REPORT
of base calibration for 2БК-7/9-ТБ (LL2T) tool

Company: VIETSOVPETRO
Calibration date: 20-07-16
Tool number: 5
Used equipment:
-ground cable equivalent;
-log recorder <KASKAD>;
-imitator of the gradient sondes;
-digital voltmeter (220V 50H, class not less 2.5);
-resistor bank R-4834 (from 0.01 ohm to 999999 ohm) 1 pcs.;
-resistor bank(from 0.01 ohm to 999999 ohm, having relative error 0,05%) 2 pcs.;
-stabilized PSU dc voltage;
-set of the connectors and other implements, as per ZIP list.
Calibration results:

PRIMARY DATA OF TOOL CALIBRATION

SONDE	Equiv.resist., ohmm	Current, adcu	Voltage, adcu	Transform factor
LL7	0.2 50.0 5000.0	20527.4 12648.8 445.0	21.9 2330.2 11491.9	a1: 276.305 a2: 6.94 a3: -189.67
LL9	0.2 50.0 5000.0	20627.2 16066.1 1308.8	1.0 1251.6 10908.5	a1: 642.780 a2: -5.45 a3: -94.26
PZ	0.5 50.0 500.0	17863.6 17723.6 16568.7	6.7 1008.2 9386.0	a1: 793.551 a2: -3.55 a3: 1666.52
RB	0.2 1.0 5.0	17833.4 17814.5 17757.6	1305.1 5797.4 28087.5	a1: 3.172 a2: 182.02 a3: 0.00

SONDE	Equiv.voltage, mV	Meas.value, adcu	Transform factor
SP	0 400	-2.8 5155.2	A: 0.078 B: 0.217

Channels LL7,LL9,PZ and RB data are transfered to physical measurement units using coefficients in the following way:

$$PHYS.UNIT(OHMM) = a1 * \frac{U(ADCU)-a2}{I(ADCU)-a3}$$

SP channel data are transfered to physical measurement units using coefficients in the following way:

$$PHYS.UNIT(mV) = A*SP(ADCU)+B$$

MEASUREMENT RANGE, MAIN RELATIVE MEASUREMENT ERROR

Sonde LL-7 Sonde coef. = 0.700 m Transf.factor = 276.305

$\rho_к$, ohmm	Ro, ohm	Rmeas., ohmm	Meas.error, %	Permis.error, %
0.2	0.29	0.16	19.55	105.0
5.0	7.14	5.14	2.79	9.0
50.0	71.43	50.03	0.05	5.4
500.0	714.29	511.71	2.34	5.3
5000.0	7142.86	5002.51	0.05	7.5
10000.0	14285.71	10025.92	0.26	10.0
20000.0	28571.43	19881.72	0.59	15.0

Sonde LL-9 Sonde coef. = 1.640 m Transf.factor = 642.780

$\rho_к$, ohmm	Ro, ohm	Rmeas., ohmm	Meas.error, %	Permis.error, %
0.2	0.12	0.20	0.53	105.0
5.0	3.05	5.11	2.28	9.0
50.0	30.49	50.02	0.04	5.6
500.0	304.88	499.41	0.12	7.5
5000.0	3048.78	5002.31	0.05	30.0

Sonde PZ Sonde coef. = 6.500 m Transf.factor = 793.551

$\rho_к$, ohmm	Ro, Ом	Rmeas., ohmm	Meas.error, %	Permis.error, %
0.2	0.03	0.28	37.69	105.0
0.5	0.08	0.50	0.74	45.0
1.0	0.15	1.03	3.32	25.0
5.0	0.77	5.00	0.07	9.0
50.0	7.69	50.00	0.01	5.4
500.0	76.92	499.99	0.00	5.0
1000.0	153.85	1002.51	0.25	5.0

Sonde RB Sonde coef. = 1.110 m Transf.factor = 3.172

$\rho_к$, ohmm	Ro, ohm	Rmeas., ohmm	Meas.error, %	Permis.error, %
0.05	0.04	0.044	2.78	25.0
0.100	0.09	0.099	1.36	15.0
0.2	0.18	0.20	0.42	10.0
1.0	0.90	1.00	0.01	6.0
5.0	4.50	4.99	0.25	5.0

Sonde SP Transf.factor = 0.078

Equiv.voltage	Meas.voltage, mV	Meas.error, %	Permis.error, %
10	10.38	3.76	10.0
100	100.64	0.64	5.0
400	400.04	0.01	5.0
-10	-10.10	0.97	10.0
-100	-100.83	0.83	5.0
-400	-399.72	0.07	5.0

Table of the sondes zero

SONDE	Current, adcu	Tol.current, adcu	Voltage, adcu	Tol.voltage, adcu
LL-7	-189.31	[-350; +350]	-0.38	[-50; +50]
LL-9	-102.76	[-350; +350]	-6.00	[-50; +50]
PZ	-3.48	[-200; +200]	-9.38	[-200; +200]
RB	-3.48	[-200; +200]	-5.00	[-200; +200]
SP	----------	----------	-2.79	[-200; +200]

CONCLUSION

Conclusion of a tool suitability: TOOL IS SUITABLE FOR USE
Next calibration should be performed not later than: 20-07-17

Performed by:	Duc Huy-Long