



HpE Process
Tank Safety and Cleaning Systems

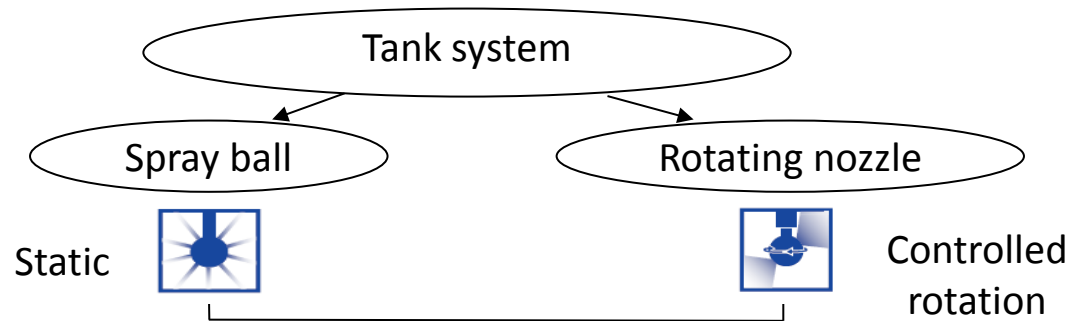


4. Range Tank Safety and Cleaning Systems

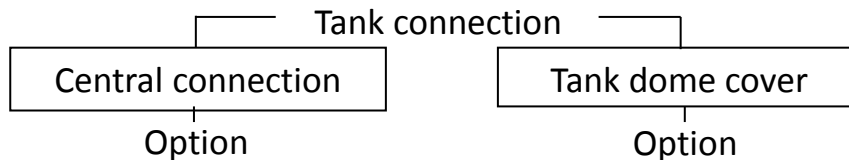
Used for tank cleaning, protection of the tank against overpressure and vacuum and management of gas and liquid flows



Technical Details



SM	Switch over CIP / gas, automatic without auxiliary energy - switching module
BV	Switch over CIP / gas, with pneumatic power supply - Butterfly valve
SC	Switch over CIP / gas, with pneumatic power supply - Divert valve
RV	Gas pressure control, with electro-pneumatic power supply - Control valve



Pressure transmitter	Pressure transmitter
Level indication	Level indication
Sight glass	Sight glass
	Safety valve



Customer Benefits



- Design according to product and process requirements
- Selection according to range
- Compact unit
- Cost saving concept
- Easy assembly and disassembly

4.1 Tank Safety Systems – Application

Tank safety systems are employed to clean open (unpressurised) and closed (pressurised) containers (e.g. vessels and tanks), and at the same time protect the container against overpressure and vacuum.

Application range

- Cleaning/ protection of fermenting tank (brewery technology)
- Cleaning/ protection of storage tank
- Cleaning/ protection of yeast tank
- Cleaning/ protection of buffer tank
- Cleaning/ protection of vessels for other areas of application



4.1 Tank Safety Systems – Processes and Functions

	Tank condition	Task of the tank safety system	Information
1.	The tank is clean and empty. Filling is carried out separately via a filling unit.	The tank safety system must discharge gases/ liquids accordingly to the filling capacity.	Distinction between: a. Fermenting tank, filled with air and depressurised b. Pressure tanks, under pressure c. Storage tanks, filled with CO ₂ , in some cases with air
2.	The tank is filled with medium and e.g. further fermentation processes take place (see a).	(a) CO ₂ , in some cases air, must be discharged either slowly or quickly, depending on the process. (b + c) The minimum pressure after the filling must be sustained, the valves /functional units must be leak-proof.	The set pressure of the safety valves should at least be 10% higher than the operating pressure.
3.	The tank is discharged.	Depending on the discharge capacity, gas must be replenished in order to avoid vacuum or to keep up the pressure of the medium.	
4.	The tank is blown out in order to remove the remaining CO ₂ or a CO ₂ mix.	Gas must be replenished.	See performance requirements.
5.	Cleaning of the tank • The tank outlet is closed.	The tank safety system must perform the cleaning, sometimes the components (Safety valve and vacuum valve) are lifted during cleaning.	Cleaning program, hot (85 °C) and cold • Pre-rinsing • Water rinsing • Rinsing with cold or hot caustic • Water rinsing • Rinsing with acid/disinfectant • Water rinsing

BS-NA

Übersicht über Manipulationen zur Auslegung von Tanktops

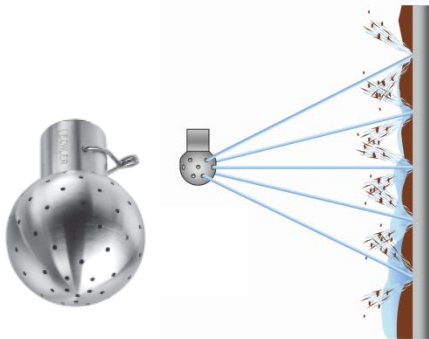
Manipulation	ZKG 400-1500hl	ZKG 1500-4000hl	ZKG 5000-8000hl	Hefetank 20-100hl	Hefetank 150-300hl	Reinzuchtank 5-50hl	Herführtank 100-500hl
Befüllung hl/h	200-400	300-600	600-1000	10-30	20-80	100-250	200-600
Gegendruck: 0,3-0,8 bar							
Entleerung hl/h	200-400	300-600	500-600	20-50	30-100	100-250	200-600
Spanngasdruck: 0,8-1,8 bar							
Abführ. Gärungs-CO ₂	15-60 Nm ³ /h	60-160 Nm ³ /h	200-320 Nm ³ /h				
Gegendruck: 0,5-1,8 bar							
Durchsatz m ³ /h	18-23	23-28	28				
Reinig.- system ZSR							
Durchsatz m ³ /h	12-22	22-30	36-45	12-18	12-18	12	12-18
Reinig.- system Kugel							
Manipulation	ZKL 400-1500hl	ZKL 1500-4000hl	ZKL 5000-8000hl	Drucktank 200-1000 hl	Drucktank 1500-3000 hl	Puffertank 20-100 hl	Tank entg. Wasser 100-1000 hl
Befüllung hl/h	200-400	300-600	600-1000	200-600	400-600	200-600	10-50
Gegendruck:	0,8-1,0 bar	0,8-1,0 bar	0,8-1,0 bar	0,8-1,3 bar	0,8-1,3 bar	1,0-1,5 bar	0,5-3,0 bar
Entleerung hl/h	200-400	300-600	600	50-300	50-300	150-600	100-600
Spanngasdruck:	0,8-1,0 bar	0,8-1,0 bar	0,8-1,0 bar	0,9-1,3 bar	0,9-1,3 bar	1,0-1,5 bar	0,5-3,0 bar
CO ₂ - Ausblasen v. oben	80-300	300-800	1000-1500	80-200	300-600	5-20	80-200
Gegendruck: 0,5 bar	Nm ³ /h	Nm ³ /h	Nm ³ /h	Nm ³ /h	Nm ³ /h	Nm ³ /h	Nm ³ /h
Angen. Zeit: 1h							
Durchsatz m ³ /h	18-23	23-28	28		18		
Reinig.- system ZSR							
Durchsatz m ³ /h	12-22	22-30	36-45	12-23	16-36	12	12-23
Reinig.- system Kugel							

4.1 Variants of Cleaning Systems

Technical Details

- Spray ball
- Rotating nozzle
- Optional:
Rotation monitoring sensor

Static



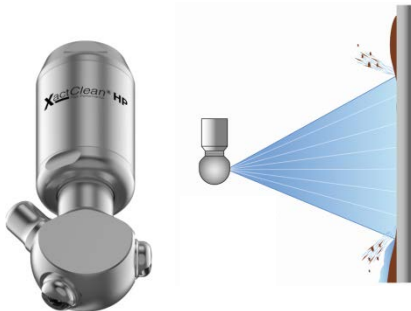
Free spinning



Internal regulated drive



Programmed rotation machines



Customer Benefits

- Design according to product and process requirements
- Selection according to range
- Maximum process stability
- Shorter cleaning time
- Lower process costs
- Cost saving

4.1 Variants of Tank Connections



Technical Details

- Central connection
- Tank dome cover



Customer Benefits



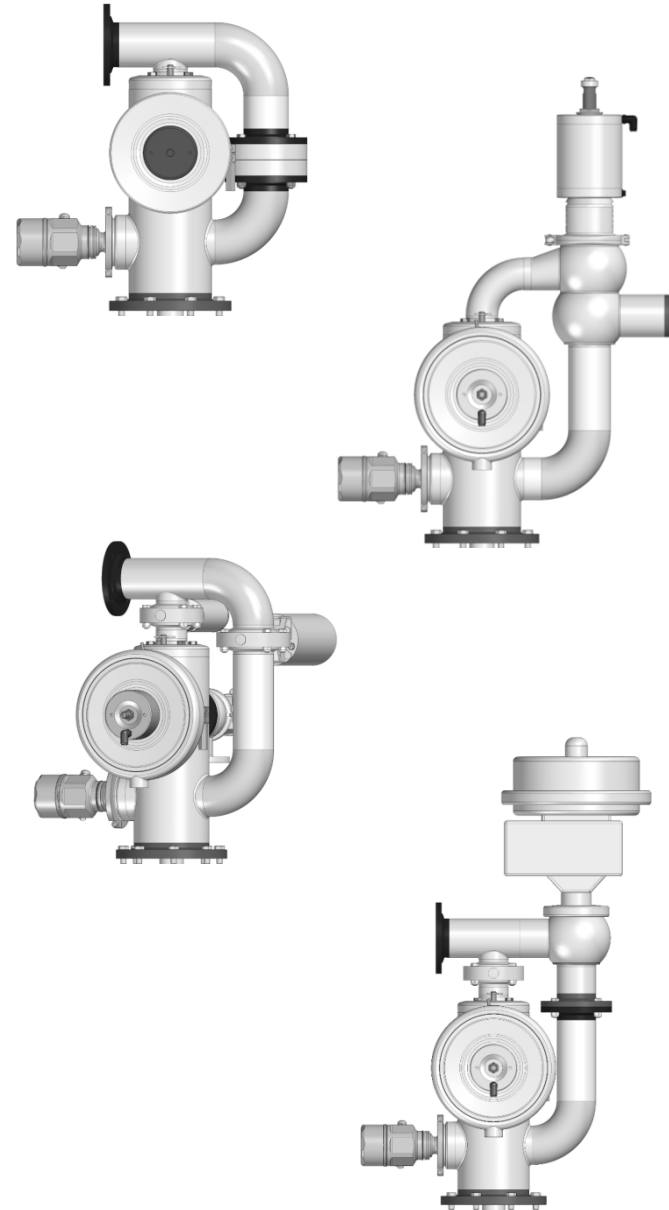
- Design according to product and process requirements
- Selection according to range
- Cost saving

4.1 Variants of Switching Modules CIP / Gas



Technical Details

- Switch module automatic, without auxiliary energy
- Divert valve with pneumatic power supply
- Butterfly valve with pneumatic power supply
- Control valve / Butterfly valve with electro-pneumatic power supply

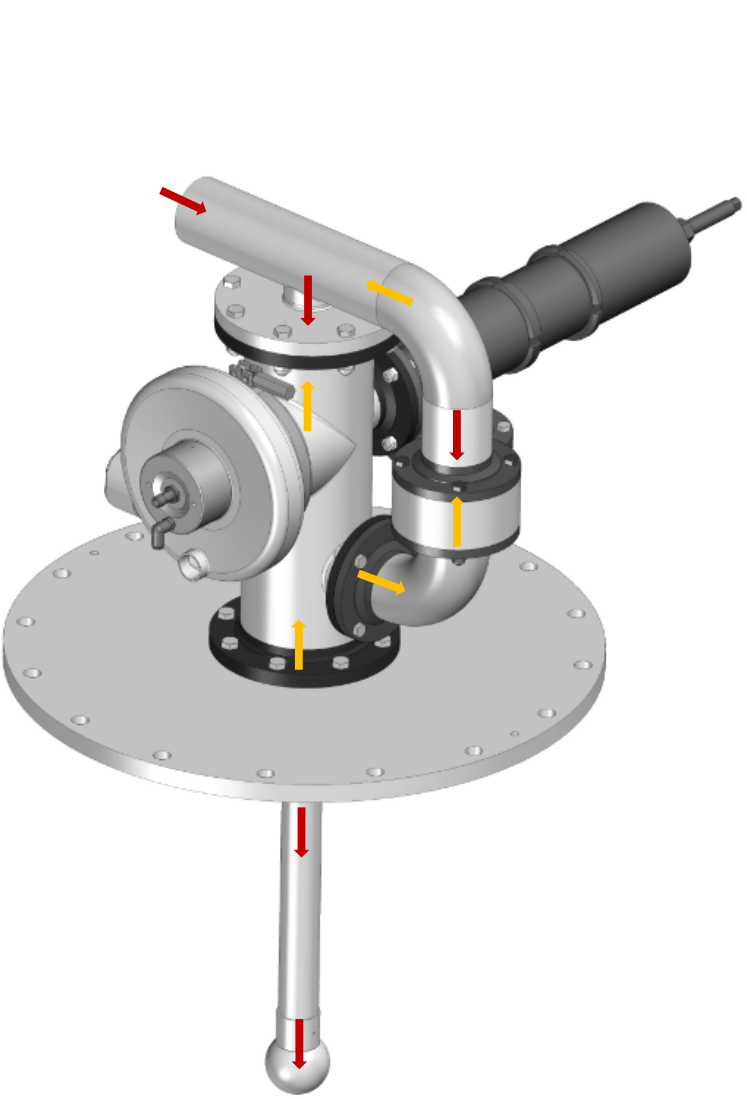


Customer Benefits

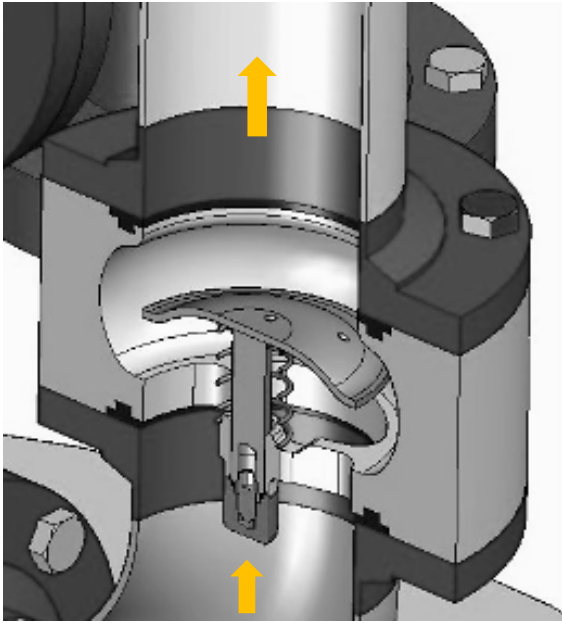


- Design according to product and process requirements
- Selection according to range
- Compact unit
- Cost saving concept

4.1 Switching Module – Automatic Switching

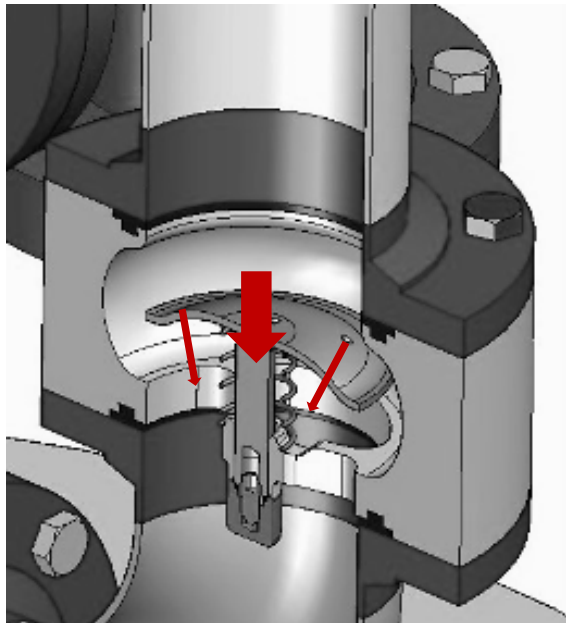


➔ Degassing



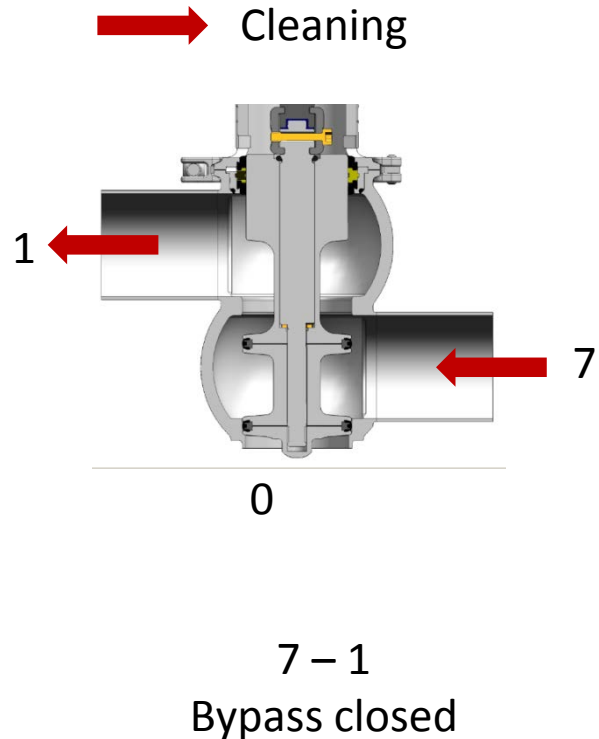
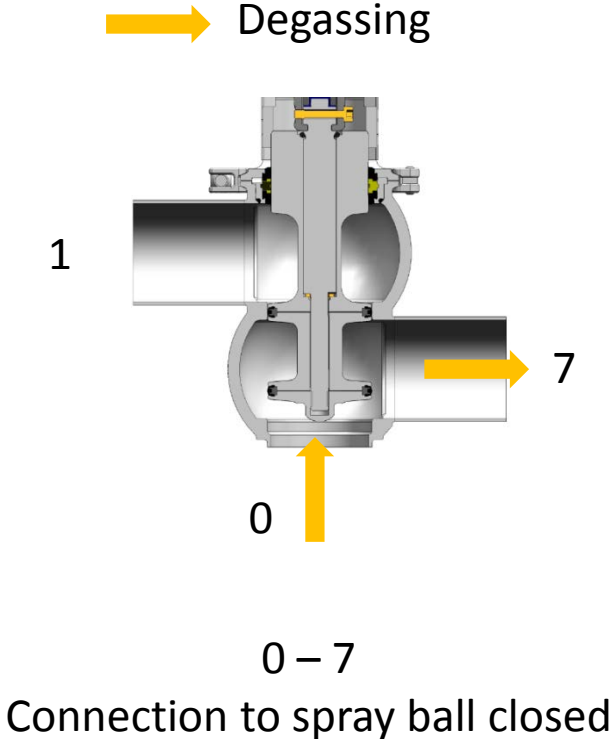
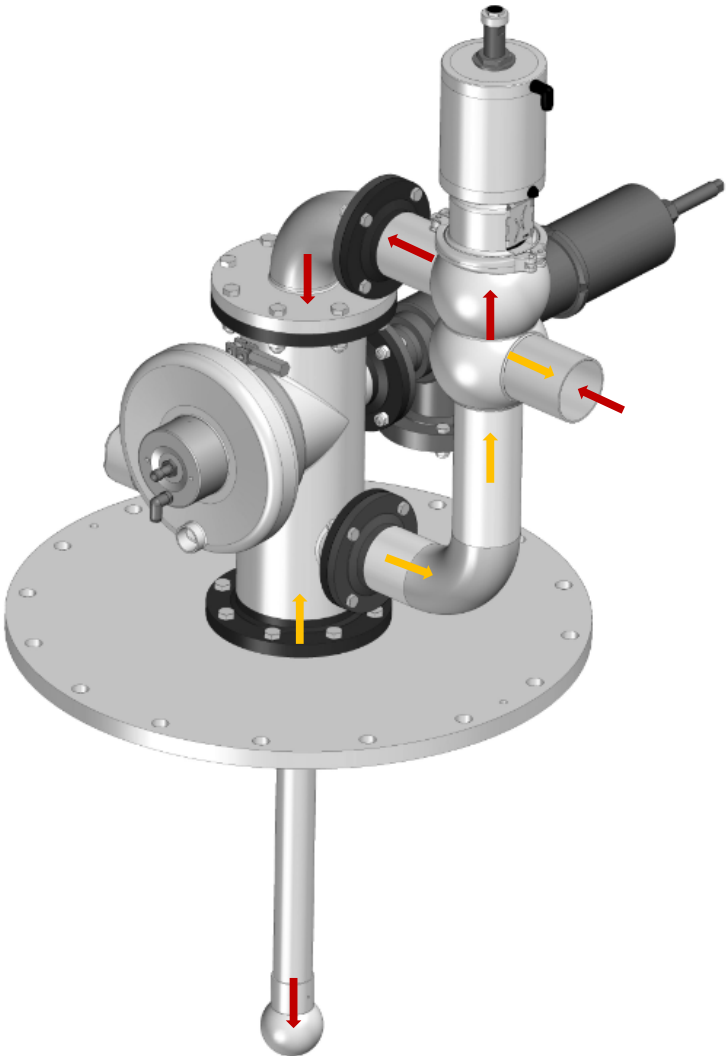
Switching module
Position „open“
Way to spray ball „open“

➔ Cleaning

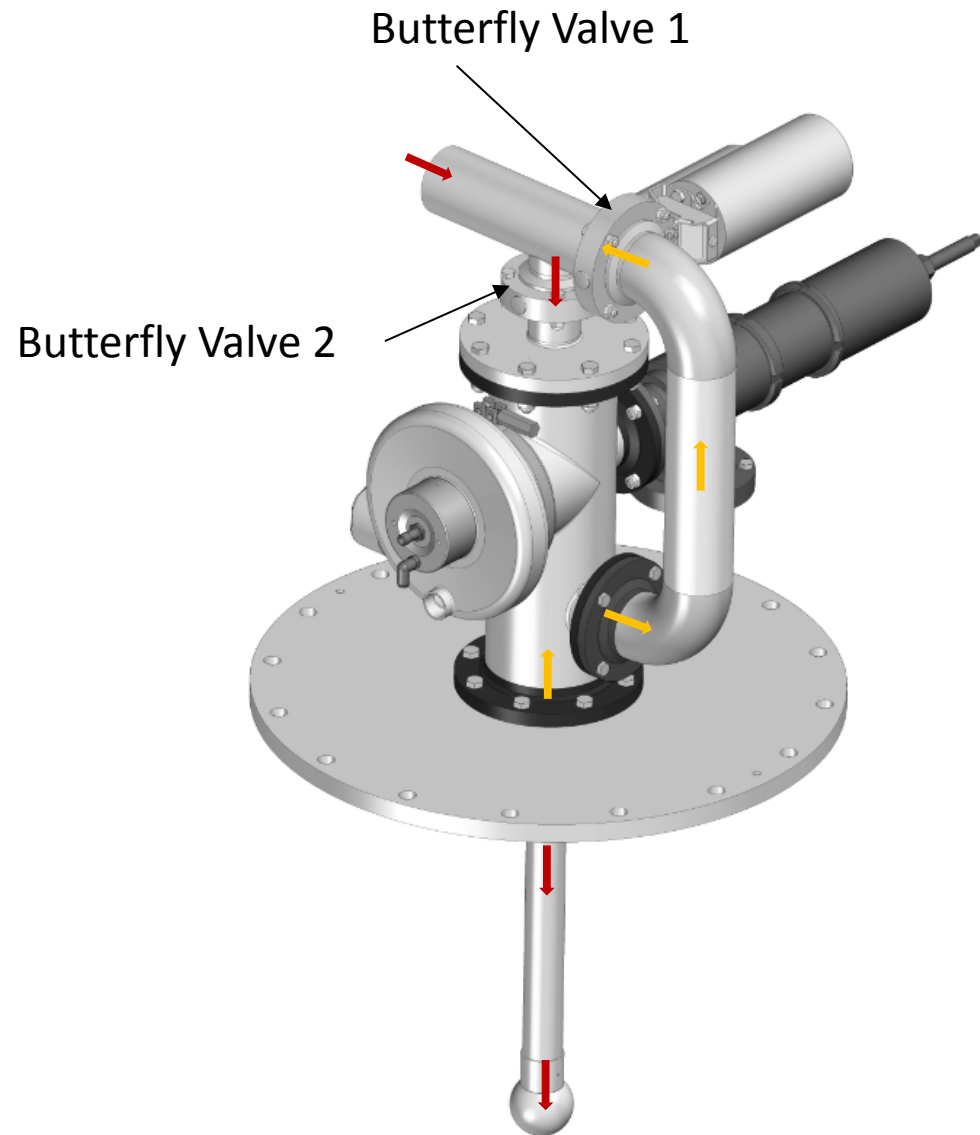


Switching module closes automatically with
oncoming flow
Holes in the disc for cleaning of the bypass

4.1 Switching Module – Divert Valve



4.1 Switching Module – Butterfly Valve



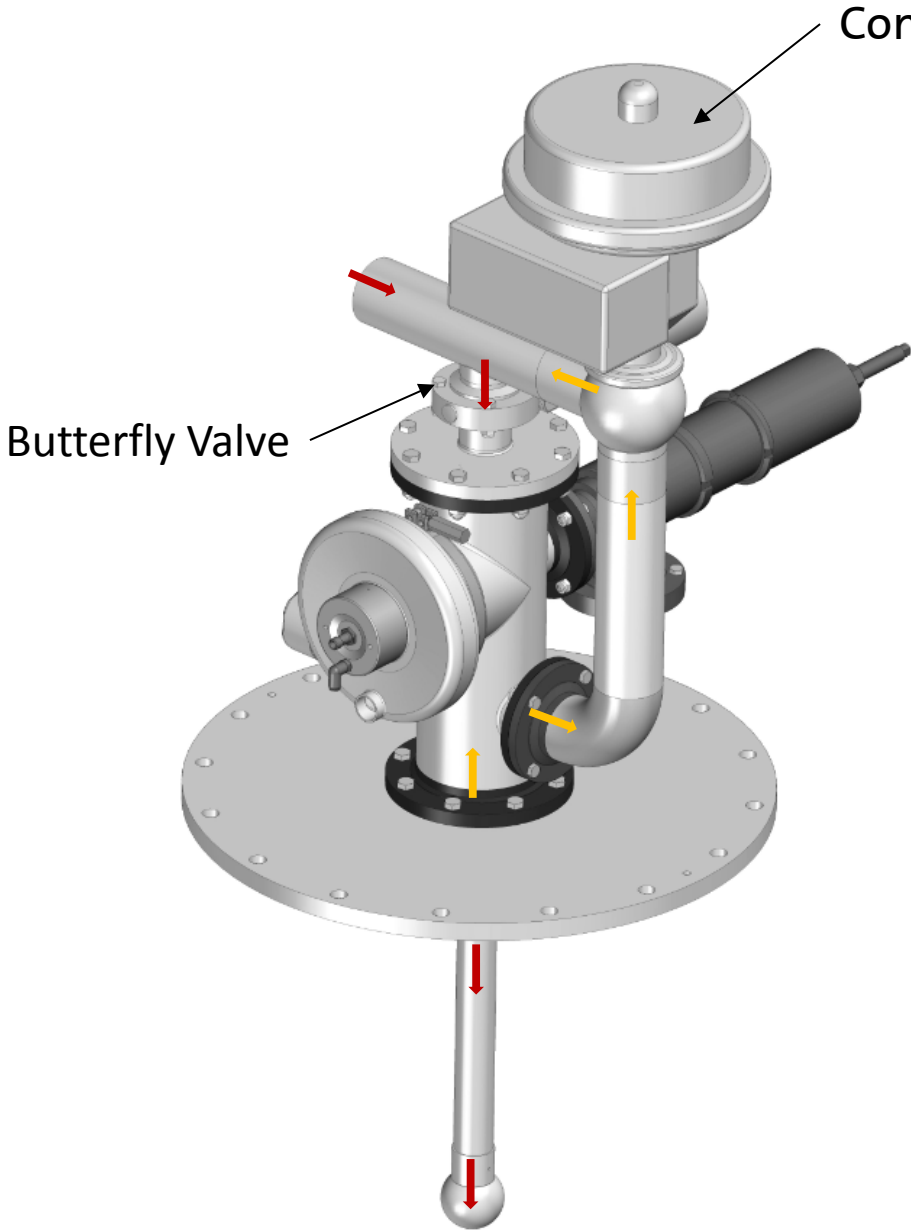
→ Degassing

Butterfly valve 1 „open“
Butterfly valve 2 „closed“
Connection to spray ball closed

→ Cleaning

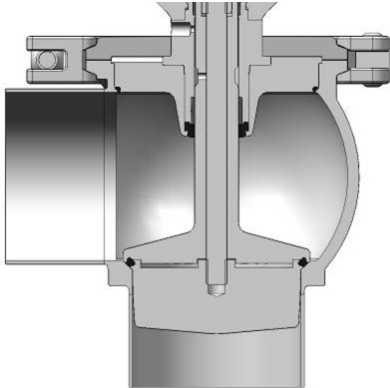
Butterfly valve 1 „closed“
Butterfly valve 2 „open“
Bypass closed

4.1 Switching Module – Butterfly Valve and Control Valve



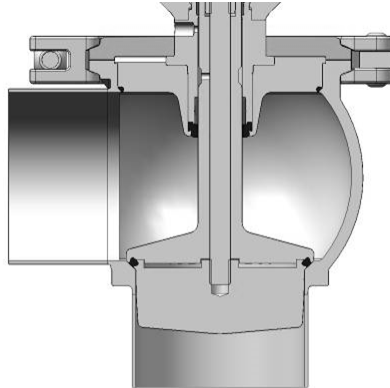
→ Degassing

Butterfly valve „closed“
 Control valve in position
 Gas pressure control
 Connection to spray ball closed



→ Cleaning

Butterfly valve „open“
 Control valve „closed“
 Bypass closed

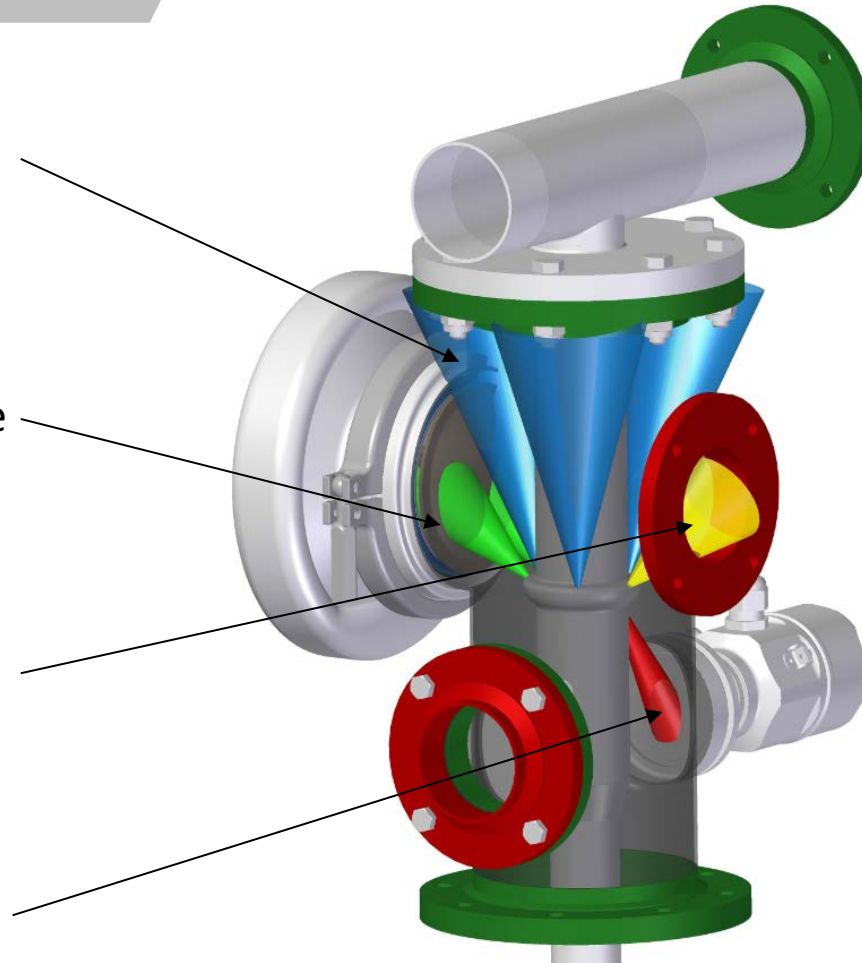


4.1 Cleaning - Tank Safety Systems



Technical Details

- Cleaning the cross piece
- Cleaning the vacuum valve
- Cleaning the safety valve
- Cleaning the sensor



Customer Benefits



- Design according to product and process requirements
- Selection according to range
- Compact unit
- Optimal cleaning conditions without extra nozzles
- Cost saving concept