

Butterfly Control Valve

DMK/6 Series

DUNGS[®]
Combustion Controls



UL Listed for US and Canada

- UL 842 and ULc C125 & C842
- File # MH 18741

Models

- DMK 707/6 (3/4" NPT)
- DMK 710/6 (1" NPT)
- DMK 712/6 (1 1/4" NPT)
- DMK 715/6 (1 1/2" NPT)
- DMK 720/6 (2" NPT)

Commonwealth of Massachusetts Approved Product

- Approval code G1-1107-35
- Control Valve, Butterfly Type

Codes and Standards

This product is intended for installations covered by but not limited to NFPA 86, ANSI Z83.4/CSA 3.7, ANSI Z83.18/CSA 4.9, ANSI Z21.13, CSD-1, UL 795 or CSA B149.1, CSA B149.3, CSA B149.6.

DUNGS is an ISO 9001 manufacturing facility.



Technical description

The DMK butterfly control valve actuates from 0° to 90° degrees in either direction; it is not a tight shut-off valve. Inlet side male thread and outlet-side female thread enable a space-saving assembly directly on most DUNGS safety shutoff valves.

- Max. operating pressure: 7 PSI
- Max. differential pressure: 3.6 PSI
- Multiple internal orifice diameters available for specific flow requirements
- Requires a DUNGS direct drive DMA actuator with operation time: 12 s or 30 s for 90°; 4 - 20 mA input.
- Small, light weight, easy to install, functional, rugged, and maintenance-free due to no linkages

Application

The DMK is recommended for industrial and commercial heating applications for modulating gas or air supply to burners. The DMK butterfly control valve is suitable for dry natural gas, propane, butane, air and other inert gases. Suitable for up to 0.1 % by volume, dry H₂S.

A "dry" gas has a dew point lower than +15 °F and its relative humidity is less than 60 %.

DMK/6 Butterfly control valve is used for modulating gas or air supply to burners; not a tight shut-off valve.

| Specifications | DMK 707/6 | DMK 710/6 | DMK 712/6 | DMK 715/6 | DMK 720/6 | | | | | |
|---|--|-------------------|-----------|-------------------|-----------|-------------------|-----------|--------------------------|-----------|-------------------|
| Pipe thread (NPT) Male input female output | 3/4" | 1" | 1 1/4" | 1 1/2" | 2" | | | | | |
| Max. pressure | 7 PSI (500 mbar) | | | | | | | | | |
| Max. differential pressure (Highfire) | 3.6 PSI (250 mbar) for optimal performance | | | | | | | | | |
| Max. body pressure | 15 PSI (1000 mbar) | | | | | | | | | |
| Flow when closed (0°) | See flow curve 1 | | | | | | | | | |
| Flow when open (90°) | See flow curves 2, 3, & 4 | | | | | | | | | |
| Torque | Max. 4.4 in-lbs (50 Ncm) | | | | | | | | | |
| Actuator angle | 90° from open to closed | | | | | | | | | |
| Orifice diameters available (mm) | DMK 707/6 | Diameters (mm) 11 | DMK 710/6 | Diameters (mm) 15 | DMK 712/6 | Diameters (mm) 19 | DMK 715/6 | Diameters (mm) 24 and 28 | DMK 720/6 | Diameters (mm) 32 |
| Materials in contact with gas | Housing: | Aluminium | | | | | | | | |
| | Shaft: | Stainless steel | | | | | | | | |
| | Seals: | NBR-based rubber | | | | | | | | |
| Ambient temperature | 5 °F to +140 °F (-15 °C to +60 °C) | | | | | | | | | |
| Installation position | Multipoised | | | | | | | | | |
| Actuator | Use with DUNGS DMA actuator | | | | | | | | | |
| Turndown | 20 : 1 | | | | | | | | | |

Equipment selection

Always select the valve with the largest Δp pressure drop ($\Delta p > 4.0$ in. W.C.) to achieve good "regulating and control behavior".

The following values must be known to size the DMK.

1. Maximum flow V_{\max} .
2. Pressure drop Δp at maximum flow.
3. Minimum flow V_{\min} .
4. Pressure drop Δp at minimum flow.

Check whether the required minimum flow is attained in valve position 0°. The minimum flow of the application should fall within the recommended operating ranges in diagram 1.

At low flow, the pressure drop of upstream equipment is reduced and the available Δp of the valve increases. At low flow, the pressure drop of upstream equipment is reduced and the available Δp of the valve increases.



Perform leakage and functional tests after mounting.

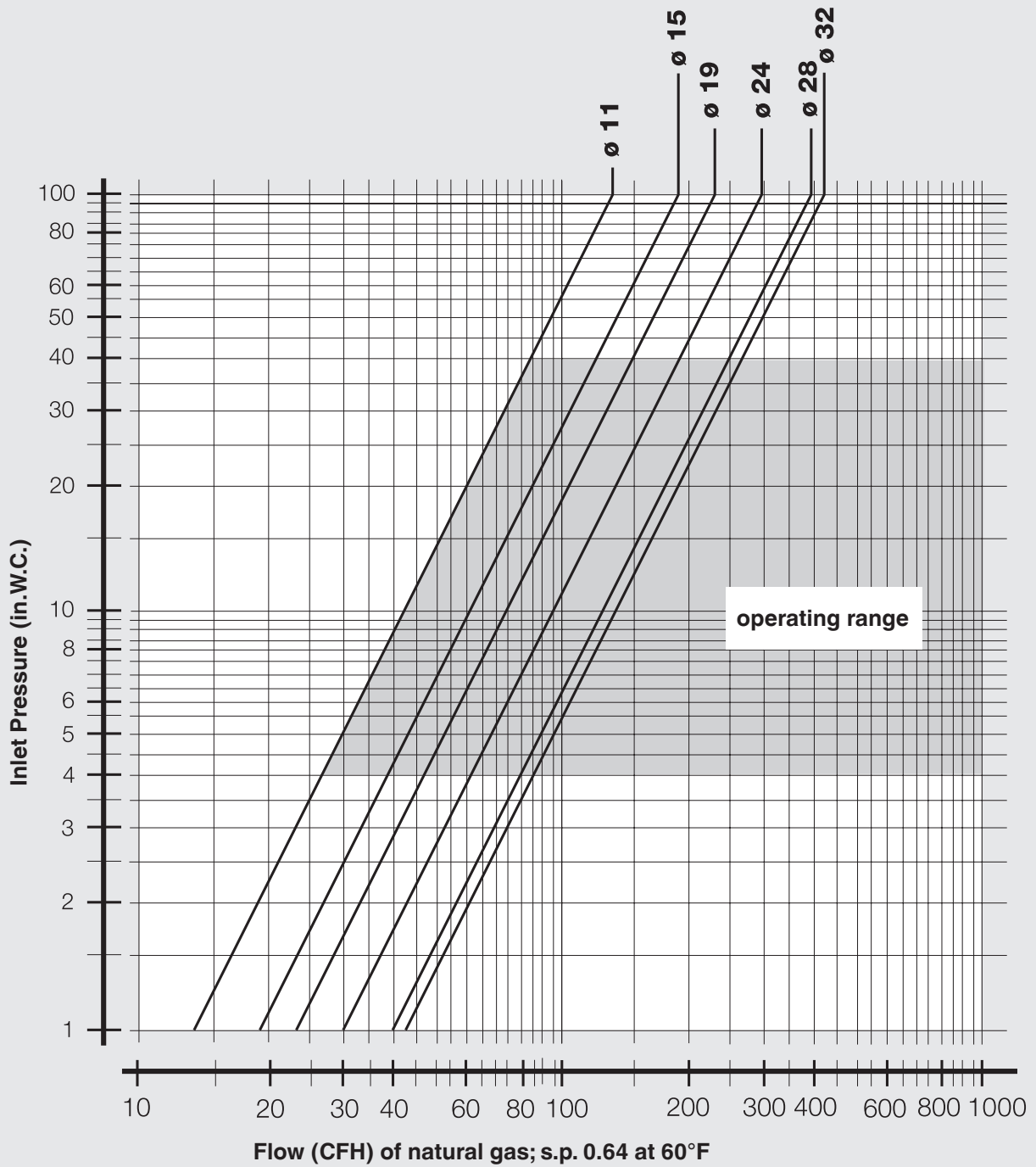


Direct contact between hardening masonry, concrete walls, floors and butterfly valve is not permitted.



Set pressure reference value on gas pressure regulator. Only perform load reduction via butterfly valve.

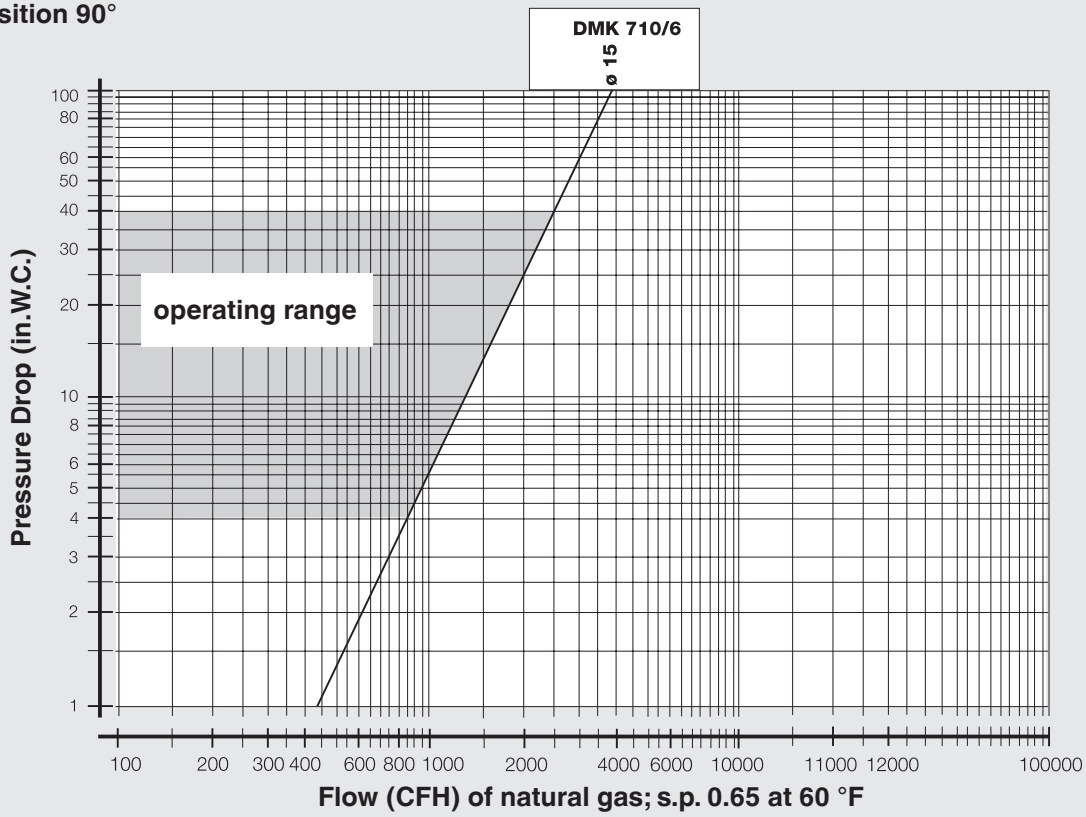
Flow Curve 1
 DMK/6 series
 V_{min} . valve position 0°
 valve closed



Flow Curve 2

DMK 710/6

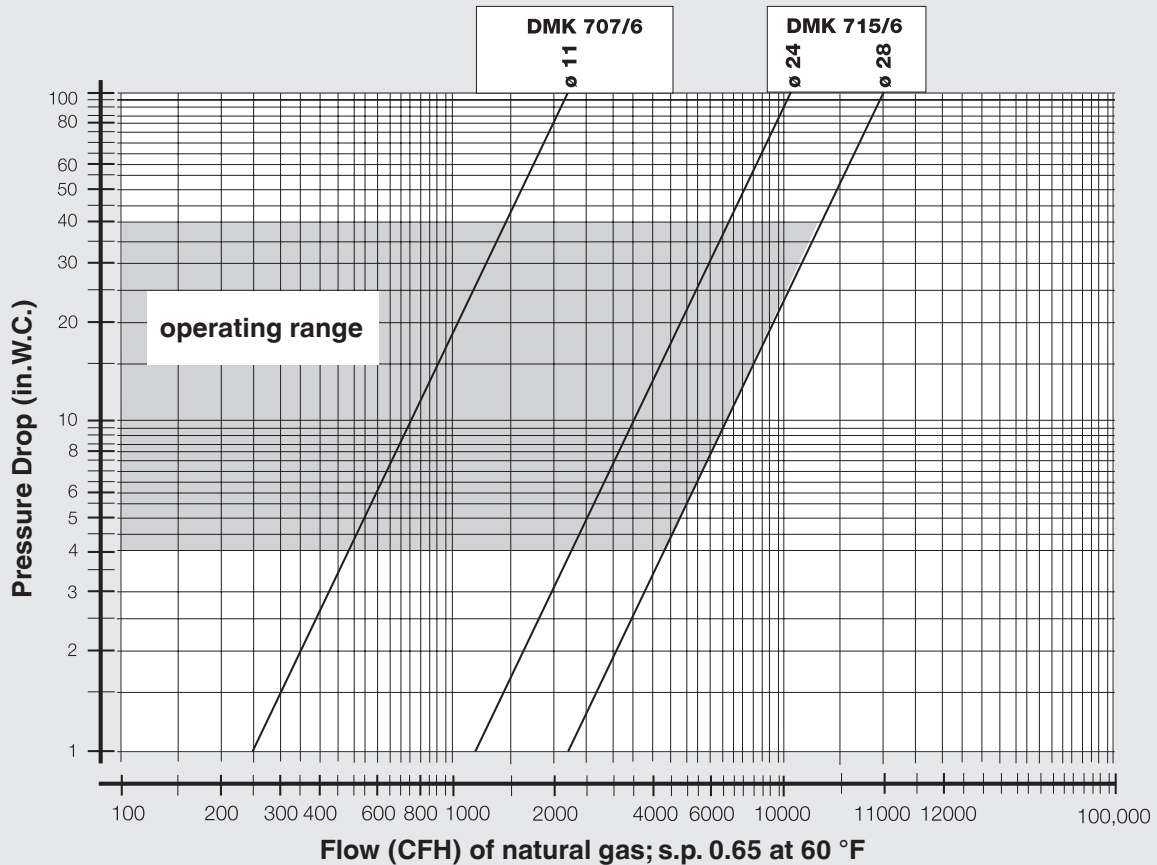
V_{max} valve position 90°
valve open



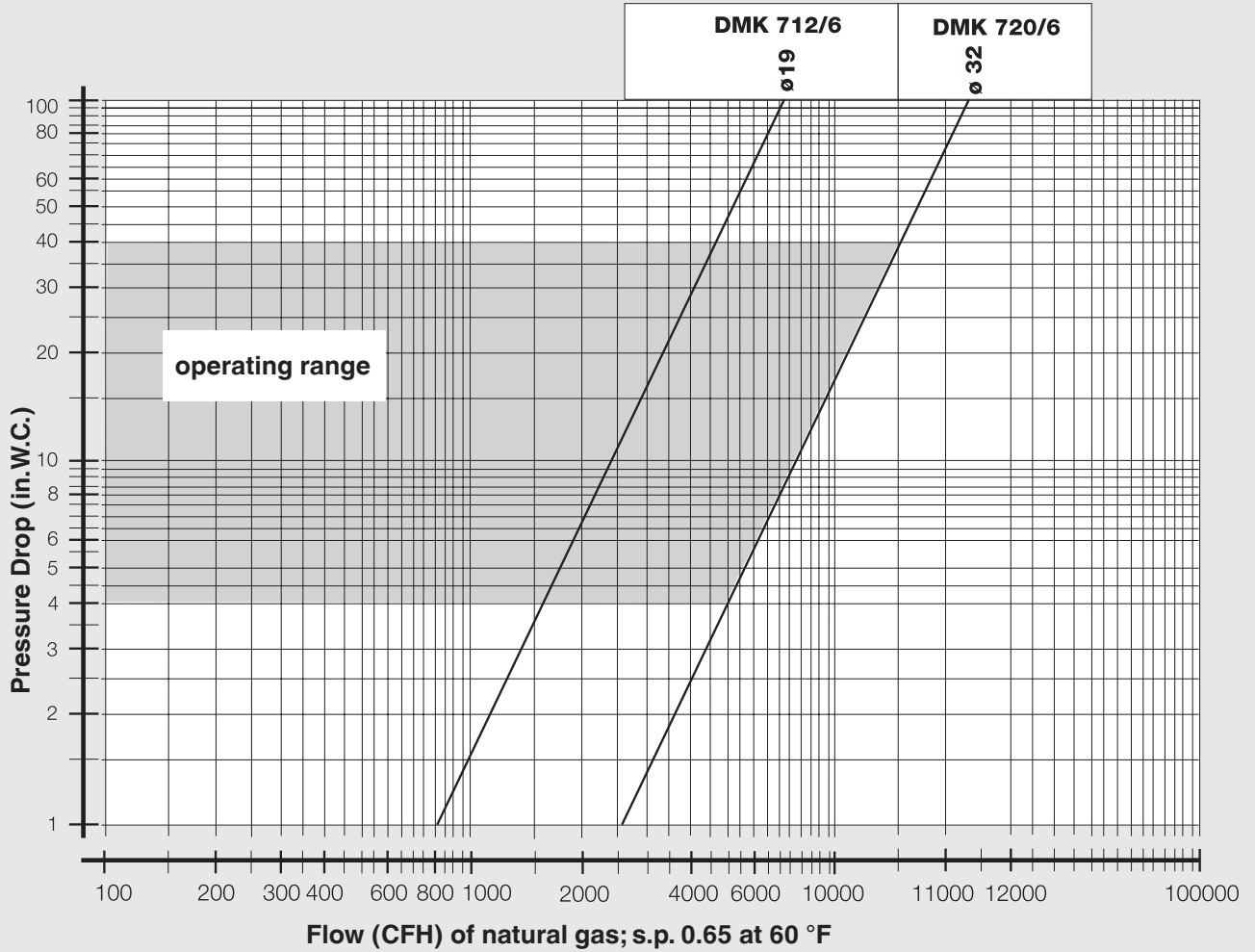
Flow Curve 3

DMK 707/6 - DMK 715/6

V_{max} valve position 90°
valve open



Flow Curve 4
DMK 712/6, DMK 720/6
 V_{max} valve position 90°
 valve open



Pressure drop for other gases

To determine the pressure drop when using a gas other than natural gas, use the flow formula below and f value located in the table below to determine

the “corrected” flow rate in CFH through the valve for the other gas used. For example, when using propane, divide the volume (CFH) of propane required for the application by the calculated value

f (f = 0.66 for propane). Use this “corrected” flow rate and the flow curve on the next page to determine pressure drop for propane.

Determining equivalent flow through valves using another gas

$$\dot{V}_{\text{gas used}} = \dot{V}_{\text{Natural gas}} \times f$$

$$f = \frac{\text{Density of Natural gas}}{\text{Density of gas used}}$$

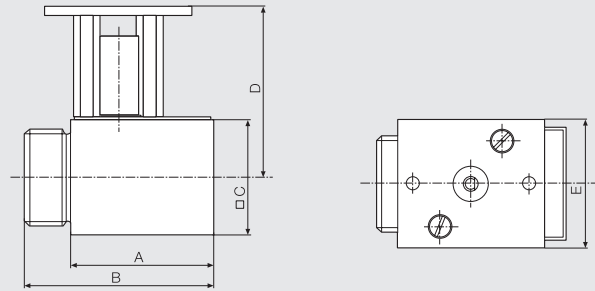
| Type of gas | Density [kg/m³] | s.g. | f |
|-------------|-----------------|------|------|
| Natural gas | 0.81 | 0.65 | 1.00 |
| Butane | 2.39 | 1.95 | 0.58 |
| Propane | 1.86 | 1.50 | 0.66 |
| Air | 1.24 | 1.00 | 0.80 |

**Butterfly Control Valve
DMK/6**



**Dimensions inch (mm)
DMK 707/6 - 720/6**

| | A | B | C | D | E |
|------------------|---------------|---------------|-------------|---------------|-------------|
| DMK 707/6 | 2.3 (59) | 3.2 (81) | 1.6 (40) | 2.8 (70) | 2.0 (50) |
| DMK 710/6 | 2.5 (62,5) | 3.4 (87,5) | 2.0 (50) | 3.0 (75) | 2.0 (50) |
| DMK 712/6 | 2.5 (62,5) | 3.7 (90,5) | 2.0 (50) | 3.0 (75) | 2.0 (50) |
| DMK 715/6 | 2.6 (66) | 3.7 (94) | 2.4 (60) | 3.2 (80) | 2.0 (50) |
| DMK 720/6 | 2.3 (70) | 3.9 (100) | 3.0 (75) | 3.5 (87,5) | 2.0 (50) |



| Typ | Orifice [mm] | NPT | Order No. |
|------------------|-------------------------|------------|------------------|
| DMK 707/6 | 11 | 3/4" | 228754 |
| DMK 710/6 | 15 | 1" | 237614 |
| DMK 712/6 | 19 | 1 1/4" | 228770 |
| DMK 715/6 | 24 | 1 1/2" | 228779 |
| DMK 715/6 | 28 | 1 1/2" | 228783 |
| DMK 720/6 | 32 | 2" | 228787 |

We reserve the right to make any changes in the interest of technical progress.



Karl Dungs, Inc.
3890 Pheasant Ridge Drive NE
Suite 150
Blaine, MN 55449, U.S.A.
Phone 763 582-1700
Fax 763 582-1799
e-mail info@karldungsusa.com
Internet <http://www.dungs.com/usa/>

Karl Dungs GmbH & Co. KG
P.O. Box 12 29
D-73602 Schorndorf, Germany
Phone +49 (0)7181-804-0
Fax +49 (0)7181-804-166
e-mail info@dungs.com
Internet <http://www.dungs.com>