipment*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO 18991 has been developed by users and manufacturers of top drive systems and is intended for use in the petroleum and natural gas industry worldwide. ISO 18991 provides requirements and information in the selection, manufacturing, testing, documentation, marking, packaging, transportation, storage, maintenance, inspection, repair, recertification of top drive systems as defined in the scope.

Further, ISO 18991 addresses manufacturers' requirements, which set the minimum parameters with which it is necessary that manufacturers comply to claim conformity with ISO 18991. Also, suggestions on transportation and storage of top drive systems are put forward in this document.

Oil and gas industries including lower carbon energy — Drilling and production equipment — Top drive systems

1 Scope

This International Standard provides the classification and specifications, functions, design, manufacturing, testing, inspection, documentation, marking, packaging, transportation, storage, maintenance, inspection, and recertification for top drive drilling systems (hereinafter referred to as "TDS") and their supporting devices for the oil and gas industry, including low-carbon energy drilling and oil production equipment.

This document is applicable to the classification and specifications, functions, design, manufacturing, testing, inspection, documentation, marking, packaging, transportation, and storage of top drives and their supporting devices.

This International Standard establishes requirements for two product specification levels (PSLs). These two PSL designations define different levels of technical requirements. All the requirements of [clause 5](#) to [clause 13](#) are applicable to PSL 1 unless specifically identified as PSL 2. PSL 2 includes all the requirements of PSL 1 plus the additional practices as stated herein. Supplementary requirements apply only when specified.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10100, *Hydraulic fluid power — Cylinders — Acceptance tests*

ISO 11158, *Lubricants, industrial oils and related products (class L) — Family H (hydraulic systems) — Specifications for categories HH, HL, HM, HV and HG*

ISO 13535:2000, *Petroleum and natural gas industries — Drilling and production equipment — Hoisting equipment*

ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 1436:2020, *Rubber hoses and hose assemblies — Wire-braid-reinforced hydraulic types for oil-based or water-based fluids — Specification*

ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 15614-1:2017, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*

ISO 4409, *Hydraulic fluid power — Positive-displacement pumps, motors and integral transmissions — Methods of testing and presenting basic steady state performance*

ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4986:2020, *Steel and iron castings — Magnetic particle testing*

ISO 4992-1:2020, *Steel castings — Ultrasonic testing — Part 1: Steel castings for general purposes*

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 9223:2012, *Corrosion of metals and alloys — Corrosivity of atmospheres — Classification, determination and estimation*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

IEC 60034-30-3:2024, *Rotating electrical machines — Part 30-3: Efficiency classes of high voltage AC motors (IE-code)*

IEC 60447, *Basic and safety principles for man-machine interface, marking and identification - Actuating principles*

IEC 60079 (all parts), *Explosive atmospheres*

IEC 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60529:2013, *Degrees of protection provided by enclosures (IP Code)*

IEC 60364-5-54:2021, *Low-voltage electrical installations — Part 5-54: Selection and erection of electrical equipment — Earthing arrangements and protective conductors*

IEC 61439-1, *Low-voltage switchgear and control gear assemblies - Part 1: General rules*

IEC 61800 (all parts), *Adjustable speed electrical power drive systems*

IEC 61892-3, *Mobile and fixed offshore units — Electrical installations - Part 3: Equipment*

API RP 8B:2014, *Recommended practice for procedures for inspections, maintenance, repair and remanufacture of hoisting equipment*

API Spec 8C:2025, *Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)*

EN 10228-3:2016, *Non-destructive testing of steel forgings — Part 3: Ultrasonic testing of ferritic or martensitic steel forgings*

EN 10228-4:2016, *Non-destructive testing of steel forgings — Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

backup clamp

backup tong

grabber

grabber box

assembly in pipe handler that can grip drill string, used to provide clamp force when the main shaft(quill) applies torque to makeup or breakout the connection thread between saver sub and drill string

Note 1 to entry: The backup clamp is also known as torque wrench, and some type of torque wrench can apply torque for make-up and break-out of drill-pipe connections.

3.2

bail

connection link

link by which the TDS is suspended

3.3

casing running tool

CRT

a specialized device used in oil and gas drilling operations to run and make-up casing into the wellbore

3.4

design safety factor

factor to account for a certain safety margin between the maximum allowable stress and the specified minimum yield strength of a material

[SOURCE: ISO 13535:2000, 3.1.3]

3.5

design verification test

test performed to validate the integrity of the design calculations used

[SOURCE: ISO 13535:2000, 3.1.4]

3.6

direct-drive TDS

TDS whose power machine rotates drill string directly with no belts, gears, or other power transmitting elements in the power train

3.7

dolly

torque bushing

equipment used to hold the TDS in correct position relative to the derrick along with the guide rail during various operations

3.8

dropped objects

DROPS

industry-widely initiative focused on preventing dropped objects

[SOURCE: ISO 20321:2020, 3.4]

3.9

electric TDS

TDS whose main rotary power is provided by AC or DC motor

3.10

elevators

tools for lifting, lowering and suspending the pipe string, which are used in conjunction with the elevator links and suspended at the lower end of the elevator links

3.11

elevator links

one of the tripping tools, which is used in pairs. It is suspended on the rotating head link adapter on both sides of the swivel head, and its lower end is connected to the elevator

3.12

guide rail

torque track

structural steelwork that provides smooth flat surfaces for the TDS to move up and down within the rig derrick and fixes the position of the TDS spin axis relative to the derrick

Note 1 to entry: Guide rail should withstand reverse torque

3.13

hydraulic hose reel

drum-like structure around which the hydraulic hose is wrapped

3.14

hydraulic power unit

a power source that uses hydraulic oil as the working medium and is used to convert hydraulic energy into mechanical energy

3.15

hydraulic TDS

TDS whose main rotary power is provided by a hydraulic motor

3.16

inside blowout preventer

device that is mounted in the primary-load-carrying channel of the TDS that, when closed, can prevent the ejection of drilling fluid from the drill string channel during a well kick or blowout

3.17

maximum allowable stress

specified minimum yield strength divided by the design safety factor

[SOURCE: ISO 13535:2000, 3.1.9]

3.18

pipe handler

device that grips and releases drill string to apply clamp force for makeup or breakout the connection thread between the saver sub and the drill string

Note 1 to entry: The pipe handler should tilt the link forwards, backward and rotate.

3.19

primary load-carrying component

component of the equipment through which the primary load is carried

[SOURCE: ISO 13535:2000, 3.1.11]

3.20

rated load

maximum operating load, both static and dynamic, to be applied to the TDS

3.21

rotary power assembly

assembly that supports the drill string, moves with traveling block, and is designed to directly provide rotary power to the top of the drill string during drilling operations

3.22

rotating head

assembly in TDS that is rotated by power device around the central axis

3.23

saver sub

connection sub between the lower end of TDS drilling fluid circulating channel and the drill string

3.24

test unit

prototype unit upon which a design verification test is conducted

[SOURCE: ISO 13535:2000, 3.1.19]

3.25

top drive system

TDS

equipment consisting of rotary power assembly, pipe handler, mud circulation conduit and other components, which can rotate the drill string, makeup or breakout the connections, moving upward or downward (even forward) along the guide rail