



FLOW CONTROL VALVES FOR POWDERS



One of the most common applications for sanitary valves in Powder handling systems is to control the flow of product into or out of a machine or transport container.

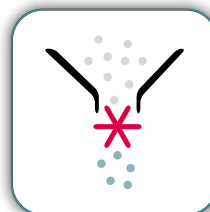
Depending on the details of the host installation and the product/processing conditions a choice needs to be made between many different possible configurations of valve and types of drive.

The factors that can affect that choice include, among other things – chute size, discharge volume, process temperature & pressure conditions.

This datasheet is designed to help the user choose the right valve for each application.

Valvengineering Offers a **full range of solutions for Powder flow control** in the Pharmaceutical, Chemical, Food & Beverage and Cosmetics Industries.

All the valves are designed to the highest cGMP standards and are offered in full Pharma specification with AISI 316L wetted parts, hand polished to a top quality mirror finish, with other finish types available on demand.



FIELD OF APPLICATION

Powder shut off - Vacuum

FLOW CONTROL VALVES FOR POWDERS

Intermittent Dosing

The Oyster Flowmaster valve is the ideal choice for intermittent applications. The valve design is based on air standard butterfly valve, HYC-ienic and so is available in a full range of body types mounting options and seal materials.

Key features of the Oyster Flowmaster valve

- Exceptionally easy to strip down, clean and re-assemble
- Range of seal materials to suit all applications
- Robust engineering to ensure long life

The valve is offered with tri-clamp connections as standard but a full range of variations are possible:

- ASME/BPE, BS4825, DIN 32676 triclamp connections
- Weld ends
- Hose connections
- Wafer
- All flanges and collars can be supplied to customised lengths where necessary

Drive Options:

- 180° pneumatic actuator, either aluminium or stainless steel
- Solenoid valves
- Limit switches
- 4-20mA or 3-15psi Positioner for proportional control of rotor movement
- “Quick release” actuator mount (see photo 1)

FLOWMASTER VALVE FLOW ESTIMATES

| | 4" | 6" | 8" | 10" | 12" |
|---|------|-------|-------|-------|--------|
| Nominal Valve Size: | 100 | 150 | 200 | 250 | 300 |
| Num. lobes | 4 | 6 | 6 | 6 | 6 |
| Volume transferred per cycle: (6 pockets) (ml) | 349 | 1.230 | 3.300 | 6.854 | 12.286 |
| Density of product | 0,50 | 0,50 | 0,50 | 0,50 | 0,50 |
| Nominal cycles/min. (suggested MAX speed) | 24 | 22 | 20 | 16 | 12 |
| Notional Eff. Ratio | 80% | 80% | 80% | 80% | 80% |
| Estimated weight (Kg) per Hour: | 201 | 650 | 1.584 | 2.632 | 3.538 |
| Estimated weight per single pocket (gr.) | 23 | 82 | 220 | 457 | 819 |

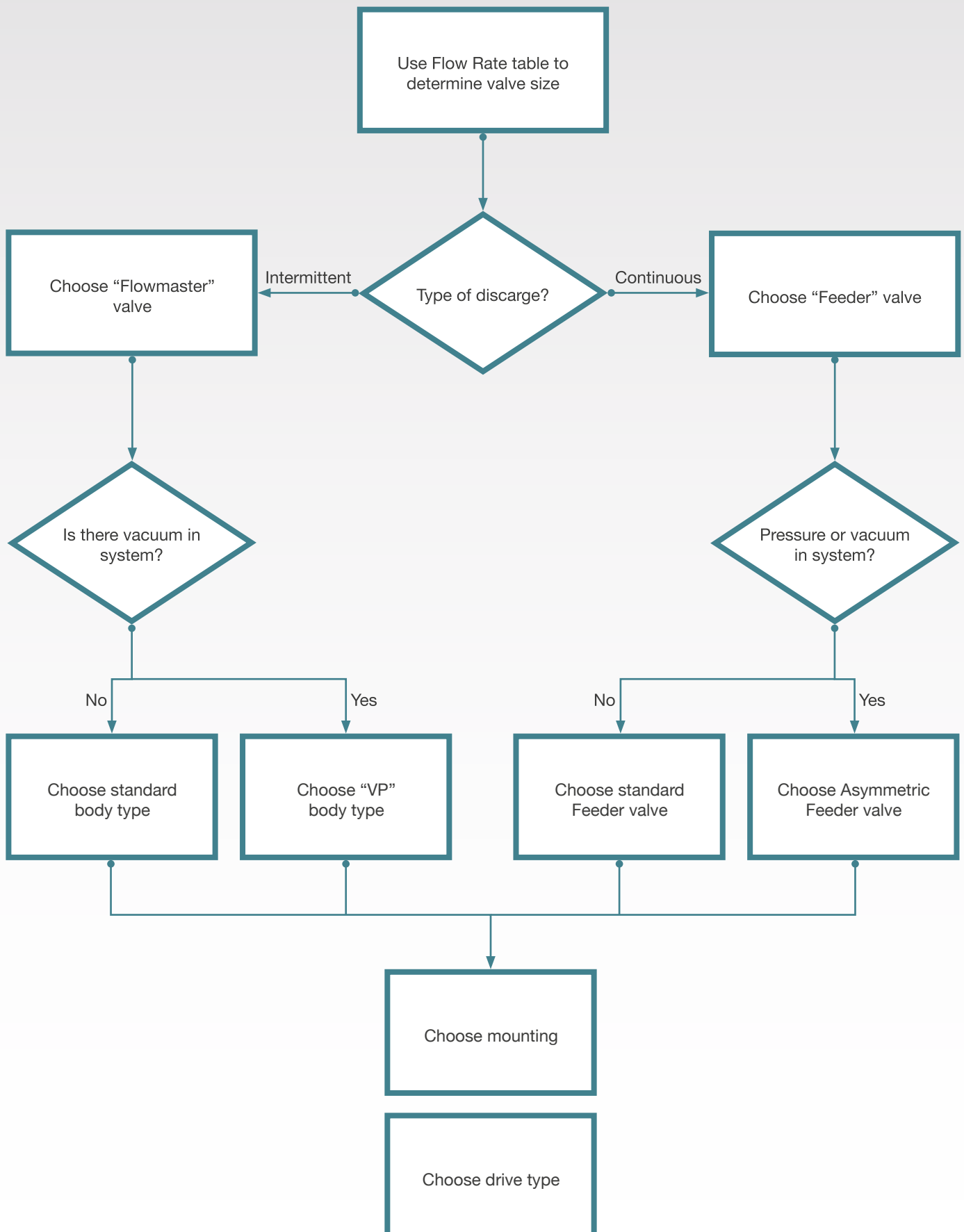
Where the valve is to be used on a system in which the valve will be exposed to a vacuum while operating a vacuum resistant design is needed, in order to avoid the risk of the vacuum dislodging the seal. In this case we offer the VRB or the VRC type design. These valves have a specially designed body with o-rings positioned to prevent the vacuum from interfering with the seal, and are not only fully vacuum compliant but also fully cGMP compatible and designed to full sanitary specification.



Photo 1: Quick release actuator support

FLOW CONTROL VALVES FOR POWDERS

Choose your Powder Flow Control valve



FLOW CONTROL VALVES FOR POWDERS

Valves for continuous Operation

On continuous drive applications the preferred solution is by motor drive, which can be either electric or pneumatic. These are called Feeder valves as the requirement is to feed product into or out of a container or machine at a controllable rate. It is easy to vary the discharge rate by controlling the speed of the motor, and the motorised design also allows for a higher maximum speed than can be achieved by pneumatic actuators.

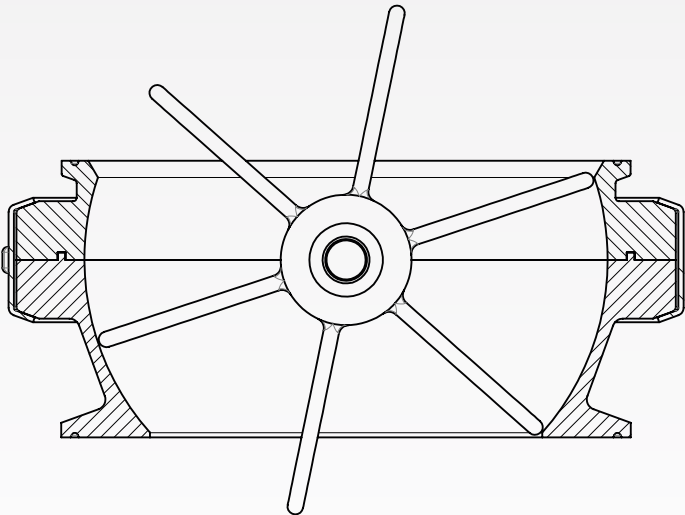
The Oyster Feeder valve has no seal, which would be damaged by the continuous operation, and is anyway not needed because the valve is not designed to be stopped for any length of time.

Instead the inside of the valve body is designed so that there is at all times one lobe of the dosing rotor close enough to the wall of the valve body to ensure complete control of product flow. At no stage in the rotation of the valve does the product have an uncontrolled route through the valve.

| FEEDER VALVE FLOW ESTIMATES | | | | | |
|--|------|-------|-------|-------|--------|
| | 4" | 6" | 8" | 10" | 12" |
| Nominal Valve Size: | 100 | 150 | 200 | 250 | 300 |
| Num. lobes | 6 | 6 | 6 | 6 | 6 |
| Volume transferred per cycle: (6 pockets) (ml) | 325 | 1.230 | 3.300 | 6.854 | 12.286 |
| Density of product | 0,50 | 0,50 | 0,50 | 0,50 | 0,50 |
| Nominal cycles/min. (suggested MAX speed) | 50 | 45 | 40 | 35 | 30 |
| Notional Eff. Ratio | 80% | 80% | 80% | 80% | 80% |
| Estimated weight (Kg) per Hour: | 389 | 1.329 | 3.168 | 5.757 | 8.846 |
| Estimated weight per single pocket (gr.) | 22 | 82 | 220 | 457 | 819 |

Key features of the Oyster Feeder Valve:

- No seal and so is ideal for continuous drive
- Continuous drive enables higher speeds and easy control of flow rate
- Shaped valve body ensures complete control of product flow



Oyster Feeder Lump-breaker
The Feeder valve is also available in a Lump-breaker version.

- Key features of the Oyster Lump-breaker:
- Main body components including the grill are machined from solid for maximum rigidity and mechanical strength
 - Fluid tight from inside to outside
 - Motor drive
 - ATEX rated for zone 1/21
 - High quality Pharma finish, mirror polished internal surfaces, AISI 316L

The Feeder valve can be supplied either with a clamped body or bolted.
Asymmetric Type

For applications with a fluid pressure inside the systems or where the system is subject to CIP, a modified design of the Feeder valve is needed, called the Asymmetric Feeder. This valve is tested before despatch to ensure leak tightness to 0.5 bar, and is also vacuum resistant.

ATEX – all configurations of the Oyster Flowmaster and Feeder valves can be supplied ATEX marked for installation in hazardous zones according to the ATEX Directive 94/9/CE.



FLOW CONTROL VALVES FOR POWDERS

Where the desired flow rate is not immediately compatible with the chute diameter:

- There is limited scope to increase the operating speed by pneumatic actuator. Faster operating speeds can be obtained by using a continuous drive motor, however in this case the Feeder type valve is probably a more suitable solution (please see the section on Continuous Operation)
- Reduced capacity lobes can be supplied where the required flow rate is much less than the indicated rate. This is particularly useful where products are not free flowing or where the valve is being used in a situation in which there can be very large differences in flow rate between one campaign and the next (see photo 2)



Photo 2: Reduced capacity lobes

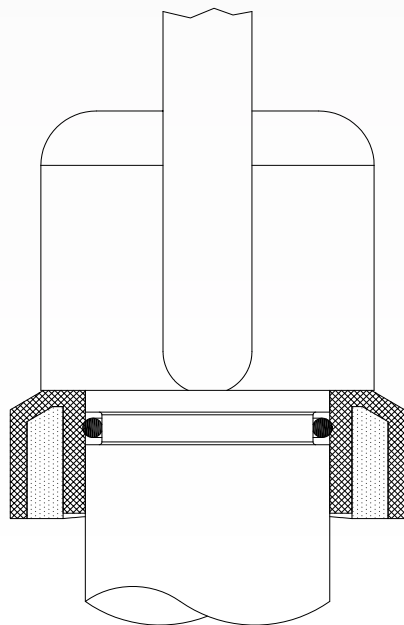
A wide range of seal materials is available

The Oyster Flowmaster valve is available in a full range of seal materials. The right choice of seal material is fundamental to satisfactory performance. All materials are FDA certified.

Each choice has its pros and cons:

| CHOICE OF SEAL MATERIALS | | |
|-----------------------------------|--|---|
| | For | Against |
| Silicone (Clear) | <ul style="list-style-type: none">• Excellent sealing qualities• Good wear qualities• FDA/USP class VI certified | <ul style="list-style-type: none">• Poor compatibility with some solvents |
| EPDM (White) | <ul style="list-style-type: none">• Better solvent resistance | <ul style="list-style-type: none">• Poorer sealing qualities• Can shed with heavy use |
| PTFE Encapsulated Silicone | <ul style="list-style-type: none">• Excellent chemical compatibility | <ul style="list-style-type: none">• Poor sealing performance• Needs frequent replacement |
| FFKM (White) | <ul style="list-style-type: none">• Very good chemical compatibility | <ul style="list-style-type: none">• High cost• Not available in all sizes |

Additional information about the PTFE seal



- The PTFE encapsulated seal will not reliably hold a fluid pressure from above to below the valve
- We add FFKM o-rings to the valve shaft to provide tightness from inside to outside the valve
- The PTFE lining extends the full depth of the shaft holes (unlike some competitor products) minimising the risk of contact between the product and the silicone backing

FLOW CONTROL VALVES FOR POWDERS

Guide to Flow Control valve configurations:

| Valve Type | Body closure | Nominal size | Seal material | Conn. In | Conn. Out | Drive | Hazardous area |
|------------|--------------|--------------|---------------|----------|-----------|-------|----------------|
| AA | A | NNN | A | A | A | XX | A |

| | |
|----|----------------------------|
| RV | Flowmaster valve |
| FV | Feeder valve Standard type |
| FA | Feeder valve Asymmetric |

| | |
|---|-------------------------|
| C | Clamshell clamp |
| B | Bolted |
| M | Monobloc |
| S | Traditional style clamp |

| |
|-----------------------|
| Nominal Diameter - mm |
|-----------------------|

| | |
|---|--------------------|
| S | Silicone |
| E | EPDM |
| P | PTFE-lined |
| K | FFKM |
| N | None - metal/metal |

| | |
|---|--------------------------|
| A | TC Asme/BPE |
| B | TC BS4825 |
| D | TC Din 32676 |
| W | Weld end H=15,5x3 |
| Y | Compact Mounting Collar |
| H | Hose connection |
| N | None - wafer type |
| S | Traditional clamp flange |

| | |
|----|--------------------------------|
| S5 | ISO F05 flange, 14mm drive sq. |
| S6 | ISO F05 flange, 17mm drive sq. |
| S7 | ISO F07 flange, 17mm drive sq. |
| S1 | ISO F10 flange, 17mm drive sq. |
| D5 | ISO F05 flange, 10mm DD |
| D6 | ISO F05 flange, 14mm DD |
| D7 | ISO F07 flange, 14mm DD |
| MW | Keyway for Motor Drive |
| WW | Handwheel drive |

| | |
|---------|--|
| X | ATEX compliant and CE marked |
| [Blank] | Safe area/not in scope (manual valves) |

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