On approval of the technical standard document in the field of gas and gas supply

Unofficial translation

Order of the Minister of Energy of the Republic of Kazakhstan of December 29, 2017 No. 491. Registered with the Ministry of Justice of the Republic of Kazakhstan on February 26, 2018 No. 16429.

Unofficial translation

In accordance with subparagraph 32) of Paragraph 16 of the Regulations on the Ministry of Energy of the Republic of Kazakhstan, approved by the Decree of the Government of the Republic of Kazakhstan dated September 19, 2014 No. 994, **I HEREBY ORDER:**

Footnote. Preamble - as amended by the order of the Minister of Energy of the Republic of Kazakhstan dated .23.08.2021 No. 272 (shall be enforced ten calendar days after the day of its first official publication).

1. To approve the appended Methodology for recalculation of readings of meters without gas volume correctors by adjusting gas operational parameters to standard conditions.

2. In accordance with the procedure established by the legislation of the Republic of Kazakhstan, the Department of Gas Industry Development of the Ministry of Energy of the Republic of Kazakhstan shall:

1) ensure state registration of this order by the Ministry of Justice of the Republic of Kazakhstan;

2) within ten calendar days of the state registration of this order, send its Kazakh and Russian hard and soft copies to the Republican Center of Legal Information of the Ministry of Justice of the Republic of Kazakhstan Republican State Enterprise with the Right of Economic Management for its official publication and inclusion to the Reference Control Bank of Regulatory Legal Acts of the Republic of Kazakhstan;

3) within ten calendar days of the state registration of this order, send its copy to periodicals for its official publication;

4) place this order on the official website of the Ministry of Energy of the Republic of Kazakhstan;

5) within ten working days of the state registration of this order by the Ministry of Justice of the Republic of Kazakhstan, submit information on the implementation of measures, provided for in subparagraphs 1), 2) and 3) of this paragraph, to the Legal Department of the Ministry of Energy of the Republic of Kazakhstan.

3. Control over execution of this order shall be entrusted to the supervising vice-minister of energy of the Republic of Kazakhstan.

4. This order shall take effect upon the expiry of ten calendar days after the day of its first official publication.

Minister of Energy of the Republic of Kazakhstan   *K. Bozumbayev*

"AGREED"
Minister of Investments and Development
of the Republic of Kazakhstan
_____ Zh. Kassymbek
"___" _____ 201_
"AGREED"
Minister of National Economy
of the Republic of Kazakhstan
_____ T. Suleimenov
"___" _____ 201_

Methodology for recalculation of readings of meters without gas volume correctors by adjusting gas operational parameters to standard conditions Chapter 1. General provisions

1. This Methodology for recalculation of readings of meters without gas volume correctors by adjusting gas operational parameters to standard conditions (hereinafter referred to as the Methodology) was developed in accordance with subparagraph 16) of paragraph 16 of the Regulation on the Ministry of Energy of the Republic of Kazakhstan, approved by Resolution № 994 as of September 19, 2014 of the Government of the Republic of Kazakhstan, and is intended for recalculation of readings of a meter without gas volume correctors (hereinafter referred to as the meter) by adjusting gas operational parameters to standard conditions in accordance with NS (National Standard) 2939-63 "Gases. Conditions for volume determination" (hereinafter referred to as NS 2939-63).

2. The methodology is applied to meter commercial gas using household gas meters installed outdoors.

Chapter 2. Recalculation of readings of meters without gas volume correctors by adjusting gas operational parameters to standard conditions

3. Commercial gas supplied to the gas distribution system through the gas distribution station is metered with the help of the meters, where actual volumes of the flowing gas are adjusted to volumes under standard temperature conditions, namely $t_{cm} = 20°C$ (293,15°K) and $P = 760$ mm Hg (101325 Pa) (hereinafter referred to as standard conditions). In accordance with NS 2939-63, objective assessment of gas metering at commercial gas

metering stations and by the meter requires the correction of gas volumes by way of their recalculation to volumes under standard conditions.

4. The volume of gas supplied to consumers is metered with the help of the meters with gas volume correctors in accordance with NS 2939-63.

The volume of gas supplied to consumers with the help of the meters without temperature and pressure correctors is adjusted using the calculation method in accordance with the requirements of this Methodology.

Gas is sold to household and domestic consumers using the meters with correctors and those without temperature and pressure correctors.

5. When servicing consumers, average monthly correction factors are used to recalculate the volumes of gas supplied to standard conditions for a settlement period.

The settlement period is a time period for which the volume of gas supplied is determined, mutual settlements between the supplier and the consumer are made for the gas supplied. The settlement period is one calendar month running from the 1st day of a month through its last day.

6. Correction factors for recalculation of volumes of gas supplied to standard conditions (according to NS 2939-63) for a settlement month are calculated with account of the regional value of barometric pressure and the average monthly outdoor temperature using the formula:

$$\kappa = 0,0029 \cdot \frac{(P_{\text{б}} + P_{\text{г}})}{(273,15 + t_{\text{г}})}, \qquad (1)$$

where κ – is the correction factor for recalculation of volumes of gas supplied to standard conditions;

0,0029 - is the standard conditions adjustment factor, obtained by dividing the standard temperature equal to 293,15°K and the standard pressure equal to 101325 Pa;

$P_{\text{г}}$ – is excess pressure of gas supplied to household consumers (2000 Pa);

$P_{\text{б}}$ – is barometric pressure in a region of gas supply, Pa, determined according to the data of a relevant territorial unit of the Meteorological Office;

273,15 – is the factor for converting Celsius temperature values to units of thermodynamic temperature in Kelvin;

$t_{\text{г}}$ – is the average gas temperature in the meter, which is calculated using the formula (2) for a settlement period depending on the meter's location or adopted based on the measurements of the temperature of gas flowing through the meter with account of its location, or gas temperature values in the meter $t_{\text{г}}$ depending on outdoor temperature, which is calculated using the formula (2) according to appendices 1 and 2 to this Methodology.

In the case of outdoor location of the meter, the gas temperature in the meter is considered to be equal to the outdoor temperature, according to Appendix 1 to this Methodology.

7. The values of the gas temperature in the meter $t_г$, depending on the outdoor temperature , are determined using the formula:

$$t_г = t_в + (t_{ср} - t_в) \cdot e^{-Shu}, \quad (2)$$

where Shu = 0,546 - is the Shukhov number for bushings from steel pipes;

e = 2,72 – is the base of the natural logarithm;

$t_{ср}$ – is the average outdoor temperature for a month is adopted based on the actual data provided by a relevant territorial unit of the Meteorological Office;

$t_в$ – is the average air temperature, 20°C.

The values of gas temperature in the meter $t_г$, depending on the outdoor temperature, calculated using the formula (2) for a number of average values, are presented in Appendix 2 to this Methodology.

8. When calculating monthly factors, the actual averaged data on the temperature and barometric pressure of a relevant region are applied for a settlement period. A relevant territorial unit of the Meteorological Office submits actual data on the basis of a contract.

9. The gas volume to be compensated, m3, is determined using the formula:

$$\Delta V = (к - 1) \cdot V_{ПУ}, \quad (3)$$

where

$V_{ПУ}$ - is gas consumption per month according to meter readings.

It is also possible to determine the corrected volume of gas under standard conditions, used for mutual settlements with consumers, using the formula:

$$V_{см} = к \cdot V_{ПУ} \quad (4)$$

$V_{см}$

- gas volume under standard conditions.

Determination of the temperature of gas flowing through the meter with account of its location

The meter's location	Gas temperature in the meter, $t_\text{г}$ °C		Correction factor, κ
	in the heating season (from October through April)	in summertime (from May through September)	
Outdoor location	$t_\text{ср}$	$t_\text{ср}$	To be calculated using the formula (1)

Appendix 2
to the Methodology for
recalculation of readings of meters
without gas volume correctors by
adjusting gas operational
parameters to standard conditions

Values of gas temperature in the meters $t_\text{г}$ depending on outdoor temperature, calculated using the formula (2)

Values $t_\text{ср}$	Values $t_\text{г}$	Values $t_\text{ср}$	Values $t_\text{г}$
36.0	29.3	-1.0	7.8
34.0	28.1	-2.0	7.3
32.0	26.9	-3.0	6.7
30.0	25.8	-4.0	6.1
28.0	24.6	-5.0	5.5
26.0	23.5	-6.0	4.9
24.0	22.3	-7.0	4.4
22.0	21.2	-8.0	3.8
20.0	20.0	-9.0	3.2
18.0	18.8	-10.0	2.6
16.0	17.7	-12.0	1.5
14.0	16.5	-14.0	0.3
12.0	15.4	-16.0	-0.8
10.0	14.2	-18.0	-2.0
9.0	13.6	-20.0	-3.2
8.0	13.1	-22.0	-4.3
7.0	12.5	-24.0	-5.5
6.0	11.9	-26.0	-6.6
5.0	11.3	-28.0	-7.8
4.0	10.7	-30.0	-9.0
3.0	10.2	-32.0	-10.1
2.0	9.6	-34.0	-11.3

1.0	9.0	-36.0	-12.4
0.0	8.4	-38.0	-13.6