



EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 143/18 - 5559

Page 1 from 12 pages

In accordance: with Directive 2014/32/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to the making available on the market of measuring instruments(implemented in Czech Republic by Government Order No. 120/2016 Coll.).

Manufacturer: Taizhou Durui Metering Co.,Ltd.
No.422, Xinda Str., Xinqiao Town, Luqiao Dist.
Taizhou City, 318055
Zhejiang
China

For: diaphragm gas meter
type: G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A
MPE 1.5 %
mechanical environment class: M1

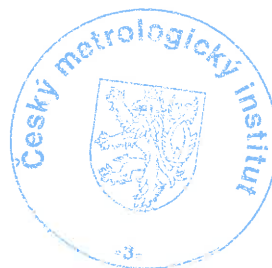
Valid until: 17 June 2028

Document No: 0511-CS-A021-18

Description: Essential characteristics, approved conditions and special conditions, if any, are described in this certificate.

Date of issue: 18 June 2018

Certificate approved by:



RNDr. Pavel Klenovský

1. Characteristics of instrument

The diaphragm gas meters of the type G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A (*Figure no.1*) are volumetric gas meters where the volume is measured by periodical filling and emptying of several measuring chambers with deformable walls (diaphragms). This type is manufactured in four sizes G4, G2.5 and G1.6. It is designed for measurement of dry fuel gases. The diaphragm gas meter is composed of a measuring module, of a housing and of an index.

The housing (casing) of gas meters G4S, G2.5S, G1.6S are made from steel, the housing (casing) of gas meters G4S, G2.5S, G1.6S are made from aluminium alloy. The housing (casing) is split horizontally and it is composed of two parts. In the case of steel housing these two parts are connected by a band. In the case of aluminium alloy housing these two parts are connected by screws. The surface is covered by painting in order to withstand to ambient conditions. The gas meter is manufactured in two-pipe version. The drawing of gas meters G4S, G2.5S, G1.6S is mentioned on *Figure no. 2*. The drawing of gas meters G4A, G2.5A, G1.6A is mentioned on *Figure no. 3*. There are no thermo-wells and no pressure test point outputs in the housing.

The measuring module (*Figure no. 4*) is composed of four chambers which are divided by synthetic diaphragms. The list of components and their materials is mentioned in *Figure no.5*. The chambers have no firmly determined measuring spaces. A crank drive converts the translation movement of diaphragms and valves into rotational one. A transmission drives the horizontal output shaft. The measuring module is equipped with a return stop in order to prevent the registration of reverse flow. The measuring module with cyclic volume 1.2 dm³ is used. The gas meter is equipped with an index drive with lip seal for the transmission of the rotational movement of the output shaft from the housing filled with fuel gas to index. It means there is no magnetic coupling in the gas meter.

The index is equipped with two plastic cog wheels which serve for adjustment of the gas meter. The gas meter indication is on mechanical drum index. The index has 8 drums. The index is also suitable for attachment of a reed contact pulse emitter. The reed contact pulse emitter can be secured by a user seal. The diaphragm gas meter of the type G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A measures and indicates the volume at metering conditions. The values are indicated in m³ whereby three decimal places are displayed.

2. Main characteristics

Electromagnetic class of the gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A:
Not applicable.

The mechanical environment class of the gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A:
M1 - This class applies to instruments used in locations with vibration and shocks of low significance, e.g. for instruments fastened to light supporting structures subject to negligible vibrations and shocks transmitted from local blasting or pile-driving activities, slamming doors, etc.

Accuracy class: 1.5

Maximum permissible error (MPE) of measurement in flow rate range $Q_t \leq Q \leq Q_{max}$	%	1.50
Maximum permissible error (MPE) of measurement in flow rate range $Q_{min} \leq Q < Q_t$	%	3.00
Temperature range of the gas	°C	(-10 ÷ +55)
Temperature range for the climatic environment	°C	(-10 ÷ +55)
Storage temperature and temperature during transport	°C	(-20 ÷ +60)
Range of index	m ³	99999.999
Attachable low frequency pulse emitter (reed contact) number		100 imp/m ³ (0.01 m ³ /imp)

The gas meter is designed for an indoor use in areas without condensing humidity.



Size G	Q_{max} (m ³ /h)	Q_t (m ³ /h)	Q_{min} (m ³ /h)	Maximum permissible pressure loss ΔP in Q_{max} (Pa)	P_{max} (bar)
G4	6.0	0.6	0.04	200	0.50
G2.5	4.0	0.4	0.025	200	0.50
G1.6	2.5	0.25	0.016	200	0.50

Q_t The transitional flow rate is the flow rate occurring between the maximum and minimum flow rates at which the flow rate range is divided into two zones, the 'upper zone' and the 'lower zone'. Each zone has a characteristic MPE.

Q_{min} The lowest flow rate at which the gas meter provides indications that satisfy the requirements regarding maximum permissible error (MPE.) This value is valid for air flow density of about 1.2 kg/m³.

Q_{max} The highest flow rate at which the gas meter provides indications that satisfy the requirements regarding MPE.

ΔP The pressure loss of the gas meter, which is the value that is valid for testing with air with a density of approximately 1.2 kg/m³.

The gas meter can be produced with the distance between connections (male threads): 110 mm, 130 mm

The male threads used in gas meters G4S, G2.5S and G1.6S:
G1¼", G1", G7/8", G3/4", M30*2, 3/4"NPT, 1"BS746, 3/4"BS746

The male threads used in gas meters G4A, G2.5A and G1.6A:
G1¼", G7/8", G3/4", M30*2, M26*1.5

3. Tests

The relevant tests of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A for this Certificate were performed in the laboratory of CMI. These and other tests are mentioned in the *Test Report no.5012-PT-A0004-18*. It was found, with regards to the result of tests and submitted documentation, that the diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A are able to perform the function for which they are intended. The relevant tests were performed according to harmonised standard EN 1359:1998/A1:2006 or normative document OIML R 137 (Edition 2012).

4. Conformity marks and inscription

The label in the index of the gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A shall contain the following information (*Figure no. 6*) :

- number of *EU-type examination certificate* : **TCM 143/18 – 5559**
- manufacturer's name or brand
- type and size G
- accuracy class: *1.5*
- year of manufacture and the serial number
- maximum flow Q_{max} (m³/h)
- transitional flow Q_t (m³/h)
- minimum flow Q_{min} (m³/h)
- maximum pressure P_{max}
- temperature range T_m
- manufacturer's address



- pulse number
- 'CE' marking and supplementary metrology marking. The supplementary metrology marking consists of the capital letter "M" and the last two digits of the year in which the mark was affixed. The 'CE' marking and supplementary metrology marking are followed by the identification number of the Notified Body.
- units of volume (m^3)
- letter "T" which indicates the ability to withstand to high temperatures according article 5.7. of EN 1359/A1 (Only gas meters G4S, G2.5S, G1.6S with steel housing passed this test. Gas meters G4A, G2.5A, G1.6A must not be marked with "T".)

The indication is in volume unit m^3 , which mark is located on the index. Behind the decimal point to the right there the 3 drums shall be red and framed in other colour than 5 black drum which are to the left of decimal point and which are framed black. Examples of labels are shown in *Figure no. 5*. The flow direction is indicated with arrow on the meter between connections.

5. Ensuring the integrity of the instruments

The gas meters G4S, G2.5S, G1.6S (steel housing) that corresponds to this *EU-type examination certificate* and to other requirements concerning the assessment according to the module F or D are sealed with two seals in the way mentioned in *Figure no.7*.

The gas meters G4A, G2.5A, G1.6A (aluminium alloy housing) that corresponds to this *EU-type examination certificate* and to other requirements concerning the assessment according to the module F or D are sealed with seals in the way mentioned in *Figure no.8*.

6. Annexes

- Figure no.1* Design of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A
Figure no.2 Drawing of diaphragm gas meters G4S, G2.5S, G1.6S with steel housing
Figure no.3 Drawing of diaphragm gas meters G4A, G2.5A, G1.6A with aluminium alloy housing
Figure no.4 Measuring mechanism of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A
Figure no.5 List of components and materials of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A
Figure no.6 Examples of labels of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A
(Other language versions are allowed.)
Figure no.7 Location of a seal on diaphragm gas meters G4S, G2.5S, G1.6S (steel housing)
Figure no.8 Location of seals on diaphragm gas meters G4A, G2.5A, G1.6A (aluminium alloy housing)



Steel housing G4S, G2.5S, G1.6S :

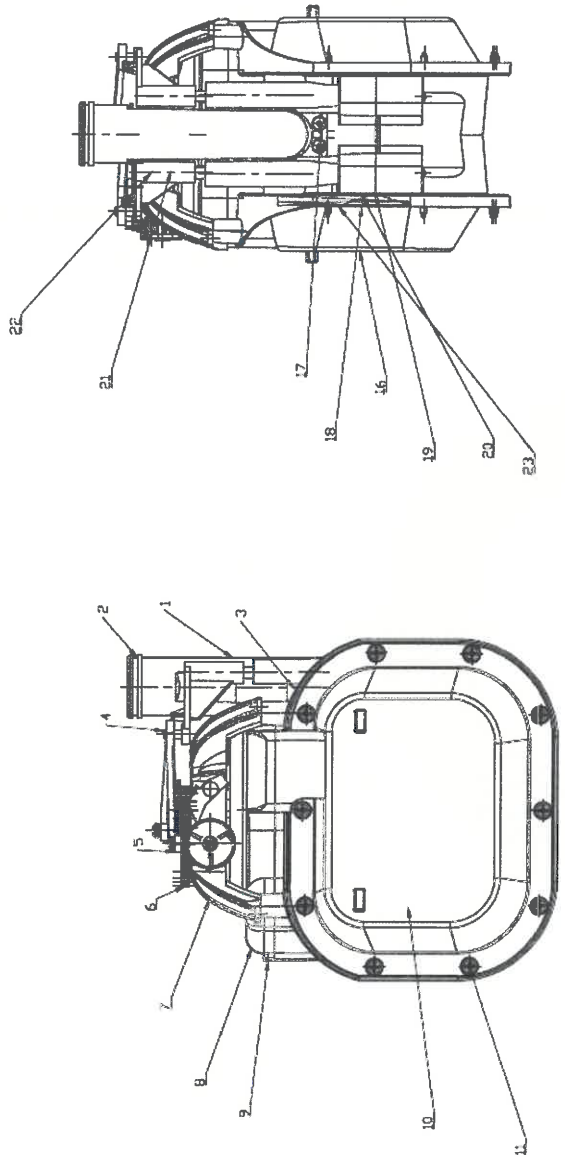


Aluminium alloy housing G4A, G2.5A, G1.6A :



Figure no.1 Design of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A





NO	NAME	DRAWING NO.	QTY	MATERIAL
1	spoke for diaphragm II	DR-GS-12-0028	2	POM-ABS
2	side bracket	DR-GS12-0031	2	NBR
3	toggle		2	304
4	diaphragm basket	DR-GS-12-0035	2	NBR
5	diaphragm	DR-GS-12-0011	2	NBR
6	folded plate	DR-GS-12-0014	2	ABS
7	Screw		1	304
8	side cover	DR-GS-12-0026	1	ABS
9	Screw		4	304
10	connecting rod (top right)	DR-GS-12-0024	1	POM
11	toggle	DR-GS-12-0023	1	POM
12	fastening buckle	DR-GS-12-0015	1	POM
13	side cover	DR-GS-12-0039	20	304
14	valve base	DR-GS-12-0025	1	ABS
15	rotary valve	DR-GS-12-0009	1	MAKINEX PLASTIC 19-A
16	bracket	DR-GS-12-0010	1	MAKINEX PLASTIC 19-A
17	Transition gear	DR-GS-12-0018	1	POM
18	core wheel	DR-GS-12-0018	1	POM
19	toggle	DR-GS-12-0021	1	POM
20	27#21 O-ring	DR-GS-12-0031	1	POM
21	27#23 O-ring	DR-GS-12-0031	1	POM
22	outlet pipe	DR-GS-12-0032	1	POM
23		DR-GS-12-0027	1	POM

MEASURING ASSEMBLY		NO.	
Design	DR-GS-12-304	Scale	1:1
Drawn		Checked	
Approved		Reviewed	
Company	Arizona Turbine Metering Co., Ltd		

Figure no.4 Measuring mechanism of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A



Component list of gas meter

No.	Name	Drawing No.	Quantity	Material
1	Measuring body	DR-GS-12-0013	1	POM
2	Folded plate	DR-GS-12-0014	1	ABS
3	Actu gasket	DR-GS-12-0031	2	NBR
4	Toggle	DR-GS-12-0015	2	POM
5	Diaphragm gasket	DR-GS-12-0035	2	NBR
6	Bearing splint for diaphragm	DR-GS-12-0028	2	POM
7	Diaphragm	DR-GS-12-0011	2	NBR
8	Splint for diaphragm	DR-GS-12-0036	2	POM
9	Side cover	DR-GS-12-0025	2	ABS
10	Fanswing backls	DR-GS-12-0039	2	304SS
11	Valve base	DR-GS-12-0009	1	Bakelite plastic 19-A
12	Rotary valve	DR-GS-12-0010	1	Bakelite plastic 19-A
13	Bracket	DR-GS-12-0016	1	POM
14	Core wheel	DR-GS-12-0021	1	POM
15	Drive gear	DR-GS-12-0017	1	POM
16	Connecting shaft	DR-GS-12-0019	1	POM
17	Actu reverse bottle	DR-GS-12-0020	1	POM
18	Transition gear	DR-GS-12-0018	1	POM
19	Core wheel bottle	DR-GS-12-0022	1	POM
20	Connecting rod (top right)	DR-GS-12-0023	1	POM
21	Connecting rod (down left)	DR-GS-12-0024	1	POM
22	Flat gasket	DR-GS-12-0038	1	NBR
23	Output shaft gasket	DR-GS-12-0034	1	NBR
24	Drive shaft bushing	DR-GS-12-0029	1	POM

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Figure no.5 List of components and materials of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A

25	Copper shaft sleeve	DR-GS-12-0040	1	Copper
26	Shift fork	DR-GS-12-0030	1	POM - 304SS
27	Output shaft	DR-GS-12-0037	1	POM
28	Connecting threads	DR-GS-12-0041	2	304SS
29	O-ring 27*3.1	DR-GS-12-0032	1	NBR
30	O-ring 27*3	DR-GS-12-0033	1	NBR
31	Outlet pipe	DR-GS-12-0037	1	POM
32	Lower case	DR-GS-12-0008	1	Steel
33	Upper case	DR-GS-12-0009	1	Steel
34	Case band	DR-GS-12-0034	1	304SS
35	Caps	DR-GS-12-0045	1	POM
36	Counter cover	DR-GS-12-0047	1	ABS
37	Counter base	DR-GS-12-0048	1	ABS
38	Counter driving wheel	DR-GS-12-0049	1	POM
39	Counter wheel (first wheel)	DR-GS-12-0050	1	ABS
40	Counter wheels	DR-GS-12-0051	1	ABS
41	Drum wheel shaft	DR-GS-12-0052	1	304SS
42	Counter rack patch	DR-GS-12-0053	1	POM
43	Nameplate	DR-GS-12-0012	1	Aluminium
44	Screws	Standard part	2	304SS
45	Seals	DR-GS-12-0034	2	POM-Lead

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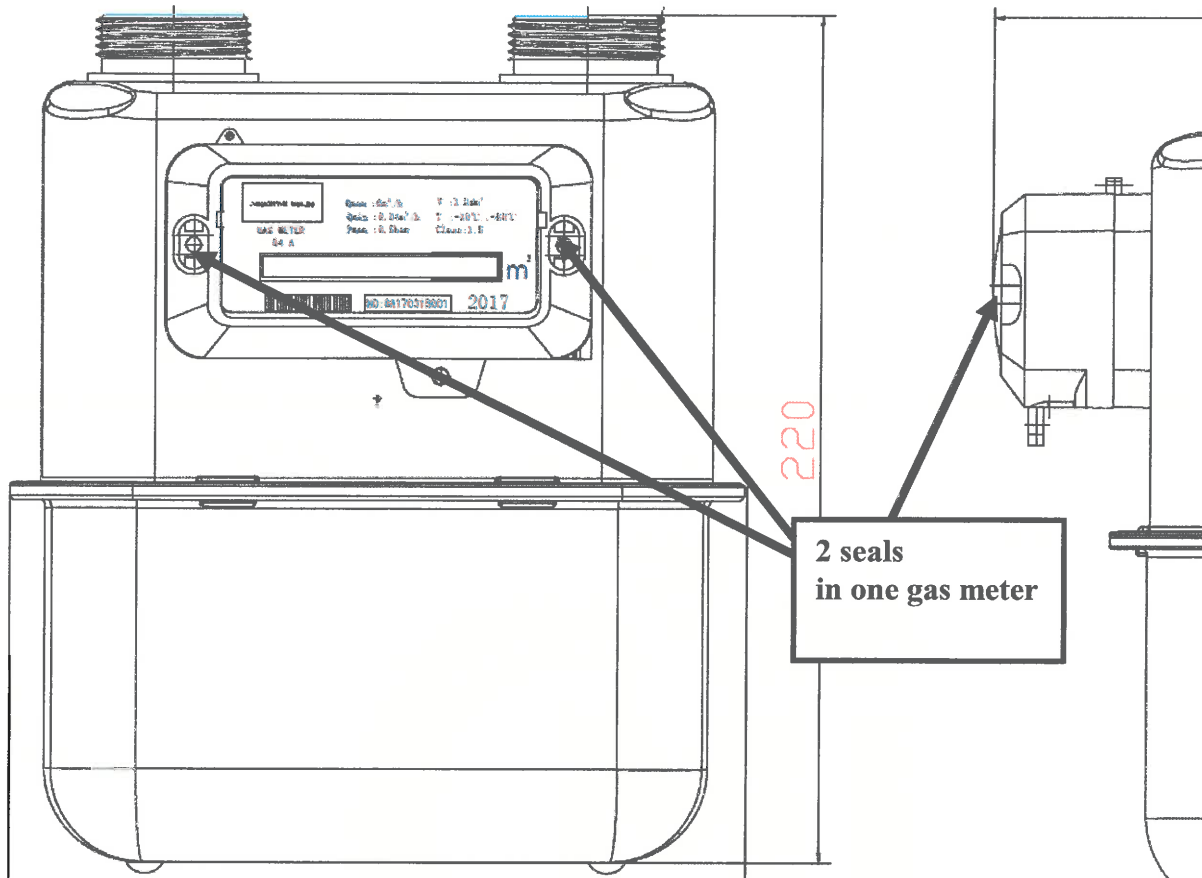




Figure no.6 Examples of labels of diaphragm gas meters G4S, G2.5S, G1.6S, G4A, G2.5A, G1.6A (Other language versions are allowed.)



Diaphragm gas meters G4S, G2.5S, G1.6S (steel housing)



Seals:

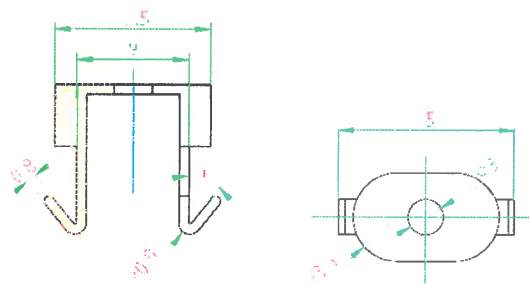


Figure no.7 Location of 2 seals on diaphragm gas meters G4S, G2.5S, G1.6S (steel housing)



G4A, G2.5A, G1.6A (aluminium alloy housing)

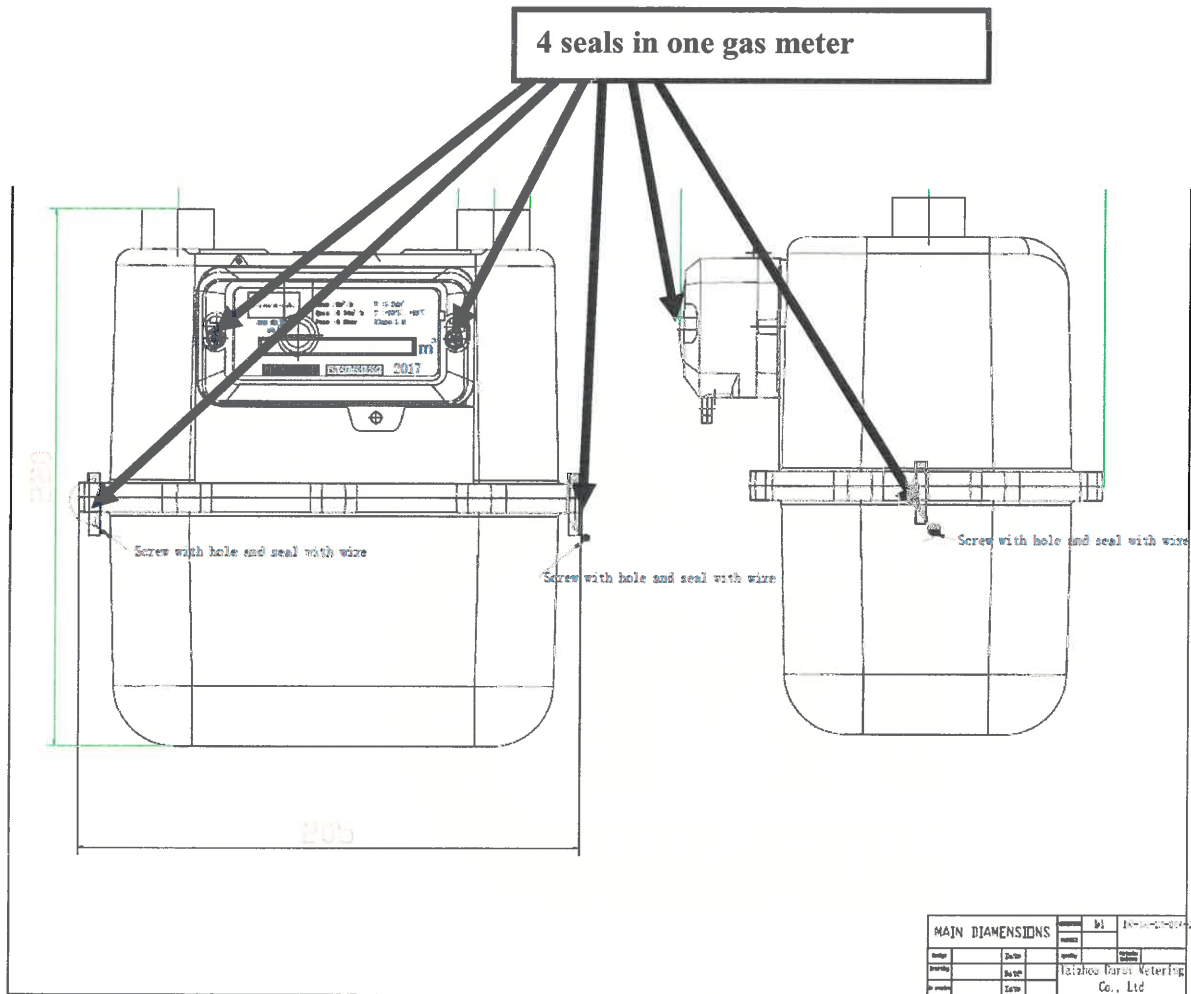


Figure no.8 Location of seals on diaphragm gas meters G4A, G2.5A, G1.6A (aluminium alloy housing)

