Instrument

Filter, Regulator

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In-Line & Tee Filter
VF

In-Line & Tee Filter VF

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Features

Traps undesirable materials for protection of system components from fluid particles as well as contaminants

Replaceable sintered 316SS filter element with micron filtering ranges - 0.5, 2, 7, 15, 60 & 90 microns

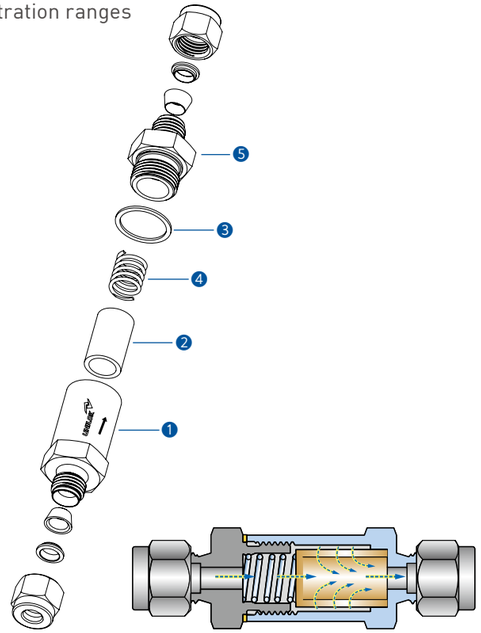
Compact body design

Wide choices of port sizes and end connections

VFI series In-line Filters

Maximum working pressure up to 3000psig (206bar) at 100˚F(37˚C)

For limited space and when filter element don t have to be replaced often Compact design with broaden filtration ranges



Materials of Construction

No.	Description	Materials	
Series		FT- T	FI - Inline
1	Body	316SS	
2	Sintered Filter	316SS	
3	Gasket	316SS plated with silver	
4	Spring	302SS	
5	Outlet Body	-	316SS
6	Bonnet	316SS	-
7	Nut	316SS	-

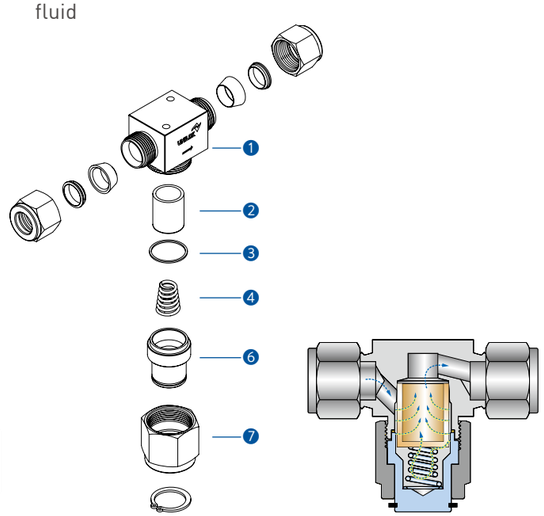
VFT series T Filters

Maximum working pressure up to 6000psig (413bar) at 100˚F(37˚C)

Easy replacement of filter element on-line

Union bonnet design for safe high pressure application

Bypass option for sampling or purging of process fluid



Definitions

Filter Element

Made of sintered stainless steel , porous with lots of tiny holes

Traps media contamination which is bigger than the porous in the filter element

Filtration Area

Actual surface area of the filter element to trap media contamination

Micron

Pore diameter of filter element or particle diameter of media contamination 1 micron = 0.001mm or 0.00004 inch

Cleaning

UNILOK filters are free from machine oils, loose particles and grease throughout the close cleaning process.

The special cleaning for high purity application is available upon request.

Testing

Every VF series filter is 100% factory tested with air and nitrogen at 1000psig (69bar) to a requirement of no detectable leakage.

Important Notification

Proper installation, materials compatibility, operation and maintenance of these filters are the responsibility of the user. The total system design must be taken into consideration to ensure optimal performance and safety.

When undesirable contaminants are trapped by filter element, the system pressure build up occurs. It comes earlier when the flow volume is high and the media is not clean. In this case, the filter elements need to be replaced and clean metal components when replacement for minimal pressure drop as well as system purity.

How To order

UNILOK VF series filters are ordered by part number as shown below.

Example: The following part number, ***VFT3U-08T-SS-60-B02N*** is designated for FT series filter with both 1/2 UNILOK tube fittings, 316SS, 60 micron filter element, 1/8 Female NPT by-pass option.

V	FT3	U	-	08T	-	SS	-	60	-	B02N
UNILOK Filter	Filter Type	Connection Type		Connection Size		Body Materials		Filtration Ranges		By-pass Option

Thread Type Designation	
FI	In-line Filter
FT	T Filter

Connection Type	
U	UNILOK Tube Fitting
F	Female NPT or ISO7/1(PT)
M	Male NPT or ISO7/1(PT)

Body Materials	
SS	316SS
BS	Brass

Connection Size					
Fractional(Inch) Tube O.D. Designation					
Tube O.D.	inch	1/8	1/4	3/8	1/2
	mm	3.17	6.35	9.52	12.70
Designator		02T	04T	06T	08T

Metric Tube O.D. Designation						
Tube O.D.	mm	3	6	8	10	12
Designator		M03T	M06T	M08T	M10T	M12T

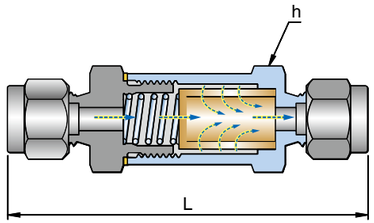
Pipe Size Designation (NPT or ISO7/1-PT)				
Pipe Size	1/8	1/4	3/8	1/2
Designator	02N/R	04N/R	06N/R	08N/R

Filtration Ranges	
Designator	Norminal Micron
05	0.5
2	2
7	7
15	15
60	60
90	90

By-pass Option	
None	None
B02N	By-pass with Female 1/8"NPT
B04N	By-pass with Female 1/4"NPT

VFI series

(In-line Filters)



Maximum working pressure up to 3000psig (206bar) at 100˚F(37˚C)
For limited space and when filter element don't have to be replaced often
Compact design with broaden filtration ranges

Ordering Information & Dimensions

Part Number		End Connection		Orifice (mm)	Dimensions (mm)	
		Inlet	Outlet		L	h
VFI1	U-02T-	1/8" UNILOK		2.4	59.7	14.3
	U-M03T-	3mm UNILOK			60.5	
	F-02N-	1/8" Female NPT			54.9	
VFI2	U-04T-	1/4" UNILOK		4.7	74.9	19.0
	U-M06T-	6mm UNILOK			75.2	
	F-04N-	1/4" Female NPT			72.9	
	M-04N-	1/4" Male NPT			68.3	
VFI3	U-06T-	3/8" UNILOK		7.1	81.8	25.4
	F-06N-	3/8" Female NPT			77.2	
	M-06N-	3/8" Male NPT			71.6	
VFI4	U-08T-	1/2" UNILOK		10.3	88.6	
	U-M10T-	10mm UNILOK			82.2	

ISO7/1 Tapered Threads (PT) are available for all fractional sizes of VFI series filters. Add "R" as a suffix instead of "N"

Effective Filtration Area

Series	Effective Filtration Area	
	sq. inch	sq. meter
VFI1	0.55	0.00035
VFI2	1.30	0.00083
VFI3, VFI4	2.00	0.00128

Filter Elements & Ordering Designator

The elements can trap 95% of undesirable particles larger than the nominal pore size.

Ordering Designator	Norminal Pore Size(㎛)	Pore Size Range(㎛)
05	0.5	0.5 ~ 2
2	2	1 ~ 4
7	7	5 ~ 10
15	15	11 ~ 25
60	60	50 ~ 75
90	90	75 ~ 100

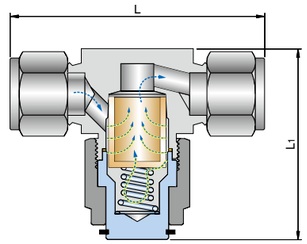
Technical Data

Series	Max Working Pressure at 100˚F(37˚C)				Working Temperature Rating	
	316SS		Brass		316SS	Brass
	psig	bar	psig	bar		
VFI1	3000	206	3000	206	-20 ~ 900˚F -28 ~ 482˚C	-20 ~ 300˚F -28 ~ 148˚C
VFI2	3000	206	3000	206		
VFI3, VFI4	2500	172	2000	137		

Dimensions are for reference only and are subject to change without prior notice.

VFT series

(T Filters)



Maximum working pressure up to 6000psig (413bar) at 100˚F(37˚C)
Easy replacement of filter element on-line
Union bonnet design for safe high pressure application
Bypass option for sampling or purging of process fluid

Ordering Information & Dimensions

Part Number		End Connection		Orifice (mm)	Dimensions (mm)	
		Inlet	Outlet		L	L_1
VFI1	U-02T-	1/8" UNILOK		2.4	57.7	47.5
	U-04T-	1/4" UNILOK		4.4	62.7	
	U-M06T-	6mm UNILOK			62.5	
	F-02N-	1/8" Female NPT			50.8	
	F-04N-	1/4" Female NPT			54.1	
	M-02N-	1/4" Male NPT			54.1	
VFI2	U-06T-	3/8" UNILOK		5.4	72.1	56.0
	M-08N-	8mm UNILOK			72.1	
VFI3	U-08T-	1/2" UNILOK		6.4	77.2	56.0
	U-M10T-	10mm UNILOK			72.6	
	U-M12T-	12mm UNILOK			77.2	
	M-06N-	3/8" Male NPT			60.5	
	M-08N-	1/2" Male NPT			69.9	

ISO7/1 Tapered Threads (PT) are available for all fractional sizes of VFT series filters. Add "R" as a suffix instead of "N".

Filter Elements & Ordering Designator

The elements can trap 95% of undesirable particles larger than the nominal pore size.

Ordering Designator	Norminal Pore Size(㎛)	Pore Size Range(㎛)
05	0.5	0.5 ~ 2
2	2	1 ~ 4
7	7	5 ~ 10
15	15	11 ~ 25
60	60	50 ~ 75
90	90	75 ~ 100

Technical Data

Series	Max Working Pressure at 100°F(37˚C)				Working Temperature Rating	
	316SS		Brass		316SS	Brass
	psig	bar	psig	bar		
VFT1, VFT2	6000	413	2000	137	-20 ~ 900˚F -28 ~ 482˚C	-20 ~ 300˚F -28 ~ 148˚C
VFI3						

Dimensions are for reference only and are subject to change without prior notice.

Flow Data at 70°F(21°C)

VFI series In-line Filters

Norminal Element Pore Size (μm)	Inlet Pressure psig/bar									Pressure Drop psig/bar								
	5psig/0.34bar			10psig/0.68bar			15psig/1.00bar			10psig/0.68bar			50psig/3.40bar			100psig/6.80bar		
	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm
	Air Flow, L/min									Water Flow, L/min								
0.5	1.1	3.4	10	1.7	7.3	24	3.4	13	45	0.03	0.15	0.34	0.15	0.64	1.5	0.45	1.0	2.8
2	5.6	17	39	11	39	79	17	65	110	0.30	0.90	0.98	0.91	3.2	4.1	1.5	4.9	6.0
7	14	39	51	25	82	119	34	130	190	0.37	1.5	2.4	1.1	4.9	8.3	1.8	7.5	13
15	22	34	51	36	82	130	42	130	220	0.45	1.8	3.1	1.3	4.9	9.8	2.1	7.9	15
60	48	87	140	62	160	280	68	240	420	0.56	3.4	7.5	1.8	12	25	2.6	17	37
90	51	110	170	62	210	310	73	280	450	0.75	4.5	8.7	1.8	15	28	2.2	23	41

VFT series T Filters

Norminal Element Pore Size (μm)	Inlet Pressure psig/bar									Pressure Drop psig/bar								
	5psig/0.34bar			10psig/0.68bar			15psig/1.00bar			10psig/0.68bar			50psig/3.40bar			100psig/6.80bar		
	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm	1/8 3mm	1/4 6mm	3/8,1/2 10,12mm
	Air Flow, L/min									Water Flow, L/min								
0.5	1.1	3.4	10	1.7	7.3	24	3.4	13	45	0.15	0.15	0.34	0.64	0.64	1.5	1.0	1.0	2.8
2	5.6	17	39	11	39	79	17	65	110	0.30	0.90	0.98	0.90	3.2	4.1	1.5	4.9	6.0
7	14	39	51	25	82	119	34	130	190	0.37	1.5	2.4	1.1	4.9	8.3	1.8	7.5	13
15	22	34	51	36	82	130	42	130	220	0.45	1.8	3.1	1.3	4.9	9.8	2.1	7.9	15
60	48	87	140	62	160	280	68	240	420	0.56	3.0	5.6	1.8	10	18	2.6	14	25
90	51	110	170	62	210	310	73	280	450	0.75	4.1	6.4	1.8	12	20	2.2	18	28

INSTRUMENT

Regulator

RE

RE01 Series

Specification

Pressure Ratings

Per criteria of ANSI/ASME B31.3

Max. Inlet Pressure	3500 or 500 psig (241 or 34.5 bar)
Outlet Pressure Range	25, 50, 100, 250 and 500 psig (1.7, 3.5, 6.9, 17.3 and 34.5 bar)
Design Proof Pressure	150% of maximum rated

Operating Temperature

PCTFE Seat	-40 ~ 60°C (-40°F ~140°F)
Vespel® Seat	-40 ~ 177°C (-40°F ~350°F)

Flow Capacity

3500 psig / 241 bar	0.06 Cv
500 psig / 41.4 bar	0.2 Cv

Helium Leak Test

Inboard Leak Rate	2x10^{-8} atm cc/sec

Media Contact Materials

Body	316L Stainless Steel
Diaphragm	316L Stainless Steel or Hastelloy®
Seat	PCTFE (Optional Vespel®)
Spring	316 Stainless Steel or Inconel®
Poppet, Retainer	316L Stainless Steel

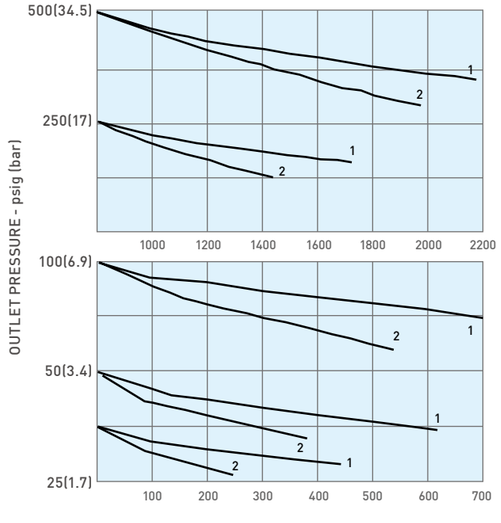
Cleaning

UNILOK Regulators are free from machine oils, loose particles and grease throughout the close cleaning process.

Features

- The RE01 series provides excellent stability of set pressure with accuracy, sensitivity.
- Metal to metal diaphragm seals provide enhanced leak integrity
- Optimum performance and cleanliness at a great value
- Low internal volume
- Adjustable stop to limit outlet pressure

Flow Chart



1- Inlet 3500 psig 2- Inlet 500psig

How To order

RE01	S	F	-	04N	12	0	-	
Regulator Type	Body Material	Connection Type		Connection Size	Inlet /Outlet Pressure	Gauge Port Option		Trim Material

Regulator Type	
RE01	RE01 Series

Body Material	
S	316L SS
B	BRASS

Connection Type	
F-*N	Female NPT
U-*T	UNILOK Tube Fitting

Connection Size	
04	1/4"

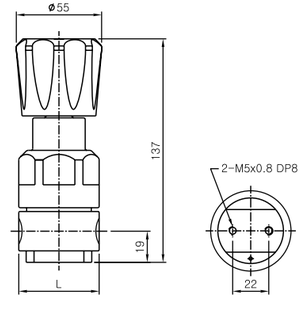
Maximum Inlet Pressure	
1	3500 psig / 241bar
2	500 psig / 34.5 bar

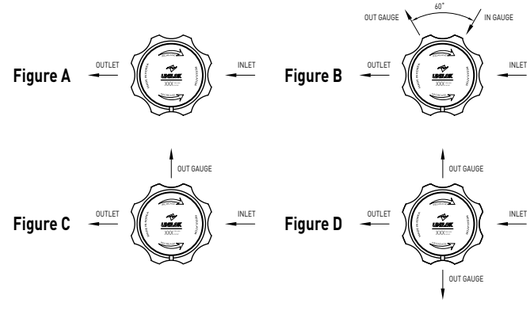
Outlet Pressure Range	
0	1 ~ 25 psig / 1 ~ 1.7 bar
1	1 ~ 50 psig / 1 ~ 3.5 bar
2	1 ~ 100 psig / 1 ~ 6.9 bar
3	1 ~ 250 psig / 1 ~ 17.3 bar
4	1 ~ 500 psig / 1 ~ 34.5 bar

Gauge Port Option	
0	None (Fig. A)
1	1/4 " Female NPT (Fig. B)
2	1/4 " Female NPT (Fig. C)
3	1/4 "Female NPT (Fig. D)

Trim Material	
None	316L SS
H	Hastelloy®

Ordering Information & Dimensions





Gauge Port Option

Part No.		End Connection		Dimensions(mm)
		Inlet	Outlet	L ± 1
RE01*	F-04N	1/4" Female NPT		49
	U-04T	1/4" UNILOK Tube Fitting		109.7

Dimensions are for reference only and are subject to change without prior notice.

RE02 Series

Specification

Pressure Ratings

Per criteria of ANSI/ASME B31.3

Max. Inlet Pressure	3500 or 500 psig (241 or 34.5 bar)
Outlet Pressure Range	25, 50, 100, 250 and 500 psig (1.7, 3.5, 6.9, 17.3 and 34.5 bar)
Design Proof Pressure	150% of maximum rated

Operating Temperature

PCTFE Seat	-40 ~ 60°C (-40°F ~140°F)
Vespel® Seat	-40 ~ 177°C (-40°F ~350°F)

Flow Capacity

Flow Capacity	0.5 Cv

Helium Leak Test

Inboard Leak Rate	$2x10^{-8}$ atm cc/sec

Media Contact Materials

Body	316L Stainless Steel
Diaphragm	316L Stainless Steel or Hastelloy®
Seat	PCTFE (Optional Vespel®)
Spring	316 Stainless Steel or Inconel®
Poppet, Retainer	316L Stainless Steel

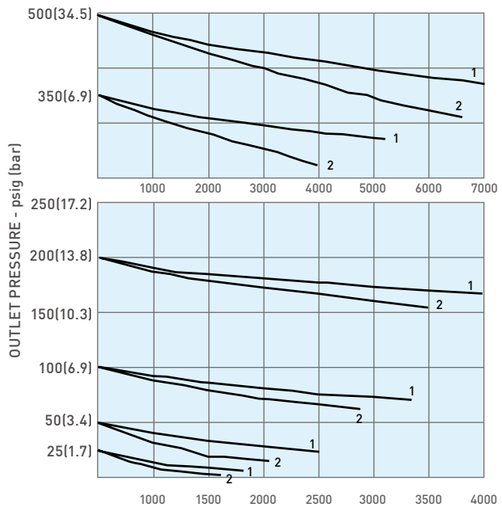
Cleaning

UNILOK Regulators are free from machine oils, loose particles and grease throughout the close cleaning process.

Features

- The RE02 series provides excellent stability of set pressure with accuracy, sensitivity.
- Metal to metal diaphragm seals provide enhanced leak integrity
- Optimum performance and cleanliness at a great value
- Low internal volume
- Adjustable stop to limit outlet pressure

Flow Chart



1- Inlet 3500 psig 2- Inlet 500psig

How To order

RE02	S	F	-	08N	12	0	-	
Regulator Type	Body Material	Connection Type		Connection Size	Inlet /Outlet Pressure	Gauge Port Option		Trim Material

Regulator Type	
RE02	RE02 Series

Body Material	
S	316L SS
B	BRASS

Connection Type	
F-*N	Female NPT
U-*T	UNILOK Tube Fitting

Connection Size	
06	3/8"
08	1/2"

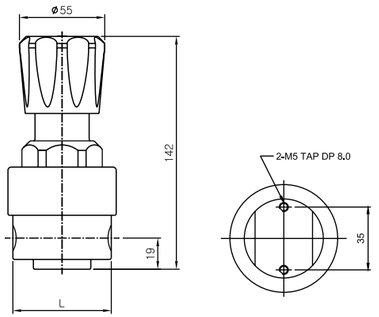
Maximum Inlet Pressure	
1	3500 psig / 241bar
2	500 psig / 34.5 bar

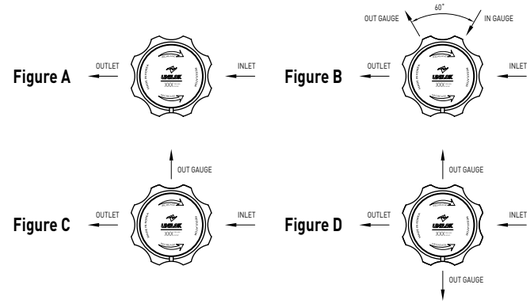
Outlet Pressure Range	
0	1 ~ 25 psig / 1 ~ 1.7 bar
1	1 ~ 50 psig / 1 ~ 3.5 bar
2	1 ~ 100 psig / 1 ~ 6.9 bar
3	1 ~ 250 psig / 1 ~ 17.3 bar
4	1 ~ 500 psig / 1 ~ 34.5 bar

Gauge Port Option	
0	None (Fig. A)
1	1/4 " Female NPT (Fig. B)
2	1/4 " Female NPT (Fig. C)
3	1/4 "Female NPT (Fig. D)

Trim Material	
None	316L SS
H	Hastelloy®

Ordering Information & Dimensions





Gauge Port Option

Part No.		End Connection		Dimensions(mm)
		Inlet	Outlet	L ± 1
RE02*	F-08N	1/2" Female NPT		60.0
	U-06T	3/8" UNILOK Tube Fitting		136.7
	U-08T	1/2" UNILOK Tube Fitting		136.7

Dimensions are for reference only and are subject to change without prior notice.

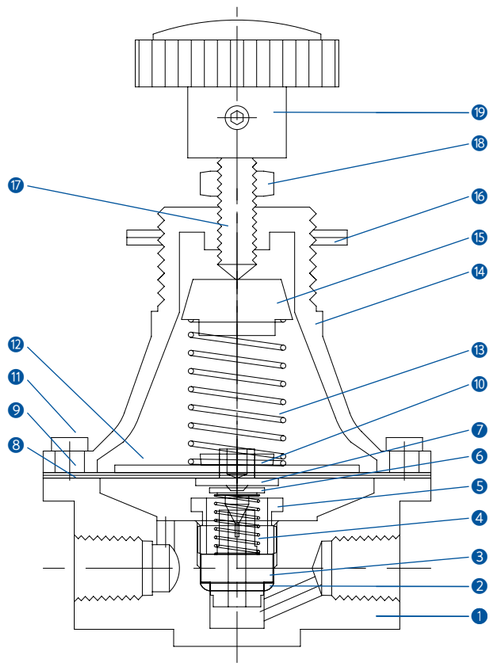
Back Pressure Regulator
VBR

Features

UNILOK Back Pressure Regulator is used to maintain a constant upstream pressure of gas, vapor or liquid. Designed for accurate regulation under low flow conditions, these units are widely used for protection of analysis instrumentation or as a relief valve in supply pressure lines to control valves.

Specification

Connection : 1/4 Female NPT
Operating Temperature : -29°C(-20°F) ~ 66°C(150°F)
Sensitivity : 0.05psi
Regulated Back Pressure Ranges : 0~125psig as standard



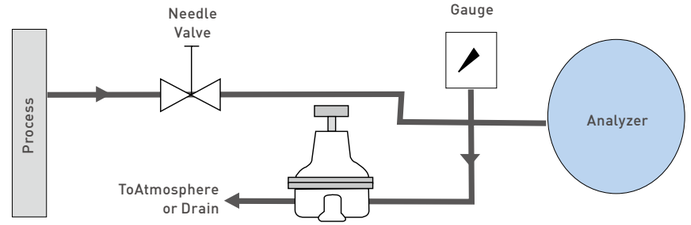
Materials of Construction

No.	Description	Materials
1	Body	316SS
2	Body Seat	PTFE
3	Nozzle	316SS
4	Plug Spring	304SS
5	Nozzle Retaining Nut	316SS
6	Plug	316SS
7	Rivet	316SS
8	Packing Plate	PTFE
9	Rubber Seat	Rubber
10	Rivet Gland	316SS
11	Bolt	304SS
12	Ribet Plate	Brass
13	Range Spring	302SS
14	Bonnet	Aluminum
15	Spring Plug	Brass
16	Panel Nut	316SS
17	Handle Stem	316SS
18	Lock Nut	316SS
19	Handle	Xenoy

Principle of Operation

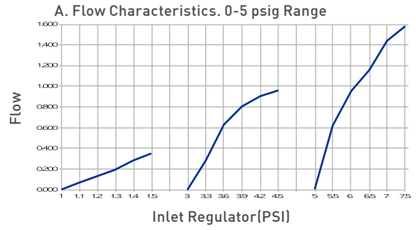
Turning the hand wheel changes the force exerted by the range spring on the diaphragm assembly. In equilibrium, the force exerted by the range spring is balanced by the force from back pressure acting underneath the diaphragm assembly.
If the back pressure rises above the set pressure, the diaphragm seat is lifted allowing the nozzle plug to open.
The excess pressure flows through the exhaust port until the back pressure is reduced to the set point.
While the back pressure is at or below the set point, the range spring holds the nozzle plug against its seat, shutting off the flow to the exhaust port.

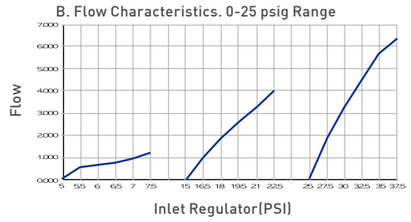
Application

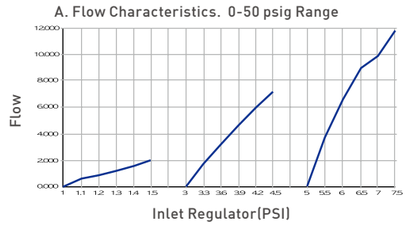


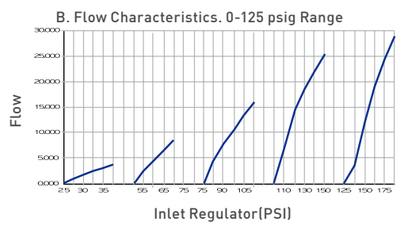
In the above application, UNILOK Back Pressure Regulator is maintaining a constant upstream pressure on the sample stream by relieving the excess pressure prior to its arrival at the analyzer

Range Selection









Important Notification

Proper installation, materials compatibility, operation and maintenance of these valves are the responsibility of the user. The total system design must be taken into consideration to ensure optimal performance and safety.