



Mucon
The Power to Control Powders

DISC VALVES

**DRY BULK SOLIDS
CONTROL VALVE WITH
NON-JAMMING ACTION**





Mucon

DISC VALVES

The Origin

The name MUCON is synonymous the world-over with our well established range of Iris Diaphragm Valves. They have been long recognised as the best valve for controlling the flow of dry bulk solids. Continued development has produced a variety of models to suit most applications.

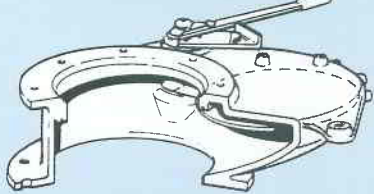
Even so, despite its unique versatility, the MUCON Iris Diaphragm Valve is not suitable for every single application - particularly those involving high temperature, pressure or where regular inspection/maintenance is not possible.

The MUCON Disc Valve is the result of a development exercise where the designer's brief was to produce a dry materials valve to



150mm N.B. HAND OPERATED 'FIRST GENERATION' DISC VALVE

The Disc Valve Action



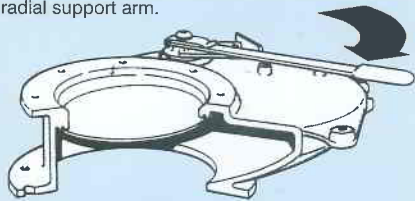
Disc Valve in the open position

The Disc is completely inside the recess and does not obstruct the flow of material.



Half closed position

The Disc in this position does not contact the seat and remains free to 'float' a small amount on the radial support arm.



Fully closed position

The Disc contacts the seat over the last few degrees of hand lever movement and, with a mild wedging action, provides a complete seal both through the valve and to the environment.

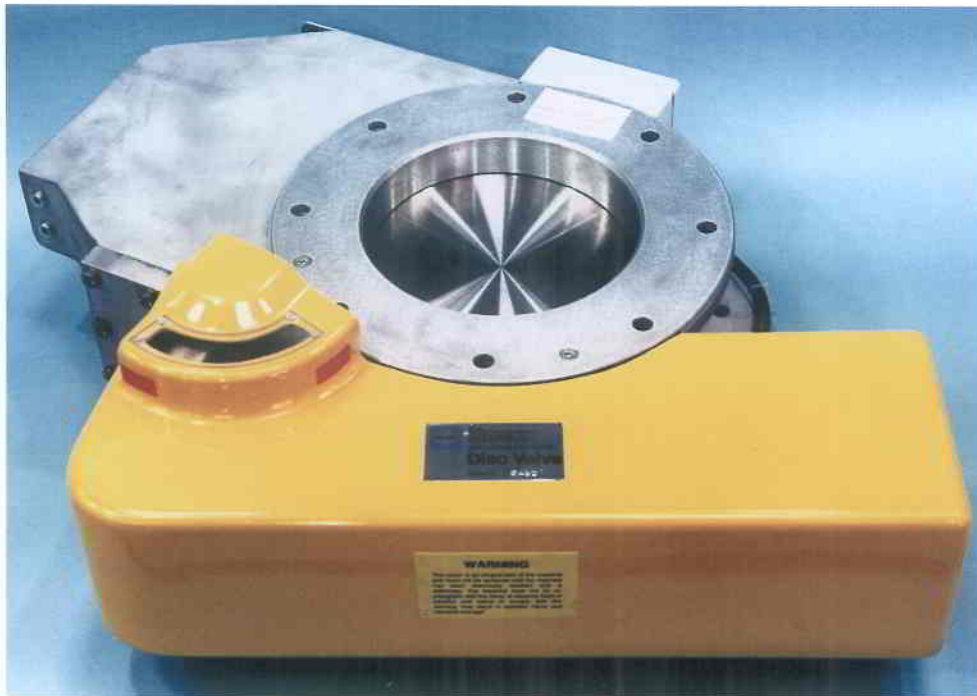
encompass some of the advantages of slide and butterfly type valves but with none of their inherent disadvantages. The resultant design concept is simplicity itself; a factor which has been a major contribution to the Disc Valve's reputation for reliability and longevity.

A free floating stainless steel disc, supported on a radially acting arm swings across the underside of the orifice through which product flows. Disposed around the orifice is an angled seat face. Thus as the disc closes onto the seat it adopts the same angle, resulting in a mild wedging action providing an excellent seal even to the finest of powders. Disc Valves can either be manually or pneumatically operated.

Since the sliding of the disc over the angled seat is only the minimum required to achieve a seal, mechanical wear is substantially reduced. The absence of any slideways and the use of a radial action ensures that product cannot jam the valve during operation.

The only component breaching the valve body casting is the shaft which rotates the operating arm. This is easily sealed by 'O' rings or, for high temperature applications, by a stuffing box arrangement and accordingly, no product can escape to atmosphere.

A dovetail groove is machined into the seat face to accept an 'O' ring of a material best suited to the application. 'O' rings are particularly required



200mm N.B. PNEUMATICALLY OPERATED 'SECOND GENERATION' DISC VALVE

when there is a differential pressure across the valve. Their use is not essential for many applications and metal to metal sealing is used for those involving the highest of temperatures.

The seat face is out of the product flow and the outlet is at least 50mm larger than the inlet diameter. Both of these features ensure minimum wear to the valve even when used on the most abrasive of products.

'First Generation' Disc Valves have one piece body castings. To meet the needs of customers wishing to use Disc Valves for applications where frequent thorough cleaning is essential a 'Second Generation' design is available for some sizes. 'Second Generation' valves have operating internal parts which can be removed without taking the valve out of line. In addition, the seat is renewable and does not necessarily have to be of the same material as the valve body.

All valves are furnished with blanked-off tappings to the Disc cavity to accept air purging or to accommodate clean-in-place connections.

Applications

MUCON Disc Valves relish the most arduous of applications - abrasive products and high frequency operation. In such situations, they readily prove their worth in terms of reliability, longevity and low maintenance. Not only will they consistently control the flow of product, they will ensure it stays within the system and not let it leak to atmosphere.

Besides their proven worth as a general purpose dry bulk solids shut-off valve, Disc Valves have demonstrated that they are the ideal valve for charging dry materials into reactor vessels. Many such vessels give off toxic and/or other hazardous vapours and operate under pressure/elevated temperatures.

Used in pairs, together with a safely vented spool piece, Disc Valves can form an effective airlock for loading substances into dangerous processes. When used in conjunction with sequential operating controls, they are an

- Non-jamming action

- 100% product shut-off

- Full bore opening

- Dust tight to atmosphere

- Reliable, long-life, low maintenance design

- High temperature applications

- Up to 2.7 Bar BELOW Disc

- Full vacuum ABOVE Disc



WASTE COLLECTION BINS USED BY A MAJOR BREWER. 300mm DISC VALVE IS FITTED TO TOP AND 150mm DISC VALVE FITTED TO OUTLET

Typical Materials

A few of the many successful MUCON product applications:

Limestone Flour	Red Lead Oxide
Calmag	Salt
Dicalcium Phosphate	Sodium Carbonate
Limestone granules	Hydrosilicate
Rice	Sand
Fly Ash	Pearlite
Titanium Dioxide	Tobacco Dust
Pulverised Coal	Glass Cullet
Perspex granules	Starch
Graphite Dust	Tea
Reclaimed Foundry Sand	Talcum Powders
Photographic Powders	Flour
Iron Oxide	Alumina
Aluminium Chloride	Cement Powder

alternative to Rotary Valves. One customer has reported a pair of Disc Valves metering a mildly abrasive chemical, each valve operating 3 times a minute, 24 hours per day, for 18 months before any attention was required. Previously the Rotary Valve which the Disc Valves replaced required *daily* attention to maintain a vacuum across the system.

How to Order Disc Valves

In common with most pieces of equipment, their successful performance relies on their correct application. When ordering please ensure that our Engineers have the fullest information to hand including the following:

1. Inlet diameter of valve
2. Hand or pneumatic operation
3. Body material
4. Body finish
5. Internal pressure to which valve body will be subjected
6. Pressure differential across the seat AND ITS DIRECTION
7. Will any pressure differential be relieved prior to operation of the valve
8. Operating temperatures
(a) Product (b) Ambient
9. Environment details (exposed to elements, salt water, will the valve be mounted on a moving vehicle)
10. Is a soft ('O' ring) seal appropriate
11. Product for which the valve is required and details of its characteristics (particle size, shape, bulk density, abrasiveness etc.)
12. Frequency of operation
13. Nature of task valve is to perform (isolation valve, weighing, air-lock etc.) and details of equipment to which the valve will be fitted/connected

For Pneumatically Operated Valves

14. Is control solenoid required
15. Are limit indication switches required
16. Is trickle feed facility appropriate
17. Explosion proof electrics
18. Failsafe pneumatics
19. Electric supply voltage
20. Air supply

ALWAYS consult our Engineers to ensure the correct application/specification where temperature and/or pressure is involved

SPECIFICATIONS

Hand Operated Valves

Operation: Handlever

Sizes: 100mm (4in), 150mm (6in), 200mm (8in), 300mm (12in).

Body Materials:

Standard Cast corrosion resistant LM25 Aluminium Alloy, Cast Iron grade 14 or Stainless Steel grade 316 (not 300mm).

Body Finish:

Standard Aluminium and Stainless Steel are natural finish.

Cast Iron grey primed externally.

Options Electroless Nickel Plating.
Fluorocarbon coating.

Flanges:

Standard BS 4504 NP 10 (Hole positions only) equivalent to DIN 2532 (Hole positions only).

Option Alternatives to standard on application.

Disc Material:

Standard Stainless Steel 316 S12 grade. Machined finish.

Radial Arm Material:

Standard Cast Stainless Steel 347 S17 grade.

Operating Spindle:

Standard Stainless Steel 316 S12 grade. Machined finish.

Bearings:

Standard Cast Molybdenum filled Nylon. Machined finish.

Options Cast Iron grade 12 for high temperature applications.
PTFE where temperature and corrosive considerations both apply.

Operating Lever and Stop Plate:

Standard Mild Steel with plated finish (First Generation).
Cast Aluminium/Plastic (Second Generation).

Seat Seal:

Standard Nitrile Rubber 'O' ring.
Options Silicone, Viton or PTFE encapsulated Viton Rubber 'O' ring.

Shaft Seals:

Standard Nitrile Rubber 'O' rings.
Options Silicone or Viton Rubber 'O' rings or packed stuffing boxes for high temperature applications.

Temperatures:

Standard The Disc Valve to the standard specification is suitable for temperatures of up to 100°C (212°F).

Options When fitted with cast iron bearings and silicone seals, the valve is suitable for temperatures of up to 200°C (392°F). Higher temperatures are possible for certain applications where a face seal is not required. Consult KEMUTEC for a specific recommendation for any high

temperature application. Valves have been supplied to work intermittently up to 500°C (1175°F).

Pressures:

Standard The Disc Valve to standard specification is suitable for differential pressures and vacuums of up to 0.35 Bar (5 PSIG) across the seat face provided that pressure relief is possible before the valve is operated in applications where the pressure is on the underside of the disc.

Option Pressure tested valves available against special request up to a maximum operating pressure 2.7 BAR (45 PSIG) dependant upon direction of effective differential pressure and nature of the product concerned. Always consult KEMUTEC for advice.

Weights:

Size	Aluminium	Cast Iron	Stainless Steel
100mm (4in)	10.5kg (23lbs)	24.5kg (54lbs)	30kg (66lbs)
150mm (6in)	15kg (33lbs)	35kg (77lbs)	42kg (92lbs)
200mm (8in)	20kg (44lbs)	45kg (99lbs)	54kg (119lbs)
300mm (12in)	75kg (165lbs)	145kg (319lbs)	

Air Purge Facility:

Standard Plugged air purge tappings into Disc recess area.

Pneumatically Operated Valves

Specification same as hand operated valve except:

Operation: Pneumatic cylinder mounted on a zinc coated steel plate and covered by a glass reinforced plastic cover.

Supply and Consumption:

Air supply: 5.5 Bar (80 PSIG). Clean lubricated compressed air.

Consumption*:

Size	cc/s	ft ³ /min
100mm (4in)	20	0.014
150mm (6in)	60	0.13
200mm (8in)	100	0.22
300mm (12in)	460	1.00

*The figures are for continuous operation of the valve.

Electric supply:

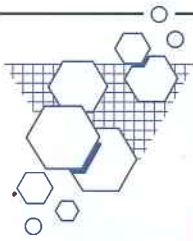
110V or 240V 1ph 50Hz or 60Hz depending upon voltage of solenoid valve fitted.

Weights:

Size	Aluminium	Cast Iron	Stainless Steel
100mm (4in)	17.5kg (39lbs)	31.5kg (69lbs)	38kg (84lbs)
150mm (6in)	25kg (55lbs)	45kg (99lbs)	54kg (119lbs)
200mm (8in)	30kg (66lbs)	55kg (121lbs)	66kg (145lbs)
300mm (12in)	90kg (198lbs)	160kg (352lbs)	

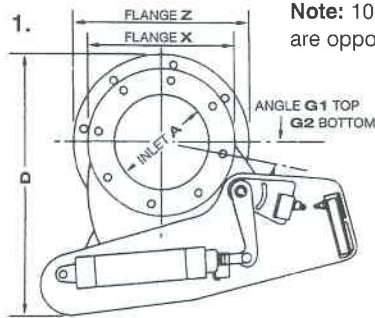
Optional Extras:

Limit switches - Full tricklefeed facility -
Operating solenoids - Failsafe assembly



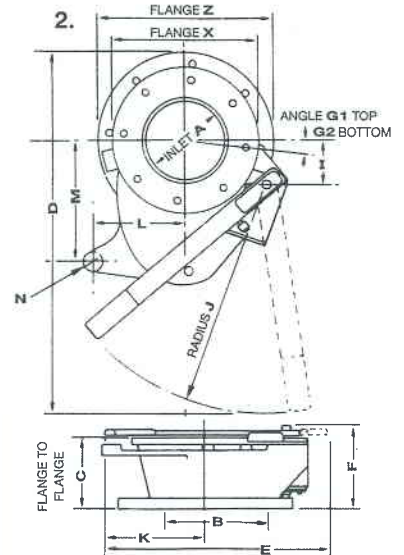
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DISC VALVES



View with cover removed

Note: 100mm and 200mm 'Second Generation' valves are opposite hand to way shown on drawing.



1. Pneumatically operated valves

Valve Size	Inlet A	Outlet B	C	D	E	F	K	Angle G		Flange X				Flange Z			
								G1	G2	OD	No. of Holes	Diameter	PCD	OD	No. of Holes	Diameter	PCD
* 100 (4in)	110	150	130	435	510	158	234	0	0	228	8	tapped M10 x 15 deep	170	280	8	tapped M10	225
150 (6in)	150	200	140	503	632	250	260	6.5	6.5	280	8	8 tapped M12	240	336	8	4 x 15 deep 4 x through	295
200 (8in)	200	250	160	595	680	280	260	10.5	18	335	8	8 tapped M12	295	400	12	6 drilled ø14 3 tapped M12	350
* 200	200	250	145	640	745	190	362	22.5	20	335	8	4 tapped M12 4 drilled ø14	295	400	12	6 tapped M12 6 drilled ø14	350
300 (12in)	300	400	235	885	1005	405	401	18	10.5	480	12	12 tapped M16	400	595	16	4 tapped M16 11 drilled ø18	515

2. Hand operated valves

Valve Size	A	B	C	D	E	F	Angle G		H	J	K	L	M	N	Flange X				Flange Z			
							G1	G2							OD	No. of Holes	Diameter	PCD	OD	No. of Holes	Diameter	PCD
* 100 (4in)	110	150	130	530	373	130	0	0	66	R225	234	-	-	-	228	8	tapped M10 x 15 deep	170	280	8	tapped M10	225
150 (6in)	150	200	140	699	438	164	6.5	6.5	87.5	R445	168	228	270	R25	280	8	8 tapped M12	240	336	8	2 tapped M12 6 drilled ø14	295
200 (8in)	200	250	160	756	580	170	10.5	18	110.5	R445	200	214	300	R25	335	8	8 tapped M12	295	400	12	3 tapped M12 9 drilled ø14	350
* 200 (8in)	200	250	145	625	562	170	22.5	20	114	R250	362	-	-	-	335	8	4 tapped M12 4 drilled ø14	295	400	12	6 tapped M12 6 drilled ø14	350
300 (12in)	300	400	235	1080	676	282	18	10.5	166	R620	297.5	352	485	R30	480	12	12 tapped M16	400	595	16	4 tapped M16 11 drilled ø18	515

* 'Second Generation' models with removable internals.

■ Spaced as 16 holes but only 15 drilled for connecting bolts

- A Inlet Dia
- B Outlet Dia
- C Flange to flange height
- D Max width - as per diagram
- E Max length - as per diagram
- F Overall height (bottom flange - top of cover/handle)
- G1 Angle to first hole on top flange
- G2 Angle to first hole on bottom flange
- H Centre line of valve to centre line spindle
- J Radius of arm
- K Centre line to left hand extremity of cover/handle

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