



brands you trust.



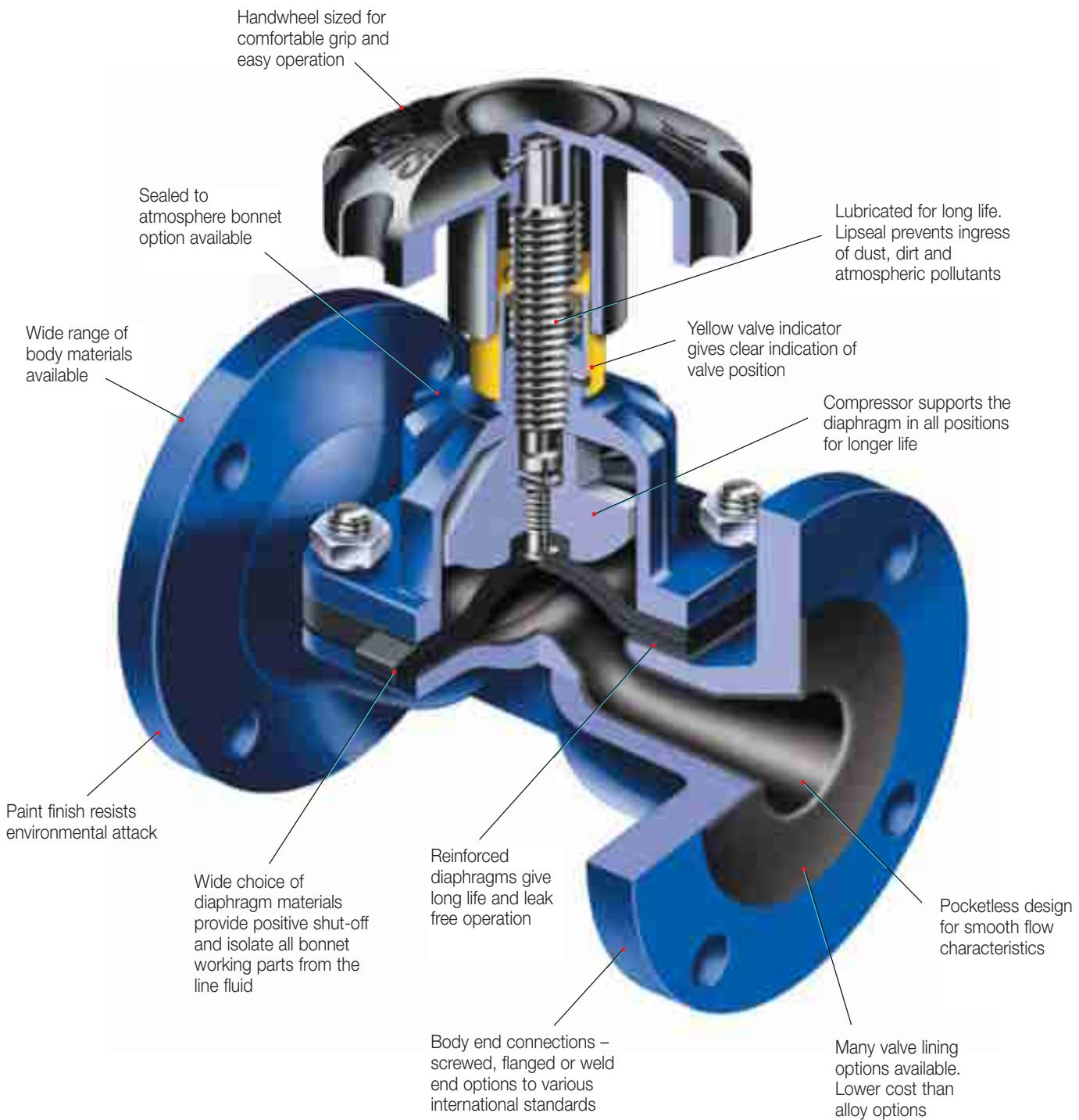
Industrial Diaphragm Valves

CRANE

ChemPharma Flow Solutions

The Original and the Best

Saunders diaphragm valve features and benefits
for corrosive and abrasive applications with
100% leaktight closure operation



Saunders Diaphragm Valve Range

Valves for Corrosive and Abrasive Applications

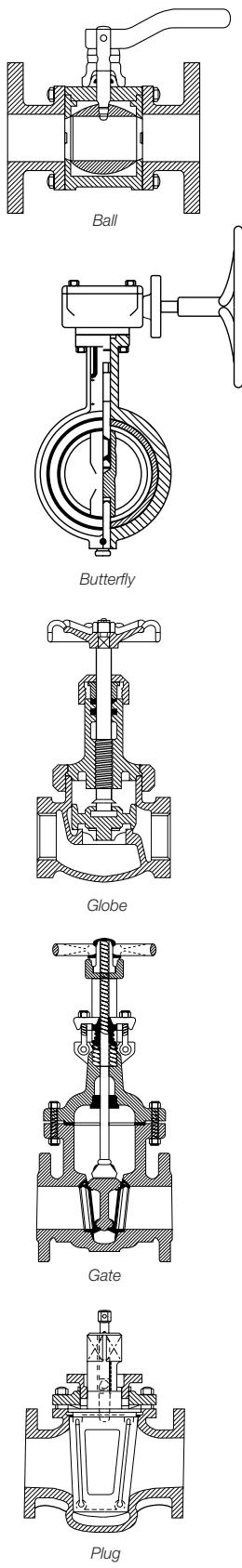
We at Crane Process Flow Technologies Ltd have in our Saunders portfolio a comprehensive range of diaphragm valves for industry. They encompass the full spectrum of corrosive and abrasive applications that require reliable leak free valve operation.

Easily maintained to ensure many years of trouble free operation, the Saunders valve has become the standard valve used in many industries such as chemical production, mining, water treatment, fertiliser production and marine to name just a few.

Comparison of different valve types against industrial process requirements

Valve/Service features	Diaphragm	Ball	Butterfly	Globe	Gate	Lubricated Plug
Ability of leak tight shut-off against gases, liquids and solids	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Resistance to abrasion and erosion	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Wide choice of materials to match service	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Non-turbulent flow path	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Low fluid friction loss	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Weight/size ratio	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★
Resistance to corrosion	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Compact overall height	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★
Pressure range	★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Vacuum capability	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★
Maintenance – in line servicing, low cost spares	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
High purity	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Control applications	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
On/off applications	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Temperature range	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★

★★★★★ Five stars – exceptional
★ One star – poor



Saunders Diaphragm Valve Range

Valves for Corrosive and Abrasive Applications



A Type flanged

Weir type flanged valve in cast iron, SG iron, cast steel, gunmetal and stainless steel. Can also be provided with various body linings and diaphragms to suit most industrial duties including corrosive and abrasive applications.

DN15 to DN350



A Type screwed

Weir type valve in SG iron, gunmetal and stainless steel.

DN8 to DN50



AFP valve

Weir type diaphragm valve in stainless steel for the biopharm and chemicals markets.

DN8 to DN150



WFB

A specialised range of weir type diaphragm valves for marine and firefighting applications. Used primarily as water hydrant valves because of 100% reliability in adverse conditions.

DN40 and DN65



KB Type screwed

Straight through bore screwed valve in cast iron, gunmetal and stainless steel.

DN15 to DN50



KB Straight through valve

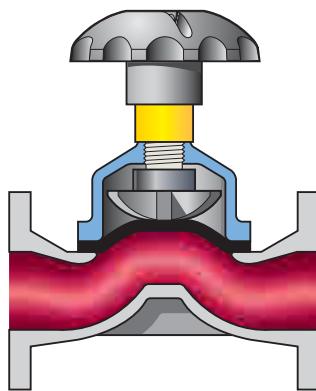
Diaphragm valve with a full bore opening to ensure maximum flow when handling viscous or abrasive fluids. Also available with various diaphragm and lining options.

DN15 to DN350

Saunders A Type Diaphragm Valves

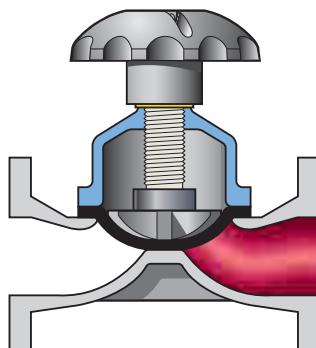
Valve Benefits for Corrosive and Abrasive Applications

Our Saunders A Type diaphragm valves have been developed to handle a wider range of fluids and gases than any other valve type. A wide choice is available for materials, methods of operation and body end connections – to satisfy the needs of most corrosive and abrasive applications.



Valve flow

Pocketless design for contamination free performance and smooth flow characteristics. Linear operation ensures valve does not induce damaging pressure surges or static charges.



Ease of maintenance

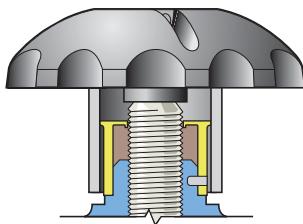
Three part design allows maintenance and actuator retrofitting without removing the valve from the pipeline. Overall this results in lower cost of ownership compared to other valve types.



On pressure and vacuum, Saunders diaphragm valves operate and close 100% leaktight even after thousands of operations. This feature reduces processing and handling costs, by eliminating emissions normally associated with conventional valve designs.

All working parts of the valves are isolated from the line media and positive closure is obtained even on frequent cycling or with entrained particulates in the line unlike quarter turn ball and butterfly valves. Throttling and control characteristics are enhanced by a streamlined flow path that is cavity free and provides excellent flow control capabilities.

Extended life, reliability, safety and ease of use, combined with an essentially simple design, results in low maintenance for minimum running costs.

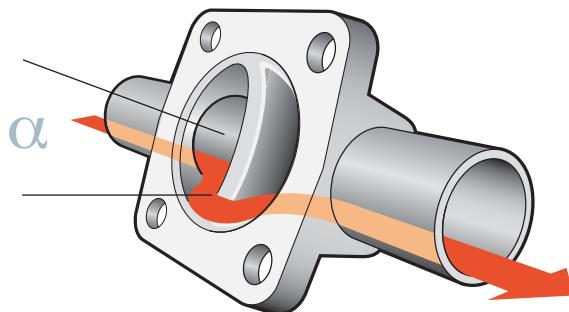
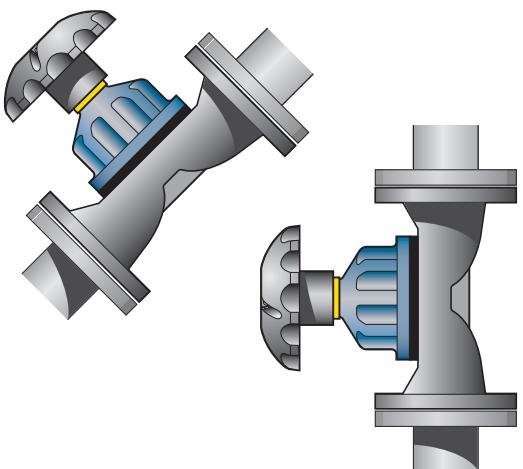


Lubrication

Bonnet assembly lubricated for long life.
Needs no additional grease. The indicator lip seal stops the ingress of dust, dirt and atmospheric contaminants.

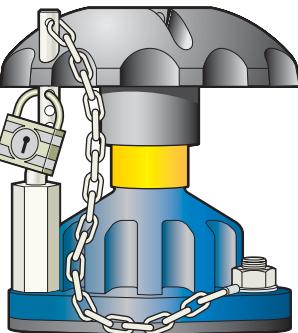
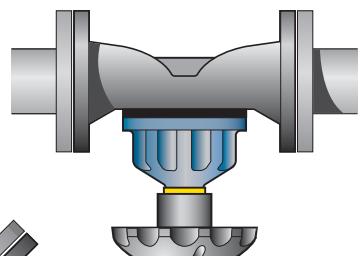
Valve usable in any position

The Saunders valve can be installed in any position without affecting its operation. However, we recommend 6x pipe diameter from bend or pump.



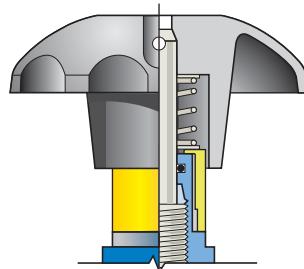
Valve set for self draining

The Saunders valve can be installed to assist self-draining if required. Please consult us for drainage angle advice.



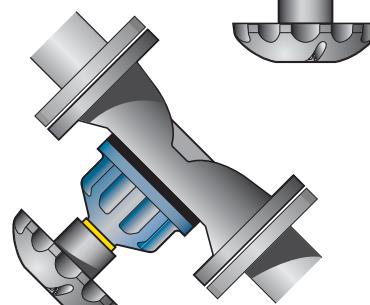
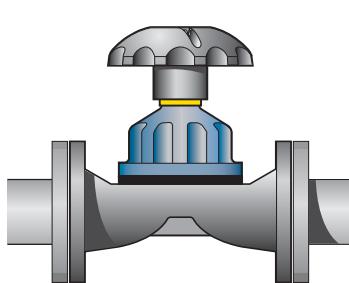
Padlock bonnet

Restricted valve operation can be achieved by utilising the padlocking bonnet option.



Sealed bonnet

In cases where hazardous liquids or gases are being handled and where additional safety features are considered to be necessary.

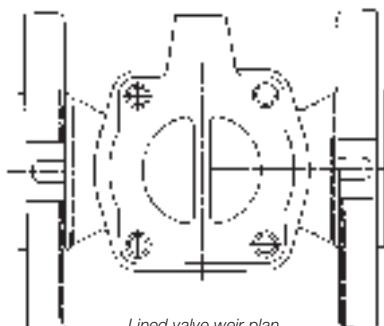
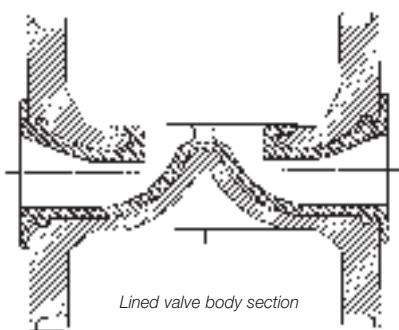


Saunders A Type Diaphragm Valves

Materials of Construction – Valve Bodies

Standard Unlined Body Material

CAST IRON			
BS EN 1561	GJL-250	Flanged	DN15–DN500
SG IRON			
BS EN 1563	GJS-450-10	Screwed	DN15–DN50
BS EN 1563	GJS-400-18	Flanged	DN15–DN150
GJS-400-18-LT			
CAST STEEL			
	ASTM A216 WCB	Flanged	DN15–DN100
BRONZE			
BS EN 1982	CC491K-GS	Screwed	DN15–DN50
BS EN 1982	CC492K-GS	Flanged	DN15–DN100
STAINLESS STEEL			
BS 3100	316C16	Screwed	DN15–DN50
BS 3100	316C16	Flanged	DN15–DN150



Plastic lined body features

- ◆ SG iron body – high mechanical strength
- ◆ SG iron body – mechanically supports plastic lining
- ◆ Lining protected from ultraviolet (UV)
- ◆ Injection gate to side of weir flange means:-
 - Smooth weir for diaphragm sealing and zero leakage
 - Lining lock-on weir flange and in-bore inlet
 - Lining thickness range 3–5mm (DN20–DN150)

Rubber lined body data

- ◆ Soft rubber linings
 - Butyl (Isobutylene isoprene), 60–66° IRHD
- ◆ Hard ebonite rubber HRL, 75–85° Shore D
- ◆ Lining thickness range 2–4.5mm (DN20–DN350)

Valve body lining – production tests

All Saunders lined valves have each body individually tested for lining integrity.

- ◆ Glass lining – Spark test 10kV ac
- ◆ Rubber, Butyl – Spark test 14kV ac/dc
- ◆ Rubber, HRL – Spark test 17kV ac/dc
- ◆ Plastic lined – Spark test 20kV ac/dc

Saunders Environmental Protection

Saunders environmental protective coating has been developed specifically to provide unrivalled corrosive resistance in the industrial processing industry, the new protective coating utilises Du Pont's Tefzel™ (Ethylenetetrafluoroethylene) material.

The green Tefzel™ coating is applied before the injection moulding of the Perfluoroalkoxy (PFA) or Ethylenetetrafluoroethylene (ETFE) lining, using an electrostatic powder coating method. By coating the valve body, bonnet and hand wheel, both internal and external corrosive protection is maximised providing peace of mind in extreme corrosive material processing applications.

Available in DN 20-100 with a PFA lining and DN 20 – 150 in the ETFE lined option.



Valve Body Linings for Saunders Valves

◆ Hard Rubber – NR/HRL

Used for salts in water, dilute mineral acids, chlorine water, de-ionised water, plating solutions and potable water.

◆ Soft Butyl Rubber – IIR/BL

Good for corrosive and abrasive slurries, mineral acids and acidic slurries.

◆ Glass

Used in multi-process chemical plants on acids and solvents.

◆ Polypropylene – PP

Main applications include mineral acids, salts in water, water and effluent treatment chemicals.

◆ Ethylene tetrafluoroethylene – ETFE

Suitable for strong acids, salts in water at higher temperatures, solvents at medium temperature.

◆ Perfluoroalkoxy – PFA

Most suitable for concentrated mineral acids at high temperature, aromatic, aliphatic and chlorinated solvents.

◆ Polytetrafluoroethylene – PTFE

Most suitable for concentrated mineral acids at high temperature, aromatic, aliphatic and chlorinated solvents.

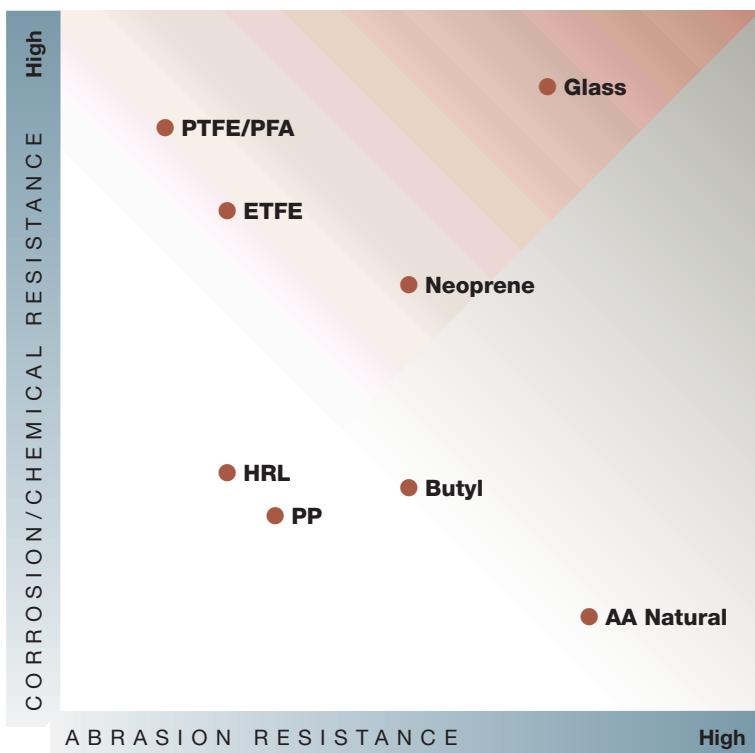
◆ Soft Natural Rubber - AA/SRL

High abrasion resistance.
Suitable for use on powders, abrasive slurries, clays, coal dust, dry fertilizer, gypsum.

◆ Neoprene – NRL

Particularly suitable for animal, vegetable, fatty oils and greases. Abrasion resistance over wide pH range –used for aggressive slurries.

Valve Body Lining Materials – Visual Process Resistance Guide



Saunders A Type Diaphragm Valves

Materials of Construction – Diaphragms

We at Crane Process Flow Technologies are proud of our core competence, the in-house manufacture of Saunders diaphragms for use within our valve range. Many years of experience has resulted in a range of diaphragms, which handle a wide variety of fluids with total security. The guaranteed high performance of Saunders diaphragms results from stringent quality control and continuous development.



Key Considerations

- ◆ High flex performance
- ◆ Good compression set properties
- ◆ Chemical resistance
- ◆ Abrasion resistance
- ◆ Anti-aging
- ◆ Approvals, traceability

Diaphragm Construction

Rubber Diaphragms

The polymer material is bonded with a high strength woven reinforcement to ensure maximum strength and durability.

- ◆ Constructed with multi-layers of rubber and nylon reinforcement
- ◆ Studs are attached with bonding adhesive and mechanical anchorage
- ◆ Rib on face for weir flange and across weir for leak tight sealing and lower closure torque
- ◆ Compressor support in both the open and closed positions for extended life

PTFE Diaphragms

A two piece construction PTFE face with a rubber backing diaphragm to increase pressure rating and durability. These diaphragms have a bayonet fitting to ensure reliable installation, reduced point loading and ensure maximum life. The 214K is three piece specially reinforced for chlorine service.



PTFE diaphragm bayonet fixing



Rubber diaphragm screw fixing

Saunders A Type Diaphragm Valves

Diaphragm Materials of Construction

Grade	Elastomer type	General service and approvals
C	Butadiene Acrylonitrile, sulphur cured, black reinforced	Lubricating oil, cutting oils, paraffin, animal and vegetable oils, aviation kerosene
CV	Butadiene Acrylonitrile, sulphur cured, black reinforced	Vacuum where oils are present, compressed air, liquid petroleum gas (LPG)
HT	Polychloroprene, sulphur cured, black reinforced	Abrasives slurries containing hydrocarbons
Q	Natural rubber polyisoprene/SBR, sulphur cured, black reinforced	Salts in water, dilute acids and alkalis, abrasives
226	Fluoroelastomer, amine cured, black reinforced	Concentrated acids, aromatic solvents, chlorine, ozone, chlorinated solvents, unleaded petroleum
237	Chlorosulphonated polyethylene metal oxide cured, black reinforced	Strong acids, sodium hypochlorite, chlorine gas
286	Chlorosulphonated polyethylene metal oxide cured, black reinforced Kevlar fabric reinforced	Fire mains isolation in WFB valve
300	Isobutylene Isoprene, resin cured black reinforced	Salts in water, dilute acids and alkalis, drinking water, Food & Drug Administration (FDA), United States Pharmacopeia (USP), Water Regulations Advisory Scheme (WRAS)
425	Ethylene propylene (EPM) organic peroxide cured, black reinforced	Salts in water, acids and alkalis, ozone, intermittent steam, drinking water, FDA, USP, WRAS
425V	Ethylene propylene (EPM) organic peroxide cured, black reinforced	Vacuum where acid, alkali, water vapours are present, FDA, USP, WRAS
214/226	Virgin PTFE/Fluoroelastomer – two piece	Strong acids, solvents, chlorine, bromine at higher temperatures
214/300	Virgin PTFE/Isobutylene isoprene – two piece	Strong acids, alkalis and salts in water at high temperature. Constant steam, water for injection (WFI), biopharmaceuticals, FDA USP, WRAS
214/425	Virgin PTFE/Ethylene propylene – two piece	Strong acids, alkalis and salts in water at high temperature. Constant steam, water for injection (WFI), biopharmaceuticals, FDA, USP, WRAS
214S/425	Virgin PTFE/PPVE/Ethylene propylene – two piece	Strong acids, alkalis and salts in water at high temperature. Constant and intermittent steam, WFI, biopharmaceuticals, FDA, USP, WRAS
214K/425	Virgin PTFE/PVDF/Ethylene propylene – three piece	Chlorine, bromine gas and chlorinated solvents



Standard

- ◆ Rubber diaphragms have a brass stud
- ◆ Diaphragms suitable for vacuum duties (eg. CV) have steel stud
- ◆ PTFE diaphragms are fitted with stainless steel bayonet

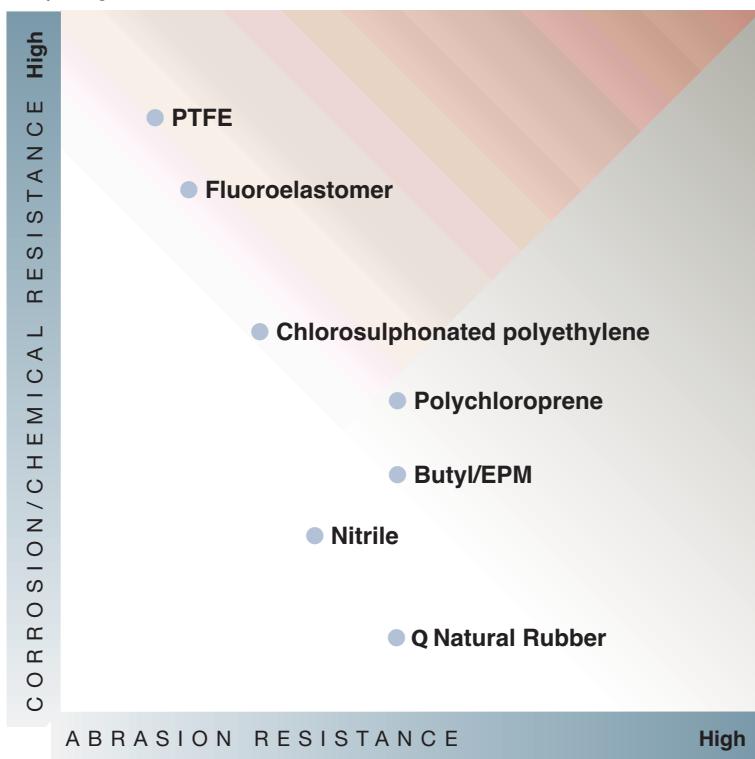
Saunders Diaphragms are provided with:-

- ◆ Full traceability of manufacture to EN10204 3.1b (was DIN 50049 3.1b)
- ◆ Coding tag for both material and batch number for easy identification
- ◆ Saunders name to confirm genuine manufacture and maximum reliability

Saunders A Type Diaphragm Valves

Diaphragm Materials

Diaphragm Materials – Visual Process Resistance Guide



Material	Grade
PTFE	214/214K
Fluoroelastomer	226
Chlorosulphonated polyethylene	237
Polychloroprene	HT
Nitrile	C, CV
Butyl	300, 300V
EPM	425, 425V
Natural Rubber	Q

Maximum working pressure (bar) – A Type valves

As with all valves, the application and environment have a major bearing on actual valve operating limits, but the following can be used as a guide to the maximum operational limits.

Size DN	8	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	
Non-rising handwheel															6	5	4	3.5
Rising handwheel	16	16	16	16	16	16	16	16	10	10	10	10	10	10	10	10		
WFB and tank cleaning									15	15								

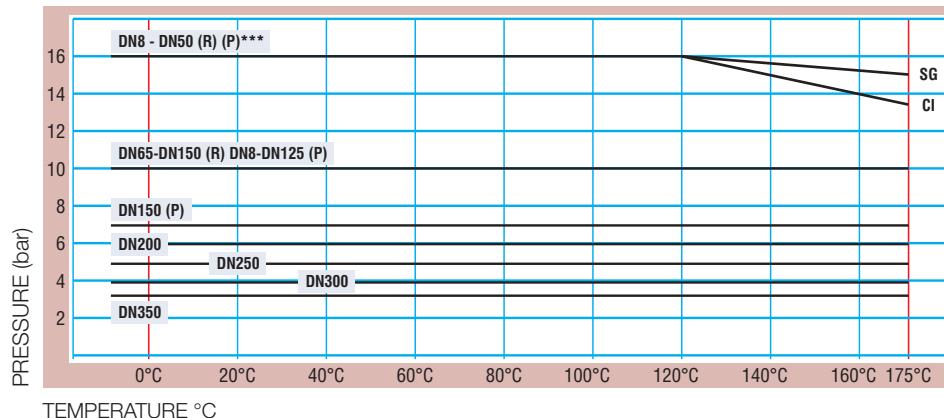
Size DN	8	10	15	20	25	32	40	50	65	80	100	125	150	200	250		
Non-rising handwheel															6	5	
Rising Handwheel	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	7	

Diaphragm Performance

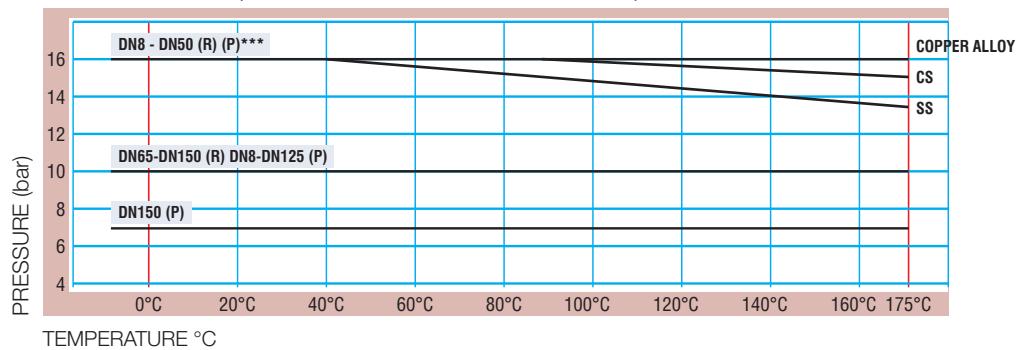
Temperature and Pressure Relationship

Diaphragm Temperature Type A (°C)		
-5°	214/226	175°
-20°	214/425	160°
-20°	214/300	150°
-50°	Q	100°
-20°	C & CV	100°
-30°	HT	100°
-5°	226	150°
-10°	237 & 286	100°
-40°	300 & 300V	130°
-40°	425 & 425V	130°
-20°	214K/425	100°

A Type Valve Body (SG Iron & Cast Iron) Temperature/Pressure Relationship



A Type Valve Body (Carbon Steel, St.Steel & Copper Alloys) Temperature/Pressure Relationship



Body Temperature Limit (°C)**

-10°	HARD RUBBER LINED	85°
-10°	POLYPROPYLENE LINED (P.P.)	85°*
-10°	BUTYL RUBBER LINED	110°
-10°	ETHYLENE TETRAFLUOROETHYLENE (ETFE)	150°
-10°	CAST IRON: UNLINED, GLASS LINED & PTFE LINED	175°
-10°	SG IRON: UNLINED AND PFA LINED	175°
-30°	OTHER METALS: CARBON STEEL, STAINLESS STEEL, COPPER ALLOYS	175°

Temperature bands for diaphragms are shown as a guide only. Many aspects of service conditions will determine the highest working temperature. For example, 325 diaphragms have given excellent performance under certain conditions up to 150°C.

In certain applications the following temperature ratings apply:

SG: -20°C, SS: -30°C, GM: -30°C.

* Depends on body substrate material.

** When lined body is cast steel, minimum temperature is -30°C.

When SG Grade EN-GJS-400-18-LT is used, minimum temperature is -20°C.

*** 214S manual operation only.

Saunders Diaphragm Valves

Dimensions, Weights and Standards

Valve Standards

As well as being in overall lengths to EN 558-1 Series 1 and Series 7 and MSS SP88, Saunders valves are manufactured to the following standards:

Flanges

BRITISH	BS 10 tables D and E BS 4504 tables PN10/16 BS 1560 Class 150
EUROPEAN	EN 1092-1 PN10/16 EN 1092-2 PN10/16
AMERICAN	ASME/ANSI B16.1 Class 125 ASME/ANSI B16.5 Class 150 and B16.24 Class 150
JAPANESE	JIS B 2212

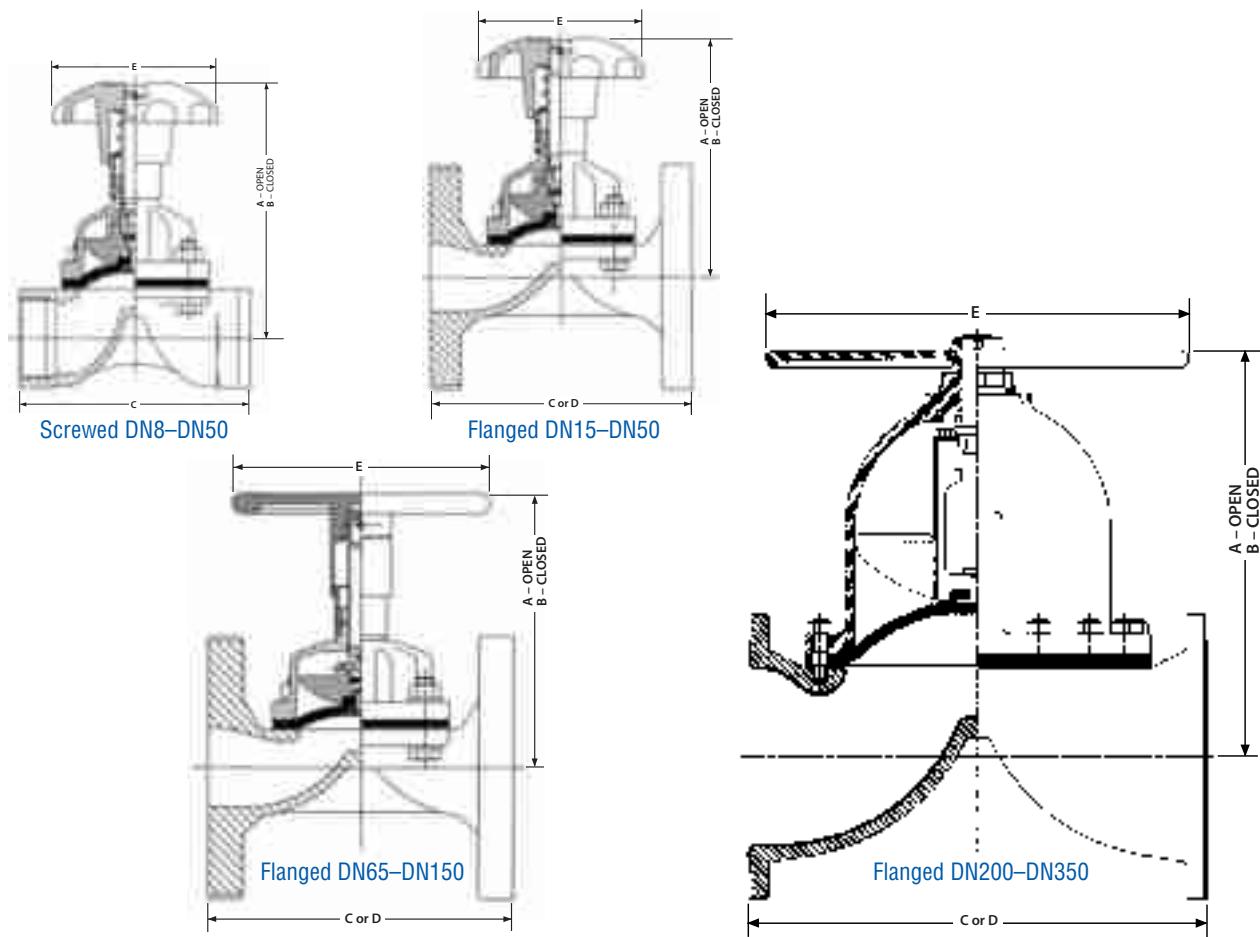
Female screwed pipe connections

BRITISH	BS 21 taper BS 21 parallel
AMERICAN	API 5B
GERMAN	DIN 259
INTERNATIONAL	ISO 7/1 taper ISO 7/1 parallel



Saunders A Type Diaphragm Valves

Dimensions and Weights



Valve Diameter (DN)

		100	125	150	200	250	300	350								
Screwed	A	54	67	90	94	119	154	164	188							
	B	52	61	84	88	108	142	148	164							
	C	49	49	63.5	83	111	125	145	168							
	Weight	0.11	0.15	0.45	0.90	1.13	1.80	2.70	5.00							
		—	—	—	—	—	—	—								
Flanged	A	—	—	100	91	108	143	157	175							
	B	—	—	93	85	98	131	141	152							
	C	—	—	108	117	127	146	159	190							
	D	—	—	130	150	160	180	200	230							
	Weight	—	—	1.80	1.80	2.70	4.00	4.90	7.70							
Flanged Rubber Lined	A	—	—	—	97	111	146	160	177							
	B	—	—	—	91	101	134	144	154							
	C	—	—	—	121	131	150	163	194							
	D	—	—	—	150	160	180	200	230							
	Weight	—	—	—	2.70	3.10	4.50	5.40	8.20							
Flanged Glass Lined	A	—	—	101	92	109	144	158	176							
	B	—	—	94	86	99	132	142	153							
	C	—	—	110	119	129	148	161	192							
	D	—	—	130	150	160	180	200	230							
	Weight	—	—	1.80	1.80	3.10	4.50	5.40	8.20							
Flanged Plastic Lined	A	—	—	—	97	112	—	162	176							
	B	—	—	—	91	102	—	145	155							
	C	—	—	—	123	133	—	165	196							
	D	—	—	—	150	160	—	200	230							
	Weight	—	—	—	2.70	3.10	—	5.40	8.20							
E	38	50	62	62	80	120	120	170	230	280	280	368	482	584	699	699

Weights in kg. **C** valve length = EN 558-1 Series 7 (ex BS 5156). **D** valve length = EN 558-1 Series 1 (ex DIN 3202 Series F1).

Saunders A Type Valve

Flow Co-efficient of Valve Range Cv (Kv)

DN	BODY MATERIAL/LINING							
	Cast iron		Rubber Lined		Glass		Plastic Lined	
% Open	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	5.50	4.71	—	—	6.00	5.14	—	—
90	5.28	4.53	—	—	5.75	4.93	—	—
80	5.06	4.33	—	—	5.51	4.72	—	—
70	4.83	4.14	—	—	5.27	4.52	—	—
60	4.61	3.95	—	—	5.03	4.31	—	—
50	3.84	3.29	—	—	4.19	3.59	—	—
40	3.08	2.62	—	—	3.35	2.87	—	—
30	2.30	1.97	—	—	2.51	2.15	—	—
20	1.54	1.32	—	—	1.67	1.43	—	—
10	0.77	0.66	—	—	0.83	0.71	—	—
0	0	0	—	—	0	0	—	—

DN	BODY MATERIAL/LINING							
	Cast iron		Rubber Lined		Glass		Plastic Lined	
% Open	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	11.50	9.86	9.20	7.89	12.00	10.29	6.50	5.59
90	11.03	9.45	9.00	7.71	11.51	9.87	6.24	5.35
80	10.57	9.06	8.80	7.54	11.03	9.45	5.98	5.13
70	10.12	8.67	8.40	7.20	10.55	9.04	5.72	4.90
60	9.66	8.28	7.70	6.60	10.07	8.63	5.45	4.67
50	8.05	6.90	6.70	5.74	8.39	7.19	4.54	3.89
40	6.43	5.51	5.50	4.71	6.71	5.75	3.63	3.11
30	4.83	4.14	4.10	3.51	5.03	4.31	2.72	2.33
20	3.21	2.75	2.50	2.14	3.35	2.87	1.81	1.55
10	1.60	1.37	1.00	0.86	1.67	1.43	0.90	0.77
0	0	0	0	0	0	0	0	0

DN	BODY MATERIAL/LINING							
	Cast iron		Rubber Lined		Glass		Plastic Lined	
% Open	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	17.60	15.09	14.00	12.00	18.00	15.43	11.19	9.60
90	16.29	13.96	13.70	11.74	17.28	14.81	10.75	9.21
80	16.19	13.88	13.40	11.49	16.56	14.19	10.30	8.83
70	15.48	13.26	12.70	10.89	15.83	13.57	9.85	8.42
60	14.78	12.67	11.60	9.94	15.11	12.95	9.40	8.06
50	12.32	10.56	10.20	8.74	12.59	10.79	7.83	6.71
40	9.85	8.44	8.40	7.20	10.07	8.63	6.27	5.37
30	7.39	6.33	6.30	5.40	7.55	6.47	4.70	4.02
20	4.92	4.22	3.80	3.25	5.03	4.31	3.13	2.68
10	2.46	2.11	1.50	1.29	2.51	2.15	1.56	1.34
0	0	0	0	0	0	0	0	0

DN	BODY MATERIAL/LINING							
	Cast iron		Rubber Lined		Glass		Plastic Lined	
% Open	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	27.50	23.57	22.00	18.86	28.00	24.00	16.70	14.31
90	26.39	22.61	21.12	18.10	26.88	23.04	16.03	13.74
80	25.29	21.68	20.24	17.35	25.75	22.07	15.36	13.17
70	24.20	20.74	19.35	16.59	24.64	21.11	14.69	12.59
60	23.09	19.79	18.47	15.83	23.51	20.15	14.02	12.02
50	19.25	16.50	15.39	13.19	19.60	16.80	11.69	10.02
40	15.39	13.19	12.32	10.57	15.67	13.43	9.35	8.01
30	11.54	9.89	9.23	7.91	11.75	10.07	7.01	6.01
20	7.69	6.59	6.16	5.28	7.83	6.71	4.67	4.00
10	3.84	3.29	3.08	2.62	3.91	3.35	2.33	1.98
0	0	0	0	0	0	0	0	0

DN	BODY MATERIAL/LINING							
	Cast iron		Rubber Lined		Glass		Plastic Lined	
% Open	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	43.00	36.86	35.00	30.00	45.00	38.57	31.00	26.57
90	41.28	35.40	34.00	29.14	43.20	37.03	29.76	25.51
80	39.56	33.91	33.6	28.80	41.39	35.48	28.51	24.43
70	37.84	32.43	32.00	27.43	39.59	33.93	27.28	23.38
60	36.11	30.95	29.00	24.86	37.79	32.41	26.03	22.32
50	30.10	25.81	26.00	22.28	31.50	27.00	21.69	18.59
40	24.07	20.63	21.00	18.00	25.19	21.59	17.35	14.87
30	18.05	15.47	16.00	13.68	18.89	16.19	13.01	11.15
20	12.03	10.31	9.5	8.14	12.59	10.79	8.67	7.43
10	6.01	5.15	3.9	3.34	6.29	5.39	4.33	3.71
0	0	0	0	0	0	0	0	0

DN	BODY MATERIAL/LINING							
	Cast iron		Rubber Lined		Glass		Plastic Lined	
% Open	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	80.00	68.61	64.00	54.89	88.00	75.47	59.00	50.60
90	76.80	65.86	63.00	54.03	84.48	72.45	56.00	48.00
80	73.59	63.11	61.00	52.31	80.96	69.43	54.00	46.29
70	70.40	60.37	58.00	49.71	77.43	66.40	52.00	44.57
60	67.19	57.62	53.00	45.43	73.91	63.38	50.00	42.86
50	56.00	48.03	47.00	40.29	61.69	52.82	41.00	35.14
40	44.79	38.39	38.00	32.57	49.28	42.24	33.00	28.28
30	33.59	28.79	29.00	24.86	36.95	31.67	25.00	21.43
20	22.39	19.19	17.00	14.57	24.64	21.11	16.00	13.71
10	11.19	9.60	7.00	6.00	12.32	10.56	8.00	6.86
0	0	0	0	0	0	0	0	0

DN	BODY MATERIAL/LINING							
	Cast iron		Rubber Lined		Glass		Plastic Lined	
% Open	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	185.00	158.60	148.00	126.90	186.00	159.40	148.00	126.90
90	177.00	151.70	145.00	124.30	178.00	152.60	142.00	121.70
80	170.00	145.70	142.00	121.70	171.00	146.60	136.00	116.60
70	162.00	138.90	135.00	115.70	163.00	139.70	130.00	111.40
60	155.00	132.90	123.00	105.40	156.00	133.70	124.00	106.30
50	129.00	110.60	108.00	92.60	130.00	111.40	103.00	88.30
40	103.00	88.30	89.00	76.30	104.00	89.10	82.90	71.00
30	77.70	66.60	67.00	48.90	78.10	67.00	62.20	44.70
20	51.80	44.40	40.00	34.30	52.10	44.60	41.40	35.50
10	25.90	22.20	16.00	13.70	26.00	22.30	20.70	17.80
0	0	0	0	0	0	0	0	0

B O D Y M A T E R I A L / L I N I N G								
DN	Cast iron		Rubber Lined		Glass		Plastic Lined	
100	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	315	270	252	216	336	288	270	231
90	302	259	247	212	322	276	259	222
80	289	248	242	207	309	265	248	213
70	277	237	229	196	295	253	237	203
60	264	226	209	179	282	242	226	194
50	220	189	184	158	235	201	189	172
40	176	151	151	129	188	161	151	129
30	132	113	113	97	141	121	113	97
20	88.20	76	68	50	94.10	81	75.60	65
10	44.10	38	28	24	47.00	40	37.80	32.40
0	0	0	0	0	0	0	0	0

B O D Y M A T E R I A L / L I N I N G								
DN	Cast iron		Rubber Lined		Glass		Plastic Lined	
125	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	420	360	363	311	440	377	-	-
90	403	345	348	298	422	362	-	-
80	386	331	333	285	404	346	-	-
70	369	316	319	273	387	332	-	-
60	352	302	304	261	369	316	-	-
50	294	252	254	218	308	264	-	-
40	235	201	203	174	246	211	-	-
30	176	151	152	130	184	158	-	-
20	117	100	101	87	123	105	-	-
10	59	49	51	44	62	53	-	-
0	0	0	0	0	0	0	-	-

B O D Y M A T E R I A L / L I N I N G								
DN	Cast iron		Rubber Lined		Glass		Plastic Lined	
150	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	605	519	484	415	630	540	505	433
90	580	497	474	406	604	518	484	414
80	556	477	465	399	579	496	464	398
70	532	456	440	377	554	475	444	381
60	508	435	402	345	529	453	424	363
50	423	363	353	303	441	378	353	303
40	338	290	290	249	352	302	282	242
30	254	218	218	187	264	226	212	182
20	169	145	131	112	176	151	141	121
10	85	73	53	45	88	75	71	61
0	0	0	0	0	0	0	0	0

B O D Y M A T E R I A L / L I N I N G								
DN	Cast iron		Rubber Lined		Glass		Plastic Lined	
200	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
100	1300	1114	1309	1122	1320	1131	-	-
90	1248	1070	1256	1077	1267	1086	-	-
80	1196	1025	1204	1032	1214	1041	-	-
70	1144	981	1151	987	1161	995	-	-
60	1092	936	1099	942	1108	950	-	-
50	910	780	916	785	924	792	-	-
40	728	624	733	628	739	633	-	-
30	546	468	549	471	554	475	-	-
20	364	312	366	314	369	316	-	-
10	182	156	183	157	184	158	-	-
0	0	0	0	0	0	0	-	-

DN	B O D Y M A T E R I A L / L I N I N G					
	Cast iron		Rubber Lined		Glass	
% Open	Cv	Kv	Cv	Kv	Cv	Kv
250	1980	1697	2000	1714	2100	1800
90	1900	1629	1920	1646	2015	1727
80	1821	1561	1840	1577	1932	1656
70	1742	1493	1760	1509	1848	1584
60	1663	1425	1679	1439	1763	1511
50	1386	1188	1400	1200	1470	1260
40	1108	950	1120	960	1176	1008
30	831	712	839	719	881	755
20	554	475	560	480	588	504
10	277	237	280	240	294	252
0	0	0	0	0	0	0

DN	B O D Y M A T E R I A L / L I N I N G					
	Cast iron		Rubber Lined		Glass	
% Open	Cv	Kv	Cv	Kv	Cv	Kv
300	3700	3171	3750	3214	3880	3326
90	3552	3045	3600	3086	3724	3191
80	3404	2917	3450	2957	3569	3059
70	3256	2791	3300	2829	3414	2926
60	3107	2663	3149	2699	3259	2793
50	2590	2220	2625	2250	2716	2327
40	2072	1776	2100	1800	2172	1861
30	1553	1331	1574	1349	1629	1396
20	1036	888	1050	900	1086	931
10	518	444	525	450	543	465
0	0	0	0	0	0	0

Note: Differing Cv & Kv rating can be derived, depending on the method used for testing. The tables above are based on British Standards 1042 and EN 605314/IEC 534.2.3 and show flow in US gallons per minute and cubic metres per hour.

Cv is flow in US gpm through valve at ΔP of 1 psi
Kv is flow in m ³ /hr through valve at ΔP of 1 bar

Saunders A Type Diaphragm Valves

Large Valve Sizes: DN400, DN450 & DN500

Some applications, for example, in the minerals processing and water treatment industries involving corrosive and abrasive slurries, have successfully utilised larger size Saunders diaphragm valves for many years. Double weir options are also available.

These double weir bodies utilise diaphragms and bonnets from the tried and tested DN300 and DN350 range of valves.

Valve sizes

DN400 fitted with two DN300 bonnets

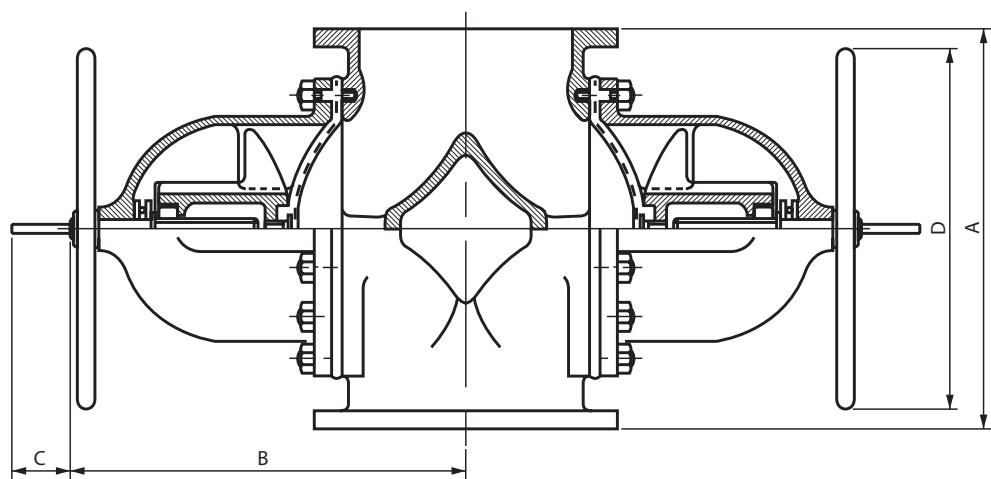
DN450 fitted with two DN300 bonnets

DN500 fitted with two DN350 bonnets

Note: These valves are not suitable for use with Group 1 (Dangerous) Gases



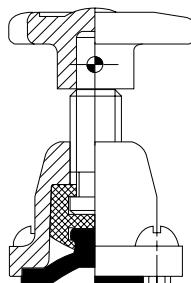
Large A Type valves installed in a distillery



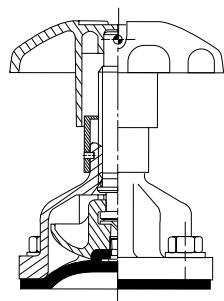
Size DN	A	B	C (TRAVEL)	D
400	750	750	190	700
450	750	750	190	700
500	750	780	230	700

Manual Bonnet Options for A Type Valves

Standard Range



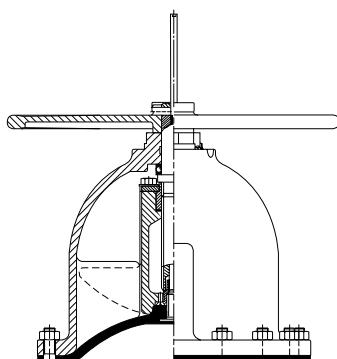
Rising Handwheel
Valve sizes: DN8 to DN10



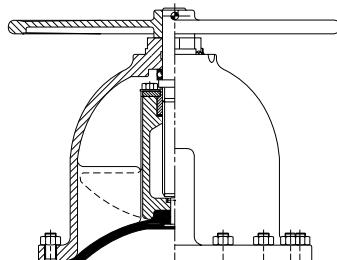
Cast Iron Rising Handwheel Bonnet
Valve sizes: DN15 to DN50



Cast Iron Rising Handwheel
Valve sizes: DN65 to DN150

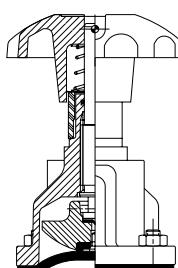


**Non-rising Handwheel
with Indicator**
Valve sizes: DN200 to DN300

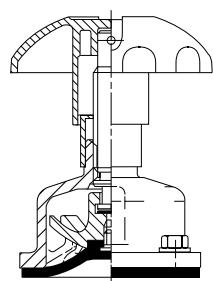


**Non-rising Handwheel
without Indication**
Valve sizes: DN200 to DN350

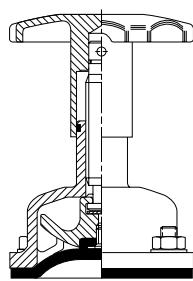
High Performance Range



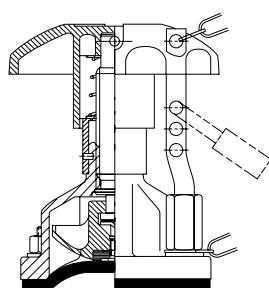
Fluoroelastomer Sealed Bonnet
Valve sizes: DN15 to DN150*



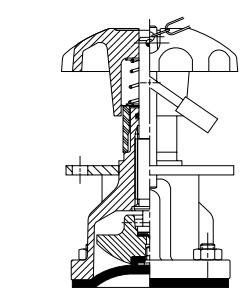
Stainless Steel
Valve sizes: DN15 to DN150*



Stainless Steel (Silicone Sealed)
Valve sizes: DN8 to DN80



Rising Handwheel Indicator
(simple padlocking)
Valve sizes: DN15 to DN150*



Fluoroelastomer Sealed Padlocking
Valve sizes: DN15 to DN150*

* Handwheel is spoked design DN65 – DN150

Saunders WFB Type Valves

For Marine and Firefighting Applications

The WFB valve is a weir type diaphragm valve developed to overcome conventional valve problems on fire fighting, tank cleaning and wash-down on land or sea, wherever guaranteed valve operation is needed.

There are no second chances with a defective fire hydrant valve. Saunders WFB model provides dependable operation when it matters – even after years of non-use.

This highly specialised fire hydrant valve has been tested and approved by the world's leading safety agencies. Similar in design and operation to the widely used A Type, it has the added benefit of a certified chlorosulphonated polyethylene base fire resistant diaphragm. The WFB valve is available in SG iron or gunmetal providing high mechanical strength. This means that they provide greater resistance to accidental impact. Gunmetal resists corrosion on the more demanding applications.



Model 4 with
body and
bonnet material
in SG Iron

Diaphragms

Fire mains use:

- ◆ 286 grade 'Fire' diaphragm
- ◆ 233 CV grade diaphragm (tank cleaning)

Flanges

- ◆ BS10 Tables D, E and F (Gunmetal & SG)
- ◆ BS4504 PN16
- ◆ DIN 86021 ND16 and
ANSI B16.24 Class 150 (Gunmetal)
- ◆ EN1092-2 PN16 and
ANSI B16.1 Class 150 (SG Iron)

Main Body Inlet/Outlet Body Options

Screwed Flanged

BS 21RP	BS4504 PN16
BS 21RP	ANSI Class 150
BS 21RP	BS10 Table D
BS 21 RP	JIS10K

ANFT 7.5 TPI
(American National Fire thread)
Male or female

(Other screwed and flanged
connections available on request)



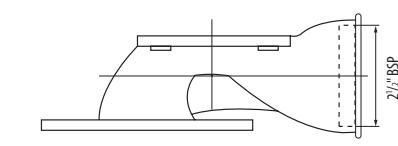
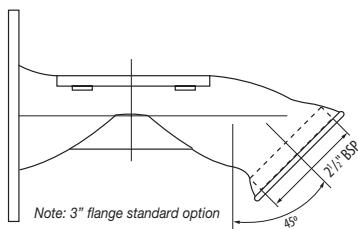
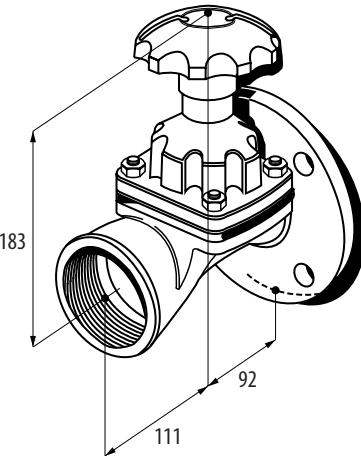
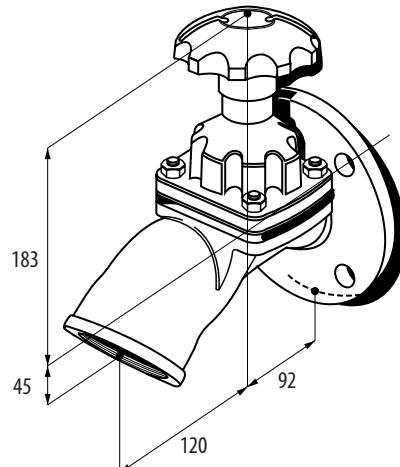
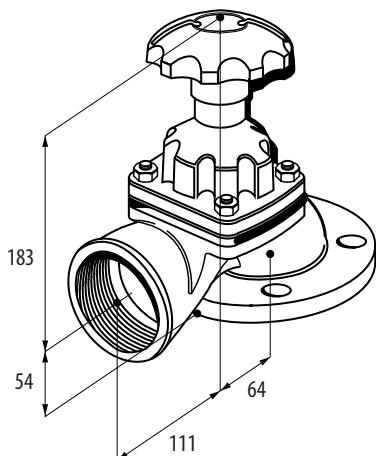
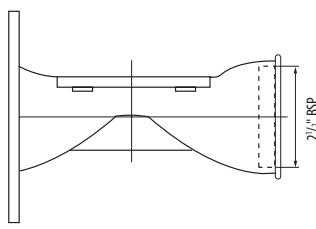
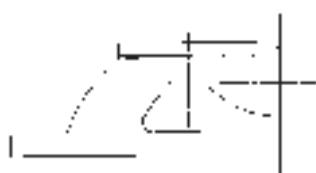
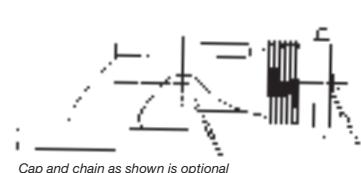
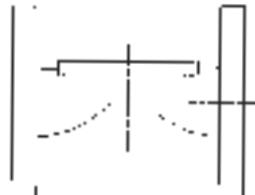
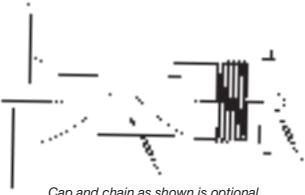
Model 11 with body
and bonnet material
in gunmetal.

Valve Weights (kg)

Model	4	9	11
Gunmetal	10.3	10	11.5
S.G.Iron	8	7.8	8.95



Model 4 with body
and bonnet material
in gunmetal.

Model 4**Model 11****Model 9****Model 1****Model 2****Model 6****Model 7****BODY MATERIALS**

	1	2	4	6	7	9	11	
DN40	-	✓	✓	-	✓	✓	-	Gunmetal
DN65	✓	✓	✓	✓	✓	✓	✓	Gunmetal and SG Iron

Testing Valves tested in accordance with BS 6755 i.e. body strength test to 22.5 bar, seat test to 16.5 bar (1.1 x maximum working pressure)

"We specified Saunders WFB 65mm nominal bore fire-mains and cruise liners. Significant factors behind this choice are excellent reliability and the low maintenance costs".
P&O Cruises (UK) Ltd

Product approvals

Det Norske Veritas
Register of Type Approval
Products No. 5: Mechanical
Engineering and Piping 1997/98
Page 54
Certificate No: P-9951
Model No: DN65



Marine Safety Agency
The Department of Transport
Certificate of Inspection and Tests
Certificate No: SUR 222 (REV 4/94)
Model No: DN40, DN65



Lloyds Register of Shipping
LR Type Approval Certificate
Certificate No: 97/00047
Model No: DN40, DN65



Bureau Veritas
Type Approval Certificate
Certificate No: 2207 3457 C10 H
Model No: DN40, DN65



Registro Italiano Naval
Rina
Type Approval
Certificate No: MAC/057/94
Model No: DN65



American Bureau of Shipping
List of Type Approved Equipment
Page 25.
Certificate No: 96-WM10305-X
Model No: DN40, DN65

- American Bureau of Shipping
- UK Marine Safety Agency
- Bureau Veritas
- Det Norske Veritas
- Rina
- Lloyds
- DTI

The whole valve has successfully undergone a high temperature resistance test, BS 5041 Part 1, audited by a Lloyds Surveyor.

Pneumatic Valve Actuation

EV and ES Modular Actuators

The ES Modular Actuator offers efficient mechanical/pneumatic control of the diaphragm, allowing remote and automated operation.

Saunders ES Modular Actuator has been designed to offer full flexibility to the user. Cost of ownership have been reduced through standardization of the Actuator Heads, and a unique interchangeable bonnet assembly.

Several different actuator models may be provided for each valve size to suit different line and operating pressures. The range allows valve closure against the maximum valve working pressure and can be successfully used for modulating control duties in addition to more normal isolation functions.

Failsafe closing actuators are fully adjustable, i.e. spring compression can be externally adjusted to provide optimum diaphragm forces and hence provide extremely long diaphragm life in service.

Many accessory options are available which include solenoid valves, remote indication devices (switches or sensors) to suit environmental conditions such as hazardous services.

Limit stops and positioners and many other devices may be offered to allow usage within particular control systems. ES Modular Actuators are provided with a tough polyester coating which gives maximum durability, even in exposed locations.



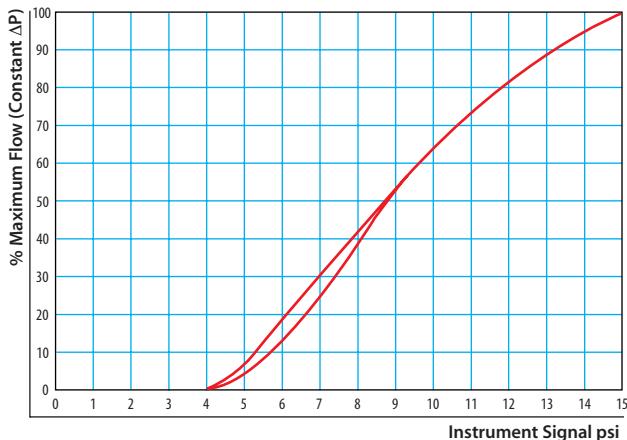
EV spring close
(DN15-150)

ES Modular
(DN15-150)

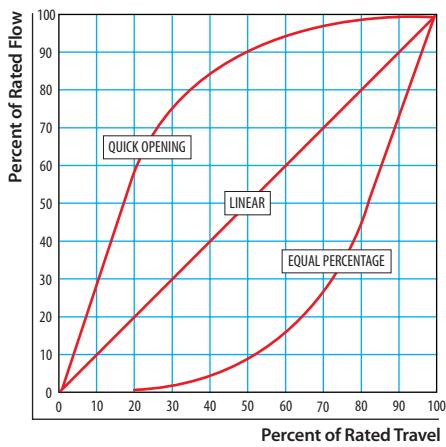
Pneumatic Valve Actuation

Valve Throttling and Flow Control

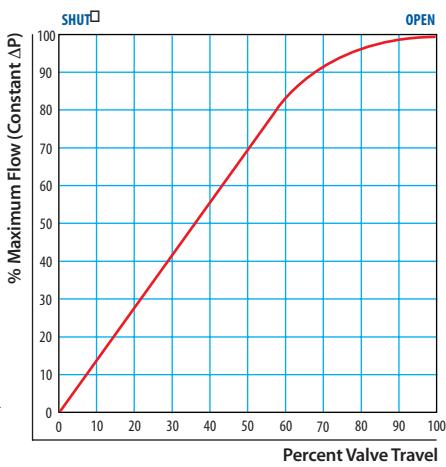
Hysteresis for weir type diaphragm valve fitted with actuator plus valve positioner



Diaphragm valve characteristic curves



% flow/% travel, weir type diaphragm valve



Saunders diaphragm valves offer excellent control capabilities within a broad range of pressure, flow or level control applications.

Rangeability (ratio of maximum flow vs. minimum control flow) of Saunders weir type valves is 35:1 extending beyond the range of most process and service control systems.

The positive shut-off characteristics of the valve can, in many instances, eliminate the need for independent block valves, a major component in the piping system cost.

The inherent flow characteristics illustrated shows linearity up to 60% of travel (80% of flow).

The chart illustrates installed characteristics affected by the dynamic friction loss for the remainder of the piping system. Equal % characteristics can be obtained through the use of characterised positioners.

Pressure recovery factor = 0.7.

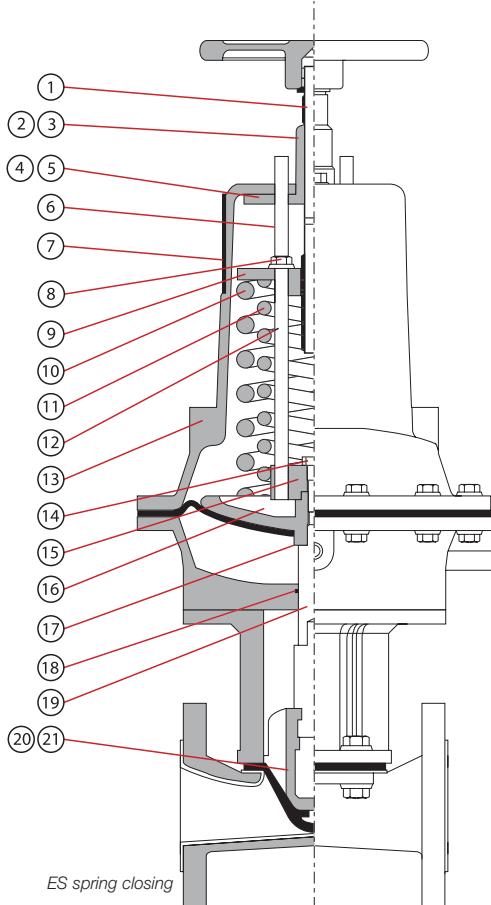


Actuator with digital foundation fieldbus positioner

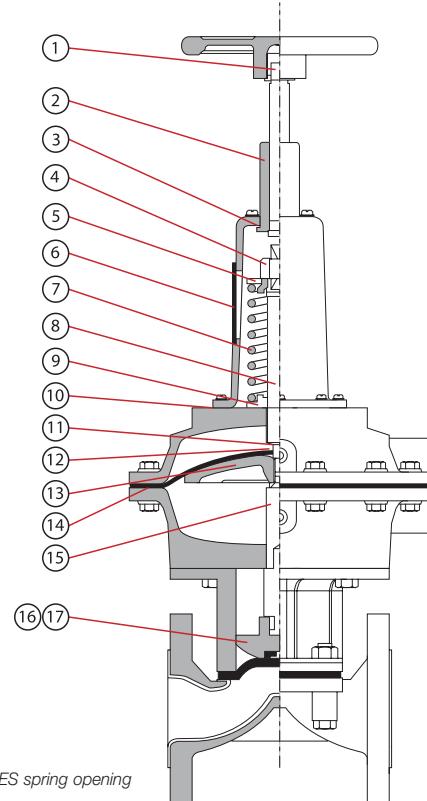
TECHNICAL DATA

ES Modular Pneumatic Actuation DN15 — DN150

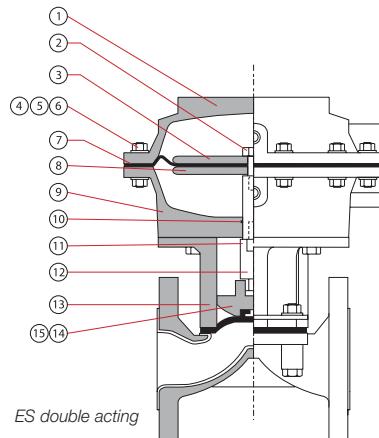
Materials of Construction



ES spring closing



ES spring opening



ES double acting

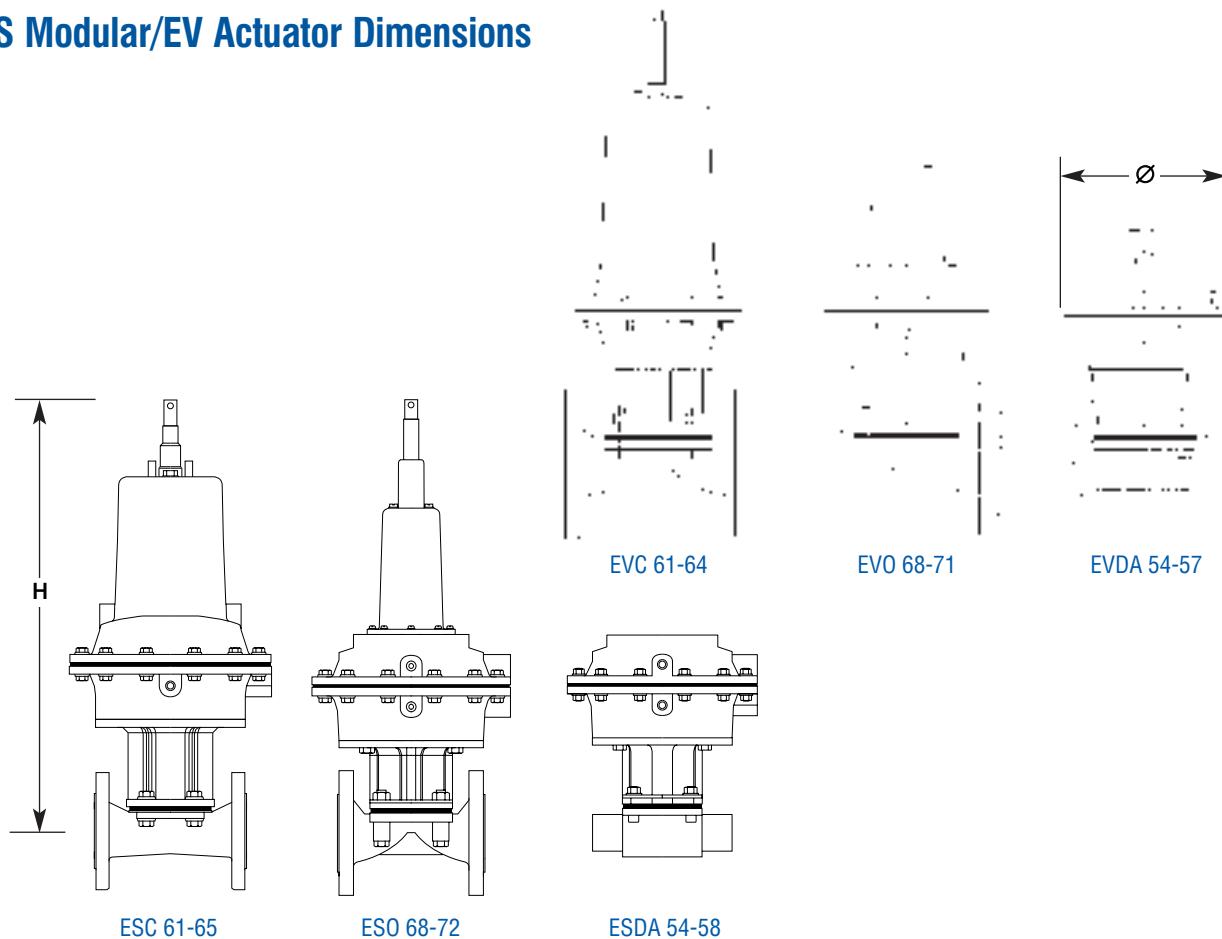
MATERIALS OF CONSTRUCTION		ES (SC)
Item	Component	Material
1	Handwheel Spindle	Mild steel
2	Locking bush	Mild steel
3	Locking bush screw	Steel
4	Reinforcing plate	Forged steel
5	Cover seal	PVC
6	Indicator sleeve	PVC
7	Slot seal	PVC
8	Lifting rod locknut	Steel
9	Upper spring plate	Forged steel
10	Outer spring	Steel
11	Inner spring	Steel
12	Lifting rod	Mild steel
13	Cover	Silicon Alumin
14	Lifting plate screw	Steel
15	Lifting plate	Mild steel
16	Diaphragm plate	Forged steel
17	Clamp washer	Mild steel
18	Lower cylinder o ring	Rubber
19	Master spindle	Stainless steel
20	Compressor pin	Steel
21	Compressor	Cast iron

MATERIALS OF CONSTRUCTION		ES (SO)
Item	Component	Material
1	Handwheel spindle	Mild steel
2	H/wheel spindle bush	Mild steel
3	Cover seal	PVC
4	Adj. screw locknut	Mild steel
5	Upper spring plate	Steel
6	Slot seal	PVC
7	Spring	Steel
8	Adjusting screw	Mild steel
9	Lower spring plate	Mild steel
10	'O' ring	Nitrile
11	Dished washer	Mild steel
12	Clamp washer	Mild steel
13	Diaphragm plate	Forged steel
14	Operating diaphragm	Rubber
15	Master spindle	Stainless steel
16	Compressor pin	Steel
17	Compressor	Cast iron

MATERIALS OF CONSTRUCTION		ES (DA)
Item	Component	Material
1	Upper cylinder	Silicon alumin
2	Diaphragm plate screw	Steel
3	Upper diaphragm plate	Mild steel
4	Cylinder nut	Steel
5	Cylinder bolt	Steel
6	Cylinder washer	Steel
7	Operating diaphragm	Rubber
8	Lower diaphragm plate	Mild steel
9	Lower cylinder	Silicon alumin
10	Lower cylinder 'o' ring	
11	Master spindle	Stainless steel
12	Spindle attachment	Stainless steel
13	Bonnet	Cast iron
14	Compressor pin	Steel
15	Compressor	Cast iron

TECHNICAL DATA

ES Modular/EV Actuator Dimensions



Model		Δ	H (Type A Valve) – Size in mm										h (Type KB Valve) – Size in mm															
			15	20	25	32	40	50	65	80	100	125	150	15	20	25	32	40	50	65	80	100	125	150				
Fail Safe Spring CLOSING	ES 61	169	408	413	423		435	461							480	480												
	EV 62	260			462		476	501	501	503					520	521	518	547										
	EV 63	316					700		729	732	756					740	765	797	827									
	EV 64	425						784		800	828	895							841	871	847	962						
	ES 65	549								1031	1059	1125								1102	1078	1193						
Fail Safe Spring OPENING	ES 68	169	378	383	393		406	432							450	450												
	EV 69	260			497		511	537	536	538					556	557	555	582										
	ES 70	316					773	783	786	810						794	819	850	881									
	EV 71	425						763		786	813	881							827	857	833	948						
	ES 72	549								879	907	974								950	926	1041						
DOUBLE ACTING	ES 54	169	155	160	170		183	209							227	227												
	ES 55	260			222		235	246	259	271					280	281	280	307										
	ES 56	316					306	315	318	357						326	351	382	413									
	ES 57	425						336		363	378	444							400	430	406	521						
	ES 58	549								382	410	479								453	429	544						

Δ = Actuator Diameter/Width **H** = Actuator Height

Dimension table shows in mm diameter/width of actuators and the maximum height of the actuator from the centre of the valve flange or pipeline.

Note

All dimensions are based on unlined bodies and bare shaft actuators. Add on handwheel dimensions are below (ES Modular only)

Actuator	Add-on
68/69/70	+14mm
61/62/63	+14mm
71/64	+18mm

Saunders Diaphragm Valves

Typical Applications

The table shows typical application areas for Saunders diaphragm valves under four categories, Abrasive, Corrosive, Industrial and Aseptic.

ABRASIVE	CORROSIVE	INDUSTRIAL	ASEPTIC
Gold Mining Cement Copper Mining Ceramics FGD Sugar Coal Slurry Phosphate Sand Fertilisers Titanium dioxide Sewage	Chlor-Alkali Iron and Steel Sulphuric Acid Effluent treatment Potable Water Pulp & Paper Basic Chemicals Acids and Alkalies Organics Toxic Fluids Nitric Acid	Marine Vegetable Oil Paints Fire Fighting Tanning Oil Production Automobile Air Effluent Gases, Fuels Dye Liquors	Biotechnology Pharmaceuticals WFI Fine Chemicals Chromatography Cosmetics Ultra Filtration Clean Water CIP Yeast Food & Beverage Soap

Abrasive

- ◆ Minerals processing, chemicals, fertilisers, china clay, paper, power generation are some of the industries that rely on Saunders KB Type diaphragm valves to withstand a wide variety of abrasive service conditions.
- ◆ Ores – phosphate rock or bauxite in aggregate form, slurries such as gypsum in power plant de-sulphurisation, powders – titanium dioxide in pigment application are typical service examples.
- ◆ Applications requiring a combination of corrosion and abrasion resistance, such as phosphate rock/sulphuric acid, together with reliability and long service life are also well catered for by the Saunders KB range.

Corrosive

- ◆ Corrosion is estimated to cost worldwide industry 300 billion Euros every year. Every process industry sector handles corrosive fluids to a smaller or greater extent.
- ◆ Saunders have expertise and unrivalled experience in corrosive applications.
- ◆ Continuous development of 'in-house' materials technology has resulted in the current extensive range of valve options including elastomer and fluoropolymer linings, designed to combat corrosion.

Industrial

- ◆ Saunders valves are widely used on utility (air, water, and gas) service lines. Also, as most process plants have an effluent treatment system there are many applications where Saunders valves can be used successfully: –
- ◆ The Food Industry – Saunders valves are widely used on margarine, yogurt and corn processing plants.
- ◆ In the Transport Industries Saunders have found success in the marine sector as mentioned earlier, in the automobile sector on service lines and paint coating systems and on road and rail tankers.

Aseptic

- ◆ Saunders is a key player in the evolution of high purity valve technology.
- ◆ The top ten pharmaceutical companies in the world head our international customer base.
- ◆ Saunders extensive range of valves designed for the pharmaceutical industry are detailed in other dedicated literature available from us.



Actuation Accessories

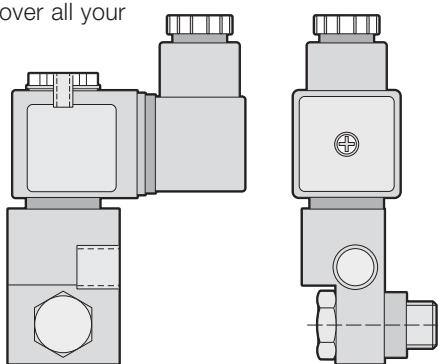
Overview

MODEL	SIZE RANGE	STYLE	MATERIAL	SOLENOID	SWITCH BOX	POSITIONER	AIR FILTER	HANDWHEEL
EC	DN8-50	A, AFP	PES	✓	✓	✓	✗	✗
SSC	DN8-50	A, AFP	316 C12	✓	✓	✓	✗	✓
ECX	DN65-150	A, AFP	SiAl	✓	✓	✗	✓	✗
EV	DN15-150	A, AFP, KB	SiAl	✓	✓	✓	✓	✗
ESM	DN15-150	A, AFP, KB	SiAl	✓	✓	✓	✓	✓

✓ = Available and ✗ = Not available

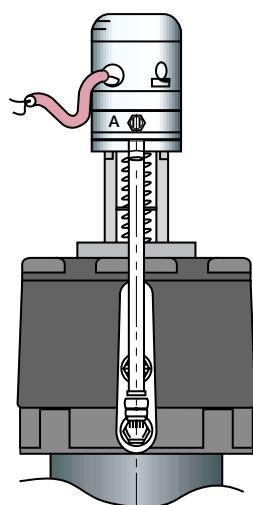
Solenoid Valves

A wide range of locally mounted banjo solenoid valves can be fitted to the Saunders actuator range with a manual override option and various hazardous area classifications. The solenoid range should cover all your requirements.



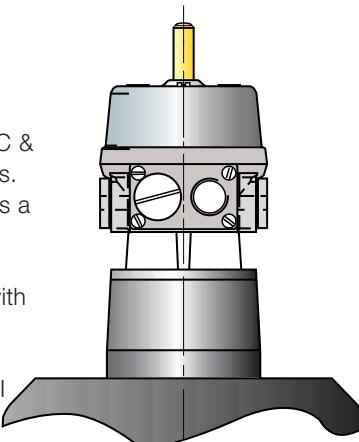
Mini Positioner

For control application on the EC and SSC the VIAPOS mini offers both pneumatic, electro-pneumatic and digital inputs with sensor feedback option and linear mounting design providing a neat control solution.



Module

This highly modular switchbox option is available for EC/SSC & ECX actuator ranges. The switchbox offers a wide range of V3 mechanical and proximity sensors with space for up to 4 switch, integral solenoid valve & ASI interface*.



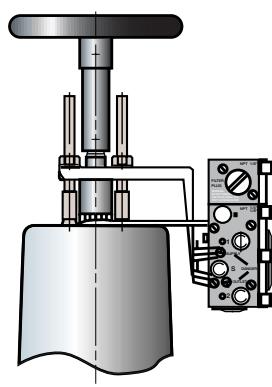
Opti-SET Switchbox

Suitable for EC and SSC Actuators. The Opti-SET is an easy to set switchbox. Available with two mechanical or proximity switches and intrinsically safe Option. Manufactured from carbon filled Nylon 66.



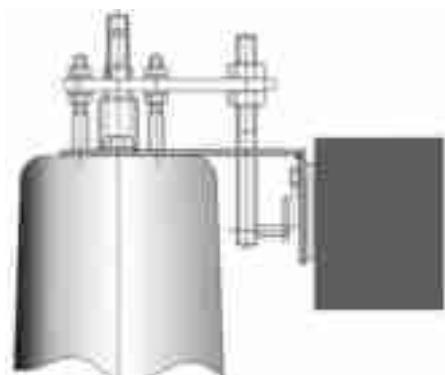
ES Positioner

Providing precise control of the flow through the valve. This long life corrosion resistant range suits a wide variety of applications with reliability and accuracy. Available as pneumatic electro pneumatic intrinsically safe and explosion proof, together with a variety of feedback options.



007 Switchbox

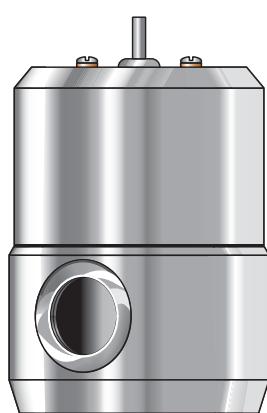
Manufactured from polyester coated aluminium. This switchbox is used for the ESM and EV linear actuators. It has the capability for up to 4 switches and can incorporate internal solenoid valve and ASI system.



Shown mounted to ESM Actuator

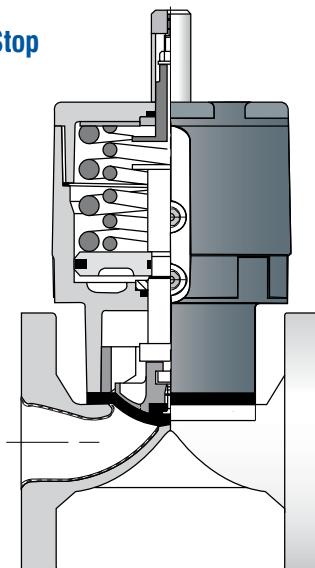
SSC Switchbox

Manufactured from 316 stainless steel. This switchbox is used for the EC and SSC compact actuator. It is available with either mechanical switches or proximity sensors.



EC & SSC Limit Open Stop

The EC/SSC limit open stop can be supplied to order and offers a fully adjustable travel stop. With the removal of the plastic indicator the limit stop is easily accessible.



SSC M/O

For extra security the SSC can be supplied with an emergency manual over-ride manufactured from stainless steel. Please contact Crane for further information.

