duxvalves

MANUAL

VALVE AND FLOW CONTROL SPECIALISTS
SERVICE AND RELIABILITY

Choke Control Valves
Hydraulic & Pneumatic Actuators

INDEX

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1. INTRODUCTION

Our Company

We are a company specialised in Valve & Actuator Engineering. Established in Almelo (The Netherlands), we produce high quality products in accordance with international standards.

Our products and services are:
- Choke control valves
- Micro disc control valves
- Pneumatic & hydraulic actuators
- Worldwide valve service
- Valves & Instrumentation service from any source

Our focus:
- Reducing Operational Expenditure (OPEX - Process Optimization)
    - Longer life time
    - Reducing spare part consumption
    - Avoiding unnecessary down-time and maintenance cost
- Fast track delivery
    - Significant shorter lead times
- Safe and optimal process operation
- Extensive field and application knowledge
    - Proven design
    - References at major Oil & Gas companies

Main markets we supply to are:
- Gas- and oil-exploration, on- and offshore
- Underground gas-storage
- (Petro)chemical industry

We represent quality in the manufacture of our products through all phases of development and manufacture which complies with various international standards.

Our products will be delivered to the following European directives:
- PED 2014/68/EU (module H)
- ATEX 2014/34/EU

Our quality assurance system is based on:
- API/ISO 9001:2015 series
- API Specifications Q1
- API Spec 6A

Material will be delivered according to:
- NACE MR-01.75

Our Safety, Health and Environmental policy is certified to **SCC**.
- SCC* 2008/5.1 (**S**afety, Health, Environment – **C**hecklist – **C**ontractor)

2. APPLICATIONS

The importance of implementing our valves on certain applications:
- Our unique design enables us to extend the meantime between failure (MTBF) substantially, resulting in low maintenance and life-cycle costs
- The in-depth knowledge of our customers processes and operating practices
- Our familiarity with international standards and design practices, product application expertise and our know-how on application related disciplines, such as metallurgy and control systems, contribute to customer demands
- Our After Sales and Service capabilities, which enable us to provide worldwide service

All applications where standard control valves fail:
1. **Level control valve for (high) pressure separators**
2. **Gas or Oil production choke valve**
3. **Blow down valve / (de)pressurization valve**
4. **Water injection valve**
5. **Gas lift valve**
6. **High pressure well treatment valve (fracturing)**
7. **Methanol injection**
8. **Fuel injection**

Some applications in detail:

1. Level Control Valve for (high) pressure separators.
The fluid drained from the separator often contains tremendous amounts of sand and other contaminations. The fluid is drained from the pressure in the separator (up to several hundred bars) to sometimes atmospheric pressure, so a high pressure drop very often results in erosion and or cavitation problems. Furthermore, if the valve is not tight, high pressure gas can get into your low-pressure system resulting in a very dangerous situation, which could result in shutdown of the plant. Our design enables you to improve your system substantially.

2. Oil or Gas Production Choke Valve.
The production choke valve is the first control valve after the well head Christmas tree, it controls the flow and or reduces the pressure of oil and gas wells. The product often comprises of a combination of liquids and gasses, containing water, CO_2, H_2S and abrasive particles. Important aspects of the wellhead production choke valves are:
- Flashing and cavitation due to high pressure drops.
- Corrosion resistance if the medium contains H_2S or wet CO_2.
- Erosion caused by sand or other abrasive particles

3. Blow Down Valve.
Our valves are suitable blow down applications because the design is excellent in handling gasses under a high pressure and/or high pressure drop.

For installations, processing and handling, high pressure gas blow-down and depressurization facilities are used. Important aspects for using a blow-down valve are:
- Tight shut-off FCI-70.2 class V to VI (also for environmental aspects)
- Guaranteed (maximum) fixed Cv value because of flair capacity.
- Capability to handle high pressure drops.

3. FEATURES

Spring Construction
A spring is fitted to pre-load the rotating disc. This allows the valve to be mounted in any position. The spring also absorbs thermal expansion due to temperature changes.

Body Cage
The body cage protects the body against erosion. This is part of the internal complete, for service the internal can be retrieved as one part from the choke.

Bonnet-design (triple seal) (standard)
Because of its blowout design, the bonnet has a special triple seal to extend leakage over the stem. If the shaft for any reason fractures, it can't be blown out by the internal pressure. The bonnet is also equipped with a carrying ring providing a secure sealing.

Bonnet-design (EEB – Easy Entry Bonnet)
To reduce service time, the 1 & 2" inch body sized inline and angle type chokes can be foreseen with a quick access bonnet design. The actuator remains to the body after lifting it from the bonnet shaft. Then the hammer nut type bonnet can be opened easily.
Advantages:
- Very short down time down to 50% of conventional bonnet
- No lifting tools are required
- Service can easily be done by one person
- In locked position, the frame secures the hammer nut against opening
- This bonnet comes with flexible hoses (air connections do not have to be removed)

Temperature ranges
Our valves are designed for 3 temperature ranges. The standard range is equipped with O-rings. The low temperature range has special seals just as the high temperature range, which has an extended bonnet-execution to relieve high temperatures.

Flow Characteristics
The flow characteristics of the disc with a circular orifice are almost linear. To allow a minimum controllable flow, front discs with pie shaped holes (PS trim) can be provided for the 1 and 2" body sized chokes with equal percentage characteristics.

Easy-maintenance
Type C & E are standard fitted with a bolted bonnet. For sizes 1 & 2 inch a hammer nut construction can be provided on request. Their special design makes it easy to change the internal parts on site, without having to disassemble the actuation from the valve. For every body size the complete internal can easily be removed as one part using a special internal wrench.

Repairable Internals
If the discs are effected by erosion or cavitation it is possible to repair the internals. The internals will be grinded and lapped and will be as new.

Low Emissions
The sealing construction is such that low emissions can be guaranteed and meet the fugitive emission requirements.

4. VALVE PRINCIPLES

BASIC PRINCIPLE

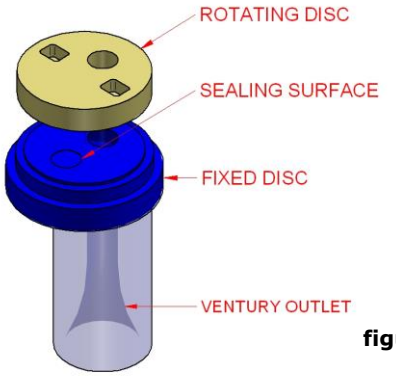


figure 1

The Duxvalves design enables one to improve their system substantially. Its design and material selection can handle these process conditions for longer periods. The multistage inlet will reduce possible cavitation by reducing the pressure over several small steps.

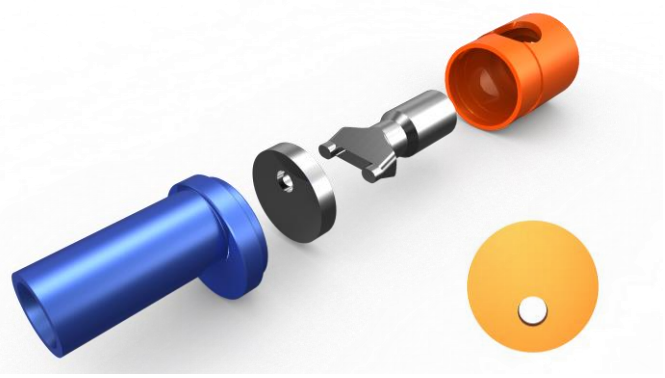
Our design guarantees a tight shut off to class V. Even after possible wear class V can still be guaranteed, because the sealing surface (figure 1) is not in contact with the flowing medium. This means the sealing surface will not be affected by the medium, so the seat tightness (FCI-70.2 class V/VI) can be guaranteed for a much longer period.

The back disc has an abrasive resistant ventury (figure 1), which removes most cavitation's and erosive material from the sealing surfaces as well as from the valve body. Furthermore, the ventury outlet (figure 1) will not only protect the body against possible erosion/cavitation, it also will transfer turbulent flow into laminar flow.

Even if there is erosion at the surface downstream the original diameter size is still available as the ventury outlet has the same orifice diameter as the discs over a considerable part, so maximum Cv can still be guaranteed.

	Principle	Trim type	Application
1.	Basic Disc	BD	Simple rigid design
2.	Pico Disc	PD	Wide range for large range ability
3.	Large Cv disc	LC	"Full bore" design with Cv value up to 650
4.	Wide range Low noise disc	WL	Large range ability icw low noise production
5.	Low Noise disc	LN	Low noise design icw strainer
6.	Filter Disc	FD	Filter to avoid clogging up the system
7.	Cage Disc	CD	2 stage flow control
8.	Diamond Disc	DD	For extreme heavy-duty applications
9.	Dual Orifice	DO	High range ability and dual applications
10.	Micro Disc	MD	Micro design for very small Cv values

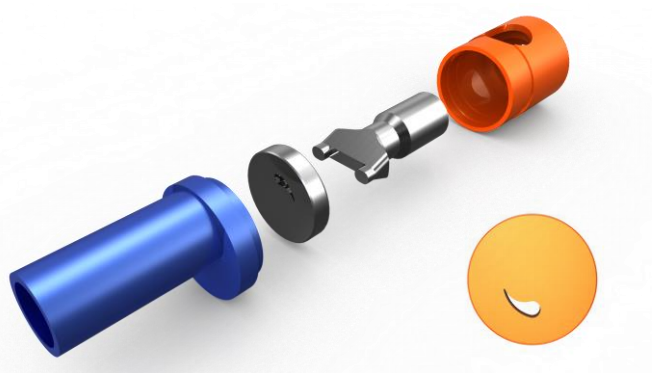
Above mentioned valve principles can be installed in different executions (angle or inline).



1. Basic Disc:
The basic version has a simple and rigid design to cover the most severe conditions where life cycle costs and long meantime between failures are an issue.

The rigid rotating disc design provides:

- **High erosion & cavitation resistance**
- **High and guaranteed seat tightness**
- **High pressure (drops)**
- **Stable control**

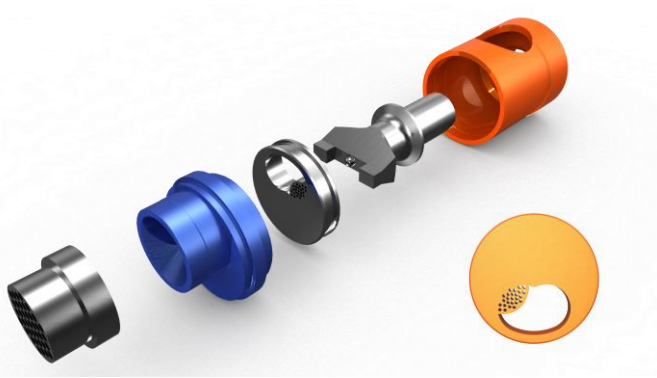


2. Pico Disc:
The pico disc version enables you to have a rigid design valve with a large range ability.

- **Large Range ability**

3. Large capacity:
At older fields, the well pressure drops. The choke should create a minimum of pressure drop. However, after closing the well for a certain period the pressure might increase and a high-performance choke valve after the X-mass tree is then required. The Duxvalves large capacity trim combines features were both earlier described cases can be handled.

- **"Full bore" design**
- **Cv values up to 650**



4. Wide range low noise:
If a large range-ability is required but noise production is also an issue Duxvalves WL trim is the solution.

- **Large Range ability**
- **Low noise**

5. Low Noise:
The low noise disc principle has a multiple orifice rotating disc in combination with a silencer after the ventury. The trim can be changed to a large capacity trim (4) without changing the body of the choke. This trim shows excellent performance at high pressure production chokes or blow down applications.

- **Low noise level**
- **Easy modification to large capacity**

6. Filter Disc:
The filter disc principle has a fixed cage combined with a solid disc control for heavy polluted fluids. The filter revents an orifice from blockage and clogging.

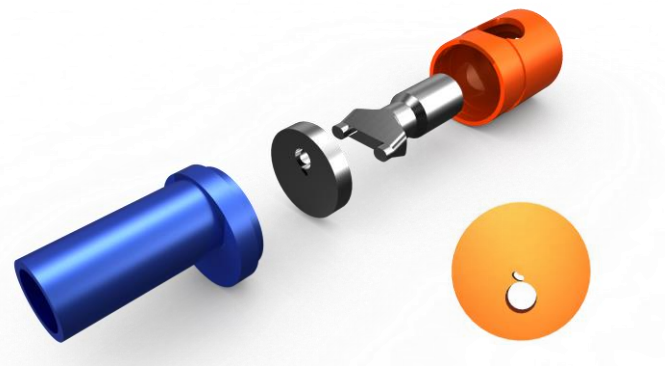
- **Anti-clogging/blockage**

7. Cage Disc:
The cage disc principle is a mixture of two valve principles (cage & disc). Combining these two principles results in a valve that is highly suitable for applications that require:

- **Low noise**
- **Anti-cavitation trim**
- **Perfect controllability**
- **High Pressure (drops)**

8. Diamond disc:
For extreme heavy-duty applications Duxvalves has developed an internal where in the Tungsten Carbide discs (carrier) another disc (sealing surfaces) out of solid diamond (PCD) is mounted.

- **Very high erosion resistance**



9. Dual Orifice:
The dual orifice principle is designed for applications where a stable controllability in the lower Cv values (very high range-ability) in combination with high flow capacity is required. For example, this valve can be used for both production as well as water injection without changing the internal.

- **Very high range-ability**
- **Dual application**

10. Micro Disc:
The micro disc principle is a unique design. The design is highly suitable for applications where small or variable face to face dimensions and small Cv values are required. The front and back discs are made out of solid tungsten carbide resulting in a high erosion and cavitation resistance.

With this principle Duxvalves focuses on all kinds of applications (Cv 0.01 to 3,8) in where one is facing erosion, cavitation's, leakage, controllability or other problems.

- **Compact design**
- **Small Cv values**
- **Easy exchangeability**

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5. DCV-C SERIES

The Duxvalves angle type choke control valve (type DCV-C series) is a modular built up design suitable for severe applications with possible short delivery times.

RANGE:

Body sizes	: ½ till 6"
Flange sizes	: ½ till 12"
Flange or hub types to	: ANSI, API, DIN
Rating	: ANSI 150 - 4.500 Lbs. API 2.000 - 15.000 Lbs.
Temperature	: -100 °C / + 300 °C

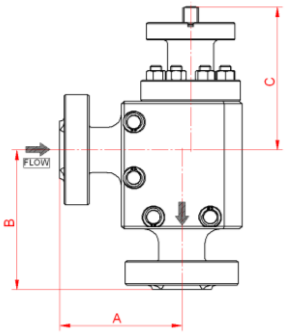
BODY MATERIAL: ASTM A350-LF2; ASTM A352-LCC; ASTM A995-4A; Duplex S31803; ASTM A487-1C; ASTM A487-CA6NM (other material on request)

TRIM MATERIAL: 1"-2" Solid Tungsten Carbide
3"-6" Tungsten Carbide in AISI 410/Duplex Holder

Trim size									
1"	BD/PD	0.3	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	CD	0.2	0.5	0.8	1.1	1.5	2.0	3.1	4.8
	FD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	DD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	LC	24** (Cv depending on inlet pipe size)							
2"	BD/PD	9	12	17	24				
	CD	7	10	14	19				
	FD	9	12	17	24				
	DD	9	12	17	24				
	LC	96** (Cv depending on inlet pipe size)							
3"	BD	34	47	61	78	96			
	CD	27	38	49	62	77			
	FD	34	47	61	78	96			
	LC	216** (Cv depending on inlet pipe size)							
4"	BD	116	138	172	188	216			
	CD	93	110	138	150	173			
	FD	116	138	172	188	216			
	LC	348** (Cv depending on inlet pipe size)							
6"	BD	258	311	384					
	CD	206	249	307					
	FD	258	311	384					
	LC	650** (Cv depending on inlet pipe size)							

Trims types as described at page 7
Other types on request
Smaller orifices can be installed

Dimensions DCV-C series



Standard dimensions are given, other dimensions are possible given our flexible design.

		Flange connection	A (mm)	B (mm)	C (mm)	Weight (kg)
1" Body	ANSI	1"-300#	165	175	190	40
		1"-600#	165	175	190	41
		1"-900#	165	175	190	45
		1"-1.500#	165	175	190	45
		1"-2.500#	175	185	190	48
		2"-300#	175	205	190	44
		2"-600#	175	205	190	46
		2"-900#	175	205	190	59
		2"-1.500#	175	205	190	59
		2"-2.500#	215	245	190	70
		3"-300#	175	205	190	51
		3"-600#	175	205	190	54
		3"-900#	215	245	190	77
		3"-1.500#	230	290	190	84
		3"-2.500#	280	340	190	110
	API	1 13/16" 10.000#	175	205	190	44
		2 1/16" 2.000#	175	205	190	48
		2 1/16" 3.000#	175	205	190	63
		2 1/16" 5.000#	175	205	190	63
		2 1/16" 10.000#	215	245	190	67
		2 9/16" 10.000#	215	245	190	77
		3 1/8" 2.000#	175	205	190	58
		3 1/8" 3.000#	215	245	190	68
		3 1/8" 10.000#	230	290	190	83

		Flange connection	A (mm)	B (mm)	C (mm)	Weight (kg)
2" Body	ANSI	2"-300#	175	205	255	57
		2"-600#	175	205	255	59
		2"-900#	175	205	255	72
		2"-1.500#	175	205	255	72
		2"-2.500#	215	245	255	83
		3"-300#	175	205	255	64
		3"-600#	175	205	255	67
		3"-900#	245	245	255	77
		3"-1.500#	290	290	255	90
		3"-2.500#	340	340	255	123
		4"-300#	230	290	255	72
		4"-600#	230	290	255	85
		4"-900#	280	340	255	95
		4"-1.500#	280	340	255	110
		4"-2.500#	310	415	255	161
	API	2 1/16" 2.000#	175	205	255	57
		2 1/16" 3.000#	175	205	255	70
		2 1/16" 5.000#	175	205	255	70
		2 1/16" 10.000#	215	245	255	75
		3 1/8" 2.000#	175	205	255	65
		3 1/8" 3.000#	215	245	255	75
		3 1/8" 5.000#	260	290	255	88
		3 1/16" 10.000#	280	340	255	102
		4 1/16" 2.000#	230	290	255	83
		4 1/16" 3.000#	280	340	255	93
		4 1/16" 5.000#	280	340	255	108
		4 1/16" 10.000#	310	415	255	127

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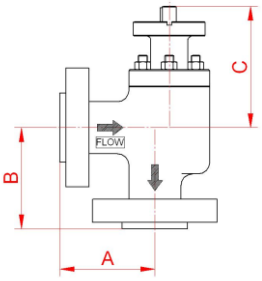
Dimensions DCV-C series

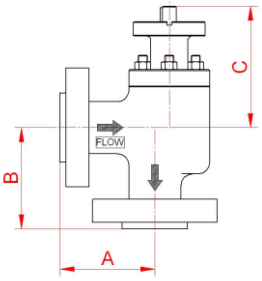


Standard dimensions are given, other dimensions are possible given our flexible design.

		Flange connection	A (mm)	B (mm)	C (mm)	Weight (kg)
3" Body	ANSI	3"-300#	185	250	355	125
		3"-600#	195	255	355	130
		3"-900#	230	290	355	140
		3"-1.500#	230	290	355	170
		3"-2.500#	280	340	355	180
		4"-300#	230	290	355	130
		4"-600#	230	290	355	145
		4"-900#	280	340	355	155
		4"-1.500#	280	340	355	190
		4"-2.500#	310	410	355	220
		6"-300#	280	340	355	150
		6"-600#	355	455	355	180
		6"-900#	355	455	355	205
		6"-1.500#	355	455	355	245
		6"-2.500#	415	515	355	395
	API	3 1/8" 2.000#	195	255	355	130
		3 1/8" 3.000#	230	290	355	140
		3 1/8" 5.000#	230	290	355	175
		3 1/16" 10.000#	280	340	355	180
		4 1/16" 2.000#	230	290	355	150
		4 1/16" 3.000#	280	340	355	160
		4 1/16" 5.000#	280	340	355	180
		4 1/16" 10.000#	310	410	355	190
		7 1/16" 2.000#	355	455	355	185
		7 1/16" 3.000#	355	455	355	210
		7 1/16" 5.000#	355	455	355	250
		7 1/16" 10.000#	415	515	355	395

		Flange connection	A (mm)	B (mm)	C (mm)	Weight (kg)
4" Body	ANSI	4"-300#	310	410	495	500
		4"-600#	330	430	495	510
		4"-900#	355	455	495	520
		4"-1.500#	355	455	495	540
		4"-2.500#	355	455	495	590
		6"-300#	335	430	495	520
		6"-600#	380	455	495	550
		6"-900#	380	455	495	570
		6"-1.500#	380	455	495	610
		6"-2.500#	465	515	495	760
		8"-300#	380	455	495	540
		8"-600#	380	455	495	590
		8"-900#	465	515	495	640
		8"-1.500#	465	515	495	710
		8"-2.500#	515	555	495	910
	API	4 1/16" 2.000#	330	430	495	515
		4 1/16" 3.000#	355	455	495	525
		4 1/16" 5.000#	355	455	495	540
		4 1/16" 10.000#	355	455	495	570
		7 1/16" 2.000#	380	455	495	550
		7 1/16" 3.000#	380	455	495	580
		7 1/16" 5.000#	380	455	495	620
		7 1/16" 10.000#	465	515	495	760
		9" 2.000#	380	455	495	590
		9" 3.000#	465	515	495	645
		9" 5.000#	465	515	495	715
		9" 10.000#	510	550	495	910

Dimensions DCV-C series



Standard dimensions are given, other dimensions are possible given our flexible design.

		Flange connection	A (mm)	B (mm)	C (mm)	Weight (kg)
6"Body	ANSI	6"-300#	330	430	495	890
		6"-600#	380	455	495	920
		6"-900#	380	455	495	950
		6"-1.500#	380	455	495	990
		6"-2.500#	465	515	495	1140
		8"-300#	380	455	495	910
		8"-600#	380	455	495	960
		8"-900#	465	515	495	1020
		8"-1.500#	465	515	495	1090
		8"-2.500#	515	555	495	1290
		10"-300#	400	475	495	940
		10"-600#	400	475	495	1030
		10"-900#	485	535	495	1090
		10"-1.500#	485	535	495	1240
		10"-2.500#	615	655	495	1670
	API	7 1/16" 2.000#	380	455	495	930
		7 1/16" 3.000#	380	455	495	955
		7 1/16" 5.000#	380	455	495	995
		7 1/16" 10.000#	465	515	495	1140
		9" 2.000#	380	455	495	970
		9" 3.000#	465	515	495	1020
		9" 5.000#	465	515	495	1090
		9" 10.000#	515	555	495	1285
		11" 2.000#	400	475	495	1035
		11" 3.000#	485	535	495	1100
		11" 5.000#	485	535	495	1250
		11" 10.000#	615	655	495	1675

6. DCV-E SERIES

The Duxvalves inline type choke control valve (type DCV-E series) is a modular built up design suitable for severe applications with possible short delivery times.

RANGE:

Body sizes	: ½ till 6"
Flange sizes	: ½ till 12"
Flange or hub types to	: ANSI, API, DIN
Rating	: ANSI 150 - 4.500 Lbs. API 2.000 - 15.000 Lbs.
Temperature	: -100 °C / + 300 °C

BODY MATERIAL: ASTM A350-LF2; ASTM A352-LCC; ASTM A995-4A; Duplex S31803; ASTM A487-1C; ASTM A487-CA6NM (other material on request)

TRIM MATERIAL: 1"-2" Solid Tungsten Carbide 3"-6" Tungsten Carbide in AISI 410/Duplex Holder

Trim size									
1"	BD/PD	0.3	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	CD	0.2	0.5	0.8	1.1	1.5	2.0	3.1	4.8
	FD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	DD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	LC	24** (Cv depending on inlet pipe size)							
2"	BD/PD	9	12	17	24				
	CD	7	10	14	19				
	FD	9	12	17	24				
	DD	9	12	17	24				
	LC	96** (Cv depending on inlet pipe size)							
3"	BD	34	47	61	78	96			
	CD	27	38	49	62	77			
	FD	34	47	61	78	96			
	LC	216** (Cv depending on inlet pipe size)							
4"	BD	116	138	172	188	216			
	CD	93	110	138	150	173			
	FD	116	138	172	188	216			
	LC	348** (Cv depending on inlet pipe size)							
6"	BD	258	311	384					
	CD	206	249	307					
	FD	258	311	384					
	LC	650** (Cv depending on inlet pipe size)							

Trims types as described at page 7
Other types on request
Smaller orifices can be installed

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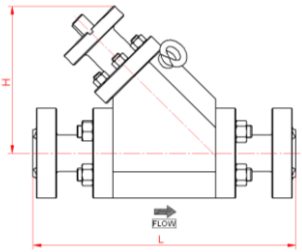
Dimensions DCV-E series



Standard dimensions are given, other dimensions are possible given our flexible design.

		Flange connection	L (mm)	H (mm)	Weight (kg)
1" Body	ANSI	1"-150#	410	*	40
		1"-300#	415	*	45
		1"-600#	415	*	45
		1"-900#	445	*	50
		1"-1.500#	445	*	50
		1"-2.500#	460	*	52
		2"-150#	425	*	52
		2"-300#	430	*	54
		2"-600#	435	*	55
		2"-900#	460	*	65
		2"-1.500#	460	*	65
		2"-2.500#	485	*	75
	API	1 11/16" 10.000#	450	*	65
		1 13/16" 10.000#	450	*	65
		2 1/16" 2.000#	425	*	60
		2 1/16" 3.000#	450	*	65
		2 1/16" 5.000#	450	*	65
		2 1/16" 10.000#	450	*	80
		2 9/16" 10.000#	465	*	85
		2 11/16" 10.000#	460	*	65
		2 13/16" 10.000#	460	*	65
		3 1/16" 2.000#	425	*	60
		3 1/16" 3.000#	460	*	65
		3 1/16" 5.000#	460	*	65

		Flange connection	L (mm)	H (mm)	Weight (kg)
2" Body	ANSI	2"-150#	515	*	57
		2"-300#	520	*	60
		2"-600#	525	*	65
		2"-900#	550	*	70
		2"-1.500#	550	*	70
		2"-2.500#	575	*	5
	API	2 1/16" 2.000#	520	*	60
		2 1/16" 3.000#	525	*	65
		2 1/16" 5.000#	550	*	70
		2 1/16" 10.000#	575	*	75
Other dimensions are on request					

* Depending on actuation

7. DCV-G SERIES

The Duxvalves inline type choke control valve (type DCV-G series) is a modular built up design suitable for severe applications with possible short delivery times.

RANGE:

Body sizes	: ½ till 6"
Flange sizes	: ½ till 12"
Flange or hub types to	: ANSI, API, DIN
Rating	: ANSI 150 - 4.500 Lbs. API 2.000 - 15.000 Lbs.
Temperature	: -100 °C / + 300 °C

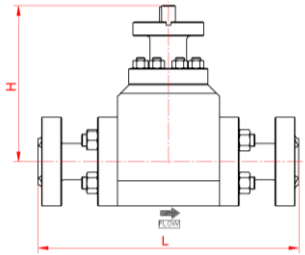
BODY MATERIAL: ASTM A350-LF2; ASTM A352-LCC; ASTM A995-4A; Duplex S31803; ASTM A487-1C; ASTM A487-CA6NM (other material on request)

TRIM MATERIAL: 1"-2" Solid Tungsten Carbide
3"-6" Tungsten Carbide in AISI 410/Duplex Holder

Trim size									
1"	BD/PD	0.3	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	CD	0.2	0.5	0.8	1.1	1.5	2.0	3.1	4.8
	FD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	DD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	LC	24** (Cv depending on inlet pipe size)							
2"	BD/PD	9	12	17	24				
	CD	7	10	14	19				
	FD	9	12	17	24				
	DD	9	12	17	24				
	LC	96** (Cv depending on inlet pipe size)							
3"	BD	34	47	61	78	96			
	CD	27	38	49	62	77			
	FD	34	47	61	78	96			
	LC	216** (Cv depending on inlet pipe size)							
4"	BD	116	138	172	188	216			
	CD	93	110	138	150	173			
	FD	116	138	172	188	216			
	LC	348** (Cv depending on inlet pipe size)							
6"	BD	258	311	384					
	CD	206	249	307					
	FD	258	311	384					
	LC	650** (Cv depending on inlet pipe size)							

Trims types as described at page 7
Other types on request
Smaller orifices can be installed

Dimensions DCV-G series



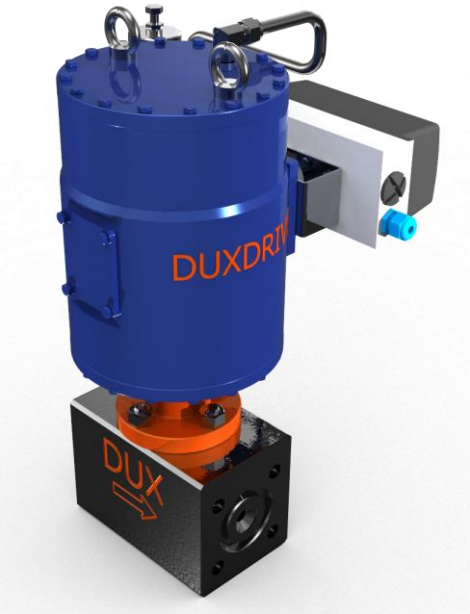
Standard dimensions are given, other dimensions are possible given our flexible design.

		Flange connection	L (mm)	H (mm)	Weight (kg)
1" Body	ANSI	1"-150#	410	*	40
		1"-300#	415	*	45
		1"-600#	415	*	45
		1"-900#	445	*	50
		1"-1.500#	445	*	50
		1"-2.500#	460	*	52
		2"-150#	425	*	52
		2"-300#	430	*	54
		2"-600#	435	*	55
		2"-900#	460	*	65
		2"-1.500#	460	*	65
		2"-2.500#	485	*	75
	API	1 11/16" 10.000#	450	*	65
		1 13/16" 10.000#	450	*	65
		2 1/16" 2.000#	425	*	60
		2 1/16" 3.000#	450	*	65
		2 1/16" 5.000#	450	*	65
		2 1/16" 10.000#	450	*	80
		2 9/16" 10.000#	465	*	85
		2 11/16" 10.000#	460	*	65
		2 13/16" 10.000#	460	*	65
		3 1/16" 2.000#	425	*	60
		3 1/16" 3.000#	460	*	65
		3 1/16" 5.000#	460	*	65

		Flange connection	L (mm)	H (mm)	Weight (kg)
2" Body	ANSI	2"-150#	515	*	57
		2"-300#	520	*	60
		2"-600#	525	*	65
		2"-900#	550	*	70
		2"-1.500#	550	*	70
		2"-2.500#	575	*	5
	API	2 1/16" 2.000#	520	*	60
		2 1/16" 3.000#	525	*	65
		2 1/16" 5.000#	550	*	70
		2 1/16" 10.000#	575	*	75
Other dimensions are on request					

* Depending on actuation

8. DCV-F series



The Duxvalves micro disc type choke control valve (type DCV-F series) is a compact built up design suitable for severe applications with possible short delivery times.

RANGE:

Body sizes	: ½ till 1"
Flange sizes	: ½ till 1"
Flanges	: ANSI, DIN
Rating	: ANSI 150 - 2.500 Lbs.
Cv range	: 0.01 – 3.8
Temperature	: -50 °C / + 200 °C

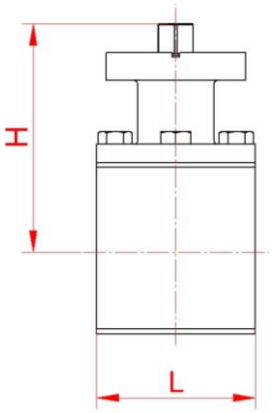
BODY MATERIAL: ASTM A350-LF2; Duplex S31803; (other material on request)

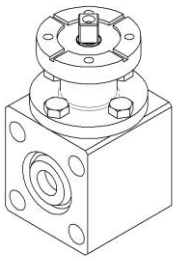
TRIM MATERIAL: 1" Light duty AISI 316 hardened
1" Heavy duty Solid Tungsten Carbide

Trim size									
1"	BD/PD	0.3	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	CD	0.2	0.5	0.8	1.1	1.5	2.0	3.1	4.8
	FD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	DD	0.2	0.6	1.0	1.4	1.9	2.5	3.9	6.0
	LC	24** (Cv depending on inlet pipe size)							
2"	BD/PD	9	12	17	24				
	CD	7	10	14	19				
	FD	9	12	17	24				
	DD	9	12	17	24				
	LC	96** (Cv depending on inlet pipe size)							
3"	BD	34	47	61	78	96			
	CD	27	38	49	62	77			
	FD	34	47	61	78	96			
	LC	216** (Cv depending on inlet pipe size)							
4"	BD	116	138	172	188	216			
	CD	93	110	138	150	173			
	FD	116	138	172	188	216			
	LC	348** (Cv depending on inlet pipe size)							
6"	BD	258	311	384					
	CD	206	249	307					
	FD	258	311	384					
	LC	650** (Cv depending on inlet pipe size)							

Trims types as described at page 7
Other types on request
Smaller orifices can be installed

Dimensions DCV-F series





		Flange connection	L (mm)	H (mm)	Weight (kg)
1" Body	ANSI	1"-150#	102	147	11
		1"-300#	102	147	11
		1"-600#	102	147	11
		1"-900#	102	147	11
		1"-1.500#	102	147	11
		1"-2.500#	102	147	12
		1"-150#	160	147	12
		1"-300#	160	147	12
		1"-600#	160	147	12
		1"-900#	160	147	12
		1"-1.500#	160	147	12
		1"-2.500#	160	147	13

Standard dimensions are given, other dimensions are possible given our flexible design.

9. ACTUATION & CONTROLS

Actuators:

The following types can be fitted:

A) Pneumatic actuators*

The Duxdrive (DDP Series) is a pneumatic spring return or double acting actuator with a rotary output suitable to operate on/off or modulating Duxvalves.

FEATURES

- Short delivery times
- Fits to all Duxvalves sizes
- Custom torque curve
- Compact design
- Uncomplicated design
- Smooth output rotation (no slip-stick)
- Xylan coated cylinder (ultimate corrosion protection)
- Simple & safe maintenance
- Easy & direct mounting
- Different angular mounting positions
- ISO 5211 or custom valve interface
- VDI/VDE 3845 position indication (dual optional)
- Minimum adjustment open/close required
- Carbon steel housing (stainless steel optional)

APPLICATIONS:

- On/Off valves
- Modulating valves

RANGE:

Torque	: 160 till 6000 Nm (larger on request)
Output angle	: to suit Duxvalves
Mounting flange connection	: F07 till F25

*(Other brands are available on request)

B) Hydraulic actuators*

The Duxdrive (DDH series) is a hydraulic spring return or double acting actuator with a rotary output suitable to operate on/off or modulating Duxvalves.

FEATURES

- Short delivery times
- Fits to all Duxvalves sizes
- Custom torque curve
- Compact design
- Uncomplicated design
- Smooth output rotation (no slip-stick)
- Simple & safe maintenance

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- Easy & direct mounting
- Different angular mounting positions
- ISO 5211 or custom valve interface
- VDI/VDE 3845 position indication (dual optional)
- Minimum adjustment open/close required
- Carbon steel housing (stainless steel optional)

APPLICATIONS:

- On/Off valves
- Modulating valves

RANGE:

Torque	: 160 till 6000 Nm (larger on request)
Output angle	: to suit Duxvalves
Mounting flange connection	: F07 till F25 (or custom)

*(Other brands are available on request)

C) Electric actuators

Actuators can be single-, double acting or stepping type. As mentioned in the individual descriptions, the rotation angle of the actuators are essential for the service life of the internal parts.

The Duxvalves chokes can be fitted with a manual override on the actuator if required.

General:

The rotating disc type chokes can also be equipped with an actuator for remote control operation. Chokes fitted with an actuator can be operated on/off, stepping or modulating.

The disc in the Duxvalves can be rotated by means of a hand wheel or lever. In general, all types of chokes can be manually operated. The gearbox will be equipped with a side mounted hand wheel. Both manually and actuated chokes can be equipped with open-close limit switches.

Valve positioners:

Where chokes are used in a controlled mode, valve positioners are usually fitted. Valve positioners are available for control signals of 0.2 - 1.0 bar or 4 - 20 mA, both conventional or microprocessor based.

The **conventional** valve positioners are equipped with a specially shaped cam to determine the valve opening. The shape of the cam is adapted to the required control characteristic. Thus, linear or equal percentage control characteristics can be achieved.

At the **SMART** (microprocessor based) valve positioner the curve is programmed so no cam per orifice diameter is required.

On request the "**Turning principle**" drawing where the way of minimizing the dead band of the disc-principle is indicated, can be sent.

Range-ability:

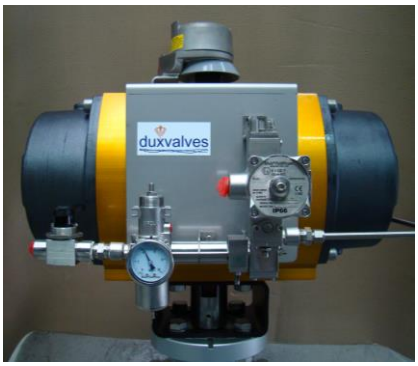
To allow a minimum controllable flow, rotating discs with special shaped holes can be provided for small orifice diameters. To increase the turndown ratio a specially shaped orifice can be fitted (Pico disc trim).

Stroking Times:

The stroking time of a choke fitted with actuator and a valve positioner depends on many factors such as type and size of actuator, valve positioner, available supply pressure etc. Boosters can be fitted between the valve positioner and actuator, if the stroking time is too long.

Other Accessories:

Where required our valves can be equipped with:



- Limit switches for indicating the open and/or closed position
- Position transmitters to feedback the actual valve opening
- Solenoid valves
- Quick blow-off valves to provide short stroking time of valves in on/off mode
- Snap-action relays
- Filter regulators

(E & O.E.)
Errors and omissions excepted

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