APS®

BY

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Air Product Separator®

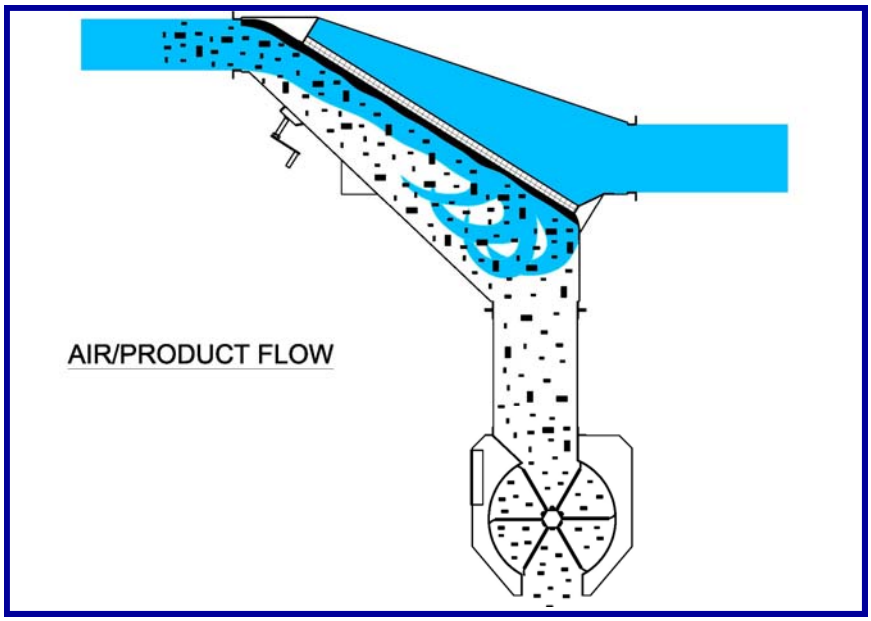
What is an APS® Separator?

It is:

- **Small -** requires less than 1/3 of the space of an equivalent cyclone
- **Light weight** - can be placed in the roof truss area with minimal structural support.
- **Effective** - can separate material that can-not be separated in a cyclone.
- **Gentle** - minimal product degradation.
- **Reliable** - has no moving parts in basic unit.

Principle of Operation

Air enters the APS® in a horizontal plane, where it encounters a deflector plate which turns the air-flow downwards. After turning, the air then flows parallel to the face of the screen. At this point the air is moving in two directions; it is flowing along the screen and also *through* the screen. Because of the resistance to flow caused by the mesh, a layer of air is formed over the surface of the screen and the material bounces off this layer, deflected down to the discharge. Because of this layer of air, the material does not touch the screen.



Pressure Drop

In the design of the system, a pressure drop across the APS® of 1/2" to 2" water gauge should be allowed. Actual pressure drop depends on air flow and throat valve settings (which are in turn dependent upon material being collected).

Sizing an APS®

APS® Separators may be selected from **Table 1** on the basis of the air volume from which product/ waste material is to be removed. (Unfavorable material characteristics may require de-rating separator capacities. Refer new applications to factory for assistance.)
When selecting an APS®, total air flow in cubic feet per minute should be determined by adding the flows from multiple inputs, plus any allowance for future capacity. If multiple lines feed the unit, at least 75% of rated flow should pass through the unit at all times (85% for light materials). Provisions for bleed-in air, a divided unit, or appropriate operating restrictions must be made to keep flows within this range. In normal operations, a flow range of plus/minus 10% can be accommodated without adjustment to the throat valve. With adjustment of the throat valve, flows may be varied up to 25%.

System Design

Systems using APS® Separators can be divided into three kinds: push, pull, and balanced.
Push systems are those in which the air and material are *blown* into the APS® with the fan before the APS®. In this situation, pressure within the APS® body is above atmospheric pressure.
Pull systems are those in which air product are *pulled* through the fan after the APS®. In pull systems, the APS® body is kept below atmospheric pressure.
A balanced system is one in which the air product mixture is both pulled AND pushed through the unit and the APS® is maintained at atmospheric pressure. A balanced system is often the best solution for complex systems. We suggest you contact your sales engineer for a complete explanation of the design of a balanced system.
A push-type system is recommended when handling extremely light or floating materials. While this is the simplest system to design, it is also the least *efficient* because a low-efficiency material handling fan must be used, since the materials pass through the fan. When designing positive systems with more than one pipe where one of the pipes may be inactive, provision for non-return valves should be used.
More efficient fans may be used with pull-through systems, since the APS® Separator in this configuration removes the product from the system prior to the air entering the fan.
This type of system requires the use of an airlock to prevent air flow into the APS® from the discharge. When collecting very light materials there should be a chute at least 30" long between the APS® and the airlock. In addition, we also recommend that an airlock of some type be used at the discharge of the APS® to prevent leakage from a baler or remove collection bin. The airlock also eliminates the need to shut down the system when changes in the container are made (such as emptying or compacting.)

Physical Installation

It is recommended that the following be taken into consideration when designing an APS® installation:

- ❑ Platforms at the level of the APS® unit should be provided (with access ladders, etc.) for inspection, adjustment and screen replacement.
- ❑ Space allowances for screen removal should be carefully checked.
- ❑ When feeding material to a baler, compactor, or similar non-continuous device, insure that drop chute/transition is of sufficient size to allow for accumulation, and that the angle of a transition is greater than the angle of repose of the material.

Construction

Body

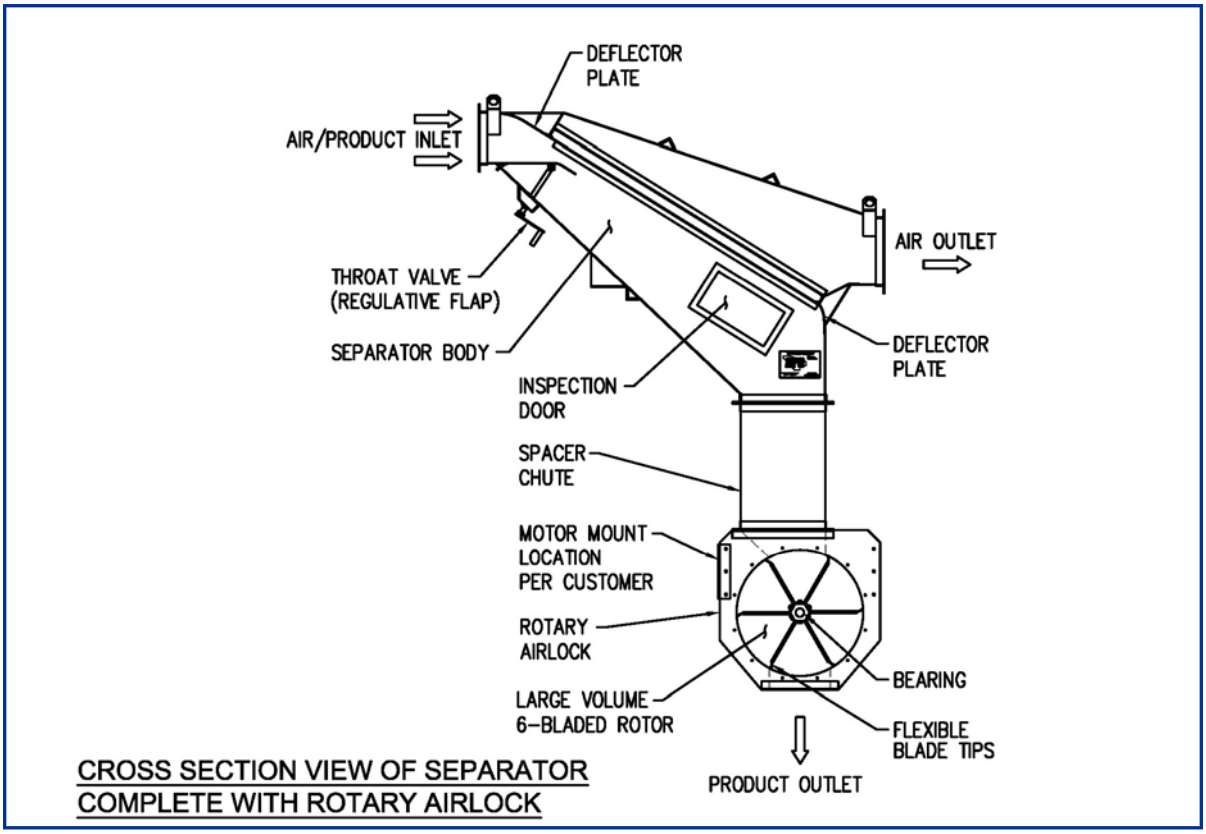
The body is made of continuously welded 1/8” or 3/16” hot-rolled steel plate, depending on the size of the unit (1/4” or AR plate are available for abrasive service), and is constructed to eliminate points where material may collect.

The standard unit is designed for pressures of ± 15 inches of water. Special units are available to operate at several pounds per square inch.

The standard body includes 1/4” polycarbonate windows on each side and has a quick-release system for screen removal. Lifting lugs are supplies with each unit. (The body is also available in a bolt-together construction for assembly on the job.)

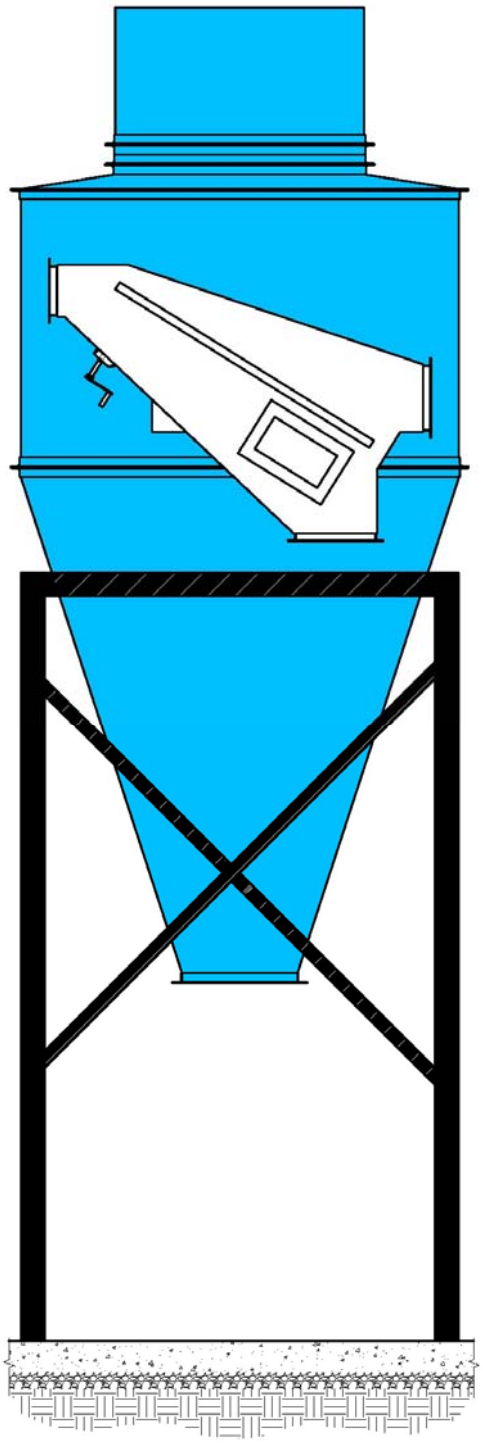
Airlocks

Airlocks are continuously welded and reinforced. Eighteen-inch diameter airlocks are constructed of 10 gauge; thirty inch diameter airlocks are of 3/16” plate. The APS® airlock is normally the *full* width of the APS® . The rotor is four-bladed for 18” diameter, six-bladed for 30” diameter, and is accurately machined between centers then mounted to the side plates on heavy-duty ball bearings. The rotor’s flexible tips are made of fabric-reinforced plastic. The airlock is driven by a TEFC motor, through hollow shaft reduction gearing, or by gear motor and chain drive. Airlock motor sizes are shown in Table 1.



CROSS SECTION VIEW OF SEPARATOR COMPLETE WITH ROTARY AIRLOCK

Specifications are subject to change without notice.



The minimal space requirements of an APS® are obvious when a 25,000 CFM unit is compared with a 25,000 CFM Cyclone.

Options

Windows
Two windows are standard; additional windows are available.

Body Door
An alternative to windows, these inspection doors are made of ¼" polycarbonate with metal frame. Quick-opening latches permit easy access to the interior of the APS®.

Special Screens
Standard screens are woven stainless steel wire cloth. Also available are screens with different meshes, and/or different materials such as brass, aluminum, nickel or spring steel.

Screen Removal Options
Double screens (one removed from each side) are available on all units and are standard on larger sizes. Special units are available with either double screen removal from one side, or bottom screen removal. Multiple narrow screens can be provided to permit screen removal when space is restricted.

Split APS® Unit
Body Divider panels and airlock divisions allow a single APS® unit to be divided in two or more compartments. This configuration is used when it is desirable to have material discharging into a single chute but with flows from several systems.

Tobacco/Tea/Food Modifications
APS®'s are available with special construction for "food grade service".

Special Materials of Construction
APS® and airlock bodies of stainless or abrasion-resistant alloys are available for corrosive, high temperature, or abrasive service; certain components such as airlock blades, gaskets, window materials are modified as well.

Bolt-Together Construction (APS® Body)
Bolted construction in place of all-welded construction for on-site assembly. Recommended where installation of complete unit is difficult or where abrasive service makes it desirable for partial rebuilds.

APS® Modifications for Lighting and/or Fire Protection
These modifications include the fitting of properly enclosed light fixtures to illuminate the interior of the APS®; mounting of sprinkler/spray nozzles for attachment to building's fire protection system; or alternately, a complete self-contained fire protection system.

Powered Throat Valve Actuation
Rotary electric actuators mounted to the throat valve eliminate the need for access to the unit to set throat valve. Recommended for systems requiring frequent adjustments or those to be adjusted by electronic control.

Rotary Locks
Standard unit described above as part of APS®. Also available in divided construction to keep material and air flows separated in section of the APS®/airlock combination. Zero speed switches and mechanical or electrical drive protection can be supplied for airlocks.

Dump Valves
Used with material which may bind or wrap in rotary airlocks, or for use with hazardous materials, the Double Damp Valve is a two-door unit with an intermediate compartment.

Spacer Chutes
Mounted between APS® body and APS® airlock, the chute is used with very light materials.

Paper and Dust Pros, Inc. APS®

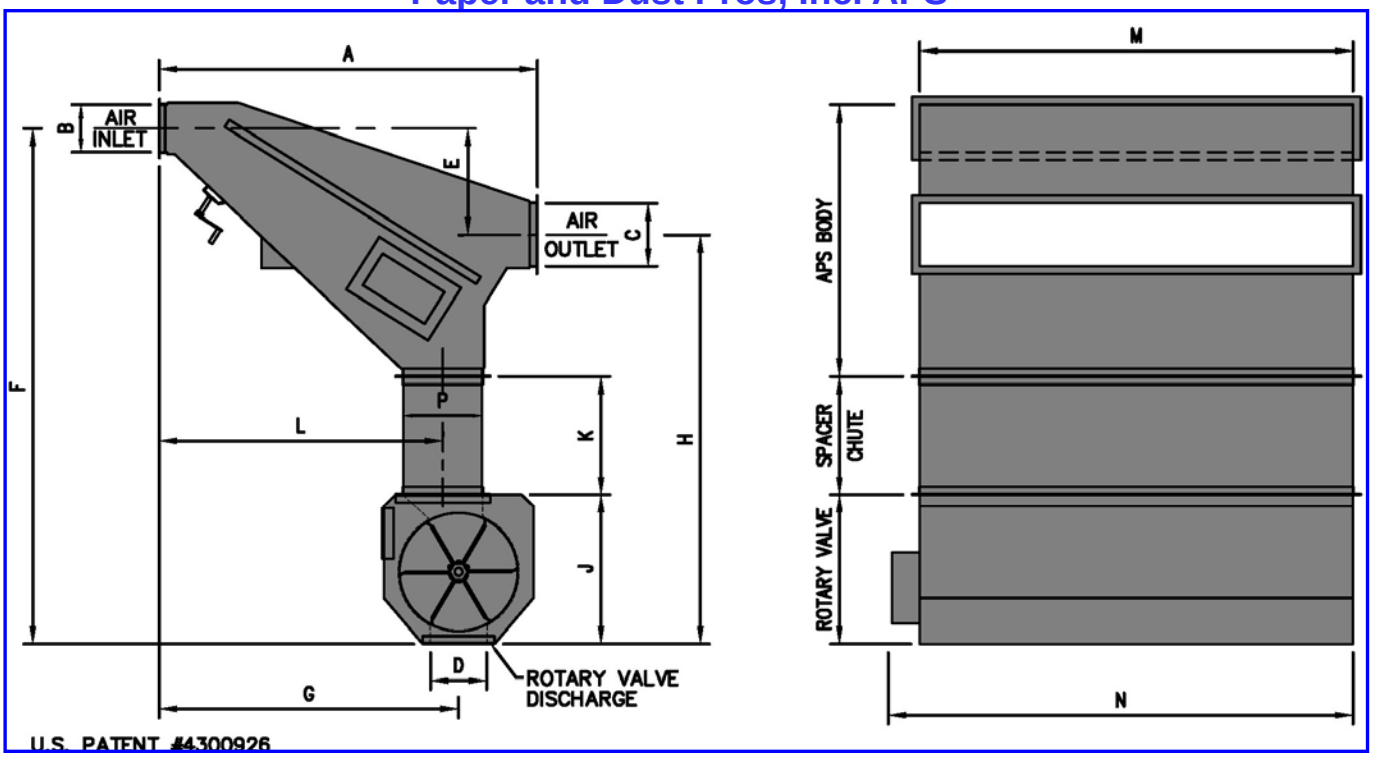


TABLE 1

	FLOW	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	VALVES	ROTARY VALVE DRIVE HP
APS1	600	39	3 1/2	7	5	9 1/2	57 1/2	31	48	16 1/2	18	28 11/16	10	17 1/4	9 3/8	10	(1)-10" DIA.	1/2 HP
APS2	1000	60	3 1/2	7	7	16 1/4	72 7/8	39 1/2	56 5/8	19 5/8	18	36 7/8	10	17 1/4	12 1/4	10	(1)-12" DIA.	1/2 HP
APS3	1500	60	7	10	7	15	73 1/8	39 1/2	58 1/8	19 5/8	18	36 7/8	15	22	12 1/4	15	(1)-12" DIA.	1/2 HP
APS 3A	2400	60	7	10	7	15	73 1/8	39 1/2	58 1/8	19 5/8	18	36 7/8	24	31	12 1/4	24	(1)-12" DIA.	3/4 HP
APS 3B	3000	60	7	10	7	15	73 1/8	39 1/2	58 1/8	19 5/8	18	36 7/8	30	37	12 1/4	30	(1)-12" DIA.	3/4 HP
APS 4	2600	78	9	12	11	21 1/2	89 1/2	50 1/2	68	28	18	46	20	27	20	20	(1)-18" DIA.	1 HP
APS 5	4000	78	9	12	11	21 1/2	89 1/2	50 1/2	68	28	18	46	30	37	20	30	(1)-18" DIA.	1 HP
APS 6	5500	78	9	12	11	21 1/2	89 1/2	50 1/2	68	28	18	46	36	43	20	36	(1)-18" DIA.	1 1/2 HP
APS 7	7200	78	9	12	11	21 1/2	89 1/2	50 1/2	68	28	18	46	48	55	20	48	(1)-18" DIA.	1 1/2 HP
APS 8	9000	78	9	12	11	21 1/2	89 1/2	50 1/2	68	28	18	46	60	67	20	60	(1)-18" DIA.	1 1/2 HP
APS 9HV	13000	96	12	14	14 3/16	28	119	76	91	38	18	72	60	67	20	60	(1)-30" DIA.	1 1/2 HP
APS 10	10500	78	12	14	14 3/16	19	110	50	91	38	30	46	70	77	20	70	(1)-30" DIA.	2 HP
APS 10HV	16000	96	12	14	14 3/16	28	131	76	103	38	30	72	70	77	20	70	(1)-30" DIA.	2 HP
APS 11HV	20000	96	12	14	14 3/16	28	131	76	103	38	30	72	90	97	20	90	(1)-30" DIA.	3 HP
APS 12HV	25000	96	12	16	14 3/16	27	131	76	104	38	30	72	110	117	20	110	(1)-30" DIA.	5 HP
APS 14HV	30000	96	12	16	14 3/16	27	131	76	104	38	30	72	132	134	20	126	(2)-60" LOCKS 30"	1 1/2 HP EACH
APS 15HV	34000	96	12	16	14 3/16	27	131	76	104	38	30	72	150	152	20	145	(2)-70" LOCKS 30"	2 HP EACH
APS 16HV	38500	96	12	16	14 3/16	27	131	76	104	38	30	72	170	163	20	155	(2)-70" LOCKS 30"	2 HP EACH
APS 17HV	42000	96	12	16	14 3/16	27	131	76	104	38	30	72	185	170	20	162 1/2	(2)-70" LOCKS 30"	2 HP EACH
APS 18HV	46200	96	12	16	14 3/16	27	131	76	104	38	30	72	200	178	20	170	(2)-70" LOCKS 30"	2 HP EACH

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