

HIGH DENSITY SCRUBBER TYPE: HDS SERIES



THE SOLUTION TO CORROSION & ODOR CONTROL

THE HIGH DENSITY SCRUBBER (HDS)

The High Density Scrubber (HDS) removes corrosive, malodorous and toxic contaminants and is designed for applications requiring high removal efficiency and extensive media life. The HDS system integrates three principal components: an industrial blower, a vessel containing chemical media and a discharge particulate filter section. The contaminated air is blown through an even-flow plenum section by the skid-mounted industrial blower. The air is then forced up through a deep bed of MULTI-MIX® media for removal of gaseous contaminants such as hydrogen sulfide, sulfur dioxide, chlorine, ammonia, etc. The selection of media and its depth depends on the type and severity of the challenge contaminants.

To ensure optimum contaminant removal efficiency, a minimum residence time of 1.0 second is maintained. After chemical purification, the air is further filtered by ASHRAE rated final filters at 40% (MERV 9) and 90% (MERV 14) efficiency. The air is then discharged. Periodically, samples of operating media are analyzed free of charge at our laboratory to verify media life and ensure optimum system performance (see TECH-CHEK™ Services at back of brochure).

THE CONVENTIONAL SOLUTION

The traditional method for odor and corrosion control typically relies on wet scrubbers which use chemical solutions to neutralize odors. These types of systems are used in cases with very high concentrations (greater than 20 ppm) in order to reduce contaminant loads. Unfortunately, wet scrubbers involve a major financial investment, require substantial maintenance, and have the potential to become an environmental hazard. In addition, wet scrubbers do not have the pull-down capacity to achieve low ppb gas leaving concentrations.

THE CIRCUL-AIRE SOLUTION

Circul-Aire's High Density Scrubbers (Hds) Are Vertical Configuration Dry Scrubbers Requiring Smaller Footprints Filled With Granular Multi-Mix® Media. For Lower Concentrations (Less Than 20 Ppm), Hds Dry Scrubbers Will Efficiently Remove Contaminants To Non-Detectable Levels. Servicing Hds Scrubbers Is Minimal, Only Requiring Annual Bulk Loading Of The Replacement Media Rather Than The Complex And Frequent Maintenance Procedures Necessary For Wet Scrubbers.

FEATURES

- Rugged industrial construction for maximum protection against corrosion and other severe environmental conditions.
- Complete range of MULTI-MIX® chemical media to suit various applications.
- Factory-assembled packages to facilitate installation and start-up. Partially assembled systems are also available where passage is restricted.
- Counter flow design to reduce maintenance downtime using gravity loading and unloading.

CORROSION & ODOR CONTROL APPLICATIONS

- Pulp & paper mills
- Oil & gas refineries
- Incineration plants
- Sewage treatment plants
- Steel mills
- Pharmaceutical plants
- Electronic component manufacturing
- Computer rooms

THE PROBLEMS

Many manufacturing processes result in the release of multiple airborne contaminants that lead to odor and corrosion problems. Oil and gas refineries, pulp and paper plants, and wastewater treatment facilities all generate a variety of harmful contaminants. In particular, hydrogen sulphide, an undesirable by-product of many processes is malodorous, toxic and highly volatility a special contaminant control technology. The Circul-Aire High Density Scrubber (HDS) can control these gases and provide the ventilation required in these spaces.

For example, in wastewater treatment facilities, basin detention times, loadings to biological processes and sludge generation potential can influence odor levels. Sept age and sludge handling systems are also common sources of strong odors. Odor generation is often the result of organic overloading, an inadequate supply of oxygen, improper ventilation or simply a failure to recognize that certain unit processes may require a special contaminant control technology. The Circul-Aire High Density Scrubber (HDS) can control these gases and provide the ventilation required in these spaces.

Table 1 - FILTER REQUIREMENTS/AIR FLOW CAPACITIES

HDS Unit		Chemical Media Housing Size/Model									
		26	33	39	44	54	62	73	82	90	100
Approx. Air Flow Range	CFM	280 to 400	450 to 650	650 to 950	800 to 1200	1200 to 1800	1600 to 2400	2300 to 3200	2800 to 4200	3600 to 5200	4300 to 6250
	m³/h	476 to 680	765 to 1105	1105 to 1615	1360 to 2040	2040 to 3060	1600 to 2400	3910 to 5440	4760 to 7140	6120 to 8840	7310 to 10625
Media Volume Per 1-inch Bed Depth		0.39 ft³	0.63 ft³	0.88 ft³	1.12 ft³	1.69 ft³	2.22 ft³	3.08 ft³	3.89 ft³	4.94 ft³	5.88 ft³
Pre-Filter 30% (MERV 6) eff.											
12" x 12" x 2"		1	-	-	-	-	-	-	-	-	-
24" x 12" x 2"		-	1	-	-	-	-	-	-	2	2
24" x 24" x 2"		-	-	1	1	1	1	2	2	2	2
After-Filter 40% (MERV 9) eff.											
12" x 12" x 4"		1	-	-	-	-	-	-	-	-	-
24" x 12" x 4"		-	1	-	-	-	1	-	-	2	2
24" x 24" x 4"		-	-	1	1	1	1	2	2	2	2
Final Filter 90% (MERV 14) eff											
12" x 12" x 12"		1	-	-	-	-	-	-	-	-	-
24" x 12" x 12"		-	1	-	-	-	1	-	-	2	2
24" x 24" x 12"		-	-	1	1	1	1	2	2	2	2

Table 2 - FAN PERFORMANCE

Size/Model	Air Flow		Radial Blade Steel Fan, SISW Fan Arrangement					
			MM-1955 or MM-1355 *Unit Pressure Drop Approx. 8.5" (2.1 kPa) WC			MM-3000, 7000 or 9000 *Unit Pressure Drop Approx. 10.5" (2.5 kPa) WC		
	CFM	m³/h	RPM	BHP	HP (KW)	RPM	BHP	HP (KW)
26	300	510	3551	0.90	2.0 (1.5)	3260	1.01	2.0 (1.5)
33	500	850	3666	1.30	2.0 (1.5)	3731	1.90	3.0 (2.2)
39	800	1360	2845	1.95	3.0 (2.2)	3066	2.32	5.0 (3.0)
44	1000	1700	2918	2.42	5.0 (3.0)	3132	2.84	5.0 (3.0)
54	1630	2770	2428	3.93	5.0 (3.0)	2604	4.60	7.5 (5.5)
62	2000	3400	2132	4.85	7.5 (5.5)	2289	5.70	7.5 (5.5)
73	2800	4760	1799	6.31	7.5 (5.5)	1935	7.38	10.0 (7.5)
82	3500	5950	1548	7.85	10.0 (7.5)	1666	9.20	15.0 (11.0)
90	4400	7480	1346	9.64	15.0 (11.0)	1450	11.40	15.0 (11.0)
100	5200	8840	1371	11.50	15.0 (11.0)	1472	13.40	15.0 (11.0)

BASED ON: 2-second residence time and chemical media bed velocity @ 75 FPM (0.38 m/s).
*Includes 1.0" (249 Pa) WC external static pressure.

Table 3a - MOTOR PERFORMANCE (60 HERTZ)

HP (kw)	Full Load rpm	Voltage/3ø/60 Hz				NEMA Code		Full Load Efficiency
		380V/3ø/50 Hz		575				
		FLA	LRA	FLA	LRA	Design	Code	
1.0 (0.75)	1720	1.6	11.5	1.28	9.2	B	L	82.5
1.5 (1.1)	1710	2.2	17	1.75	13.6	B	L	84.0
2.0 (1.5)	1740	2.95	23	2.35	18	B	L	84.0
3.0 (2.2)	1740	4	32	3.2	25.6	B	K	87.5
5.0 (3.0)	1740	6.25	46	5	37	B	J	87.5
7.5 (5.5)	1740	9.3	62	7.5	50	B	H	89.5
10.0 (7.5)	1750	12.5	81	10	65	B	H	89.5
15.0 (11.0)	1750	12.5	112	14.1	90	B	G	91.0
20.0 (15.0)	1760	23	140	18.5	112	B	G	91.0

INSULATION: Class F
TEMPERATURE: 800
C at Rated H.P.
SERVICE FACTOR: 1.15
RATING: Continuous

Table 3b - MOTOR PERFORMANCE (50 HERTZ)

HP (kw)	Full Load rpm	Voltage/3ø/60 Hz		NEMA Code		Full Load Efficiency %
		460		Design	Code	
		FLA	LRA			
1.0 (0.75)	1430	1.9	13.5	B	L	82.5
1.5 (1.1)	1425	2.6	20	B	L	84.0
2.0 (1.5)	1425	3.6	28.1	B	L	84.0
3.0 (2.2)	1450	4.8	38	B	K	87.5
5.0 (3.0)	1450	7.6	56	B	J	87.5
7.5 (5.5)	1450	11.3	76	B	H	89.5
10.0 (7.5)	1460	15.1	98	B	H	89.5
15.0 (11.0)	1460	21.3	136	B	G	91.0
20.0 (15.0)	1465	27.8	170	B	G	91.0

INSULATION: Class F
 TEMPERATURE: 800
 C at Rated H.P.
 SERVICE FACTOR: 1.0
 RATING: Continuous

HDS DIMENSION

DIMENSIONS FOR HORIZONTAL & VERTICAL DISCHARGE MODEL											
Size Model	A	B	C Max	D	E	F	G	H	J	K	Weight* lb (kg)
26	26 (660)	56 (1422)	70 (1778)	30 (762)	30 (762)	72 (1829)	12 (305)	12 (305)	12 (305)	12 (305)	1079 (490)
33	33 (838)	71 (1803)	80 (2032)	38 (965)	36 (914)	78 (1981)	12 (305)	24 (610)	24 (610)	12 (305)	1320 (599)
39	39 (1118)	89 (2388)	95 (2413)	50 (1270)	44 (1118)	85 (2159)	24 (610)	24 (610)	24 (610)	24 (610)	1686 (765)
44	44 (1118)	94 (2388)	95 (2413)	50 (1270)	44 (1118)	85 (2159)	24 (610)	24 (610)	24 (610)	24 (610)	1888 (857)
54	54 (1372)	104 (2642)	85 (2159)	50 (1270)	44 (1118)	85 (2159)	24 (610)	24 (610)	24 (610)	24 (610)	2250 (1020)
62	62 (1575)	112 (2849)	85 (2159)	50 (1270)	44 (1118)	88 (2235)	24 (610)	36 (914)	36 (914)	24 (610)	2838 (1287)
73	73 (1930)	135 (3429)	90 (2286)	62 (1575)	50 (1270)	98 (2489)	24 (610)	48 (1220)	48 (1220)	24 (610)	3304 (1499)
82	82 (2083)	148 (3759)	90 (2286)	62 (1575)	62 (1575)	98 (2489)	24 (610)	48 (1220)	48 (1220)	24 (610)	3800 (1724)
90	82 (2083)	170 (4318)	100 (2540)	66 (1676)	62 (1575)	101 (2565)	36 (914)	48 (1220)	60 (1524)	24 (610)	4636 (2103)
100	82 (2083)	190 (4829)	100 (2540)	66 (1676)	66 (1676)	101 (2565)	36 (914)	48 (1220)	72 (1829)	24 (610)	4978 (2258)

NOTE: Drawing is not to scale.
 Dimensions listed are inches (mm).
 *Chemical media not included in weights

CIRCUL-AIRE MULTI-MIX® MEDIA & SERVICES

MULTI-MIX® MEDIA & TECH-CHEK™ SERVICE

CIRCUL-AIRE's MULTI-MIX® is a proven filter media which provides continuous purification of corrosive, odorous and toxic contaminants in industrial and commercial environments. MULTI-MIX® media combines the adsorption properties of activated carbon and enhanced carbons with the oxidation properties of chemically impregnated alumina. For more information on MULTI-MIX® media, refer to our MULTI-MIX® brochures.

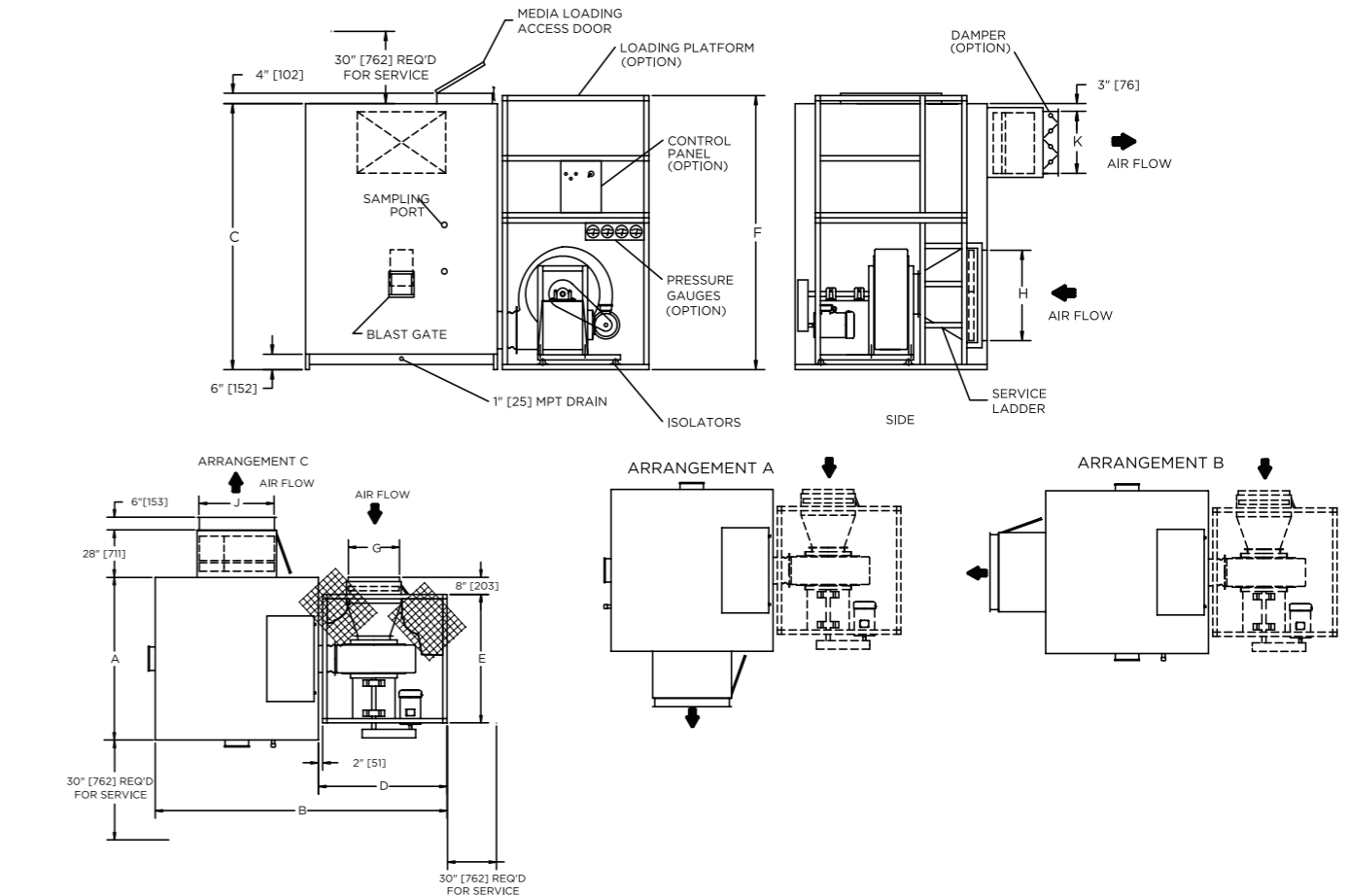
Media analysis through our lifetime TECH-CHEK™ Program ensures maximum efficiency of our products. A complete computerized report establishes media replacement schedule for each unit. CIRCUL-AIRE's in-house laboratory can also provide additional performance tests against specific air contaminants.

SEALING INTEGRITY VERIFICATION (SIV)

The Sealing Integrity Verification (SIV) measures the protected area where process control equipment is located. Building enclosures can never be perfectly sealed. Often leakage allows contaminated air to infiltrate usually in significant quantities, even to the extent of preventing the required pressurization.

The Sealing Integrity Verification (SIV) measures room differential pressure and flow pressure of pressurization/de pressurization. The values are used to calculate probable effective leakage area and geometry. Should verification analysis prove improper sealing, leakage identification and sealing procedures are implemented.

HDS DIMENSIONS (1)



HDS DIMENSIONS (2)

