



Technical proposal No.

All-purpose cementing head GCU-R3

The All-purpose cementing head GCU-R3 is designed to work together with the top drive and provides hydraulic communication of the cementing aggregates with the casing string during its cementing.

The head also serves as a container enclosing cementing plug with their fixation before starting in the column.

Work brief description

The head is screwed with the upper drive stem by the locking thread and with a casing string by the lower thread of casing pipes, that is suspended together with the string on the upper drive stem.

Apart from retaining the string hanging and vertically reciprocating, the head allows the string reciprocating operation with rotation, which significantly improves the well casing quality.

In cementing, the cement slurry is pumped into the well through the ball valve 23, while the top drive provides smooth rotational and reciprocating movement of the string.

The body 3 is kept from rotating by means of the torque rod 8.

After completion of cement slurry pumping, the ball valve of the head is closed, after which the displacing fluid of necessary density is fed through the upper drive.

The force created by the displacing fluid pressure cuts the pins 14 of the upper bypass plug 2, which moves into the head cavity and mounts in the mounting seat of the lower bypass plug 1, at which pins 15 are also cut and the assembled plugs are pushed down to the bottom of the string.



Technical characteristics

Table 1.

Parameter name	GCU-102R3	GCU-114R3	GCU-127R3	GCU-146R3	GCU-168R3	GCU-178R3	GCU-245R3
Nominal diameter, mm	102	114	127	146	168	178	245
Thread on the head for casing string D ₁ , mm	OTTM-102	Buttress -114 (or other)	Buttress -127 (or other)	Buttress -146 (or other)	Buttress -168 (or other)	Buttress -178 (or other)	Buttress -245 (or other)
The maximal working pressure*, MPa (kgf/cm ²)	40 (400)	40 (400)	40 (400)	32 (320)	32 (320)	32 (320)	32 (320)
Test pressure, MPa (kgf/cm ²), min.	56 (560)	56 (560)	56 (560)	44.8 (448)	44.8 (448)	44.8 (448)	44.8 (448)
Upper coupling thread D ₂ , GOST R 50864-96	3-86	3-86	3-102	3-102	3-102	3-102	3-133
Internal diameter of the head, mm, min.	50	50	66	66	66	66	92
Number of coupling lateral outlets, pcs.	1	1	1	1	1	1	1
The biggest contractible diameter of the lower plug, mm	93	104	116	133	154	166	229
The smallest contractible diameter of the lower plug, mm	84	94	105	124	144	152	213
Head height H, mm,	1145	1 200	1280	1300	1350	1370	1445
Head width L, mm,	1250	1250	1265	1265	1265	1275	1300
Head outer diameter D, mm,	120	127	146	166	188	194	270
Stem outer diameter D ₃ , mm,	108	108	120	120	120	120	155
Head internal diameter in place of plug mounting, d ₁ , mm	85	97	108	124	144	156	223
Head weigh, kg, ±3%	105	110	115	120	130	135	200
Cargo capacity**, tones, max.	80	80	100	120	150	150	200
Approximate moment of screwing the connection with the pipe casing, N*m	7000	8152	9165	11000	12502	12307	16512
Item materials	Heat-treated steel 40X GOST 4543-71 σ _{тек.} = 650 MPa or the analogue; Aluminum alloy Д16; Rubber						
Handling medium	Cementing and drilling fluids						

* possible increase in working pressure

** possible increase in cargo capacity

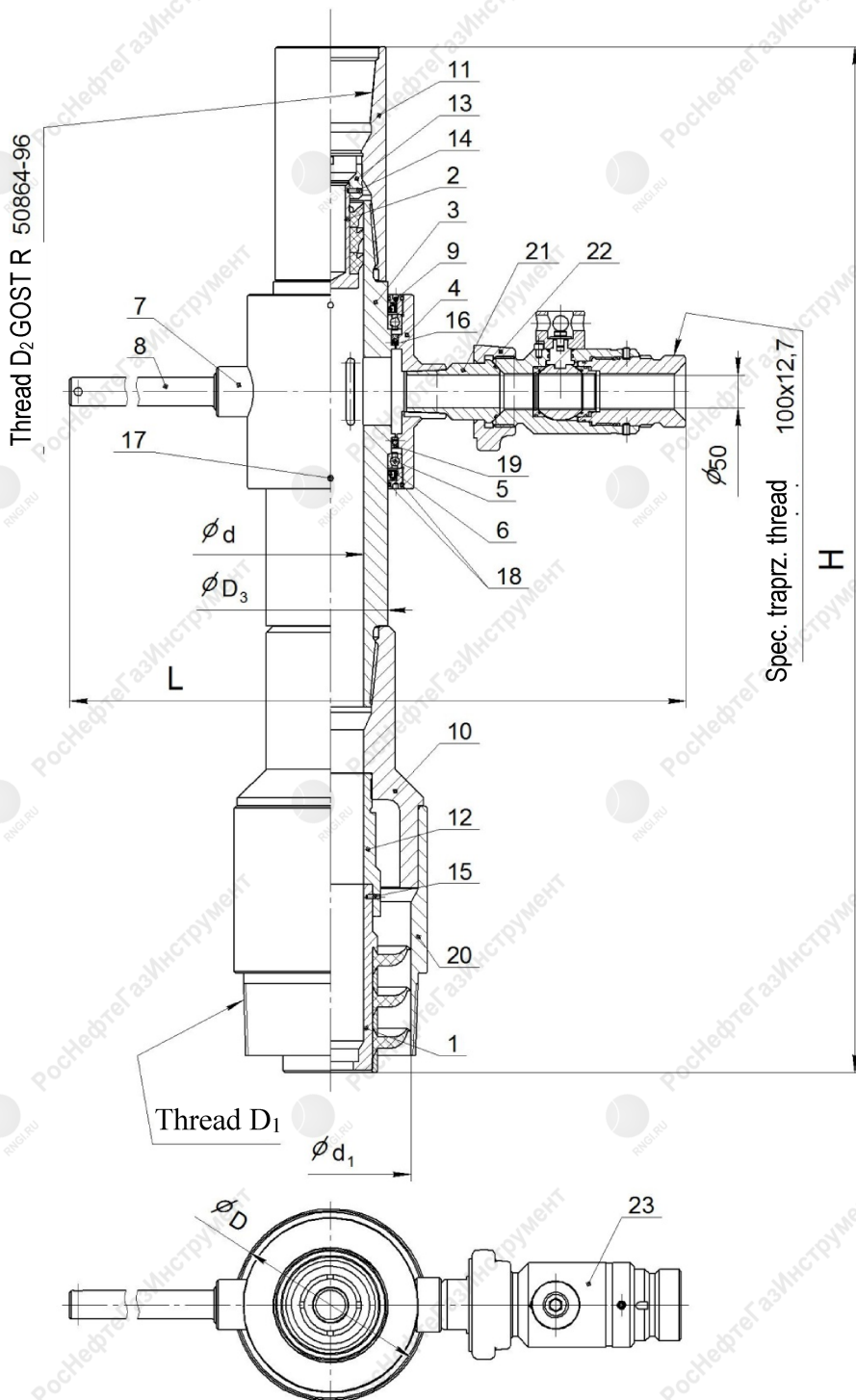


Figure 1 – All-purpose cementing head GCU-R3

1 - lower bypass plug; 2 - upper bypass plug; 3 - housing; 4 - holder; 5 - bearing (2 pcs.); 6 - insulation joint (2 pcs.); 7 - threaded bushing; 8 - torque rod; 9 - cover (2 pcs.); 10 - adapter sub under the column; 11 - upper sub; 12 - bushing under the lower plug; 13 - plug under the upper plug; 14, 15 - breaking pin; 16 - spacing ring (2 pcs.); 17 - dump bolt (4 pcs.); 18 - rings; 19 - insulation joint (polyurethane) 2 pcs.; 20 - technological sub; 21 - seal cone; 22 - the nut BRS 2"; 23 - crane KSH-BRS2 "P1.