



# WATER HYDRAULIC VALVES FOR HYGIENIC PRODUCTION

Brewery  
Dairy  
Juice  
Soft Drink  
Personal care  
Other liquid processing





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# ABOUT HYDRACT



Hydract is the story of how an innovative, Danish greentech company can cause radical changes for an entire industry through the development of new, groundbreaking technology.

In short, the ambition of Hydract is to contribute to reorganizing the beverage and food industry all over the world through the use of unique and patented water hydraulic process technology. So far, the technology has shown very promising results, making Hydract a serious challenge to the established suppliers of process valves.

Traditionally, the industry uses production technology based on compressed air, to mix, transport and dispense ingredients.

Hydract technology is based on water hydraulics as the driving force in our process valves. This provides an unprecedented precision for process valves, and – at the same time – a minimal energy consumption for driving process valves. Therefore, Hydract valves have the potential to move the beverage and food industry to a new level of sustainable, efficient, agile and safe production.

The idea of replacing compressed air with water to open/close and regulate valves was created by Peter Espersen, who is the founder Hydract A/S.

The original goal of water hydraulics was to reduce energy consumption and increase food safety, but it turned out that the precision of the valve created completely new possibilities for mixing liquids.

Years of cooperation between Hydract and Carlsberg, Fredericia, have exposed the huge possibilities by using water hydraulic valves for new ways of producing beers, and it turns out the Hydract valve is part of the answer for some of the food and beverage industry's most urgent needs:

- Sustainable production and reduction of CO2 emissions
- Speeding up the time-to-market and greater agility against market needs
- Improved profit and reduction of capital investments
- Increased requirements for food safety



### TECHNICAL INFORMATION IN SHORT

The patented Hydract technology ensures that valves are hydraulically locked and deliver unprecedented precision. The precision combined with advanced sensors provides the valve with double functionality: The hydract regulating valve can also be used as open/close valve and control valve. Thus saving the on/off valves in front of the regulating valve.

The process valve is fully digital and programmable, which makes it possible to utilize and control the valve precision in relation to eg. mixing or dosing liquids.

The Hydract actuators are working with pressurized tap water or with a water/ glycol mix. The pressurized water is supplied by the Hydract powerpack, which supplies a 50 bar pressure in a closed leak-free system.

The Hydract powerpack comes fully equipped with an accumulator for balancing the power and a reverse osmosis system to keep the system clean. The actuator closes with a force of up to 12,500N eliminating the risk of unintentionally mixing of fluids. Besides, the actuator opens and closes the valve slowly and ramp-up to full velocity to reduce the risk of creating pressure transients (water hammers).

Hydract valves reduce the electrical power consumption by more than 95 % for valve actuation. It cannot use more than 2,2 kWh for running up to 8000 valves.

# THE TECHNOLOGY

## GENERAL TECHNICAL INFORMATION

When most people think hydraulics, they think of oil. This should not come as a surprise as the majority of hydraulic systems uses oil as the hydraulic medium. Water hydraulics has traditionally been used in fire-fighting applications. But surprisingly enough, Water hydraulics is used in a broad variety of applications from food processing to automobile manufacturing and mining and hot metals.

The main benefits of water are evident. Opposed to Oil, water is inflammable and an environmentally friendly solution. Water has a lower viscosity than oil and will therefore have a lower pressure drop. Ergo water can transmit power through the system faster and more efficiently than oil. Water has a lower film strength than oil, meaning that water is less likely to retain bubbles and foaming is less likely to occur.

The challenge with water's lower viscosity is the sealing. Leakage from the hydraulic system will not pose as significant a problem as with oil – but must be dealt with and taken into the design. The solution to the lower viscosity includes a non-metallic PTFE coated sealing.

Even more crucial is that the low viscosity of water obstructs the forming of film lubrication as in oil systems. To overcome this, the right material and an ultra-smooth finish are required.

Long lifetime and safe operation are crucial in the process industry and this requires high-quality materials. The above examples clearly indicate that water hydraulics is the best way to go for the process industry. With its distinct advantages over other technologies like pneumatic or electric – the strength of the system lies in applications that demand power, precision, safety, fireproofing, and environmental compatibility. Which makes water hydraulics a commercially sound and technically feasible.

As the hydraulics medium is tap water that is being filtered and cleaned by Reversed Osmosis – Water hydraulics offers a very clean system with no airborne bacteria being distributed to the products or surroundings.

### Powering water hydraulics

The system to power the water hydraulic system is made with a pump, a water tank with a 3 µ m filter, an accumulation tank, and a Reverse Osmosis system to keep the system clean. The Powerpack delivers 50 bar of pressurized water. The accumulator works as a pressure storage device as well as a hydraulic transient damper to ensure that the pump does not need to continuously run or cause pressure transients in the system. For larger systems, an uninterrupted power supply and accumulators are specified. The Ro runs 3 times a week to keep the water clean and hygienic, without affecting the system's ability to power the valves.

### System Safety

In all plant systems there need to be a safe shutdown action in the event of power failure or system failure. In the hydraulic system, there are two ways to do this. 1 is an accumulator. 2 is back up power for the pump and actuators. If a power failure occurs the valve will return to its normal position which is set in the valve configuration and locks itself in the position. The accumulator is specified by how many valves it has to close down at the same time.

If a valve should lose hydraulic pressure, emergency spring-loaded valves can be designed into the system as a shutdown procedure, this would be incorporated into either inlet/outlet of the pipe system or both. The pipework or the hydraulic system consists of a press-fit system that has a maximum working pressure of 90 bar. The maximum pressure of the system is 180 bar. Giving the system a safety factor of 3,6.



### **Pneumatic or water hydraulics**

Pneumatic and water hydraulic systems use fluid to move force and energy through machines. But if both types of fluid power do similar jobs why choose water hydraulics over pneumatics?

For high power, soft action, or force absorbing applications where accuracy is critical water hydraulic systems are preferred and have no problem with variations in air temperature. The incompressibility of water gives accuracy and precision to the actuator as the density of the medium

stays the same under pressure. This will give the system an energy advantage from pneumatics that use approximately 90 % energy creating heat.

Water hydraulic controlled actuators have relatively little momentum so they can be started, stopped, and reversed more quickly. Further, the fluid disperses heat so there is no chance of overheating.

Water hydraulic actuators are much more silent than their pneumatic counterpart.



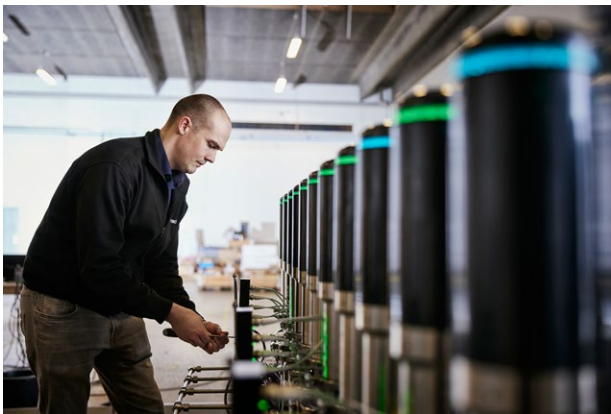


# ADVANTAGES

The patented HYDRACT valve has several features, which are highly superior compared to pneumatic valves. Energy saving, precision and better regulation are basic advantages by choosing water hydraulic valves. These key features are listed below.

Even greater advantage is achieved when using HYDRACT valves in an application. The unpreceded precision allows the user to precisely inline mix fluids – which will lead to changing the ways mixing and/or blending of e.g. alcoholic and non-alcoholic beverages production.

The achievement is especially useful for late product differentiation of beverages and will revolutionize the beverage industry making it possible to produce just in time and on-demand.



The dynamic market situation that is currently happening in the beverage industry is challenging the lifetime of products. The late product differentiation will help the industry overcome this hurdle. The system brings operational scalability and flexibility to the industry where it is much needed.

## Basic advantages by choosing HYDRACT valves

### Energy Savings

An astonishing >95 % energy saving compared to compressed air – equal to saving approximate 5-10 % of the total energy consumption in a beverage plant.

### Precision

Fast and precise positioning to  $\pm 0,05\text{mm}$  for both single, upper, and lower seat – with a regulating frequency of 0,5 seconds.

### Reliability

Experience no oscillation in fluid mixing – boosting operations with smaller rejection rates, more consistent product quality, and increased output.

### Water hammer avoidance

Eliminates hydraulic shock in process valves – a positive effect on the lifetime of the pipe system and no unintentional mixing of fluids.

### Regulating

Minimizing fluctuation in the production – a versatile valve with bi-directional product flow.

### Flow and design

Designed according to EHEDG and optimized for flow, stability, less turbulence, and vibration.

### Communication

Full digital system – get insight into operations, experience real-time control, and operational excellence.

### Monitoring

Enable IOT and a full digitalization of your production.



# ENVIRONMENTAL IMPACT

Hydract A/S is listed on Nasdaq First North Growth Market Denmark as a greentech company, and this is a status we take very seriously.

The work with sustainability is high on our agenda and is absolutely essential in our products. Technologically, Hydract's valves are extremely energy efficient compared to the competing products, which are powered by compressed air.

- > 95 % saving on electricity
- Less product waste
- Less use of cleaning water

The above are the very basic savings of our products. In addition, our valves are included in applications and complex setups, where the precision of the valves and possibilities for in-line mixing open up an even greater sustainability potential.

- Direct CO2 savings in tanks and products
- Lower climate footprint due to lower investments in production equipment
- Less product waste and efficiency in production
- Less use of water and chemicals for cleaning

Hydract does not work towards a goal of a neutral CO2 footprint - we aim higher. Our goal is to achieve an overall negative net CO2 emission through the significant CO2 savings that our valves create through streamlining at the customer.

Hydract works intensively to calculate the CO2 savings achieved by our customers, so that we can show and prove that the total emissions are negative.





Join us making a  
more sustainable world



# THE POWERPACK

## INFORMATION

The Power pack serves the same purpose as a typical compressor does for pneumatic actuators, but with water instead of air.

The Power Pack is the driving force of the actuator(s) and delivers 50 bar of pressurized water or a water glycol mix to the actuator(s). The Power Pack is a necessity when using HYDRACT actuators. The Power Pack includes an accumulator (hydrophore) or an uninterruptible power supply (UPS) which works as a fail-safe if a power failure should occur.

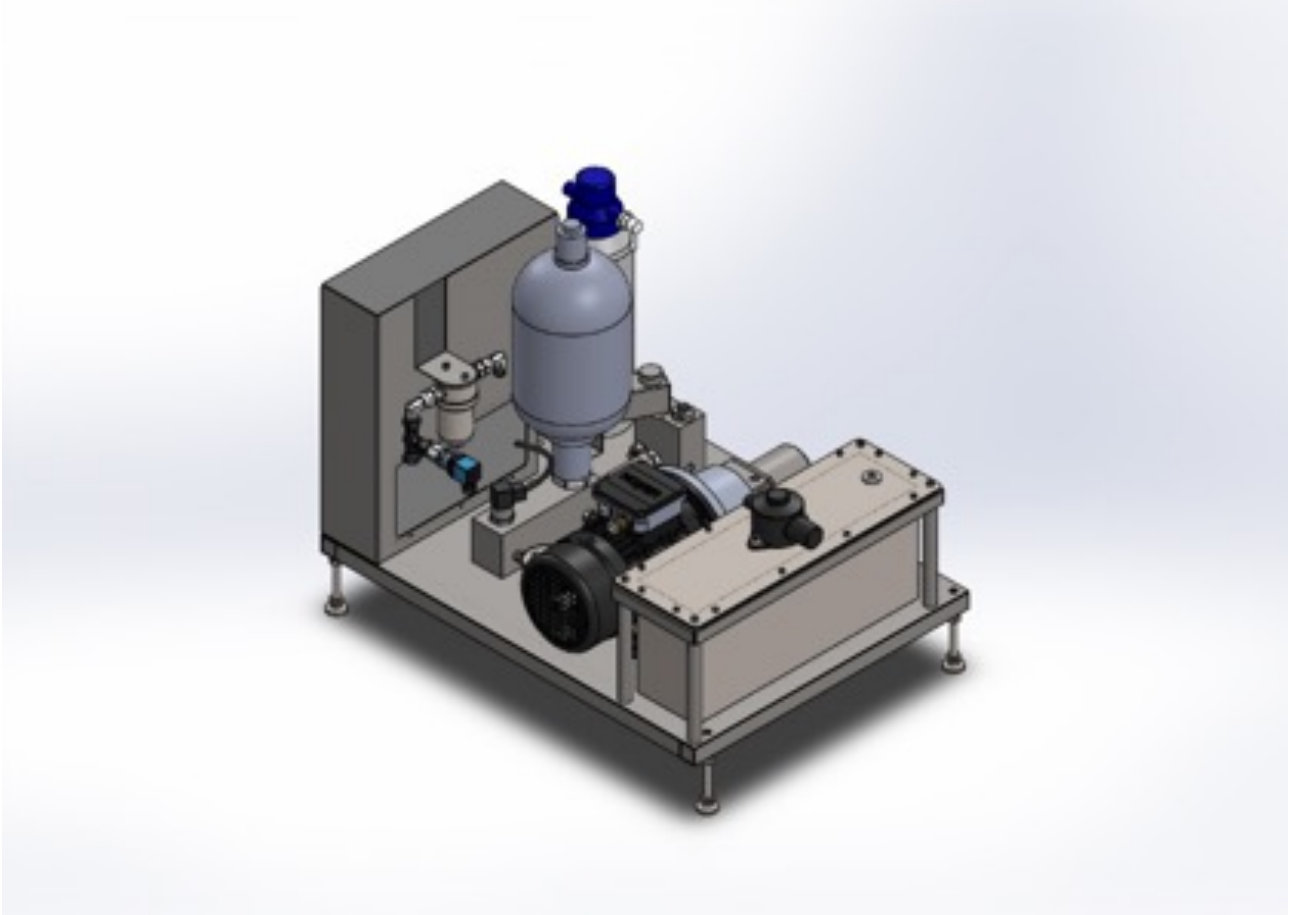
The accumulator also works as a pressure storage device to ensure that the pump does not need to continuously run. It is recommended to include both an uninterruptible power supply and accumulators for larger systems.

The Power Pack comes equipped with a reversed osmosis system.

The Power Pack can also be equipped with an optional UV-sterilizing unit to kill potential bacteria growth in the system.

## TECHNICAL DATA

Pressure output	The Power pack delivers 50 bar.
Hydraulic fluid	The Power pack can be used with a water and glycol mix or with regular tap water.
Reverse Osmosis	The System will keep the water clean with Reverse Osmosis.
Accumulator / UPS	The accumulator and the uninterruptible power supply (UPS) size are calculated from the number of valves required to be operated in the event of a power failure.
UV-sterilizing unit	The optional UV-sterilizer kills potential bacteria build up in the system and ensures a clean and sterile water supply to the actuators.
Overall dimensions	The pump, accumulator, UPS and the water tank in general determine the overall size of the power pack and will increase in size accordingly to the amount and use of actuators in the installation.
Input/Output connections	Return line: 3/8" up to 1.1/2" BSPP. Pressure line: 1/4" up to 1" BSPP. (depending on the power pack size).
Power supply	Power Supply: 3 phase (voltage can be specified).
Customization	Power packs can be specified to order to meet customer requirements.
Ambient temperature	-20°C to +45°C



## FEATURES AND BENEFITS

- Automatic water top-up.
- Automatic cleaning of water twice a week.
- Balanced pressure
- Redundant pump
- Possibility to expand existing powerpack
- Reversed osmosis reduces maintenance, operating, and energy costs
- Very low energy consumption
- Programmable via PLC

## DIMENSIONS

Call us for more info.



# THE ACTUATOR

## INFORMATION

The HYDRACT actuators are working with pressurized tap water or with water containing glycol. The pressurized water is supplied in a 50 bar closed leak free system. The pressure is produced by a decentralized power unit called a Power pack together with an accumulator (or uninterruptible power supply) capacity suitable for the number of valves required to go to a safe position in the event of power failure.

The actuator will by default open and close the valve slowly and ramp up to full velocity to reduce the risk of creating pressure transients (water hammers). The speed and seat position is fully programmable and can be specified to order. The actuator can be installed as normally closed, normally open and/or with regulation ability. The double seat actuator can independently control the upper and lower seats (seat lift) in order to keep the valve clean during operation.

The HYDRACT Valve internals do not require pressure balancing as a precaution towards pressure transients due to being hydraulically locked. Furthermore, the lower seat shape ensures optimal flow conditions. During upper and lower seal flush, the upper or lower disc of the Valve internals are independently lifted enabling the seals to be cleaned.



**TECHNICAL DATA**

Double seat:	<p>HDm: Diameter: 99 mm Height: 418 mm Stroke length: Up to 47 mm</p>	<p>HDs: Diameter: 99 mm Height: 380 mm Stroke length: Up to 30 mm</p>
Single seat:	<p>HSm: Diameter: 100 mm Height: 445 mm Stroke length: Up to 47 mm</p>	
Communication	AS -i bus & Bluetooth 4,2 (tablet) compatible. PROFIBUS and IO_Link	
Power supply	<p>24-30 volt DC supply from bus system. Peak current: &lt;=250mA. Standby current: &lt;=100mA. Optional battery backup</p>	
Maximum force	<p>Upper seat: 12500N (downward), 9300N (upward). Lower seat: 4500N (downward), 3200N (upward). Single seat: 12500N (downward and upward).</p>	
Filtration requirements	<p>5 µ m abs filter on return line. It is recommended that a 3 µ m filter is used on the pressure line.</p>	
Working pressure	4,7 to 5 MPa.	
Materials	<p>FDA approved materials. Material not in contact with product: AISI 304 Seals in EPDM Control top Housing in ABS with cleaning chemical resistant coating.</p>	
Opening & closing operations	<p>Velocity: from 0,1 - 11,5 mm/s Opening and closing times are dependent on valve stroke, between 3 and 12 seconds. Each actuator can be also configured with normal or fast speed for open/close operations.</p>	
Position control	Accuracy ± 0.05 mm (both single, upper, and lower seat).	
Seat calibration	<p>The upper seat seal compression can be adjusted by connecting the actuator to a tablet (Hydract app). This ensures the seal can be adjusted during it's lifetime and ensure the correct expansion when exposed to heat which aids in increasing lifetime of the seal.</p>	
Ambient temperature	-20°C to +45°C	

### FEATURES AND BENEFITS

- Hydraulic lock that withstands pressure transients
- Full regulation capability and on/off
- Bi-directional flow
- Inline mixing
- 5/100 mm precision
- No unintentional mixing of fluids
- Reduced energy consumption
- Fast calibration via app
- Fully Digital and can be programmed to meet any demand
- Upper and lower seat can be programmed to fit your CIP cleaning. (Pulse, spray, small opening, etc.)
- Can be configured to be both NC/NO

### DIMENSIONS

Call us for more info.



## THE ACTUATOR

### Control & communication:

Full digital process control! Standard communication is I/O link ensures that every Hydract valve communicate individually. This enables proactive performance reporting and maintenance procedures. Precise valve position is essential to optimal system operation and automation. The Control and communication is fully digital and programmable to meet your production needs. The 360° LED display for easy visual valve status is also fully programmable.

### Hydraulic Cylinder:

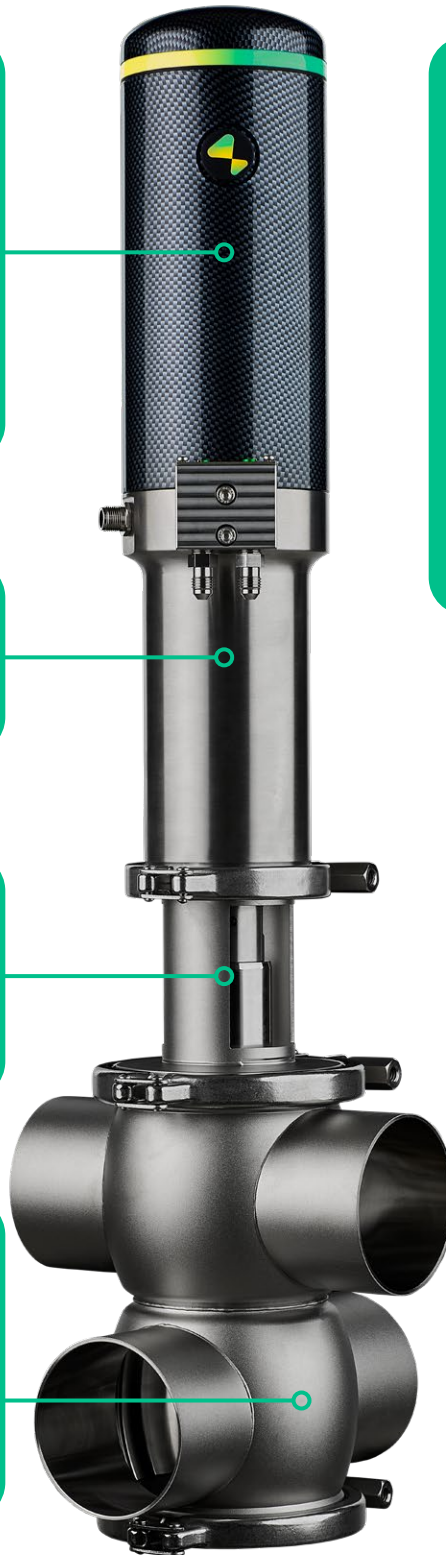
The piston rod of the cylinder transmits the power from the displacement of pressurized hydraulic fluid via the piston inside the cylinder.

### Lantern:

The lantern works as a separation between the actuator and the valve house. The design is open which allows for visual inspection of the piston seal and leakage.

### Valve house:

Hydract offers a broad and versatile valve house programme for different process applications. The Hydract valve house internal is elliptical which creates a more uniform flow velocity and thereby better cleanability. Houses can be combined crosswise and can be either clamped or welded.



### Actuator:

The Hydract actuator has tremendous force of up to 12.500 N and its hydraulically locked – eliminating the risk of unintentional mixing of fluids. Due to the precise control and power the Actuator can position the piston by 5/100 mm.

As water is incompressible it grants better mechanical work. It simply uses the energy better.

The actuator will by default open and close the valve slowly and ramp-up to full velocity to reduce the risk of creating pressure transients (water hammers). The HYDRACT actuator reduces the electrical power consumption by more than 95 % for valve actuation.

# THE VALVE

## THE VALVE CONCEPT

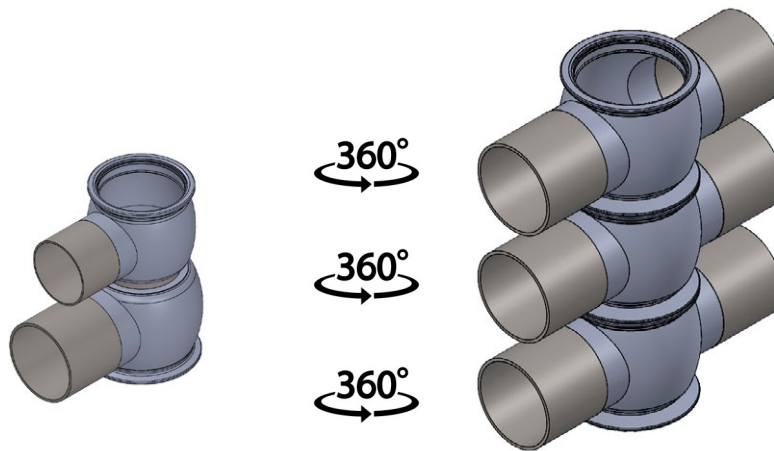
The Hydract valve housing is designed in cooperation with hygienic design specialists to offer a great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow.

It is designed to deliver high performance every time, every day!

The Concept is designed to be a modular and versatile setup that can be combined crosswise in size.

The shape of the valve house internal is elliptical, which is the optimal combination of globe and cylindric shape. The elliptical shape creates higher flow velocity and thereby minimises the areas with low wall shear stress – thus resulting in faster and more optimal cleaning properties, flow proportion, and hygiene.

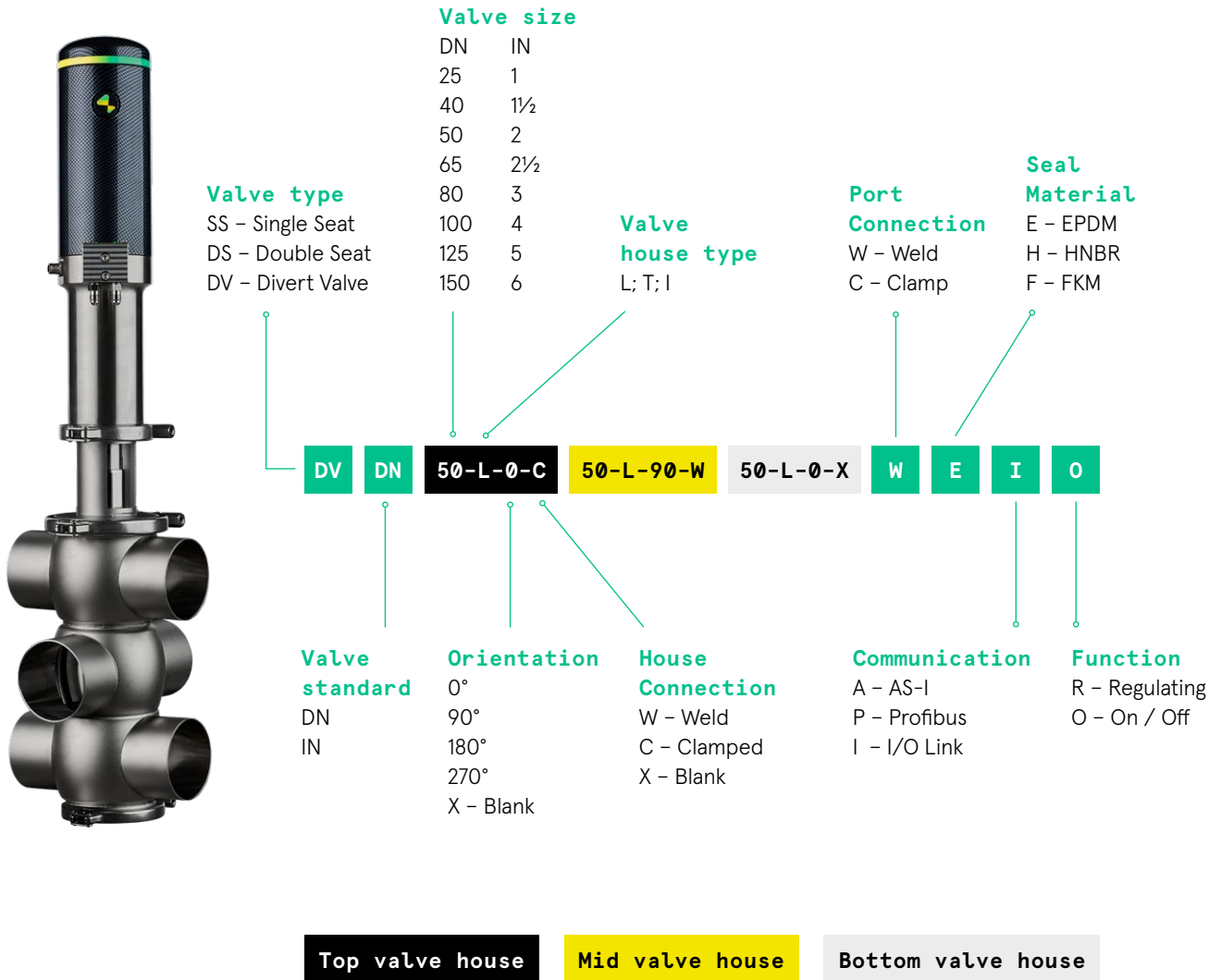
By using an elliptical shape, the design becomes more compact thus minimising the installation space needed.



## CHOOSING THE RIGHT VALVE

How to specify valves.

- Orientation - For first valve house, always use 'X' or 'O'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigable bottom port.



# SINGLE SEAT VALVES

## SINGLE SEAT VALVE

### INFORMATION

The Hydract single seat valve housing is designed in corporation with hygienic design specialists to offer a great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow.

It is designed to deliver high performance every time, every day!

The valve houses are clamped together with the actuator to ensure fast and easy assembly of the total valve system.

The flow direction is bi-directional, meaning that the flow can be both upstream and downstream using the same valve.

**Seat Calibration and lifetime** – The upper seat seal compression can be adjusted by connecting the actuator to a tablet (Hydract app). This ensures the seal can be adjusted during its lifetime and ensure the correct expansion when exposed to heat which aids in increasing lifetime of the seal.

**Flow conditions** – The reduced pressure drops inherent with this design, when compared to typical ON/OFF valves, is used to gain more control over the same stroke, thus giving more stability.

The valve sizes are shown in below table.

Please contact Hydract for other designs.

### TECHNICAL DATA

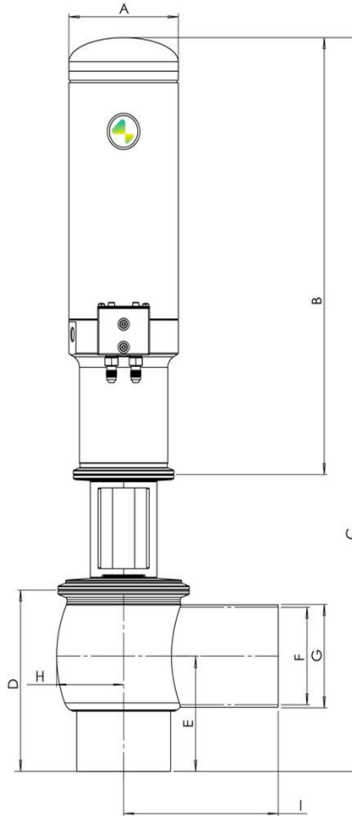
<b>Pressure:</b>	
Product Pressure	PN 145 psi (10 bar) / vacuum -13,8 psi (0,95 bar)
Housing	PN 360 psi (25 bar)
Pressure resistance	PN 650 psi (45 bar)
<b>Material:</b>	
With product contact	AISI 316 L / EN 1.4404
Without product contact	AISI 304 / EN 1.4301
Seal	EPDM, HNBR or FKM
<b>Surface:</b>	
With product contact	Ra ≤ 0.8 µm
Without product contact	Ra ≤ 1.6 µm

### FEATURES AND BENEFITS

- Hygienic design
- Easy to clean
- High wall shear stress
- Elliptical shape
- Bi-directional flow



**DIMENSIONS**

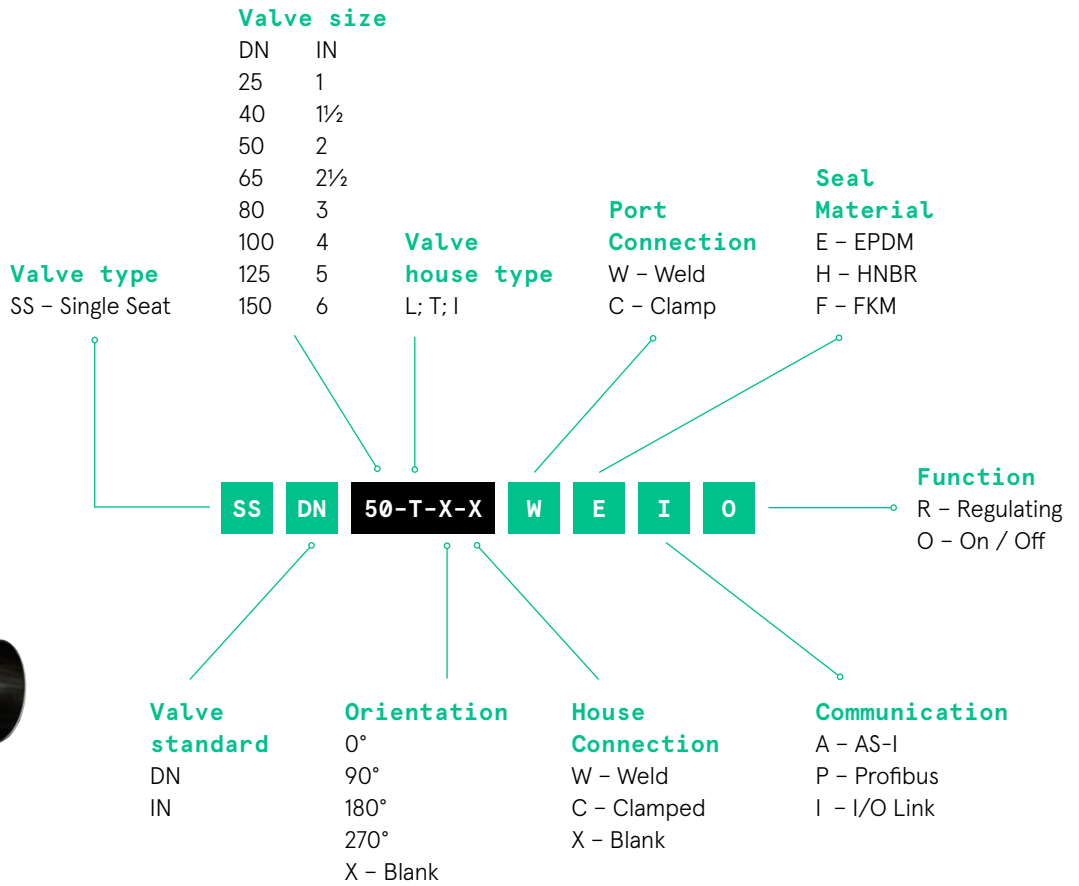


DIN/OD	ØA	B	C	D	E	ØF	ØG	H	I
DN25	99	363	508.4	75	50	26	29	21	75
DN40	99	363	554	88	90	38	41	36	90
DN50	99	363	554	88	90	50	53	42	90
DN65	99	363	614	108	110	66	70	58	110
DN80	99	363	622	110	110	81	85	64	110
DN100	99	363	633	110	110	100	104	80	110
DN125	99	363	661	202	125	125	129	100	125
DN150	99	363	752	292	200	150	154	128	200
1"	99	363	508.4	75	50	22,2	25,4	21	75
1½"	99	363	554	88	90	34,8	38,1	36	90
2"	99	363	554	88	90	47,5	50,8	42	90
2½"	99	363	614	108	110	60,2	63,5	58	110
3"	99	363	622	110	110	72,8	76,1	64	110
4"	99	363	633	110	110	97,4	101,6	80	110
5"	99	363	661	202	125			100	125
6"	99	363	752	292	200	146,9	152,4	128	200

**NUMBER SYSTEM**

How to specify valves.

- Orientation - For first valve house, always use 'X' or 'O'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigable bottom port.



**Top valve house**

# SINGLE SEAT VALVE

## VARIANTS

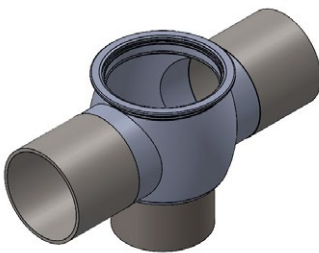
Single Chamber  
1 port + bottom



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

Single Chamber  
2 port + bottom

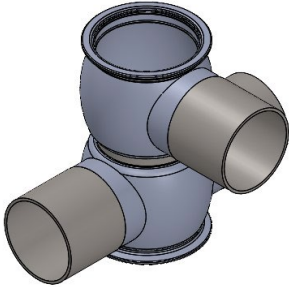


DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

VARIANTS

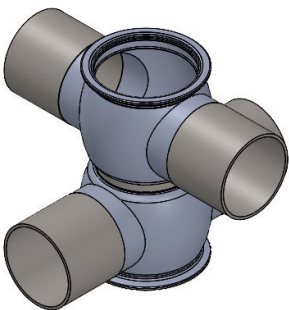
Double Chamber  
3 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

Double Chamber  
4 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•





# DOUBLE SEAT VALVES

## DOUBLE SEAT MIXPROOF VALVE

### INFORMATION

The Hydract double seat valve housing is designed in corporation with hygienic design specialists to offer a great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow. It is designed to deliver high performance every time, every day!

**Flow direction** – the flow is bi-directional (flow can be both upstream and downstream)

**Mixproof safety** – the valve internals seal off the two pipelines to avoid any unintentional mixing of fluids. If seal leakage should occur, the leaking fluid will travel through the leakage chamber instead and thereby create a visible leak indication.

**Seals** – The available seal materials are EPDM, HNBR and

FKM. Reciprocating shaft seals use PTFE as the contact material to extend lifetime.

**Seat Calibration and lifetime** – The upper seat seal compression can be adjusted by connecting the actuator to a tablet (Hydract app). This ensures the seal can be adjusted during it's lifetime and ensure the correct expansion when exposed to heat which aids in increasing lifetime of the seal.

**Flow conditions** – the conical shape of the lower seat allows for optimal flow when opening, closing or using the valve for regulation. The reduced pressure drops inherent with this design, when compared to typical ON/OFF valves, is used to gain more control over the same stroke, thus giving more stability.

Please contact Hydract for other designs.

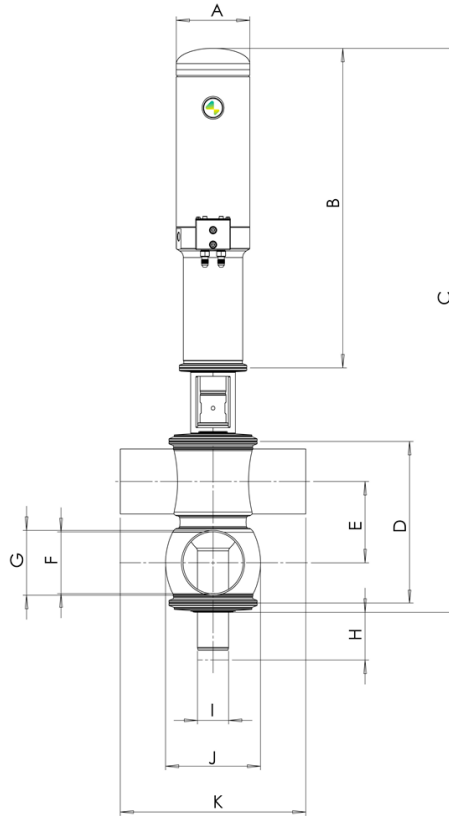
### TECHNICAL DATA

<b>Pressure:</b>	
Product Pressure	PN 145 psi (10 bar) / vacuum -13,8 psi (0,95 bar)
Housing	PN 360 psi (25 bar)
Pressure resistance	PN 650 psi (45 bar)
<b>Material:</b>	
With product contact	AISI 316 L / EN 1.4404
Without product contact	AISI 304 / EN 1.4301
Seal	EPDM, HNBR or FKM
<b>Surface:</b>	
With product contact	Ra ≤ 0.8 µm
Without product contact	Ra ≤ 1.6 µm

### FEATURES AND BENEFITS

- Hygienic design
- Easy to clean
- High wall shear stress
- Elliptical shape
- Bi-directional flow

**DIMENSIONS**



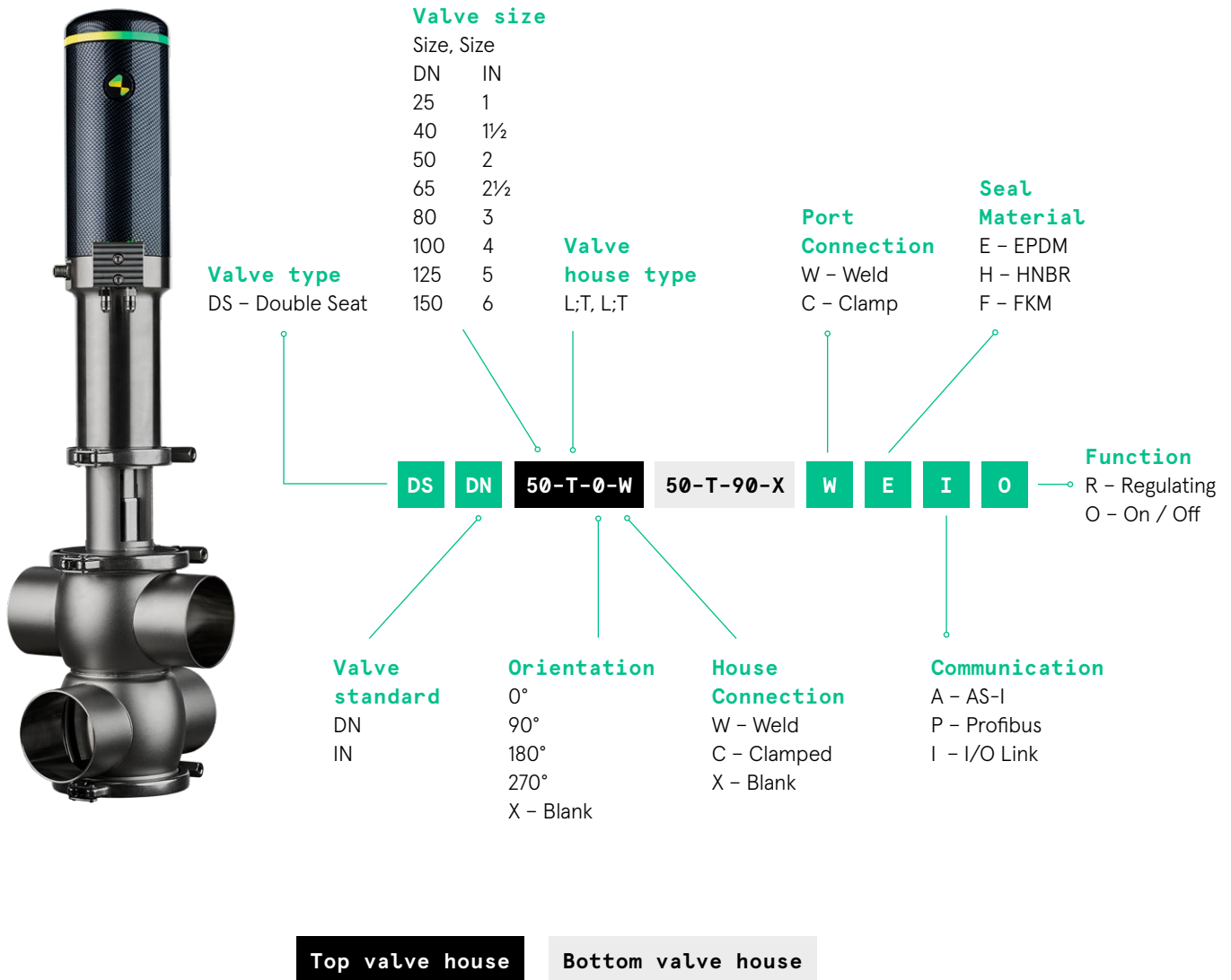
DIN/OD	ØA	B	C	D	E	ØF	ØG	H	ØI	J	K
DN25	99	380	562	77,4	61,4	26	29	59	20	60	150
DN40	99	380	587	124,6	63,4	38	41	59	20	72	180
DN50	99	380	608	148,4	75,4	50	53	59	20	84	180
DN65	99	418,5	708	181,4	91,4	66	70	71	42	116	220
DN80	99	418,5	738	211,4	106,4	81	85	71	42	128	220
DN100	99	418,5	777	249,4	125,4	100	104	71	60	160	220
DN125	99	418,5				125	129				
DN150	99	418,5				150	154				
1"	99	380	554,4	69,8	57,6	22,2	25,4	59	20	60	150
1½"	99	380	580,6	118,2	60,2	34,8	38,1	59	20	72	180
2"	99	380	603	143,4	72,9	47,5	50,8	59	20	84	180
2½"	99	418,5	696,4	169,8	85,6	60,2	63,5	71	42	116	220
3"	99	418,5	721,6	195	98,2	72,8	76,1	71	42	128	220
4"	99	418,5	771,8	244,2	122,8	97,4	101,6	71	60	160	220
5"	99	418,5									
6"	99	418,5				146,9	152,4				



**NUMBER SYSTEM**

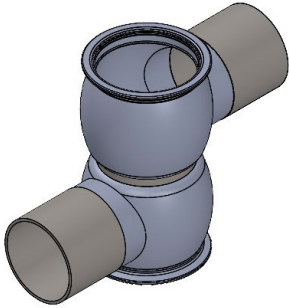
How to specify valves.

- Orientation - For first valve house, always use 'X' or '0'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigible bottom port.



**VARIANTS**

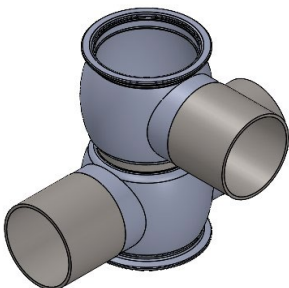
DOUBLE SEAT MIXPROOF  
2 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

DOUBLE SEAT MIXPROOF  
3 port

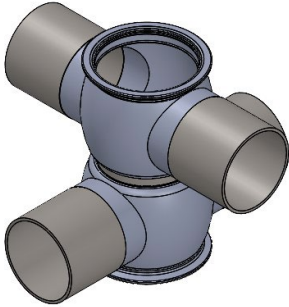


DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

**VARIANTS**

DOUBLE SEAT MIXPROOF  
4 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•





# CONTROL VALVES

## SINGLE SEAT CONTROL VALVE

### INFORMATION

The Hydract single seat valve housing is designed in corporation with hygienic design specialists to offer a great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow. It is designed to deliver high performance every time, every day!

The valve houses are clamped together with the actuator to ensure fast and easy assembly of the total valve system.

The flow direction is bi-directional, meaning that the flow can be both upstream and downstream using the same valve.

**Seat Calibration and lifetime** – The upper seat seal compression can be adjusted by connecting the actuator to a tablet (Hydract app). This ensures the seal can be adjusted during its lifetime and ensure the correct

expansion when exposed to heat which aids in increasing lifetime of the seal.

**Flow conditions** – the conical shape of the lower seat allows for optimal flow when opening, closing or using the valve for regulation. The reduced pressure drops inherent with this design, when compared to typical ON/OFF valves, is used to gain more control over the same stroke, thus giving more stability, especially when used in regulation operation. The shape of the flow controlling surface can be engineered to meet the need of the process, i.e. quick opening, equal percentage etc.

The valve sizes are shown in below table.

Please contact Hydract for other designs.

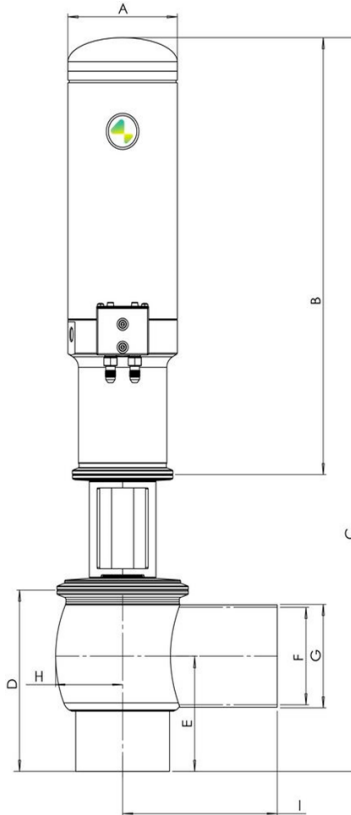
### TECHNICAL DATA

<b>Pressure:</b>	
Product Pressure	PN 145 psi (10 bar) / vacuum -13,8 psi (0,95 bar)
Housing	PN 360 psi (25 bar)
Pressure resistance	PN 650 psi (45 bar)
<b>Material:</b>	
With product contact	AISI 316 L / EN 1.4404
Without product contact	AISI 304 / EN 1.4301
Seal	EPDM, HNBR, FMK
<b>Surface:</b>	
With product contact	Ra ≤ 0.8 µm
Without product contact	Ra ≤ 1.6 µm

### FEATURES AND BENEFITS

- Hygienic design
- Easy to clean
- High wall shear stress
- Elliptical shape
- Bi-directional flow

**DIMENSIONS**

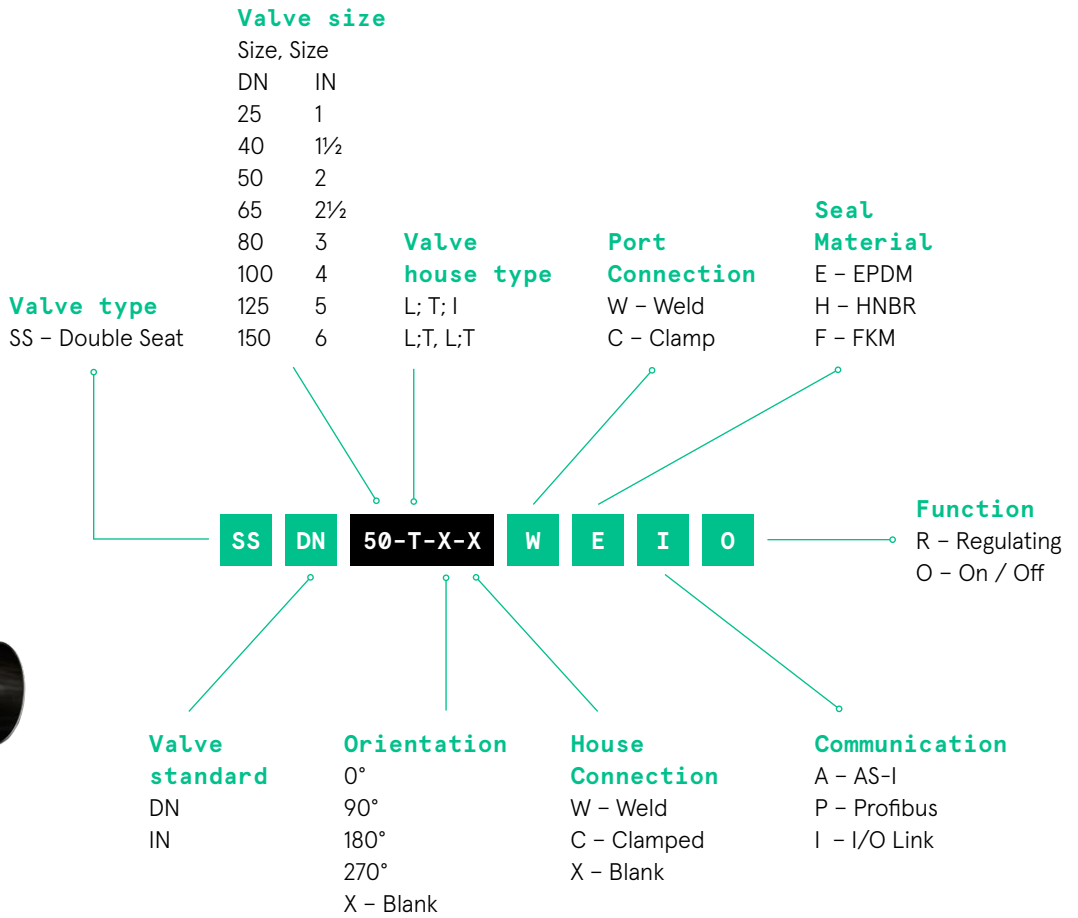


DIN/OD	ØA	B	C	D	E	ØF	ØG	H	I
DN25	99	363	508.4	75	50	26	29	21	75
DN40	99	363	554	88	90	38	41	36	90
DN50	99	363	554	88	90	50	53	42	90
DN65	99	363	614	108	110	66	70	58	110
DN80	99	363	622	110	110	81	85	64	110
DN100	99	363	633	110	110	100	104	80	110
DN125	99	363	661	202	125	125	129	100	125
DN150	99	363	752	292	200	150	154	128	200
1"	99	363	508.4	75	50	22.2	25.4	21	75
1½"	99	363	554	88	90	34.8	38.1	36	90
2"	99	363	554	88	90	47.5	50.8	42	90
2½"	99	363	614	108	110	60.2	63.5	58	110
3"	99	363	622	110	110	72.8	76.1	64	110
4"	99	363	633	110	110	97.4	101.6	80	110
5"	99	363	661	202	125			100	125
6"	99	363	752	292	200	146.9	152.4	128	200

NUMBER SYSTEM

How to specify valves.

- Orientation - For first valve house, always use 'X' or 'O'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigible bottom port.



Top valve house



**VARIANTS**

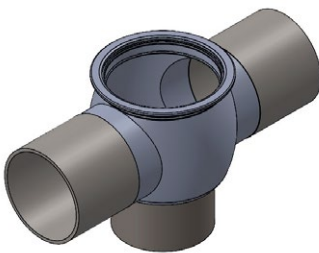
Single Chamber  
1 port + bottom



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

Single Chamber  
2 port + bottom

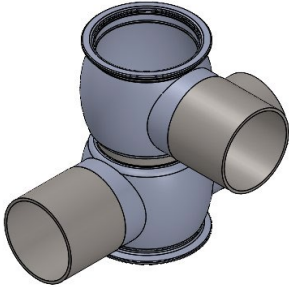


DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

VARIANTS

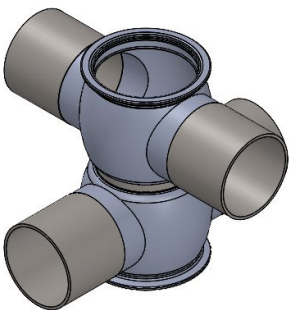
Double Chamber  
3 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

Double Chamber  
4 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•



## DOUBLE SEAT MIXPROOF CONTROL VALVE

### INFORMATION

The Hydract double seat valve housing is designed in cooperation with hygienic design specialists to offer a range of great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow.

It is designed to deliver high performance every time, every day!

**Flow direction** – the flow is bi-directional (flow can be both upstream and downstream)

**Mixproof safety** – the valve internals seal off the two pipelines to avoid any unintentional mixing of fluids. If seal leakage should occur, the leaking fluid will travel through the leakage chamber instead and thereby create a visible leak indication.

**Seals** – The available seal materials are EPDM, HNBR or FKM. Reciprocating shaft seals use PTFE as the contact material to extend lifetime.

**Seat Calibration and lifetime** – The upper seat seal compression can be adjusted by connecting the actuator to a tablet (Hydract app). This ensures the seal can be adjusted during its lifetime and ensure the correct expansion when exposed to heat which aids in increasing lifetime of the seal.

**Flow conditions** – the conical shape of the lower seat allows for optimal flow when opening, closing or using the valve for regulation. The reduced pressure drops inherent with this design, when compared to typical ON/OFF valves, is used to gain more control over the same stroke, thus giving more stability, especially when used in regulation operation. The shape of the flow controlling surface can be engineered to meet the need of the process, i.e. quick opening, equal percentage etc.

Please contact Hydract for other designs.

### TECHNICAL DATA

<b>Pressure:</b>	
Product Pressure	PN 145 psi (10 bar) / vacuum -13,8 psi (0,95 bar)
Housing	PN 360 psi (25 bar)
Pressure resistance	PN 650 psi (45 bar)
<b>Material:</b>	
With product contact	AISI 316 L / EN 1.4404
Without product contact	AISI 304 / EN 1.4301
Seal	EPDM, Other materials available on request
<b>Surface:</b>	
With product contact	Ra ≤ 0.8 µm
Without product contact	Ra ≤ 1.6 µm

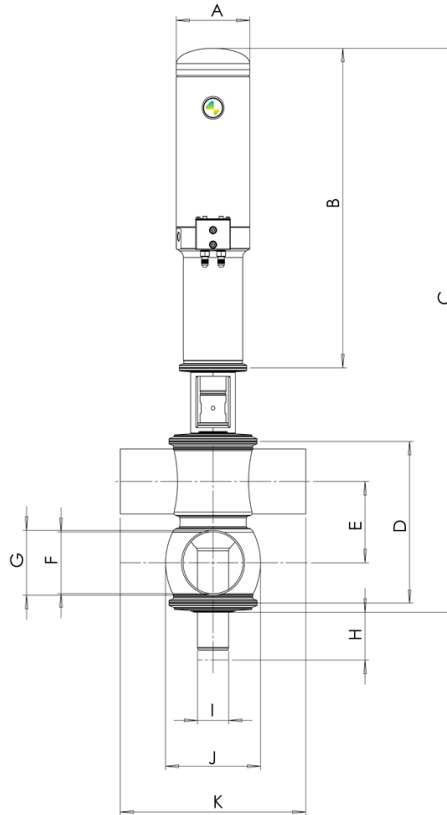
### FEATURES AND BENEFITS

- Hygienic design
- Easy to clean
- High wall shear stress
- Elliptical shape
- Bi-directional flow



# DOUBLE SEAT MIXPROOF CONTROL VALVE

## DIMENSIONS

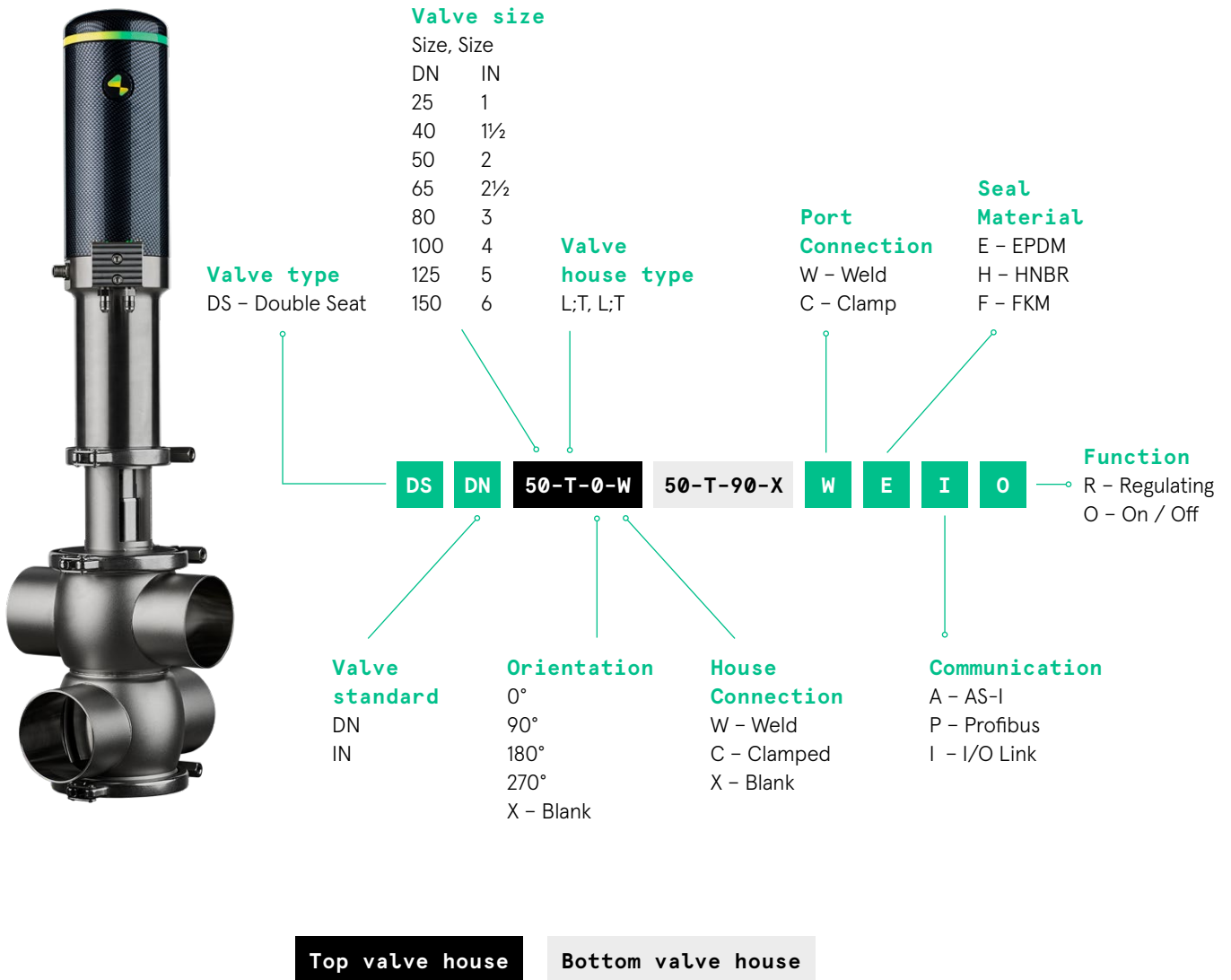


DIN/OD	ØA	B	C	D	E	ØF	ØG	H	ØI	J	K
DN25	99	380	562	77,4	61,4	26	29	59	20	60	150
DN40	99	380	587	124,6	63,4	38	41	59	20	72	180
DN50	99	380	608	148,4	75,4	50	53	59	20	84	180
DN65	99	418,5	708	181,4	91,4	66	70	71	42	116	220
DN80	99	418,5	738	211,4	106,4	81	85	71	42	128	220
DN100	99	418,5	777	249,4	125,4	100	104	71	60	160	220
DN125	99	418,5				125	129				
DN150	99	418,5				150	154				
1"	99	380	554,4	69,8	57,6	22,2	25,4	59	20	60	150
1½"	99	380	580,6	118,2	60,2	34,8	38,1	59	20	72	180
2"	99	380	603	143,4	72,9	47,5	50,8	59	20	84	180
2½"	99	418,5	696,4	169,8	85,6	60,2	63,5	71	42	116	220
3"	99	418,5	721,6	195	98,2	72,8	76,1	71	42	128	220
4"	99	418,5	771,8	244,2	122,8	97,4	101,6	71	60	160	220
5"	99	418,5									
6"	99	418,5				146,9	152,4				

NUMBER SYSTEM

How to specify valves.

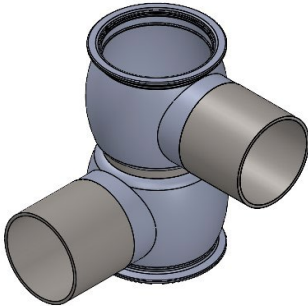
- Orientation - For first valve house, always use 'X' or 'O'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigible bottom port.



# DOUBLE SEAT MIXPROOF CONTROL VALVE

## VARIANTS

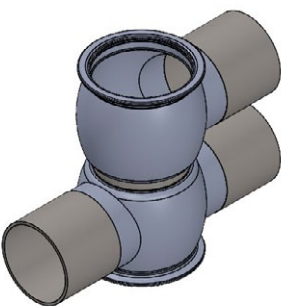
MIXPROOF  
2 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

MIXPROOF  
3 port



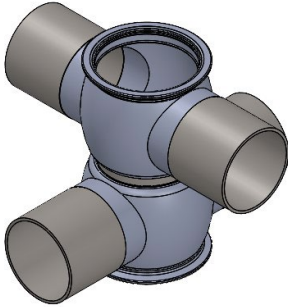
DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

# DOUBLE SEAT MIXPROOF CONTROL VALVE

## VARIANTS

MIXPROOF  
4 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•



DOUBLE SEAT MIXPROOF CONTROL VALVE





# DIVERT VALVES

## SINGLE SEAT DIVERT VALVE

### INFORMATION

The Hydract Divert valve is designed in corporation with hygienic design specialists to offer a great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow.

It is designed to deliver high performance every time, every day!

Diverting flow from an inlet to one or more outlets in the beverage industry is an important aspect for flow control and circuits or merging streams from different lines.

The valve houses are clamped together with the actuator to ensure fast and easy assembly of the total valve system.

The flow direction is bi-directional, meaning that the flow can be both upstream and downstream using the same valve.

The valve sizes are shown in below table.

Please contact Hydract for other designs.

### TECHNICAL DATA

<b>Pressure:</b>	
Product Pressure	PN 145 psi (10 bar) / vacuum -13,8 psi (0,95 bar)
Housing	PN 360 psi (25 bar)
Pressure resistance	PN 650 psi (45 bar)
<b>Material:</b>	
With product contact	AISI 316 L / EN 1.4404
Without product contact	AISI 304 / EN 1.4301
Seal	EPDM, HNBR, FKM
<b>Surface:</b>	
With product contact	Ra ≤ 0.8 µm
Without product contact	Ra ≤ 1.6 µm

### FEATURES AND BENEFITS

- Hygienic design
- Easy to clean
- High wall shear stress
- Elliptical shape
- Bi-directional flow

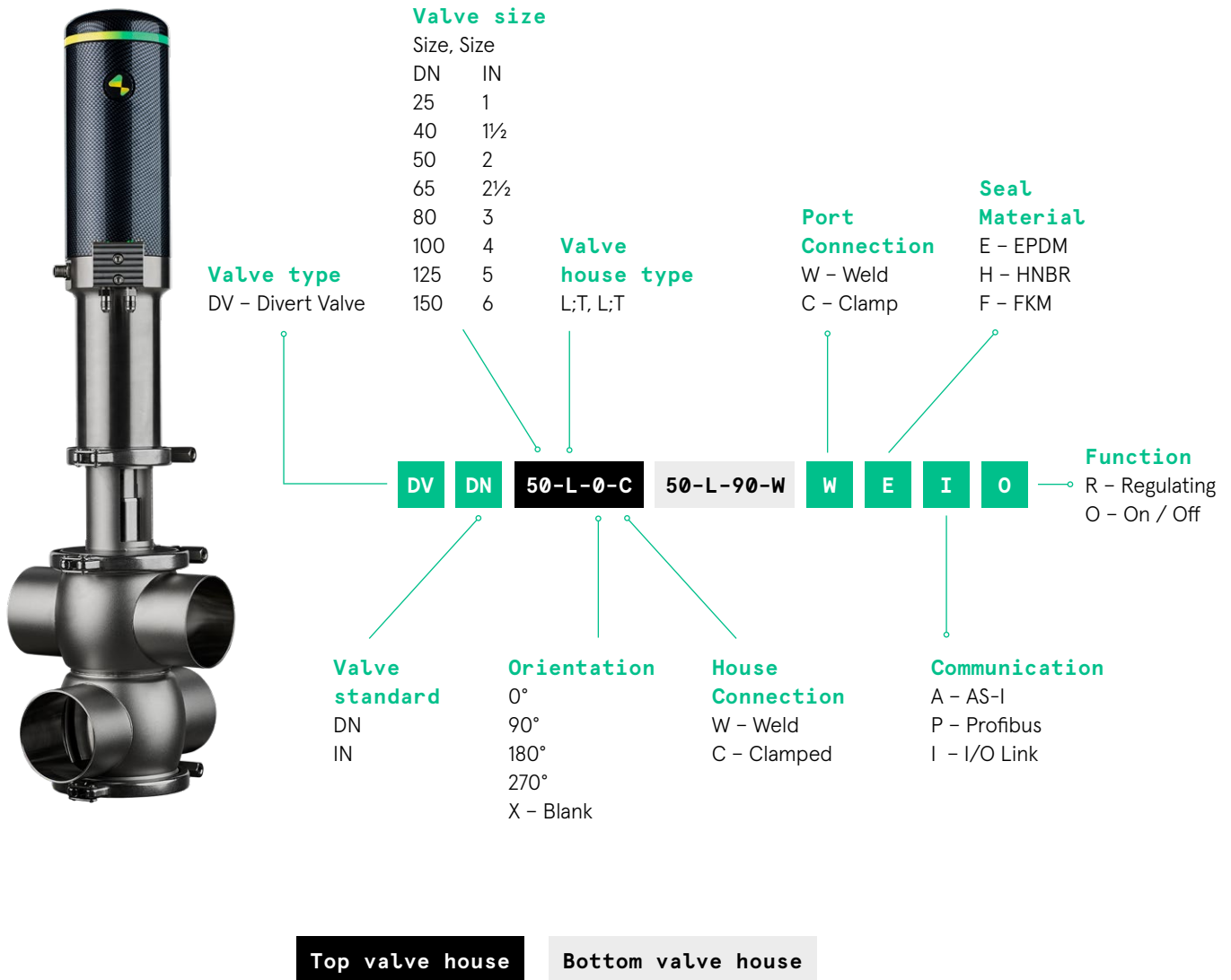
**DIMENSIONS**

DIN/ISO	ØD1 mm	ØD2 mm	ØD3 mm	L1 mm	H1 mm	H2 mm
DN25						
DN40						
DN50						
DN65						
DN80						
DN100						
DN125						
DN150						
1"						
1½"						
2"						
2½"						
3"						
4"						
5"						
6"						

## NUMBER SYSTEM

How to specify valves.

- Orientation - For first valve house, always use 'X' or '0'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigible bottom port.

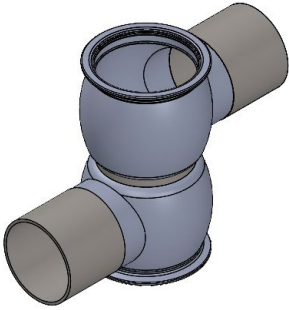




# SINGLE SEAT DIVERT VALVE

## VARIANTS

Single Seat Double Chamber  
2 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

## SINGLE SEAT DIVERT VALVE, TRIPLE CHAMBER

### INFORMATION

The Hydract Divert valve is designed in corporation with hygienic design specialists to offer a great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow.

It is designed to deliver high performance every time, every day!

Diverting flow from an inlet to one or more outlets in the beverage industry is an important aspect for flow control and circuits or merging streams from different lines.

The valve houses are clamped together with the actuator to ensure fast and easy assembly of the total valve system.

The flow direction is bi-directional, meaning that the flow can be both upstream and downstream using the same valve.

The valve sizes are shown in below table.

Please contact Hydract for other designs.

### TECHNICAL DATA

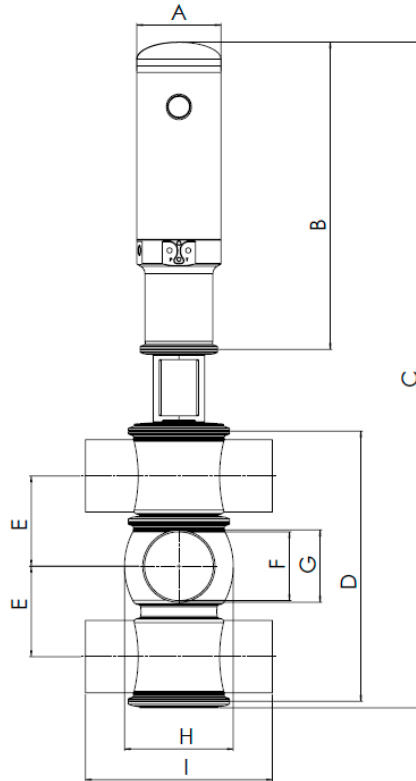
<b>Pressure:</b>	
Product Pressure	PN 145 psi (10 bar) / vacuum -13,8 psi (0,95 bar)
Housing	PN 360 psi (25 bar)
Pressure resistance	PN 650 psi (45 bar)
<b>Material:</b>	
With product contact	AISI 316 L / EN 1.4404
Without product contact	AISI 304 / EN 1.4301
Seal	EPDM, HNBR, FKM
<b>Surface:</b>	
With product contact	Ra ≤ 0.8 µm
Without product contact	Ra ≤ 1.6 µm

### FEATURES AND BENEFITS

- Hygienic design
- Easy to clean
- High wall shear stress
- Elliptical shape
- Bi-directional flow
- All valves are regulating valves

# SINGLE SEAT DIVERT VALVE

## DIMENSIONS

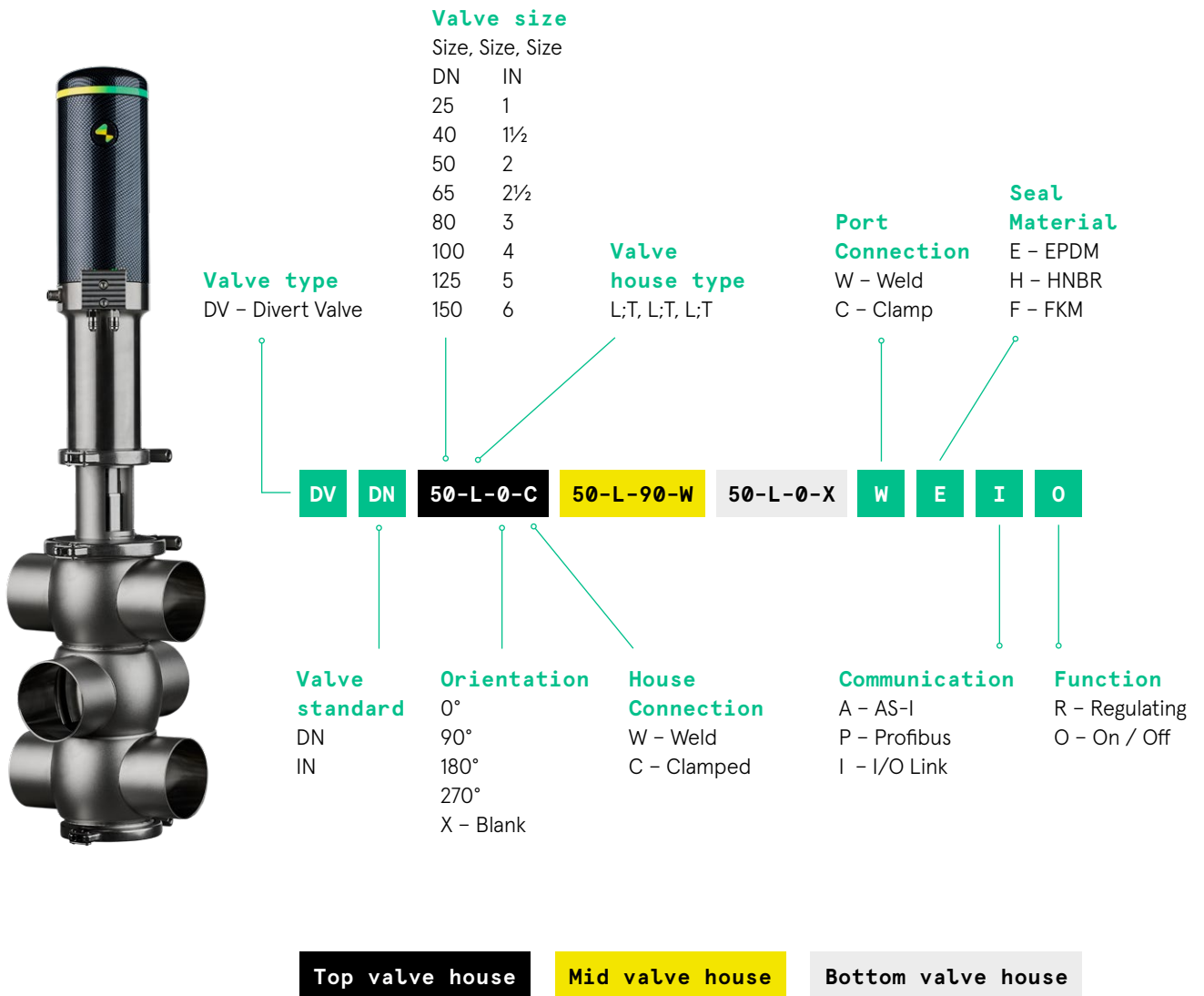


DIN/OD	ØA	B	C	D	E	ØF	ØG	H	I
DN25	99	363				26	29		
DN40	99	363	629	188	63,9	38	41	72	180
DN50	99	363	661	224	75,7	50	53	84	180
DN65	99	363	738	273	91,4	66	70	116	220
DN80	99	363	783	318	106,4	81	85	128	220
DN100	99	363	841	375	125,4	100	104	160	220
DN125	99	36	922	456	150,4	125	129	177	250
DN150	99	363	1004	538	175,4	150	154	206	300
1"	99	363				22,2	25,4		
1½"	99	363	622,6	181,6	60,7	34,8	38,1	72	180
2"	99	363	656	219	73,2	47,5	50,8	84	180
2½"	99	363	726,4	261,4	85,6	60,2	63,5	116	220
3"	99	363	766,6	301,6	98,2	72,8	76,1	128	220
4"	99	363	835,8	369,8	122,8	97,4	101,6	160	220
5"	99	36						177	250
6"	99	363	997,8	531,8	172,3	146,9	152,4	206	300

## NUMBER SYSTEM

How to specify valves.

- Orientation - For first valve house, always use 'X' or 'O'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigible bottom port.



# SINGLE SEAT DIVERT VALVE

## VARIANTS

Single SEAT tripple Chamber  
3 port



DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•



## DOUBLE SEAT MIXPROOF DIVERT VALVE

### INFORMATION

The Hydract Mixproof divert valve housing is designed in corporation with hygienic design specialists to offer a great hygienic and cleanable valve houses for the industry. The design of the valve house creates optimal conditions in terms of cleanability and flow.

It is designed to deliver high performance every time, every day!

The Mixproof divert valve is used for diverting flow from an inlet to one or more outlets in the beverage industry. This is an important aspect for flow control and circuits or merging streams from different lines, where the 2 lines must be separated from each other with mixproof function.

**Flow direction** – the flow is bi-directional (flow can be both upstream and downstream)

**Mixproof safety** – the valve internals seal off the two pipelines to avoid any unintentional mixing of fluids. If seal leakage should occur, the leaking fluid will travel through the leakage chamber instead and thereby create a visible leak indication.

**Seals** – The available seal materials are EPDM, HNBR or FKM. Reciprocating shaft seals use PTFE as the contact material to extend lifetime.

**Seat Calibration and lifetime** – The upper seat seal compression can be adjusted by connecting the actuator to a tablet (Hydract app). This ensures the seal can be adjusted during it's lifetime and ensure the correct expansion when exposed to heat which aids in increasing lifetime of the seal.

**Flow conditions** – the conical shape of the lower seat allows for optimal flow when opening, closing or using the valve for regulation. The reduced pressure drops inherent with this design, when compared to typical ON/OFF valves, is used to gain more control over the same stroke, thus giving more stability, especially when used in regulation operation. The shape of the flow controlling surface can be engineered to meet the need of the process, i.e. quick opening, equal percentage etc.

Please contact Hydract for other designs.

### TECHNICAL DATA

<b>Pressure:</b>	
Product Pressure	PN 145 psi (10 bar) / vacuum -13,8 psi (0,95 bar)
Housing	PN 360 psi (25 bar)
Pressure resistance	PN 650 psi (45 bar)
<b>Material:</b>	
With product contact	AISI 316 L / EN 1.4404
Without product contact	AISI 304 / EN 1.4301
Seal	EPDM, Other materials available on request
<b>Surface:</b>	
With product contact	Ra ≤ 0.8 µm
Without product contact	Ra ≤ 1.6 µm

### FEATURES AND BENEFITS

- Hygienic design
- Easy to clean
- High wall shear stress
- Elliptical shape
- Bi-directional flow

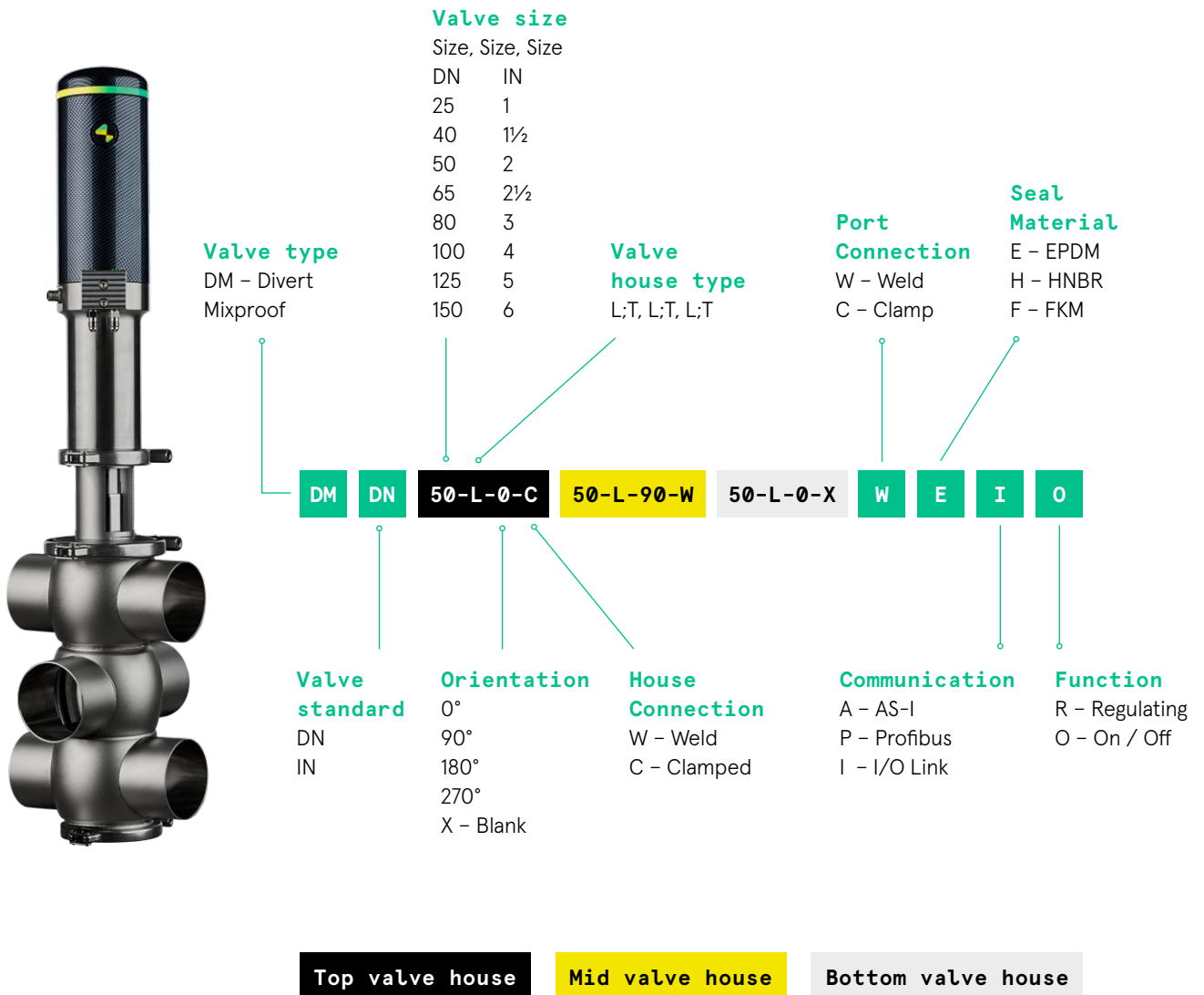
**DIMENSIONS**

DIN/ISO	ØD1 mm	ØD2 mm	ØD3 mm	L1 mm	H1 mm	H2 mm
DN25						
DN40						
DN50						
DN65						
DN80						
DN100						
DN125						
DN150						
1"						
1½"						
2"						
2½"						
3"						
4"						
5"						
6"						

## NUMBER SYSTEM

How to specify valves.

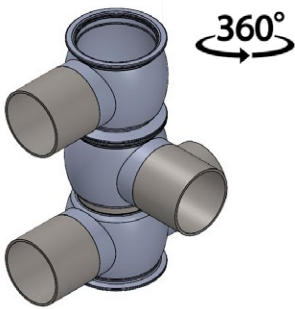
- Orientation - For first valve house, always use 'X' or '0'. All subsequent valve house orientations are referenced to the first house.
- Valve house type - L = 2 port, one bottom port, 1 side port. T = 3 port, one bottom and 2 sides. I = pigible bottom port.



# DOUBLE SEAT MIXPROOF DIVERT VALVE

## VARIANTS

Mixproof tripple Chamber  
3 port

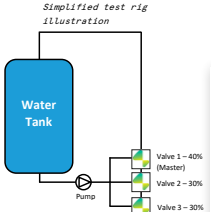


DN	EPDM	HNBR	FMK
DN25	•	•	•
DN40	•	•	•
DN50	•	•	•
DN65	•	•	•
DN80	•	•	•
DN100	•	•	•
DN125	•	•	•
DN150	•	•	•

INCH OD	EPDM	HNBR	FMK
1"	•	•	•
1½"	•	•	•
2"	•	•	•
2½"	•	•	•
3"	•	•	•
4"	•	•	•
5"	•	•	•
6"	•	•	•

# TEST REPORT

Read the test report: [Testreport.pdf](#)



**Picture of test rig**

**Simplified test rig illustration**

**Test procedure description**

During the test the total flowrate (output) were changed in order to see the effect of the regulation with different flow rates. Each tested flowrate step was kept steady over a period of time in order to follow the flow in a more stable state. This stable period is categorised as a "Constant flow set-point zone". The period between two different flowrate steps is categorised as a "ramping up/down zone".

The tested flowrate steps can be seen on the graph below.

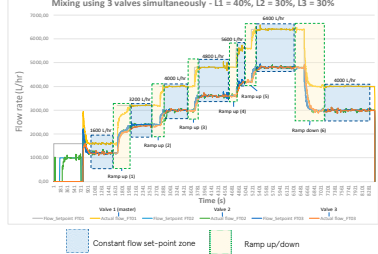
**Result description**

The test results are quantified a little different whether it is based on a constant setpoint zone or a ramping up/down zone.

The **"Constant flow set-point zones"** are based on a required constant set-point (constant flowrate) and thereby the statistic results are based on the required set point and how much the measured flows vary from their respective setpoint.

The **"Ramping up/down"** zones are on the other hand not based on a constant setpoint, since the set points are varying over time in order to reach a new required flowrate. Therefore the statistical results are based on the required constant valve flow ratios (40%, 30%, 30% respectively).

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**Graphical illustration of mixing test:**

Mixing using 3 valves simultaneously - L1 = 40%, L2 = 30%, L3 = 30%

Flow rate (L/hr)

Time (s)

Valve 1 (Master) Valve 2 Valve 3

Constant flow set-point zone Ramp up/down

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**Flow pressure, constant flow set-point zone of 16.000L/hr**

The average pressure in the time periode is 1.72 bar, with max pressure of 1.76 bar and min. pressure 1.69 bar.

**% of mixing at 16.000 L/h using 3 valves**

Mixing %

Time in seconds

Valve 1 Valve 2 Valve 3

**Pressure (16.000 L/h)**

Pressure in BAR

Time in seconds

Pressure Valve 1 Pressure Valve 2 Pressure Valve 3

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Control by Water

## FLOW REGULATION TEST



**WATER HYDRAULIC PROCESS VALVES**

# TESTIMONIAL CARLSBERG

Over the past 10 years, Carlsberg has been closely involved in developing and testing the HYDRACT valve, and since 2016 Carlsberg has implemented the HYDRACT valve at the company's brewery in Fredericia, Denmark. The project first started as an energy-reducing project – powered by water hydraulics – the patented valve technology reduces the electrical power consumption by more than 95 %. The project evolved from being the sustainable alternative to common pneumatic valves – to enabling high precision inline mixing and working with HGB and late product differentiation.

The tests of the HYDRACT valve have exceeded our expectations. The precision and repeatability achieved with water hydraulics as an alternative to compressed air enable an entirely new approach to effective and sustainable beer production. It fundamentally changes the way we can produce beer in the future, says Anders Kokholm, Brewing Director at Carlsberg Supply Company Denmark. This has led to another project that was finalized before Christmas 2021. When the new project is implemented Carlsberg will have more than 600 HYDRACT valves installed and operating in Fredericia – bringing a huge change to the way Carlsberg is producing beer.

Because water is incompressible, the hydraulic valves provide an unprecedented level of precision and control compared to pneumatic valves. HYDRACT enables customers to rethink the production methods and processes, due to the stability and precision of the HYDRACT valves.

## **New way of mixing**

The new way of mixing beer at Carlsberg, called Smart-mix, means that Carlsberg now can focus only on brewing HGB and inline mixing of these – creating a brand-new setup for the brewery – blending beer on demand for Just-In-Time filling.


In other words, Carlsberg can reduce the number of tanks, and thus beer types, considerably, and basic products can be mixed in many combinations on the way to bottling. This

gives the brewery a significantly shorter lead time. This allows the brewery to adapt much faster to the market conditions and seasons – thus minimizing the inventory carrying costs significantly.

The new inline mixing project not only achieves significant energy saving for the valves but also generates less waste and consumes less water while reducing chemical use and cleaning costs up to 30 %. Because Carlsberg will be able to brew bigger batches of the same HGB there will be fewer bright beer batches per year – hence less cleaning and a higher filling degree of the BBT.

The way Inline mixing is done at Carlsberg, we significantly increase the capacity of the BBT bottleneck in the brewery, whilst lowering the unit cost of producing beer. The system is fully automated using advanced valve, measurement, and software technologies controlling key parameters, such as alcohol, CO<sub>2</sub>, colour in real-time, producing final products within specifications and maximizing line utilization, from the smallest batch to the highest speed and capacity available in the industry, avoiding the need for mixing tanks and systems.





*"If you want to list all the benefits of using hydract's valves, then it will be a very long list. The fact that it can stay closed and regulate precisely gives us at Carlsberg the process advantage that we can make a very late product differentiation. We can cut down on our inventories to achieve higher efficiency at the bottling plant and we can produce on-demand and just-in-time while reducing our waste. It will pay off – big time!"*

**ANDERS KOKHOLM**

BREWING AND QUALITY DIRECTOR,  
CARLSBERG DENMARK



*"With the valves from HYDRACT, Carlsberg's production becomes faster and more efficient. Our production becomes easier and cheaper. We achieve better utilization of the raw materials as well as a much more flexible production with increased process reliability. It is crucial for Carlsberg to be better and more competitive than our competitors. It opens so many opportunities and creates such a good economy that it would be wrong to do otherwise."*

**PETER RASMUSSEN**

SENIOR PROCESS MANAGER,  
CARLSBERG DENMARK





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