All Dimensions in Inches (unless otherwise specified)

Model	Rated Volume (CFM)	Filter Area (ft^2)	Qty bags/ Length	Compressed Air Consumption (SCFM) [1]	Hopper	Hopper Discharge	Inlet	Outlet	A	B	C	D	Weight (lbs)	Model
SINGLE WIDTH – 5 FOOT BAG FILTERS														
36VS–5	5,700	311	36/66	1.12–2.24	pyramid	10x10	32x10	32x10	60	72	99	183	2350	36VS–5
48VS–5	7,500	415	48/66	1.49–2.98	pyramid	10x10	40x10	40x10	79	72	105	189	2625	48VS–5
60VS–5	9,500	519	60/66	1.86–3.72	Pyramid	10x10	40x12	40x12	98	72	121	205	3200	60VS–5
SINGLE WIDTH – 8 FOOT BAG FILTERS														
36VS–8	8,600	453	36/96	1.80–1.60	pyramid	10x10	32x14	32x14	60	72	99	219	2700	36VS–8
48VS–8	11,500	603	48/96	2.40–4.80	pyramid	10x10	42x14	42x14	79	72	105	225	3400	48VS–8
60VS–8	14,500	754	60/96	3.00–6.00	Pyramid	12x12	54x14	54x14	98	72	121	241	4300	60VS–8
72VS–8	17,200	905	72/96	3.60–7.20	[2]	(2)10x10	56x16	56x16	117	72	99	219	4900	72VS–8
84VS–8	20,000	1056	84/96	4.20–8.40	[2]	(2)10x10	60x16	60x16	136	72	100	220	6750	84VS–8
96VS–8	23,000	1207	96/96	4.80–9.60	[2]	(2)10x10	70x16	70x16	155	72	105	225	7650	96VS–8

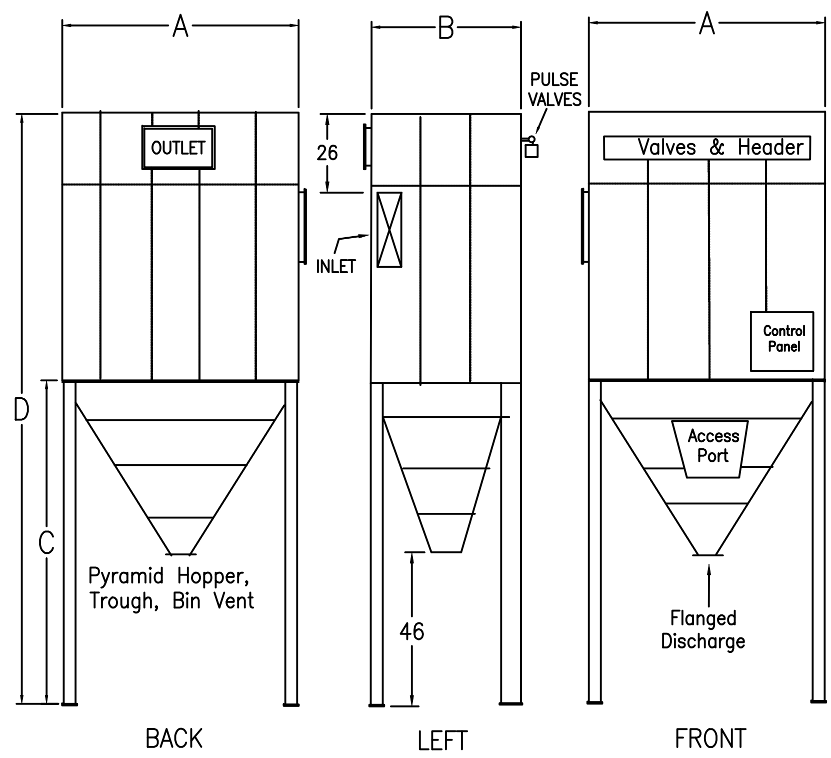
[1] Compressed air used for dust loading of 2–8 grains per cu. ft.
[2] Two pyramid hoppers or trough

- **"Advanced Technology", high-ratio, high efficiency (95-99%), low pressure drop (1.5-2.5"WC), 30-40% lower operating cost baghouse.**
- Built to; ISO 9001-2008 and CWB certification
- 11 gauge hot rolled steel, fully welded construction, strategically placed vertical re-inforcing bars to withstand +/-20"wc,
- SSPC-SP3 power-tool cleaned, epoxy primed (in and out) and exterior finish coat of Terra Brown (RAL8028) paint, good to 250°F.
- High side inlet with large dropout chamber, perforated baffle, to prevent abrasion and distribute air/dust evenly on filters. Downward flow prevents upward "can velocity", to allow operation at high filter/air-to-cloth ratio (18:1), regardless of the job conditions.
- 60°Pyramidal hoppers or troughs provided for dust collection.
- Automatic self-cleaning, advanced technology "high-ratio" reverse jet pulse, requiring no shutdown for after-pulse cleaning. Pulse sequencer supplied in NEMA 4 enclosure.
- Diaphragm valves rated at 125% of required flow to ensure proper back-flush volume.
- Computer designed supersonic converging-diverging nozzles on pulse pipes.
- One full set of top loaded and removal filter bags and wire cages.
- Optional differential pressure gauge and dust trap with connecting hardware, to monitor filter condition.
- Built to North American compliance with EPA, OSHA NFPA standards. Compliance with local codes and standards are the responsibility of the purchaser.

Selecting a collector based on Fitler ratio is an engineering mistake.
See Enginerring Bulletin, E-002.

Operating Requirements:

For best cleaning, both the process air and compressed air must be maintained at least 15°F above the dew point. Compressed air must be below a maximum temperature of 180°F at 85 psig. For the protection of the pneumatic valves and controls, compressed air for this equipment must be clean and have a refrigerant or desiccant dryer at the collector having a low enough dew point to meet conditions of operation.



QAM reserves the right to change design and specifications without notice.

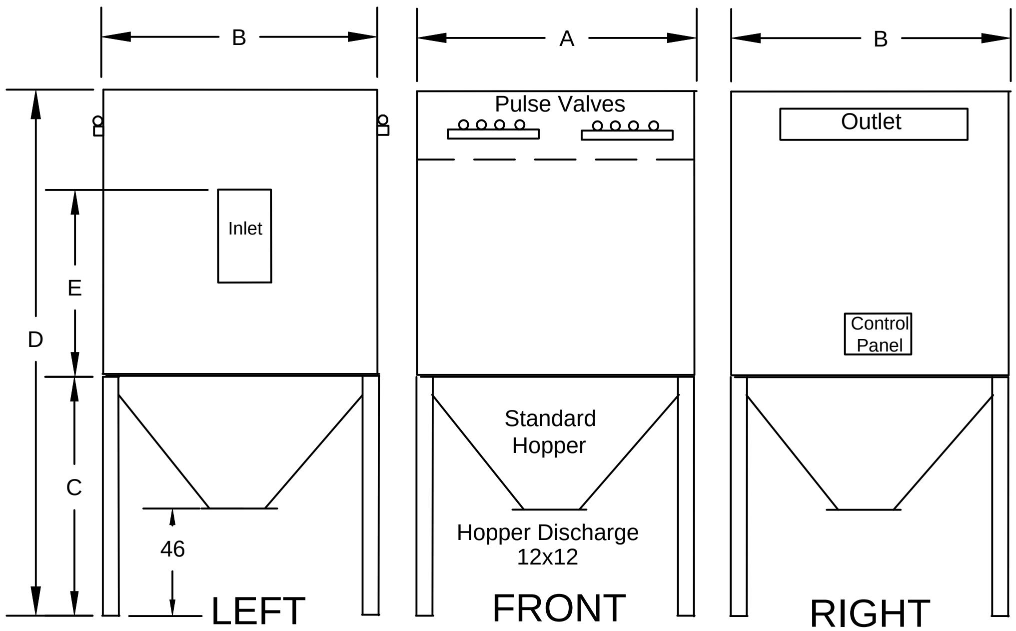
COMPANY	ALL DIMENSIONS ARE IN INCHES UNLESS STATED OTHERWISE	REV.	REV. DATE	REVISION DESCRIPTION	PROJECTION
QUALITY AIR MANAGEMENT 240 Camille Cresent, Waterloo, Ontario - phone: 1-800-267-5585 www.qamanage.com		2	08/20/2021	corrected inlet & outlet sizes	
TITLE: VS- series Baghouse; PAGE: ; DATE: 07/27/2021	SCALE: not to scale	1	08/12/2021	corrected some of the "A" dimensions	DWG. NO. V-001-1

V-SERIES TOP REMOVAL

All Dimensions in inches (unless otherwise specified)

MODEL	Rated Volume (CFM)	Filter Area (FT^2)	#bags / length	Compressed Air Consumption (SFM) [1]	Hopper	INLET H x W	OUTLET H x W	A	B	C	D	E	Weight (lbs)	MODEL
DOUBLE WIDTH - 8 FOOT BAG FILTERS														
120VD–8	29,000	1508	120/96	6.00–12.00	Pyramid	48x28	22x62	98	144	160	286	94	8100	120VD–8
144VD–8	35,000	1810	144/96	7.20–14.40	Pyramid	52x32	24x68	117	144	160	286	94	9200	144VD–8
168VD–8	40,000	2112	168/96	8.40–16.80	Pyramid	58x32	26x72	136	144	160	286	94	10,300	168VD–8
192VD–8	46,000	2413	192/96	9.60–19.20	Pyramid	68x32	26x84	155	144	168	294	94	11,100	192VD–8
DOUBLE WIDTH - 10 FOOT BAG FILTERS														
168VD–10	58,000	2640	168/120	11.76–23.52	[2]	86x32	30x90	136	156	160	322	118	13,725	168VD–10
192VD–10	67,000	3017	192/120	13.44–26.88	[2]	88x36	32x96	155	156	160	322	118	14,740	192VD–10
216VD–10	75,000	3394	216/120	15.12–30.24	[2]	90x40	36x100	174	156	162	324	118	15,640	216VD–10
240VD–10	83,000	3770	240/120	16.80–33.60	[2]	90x44	36x110	193	156	162	324	118	17,775	240VD–10
264VD–10	91,000	4148	264/120	18.48–36.96	[2]	92x46	38x112	212	156	162	324	118	19,100	264VD–10
288VD–10	100,000	4525	288/120	20.16–40.32	[2]	100x46	38x120	231	156	162	324	118	20,200	288VD–10

[1] Compressed air used for a dust loading of 2-8 grains per cu.ft.
[2] Two pyramid hoppers or a trough



Selecting a collector based on Fitler ratio is <u>an engineering mistake</u>. See Enginerring Bulletin, E-002.

- **"Advanced Technology", high-ratio, high efficiency (95-99%), low pressure drop (1.5-2.5"WC), 30-40% lower operating cost baghouse.**
- Built to; ISO 9001-2008 and CWB certification
- 11 gauge hot rolled steel, fully welded construction, strategically placed vertical re-inforcing bars to withstand +/-20"wc.
- SSPC-SP3 power-tool cleaned, epoxy primed and exterior finish coat of Terra Brown (RAL8028) paint, good to 250°F.
- High central inlet with large dropout chamber, perforated baffle, to prevent abrasion and distribute air/dust evenly on filters. Downward flow prevents upward "can velocity".
- 60°Pyramidal hoppers or troughs provided for dust collection.
- SSPC-SP3 power-tool cleaned, epoxy primed and exterior finish coat of Terra Brown (RAL8028) paint, good to 250°F.
- Automatic self-cleaning, advanced technology "high-ratio" reverse jet pulse, requiring no shutdown for after-pulse cleaning. Pulse sequencer supplied in NEMA 4 enclosure.
- Diaphragm valves rated at 125% of required flow to ensure proper back-flush volume.
- Top-removal bags allows quick and easy inspection and servicing without precarious position for the operating personnel.
- Computer designed supersonic converging-diverging nozzles on pulse pipes.
- One differential pressure gauge and dust trap with connecting hardware.
- One full set of top-removal filter bags and wire cages.
- Built to North American compliance with EPA, OSHA NFPA standards. Compliance with local codes and standards are the responsibility of the purchaser.

Operating Requirements:

For best cleaning, both the process air and compressed air must be maintained at least 15°F above the dew point. Compressed air must be below a maximum temperature of 180°F at 85 psig. For the protection of the pneumatic valves and controls, compressed air for this equipment must be clean and have a refrigerant or desiccant dryer <u>at the collector</u> having a low enough dew point to meet conditions of operation.

QAM reserves the right to change design and specificationswithout notice.

COMPANY: QUALITY AIR MANAGEMENT 240 Camille Cresent, Waterloo, Ontario - phone: 1-800-267-5585 www.qamanage.com		ALL DIMENSIONS ARE IN INCHES UNLESS STATED OTHERWISE	REV. / REV. DATE / REVISION DESCRIPTION	PROJECTION
TITLE: VD- series Baghouse	PAGE	DATE: 07/27/2021	SCALE: not to scale	DWG. NO. V-002-1

V-SERIES WALK-IN PLENUM
TOP REMOVAL

All Dimensions in inches (unless otherwise specified)

MODEL	Rated Volume (CFM)	Filter Area (ft²)	# Bags/length	Compressed Air Consumption (SFM) [1]	Hopper	INLET H x W	OUTLET diameter	A	B	C	D	E	Weight (lbs)	MODEL
DOUBLE WIDTH - 8 FOOT BAG FILTERS														
120VD–8	29,000	1508	120/96	6.00–12.00	Pyramid	48x28	42	98	144	160	359	94	9,500	120VD–8
144VD–8	35,000	1810	144/96	7.20–14.40	Pyramid	52x32	46	117	144	160	359	94	10,500	144VD–8
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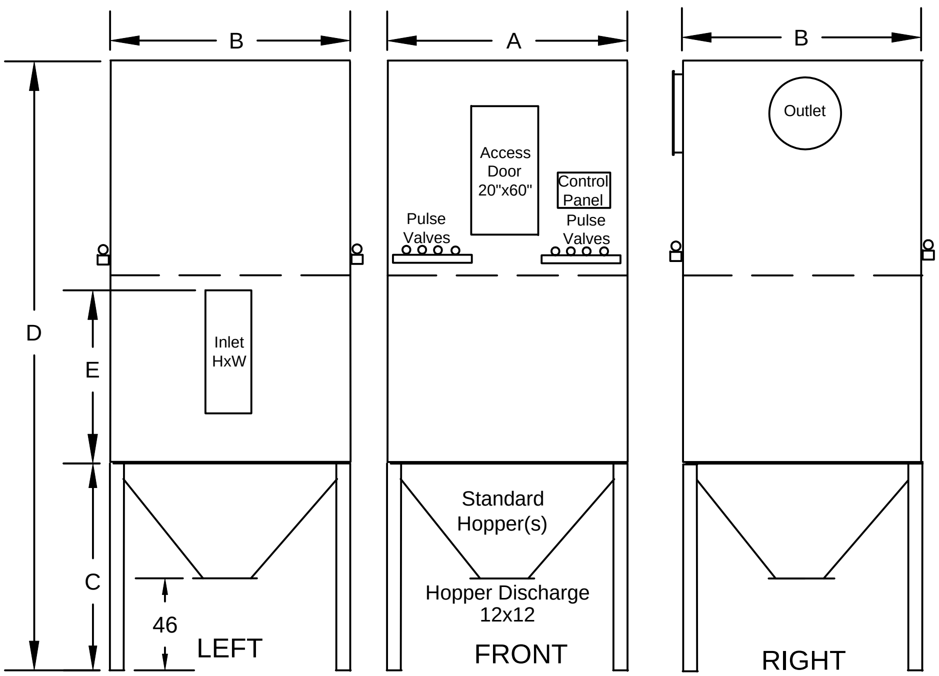
192VD–8	46,000	2413	192/96	9.60 – 19.20	Pyramid	68x32	54	155	144	168	367	94	15,000	192VD–8
DOUBLE WIDTH - 10 FOOT BAG FILTERS														
168VD–10	58,000	2640	168/120	11.76 – 23.52	[2]	86x32	60	136	156	160	383	118	17,000	168VD–10
192VD–10	67,000	3017	192/120	13.44 – 26.88	[2]	88x36	64	155	156	160	383	118	19,000	192VD–10
216VD–10	75,000	3394	216/120	15.12 – 30.24	[2]	90x40	68	174	156	162	385	118	22,000	216VD–10
240VD–10	83,000	3770	240/120	16.80 – 33.60	[2]	90x44	70	193	156	162	385	118	25,000	240VD–10
264VD–10	91,000	4148	264/120	18.48 – 36.96	[2]	92x46	74	212	156	162	385	118	28,000	264VD–10
288VD–10	100,000	4525	288/120	20.16 – 40.32	[2]	100x46	78	231	156	162	385	118	31,000	288VD–10

[1] compressed air used for a dust loading of 2-8 grains per cu.ft.
[2] two pyramid hoppers



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- Computer designed supersonic converging-diverging nozzles on pulse pipes.
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COMPANY QUALITY AIR MANAGEMENT
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TITLE	PAGE	DATE	SCALE	REV.	REV. DATE	REVISION DESCRIPTION	DWG. NO.
VD Baghouse walk-in		08/26/2021	not to scale				V-003-1

PROJECTION

Engineering Bulletin

Filter Ratio (or air-to-cloth)

QUALITY AIR MANAGEMENT
(800) 267-5585
www.qamanage.com

(A gross engineering mistake as a governing specification in cylindrical bag pulse jet dust collectors)

The History of Reverse Jet and Pulse Jet Design and Development must be reviewed to determine proper selection of collectors.

The first pulse jet collector was developed by Pulverizing Machinery of Summit New Jersey in the early 60's, to collect dust from their Pulverizers. They had tried to use the Blow-ring design but they could not handle the dust (powder) loads as their grinder Pulverizers became bigger. The typical load to the collectors from the Pulverizers were between 150 and 300 grains per cubic foot. The collector design was based on the same blow-ring filtering velocities at these loads. The cages were based on available designs from shipping pulverizer shafts. The pulse valves selected were diaphragm valves that were the fastest and the lowest cost valve available. This valve happened to be a ¾ inch diaphragm pilot operated valve. They decided to use several valves in a collector and pulse them with an electronic timer. It was found the hole sizes and venturi formed an air ejector design that had the same jet velocity that the blow-ring collector was using. But the big breakthrough came with the realization that the dust was ejected from the bag during the first 4 or 5 milliseconds of the valve opening. The valves were operated as fast as the mechanical design allowed. The operation was completed in less than 0.10 seconds. It became apparent that the frequency of cleaning was a function of the load to the collector. For instance, for loadings of 300 grains, the collectors would operate at a filtering velocity of between 7 and 9 ft per minute. At material handling facilities such as quarries, the collector would run at velocities of 14 to16 feet per minute. The typical pressure drop in these collector designs were about 3.5 inches WC pressure for the high loads and 2.0 inches WC for the lower dust loads. The typical compressed air usage, on the high loads, was 1 to 2 SCFM per 1000 CFM of filtered air. For loads under 10 grains per cubic foot, the air usage was 0.2 to 0.8 SCFM per 1000 CFM of filtered air.

Determining the filter velocity (then referred to as filter ratio) became a rather complicated procedure. The ratio presumably was determined by dust load, fineness of the dust, temperature of process gas stream, and other factors.
The hopper inlet was a carry over design from both the blow-ring collector and the previous mechanical shaker collectors.

By 1969, there were over 10,000 collectors in operation. Almost all of them were installed on process exhaust from Pulverizers or in foundries. Pulverzing Machinery changed their name to Mikropul and licensed FlexKleen to also build and Market collectors. The collectors for MikroPul had 4 ½ inch diameter bags 72 inch long and the FlexKleen units had 5 inch bags 102 inches long. Bag life was 3-5 years on Pulverizer applications and over eight years on low loading applications.

Engineering Disaster 1971

In 1971, the patent was challenged and the Pulverizing Machinery patent was declared invalid. The market changed radically because Air Pollution Control Regulations also became effective at the same time. Many new suppliers entered the market. In order to compete, Mikropul changed their design. They went from 6 foot to 10 foot bags. They increased their pulse pipe holes by the same ratio. The whole industry followed and copied the new design for hole size and venturi throat diameter. At the time, Mikropul had 40,000 venturies in stock and kept the same venturi sizes. This increased the jet velocity of the cleaning jet by 66 per cent.

This was when the dust collector market was growing at a 20% annual rate. With the new designs:

(1) pressure drop increased to 4 ½ to 6 ½ inches WC
(2) Compressed air consumption increased by over 50% for similar applications.
(3) Bag life was reduced by over 50%.
(4) In reaction to these problems the filter ratios were reduced to between 4 & 6 on almost all applications.

Reasons for Disaster

What happened was no one at that time realized what might have been a rather obvious truth, that the velocity with which the dust is ejected from the bag during cleaning is proportional to the velocity of the cleaning jet. At the new velocities, dust is driven toward adjacent rows of bags in the filter mode. Depending on the dust density, the dust will be driven through the adjoining cake into the clean side of the bags. The cake becomes denser and the pressure drop increases until the process stabilizes which takes 16-100 hours. Even after the equilibrium, the dust still penetrates and bag wear is high. With low filter ratios it takes longer for the bag to wear out and require longer times between replacements.

Today's Conditions

This disastrous design continues to be employed by most of the pulse jet collector suppliers in the world.

New Advanced Technology eliminates design flaws; allows for High Ratio Operation

In 1981 a new technology was developed, a pulse jet collector that basically changed the cleaning system design. The key to this design was to change the jet velocity to a fraction of the existing designs. New Technology eliminated the penetration of dusts from the row of cleaning bags to the adjoining row in a filtering mode.

This allowed pulse jet collectors to operate at:

(1) lower pressure drops (1 - 3 inches WC),
(2) lower compressed air consumption for cleaning (50 - 75% less)
(3) 3 to 4 times longer bag life
(4) filter ratios of over 14:1 on any application
(5) decrease dust penetration by up to 90%.

There have been several suppliers building and selling these New Technology collectors since 1982. In fact the patents have now expired. **There are over 4000 installations worldwide.**

Why is this New Technology is not accepted by all the major suppliers?

1) If you produced 40,000 collectors after the development of the new technology was published over 20 years ago, you might be subject to legal action for poor judgment and causing the public to be overcharged for their dust collection.
2) They do not have the engineering expertise to build these new technology collectors.
3) People using the old obsolete technology control over 90% of the market world-wide.
4) The suppliers of valves and filter elements would have their markets cut in half.
5) Air compressor sales and service for pulse jet collectors would be cut by 60%

Modifying existing collectors with almost no risk to the purchaser.

We can supply new bags, pulse pipes and bag plugs to alter performance to high technology low pressure drop, reduced air consumption, lower penetration (immediately noticeable) and long bag life (it takes some time to verify that but it should be obvious from the other indications). The modifications take only a few hours and if a customer is not satisfied, he can return pipes and cages for credit and re-install the old components. **If this was not an absolute certainty customers would not pay for the equipment.**