

Table 1

Technical characteristics			
Parameter name	Unit	Value	
Pressure	Operating	MPa	12.1.8
	Design		2.1
	Maximum operating		14
Wall	Minimum operating	°C	183
	Design		220
Temperature	Minimum allowable wall temperature of pressure vessel		minus 30
	Name	% mass	Unstable gas condensate
	Hazard class of working media per GOST 121007-76		3
Medium	Fire safety per GOST 121044-2018		yes
	Flammability, category and group of explosive mixture per GOST 308525-2002 and GOST 3085211-2002		IIA-T3
	Corrosion rate	mm/year	<0.1
Temperature	Maximum	°C	183
	Minimum		14
Internal volume	m ³	22	
Base metal grade		See Table 3	
Metal grade for internal elements		12X18H10T	
Corrosion allowance	mm	2	
Number of stress cycles per entire service life		not more than 1000	
Service life, not less than	years	20	
Seismicity, less than	point	7	
Wind region		III	
Location of unit		outside	
Absolute minimum temperature of the operating region	°C	minus 30	
Average temperature of air of the coldest five-day period with a security of 0.92	°C	29	
Testing conditions	Medium type		water
	Temperature of medium	°C	5.40
Test pressure	In vertical position	MPa	3.15
	In horizontal position	MPa	3.35
Weight of apparatus**	Empty with no internals	kg	10460
	In operating conditions	kg	15662
Weight of internals	During hydraulic testing	kg	35162
		kg	2702
Purpose of apparatus			Production of stable condensate
Group of apparatus per GOST 34347-2017			1
Category of apparatus per TP TC 032/2013			1
Category of apparatus per STO 002202575.063-2005			-
Amount of control of welded joints	UT, gas, X-ray and Gamma-ray inspections	%	100
	Styloscopy		-
Application of Federal Rules and Regulations	Regulations of Industrial Safety for Hazardous Facilities using Equipment Working under Excess Pressure		Yes
	General Rules for Explosion Safety of Explosive- and Fire-Hazardous Chemical/Petrochemical Plants and Oil Refineries		Yes
Registration in Rostekhnadzor			Yes
	Overall dimensions	mm	1881x1873x21072
Entrance stream capacity	max	kg/h	6950
	min		12900

- Main materials used in the product - see Table 3.
- *Reference dimensions.
- Limit deviations of dimensions for stand out of manways Д1-Д4 are ± 10 mm, nozzles E1-E4 ± 3 mm, other nozzles ± 5 mm.
- Deviation in height from the shell lower edge to the lower plate's support shall not exceed ± 5 mm, and before the upper plate's support it shall not exceed ± 15 mm, while for intermediate plates it shall change proportionally.
- Preparation of the column outer surface:
 - degreasing of the outer surface to grade 1 as per GOST 9.402-2004;
 - shot blasting of the outer surface to grade 2 as per GOST 9.402-2004.
- Coating of the column outer surface with primer-enamel Akrus-epox S - 2 layers. Coating class - VI as per GOST 9.032-74.
- Column inner surface shall be preserved as per GOST 9.014-78 and OST 26-01-890-80 for product group II-4, protection option is B3-1.
- Storage and transportation terms and conditions are specified in the operating manual.
- Surfaces of spectacle blinds shall be preserved according to the protection option B3-1 as per GOST 9.014-78, followed by depreservation when turned into the working position.
- Machined unpainted sealing surfaces of flanges shall be covered with lubricant grease as per GOST 9.014-78 and OST 26-01-890-80.
- Slings devices shall be painted in a bright contrasting color.
- To align the vertical position of the column at the top and bottom of the body at an angle of 90°, two pairs of vertical alignment tools are provided. The outside of the alignment tool's disk shall be painted with NC-132P enamel.
- Bosses of the alignment tool shall be welded to the column body with a groove directed along the longitudinal generatrix. For welding of bosses on longitudinal generatrices, flat, smooth areas without surface defects and weld defects shall be selected.
- For the time of transportation, the pin, disk and nut of the alignment tools shall be removed; holes of the bosses shall be blinded with the M16-8gx20.36 bolt as per GOST 7798-70.
- Passport data shall be marked with font 5-Pr.3 as per GOST 26.008-85. The area of marking shall be placed in a frame with NC-132P enamel.
- Relief of the grounding sign shall be painted with NC-132K enamel.
- On the column body, on two opposite sides, manipulation sign No.12 "Center of gravity" shall be applied as per GOST 14192-96 with PF-115 enamel; additionally the letters "UM" shall be applied.
- Column shall be tested with a test hydraulic pressure by holding for 30 minutes:
 - in vertical position Ppr. = 3.15 MPa,
 - in horizontal position Ppr. = 3.35 MPa.
- Tests of seams with a luminescent indicator coating shall be combined with a hydraulic test. Exposure time is 60 min.
- Column is subject to registration by Russia's Rostekhnadzor authorities.
- Manufacturing, marking, packing and transportation of the column is as per GOST 31838-2012, GOST 34347-2017, PB 03-584-03, FNP "Industrial safety rules for hazardous production facilities where equipment operating under excessive pressure is used".
- Surfaces of welded seams and heat-affected zones shall be prepared for control:
 - radiography method as per GOST 7512-82, clauses 3.1 and 3.2;
 - ultrasonic inspection as per GOST R 55724-2013 and STO 00220256-005-2005 clause 5.4;
 - dye penetrant inspection, roughness Ra is 6.3 microns; low spot between beads of the welded seam is 1 mm;
 - hydraulic test with a luminescent indicator coating as per OST 26.260.14-2001.
- Control and assessment of quality of welded seams shall be carried out in accordance with:
 - radiography method: for butt joints - defectiveness class 3, for corner and T-joints - defectiveness class 4 (assessment of single defects in width (diameter), as well as defect chains is allowed to be carried out according to the norms of the 4th class of defectiveness instead of the 3rd; 5th class of defectiveness instead of the 4th); sensitivity class is 2 as per GOST 7512-82;
 - dye penetrant inspection: sensitivity class - II as per GOST 18442-80; defectiveness class - 2 as per OST 26-5-99;
 - hydraulic test with a luminescent indicator coating; tightness class is 3 as per OST 26.260.14-2001.
 - ultrasonic inspection: as per GOST R 55724-2013, STO 00220256-005-2005.
- Strength factor of welded seams equals 1.0.
- See sheet 4 for a table of welded seams.
- All changes related to replacement of material, parts dimensions, etc. that do not violate the requirements of GOST 31838-2012, GOST 34347-2017, PB 03-584-03, FNP "Industrial safety rules for hazardous production facilities where equipment operating under excessive pressure is used" are reflected in relevant sections of the vessel's passport.
- Column shall be thermally insulated at the installation site by workforce and means of the customer. Thermal insulation materials are not included in the scope of delivery.
- Layout of brackets for fastening thermal insulation, column slinging diagrams, table of package units, see Sheet 3.
- Column is not subject to heat treatment.
- Removable internals (plates and demister) are supplied by
- Working drawings were developed on the basis of the technical project АБВ.000000.00.

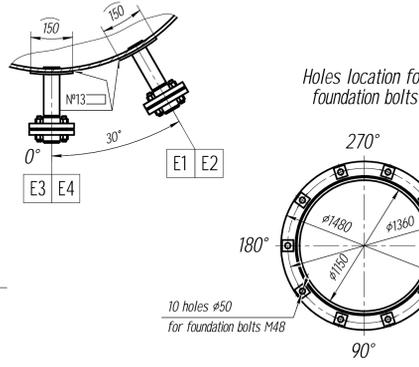
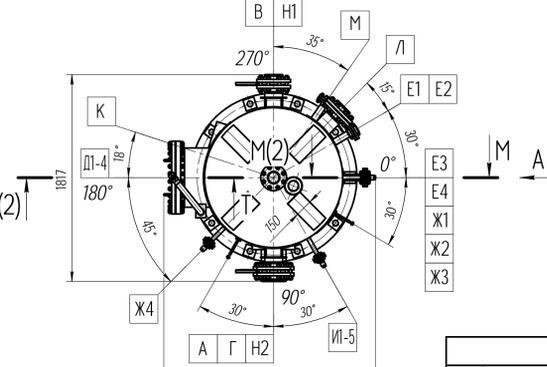


Table 3

Name of elements	Designation of material	Additional requirements
Shell, bottoms, plugs	Sheet 09Г2С-12 GOST 5520-2017	Content of sulfur: not more than 0.025%; phosphorus: not more than 0.035%
Flanges of nozzles and manways	Forging gr.IV K1245, GOST 8479-70 Steel 09Г2С, GOST 19281-2014	Impact resistance at temperature minus 40°C KCU ≥ 30 J/cm ²
Nozzle necks	Pipe B-09Г2С GOST 32528-2013	1. Bend test - impact resistance at temperature minus 40°C KCU ≥ 30 J/cm ² 2. Flattening test.
Gaskets	Paronite PMB-1 GOST 481-80	
Stud-bolts	Steel 35 per GOST 1050-2013	
Nuts	Steel 25 per GOST 1050-2013	Hardness of nuts is lower than hardness of stud-bolts by not less than 15 HB
Support	Sheet 09Г2С-8 per GOST 5520-2017	

Table 2

Denot.	Function	Qty	DN, mm	PN, MPa	Stand out, mm	Mating detail
A	Inlet for vapor	1	150	2.5	200	rotary cap, Flange 150-40-11-1-E per GOST 33259-2015
Б	Outlet for vapor	1	100	2.5	see drawing	rotary cap, Flange 100-40-11-1-E per GOST 33259-2015
B	Inlet for feed	1	150	2.5	200	rotary cap, Flange 150-40-11-1-E per GOST 33259-2015
Г	Outlet for bottoms liquid	1	200	2.5	see drawing	rotary cap, Flange 200-25-11-1-E per GOST 33259-2015
Д1-4	Manway	4	500	2.5	240	Manway lid
E1-4	For level indicator	4	50	4.0	180	Flange 50-40-11-1-E per GOST 33259-2015
Ж1-4	For pressure measuring	4	25/20x15	4.0	180	Flange 25-40-11-1-E per GOST 33259-2015
И1-5	For temperature measuring	5	25/20x15	4.0	180	Flange 25-40-11-1-E per GOST 33259-2015
K	Access manhole	1	600	-	-	Flange 150-25-11-1-E per GOST 33259-2015
Л	For safety valve	1	150	2.5	200	Flange 150-40-11-1-E per GOST 33259-2015
M	For level signaling	1	50	4.0	180	Flange 50-40-11-1-E per GOST 33259-2015
Н1,2	For ventilation of support	2	100	-	-	

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Column φ1200

Assembly drawing

Sheet 1 Sheets 111 4

See tab1 1:25

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Table of welding seams

Seam No.	Designation of standard for welding seam	Sketch of seam	Qty of seams	Electrode, welding wire, shielding gas (GOST, TU, type, grade, diameter)	Weight of weld metal, kg	Seam length, m	Welding method	Control methods							
								Radiographic 100% GOST 7512-82 or ultrasonic 100% GOST R 55724-2013 STU 00220256-005-2005	Dye penetrant method GOST 18442-80	Layer-by-layer visual inspection and measuring RD 03-606-03	Visual inspection and measuring RD 03-606-03	Mechanical testing GOST R 52630-2012	Hydraulic test with luminescent indicator cover. OST 26260.14-2001	Metallographic test RD 24.200.04-90	Pneumatic test 0.6 MPa
1			10		18,15	19,0		+	-	+	-	+	-	+	-
2	GOST 8713-79 -C7		10	OK Autrod 12.22 (ESAB) OK Flux 10.71 TU 5929-002-55224353-2004	36,73	38,46	SAW	+	-	+	-	-	-	-	-
3			4		0,75	0,96		+	-	+	-	+	-	+	-
4	GOST 8713-79 -C7		1	5 - OK Autrod 12.22 (ESAB) OK Flux 10.71 TU 5929-002-55224353-2004 A,B - OK Aristorod 12.50 (ESAB), Ar+20%CO2 TU 2114-002-05015259-97	4,09	3,86	SAW+ GMAW	+	-	+	-	-	-	-	-
5, 6	RD 26-18-8-89 У19		A		27,89			-	+	+	-	-	+	-	-
			B					-	+	+	-	-	+	-	-
			B					-	+	+	-	-	-	-	+
			Г					-	+	+	-	-	-	-	+
7	RD 26-18-8-89 У12		1	OK Aristorod 12.50 (ESAB), Ar+20%CO2 TU 2114-002-05015259-97	0,47	0,36	GMAW	+	-	+	-	-	-	-	-
8	RD 26-18-8-89 У12		14		2,81	2,17		-	+	+	-	-	+	-	-
9	GOST 16037-70 C56		4	OK Autrod 12.22 (ESAB) OK Flux 10.71 TU 5929-002-55224353-2004	8,7	6,54	SAW+ GMAW	+	-	+	-	-	-	-	-
10	GOST 16037-70 C56		4		2,93	2,2		+	-	+	-	-	-	-	-
11	GOST 16037-70 C17		3		1,34	1,74		+	-	+	-	-	-	-	-
12	GOST 16037-70 C17		14		0,45	1,88		+	-	+	-	-	-	-	-
13	GOST 14771-76 -Н1-ИП-Δ8		86		31,08	97,12		-	-	+	-	-	-	-	-
14	GOST 14771-76 -Н1-ИП-Δ10		4		4,3	3,21		-	-	+	-	-	-	-	-
15	GOST 23518-79 -Т1-ИП		1	OK Aristorod 12.50 (ESAB), Ar+20%CO2 TU 2114-002-05015259-97	1,54	3,81	GMAW	-	-	+	-	-	-	-	-
16	GOST 14771-76 -Т1-ИП-Δ3		8		4,2	1,13		-	-	+	-	-	-	-	-
17	GOST 14771-76 -Т6-ИП		109		0,07	92,92		-	-	+	-	-	-	-	-
18	GOST 23518-79 -Т1-ИП		72		51,11	33,53		-	-	+	-	-	-	-	-
19	GOST 14776-79 -Н1-ПП		430		25,15	10,75		-	-	-	+	-	-	-	-
20	GOST 23518-79 -Т1-ИП		9		0,22	0,85		-	-	-	+	-	+	-	-

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Sheet 4

Size	Zone	Pos.	Designation	Name	Qty	Remarks
<u>Documentation</u>						
*)			ABCD.000000.000 AD	Assembly drawing	4	*)A2x3, A1, A2
A2			ABCD.000000.000 PD	Packaging drawing		
A3			ABCD.0000.00.000 LP	List of purchased items		
A4			ABCD.0000.00.000 SC	Strength calculation		
A4			ABCD.0000.00.000 OM	Operating manual		
A4			ABCD.0000.00.000 IM	Assembly, running, management manual		
A4			ABCD.0000.00.000 PS	Equipment passport of vessel		
<u>Assembly units</u>						
*)	1		ABCD.0000.01.000	Support	1	*)A4x3
A2	2		ABCD.0000.02.000	Manway DN500 PN2,5	2	
*)	3		ABCD.0000.03.000	Nozzle DN200 PN2,5	1	*)A4x3
A4	4		ABCD.0000.04.000	Nozzle DN150 PN2,5	1	
A4	5		ABCD.0000.05.000	Nozzle DN150 PN2,5	1	
A3	6		ABCD.0000.06.000	Nozzle DN150 PN2,5	1	
A4	7		ABCD.0000.07.000	Nozzle DN100 PN2,5	1	
A4	8		ABCD.0000.08.000	Nozzle DN50 PN4,0	5	
A4	9		ABCD.0000.09.000	Nozzle DN25 PN4,0	9	
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Column ϕ1200						

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A4

Size	Zone	Pos.	Designation	Name	Qty.	Remarks
A4		23	ABCD.0000.00.011	Support segment	1	
A4		24	ABCD.0000.00.012	Plate	2	
WD		25	ABCD.0000.00.013	Bar	1	
				Sheet Б-ПН-0-8 GOST 19903-2015 09Г2С-8 GOST 5520-2017		
				100h14 x 70h14		
A3		26	ABCD.0000.00.014	Clamp	1	
A3		27	ABCD.0000.00.015	Nameplate	1	
A4		28	ABCD.0000.00.016	Support segment	34	
A4		29	ABCD.0000.00.017	Support segment	1	
A4		30	ABCD.0000.00.018	Plate	62	
A4		31	ABCD.0000.00.019	Plate	4	
A4		32	ABCD.0000.00.020	Plate	2	
A4		33	ABCD.0000.00.021	Plate	2	
A4		34				
				<u>Standard items</u>		
		35		Rivet 3x6.10.019 GOST 10300-80	4	
		36		Grounding sign 40-3 GOST 21130-75	2	
		37		Clamp C2 GOST 17314-81	430	
		38		Lifting Lug 4-1-8-750-09Г2С-8 GOST 13716-73	4	

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Size	Zone	Pos.	Designation	Name	Qty.	Remarks
				<u>Kits</u>		
				<u>Installation kit</u>		
A4			ABCD.0000.00.022	Pin Ш1/100 GOST 17314-81	430	
				<u>Spare parts kit</u>		
				Gaskets GOST 15180-80 Paronite PMB-1 GOST 481-80:		
				Б-25-63	18	
				Б-50-63	10	
				Б-100-63	2	
				Б-150-63	6	
				Б-200-63	2	
				Gasket 1-500-2,5 GOST 28759.6-90 PMB-1 GOST 481-80	8	
				Nuts per OST 26-2041-96:		
				M12.7H.25.019	8	
				M16.7H.25.019	4	
				M20.7H.25.019	28	
				M24.7H.25.019	10	

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Size	Zone	Pos.	Designation	Name	Qty.	Remarks
				Stud-bolts per OST 26-2040-96:		
				1-M12-8g•70.35.019	4	
				1-M16-8g•90.35.019	2	
				1-M20-8g•120.35.019	2	
				1-M20-8g•140.35.019	12	
				1-M24-8g•120.35.019	2	
				1-M24-8g•150.35.019	3	
				<u>Tare kit</u>		
				According to the packaging drawing		
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