DNV·GL

Certificate No:
TAD00001B7

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Blow out Preventer

with type designation(s)
NXT Ram BOP Assemblies

Issued to
National Oilwell Varco, LP- Rig Technologies Division - WLY
Houston, TX, USA

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Houston** on **2020-07-13**
This Certificate is valid until **2025-07-12**.
DNV GL local station: **Houston, Approval CMC**

Approval Engineer: **Marco Romero**

for **DNV GL**

Christian Nilsen
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

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Design codes/standards used as references

- API Spec 16A, Drill Through Equipment, 4th Edition.

Product description

A blowout preventer is a device attached to the casing, or to a unit of wellhead equipment installed on the casing, for the purpose of controlling pressure in the annular space between the casing and the inner string of drill pipe during drilling and completions operations. A blowout preventer has the capability to seal around pipe when appropriately-sized rams are installed in the cavities.

NXT SINGLE RAM BOP ASSEMBLIES

- BOP ASSY 18-15M NXT SGL W/ 22" OPERATORS
  DWG. NO. 20091515D

NXT DOUBLE RAM BOP ASSEMBLIES

- BOP ASSY 18-15M, DBL, NXT, SXF W/ 22" OPERATORS (4) 4-15M SO, CRA
  DWG. NO. 20039628D
- BOP ASSY, 18-15M, NXT, DBL, XSF, (4) 3-15M SO
  DWG. NO. 10738288-ASM
- BOP ASSY, 18-15M NXT, DBL, SXF 3-15M SO, (4) 22" LFS
  DWG. NO. 10900473-ASM
- BOP ASSY, 18-15M NXT, DBL, SXF, 3-15M SO, 22" X 14" U2B DOORS
  DWG. NO. 10900476-ASM
- BOP ASSY, 18-15M, DBL, NXT, SXF, W/ (4) 3-15M SO (GENERIC ASSY DWG)
  DWG. NO. 11360773-ASM
- BOP ASSY, 18-15, DBL, NXT, SXF, W/ 22" OPERATORS, (4) 4-15M SO, CRA
  DWG. NO. 16509830-ASM

NXT TRIPLE RAM BOP ASSEMBLIES

- BOP ASSY 18-15M, TRP, NXT, SXF W/ (6) 3-15M SO
  DWG. NO. 20027253D
- BOP ASSY, 18-15M, TRP, NXT, SXF, W/ (6) 3-15M SO, INCONEL
  DWG. NO. 20030638D
- BOP ASSEMBLY, 18-15M NXT, TRP, SXF, (6) 3-15M SO. INCONEL
  DWG. NO. 20079865D
- BOP ASSY, 18-15M NXT, TRP, SXF, W/(6) 3-15M SO
  DWG. NO. 20090521D
- BOP ASSY, 18-15M, TRP, NXT, SXF, (6) 3-15M SO, REVERSIBLE LWR CAVITY
  DWG. NO. 20094752D
- BOP ASSY, 18-15 NXT, TRP, SXF, W/(6) 3-15m SO
  DWG. NO. 10702315-ASM
- BOP ASSY, 18-15M NXT, TRP, SXF, 3-15 SO, REVERSIBLE CAVITY, ILF (GEN ASSY DWG)
  DWG. NO. 10801749-ASM
- BOP ASSY, 18-15M NXT, DBL, SXF, 3-15M SO, (2) 22" (2) 22X14"
  DWG. NO. 10900474-ASM
- BOP ASSY, 18-15M NXT, TRP, SXF, 3-15M SO, REV LWR CAVITY, ILF
  DWG. NO. 10903521-ASM
- BOP ASSY, 18-15M NXT, TRP, SXF, (6) 3-15M SO
  DWG. NO. 11390923-ASM

Application/Limitation

Job Id: **262.1-034034-1**
Certificate No: **TAD00001B7**

Design Parameter	Value
Family Type	: NXT
Nominal Bore Size	: 18 ¾ inches
Product Requirement	: PR2
Rated Working Pressure	: 15,000 psia
API 16A Temperature Rating for Metallic Materials	: T20/250
API 16A Temperature Rating for Non-Metallic	: See Operator Limitations
Equipment Service	: Sour (H2S)
Designation of System; Equipment	: BOP System; Ram Preventers

Ram BOP Body			
Feature	Options		
Cavities	Single	Double	Triple
Design Temperature	T-20/250		
Material of Ram BOP Body[1]	AX010018 (Min. Yield: 75,000 psi) AX010253 (Min. Yield: 80,000 psi) AX010310 (Min. Yield: 80,000 psi)		
Lower Cavity Configuration	Standard/Reversible/Inverted		
Hydraulic Port Configuration[2]	NPT, SAE Oring Boss, SAE 4-Bolt w/ or wo/ Seal Sub		
Lower Platform Ring[2]	With/Without		
Ring Groove[2]	API (BX), AX, CX		
Upper Connection	STDD- 18-10M STDD- 18-15M	STDD- 18-10M STDD- 18-15M	STDD-18-15M
Bottom Connection	STDD- 18-10M STDD- 18-15M FLGD- 18-10M FLGD- 18-15M	FLGD- 18-10M FLGD- 18-15M	FLGD-18-15M
Wellbore Outlet Size	STDD-3-10M STDD-3-15M STDD-4-10M STDD-4-15M FLGD-3-10M FLGD-3-15M FLGD-4-10M FLGD-4-15M	STDD-3-10M STDD-3-15M STDD-4-10M STDD-4-15M FLGD-3-10M FLGD-3-15M FLGD-4-10M FLGD-4-15M	STDD-3-10M STDD-3-15M STDD-4-10M STDD-4-15M FLGD-3-10M FLGD-3-15M FLGD-4-10M FLGD-4-15M
Wellbore Outlet Qty	2	4	6
Cavity Configuration[3] (Upper, Middle, Lower)	22” 14”	22”x 22” 22” x 14” 14” x 14” 14” x 22”	22” x 22” x 22” 22” x 22”x14” 22” x 14” x 14” 14” x 14” x 14” 14” x 14” x 22” 14” x 22” x 22”
BODY CREP (Corrosion Resistant Equipment Package) [2]	7		
Internal Coating[2]	Phosphate Nitride		
Stud and Nut Coating- Main Connection and Outlet Connection (if applicable) [2]	Zinc Nickle Xylan Sermagard		

Door Assy - Operators	
Material of Door Body[1]	AX010018 (Min. Yield: 75,000 psi), AX010253 (Min. Yield: 80,000 psi)

	AX010310 (Min. Yield: 80,000 psi)
Door CREP[2]	H, J, K
Stroke[2]	STD, LFBS/LFCS
Shear Ram	14" Poslock- 3.0, 4.5k psia 22" Poslock- 5K psia
Pipe Ram	14" ULIIB- 3k psia 14" ULIIB w/ ILF- 3k psia 22" x 14" ULIIB 22" x 14" ULIIB w/ ILF
API 16A Temperature Rating for Non-Metallic	14" ULIIB – DGF • Low Temperature Limit (D) : 20°F minimum • Cont. Elev. Temperature Limit (G) : 250°F maximum • Extreme Temperature Limit (F) : 350°F maximum
	22" Poslock – ECF • Low Temperature Limit (E) : 30°F minimum • Cont. Elev. Temperature Limit (C) : 210°F maximum • Extreme Temperature Limit (F) : 350°F maximum
	22" x 14" ULIIB – EDD • Low Temperature Limit (E) : 30°F minimum • Cont. Elev. Temperature Limit (D) : 240°F maximum • Extreme Temperature Limit (D) : 250°F maximum
Ram Position Indicator	With/Without
Seal Seat Insert	With/Without
Studs	API 20E based on AX010291, AX010295, AX010296, AX010297, AX010298, AZ010294
Hex Nuts	API 20E based on AX010301

Notes:
[1] Material Specification AX010253 (F22) has minimum yield stress 80ksi while AX010018 (AISI 4130) has minimum yield stress 75 ksi.
[2] The noted option(s) do not affect the critical aspects of the design.
[3] Cavity configurations with different 14"/22" door assembly combination does not affect the critical aspects of the design.

Note: *Other part numbers or updated revisions may be acceptable under this Certificate provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality department as appropriate. DNV GL's local surveyor shall verify the change before issuance of Product Certificate.*

Type Approval documentation

Fabrication Procedures

Procedures related to testing, welding and NDT, are to be reviewed/approved by DNV GL's local surveyor for compliance

Tests carried out

The followings test reports have been reviewed and found to be in compliance with the Design Verification Testing requirements of API 16A as well as the Factory Acceptance Test requirements of DNV-GL's Type Approval Programme 1.2: ER534, ER552, ER602, ER1021, ER1172, ER1461, ER542, & ER02278.

Marking of product

Marking shall:

1. Be reviewed and approved by the DNV GL local surveyor
2. Identify and differentiate each production unit <i.e. serial number>
3. Establish traceability to product design and fabrication documentation
4. Be in accordance with API 16A

Periodical assessment

For retention of the Type Approval Certificate, DNV GL's Surveyor shall perform a survey every second year in accordance with DNV GL type approval scheme "DNVGL-CP-0338"

END OF CERTIFICATE