



NOTICE OF APPROVAL

AVIS D'APPROBATION

Issued by statutory authority of the Minister of Industry for:

Émis en vertu du pouvoir statutaire du ministre de l'Industrie pour:

TYPE OF DEVICE

TYPE D'APPAREIL

PFM Regulator

Régulateur MFP

APPLICANT

REQUÉRANT

Fisher Controls International Inc.
 205 South Center Street
 Marshalltown, Iowa, 50158
 USA

MANUFACTURER

FABRICANT

Fisher Controls International Inc.
 205 South Center Street
 Marshalltown, Iowa, 50158
 USA

MODEL(S)/MODÈLE(S)

RATING/ CLASSEMENT

Type 299, 299H Pressure Reducing Regulators from 0 to 35 psig/
 Type 299, 299H régulateurs réducteurs de pression de 0 à 35 lb/po² (mano)

NOTE: This approval applies only to meters, the design, composition, construction and performance of which are, in every material respect, identical to that described in the material submitted, and that are typified by samples submitted by the applicant for evaluation for approval in accordance with sections 13 and 14 of the Electricity and Gas Inspection Regulations. The following is a summary of the principal features only.

REMARQUE: Cette approbation ne vise que les compteurs dont la conception, la composition, la construction et le rendement sont identiques, en tout point, à ceux qui sont décrits dans la documentation reçue et pour lesquels des échantillons représentatifs ont été fournis par le requérant aux fins d'évaluation, conformément aux articles 13 et 14 du Règlement sur l'inspection de l'électricité et du gaz. Ce qui suit est une brève description de leurs principales caractéristiques.

SUMMARY DESCRIPTION:

CATEGORY

PFM Regulator

DESCRIPTION

The Fisher Controls Model 299 and 299H are pilot operated regulators designed to supply consistent reduced pressure to downstream devices. The Type 299 and 299H regulators are housed in an integrated aluminum case which includes a built-in pilot and may be converted from internal to either external or dual registration. In use, the pilot diaphragm responds to outlet pressure fluctuation with greater sensitivity than the main diaphragm. When the pilot orifice is opened, additional loading pressure is supplied to the main diaphragm which opens a valve to let inlet pressure in. When the downstream pressure demand has been satisfied the outlet pressure increases, pushing the pilot diaphragm down and closing the pilot orifice. The loading pressure on the main diaphragm bleeds to the downstream line.

DESCRIPTION SOMMAIRE:

CATÉGORIE

Régulateur MFP

DESCRIPTION

Le régulateur piloté Fisher Controls, modèle 299 et 299H sont conçu pour fournir une pression réduite uniforme à des appareils en aval. Ils sont abrités dans un boîtier en aluminium intégré qui comprend un pilote solidaire et qui peut être converti de l'enregistrement interne à l'enregistrement externe ou double. En service, la membrane du pilote réagit à la fluctuation de la pression de sortie avec une plus grande sensibilité que la membrane principale. Lorsque l'orifice du pilote est ouvert, une pression additionnelle est appliquée à la membrane principale qui commande l'ouverture d'une vanne d'entrée de pression. Lorsque la demande de pression en aval est satisfaite, la pression de sortie augmente, ce qui pousse la membrane du pilote vers le bas de façon à fermer l'orifice du pilote. La pression de charge sur la membrane principale est déchargée vers la conduite aval.

The Type 299 and 299H regulator are available with internal, external or dual registration. The internal configuration uses gas pressure from the outlet which passes to the throat via threaded orifices to register on both diaphragms. The external configuration is created by screwing plugs into the threaded orifices in the throat and connecting a line from the downstream piping to the main diaphragm chamber. This allows pressure to register on the main diaphragm and on the pilot diaphragm via the small port connecting the two. Dual registration uses the same line from down stream as the external configuration except that the screws are removed so that downstream pressure registers on the main diaphragm through the threaded holes in the throat and on the pilot diaphragm through the line from the downstream side.

The maximum allowable inlet pressure depends on the orifice size. The limits for the Type 299 and 299H are as follows;

| | |
|--------------|----------|
| ¼ x 3/8 inch | 150 psig |
| 3/8 inch | 150 psig |
| ½ inch | 150 psig |
| ¾ inch | 125 psig |
| 1 inch | 60 psig |
| 1 3/16 inch | 40 psig |

Outlet pressure range is accomplished by control spring selection. Springs are identified by colour and number.

Les régulateurs de type 299 et 299H sont offerts avec possibilité d'enregistrement interne, externe ou double. La configuration interne utilise la pression du gaz de sortie qui passe de l'étranglement vers l'enregistreur des deux membranes par des orifices taraudés. La configuration externe est obtenue en vissant des bouchons dans les orifices taraudés dans l'étranglement et en reliant une tubulure de la conduite aval à la chambre de la membrane principale. Cela permet d'enregistrer la pression sur la membrane principale et sur celle du pilote par l'entremise du petit port reliant les deux. L'enregistrement double fait appel à la même tubulure aval utilisée pour la configuration externe sauf que les vis sont enlevées de sorte que la pression aval est enregistrée à la membrane principale par les trous taraudés dans l'étranglement et à la membrane du pilote par la tubulure du côté aval.

La pression d'entrée maximale admise dépend de la taille de l'orifice. Les limites du type 299 et 299H sont les suivantes:

| | |
|------------|-------------------------------|
| ¼ x 3/8 po | 150 lb/po ² (mano) |
| 3/8 po | 150 lb/po ² (mano) |
| ½ po | 150 lb/po ² (mano) |
| ¾ po | 125 lb/po ² (mano) |
| 1 po | 60 lb/po ² (mano) |
| 1 3/16 po | 40 lb/po ² (mano) |

La plage des pressions de sortie est obtenue par la sélection du détendeur de commande. Les détendeurs sont codés par couleurs et numéros.

Spring Table/Tableau des détendeurs

| <u>Colour/Couleur</u> | <u>Number/Numéro</u> | <u>Range/Plage</u> |
|-----------------------|----------------------|---------------------------|
| black/noir | T13707T0012 | 3.5 to 6 in W.C./po d'eau |
| yellow/jaune | T13589T0012 | 6 to 9 in W.C./po d'eau |
| silver/argent | IN3112X0012 | 9 to 20 in W.C./po d'eau |

| <u>Colour/Couleur</u> | <u>Number/Numéro</u> | <u>Range/Plage</u> |
|-----------------------|----------------------|--|
| purple/violet | 1B413727222 | 16 to 40 in W.C./po d'eau |
| light blue/bleu léger | T13593T0012 | 1 to 3.5 psig/lb/po ² (mano) |
| orange/orange | T13671T0012 | 3.25 to 6 psig/lb/po ² (mano) |
| red/rouge | T13600T0012 | 6 to 16 psig/lb/po ² (mano) |
| zinc/zinc | T13771T0012 | 6 to 35 psig/lb/po ² (mano) |

Construction: The body of the Type 299 and 299H are available in cast iron or steel and the upper and lower actuator casings are of A03800 aluminum. O-rings and diaphragms are of nitrile.

The 299H design differs from the 299. The differences include 3/4" control line connectors, taller pilot spring barrel, and slightly thicker casing material.

The regulating capacities are stated in Tables 3, 4 and 5 of Fisher Bulletin 71.2.299.

MARKING REQUIREMENTS

The following information shall be clearly and indelibly marked on a tag attached to the regulator:

Manufacturer's name:
 Model number:
 Serial number:
 Departmental approval number: AG-0411
 Maximum In:
 Outlet pressure set point:
 Port:
 Spring colour:
 Direction of gas flow:

SEALING REQUIREMENTS

Access to any and all adjustments shall be physically prevented with wire and disk seals.

Construction: Le corps du type 299 et 299H sont en fer ou en acier et les boîtiers des actionneurs supérieur et inférieur sont en aluminium A03800. Les joints toriques et les membranes sont en nitrile.

Le modèle 299H est différent du 299. Les différences comprennent des connecteurs de tubulure de contrôle de 3/4 po, un tuyau plus long pour le détendeur du pilote et un matériau légèrement plus épais pour le boîtier.

Les capacités de réglage sont indiquées aux tableaux 3, 4 et 5 du Bulletin Fisher 71.2.299.

MARQUAGES

Les renseignements suivants doivent être inscrits de façon lisible sur une étiquette fixée au régulateur:

Nom du fabricant:
 Numéro du modèle:
 Numéro de série:
 Numéro d'approbation du Ministère: AG-0411
 Capacité maximale d'entrée:
 Point de consigne de la pression de sortie:
 Port:
 Couleur du détendeur:
 Sens de l'écoulement du gaz:

SCELLAGE

L'accès à tout dispositif de réglage doit être empêché à l'aide d'un fil métallique et d'une pastille de scellage.

REVISION

The purpose of this revision is to add the model type 299H.

EVALUATED BY**AG-0411**

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RÉVISION

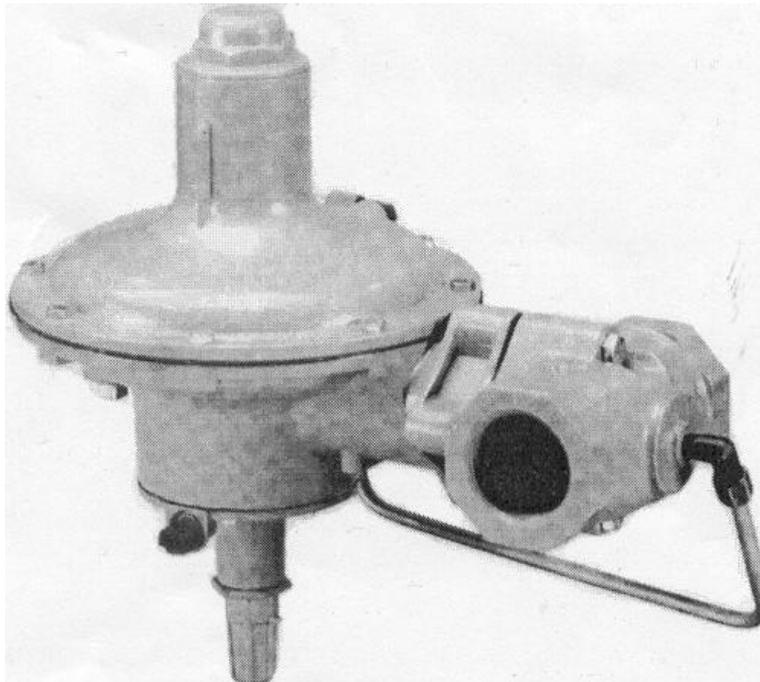
Le but de la présente révision est d'ajouter le modèle type 299H.

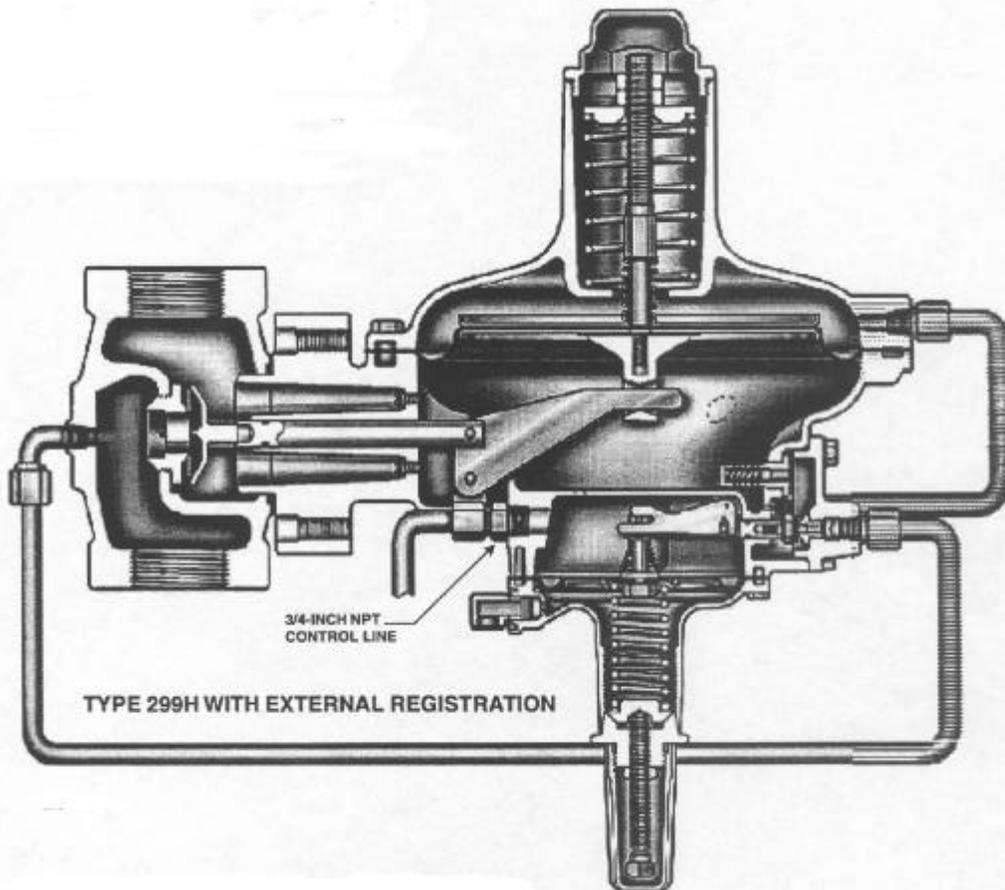
ÉVALUÉ PAR**AG-0411**

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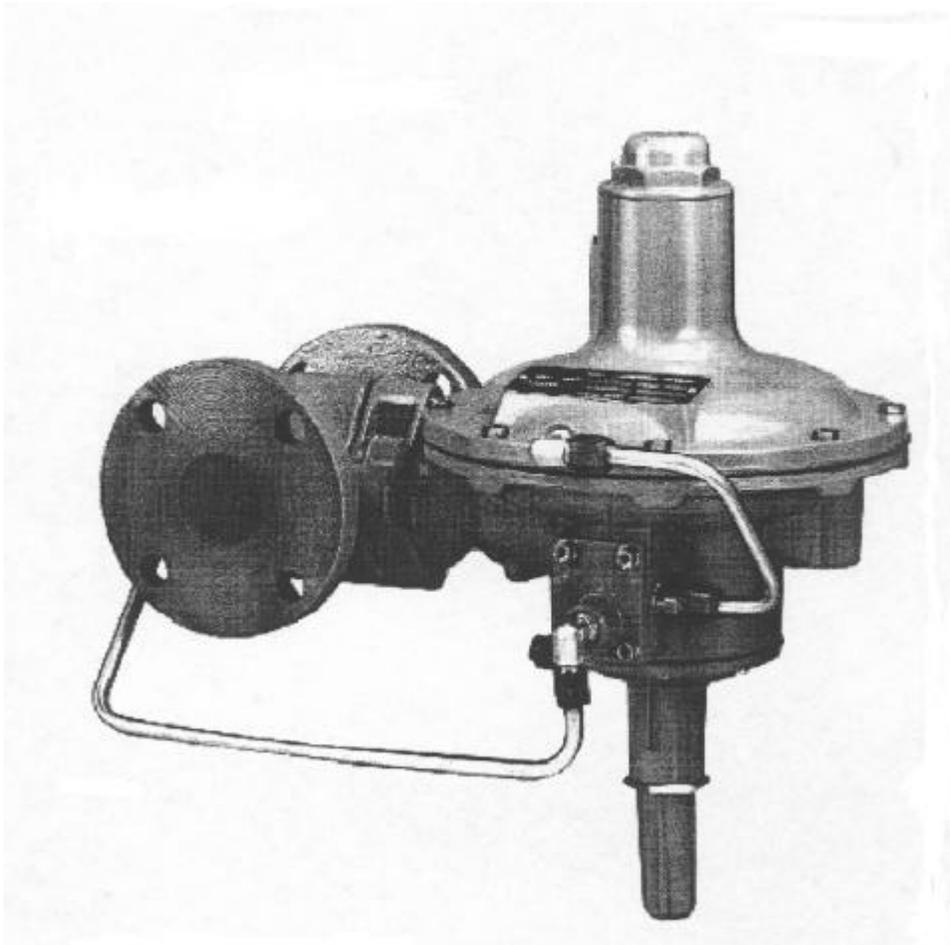


Table 3. Regulating Capacities For 1-1/2-inch and 2-inch External/Dual Registration in SCFH (60° F and 14.7 psia) of 0.6 Specific Gravity Natural Gas.

| OUTLET PRESSURE RANGE AND SETTING, CONTROL SPRING NUMBER, & COLOR | INLET PRESSURE | | ORIFICE SIZE, Inches (mm) | | | | | |
|---|---|------|---------------------------|-----------|------------|------------|----------|---------------|
| | psig | bar | 1/4 X 3/8 (6.4 X 9.5) | 3/8 (9.5) | 1/2 (12.7) | 3/4 (19.1) | 1 (25.4) | 1-3/16 (30.2) |
| 3.5 to 6 inches w.c. (8.8 to 15 mbar) 3-1/2-inch w.c. (8.8 mbar) T13707T0012 Black | 2 | 0.14 | 760 | 1560 | 2700 | 5490 | 8170 | 9940 |
| | 5 | 0.34 | 1160 | 2460 | 4270 | 8790 | 13310 | 16250 |
| | 10 | 0.69 | 1590 | 3580 | 6230 | 13060 | 20300 | 24900 |
| | 15 | 1.0 | 1920 | 4410 | 7670 | 16480 | 27210 | 33910 |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 19250 | 31790 | 39620 |
| | 25 | 1.7 | 2570 | 5890 | 10250 | 22030 | 36370 | 45330 |
| | 30 | 2.1 | 2890 | 6640 | 11540 | 24800 | 40950 | 51040 |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 30350 | 50100 | 62450 |
| | 50 | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | |
| | 60 | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 52540 | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | |
| | 125 | 8.6 | 9020 | 20730 | 36050 | 77500 | | |
| | 150 | 10.3 | 10630 | 24440 | 42500 | | | |
| | 6 to 9 inches w.c. (15 to 22 mbar) 7-inch w.c. (17.5 mbar) T13589T0012 Yellow | 2 | 0.14 | 750 | 1520 | 2650 | 5380 | 8000 |
| 5 | | 0.34 | 1160 | 2440 | 4240 | 8730 | 13220 | 16130 |
| 10 | | 0.69 | 1590 | 3580 | 6220 | 13040 | 20250 | 24830 |
| 15 | | 1.0 | 1920 | 4410 | 7670 | 16480 | 27210 | 33910 |
| 20 | | 1.4 | 2240 | 5150 | 8960 | 19250 | 31790 | 39620 |
| 25 | | 1.7 | 2570 | 5890 | 10250 | 22030 | 36370 | 45330 |
| 30 | | 2.1 | 2890 | 6640 | 11540 | 24800 | 40950 | 51040 |
| 40 | | 2.8 | 3530 | 8120 | 14120 | 30350 | 50100 | 62450 |
| 50 | | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | |
| 60 | | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | |
| 80 | | 5.5 | 6110 | 14050 | 24440 | 52540 | | |
| 100 | | 6.9 | 7400 | 17020 | 29600 | 63630 | | |
| 125 | | 8.6 | 9020 | 20730 | 36050 | 77500 | | |
| 150 | | 10.3 | 10630 | 24440 | 42500 | | | |
| 9 to 20 inches w.c. (22 to 49 mbar) 14-inch w.c. (35 mbar) 1N3112X0012 Silver | | 2 | 0.14 | 700 | 1430 | 2480 | 5040 | 7480 |
| | 5 | 0.34 | 1140 | 2400 | 4170 | 8570 | 12950 | 15800 |
| | 10 | 0.69 | 1580 | 3560 | 6190 | 12970 | 20110 | 24640 |
| | 15 | 1.0 | 1920 | 4410 | 7670 | 16480 | 27210 | 33910 |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 19250 | 31790 | 39620 |
| | 25 | 1.7 | 2570 | 5890 | 10250 | 22030 | 36370 | 45330 |
| | 30 | 2.1 | 2890 | 6640 | 11540 | 24800 | 40950 | 51040 |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 30350 | 50100 | 62450 |
| | 50 | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | |
| | 60 | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 52540 | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | |
| | 125 | 8.6 | 9020 | 20730 | 36050 | 77500 | | |
| | 150 | 10.3 | 10630 | 24440 | 42500 | | | |
| | 16 to 40 inches w.c. (40 to 99 mbar) 28-inch w.c. (70 mbar) 1B413727222 Purple | 5 | 0.34 | 1110 | 2320 | 4020 | 8250 | 12430 |
| 10 | | 0.69 | 1570 | 3530 | 6140 | 12830 | 19830 | 24290 |
| 15 | | 1.0 | 1920 | 4410 | 7670 | 16480 | 27210 | 33910 |
| 20 | | 1.4 | 2240 | 5150 | 8960 | 19250 | 31790 | 39620 |
| 25 | | 1.7 | 2570 | 5890 | 10250 | 22030 | 36370 | 45330 |
| 30 | | 2.1 | 2890 | 6640 | 11540 | 24800 | 40950 | 51040 |
| 40 | | 2.8 | 3530 | 8120 | 14120 | 30350 | 50100 | 62450 |
| 50 | | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | |
| 60 | | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | |
| 80 | | 5.5 | 6110 | 14050 | 24440 | 52540 | | |
| 100 | | 6.9 | 7400 | 17020 | 29600 | 63630 | | |
| 125 | | 8.6 | 9020 | 20730 | 36050 | 77500 | | |
| 150 | | 10.3 | 10630 | 24440 | 42500 | | | |

Table 3. Regulating Capacities For 1-1/2-inch and 2-inch External/Dual Registration in SCFH (60° F and 14.7 psia) of 0.6 Specific Gravity Natural Gas. (continued)

| OUTLET PRESSURE RANGE AND SETTING , CONTROL SPRING NUMBER, & COLOR | INLET PRESSURE | | ORIFICE SIZE, Inches (mm) | | | | | | |
|---|--|------|---------------------------|-----------|------------|------------|----------|---------------|-------|
| | psig | bar | 1/4 X 3/8 (6.4 X 9.5) | 3/8 (9.5) | 1/2 (12.7) | 3/4 (19.1) | 1 (25.4) | 1-3/16 (30.2) | |
| 1.0 to 3.25 psig (0.07 to 0.14 bar) 2 psig (0.13 bar) T13593T0012 Light Blue | 5 | 0.34 | 1020 | 2100 | 3640 | 7440 | 11140 | 13560 | |
| | 10 | 0.69 | 1550 | 3340 | 5810 | 12040 | 18460 | 22570 | |
| | 15 | 1.0 | 1920 | 4360 | 7580 | 15990 | 25050 | 30760 | |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 19250 | 31790 | 39620 | |
| | 25 | 1.7 | 2670 | 5890 | 10250 | 22030 | 36370 | 45330 | |
| | 30 | 2.1 | 2890 | 6640 | 11540 | 24800 | 40950 | 51040 | |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 30350 | 50100 | 62450 | |
| | 50 | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | | |
| | 60 | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 52540 | | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | | |
| | 125 | 8.6 | 9020 | 20730 | 36050 | 77500 | | | |
| | 150 | 10.3 | 10630 | 24440 | 42500 | | | | |
| | 3.25 to 6 psig (0.14 to 0.41 bar) 5 psig (0.3 bar) T13671T0012 Orange | 10 | 0.69 | 1390 | 2910 | 5050 | 10350 | 15600 | 19030 |
| | | 15 | 1.0 | 1870 | 4190 | 7280 | 15150 | 23310 | 28530 |
| 20 | | 1.4 | 2240 | 5090 | 9850 | 18640 | 29180 | 35820 | |
| 25 | | 1.7 | 2570 | 5890 | 10250 | 22030 | 36370 | 45330 | |
| 30 | | 2.1 | 2890 | 6640 | 11540 | 24800 | 40950 | 51040 | |
| 40 | | 2.8 | 3530 | 8120 | 14120 | 30350 | 50100 | 62450 | |
| 50 | | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | | |
| 60 | | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | | |
| 80 | | 5.5 | 6110 | 14050 | 24440 | 52540 | | | |
| 100 | | 6.9 | 7400 | 17020 | 29600 | 63630 | | | |
| 125 | | 8.6 | 9020 | 20730 | 36050 | 77500 | | | |
| 150 | | 10.3 | 10630 | 24440 | 42500 | | | | |
| 6 to 16 psig (0.41 to 1.10 bar) 10 psig (0.7 bar) T13600T0012 Red | | 15 | 1.0 | 1580 | 3280 | 5690 | 11640 | 17470 | 21280 |
| | | 20 | 1.4 | 2130 | 4720 | 8210 | 17000 | 25940 | 31690 |
| | | 25 | 1.7 | 2540 | 5710 | 9940 | 20790 | 32220 | 39490 |
| | 30 | 2.1 | 2890 | 6580 | 11440 | 24150 | 37900 | 46560 | |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 30350 | 50100 | 62450 | |
| | 50 | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | | |
| | 60 | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 52540 | | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | | |
| | 125 | 8.6 | 9020 | 20730 | 36050 | 77500 | | | |
| | 150 | 10.3 | 10630 | 24440 | 42500 | | | | |
| | 6 to 16 psig (0.41 to 1.10 bar) 15 psig (1.0 bar) T13600T0012 Red | 20 | 1.4 | 1750 | 3620 | 6290 | 12830 | 19190 | 23360 |
| | | 25 | 1.7 | 2360 | 5220 | 9070 | 18700 | 28360 | 34610 |
| | | 30 | 2.1 | 2820 | 6290 | 10940 | 22790 | 35050 | 42890 |
| | | 40 | 2.8 | 3540 | 8070 | 14020 | 29650 | 46610 | 57270 |
| 50 | | 3.4 | 4180 | 9600 | 16700 | 35890 | 59260 | | |
| 60 | | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | | |
| 80 | | 5.5 | 6110 | 14050 | 24440 | 52540 | | | |
| 100 | | 6.9 | 7400 | 17020 | 29600 | 63630 | | | |
| 125 | | 8.6 | 9020 | 20730 | 36050 | 77500 | | | |
| 150 | | 10.3 | 10630 | 24440 | 42500 | | | | |
| 16 to 35 psig (1.10 to 2.4 bar) 20 psig (1.4 bar) T13771T0012 Zinc | | 25 | 1.7 | 1920 | 3930 | 6840 | 13930 | 20800 | 23510 |
| | | 30 | 2.1 | 2580 | 5690 | 9870 | 20280 | 30630 | 37340 |
| | | 40 | 2.8 | 3480 | 7830 | 13610 | 28440 | 43980 | 53880 |
| | | 50 | 3.4 | 4180 | 9550 | 16610 | 35140 | 55310 | |
| | | 60 | 4.1 | 4820 | 11090 | 19280 | 41440 | 68420 | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 52540 | | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | | |
| | 125 | 8.6 | 9020 | 20730 | 36050 | 77500 | | | |
| | 150 | 10.3 | 10630 | 24440 | 42500 | | | | |

Table 3. Regulating Capacities For 1-1/2-inch and 2-inch External/Dual Registration in SCFH (60° F and 14.7 psia) of 0.6 Specific Gravity Natural Gas. (continued)

| OUTLET PRESSURE RANGE AND SETTING, CONTROL SPRING NUMBER, & COLOR | INLET PRESSURE | | ORIFICE SIZE, Inches (mm) | | | | | |
|---|----------------|------|---------------------------|-----------|------------|------------|----------|---------------|
| | psig | bar | 1/4 X 3/8 (6.4 X 9.5) | 3/8 (9.5) | 1/2 (12.7) | 3/4 (19.1) | 1 (25.4) | 1-3/16 (30.2) |
| 16 to 35 psig (1.10 to 2.4 bar) 25 psig (1.7 bar) T13771T0012 Zinc | 30 | 2.1 | 2070 | 4230 | 7360 | 14980 | 22310 | 27140 |
| | 40 | 2.8 | 3320 | 7350 | 12780 | 23420 | 40220 | 49120 |
| | 50 | 3.4 | 4140 | 9340 | 16250 | 34040 | 52830 | |
| | 60 | 4.1 | 4830 | 11030 | 19190 | 40630 | 64010 | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 52540 | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | |
| | 125 | 8.8 | 9020 | 20730 | 36050 | 77500 | | |
| 16 to 35 psig (1.10 to 2.4 bar) 30 psig (2.1 bar) T13771T0012 Zinc | 40 | 2.8 | 2980 | 6520 | 11330 | 23190 | 34790 | 42370 |
| | 50 | 3.4 | 4020 | 8950 | 15560 | 32300 | 49460 | |
| | 60 | 4.1 | 4800 | 10850 | 18870 | 39600 | 61630 | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 52540 | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | |
| | 125 | 8.8 | 9020 | 20730 | 36050 | 77500 | | |
| | 150 | 10.3 | 10630 | 24440 | 42500 | | | |
| 16 to 35 psig (1.10 to 2.4 bar) 35 psig (2.4 bar) T13771T0012 Zinc | 40 | 2.8 | 2350 | 4790 | 8330 | 16920 | 25150 | 30680 |
| | 50 | 3.4 | 3770 | 8300 | 14430 | 29690 | 44890 | |
| | 60 | 4.1 | 4700 | 10510 | 18270 | 38050 | 58520 | |
| | 80 | 5.5 | 6120 | 14000 | 24350 | 51600 | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 63630 | | |
| | 125 | 8.8 | 9020 | 20730 | 36050 | 77500 | | |
| | 150 | 10.3 | 10630 | 24440 | 42500 | | | |

Table 4. Regulating Capacities For 1-1/2-inch Internal Registration in SCFH (60° F and 14.7 psia) of 0.6 Specific Gravity Natural Gas.

| OUTLET PRESSURE RANGE AND SETTING, CONTROL SPRING NUMBER, & COLOR | INLET PRESSURE | | ORIFICE SIZE, Inches (mm) | | | | | |
|---|---|------|---------------------------|-----------|------------|------------|----------|---------------|
| | psig | bar | 1/4 X 3/8 (6.4 X 9.5) | 3/8 (9.5) | 1/2 (12.7) | 3/4 (19.1) | 1 (25.4) | 1-3/16 (30.2) |
| 3.5 to 6 inches w.c. (8.8 to 15 mbar) 3-1/2-inch w.c. (8.8 mbar) T13707T0012 Black | 2 | 0.14 | 760 | 1560 | 2700 | 4050 | 4310 | 4540 |
| | 5 | 0.34 | 1160 | 2460 | 4270 | 7370 | 6420 | 6840 |
| | 10 | 0.69 | 1590 | 3580 | 6230 | 8440 | 8580 | 9260 |
| | 15 | 1.0 | 1920 | 4410 | 7670 | 9540 | 10300 | 10020 |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 10650 | 10410 | 10790 |
| | 25 | 1.7 | 2570 | 5890 | 9770 | 10640 | 10520 | 10740 |
| | 30 | 2.1 | 2890 | 6640 | 10360 | 10640 | 10620 | 10690 |
| | 40 | 2.8 | 3530 | 8120 | 12170 | 10630 | 10500 | 10590 |
| | 50 | 3.4 | 4180 | 9600 | 11440 | 10610 | 11050 | |
| | 60 | 4.1 | 4820 | 11090 | 10700 | 10600 | 11610 | |
| | 80 | 5.5 | 6110 | 8760 | 8640 | 4500 | | |
| | 100 | 6.9 | 5640 | 4500 | 4500 | 4500 | | |
| | 125 | 8.6 | 5640 | 4500 | 4500 | 4500 | | |
| | 150 | 10.3 | 5620 | 4500 | 4500 | | | |
| | 6 to 9 inches w.c. (15 to 22 mbar) 7-inch w.c. (17.5 mbar) T13569T0012 Yellow | 2 | 0.14 | 750 | 1520 | 2650 | 5380 | 5610 |
| 5 | | 0.34 | 1160 | 2440 | 4240 | 7300 | 7290 | 7630 |
| 10 | | 0.69 | 1590 | 3580 | 6220 | 8500 | 8980 | 9470 |
| 15 | | 1.0 | 1920 | 4410 | 7670 | 9700 | 10670 | 10240 |
| 20 | | 1.4 | 2240 | 5150 | 8960 | 10900 | 10770 | 11010 |
| 25 | | 1.7 | 2570 | 5890 | 9930 | 10910 | 10870 | 11030 |
| 30 | | 2.1 | 2890 | 6640 | 10750 | 10920 | 10970 | 11060 |
| 40 | | 2.8 | 3530 | 8120 | 12390 | 10940 | 10870 | 11110 |
| 50 | | 3.4 | 4180 | 9600 | 11840 | 10970 | 11380 | |
| 60 | | 4.1 | 4820 | 11090 | 11280 | 10990 | 11580 | |
| 80 | | 5.5 | 6110 | 8980 | 9020 | 4500 | | |
| 100 | | 6.9 | 5640 | 4500 | 4500 | 4500 | | |
| 125 | | 8.6 | 5640 | 4500 | 4500 | 4500 | | |
| 150 | | 10.3 | 5640 | 4500 | 4500 | | | |
| 9 to 20 inches w.c. (22 to 49 mbar) 14-inch w.c. (35 mbar) 1N3112X0012 Silver | | 2 | 0.14 | 700 | 1430 | 2480 | 5040 | 6900 |
| | 5 | 0.34 | 1140 | 2400 | 4170 | 7230 | 8170 | 8430 |
| | 10 | 0.69 | 1580 | 3560 | 6190 | 8620 | 9780 | 9900 |
| | 15 | 1.0 | 1920 | 4410 | 7670 | 10020 | 11390 | 10670 |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 11410 | 11480 | 11440 |
| | 25 | 1.7 | 2570 | 5890 | 10250 | 11460 | 11570 | 11620 |
| | 30 | 2.1 | 2890 | 6640 | 11540 | 11500 | 11660 | 11790 |
| | 40 | 2.8 | 3530 | 8120 | 12820 | 11580 | 11620 | 12140 |
| | 50 | 3.4 | 4180 | 9600 | 12630 | 11670 | 12030 | |
| | 60 | 4.1 | 4820 | 10890 | 12400 | 11750 | 12200 | |
| | 80 | 5.5 | 6110 | 8920 | 9920 | 4970 | | |
| | 100 | 6.9 | 5640 | 4960 | 4970 | 4970 | | |
| | 125 | 8.6 | 5640 | 4960 | 4970 | 4970 | | |
| | 150 | 10.3 | 5640 | 4960 | 4970 | | | |
| | 16 to 40 inches w.c. (40 to 99 mbar) 28-inch w.c. (70 mbar) 1B413727222 Purple | 5 | 0.34 | 1110 | 2320 | 4020 | 6610 | 9500 |
| 10 | | 0.69 | 1570 | 3530 | 6140 | 8870 | 11380 | 10750 |
| 15 | | 1.0 | 1920 | 4410 | 7670 | 10650 | 12850 | 11530 |
| 20 | | 1.4 | 2240 | 5150 | 8960 | 12440 | 12920 | 12310 |
| 25 | | 1.7 | 2570 | 5890 | 10250 | 12550 | 12980 | 12790 |
| 30 | | 2.1 | 2890 | 6640 | 11540 | 12650 | 13050 | 13260 |
| 40 | | 2.8 | 3530 | 8120 | 13690 | 12860 | 13110 | 14220 |
| 50 | | 3.4 | 4180 | 9600 | 14220 | 13070 | 13320 | |
| 60 | | 4.1 | 4820 | 10890 | 14630 | 13290 | 13450 | |
| 80 | | 5.5 | 6110 | 9070 | 11560 | 10670 | | |
| 100 | | 6.9 | 7270 | 5420 | 5430 | 5430 | | |
| 125 | | 8.6 | 6670 | 5420 | 5430 | 5430 | | |
| 150 | | 10.3 | 6830 | 5420 | 5630 | | | |

Table 4. Regulating Capacities For 1-1/2-inch Internal Registration in SCFH (60° F and 14.7 psia) of 0.6 Specific Gravity Natural Gas. (continued)

| OUTLET PRESSURE RANGE AND SETTING, CONTROL SPRING NUMBER, & COLOR | INLET PRESSURE | | ORIFICE SIZE, Inches (mm) | | | | | | |
|---|--|------|---------------------------|-----------|------------|------------|----------|---------------|-------|
| | psig | bar | 1/4 X 3/8 (6.4 X 9.5) | 3/8 (9.5) | 1/2 (12.7) | 3/4 (19.1) | 1 (25.4) | 1-3/16 (30.2) | |
| 1.0 to 3.25 psig (0.07 to 0.14 bar) 2 psig (0.13 bar) T13593T0012 Light Blue | 5 | 0.34 | 1020 | 2100 | 3640 | 7020 | 10790 | 10820 | |
| | 10 | .069 | 1550 | 3340 | 5810 | 8990 | 12180 | 11180 | |
| | 15 | 1.0 | 1920 | 4360 | 7580 | 10970 | 13580 | 11960 | |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 12950 | 13630 | 12750 | |
| | 25 | 1.7 | 2570 | 5890 | 10250 | 13090 | 13890 | 13370 | |
| | 30 | 2.1 | 2890 | 6640 | 11540 | 13230 | 13740 | 14000 | |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 13500 | 13850 | 15250 | |
| | 50 | 3.4 | 4180 | 9600 | 15010 | 13780 | 13970 | | |
| | 60 | 4.1 | 4820 | 10890 | 15740 | 14050 | 14080 | | |
| | 80 | 5.5 | 6110 | 9000 | 12230 | 11100 | | | |
| | 100 | 6.9 | 7400 | 5200 | 5200 | 5200 | | | |
| | 125 | 8.6 | 8170 | 5040 | 5200 | 5200 | | | |
| | 150 | 10.3 | 8450 | 5870 | 5900 | | | | |
| | 3.25 to 6 psig (0.14 to 0.41 bar) 5 psig (0.3 bar) T13671T0012 Orange | 10 | 0.69 | 1390 | 2910 | 5050 | 8470 | 12010 | 12190 |
| | | 15 | 1.0 | 1870 | 4190 | 7280 | 11290 | 14300 | 12400 |
| 20 | | 1.4 | 2240 | 5090 | 8850 | 12590 | 13820 | 13260 | |
| 25 | | 1.7 | 2570 | 5890 | 10250 | 13210 | 14550 | 14310 | |
| 30 | | 2.1 | 2890 | 6640 | 11540 | 13820 | 15290 | 15370 | |
| 40 | | 2.8 | 3530 | 8120 | 14120 | 15060 | 15650 | 16630 | |
| 50 | | 3.4 | 4180 | 9600 | 16700 | 15400 | 16010 | | |
| 60 | | 4.1 | 4820 | 11090 | 16290 | 15750 | 16370 | | |
| 80 | | 5.5 | 6110 | 14050 | 14000 | 13620 | | | |
| 100 | | 6.9 | 7400 | 17020 | 9020 | 9220 | | | |
| 125 | | 8.6 | 9020 | 7690 | 7690 | 7890 | | | |
| 150 | | 10.3 | 10630 | 6330 | 6360 | | | | |
| 6 to 16 psig (0.41 to 1.10 bar) 10 psig (0.7 bar) T13600T0012 Red | | 15 | 1.0 | 1580 | 3280 | 5690 | 9930 | 13230 | 13570 |
| | | 20 | 1.4 | 2130 | 4720 | 8210 | 11990 | 14130 | 14100 |
| | | 25 | 1.7 | 2540 | 5710 | 9940 | 13400 | 15990 | 15870 |
| | 30 | 2.1 | 2890 | 6580 | 11440 | 14810 | 17850 | 17640 | |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 17640 | 18630 | 18920 | |
| | 50 | 3.4 | 4180 | 9600 | 16700 | 18110 | 19400 | | |
| | 60 | 4.1 | 4820 | 11090 | 17200 | 18580 | 20170 | | |
| | 80 | 5.5 | 6110 | 14050 | 16950 | 17810 | | | |
| | 100 | 6.9 | 7400 | 17020 | 15350 | 15900 | | | |
| | 125 | 8.6 | 9020 | 20730 | 16740 | 16270 | | | |
| | 150 | 10.3 | 6790 | 6790 | 6830 | | | | |
| | 6 to 16 psig (0.41 to 1.10 bar) 15 psig (1.0 bar) T13771T0012 Zinc | 20 | 1.4 | 1750 | 3620 | 6290 | 11380 | 14450 | 14950 |
| | | 25 | 1.7 | 2360 | 5220 | 9070 | 13590 | 17440 | 17430 |
| | | 30 | 2.1 | 2820 | 6290 | 10940 | 15810 | 20430 | 19910 |
| | | 40 | 2.8 | 3540 | 8070 | 14020 | 20230 | 21610 | 21220 |
| 50 | | 3.4 | 4180 | 9600 | 16700 | 20820 | 22800 | | |
| 60 | | 4.1 | 4820 | 11090 | 18110 | 21410 | 23890 | | |
| 80 | | 5.5 | 6110 | 14050 | 19910 | 22000 | | | |
| 100 | | 6.9 | 7400 | 17020 | 21710 | 22600 | | | |
| 125 | | 8.6 | 9020 | 20730 | 23960 | 23190 | | | |
| 150 | | 10.3 | 10630 | 24440 | 26210 | | | | |
| 16 to 35 psig (1.10 to 2.4 bar) 20 psig (1.4 bar) T13771T0012 Zinc | | 25 | 1.7 | 1920 | 3930 | 6840 | 12840 | 15670 | 16320 |
| | | 30 | 2.1 | 2580 | 5690 | 9870 | 15200 | 20740 | 20760 |
| | | 40 | 2.8 | 3480 | 7830 | 13610 | 22820 | 24600 | 23510 |
| | | 50 | 3.4 | 4180 | 9550 | 16610 | 20950 | 23620 | |
| | | 60 | 4.1 | 4820 | 11090 | 18080 | 23330 | 26120 | |
| | 80 | 5.5 | 6110 | 14050 | 20980 | 25120 | | | |
| | 100 | 6.9 | 7400 | 17020 | 23680 | 26930 | | | |
| | 125 | 8.6 | 9020 | 20730 | 26980 | 28020 | | | |
| | 150 | 10.3 | 10630 | 24440 | 30280 | | | | |

Table 4. Regulating Capacities For 1 1/2-inch Internal Registration in SCFH (60_F and 14.7 psia) of 0.6 Specific Gravity Natural Gas. (continued)

| OUTLET PRESSURE RANGE AND SETTING, CONTROL SPRING NUMBER, & COLOR | INLET PRESSURE | | ORIFICE SIZE, Inches (mm) | | | | | |
|---|----------------|-----|---------------------------|-----------|------------|------------|----------|---------------|
| | psig | bar | 1/4 X 3/8 (6.4 X 9.5) | 3/8 (9.5) | 1/2 (12.7) | 3/4 (19.1) | 1 (25.4) | 1-3/16 (30.2) |
| 16 to 35 psig (1.10 to 2.4 bar) 25 psig (1.7 bar) T13771T0012 Zinc | 30 | 2.1 | 2070 | 4230 | 7360 | 14300 | 16880 | 17700 |
| | 40 | 2.8 | 3320 | 7350 | 12780 | 16810 | 24040 | 24090 |
| | 50 | 3.4 | 4140 | 9340 | 16250 | 21090 | 24430 | |
| | 60 | 4.1 | 4830 | 11030 | 18050 | 25240 | 28260 | |
| | 80 | 5.5 | 6110 | 14050 | 22050 | 28250 | | |
| | 100 | 6.9 | 7400 | 17020 | 25650 | 31260 | | |
| 16 to 35 psig (1.10 to 2.4 bar) 30 psig (2.1 bar) T13771T0012 Zinc | 40 | 2.8 | 2980 | 6520 | 11330 | 15750 | 18100 | 19080 |
| | 50 | 3.4 | 4020 | 8950 | 15560 | 21220 | 25240 | |
| | 60 | 4.1 | 4800 | 10850 | 18020 | 27150 | 30390 | |
| | 80 | 5.5 | 6110 | 14050 | 23130 | 31370 | | |
| | 100 | 6.9 | 7400 | 17020 | 27630 | 35690 | | |
| | 125 | 8.6 | 9020 | 20730 | 33030 | 37670 | | |
| 16 to 35 psig (1.10 to 2.4 bar) 35 psig (2.4 bar) T13771T0012 Zinc | 40 | 2.8 | 2350 | 4790 | 8330 | 13640 | 19570 | 20850 |
| | 50 | 3.4 | 3770 | 8300 | 14430 | 21350 | 26060 | |
| | 60 | 4.1 | 4700 | 10510 | 18270 | 29060 | 32530 | |
| | 80 | 5.5 | 6120 | 14000 | 24350 | 34490 | | |
| | 100 | 6.9 | 7400 | 17020 | 29600 | 39920 | | |
| | 125 | 8.6 | 9020 | 20730 | 36050 | 42500 | | |

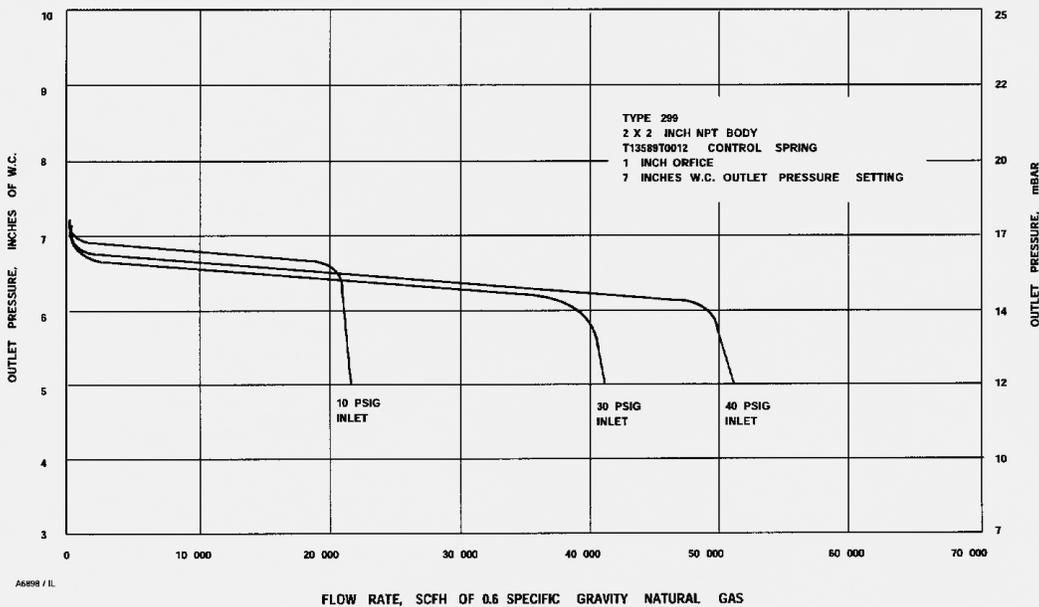


Figure 5. Typical 7 Inches (17 mbar) Water Column Performance Curves

Table 5. Regulating Capacities For 2-inch Internal Registration in SCFH (60° F and 14.7 psia) of 0.6 Specific Gravity Natural Gas.

| OUTLET PRESSURE RANGE AND SETTING, CONTROL SPRING NUMBER, & COLOR | INLET PRESSURE | | ORIFICE SIZE, inches (mm) | | | | | |
|---|---|------|---------------------------|-----------|------------|------------|----------|---------------|
| | psig | bar | 1/4 X 3/8 (6.4 X 9.5) | 3/8 (9.5) | 1/2 (12.7) | 3/4 (19.1) | 1 (25.4) | 1-3/16 (30.2) |
| 3.5 to 6 inches w.c. (8.8 to 15 mbar) 3-1/2-inch w.c. (8.8 mbar) T13707T0012 Black | 2 | 0.14 | 760 | 1560 | 2700 | 4050 | 5710 | 6350 |
| | 5 | 0.34 | 1160 | 2460 | 4270 | 7470 | 6910 | 11260 |
| | 10 | 0.69 | 1590 | 3580 | 6230 | 11230 | 14780 | 14900 |
| | 15 | 1.0 | 1920 | 4410 | 7670 | 14210 | 17080 | 17230 |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 17200 | 18230 | 17610 |
| | 25 | 1.7 | 2570 | 5890 | 10250 | 18290 | 19220 | 19040 |
| | 30 | 2.1 | 2890 | 6640 | 11540 | 19390 | 19220 | 20500 |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 21580 | 19860 | 20720 |
| | 50 | 3.4 | 4180 | 9600 | 16700 | 20170 | 23010 | |
| | 60 | 4.1 | 4820 | 11090 | 19280 | 18760 | 19120 | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 5800 | | |
| | 100 | 6.9 | 5640 | 5640 | 5640 | 5800 | | |
| | 125 | 8.8 | 5640 | 5640 | 5640 | 5810 | | |
| | 150 | 10.3 | 5620 | 5620 | 5620 | | | |
| | 6 to 9 inches w.c. (15 to 22 mbar) 7-inch w.c. (17.5 mbar) T13589T0012 Yellow | 2 | 0.14 | 750 | 1520 | 2650 | 5380 | 6260 |
| 5 | | 0.34 | 1160 | 2440 | 4240 | 8730 | 10080 | 11530 |
| 10 | | 0.69 | 1590 | 3580 | 6220 | 13040 | 15700 | 15600 |
| 15 | | 1.0 | 1920 | 4410 | 7670 | 16480 | 18040 | 18140 |
| 20 | | 1.4 | 2240 | 5150 | 8960 | 19250 | 19290 | 18540 |
| 25 | | 1.7 | 2570 | 5890 | 10250 | 22030 | 20420 | 19880 |
| 30 | | 2.1 | 2890 | 6640 | 11540 | 24800 | 20630 | 21410 |
| 40 | | 2.8 | 3530 | 8120 | 14120 | 23200 | 21300 | 22080 |
| 50 | | 3.4 | 4180 | 9600 | 16700 | 20310 | 21830 | |
| 60 | | 4.1 | 4820 | 11090 | 19280 | 20190 | 20840 | |
| 80 | | 5.5 | 6110 | 14050 | 24440 | 5620 | | |
| 100 | | 6.9 | 5640 | 5640 | 5640 | 6000 | | |
| 125 | | 8.8 | 5640 | 5640 | 5640 | 5900 | | |
| 150 | | 10.3 | 5640 | 5640 | 5640 | | | |
| 9 to 20 inches w.c. (22 to 49 mbar) 14-inch w.c. (35 mbar) 1N3112X0012 Silver | | 2 | 0.14 | 700 | 1430 | 2480 | 5040 | 7440 |
| | 5 | 0.34 | 1140 | 2400 | 4170 | 8570 | 13250 | 11800 |
| | 10 | 0.69 | 1580 | 3560 | 6190 | 12970 | 16620 | 16310 |
| | 15 | 1.0 | 1920 | 4410 | 7670 | 16480 | 18990 | 19050 |
| | 20 | 1.4 | 2240 | 5150 | 8960 | 19250 | 20350 | 19770 |
| | 25 | 1.7 | 2570 | 5890 | 10250 | 22030 | 21610 | 20720 |
| | 30 | 2.1 | 2890 | 6640 | 11540 | 24800 | 22040 | 22330 |
| | 40 | 2.8 | 3530 | 8120 | 14120 | 24490 | 22730 | 23440 |
| | 50 | 3.4 | 4180 | 9600 | 16700 | 23200 | 23350 | |
| | 60 | 4.1 | 4820 | 11090 | 19280 | 22050 | 22560 | |
| | 80 | 5.5 | 6110 | 14050 | 24440 | 5620 | | |
| | 100 | 6.9 | 5640 | 5640 | 5640 | 6000 | | |
| | 125 | 8.6 | 5640 | 5640 | 5640 | 6900 | | |
| | 150 | 10.3 | 5640 | 5640 | 5640 | | | |
| | 16 to 40 inches w.c. (40 to 99 mbar) 28-inch w.c. (70 mbar) 1B413727222 Purple | 5 | 0.34 | 1110 | 2320 | 4020 | 8250 | 9800 |
| 10 | | 0.69 | 1570 | 3530 | 6140 | 12830 | 16420 | 17010 |
| 15 | | 1.0 | 1920 | 4410 | 7670 | 16480 | 19950 | 19960 |
| 20 | | 1.4 | 2240 | 5150 | 8960 | 19250 | 21410 | 20390 |
| 25 | | 1.7 | 2570 | 5890 | 10250 | 22030 | 22810 | 21560 |
| 30 | | 2.1 | 2890 | 6640 | 11540 | 24800 | 23450 | 23250 |
| 40 | | 2.8 | 3530 | 8120 | 14120 | 25780 | 24170 | 24800 |
| 50 | | 3.4 | 4180 | 9600 | 16750 | 26090 | 24870 | |
| 60 | | 4.1 | 4820 | 11090 | 19280 | 23910 | 24280 | |
| 80 | | 5.5 | 6110 | 14050 | 24260 | 15560 | | |
| 100 | | 6.9 | 7270 | 7270 | 7270 | 10130 | | |
| 125 | | 8.6 | 6670 | 6670 | 6670 | 9580 | | |
| 150 | | 10.3 | 6830 | 6830 | 6830 | | | |

APPROVAL:

The design, composition, construction and performance of the meter type(s) identified herein have been evaluated in accordance with regulations and specifications established under the Electricity and Gas Inspection Act. Approval is hereby granted accordingly pursuant to subsection 9(4) of the said Act.

The sealing, marking, installation, use and manner of use of meters are subject to inspection in accordance with regulations and specifications established under the Electricity and Gas Inspection Act. The sealing and marking requirements are set forth in specifications established pursuant to section 18 of the Electricity and Gas Inspection Regulations. Installation and use requirements are set forth in specifications established pursuant to section 12 of the Regulations. Verification of conformity is required in addition to this approval for all metering devices excepting instrument transformers. Inquiries regarding inspection and verification should be addressed to the local inspection office of Industry Canada.

Original copy signed by:

René Magnan, P. Eng
Director
Approval Services Laboratory

APPROBATION:

La conception, la composition, la construction et le rendement du(des) type(s) de compteurs identifié(s) ci-dessus, ayant fait l'objet d'une évaluation conformément au Règlement et aux prescriptions établis aux termes de la Loi sur l'inspection de l'électricité et du gaz, la présente approbation est accordée en application du paragraphe 9(4) de la dite Loi.

Le scellement, l'installation, le marquage, et l'utilisation des compteurs sont soumis à l'inspection conformément au Règlement et aux prescriptions établis aux termes de la Loi sur l'inspection de l'électricité et du gaz. Les exigences d'installation et d'utilisation sont définies dans les prescriptions établies en vertu de l'article 18 du Règlement sur l'inspection de l'électricité et du gaz. Les exigences d'installation et d'utilisation sont définies dans les prescriptions établies en vertu de l'article 12 du dit règlement. Sauf dans les cas des transformateurs de mesure, une vérification de conformité est requise. Toute question sur l'inspection et la vérification de conformité doit être adressée au bureau local d'Industrie Canada.

Copie authentique signée par:

René Magnan, ing.
Directeur
Laboratoire des services d'approbation

Date: **AUG 6 1999**

Web Site Address / Adresse du site internet:
<http://mc.ic.gc.ca>