

# DCX4

Single sealing divert valve

/// ORIENTATION



## DCX4

### Single sealing divert valves

The DEFINOX DCX4 divert valve has been designed to efficiently respond to market requirements, both from a cleanability and an operational point of view.

Its different configurations incorporate the cutoff, tapoff and orientation functions.

With their simple design, which has been tried and tested for many years, the floating PFA seal divert valves have successfully passed the EHEDG and 3A tests, guaranteeing their hygienic design, which is particularly suitable for the food-processing industries.

The modular design facilitates the component interchangeability and incorporates a wide range of options and variants. DCX range divert valves can thus cover a large range of applications and process configurations, while at the same time meeting market expectations and requirements.

They are fitted as standard with a floating PFA seal plug ensuring excellent valve cleaning.



### DCX4 PRODUCT ADVANTAGES

- + **From DN 25 to DN 150**  
SMS-DIN and US versions.
- + **Floating PFA seal, perfectly cleanable,**  
ensuring perfect leaktightness at high temperature and good resistance to chemical products.
- + **Spherical body with thick walls**  
ensuring excellent resistance to expansion stresses and optimum cleanability.
- + **Can be used in numerous applications and configurations**
  - Various sealing solutions (different grades of latest generation elastomer - PFA).
  - Different body configuration options:  
L/L - L/T - T/L - T/T - L/X.
  - Numerous end connections possible: SMS - DIN - Clamp.
- + **Removable and easily transformable pneumatic actuator: NO-NC-Double acting.**
- + **Easy and quick maintenance**  
thanks to the clamp subassembly assembly.

# DEFINOX

## FLEXIBILITY AND PERFORMANCE



The machining, turning and welding techniques used by DEFINOX for producing special valves and fittings give the strategic components of the valve in contact with fluid a high level of finish and quality that complies with process requirements.



**DCX4 standard valve** fitted with a stainless steel plug with a floating PFA seal.



**PFA DCX4 balanced version**  
It integrates a fixing system, which avoids the release of the plug.  
Equipped with one-piece plug and floating PFA seal.

**Volume machined body and plugs** guarantees components without retention areas. This process ensures a high level of resistance to mechanical and thermal deformation. The spherical shape of divert valve bodies ensures optimum fluid flow and reduced loss of pressure.



*Volume machined valve bodies*

**The milling and turning operations provide great flexibility** for adapting the outlet pipes. Numerous valve and fitting configurations are therefore possible.



*Heat treatment*

**The internal polishing** (RA = 0.8  $\mu\text{m}$  i.e. 180 grit) provides good on-line cleanability. It ensures a finish that complies with food industry requirements (RA = 0.4  $\mu\text{m}$  for demanding applications). A passivation operation improves corrosion resistance.

**The quality of welding** (carried out by certified TIG welders) meet health standards and requirements. They guarantee the good geometry and strength of mechanically welded assemblies.



*TIG welding on pigging system*

DEFINOX is committed to a **Lean Manufacturing and continuous improvement process**. Our industrial and organizational choices optimize our production flows and bring the necessary flexibility for the production of specific valves and fittings tailored to the customer's needs.



*Mechanical and leak tests*

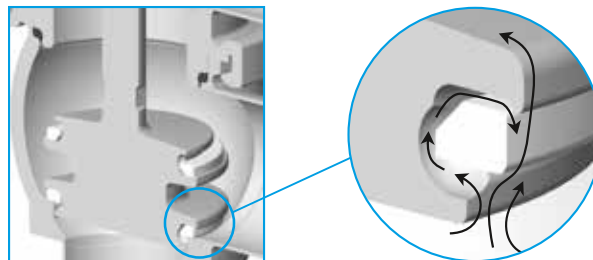
# ONE-PIECE PLUG

The DCX4 divert valves are fitted as standard with a one-piece plug with a floating PFA seal. In its standard version, the one-piece plug is made of 316L / AISI1.4404 stainless steel. Its sturdy design eliminates the risk of breakage and loosening.

## A WINNING COMBINATION PFA SEAL AND FLOATING SEAL TECHNOLOGY

The floating PFA (PerFluoroAlcoxy) seal is clipped into the plug housing. Its floating assembly ensures perfect cleanability. Its expansion allows the cleaning fluid to flow over all of its faces. Its plastomer structure also ensures the absence of porosity or crevices, risks of contamination and bacteriological growth, without risk of alteration of taste or appearance of the process fluid in contact with the PFA.

It has excellent resistance to particularly aggressive chemical products and to high temperatures.



## DIFFERENT DESIGN VARIATIONS FOR SIMPLE, FLEXIBLE ADAPTATION TO PROCESS CHANGES

### ▶ Elastomer seal for charged or abrasive products

EPDM or FKM versions available. Latest-generation elastomers providing excellent chemical resistance within their field of application.

The small area of elastomer in contact with the product increases the service life of the seals and ensures a level of hygiene that is compatible with the sanitary requirements of the processes.

### ▶ Deformable sealing diaphragm in PTFE (for aseptic applications)

Forming a physical barrier between the inside of the valve and the outside.

Surface area of diaphragm equivalent to that of the plug, helping to balance the pressure.

Optional: alcohol barrier.

Diaphragm service life: 100,000 movements at 90°C.



**NEW**

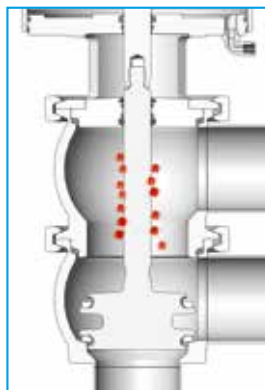
### ▶ PFA DCX4 balanced version

It integrates a fixing system, which avoids the release of the plug, and a partial balancing which limits water hammers while valve operating.

Equipped with one-piece plug and floating PFA seal.

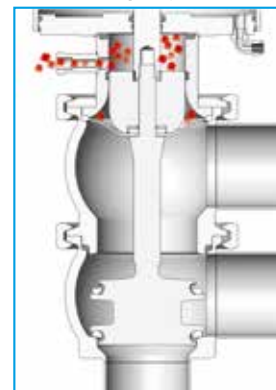
### ▶ Deformable PTFE diaphragm barrier effect

DCX4 standard valve



Valve closed

DCX4 diaphragm valve



Valve closed

 Contamination from the atmosphere

# DRIVE MECHANISM


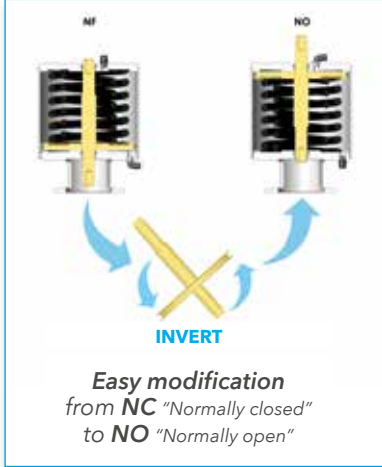


## PNEUMATIC ACTUATOR OR MANUAL DEVICE

Different versions are available to cover a maximum of functions using the same components and facilitating the management of spare parts.

All our actuators are removable. The clamp collars make for easy removal and interchangeability of the

drive mechanisms. The design of our actuators makes maintenance operations easy and quick to perform.

They are generously sized to ensure valve operation with maximum pressure acting on or under the plug (or under high line pressures).

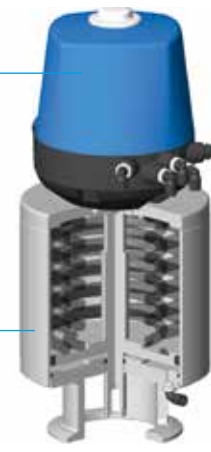
<b>DCX4 NC</b> (Normally Closed)	<b>DCX4 NO</b> (Normally Open)	<b>DCX4</b> Double-acting
 <p><i>NO version as standard</i></p>	 <p><b>INVERT</b></p> <p><i>Easy modification from NC "Normally closed" to NO "Normally open"</i></p>	 <p><i>Easily transforms into an NO or double-acting version</i></p>
<b>DCX4 manual</b>		
<p>Gradual, smooth plug operation.</p> <p>Fitted with a compression spring to prevent vibration-induced loosening.</p> <p>An indicator warns the user in the event of plug stem leakage.</p>		

# DCX4 SINGLE SEALING DIVERT VALVE

## DCX4 BALANCED

## DCX4 STANDARD VALVE

## DCX4 DIAPHRAGM VALVE



**ICS - ACS LED control tops**  
Remote valve status display.  
Easy configuration and removal.  
Resin-coated electronic module.  
Point-to-point or AS-interface.  
Plastic or stainless steel cover.

**Dismountable pneumatic actuator.** Easily transformed into "Normally Open" (NO) - "Normally Closed" (NC) or "Double-Acting" (DA).  
Actuator sized for single-acting valve operation at high line pressures.  
Fitted with quick-fitting pneumatic connections for easy maintenance.  
Common to the entire DCX. Divert valve range.

PTFE guide bushings.

Modular seal support plate.

Interchangeable components.

**Sturdy one-piece plug** meeting sanitary requirements.

**Floating PFA seal,** perfectly cleanable, ensuring perfect leaktightness at high temperature, resistant to cleaning products.

**Connection of actuator and divert assembly** by means of clamp collars for quick intervention.

**Volume-machined spherical body** with thick walls ensuring excellent resistance to expansion stresses.  
Ensures the modularity of all options and versions L/L - L/T - T/L - T/T - L/X configurations.

EPDM or FKM elastomer versions. Particularly suitable for process fluids containing particles.

**360° LED status indication**



Valve closed



Valve open



Error

Leak indicator providing a visual indication in the event of diaphragm failure.

Deformable PTFE diaphragm. Forming a physical barrier between the inside of the valve and the outside environment. Suitable for greasy and corrosive products (acid base > 3%).

# PRINCIPLE OF DCX4 OPERATION

## NORMALLY CLOSED VALVE - NC



**CLOSED POSITION**  
*Upper line flow*

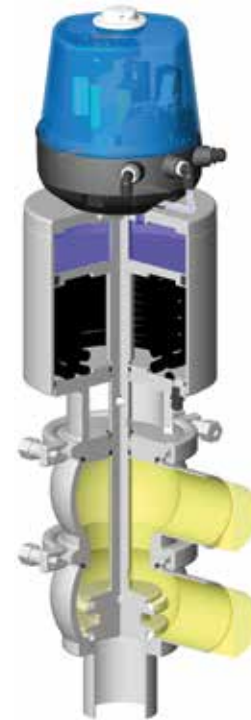


**OPEN POSITION**  
*Lower line flow*

## NORMALLY OPEN VALVE - NO



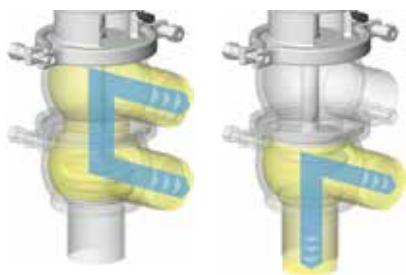
**OPEN POSITION**  
*Lower line flow*



**CLOSED POSITION**  
*Upper line flow*

# DCX4 BODY CONFIGURATIONS

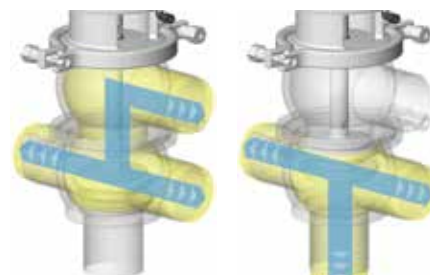
## L/L BODY



VALVE CLOSED  
Upper line flow

VALVE OPEN  
Lower line flow

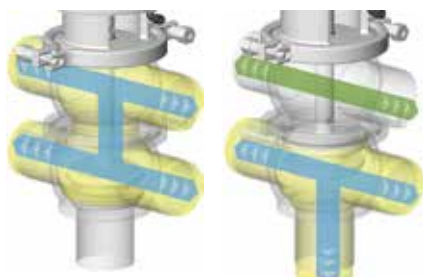
## L/T BODY



VALVE CLOSED  
Upper line flow

VALVE OPEN  
Lower line flow

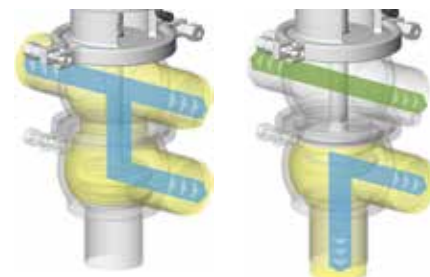
## T/T BODY



VALVE CLOSED  
Upper line flow

VALVE OPEN  
Lower line flow

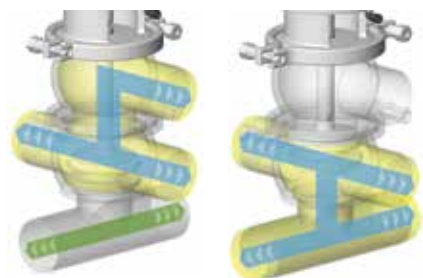
## T/L BODY



VALVE CLOSED  
Upper line flow

VALVE OPEN  
Lower line flow

## L/X BODY



VALVE CLOSED  
Upper line flow

VALVE OPEN  
Lower line flow

### ► Levels of resistance of elastomers and plastomers

	EPDM	FKM	PFA	PTFE
Oil	★	★★	★★	★★
Greasy substances	★	★★	★★	★★
NEP	★★	★★	★★	★★
Aggressive chemical products	★	★★	★★	★★
Concentrated essential oils and perfums	★	★★	★★	★★
Abrasion resistance	★	★	★	★
Low temperature < 5	★★	★	★	★

★★ Very suitable   ★ Suitable   ★ Not recommended

### ► Approval of elastomers and plastomers

	EPDM	FKM	PFA	PTFE
FDA 21 CFR 177.2660	✓	✓	✓	✓
CE 1935 / 2004	✓	✓	✓	✓
ADI Free	✓	✓	✓	✓
3-A Sanitary Standards	✓ (Class II)	✓ (Class I)	✓	✓
USP Ch.87 and Ch88 Class V	✓			
NSF 51	✓			
ACS	✓		✓	

### ► Materials

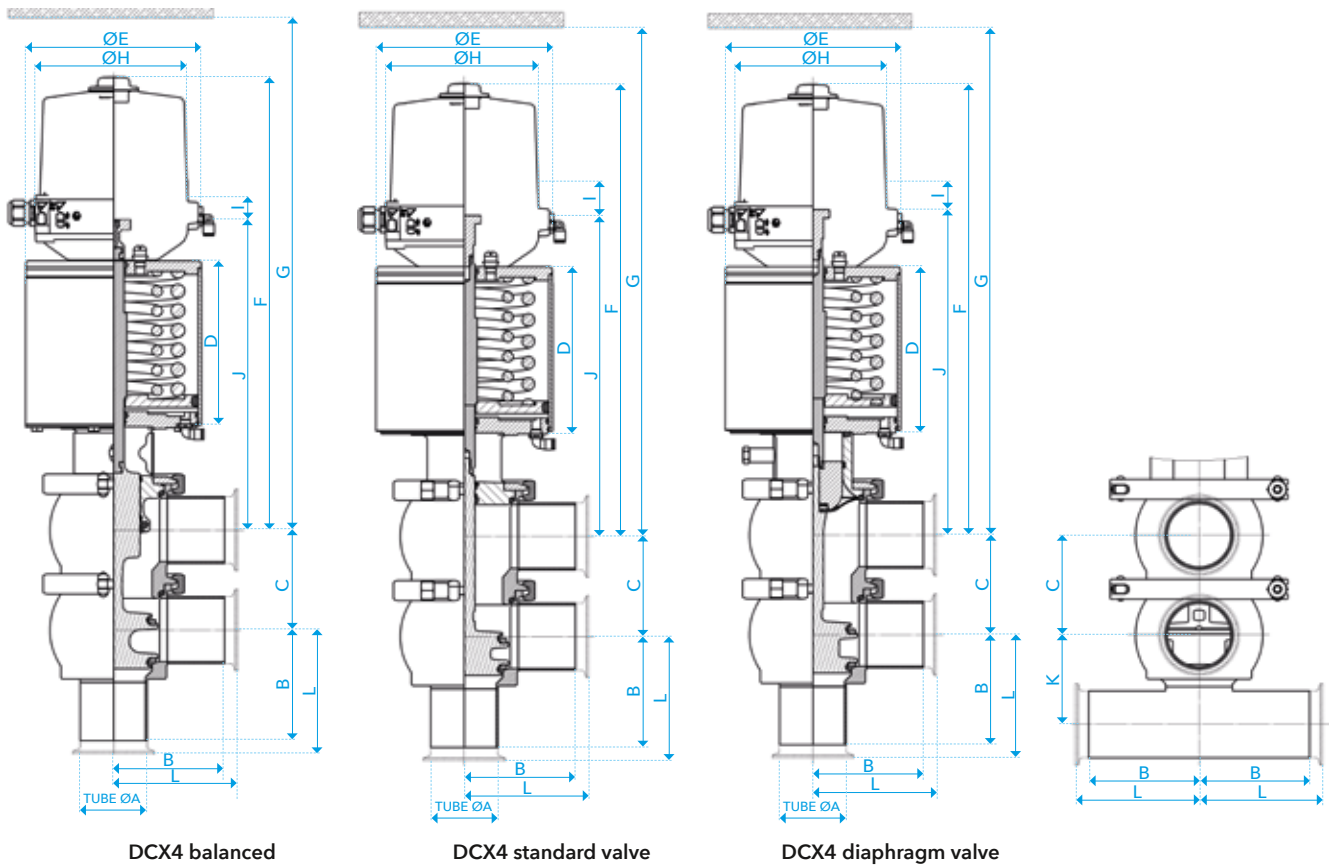
Materials	Body	Stainless steel 1.4404 / AISI 316L
	Plug	Stainless steel 1.4404 / AISI 316L or PEEK
	Plug seal	- Standard PFA version - elastomer (EPDM or FKM) - Aseptic PFA version - deformable PTFE diaphragm
	O-ring seal	Elastomer (EPDM or FKM)
	Drive mechanism	Stainless steel 1.4301 / AISI 304

Other materials upon request (HSTL C22, URANUS B6, 254 SMO,...)



# DCX4 DIMENSIONS

CAD 2D 3D E-PORTAL



Tube ØA	B	C	D	ØE	F	G	ØH	J	J	J	K	L	Weight in kg without control top DCX4 standard valve	Weight in kg without control top DCX4 diaphragm valve	Weight in kg without control top DCX4 balanced			
						with control top		DCX4 standard stroke	DCX4 diaphragm stroke	DCX4 balanced stroke	DCX4 standard valve	DCX4 diaphragm valve	DCX4 balanced					
SMS 22,6/25	55	55	110	89	337	465	104	15	11	14	236	195	210	45	70	5	5,5	5,5
SMS 35,6/38	70	70	110	89	344	465	104	20	11	18	238	201	216	55	85	5	5,5	5,5
SMS 48,5/51	82	80	123	114	373	495	104	27	17	27	273	236	247	70	97	9	9,5	9,5
SMS 60,3/63,5	105	95	159	167	423	535	104	32	25	21	324	283	295	85	125	20	21	21
SMS 72,9/76,1	110	105	159	167	429	545	104	32	25	34	329	289	301	95	130	21	22	22,5
SMS 100/104	130	150	181	216	483	622	140	36	35	36	378	339,5	353	125	155	40	41	43
DIN 26/29	55	55	110	89	337	465	104	15	11	14	236	195	210	47	-	5	5,5	5,5
DIN 32/35	55	65	110	89	342	465	104	17	11	16	243	200	217	51	-	5	5,5	5,5
DIN 38/41	70	70	110	89	344	465	104	20	11	18	238	201	216	55	-	5	5,5	5,5
DIN 50/53	80	80	123	114	373	495	104	27	17	27	273	236	247	71	-	9	9,5	9,5
DIN 66/70	108	100	159	167	425	535	104	31	25	21	324	286	295	93	-	20	21	21
DIN 81/85	115	130	159	167	455	545	104	32	35	32	335	330,5	307	105	-	28	29	29,5
DIN 100/104	130	150	181	216	483	622	140	36	35	36	378	339,5	353	125	-	40	41	43
DIN 125/129	160	165	285	270	636	752	140	54	-	-	505	-	-	155	-	73	-	-
US 1" (22,1/25,4)	51	82,5	110	89	337	465	104	15	11	14	236	195	210	45	64	5	5,5	5,5
US 1"1/2 (34,8/38,1)	57	82,5	110	89	344	465	104	20	11	18	238	201	216	55	70	5	5,5	5,5
US 2" (47,5/50,8)	76	95	123	114	373	495	104	27	17	27	273	236	247	70	89	9	9,5	9,5
US 2"1/2 (60,2/63,5)	76	108	159	167	423	555	104	32	25	21	324	283	295	85	89	20	21	21
US 3" (72,9/76,1)	82	120	159	167	429	565	104	32	25	34	329	289	301	95	95	21	22	22,5
US 4" (97,4/101,6)	130	165	181	216	483	612	140	36	35	36	378	339,5	353	125	146	40	41	43

# DCX4 OPERATING CONDITIONS

## ▶ Actuator air supply\*

min 5.5 bar  
max 7 bar

\*Pressure with direct control top supply

## ▶ Pressure (bar)

	PFA	ELASTO	DIAPHRAGM
Maximum operating pressure	8	8	6

## ▶ Temperature (°C)\*

	PFA /EPDM	PFA/FKM	ELASTO - EPDM	ELASTO - FKM	DIAPHRAGM/PFA
Min. static temperature	-5	5	-5	5	5
Max. static temperature	120	120	120	120	140
Min. dynamic temperature	-5	5	-5	5	5
Max. dynamic temperature	95	95	120	120	110
Steam flash (20 min. at 140 °C)	Oui	Oui	Oui	Oui	Oui

\* For pressure of 5 bar

## ▶ Temperature differential between the upper channel and the lower channel: max. 120 °C

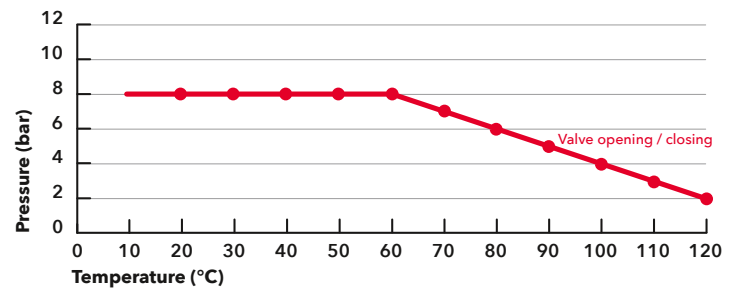
## ▶ Vacuum retention: 0.9 bar



DCX4 particle passage  
closed valve

DCX4 PFA particle passage  
open valve

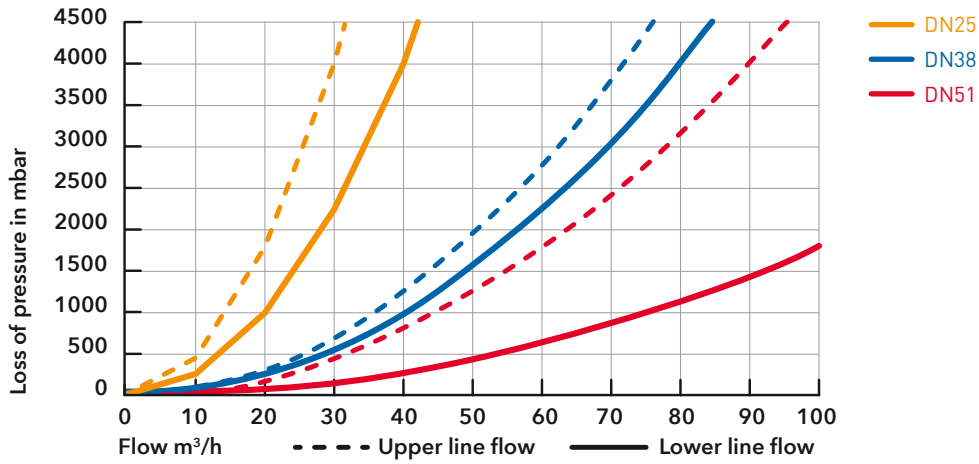
## ▶ Temperature / Pressure ratio for PFA seal



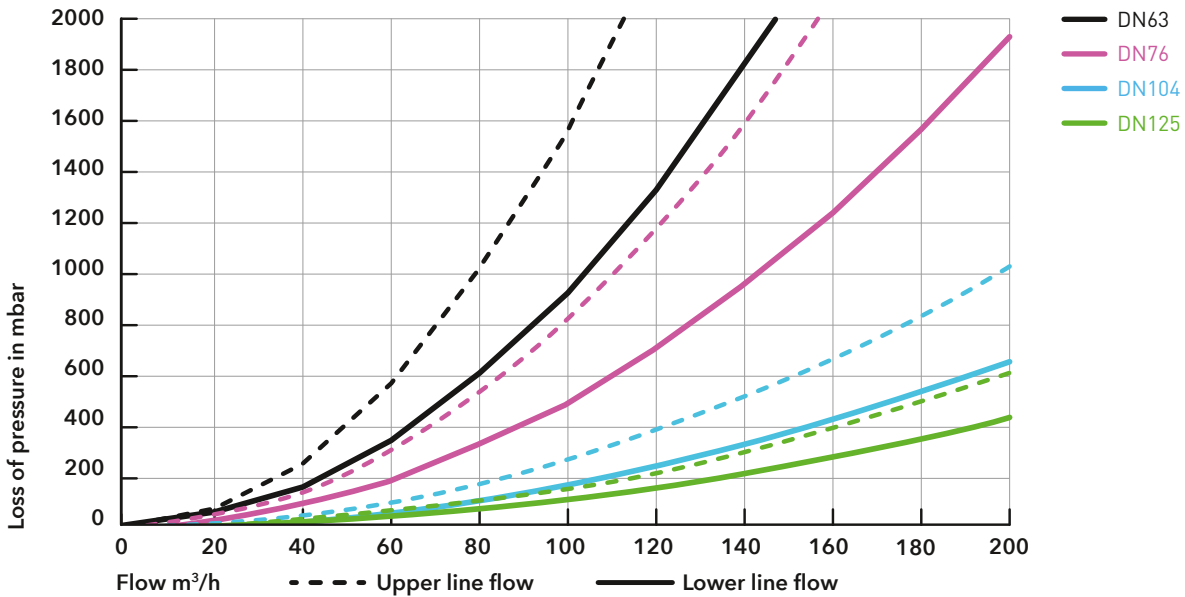
	SMS	UNIT	25		38		51		63		76		104									
			US		1 1/2		2"		2 1/2		3"		4"									
			DIN 11850 RANGE 2		25	32	40	50	65	85	100	125										
	Ø particle K standard DCX4 Upper line flow	mm	9,5	9,5	9,5	9,5	9,5	9,5	13,5	13,5	13,5	26,5	26,5	26,5	26,5	30	30	49				
	Ø particle K standard DCX4 Lower line flow	mm	10	10	10	10	13	13	16	21	21	21	26,5	26,5	25,5	27,5	27,5	26,5	30	30	49	
	Ø particle K diaphragm DCX4 Upper line flow	mm	6,5	6,5	6,5	6,5	6,5	6,5	6,5	11	11	11	19,5	19,5	19,5	20,5	20,5	20	29	29	-	
	Ø particle K diaphragm DCX4 Lower line flow	mm	6,5	6,5	6,5	7	6,5	6,5	6,5	11	11	11	19,5	19,5	19,5	20,5	20,5	19,5	29	29	-	
	Ø particle K DCX4 balanced Upper line flow	mm	5	5	-	-	5	5	-	6,5	6,5	6,5	15	15	-	17,5	17,5	26	30	30	-	
	Ø particle K DCX4 balanced Lower line flow	mm	10	10	-	-	13	13	-	31	31	31	15	15	-	27,5	27,5	26,5	30	30	-	
	Body wall thickness	mm	5	5	5	5	5	5	5	6	6	6	7	7	7	7	7	7	7	7	7	9
<b>Air consumption (volume at atmospheric pressure)</b>	Standard DC4 divert valve	NI	0,25						0,5		1,25		2,25		4							
	Diaphragm DCX4 divert valve	NI	0,125						0,25		0,875		2		2,5							
<b>Operating time (with ICS or ACS top unit)</b> Actuator air : 6 bar Operating pressure: 6 bar Circulation speed 2.5 m/s	Valve opening	sec	5/10	5/10	5/10	5/10	5/10	5/10	5/10	5/10	1	1	1	1,5	1,5	1,5	1,5	2,6	2,6	2,6	11,4	
	Valve closure	sec	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10	1,5	1,5	1,5	3,3	3,3	3,3	3,3	3,3	6,5	6,5	15,5	
	Quick drain	sec	<2/10	<2/10	<2/10	<2/10	<2/10	<2/10	<2/10	<2/10	1	1	1	1,5	1,5	1,5	1,5	1,5	2,5	2,5	6	

The operating conditions are given for information only. Combinations of extreme operating conditions may sometimes be inappropriate. In these cases, it is strongly advised to obtain advice from us.

## LOSS OF PRESSURE DCX4 DIVERT VALVES DN25 TO DN51



## LOSS OF PRESSURE DCX4 DIVERT VALVES DN63 TO DN150



SMS	25			38		51		63		76		104	
US	1"			1 1/2"		2"		2 1/2"		3"		4"	
DIN 11850 RANGE 2		25	32		40		50		65		80	100	125
Loss of pressure Kv Lower line flow	20	23	35	40	42	74	77	101	115	144	164	250	308
Loss of pressure Kv Upper line flow	15	18	30	36	38	45	48	80	94	111	131	198	256
Loss of pressure Cv Lower line flow	23,2	26,68	40,6	46,4	48,72	85,84	89,32	117,16	133,4	167,04	190,24	290	357,28
Loss of pressure Cv Upper line flow	17,4	20,88	34,8	41,76	44,08	52,2	55,68	92,8	109,04	128,76	151,96	229,68	296,96

### ► Tribofinishing

Surface condition maximizing external and internal cleanability of the valves.

For heavy-duty applications, erasure of external and internal welds upon request.

Surface condition	External	1.2 µm (150 grit)
	Internal	0.8 µm (180 grit)

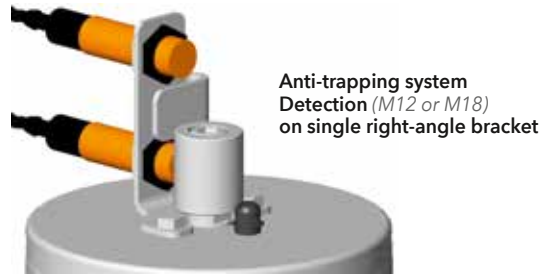
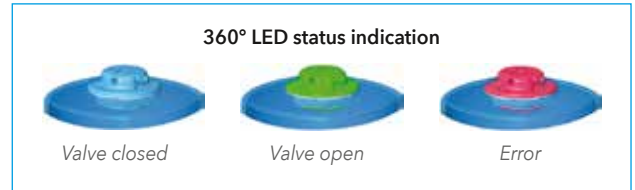
(Other surface finishing on request)

# DCX4 DIVERT VALVE CONTROL TOPS

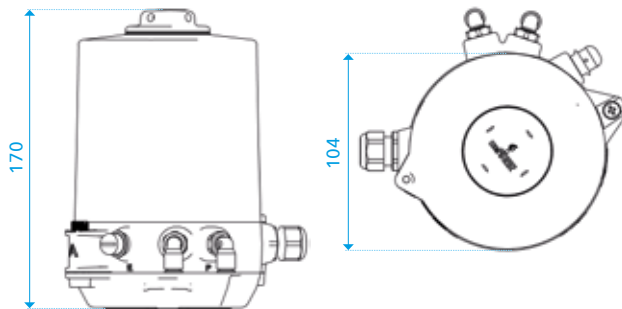
The DEFINOX control tops allow remote visualization of valve status. This easily adapted and configured unit provides numerous functions (point-to-point - AS-i - retro-data - linear sensor - relief valve).

The ACS and ICS control tops monitor and control the valves remotely and provide real time alerts for any fault conditions so that immediate action can be taken and production downtime can be minimized.

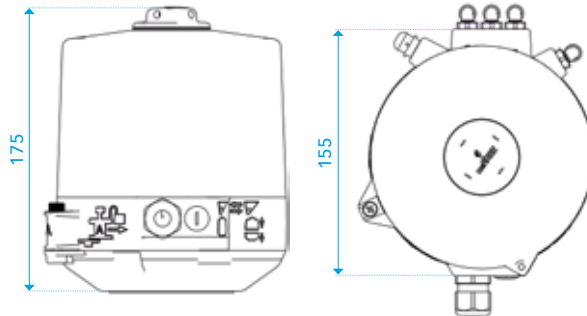
The resinated electronic modules give the DEFINOX units unique characteristics in terms of strength and protection of the components.



ICS housing  
(DN10 to DN80)  
ICS LED plastic cover



ACS housing  
(from DN100 to DN150)  
ACS LED plastic cover and for  
the double-acting version



Both versions available  
with stainless steel cap



ATEX version also available for both versions



II 2 GD (Group IIC - category 2 zone 1  
for gases - and zone 21 for dusts)

ib IIC T4 Gb - ib IIIC T135°C Db -IP67



# SUMMARY OF DCX4 SINGLE SEALING

## DIVERT VALVES

### 1/ STANDARD

- DCX4 STANDARD
- DCX4 BALANCED

### 2/ FRACTIONAL

- DCX4 FRACT. MANUAL
- DCX4 FRACT. AUTOMATIC

### 3/ ASEPTIQUE

- DCX4 STANDARD DIAPHRAGM VALVE

**DCX4 VALVES FULFILL  
THE FOLLOWING FUNCTIONS**

**/// ORIENTATION**

**/// ASEPTIC**

# PERSONALIZED SUPPORT

Our customers services offer training and maintenance services and assiste you with the management of your spare parts.

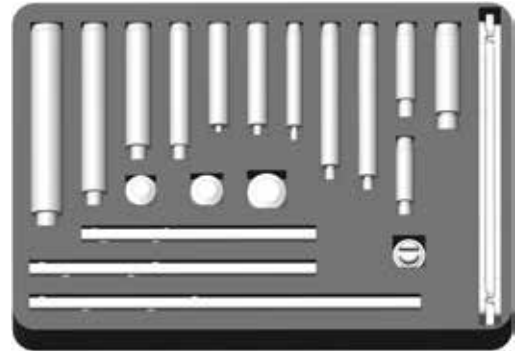
## SELF-SERVICING OF YOUR INSTALLED VALVE FLEET

With technical and practical training adapted to suit your needs, on site or at DEFINOX\*.

*\*declaration of activity recorded under number 52 44 06683 44.  
This record is not equivalent to State approval.*

## SAFE SERVICING

With tool kits and removal presses.



## PERSONALIZED VALVE FLEET MONITORING PROGRAM

Our teams of specialized technicians carry out valve maintenance in France and abroad.

Our actuators are guaranteed for 5 years from the date of delivery, under normal operating conditions, with a supply of dry, filtered air complying with DIN/ISO standard 8573-1.

We recommend replacing the wear parts of the actuator at the end of the warranty period, then once every 5 years.

## GUARANTEED OEM SPARE PARTS

- Designed and selected specifically for DEFINOX products.
- Interchangeable parts for optimum management of spare part stocks.
- Valve design for a reduced number of seals.

### ► Estimated average servicing time for our valves

TIMES (IN MINUTES)	VALVES		ACTUATOR
	ON-LINE SERVICING	WORKBENCH OPERATIONS	
DCX3/4 Fractional valve	20/30	10/15	20
DCX3	20/25	10/15	20/25
DCX4	30/40	15/20	20/25
DCX3 DE	30/40	15/20	25/30
VDCI MC	35/45	18/25	25
VDCI MC 4"	60	30	30
Control top	15		

# ID DEFINOX



## Test, download, scan...

### AUGMENTED REALITY DEVELOPED BY DEFINOX FOR ADDED SERVICES

- Instant identification of valves and their spare parts.
- Saves time for the management of the valve fleet.
- Reduced risk of errors.
- Immediate access to valve-related documents.



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