PY4 CY series

CRYOGENICS

Applications

Where are MECA-INOX ball Cryogenic valves used ?

- Road Trailers
- ASU (Air Separation Unit)
  - Filling stations & Pumping sytems
  - Gas recovery & transfer Units
- Off shore pumping systems
- Storage tank changing systems
- LNG (Liquified Natural Gas) injection systems
- Industrial processing : food & beverage, steel industry, hospitals, microelectronics...

On which applications ?

- Liquid Carbon Dioxide (LCO_2)
- Liquid Nitrogen (LN_2)
- Liquid Oxygen (LO_2)
- Liquid Natural Gas (LNG)

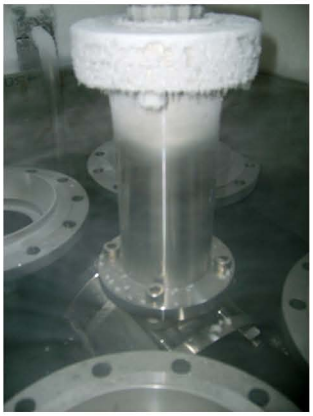
Standards

Our Cryogenic valves are fully compliant with European and international regulation: EN 1626 - ISO 21011

Degreasing & Packing

All components are degreased for oxygen service. Then, they are dried and assembled in a clean room according to EN 12 300 / ISO 23 208.
Finally, they are packed into a sealed plastic bag tagged "Degreased for Oxygen Service".

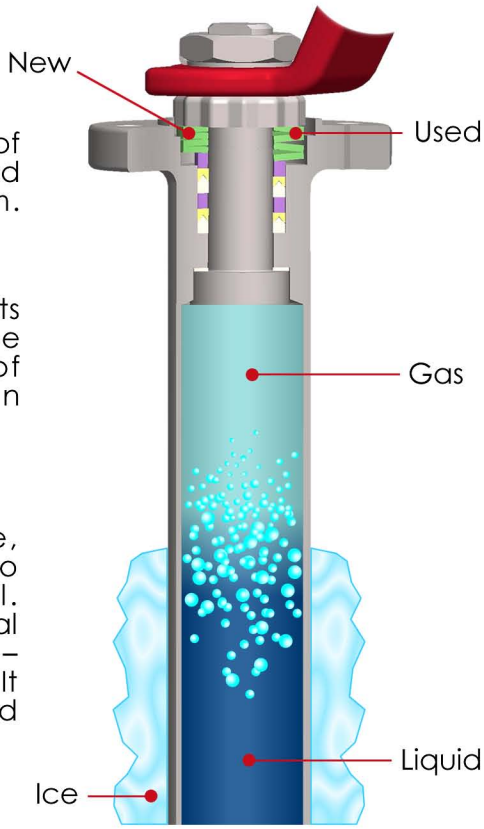
Degreasing



Testing

All valves are pneumatically and hydraulically tested. Operating torques are measured at -320°F / -196°C and at maximum pressure difference allowed. A 40% safety margin is then added to ensure operation under the most several conditions.

Features & Benefits



UPPER STEM PACKING :

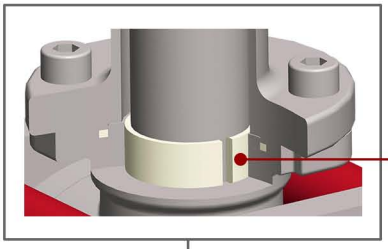
A double set of chevron packing, two glands and two pairs of live-loaded Belleville washers are located above a machined stop and thrust washer, at the top of the extended stem.

EXTENDED STEM :

Our entire valve, including ball, stem, extension tube and seats are designed specifically for cryogenic service. As such, the extended stem is precision machined from one piece of bar-stock. It has a larger ball engagement area and an oversized diameter throughout its length.

EXTENSION TUBE :

The extended stem is fully retained within a one-piece, machined extension tube that is bolted, without any welding to the valve body. Enclosed O'ring provide reliable seal. The extension precisely locates the stem and allows for minimal annular volume. Because it is made from a single extruded bar – it can be precisely machined and bolted to the valve body. It design create an upper gazeous volume to avoid any ice build up.



LOWER STEM BUSHING :

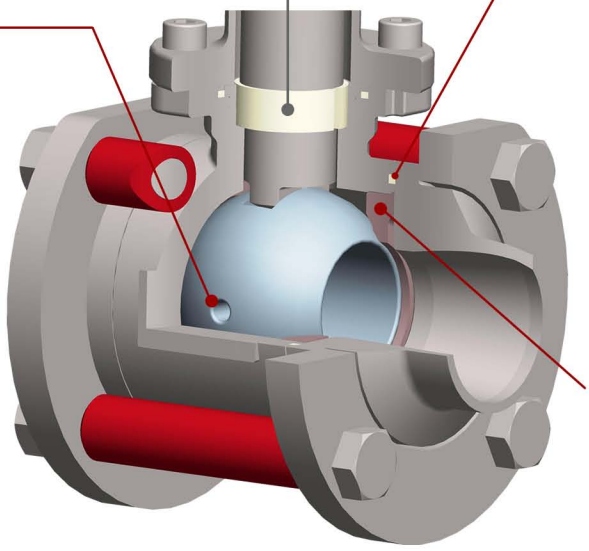
Where the stem leaves the valve body, there is a large, diagonally split-bushing that acts as a throttle bushing, restricting the flow of liquid into the extended tube. This keeps the vapor line as low as possible. Finally it is also used as stem centering bushing.

FULLY ENCLOSED BODY SEALS :

PTFE body seals are precisely located within machined grooves in the body and provide a reliable seal for all piping connections.
These seals are more accommodating than coated metal, shaped seals that, once compressed, may not adequately adapt to piping stresses due to thermal expansion and contraction.

BALL :

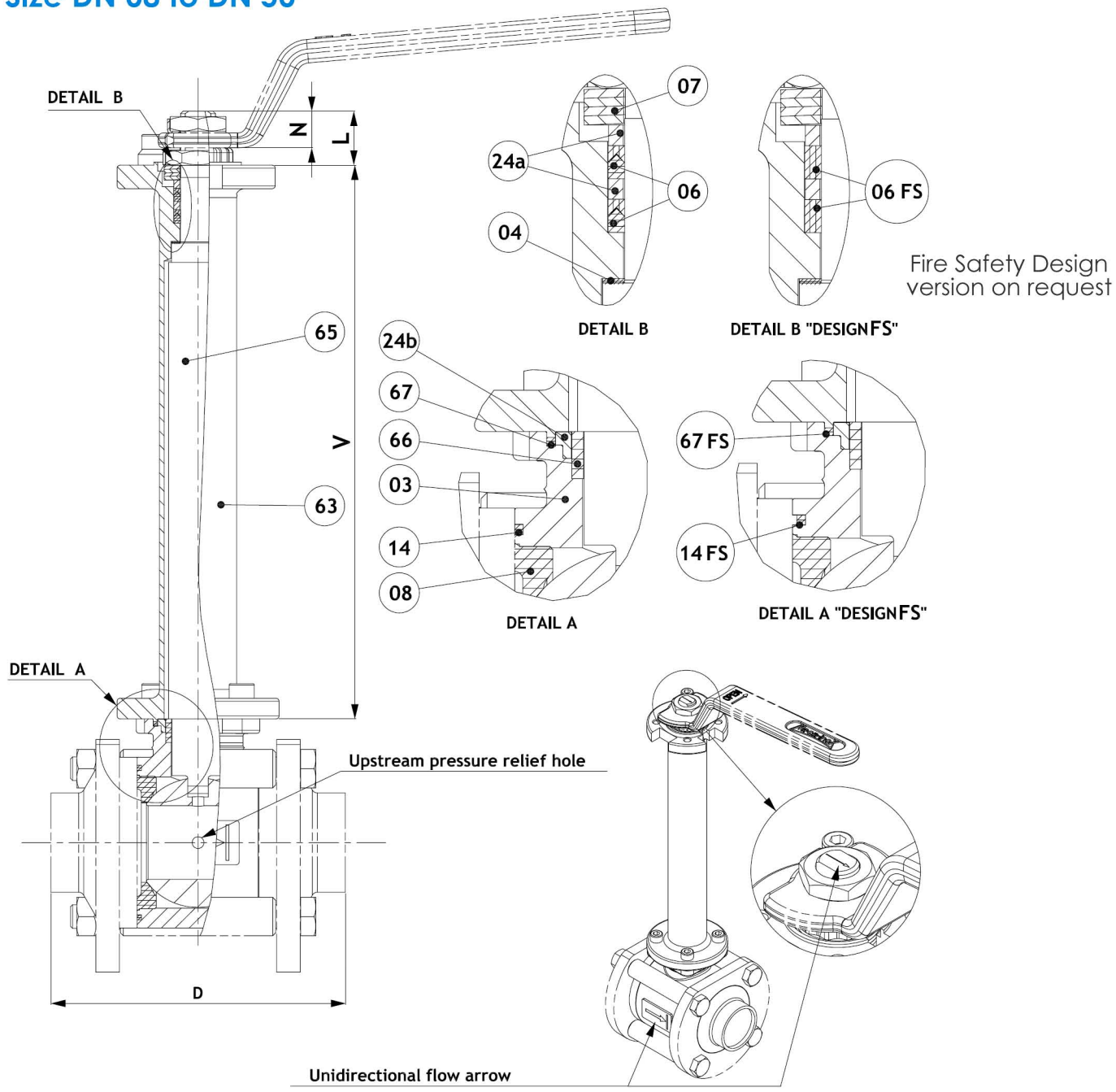
In addition to the standard top-vent hole which equalizes pressures within the body and stem extension, there is a vent hole located on the upstream side that provides cavity relief when the valve is closed. There is a corresponding arrow engraved in the valve body that indicates the proper direction of flow.
Overall, because of the increased ball / stem engagement area the valve is able to handle the greater torques seen in cryogenic applications.



SEATS :

The shape of our PTFE seats is designed to keep operating torques low and constant all the way down to -320°F and at maximum rated pressure.

Size DN 08 to DN 50



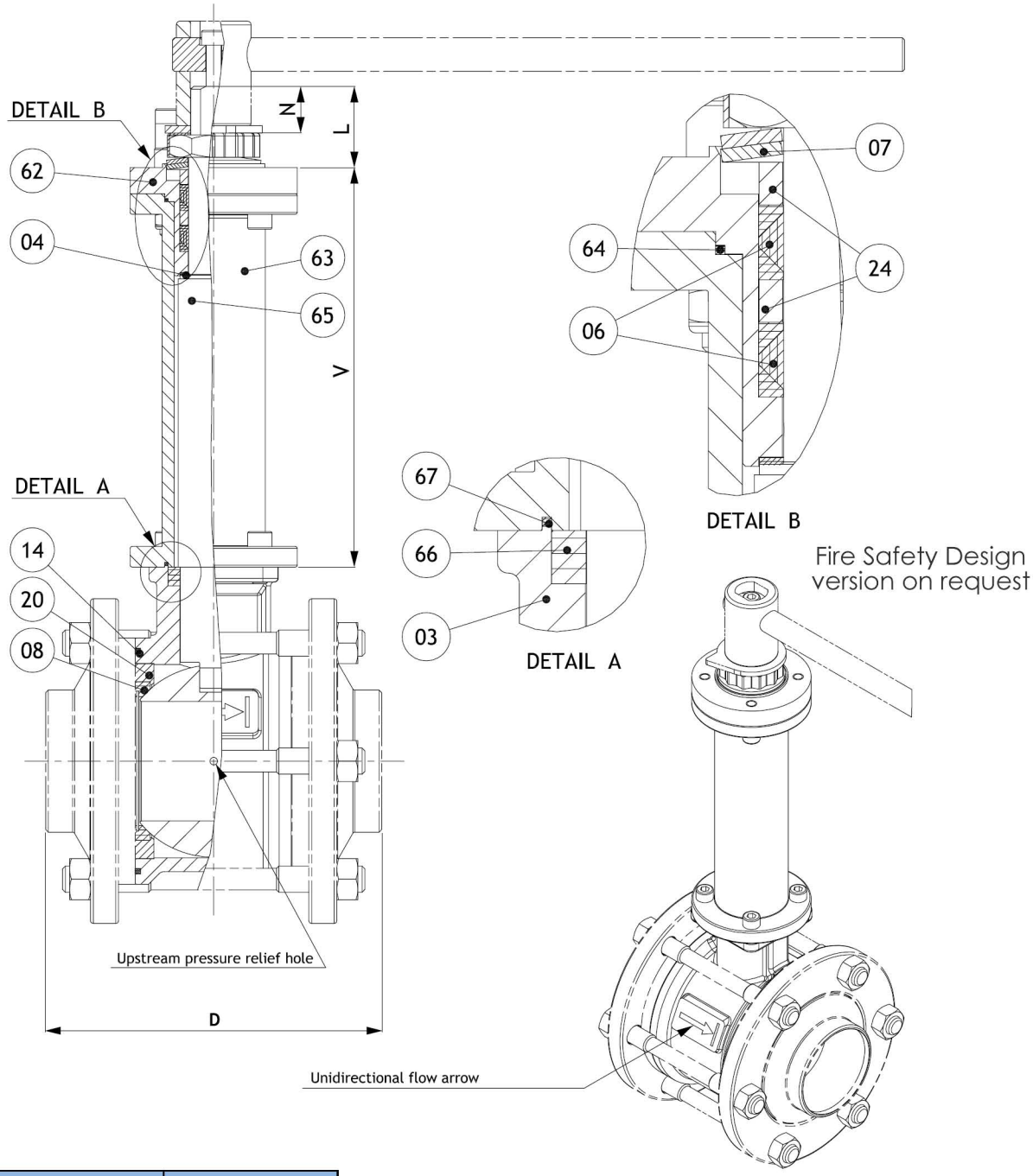
Item	Qty	Description	Material (ASTM)
03	1	Body	CF-3M
04	1	Stem thrust seal	20%PEEK PTFE
06	2	Gland packing	PTFE
06 FS**	2	Gland packing	Graphite
07	4	Spring washers	301
08	2	Seat	PTFE+Carbon
14	2	Body seal	PTFE
14 FS**	2	Body seal	Graphite
24a	2	Gland	316L
24b	1	Guide ring	316L
63	1	Extension tube	316L
65	1	Extended stem	316L
66	1	Split ring	PTFE
67	1	Lower extension seal	PTFE
67 FS**	1	Lower extension seal	Graphite

FS** Fire Safe design

Size

Size Full bore	Size Reduced bore	Pressure Bars at -196 °C	L	N	V	D
DN 08-12	DN 15	40	13,4	8,7	157	65
DN 15	DN 20	40	13,4	8,7	157	70
DN 20	DN 25	40	18,4	12,6	188	85
DN 25	DN 32	40	18,4	12,6	188	100
DN 32	DN 40	40	24,2	16,2	211,5	110
DN 40	DN 50	40	24,2	16,2	211,5	125
DN 50	DN 65	40	29,6	19	208,8	150

Size DN 65 à DN 150



Item	Qty	Description	Material (ASTM)
03	1	Body	CF-3M
04	1	Stem thrust seal	20%PEEK PTFE
06	2	Gland packing	PTFE
07	4	Spring washers	301
08	2	Seat	PTFE+Carbon
14	2	Body seal	PTFE
20	2	Seat retaining ring	316L
24	2	Gland	316L
62	1	Manual flange	316L
63	1	Extension tube	316L
64	1	Upper extension seal	316L
65	1	Extended stem	316L
66	1	Split ring	PTFE
67	1	Lower extension seal	PTFE

Size

Size Full bore	Size Reduced bore	Pressure Bars at -196 °C	L	N	V	D
DN 65	DN 80	10	43,2	25	214	180
DN 80	DN 100	10	43,2	25	216	210
DN 100	DN 150	10	49	30	216	230

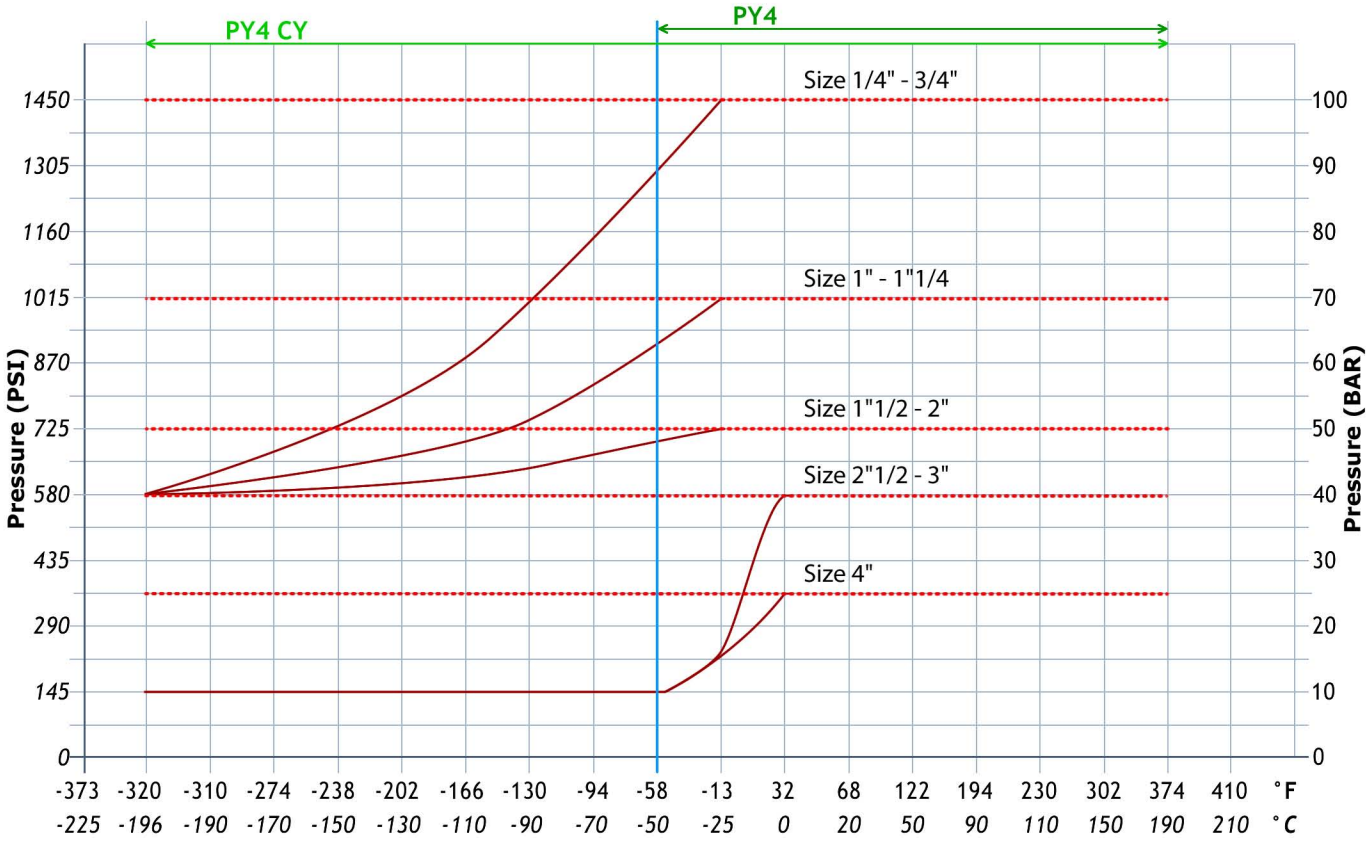
Operating Torques

Size		Max dP at -196°C / -320°F (Bar)	PN (Bar)	Torque values Nm at -196°C / -320°F
Full bore	Reduced bore			
DN 08 - 12	DN 15	40	100	6 N.m
DN 15	DN 20	40	100	11 N.m
DN 20	DN 25	40	100	16 N.m
DN 25	DN 32	40	70	26 N.m
DN 32	DN 40	40	70	51 N.m
DN 40	DN 50	40	50	86 N.m
DN 50	DN 65	40	50	157 N.m
DN 65	DN 80	10	40	172 N.m
DN 80	DN 100	10	40	172 N.m
DN 100	DN 150	10	25	301 N.m

PY4 CY with pneumatic actuator

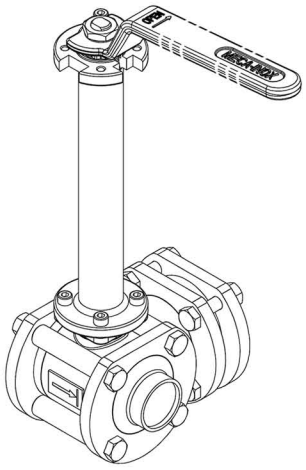
Pressure-Temperature Diagrams

(·····) Valve pressure rating
(——) Max dP for operating
All values are given for full bore size

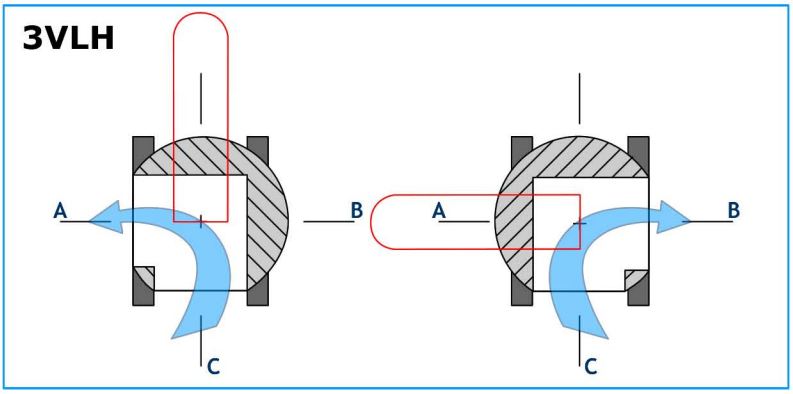


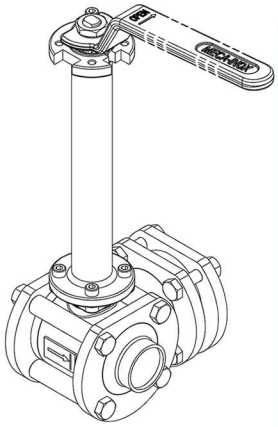
Size DN 08 to DN 150

Full bore & Reduce bore

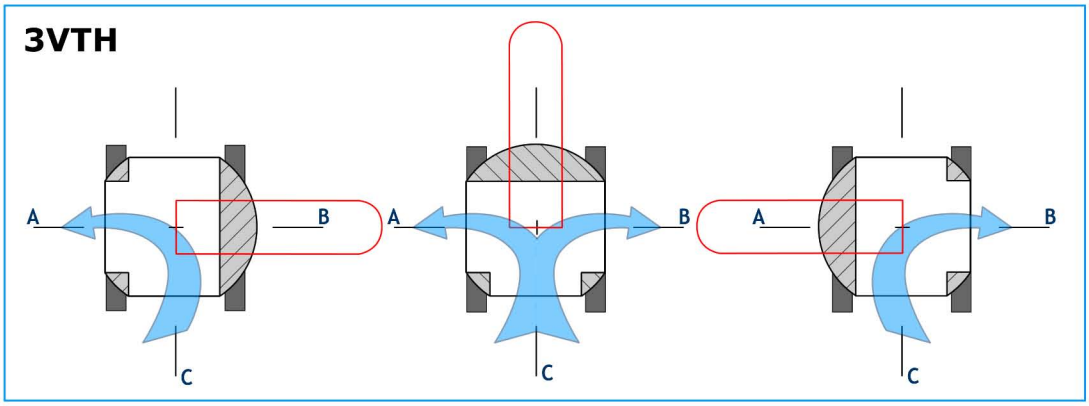


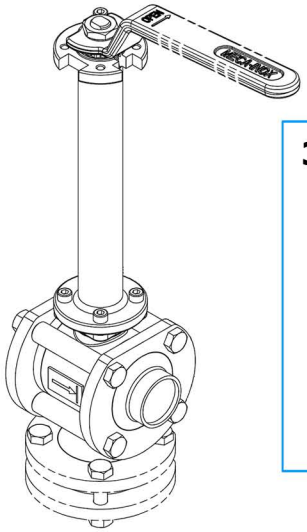
Horizontal inlet / **L** port / Diverting flow (A or B)





Horizontal inlet / **T** port / Diverting flow (A or B) or mixing (A & B)





Vertical inlet / **L** port / Diverting flow (A or B) or flow stop