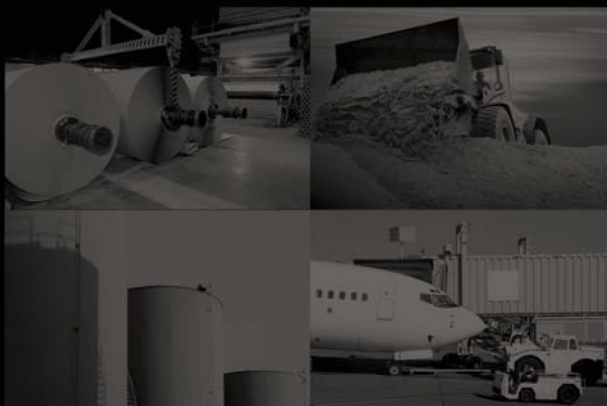


Your First Line of Defense



AIR SENTRY
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Contamination Control Breathers

Contamination Control Breathers: The First Line of Defense

Air Sentry® Breathers should be an integral part of any proactive maintenance and reliability program. Designed to replace the breather cap or air filter on gear boxes, hydraulic fluid reservoirs, bulk storage tanks, oil drums, oil-filled transformers, and other fluid reservoirs, Air Sentry® breathers adsorb water from the air before it enters your fluid system and remove particulate contaminants as small as 2 microns. Better yet, the silica gel changes color when it is fully depleted, turning from a gold color to dark green. This makes it simple to identify the condition of a breather and quickly replace the breather, maintaining the cleanliness of the fluid reservoir.

One research group found that greater than 75% of all machine wear related failures were due to particulate contaminants. Frequently the greatest cost of equipment failure is not the component replacement cost, but the labor production downtime. Most particles start off as dirt (hard silica) that becomes airborne, finds its way into lubricant and fuel reservoirs, and is later transported to bearings, bushings, seals, valves, and other machine components. There they become key ingredients in abrasion, erosion, and fatigue failures. The contaminants also cause lubricant degradation, shortening the life of the lubricant and decreasing its ability to lubricate.

When it comes to bearings, contamination is especially devastating. Bearing manufacturers claim that free of contaminants, a bearing could have an infinite life. Silt particles reduce oil's lubricity and can produce localized pressures

over several hundred thousand pounds per square inch, resulting in spalling, denting, abrasive wear, and fatigue failures. Contamination is the second leading cause of bearing failure, right behind improper lubrication. Bearings aren't the only component at risk. With typical machine clearances measured in thousandths of an inch, it doesn't take much contamination to destroy machine components such as bushings or hydraulic valves. With lubricant films typically ranging from 0.1 to 50 microns, it doesn't take a very large particle to disrupt that film. In fact, studies have shown that particles of 10 microns or smaller cause the greatest amount of wear.

Particulate contaminants aren't the only culprit. Water is just as deadly. Its presence in lubricants and hydraulic fluids creates a host of problems including, rust, lubricant additive depletion, viscosity changes, and sludge formation as a byproduct of oxidation. The result of this is excessive wear and component failure.

Air Sentry® Breathers prevent water and airborne contaminants from entering your reservoir, tank, or gearbox. Two micron filters handle the particulate contaminants and silica gel adsorbs the moisture in the atmosphere that would otherwise enter the reservoir.

Air Sentry® is a division of The Whitmore Group, a leader in creating component protection technology through the manufacture of specialized lubricants, coatings, sealants, and contamination control breathers.

Table of Contents

How Breathers Work	4-5
D-Series <i>Stationary Applications</i>	6-7
Z-Series <i>Limited Space Applications</i>	8-9
X-Series <i>High Humidity/Dust Applications</i>	10-11
R-Series <i>High Vibration Applications</i>	12-13
XR-Series <i>Extreme Environment Applications</i>	14-15
L-Series <i>In-Line Low Airflow Applications</i>	16-17
M-Series <i>Heavy Duty Applications</i>	18-19
F-Series <i>Caustic Fumes/Gaseous Applications</i>	20-21
Adapters	22-23

How Air Sentry® Breathers Work

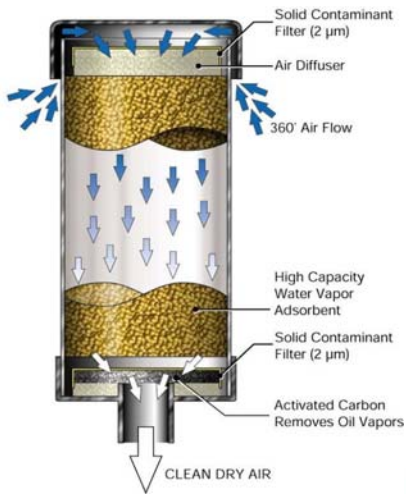


DIAGRAM 1

Air Sentry® Contamination Control Breathers replace existing breather caps or air vents on fluid holding tanks, reservoirs and gearboxes. Most older style air venting methods provide minimal, if any, contamination control. Air Sentry® breathers provide the first line of defense in contamination control methodology utilizing patented designs and featuring color indicating silica gel and self cleaning 2-micron filtration.

DIAGRAM 1 indicates how our patented design allows outside air to enter through the 360° opening in the breather's top cap. The top cap design overhangs the body of the breather helping protect the breather from rain, sleet, snow, as well as most equipment wash-down procedures.

When contaminated air enters the top of the breather, it passes through a self cleaning solid particle filter. This filter traps solid particles greater than 2 microns and keeps them from entering the breather and depositing on critical surfaces. The filtered air then passes through a bed of silica gel that adsorbs moisture in the air. During this step, up to 95% of the water vapor in the air is filtered out.

Finally, the filtered air passes through an additional 2 micron filter in the bottom of the breather to ensure that no harmful particles will enter the tank or reservoir. This three stage filtration design ensures your equipment gets **CLEAN, DRY AIR!**



As the color indicating silica gel adsorbs moisture it changes from gold to dark green. When the silica gel has adsorbed to full capacity (up to 40% of its original weight), the gel will turn dark green. This color change is easily seen and serves as a visual indication that it is time to remove and replace the disposable breather.

DIAGRAM 2 shows air being expelled from the reservoir through the desiccant breather. As contaminated air travels this reverse path, expelled water vapors are adsorbed by the silica gel.

During this reverse air flow process, the silica gel indicates the presence of excessive moisture inside the reservoir as the gold silica gel turns to dark green from the bottom of the breather rather than from the top.

An additional feature located in the bottom of most Air Sentry® models is a layer of carbon impregnated foam. This carbon pad absorbs small amounts of oil vapor exhaled from the tank and protects the silica gel from minor oil mist contamination. Excessive oil mist control may be required. Adapters are available for applications with excessive oil mist problems.

As the exhausted air passes back through the self cleaning 2-micron filter located in the top cap of the breather, any particles that were trapped as air entered the system are now back flushed from the filter.

Note: Diagrams 1 and 2 on this page depict the D-Series design. The Air Sentry® product line includes several different breather series. Each series has multiple models. All breathers filter particulates as small as 2 microns and adsorb moisture with silica gel.

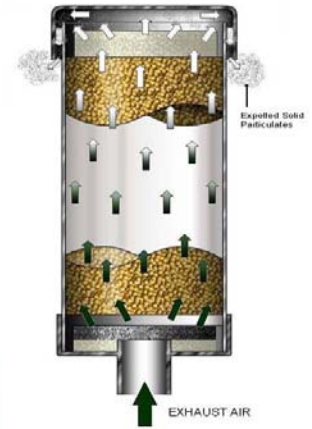


DIAGRAM 2

D-Series Stationary Applications

D-Series breathers feature seven different models designed to satisfy the requirements of most stationary applications involving hydraulic reservoirs, lubricant and fuel storage tanks, transformers, pumps and gearboxes.

D-Series models provide application flexibility by using 100% silica gel for moisture adsorption or 100% activated carbon for fume or odor control, or a mixture of both when necessary. All D-Series models feature 2 micron solid particle filtration and are available with airflow ratings of 35 cfm to 250 cfm.



Typical applications include:

TANKS
RESERVOIRS
TRANSFORMERS
PUMPS
GEARBOXES



The D-Series is constructed of industrial grade raw materials and feature high impact resistant ABS top and bottom caps. The clear acrylic window makes it easy to inspect the condition of the color changing silica

gel from a distance. The silica gel turns color from gold to green to visually indicate the adsorption of moisture and confirm the breather is doing its job!

All Air Sentry® raw materials have been tested to ensure chemical compatibility with a wide range of industrial lubricants, fuels and fluids.



Sizing Information

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type of Medium
D-100	3.5 (8.9)	5 (12.7)	1 inch slip fit	1.5 (0.7)	3.1 (92)	35	262	100% Silica Gel
D-101	5 (12.7)	5 (12.7)	1 inch slip fit	2.2 (1.0)	6.2 (183)	35	262	100% Silica Gel
D-102	8 (20.3)	5 (12.7)	1 inch slip fit	3.6 (1.6)	13.9 (411)	35	262	100% Silica Gel
D-103	8 (20.3)	5 (12.7)	1 inch male NPT	3.6 (1.6)	13.9 (411)	35	262	100% Silica Gel
D-104	8 (20.3)	5 (12.7)	2 inch male NPT	3.6 (1.6)	13.9 (411)	35	262	100% Silica Gel
D-108	10 (25.4)	5 (12.7)	2 inch male NPT	4.8 (2.2)	18.5 (547)	100	750	100% Silica Gel
D-109	14 (35.6)	6 (15.2)	3 inch male NPT	6.1 (2.8)	18.5 (547)	250	1875	100% Silica Gel
D-200	3.5 (8.9)	5 (12.7)	1 inch slip fit	1 (0.5)	—	15	112	100% Activated Carbon
D-201	5 (12.7)	5 (12.7)	1 inch slip fit	1.8 (0.8)	—	15	112	100% Activated Carbon
D-202	8 (20.3)	5 (12.7)	1 inch slip fit	2.6 (1.2)	—	15	112	100% Activated Carbon
D-208	10 (25.4)	5 (12.7)	2 inch male NPT	3.8 (1.7)	—	50	375	100% Activated Carbon
D-301	5 (12.7)	5 (12.7)	1 inch slip fit	2 (0.9)	4.4 (130)	20	150	33% Activated Carbon 67% Silica Gel
D-302	8 (20.3)	5 (12.7)	1 inch slip fit	3 (1.4)	9.0 (266)	20	150	33% Activated Carbon 67% Silica Gel
D-308	10 (25.4)	5 (12.7)	2 inch male NPT	4.3 (2.0)	13.8 (408)	50	375	33% Activated Carbon 67% Silica Gel
D-2	10 (25.4)	5 (12.7)	2 inch female NPT	4.8 (2.2)	18.5 (547)	100	750	100% Silica Gel
G-2	10 (25.4)	5 (12.7)	2 inch female NPT	4.5 (2.0)	12 (355)	30	225	50% Activated Carbon 50% Silica Gel

Z-Series

Limited Space Applications

Air Sentry® Z-Series breathers are designed for applications where space is limited or air flow requirements are below 10 cubic feet per minute (cfm). The Z-Series breather is typically used on gearbox applications and has been proven to work well on low fluid volume applications where mounting space is limited or where a larger breather won't fit without remote mounting.



Typical applications include:

- GEARBOXES
- DRUMS
- TOTES
- SMALL OIL CONTAINERS

The VaporSentry™ is an oil coalescing adapter which is designed to work in conjunction with the Z-Series breather. It is only necessary to use if there is excessive oil mist coming from the gearbox. VaporSentry's design utilizes a finned surface area to collect oil fumes from the gearbox, turn those fumes into heavier droplets, and gravity drain them back into the gear box. This helps block oil fumes from entering the breather and interrupting the moisture adsorbing properties of the silica gel.



Sizing Information

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (g)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type of Medium
Z-131	2 (.51)	2 (.51)	½ inch female NPT	0.15 (68)	0.5 (15)	10	75	100% Silica Gel
Z-132	3.25 (8.3)	2 (.51)	½ inch female NPT	0.2 (91)	0.9 (27)	10	75	100% Silica Gel
Z-133	2 (.51)	3.25 (8.3)	½ inch female NPT	0.5 (227)	1.6 (47)	10	75	100% Silica Gel
Z-134	3.25 (8.3)	3.25 (8.3)	½ inch female NPT	0.8 (363)	2.8 (83)	10	75	100% Silica Gel
Z-135	5.5 (14.0)	3.25 (8.3)	½ inch female NPT	1.2 (544)	2.0 (59)	10	75	100% Silica Gel
Z-231	2 (.51)	2 (.51)	½ inch female NPT	0.13 (59)	—	3	22	100% Activated Carbon
Z-232	3.25 (8.3)	2 (.51)	½ inch female NPT	0.18 (82)	—	3	22	100% Activated Carbon
Z-233	2 (.51)	3.25 (8.3)	½ inch female NPT	0.3 (136)	—	3	22	100% Activated Carbon
Z-234	3.25 (8.3)	3.25 (8.3)	½ inch female NPT	0.4 (181)	—	3	22	100% Activated Carbon

CASE STUDY



It isn't unusual to change oil every two to three months in paper mill gearboxes, and sumps because the air contains large amounts of water and particulates. With a standard vent cap or air filter, these contaminants quickly enter the fluid reservoir leading to dirty oil that won't adequately lubricate. When one paper mill started using Air Sentry® breathers on gearboxes, sumps, hydraulic reservoirs, and lubrication systems, they were able to extend oil change intervals to 12 to 15 months. The benefits include not only longer oil life but also reduced downtime to change the oil.

X-Series

High Humidity/Dust Applications

X-Series breathers are the perfect solution for high humidity and high dust environments. To extend the desiccant's life in these environments, the X-Series incorporates two check valves.

The intake check valve allows airflow into the breather only when differential pressure between the atmosphere and reservoir exceeds a 0.3 psi threshold, while the exhaust check valve permits air to exit the reservoir when the differential pressure between the reservoir and atmosphere exceeds a 2.1 psi threshold, providing a closed system until air flow is required. The check valves extend the life of the desiccant by allowing the air to flow through the breather only when needed to protect the integrity of the tank.

In addition to having a rugged design, X-Series breathers include a top cap that can be reused when the desiccant is spent. When the color of the silica gel has turned dark green, remove the reusable top cap from the bottom desiccant cartridge, dispose of the spent dark green desiccant cartridge, then use the same top cap with a replacement cartridge.

The X-Series rebuildable design allow for economical replacement of the desiccant cartridge.



Typical applications include:

- PAPER MILLS
- WASH DOWN AREAS
- STEAM CLEANING ROOMS
- MINE QUARRIES



Sizing Information

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type Of Medium
X-100	6.25 (15.9)	3.25 (8.3)	½ inch female NPT	2.5 (1.1)	2.0 (59)	10	75	100% Silica Gel
X-101	7 (17.8)	5 (12.7)	1 inch slip fit	3.3 (1.5)	6.2 (183)	35	262	100% Silica Gel
X-102	10 (25.4)	5 (12.7)	1 inch slip fit	4.8 (2.2)	13.9 (411)	35	262	100% Silica Gel
X-121	7 (17.8)	5 (12.7)	2 inch male NPT	3.3 (1.5)	6.2 (183)	35	262	100% Silica Gel
X-122	10 (25.4)	5 (12.7)	2 inch male NPT	5 (2.3)	13.9 (411)	35	262	100% Silica Gel

Replacement Cartridges

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Replacement for Model	Type Of Medium
L-143	5.25 (13.3)	3.25	½ inch female NPT	1.2 (.5)	2.0 (59)	10	75	X-100	100% Silica Gel
A-341	5.5 (14.0)	5 (12.7)	1 inch slip fit	2.3 (1.0)	6.2 (183)	35	262	X-101	100% Silica Gel
A-342	8.5 (21.6)	5 (12.7)	1 inch slip fit	3.6 (1.6)	13.9 (411)	35	262	X-102	100% Silica Gel
A-343	5.5 (14.0)	5 (12.7)	2 inch male NPT	2.4 (1.1)	6.2 (183)	35	262	X-121	100% Silica Gel
A-344	8.5 (21.6)	5 (12.7)	2 inch male NPT	3.7 (1.7)	13.9 (411)	35	262	X-122	100% Silica Gel

CASE STUDY



A manufacturing Company in the Midwestern United States had an application where a fluid storage tank required 58 cfm (equivalent to 435 gpm) air flow capacity. They were also concerned how often they would have to climb up and change the breather due to its location on top of the tall tank.

The solution was to provide two 35 cfm rated X-Series breathers doubling their capacity to 70 cfm. By combining these breathers and enlarging their mounting adapter we were able to exceed the flow rate requirements. Additionally, the check valve features of the X-Series design solved their additional concerns on how frequently they would have to climb up the tank and change the breather. The check valve feature extends the life of the breather by keeping air out until the tank breathes.

R-Series

High Vibration Applications

Most mobile equipment, including maintenance of way equipment, farm implements, and off-road vehicles, are equipped with hydraulic fluid tanks or reservoirs which breathe outside air.

R-Series breathers are suitable for high vibration applications including off-road vehicles, construction vehicles, haul trucks, and farm vehicles typically equipped with hydraulic fluid reservoirs. R-Series breathers are easily mounted in place of standard breather caps via rugged steel pipe threads, included with all models except the R-111. The metal reinforced base (right) is reusable.

When the silica gel cartridge turns color from gold to dark green, simply install a new replacement cartridge (below) to the reusable metal base.

The R-Series rebuildable design allows for economical replacement of the desiccant cartridge.



R-SERIES REPLACEMENT CARTRIDGES



Typical applications include:

- RAILROAD MAINTENANCE OF WAY EQUIPMENT
- CRANES
- FARM IMPLEMENT
- OFF ROAD VEHICLES



Sizing Information

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type Of Medium
R-100	5 (12.7)	5.2 (13.2)	1 inch male NPT	2.5 (1.1)	3.1 (91)	35	262	100% Silica Gel
R-101	6.5 (16.5)	5.2 (13.2)	1 inch male NPT	3.2 (1.5)	6.2 (183)	35	262	100% Silica Gel
R-102	9.5 (24.1)	5.2 (13.2)	1 inch male NPT	4.5 (2.0)	13.9 (411)	35	262	100% Silica Gel
R-111*	6 (15.2)	5.2 (13.2)	1.125 inch female thread	2.8 (1.3)	6.2 (183)	35	262	100% Silica Gel
R-123	12 (30.5)	5.2 (13.2)	2 inch male NPT	5.5 (2.5)	18.5 (547)	100	750	100% Silica Gel
R-200	5 (12.7)	5.2 (13.2)	1 inch male NPT	2.2 (1.0)	—	15	112	100% Activated Carbon
R-201	6.5 (16.5)	5.2 (13.2)	1 inch male NPT	2.5 (1.1)	—	15	112	100% Activated Carbon
R-202	9.5 (24.1)	5.2 (13.2)	1 inch male NPT	3.4 (1.5)	—	15	112	100% Activated Carbon
R-223	12 (30.5)	5.2 (13.2)	2 inch male NPT	3.8 (1.7)	—	50	375	100% Activated Carbon
R-325	12 (30.5)	5.2 (13.2)	2 inch male NPT	5.5 (2.5)	12 (355)	50	375	33% Activated Carbon 67% Silica Gel

* The R-111 is used in conjunction with the A-306 pressure relief valve, which has a 1.125 inch male thread to mount to the fluid reservoir.

Model	Height in. (cm)	Diameter in. (cm)	Replacement Cartridge for Model	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type Of Medium
A-300	3.75	5 (12.7)	R-100	1.8 (0.8)	3.1 (91)	35	262	Silica Gel
A-301	5 (12.7)	5 (12.7)	R-101 or R-111	2 (0.9)	6.2 (183)	35	262	Silica Gel
A-302	8 (20.3)	5 (12.7)	R-102	3.3 (1.5)	13.9 (411)	35	262	Silica Gel
A-323	10 (25.4)	5 (12.7)	R-123	4.6 (2.1)	18.5 (547)	100	750	Silica Gel
A-303	3.75 (9.53)	5 (12.7)	R-200	1.2 (0.6)	—	15	112	Activated Carbon
A-304	5 (12.7)	5 (12.7)	R-201	1.5 (0.7)	—	15	112	Activated Carbon
A-305	8 (20.3)	5 (12.7)	R-202	2.4 (1.1)	—	15	112	Activated Carbon
A-324	10 (25.4)	5 (12.7)	R-223	2.9 (1.32)	—	50	375	Activated Carbon
A-325	10 (25.4)	5 (12.7)	R-325	4.6 (2.1)	12 (355)	50	375	33% Activated Carbon 67% Silica gel

XR-Series

Extreme Environment Applications

Air Sentry® XR-Series breathers are designed for extreme environment applications where protection from dust, moisture and vibration are critical.

XR-Series breathers include a metal reinforced base available with male NPT threads to adapt to your equipment. The base is designed to handle the rigors of high vibration applications. The top cap implements two check valves to prevent outside moisture and solid contaminants from entering the breather until there is a need for airflow.

The XR-Series rebuildable design allows for economical replacement of the desiccant cartridge.



Typical applications include:

- WINDMILLS
- MINING EQUIPMENT
- FARMING IMPLEMENTS

Sizing Information

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type of Medium
XR-101	8.5 (21.6)	5.2 (13.2)	1inch male NPT	9.00 (4.1)	6.2 (183)	35	262	100% Silica Gel
XR-102	11.5 (29.2)	5.2 (13.2)	1inch male NPT	10.5 (10.5)	13.9 (411)	35	262	100% Silica Gel
XR-108	14 (35.6)	5.2 (13.2)	2 inch male NPT	12.5 (5.7)	18.5 (547)	35	262	100% Silica Gel

Replacement Cartridges

Model	Height in. (cm)	Diameter in. (cm)	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type of Medium
A-351	5 (12.7)	5 (12.7)	2.2 (1.0)	6.2 (183)	35	262	100% Silica Gel
A-352	8 (20.3)	5 (12.7)	3.6 (1.6)	13.9 (411)	35	262	100% Silica Gel
A-358	10 (25.4)	5 (12.7)	4.8 (2.2)	18.5 (547)	35	262	100% Silica Gel



XR-SERIES BREATHER REPLACEMENT CARTRIDGE WITH PERMANENT TOP AND BOTTOM CAPS



CASE STUDY



Originally, XR-Series breathers were designed for the rigorous requirements for the windmill industry, but they have proven to be a great solution for many mobile applications where there are high levels of vibration, humidity, and dust.

A distributor of fuels and lubricants in the Midwestern United States mounted three XR-Series breathers on each reservoir on their mobile lube truck. They found by using this design they were able to virtually eliminate the contamination issues they were having due to solid and liquid contamination of their lubricants.

L-Series

In-Line Low Airflow Applications

Air Sentry® In-Line Filter/Dryers remove water vapor and solid contaminants from air exhaust lines, low pressure compressed air lines, vacuum lines, and other in-line airflow applications where clean, dry air is required.

Air enters the filter/dryer in one end and is cleaned and dried before leaving the other end. Solid particles are removed down to 2 microns. Water vapor is removed as the air passes through a bed of silica gel. The units are disposable and easy to install in the airline between a compressor and a hydraulic tank, or other similar applications.

Activated carbon versions are ideal for removing undesirable fumes and odors from air or other gases being vented to the atmosphere.



Typical applications include:

- AIR EXHAUST LINES
- VACUUM LINES
- LOW PRESSURE COMPRESSED AIR LINES

Benefits

- Minimize rust and corrosion
- Reduce component wear
- Reduce maintenance costs
- Prolong fluid life
- Reduce oil oxidation
- Enhance lubrication
- Eliminate fumes and odors



Sizing Information

Model #	Length in. (cm)	Diameter in. (cm)	Fitting	Maximum Air Flow cfm	Water Capacity fl.oz (mL)	Type of Medium
L-141	5.5 (14)	2.0 (5.1)	1/2" Female NPT	10 CFM	1.1 (33)	100% Silica Gel
L-142	8.5 (22)	2.0 (5.1)	1/2" Female NPT	10 CFM	1.8 (53)	100% Silica Gel
L-143	5.5 (14)	3.25 (8.3)	1/2" Female NPT	10 CFM	2.0 (59)	100% Silica Gel
L-144	8.5 (22)	3.25 (8.3)	1/2" Female NPT	10 CFM	6.5 (192)	100% Silica Gel
L-241	5.5 (14)	2.0 (5.1)	1/2" Female NPT	3 CFM	—	100% Activated Carbon
L-242	8.5 (22)	2.0 (5.1)	1/2" Female NPT	3 CFM	—	100% Activated Carbon
L-243	5.5 (14)	3.25 (8.3)	1/2" Female NPT	3 CFM	—	100% Activated Carbon
L-244	8.5 (22)	3.25 (8.3)	1/2" Female NPT	3 CFM	—	100% Activated Carbon

Note: Maximum operating pressure is 60 psi (4 bar). Maximum operating temperature is 100°F (38°C).

AIR SENTRY® BREATHERS ON COMPRESSORS

Water entering a compressor through the air intake reduces the life of tools being operated by the system, as well as compressor components. Water can also negatively impact materials being applied by the air system, such as sprayed paint or coatings. A solution to this dilemma is to mount Air Sentry® breathers on the compressor's air intake. Size the breather to handle the required airflow, based on the compressor's horsepower.

M-Series

Heavy Duty Applications

M-Series breathers are designed from heavy duty materials capable of handling the requirements of the most severe environments. They replace the standard breather cap or vent tube on tanks and reservoirs. Pipe threads on the bottom standpipe make the units easy to install.

All M-Series designs have 2 micron pleated filters and silica gel bags that are easily replaced.

The M-Series design features our proprietary Splash Sentry®. This device is included in all M-Series models and prevents foaming or splashing fluids from entering the breather during normal operating conditions.



Typical applications include:

HEAVY DUTY OFF-ROAD EQUIPMENT
MOBILE EQUIPMENT



CASE STUDY

Due to poor oil cleanliness, a manufacturing operation had to change gearbox oil annually. They were using a standard air filter on all gearboxes. After switching to Air Sentry® M-107 breather they were able to more than double the life of the gear oil, resulting in a savings of nearly \$4,000 per year per gearbox.

Sizing Information

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (kg)	Water Capacity floz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type of Medium
M-103	6.6 (16.8)	10 (25.4)	1 inch male NPT	8.4 (3.8)	12 (355)	35	262	100% Silica Gel
M-104	6.6 (16.8)	10 (25.4)	2 inch male NPT	9 (4.1)	12 (355)	120	900	100% Silica Gel
M-105	12 (30.5)	10 (25.4)	1 inch male NPT	14 (6.4)	26 (770)	35	262	100% Silica Gel
M-106	12 (30.5)	10 (25.4)	2 inch male NPT	16 (7.3)	26 (770)	120	900	100% Silica Gel
M-107	13.5 (34.3)	16 (40.6)	3 inch male NPT	41.5 (18.9)	128 (3785)	300	2250	100% Silica Gel
M-203	6.6 (16.8)	10 (25.4)	1 inch male NPT	7.4 (3.4)	—	15	112	100% Activated Carbon
M-204	6.6 (16.8)	10 (25.4)	1 inch male NPT	8 (3.6)	—	15	112	100% Activated Carbon
M-205	12 (30.5)	10 (25.4)	1 inch male NPT	12 (5.5)	—	15	112	100% Activated Carbon
M-206	12 (30.5)	10 (25.4)	2 inch male NPT	14 (6.4)	—	50	375	100% Activated Carbon

Replacement Filters and Gel

Model Number	Replacement Silica Gel Bag #	Weight of Silica Gel Bag lbs. (kg)	Replacement Activated Carbon Bag #	Weight of Activated Carbon Bag lbs. (kg)	Replacement Polyester Pleated Filter #	Filter Weight lbs. (kg)
M-103	095A201	3.0 (1.4)	—	—	095A204	2.0 (0.9)
M-104	095A201	3.0 (1.4)	—	—	095A204	2.0 (0.9)
M-105	095A202	4.0 (1.8)	—	—	095A205	3.0 (1.4)
M-106	095A202	4.0 (1.8)	—	—	095A205	3.0 (1.4)
M-107	095A203	18.0 (8.2)	—	—	095A208	5.0 (2.3)
M-203	—	—	095A207	2.0 (0.9)	095A204	2.0 (0.9)
M-204	—	—	095A207	2.0 (0.9)	095A204	2.0 (0.9)
M-205	—	—	095A208	3.0 (1.4)	095A205	3.0 (1.4)
M-206	—	—	095A208	3.0 (1.4)	095A205	3.0 (1.4)

F-Series

Caustic Fumes/Gaseous Applications

Battery charging produces hydrogen and sulfuric acid gases. Consequently, many health and safety regulations require that battery charging be performed in a specially designated area where personnel, electrical equipment, and open flames are a safe distance away. Alternatively, an expensive investment in gas exhaust systems can be used. Air Sentry® Gas Neutralization System (GNS) Breathers provide an economical and simple solution to this problem.

GNS Breathers are easy to install using valves attached to the battery vents and plastic tubing which conduct the exhaust gases to the GNS mounting point, located either on or off the equipment. This flexibility allows the charging to take place at the work site or in an enclosed work area.

Air Sentry® GNS Breathers were designed in cooperation with a major international airline/air cargo company for use on ground support equipment and to reduce the health and safety risks associated with battery charging.



Typical applications include:

- AIRPORT BOARDING BRIDGES
- HYDRAULIC RESERVOIRS
- FORKLIFTS
- MARINE VEHICLES
- BAGGAGE HAULERS

Sizing Information

Model	Height in. (cm)	Diameter in. (cm)	Mounting Connection	Weight lbs. (kg)	Water Capacity fl.oz (mL)	Maximum Air Flow cfm	Maximum Reservoir Fluid Flow gpm	Type Of Medium
F-302	9.25 (23.5)	5 (12.7)	1inch slip fit	3.4 (1.5)	10.3 (305)	5	38	33% Activated Carbon 67% Silica Gel
F-309	17.25 (43.8)	5 (12.7)	1inch slip fit	7.1 (3.22)	22.3 (659)	5	38	33% Activated Carbon 67% Silica Gel

CASE STUDY

A major international airline/air cargo company used Air Sentry® GNS (Gas neutralization System) breathers on their ground support equipment. By attaching the battery vents and plastic tubing, which conduct the exhausted gases, the breathers were able to capture caustic fumes and reduce the health and safety risks associated during this process. Additional benefits from using Air Sentry® breathers include filtration of solid particles down to 2 microns and adsorption of moisture. These features keep contamination from entering fluid handling reservoirs on boarding bridge hydraulic systems, baggage haulers, forklifts, fueling trucks and fuel tanks.

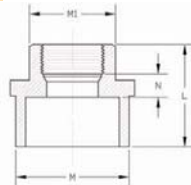


Adapters

Air Sentry® Breather Adapters for Easy Installation

Slip Fit – Threaded Adapters

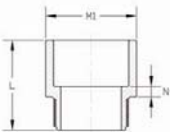
Threaded adapters, suitable for use with Air Sentry breathers that have a 1" slip fit connection, are intended for reservoirs or gearboxes with a wall thickness sufficient for a tapped hole. Male and female NPT and male BSP thread versions are available.



(female)

Part #	Material	Connection to Breather	Connection to Reservoir	M (Inches)	M1 (Inches)	N (Inches)	L (Inches)	Max. breather flow rate with this adapter (cfm)
A-410	Schedule 40 PVC	Slip Fit – 1 inch	1/2 inch female NPT	1 11/16	1 3/4	3/8	2	10

Fits all breathers with slip fit connections.



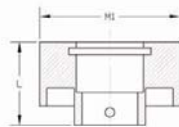
(male)

Part #	Material	Connection to Breather	Connection to Reservoir	M1 (Inches)	N (Inches)	L (Inches)	Max. breather flow rate with this adapter (cfm)
A-102	Schedule 40 PVC	Slip Fit – 1 inch	1 inch male NPT	1 3/8	1/8	2	35
A-103	Schedule 40 PVC	Slip Fit – 1 inch	3/4 inch male NPT	1 41/64	3/16	2	25
A-402	Schedule 40 PVC	Slip Fit – 1 inch	3/4 inch male NPT	1 9/16	3/8	2 7/16	10
A-301	Schedule 40 PVC	Slip Fit – 1 inch	1 inch male BSP	1 3/8	1/8	2 1/8	30

Fits all breathers with slip fit connections.

Slip Fit Bayonet Adapters

The bayonet adapter replaces a standard breather cap on a hydraulic reservoir. Simply remove the breather cap, place the bayonet adapter on the breather flange, and rotate one-quarter turn. No tank modification is required. Bayonet adapters fit Air Sentry® breathers with a 1" slip-fit connection.

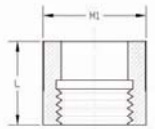


Part #	Material	Connection to Breather	Connection to Reservoir	M1 (Inches)	L (Inches)	Max. breather flow rate with this adapter (cfm)
A-104	High Density BDFML Jacket, Metal Roll Pin	Slip Fit – 1 inch	Bayonet push & turn connection	2 3/4	1 3/4	35

Fits all breathers with slip fit connections.

Slip Fit Threaded Spin-On Adapters

Threaded spin-on adapters replace the standard spin-on particle filters made by many manufacturers. These adapters fit Air Sentry® breathers with 1" slip-fit connections, are available in different sizes, and thread configurations. No tank modifications are required.

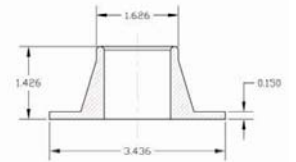


Part #	Material	Connection to Breather	Connection to Reservoir	M1 (Inches)	L (Inches)	Max. breather flow rate with this adapter (cfm)
A-105	High Density BDFML	Slip Fit – 1 inch with O-ring seal	1 inch – 12 UNF, 3/4 inch thread length	2	1 3/8	35
A-106	High Density PTFE	Slip Fit – 1 inch with O-ring seal	1 1/2 inch – 16 UNF, 3/4 inch thread length	1 1/2	2	35
A-115	Aluminum	Slip Fit – 1 inch with O-ring seal	1 1/2 inch – 14 UNF, 1 1/2 inch thread length	1 3/4	2 7/16	35

Fits all breathers with slip fit connections.

Slip Fit Flange Adapters

Flange adapters, used with breathers having a 1" slip-fit connection, are used for reservoirs where the tank wall is not thick enough to allow for tapping threads. With the Model A-101 adapter, mounting holes can be drilled in the high impact ABS molded flange to mate with any required hole pattern. The Model A-114 flange adapter has a standard ANSI 6-hole pattern pre-drilled for mounting.

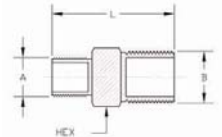


Part #	Material	Connection to Breather	Connection to Reservoir	Max. breather flow rate with this adapter (cfm)
A-101	High Impact ABS	Slip Fit – 1 inch	Customer drilled holes	35
A-114	High Impact ABS	Slip Fit – 1 inch	Six 3/8 inch clearance holes spaced 60 degrees apart on 2 7/8 inch diameter center	35

Fits all breathers with slip fit connections.

Threaded Metal Adapters

Threaded metal adapters fit the X-100 and any Z-Series breather. The breather connection is 1/2" male NPT while a variety of reservoir connection types are available.



Part #	Material	Connection to Breather (A)	Connection to Reservoir (B)	L (Inches)	Hex Size (Inches)	Max. breather flow rate with this adapter (cfm)
A-401	Carbon Steel	1/2 inch male NPT	1/4 inch male NPT	1 3/8	7/16	35
A-402	Carbon Steel	1/2 inch male NPT	1/4 inch female NPT	1 3/8	7/16	5
A-403	Carbon Steel	1/2 inch male NPT	3/8 inch male NPT	1 3/8	7/16	7
A-404	Carbon Steel	1/2 inch male NPT	3/8 inch female NPT	1 13/16	7/16	7
A-405	Carbon Steel	1/2 inch male NPT	1/2 inch male NPT	1 3/8	7/16	10
A-406	Carbon Steel	1/2 inch male NPT	3/4 inch male NPT	1 3/8	1 1/16	10
A-407	Carbon Steel	1/2 inch male NPT	3/8 inch female NPT	1 13/16	1 3/16	10
A-408	Carbon Steel	1/2 inch male NPT	1 inch male NPT	2 3/16	1 13/16	10

Fits all Z-Series breathers and X-100.