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spirax

Spira-Trol Control Valve

Description

SPIRA-TROL is a range of two-port single seat globe valves with cage retained seats conforming to EN standards. These valves are available in sizes ranging from DN15 to DN50. When used in conjunction with a pneumatic actuator they provide characterised modulating or on/off control.

SPIRA-TROL valve characteristic - options:

LE Equal percentage (E) -Suitable for most modulating process control applications providing good control at all flowrates.

SPIRA-TROL valve Internals :

Stem Sealing	PTFE seals		
Seating	Metal-to-meta	431	stainless steel
Trim	Standard trim		

Note : Various options for seating and trim are available on

SPIRA-TROL two-port control valves are compatible with the following actuators and positioners:

Pneumatic Actuator **MSA Series**
Positioners **with in- built E/P**

Sizes and Pipe Connections :

Type	Body Material	Connections	Size range
LE31	Cast iron	Screwed BSPT/ NPT	DN15, DN20, DN25, DN40 and DN50

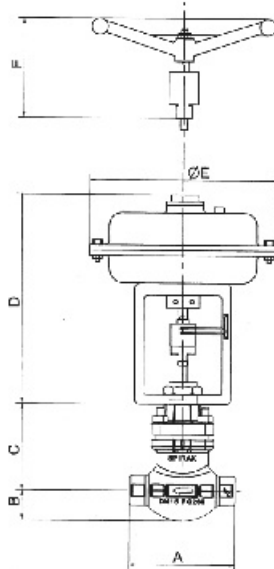
Note : Available with IBR certification on request.

Technical data :

Plug design	Parabolic	
Leakage	Metal-to-metal Class IV	
Rangeability	50:1	
Travel	DN15 to DN50	20 mm

Body design conditions

Maximum design pressure	13 bar g
Maximum design Temperature	220 C
Minimum design Temperature	-1 0 C
Maximum cold hydraulic test pressure :	26 bar g



Dimension Details :

Dimensions (Approx) in millimeters :

Valve Size	A	B	C
DN15	130	40	103
DN20	155	45	103
DN25	160	50	103
DN40	205	65	132
DN50	230	80	132

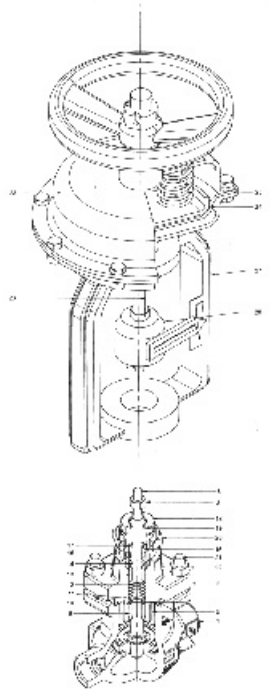
Actuator Dimensions

(approximately) in mm

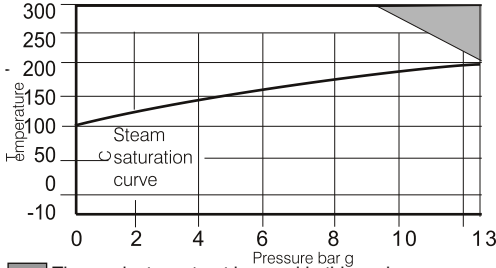
Actuator	D	ØE	F
MSA 0	300	200	11
MSA 1	295	2	13

Material

Type	No.	Part	Material
LE31	1	Body	Cast iron IS 210 FG260
	2	Bonnet	Cast iron
	3	Stem Lock	Nut Stainless steel
	4	Bonnet gasket	Spiral wound 316L/ graphite
	5	Seat retainer	Stainless steel 316L
	6	Valve seat ring	Stainless steel
	7	Seat gasket	Spiral wound 316L/ graphite
	8	Valve plug and stem	Stainless steel
	9	Lower stem guide	Glass filled PTFE
	10	Lower stem wiper	PTFE
	11	Packing guard washer	Stainless steel 316L
	12	Spring	Stainless steel
	13	Packing spacer	Stainless steel 316L
	14	Chevron packing set	PTFE
	15	Outer 'O' ring	Viton
	16	Upper stem guide	Glass filled PTFE
	17	Inner 'O' ring	Viton
	18	Gland nut	Stainless steel
	19	Scraper ring	PTFE
	20	Actuator clamp nut	Plated carbon steel
	21	Studs	carbon steel
	22	Nuts	carbon steel
MSA Actuator	23	Diaphragm Housing	Mild Steel
	24	Diaphragm	Purbunan Rubber
	25	Springs	Steel EN47
	26	Spindle	Stainless Steel
	27	Yoke	Carbon Steel
	28	Connector	Stainless Steel



Pressure / temperature limits :



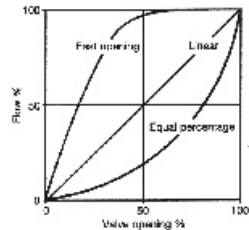
Weights for the SPIRA-TROL Valve (approximately) in kg

Valve size	LE31
DN15	4.0
DN20	5.0
DN25	5.5
DN40	10.0
DN50	11.0

Weights for Actuator (approximately) in kg

Actuator	Weight
MSA0	7.5
MSA1	9

Typical flow characteristic curves :



SATURATED STEAM SIZING CHART

Saturated steam sizing chart

This sizing chart is empirical and should not be used for critical applications

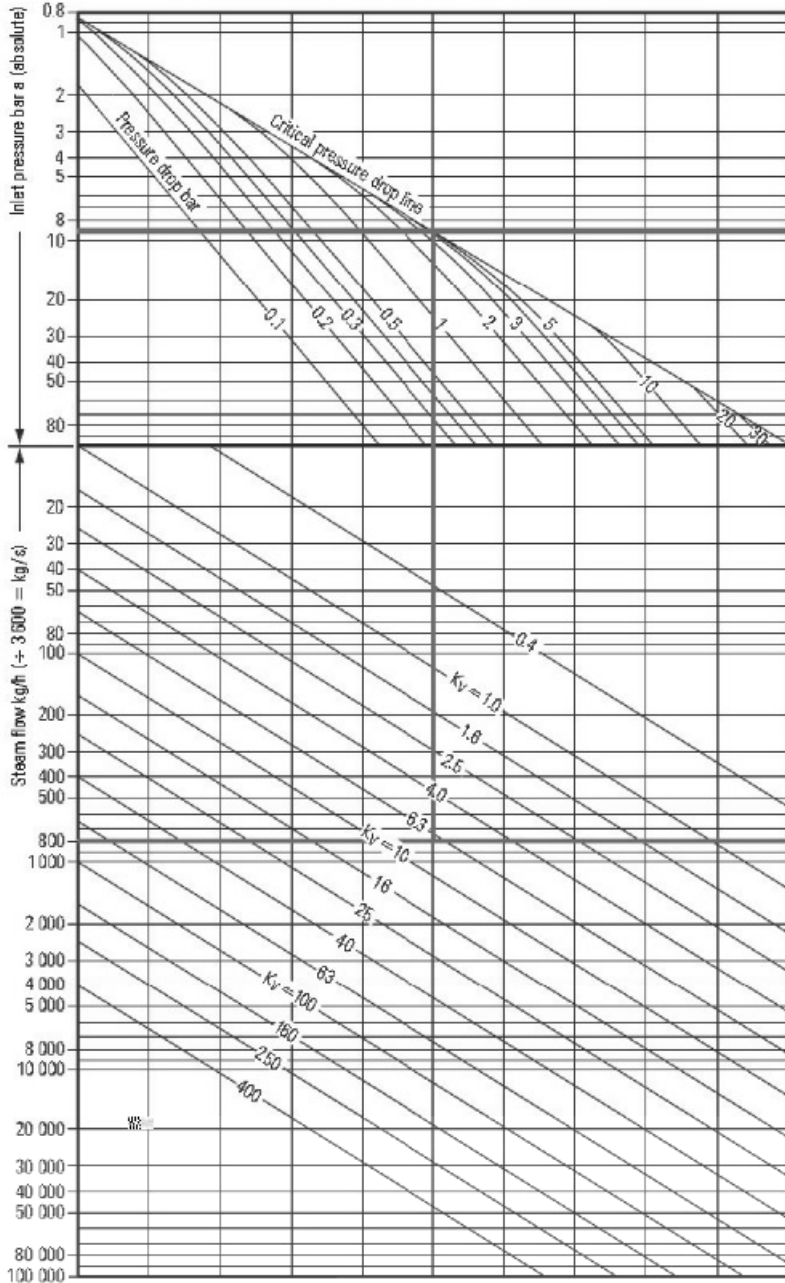


Fig. 6.4.8 Steam Kv chart

Kv Values :

Size	DN 15	DN 20	DN 25	DN 40	DN50
TRAVEL	20 mm				
Full Port	Equal %	4	6.3	10	25 36

Calculation of Flow rate from pressure drop ratio :

$$m = 12 K_v P_1 \sqrt{1 - 5.67 (0.42 - x)^2}$$

where

- m = Mass flow rate kg/h
- P₁ = Upstream pressure in bar a
- P₂ = Downstream pressure in bar a
- Kv = Valve flow coefficient
- x = Pressure drop ratio = $\frac{P_1 - P_2}{P_1}$

Note: To convert gauge pressure to absolute pressure, add 1.1 i.e. 10 bar.g. = 11 bar.a

Example :

Steam demand of heat exchanger = 200 kg/h
 Steam pressure upstream of valve = 5 bar.g. = 6 bar.a
 Steam pressure required in exchanger = 4 bar.g. = 5 bar.a

$$x = \frac{6 - 5}{6} = 0.1667$$

$$200 = 12 K_v \cdot 6 \sqrt{1 - 5.67 (0.42 - 0.1667)^2}$$

$$\text{So, } K_v = 3.48$$

Hence, valve selected for this application is 15NB LE31 valve with Kv=4.

Note :

Generally, a pressure drop of 20% may be considered.

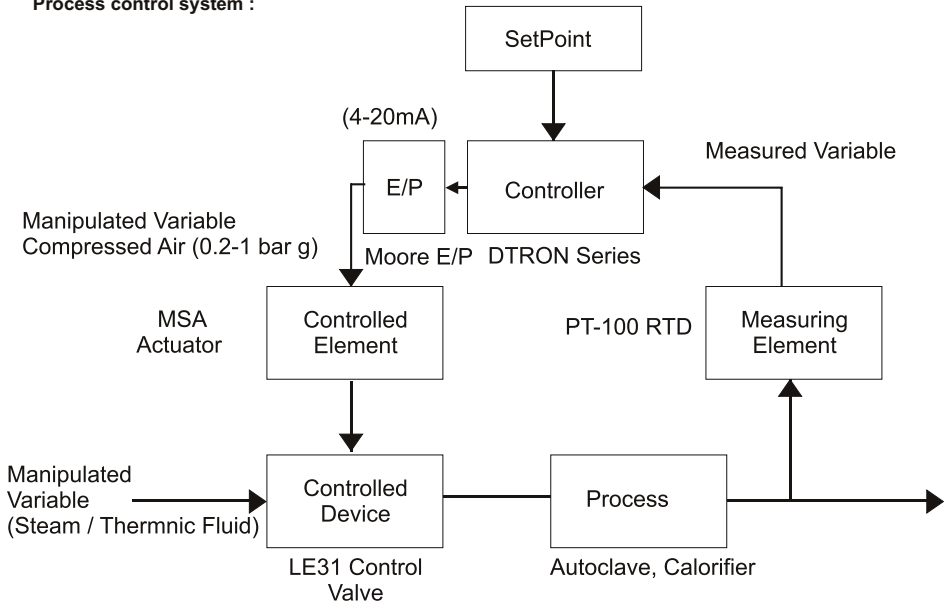
Actuator Selection

LE31 SPIRA-TROL WITH ARCA ACTUATOR (PTFE GLAND SEAL)

Valve Size	Differential Pressure bar (g) Across valve												
	1	2	3	4	5	6	7	8	9	10	11	12	13
15NB	A												
20NB	A												
25NB	B												
40NB	C												
50NB	C												

A	MSA-0-20-3JWITHPOSITIONERBUILT-INE/P
B	MSA0-20-3KWITHPOSITIONERBUILT-INE/P
C	MSA-1-20-4BWITHPOSITIONERBUILT-INE/P

Process control system :



Accessories :

<p>E/P Converter :</p> <p>The E/P transducer converts a DC milliampere input signal from controller to a pneumatic output signal that is directly proportional to the input</p>	<p>Accuracy:0.25% Input Current : 4-20 mA, Output - 0.2 -1 bar g</p>
<p>PID Controller</p> <p>The Multi-functional Controller DTRON Series is a general purpose single loop microprocessor based PID controller. It accepts a 4-20 mA analog input for the process parameter that needs to be controlled.</p>	<p>Analog Input : 4-20 mA, 2 Nos. Analog Output : 4-20 mA, 2 Nos. Power Supply : 230 VAC</p>
<p>Pneumatic Positioner (With in built E/P)</p> <p>Positioners improve the control accuracy of valve considerably. Deviations in valve position caused by : friction in the stuffing box & reactions of the medium, are balanced out by the positioner. Positioners also speed up the valve response as a volume amplifier.</p>	<p>Input current : 4 -20 mA Repeatability :± 0.5% Protection :IP 66</p>
<p>Solenoid Valve: For ON / OFF applications</p>	<p>3/2 way</p>
<p>RTD:</p> <p>PT-100 RTD</p> <p>Air Filter Regulator</p>	<p>Output : 4-20 mA corresponding to defined input temperature range</p>
<p><u>Temp.Switch for ON / OFF application</u></p>	

SPIRA TROL SELECTION GUIDE:

Valve size	DN15, DN20, DN25, DN40, DN50	025
Valve series	L = Lseries 2-port control valve	L
Valve Characteristics	E = Equal Percentage	E
Body Material	3= cast iron	3
connections	1= screwed	1
Made in India		IND
Screwed End Connections	A= BSPT B= NPT	A
Seating	M= 431 Stainless Steel	M
Approval	I= IBR N= NIBR	N
Actuator	0= MSAO 1= MSA1	O
Actuator Springs	J= 3J K= 3K B= 4B	B
Positioner	A = with positioner B = without positioner	B
Actuator handwheel	A = with handwheel B = without handwheel	A
Actuator type	C = Normally closed (Air to open)	C
Selection Examble :		

025 LE31- IND- AMN- OBBAC