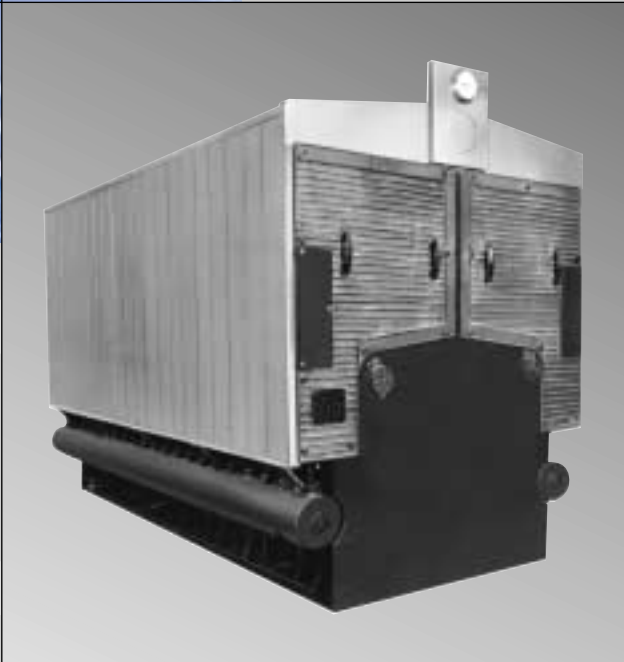


Smith  
CAST IRON



# Mills M450A

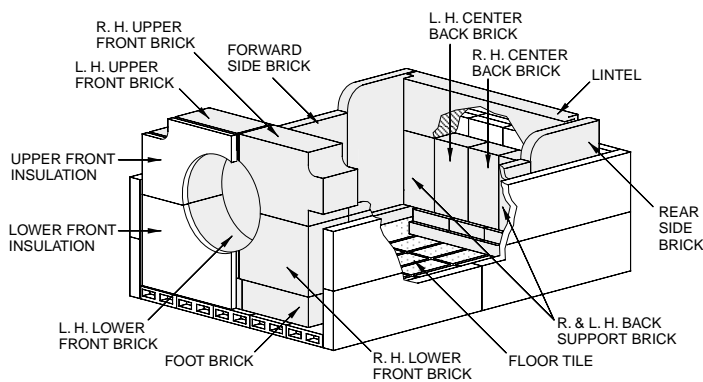
OIL, GAS-FIRED OR COMBINATION  
CAST IRON BOILER



## OPTIONAL COMBUSTION CHAMBER DETAIL

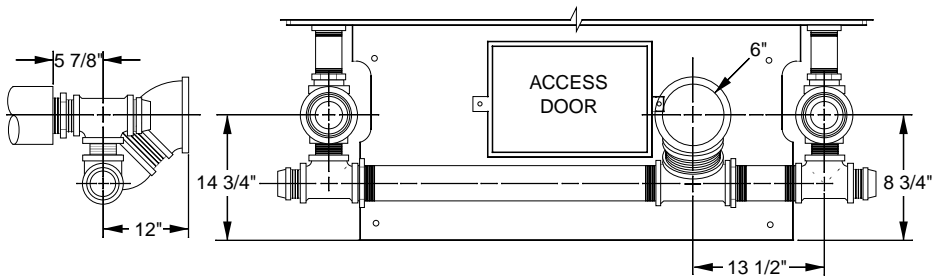
Number of Sections	Width (Inches)	Height Floor to C/L Burner (Inches)	Brick Burner Holes* Inside Diameter (Inches)			Length (Inches)	Volume (Cu. Feet)
10	32	24	10 1/4	17 1/2	20	46	12.67
11	32	24	10 1/4	17 1/2	20	52	14.39
12	32	24	10 1/4	17 1/2	20	58	16.11
13	32	24	10 1/4	17 1/2	20	64	17.83
14	32	24	10 1/4	17 1/2	20	70	19.55
15	32	24	10 1/4	17 1/2	20	76	21.27
16	32	24	10 1/4	17 1/2	20	82	23.00
17	32	24	10 1/4	17 1/2	20	88	24.71
18	32	24	10 1/4	17 1/2	20	94	26.43
19	32	24	10 1/4	17 1/2	20	100	28.16
20	32	24	10 1/4	17 1/2	20	106	29.87
21	32	24	10 1/4	17 1/2	20	112	31.59
22	32	24	10 1/4	17 1/2	20	118	33.32

\*State size when ordering



COMBUSTION CHAMBER

## OPTIONAL EQUIPMENT



RETURN YOKE — WATER (With Access Door)

## STANDARD EQUIPMENT

### All Boilers

- 24-inch high foundation
- Steel smokehood
- Steel foundation front plate with observation ports (no burner opening)
- Insulated metal jacket

### Steam

- Prefabricated steam return yoke with flexible seals. See drawing below.
- C.I. water column and piping
- Steam pressure gauge and syphon
- Safety valve set at 15 psi

### Water

- ASME 40# water relief valve

## OPTIONAL EQUIPMENT

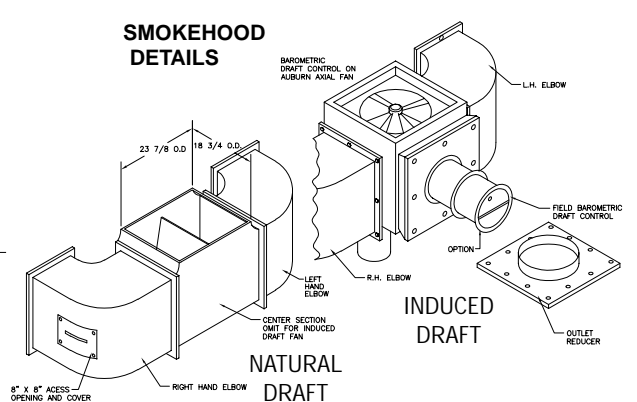
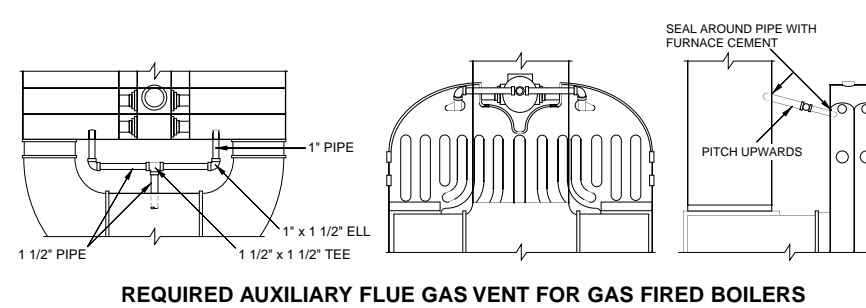
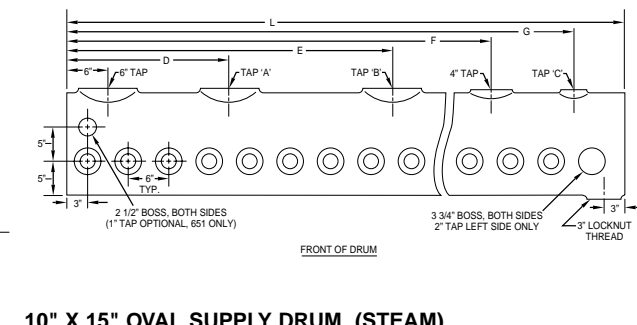
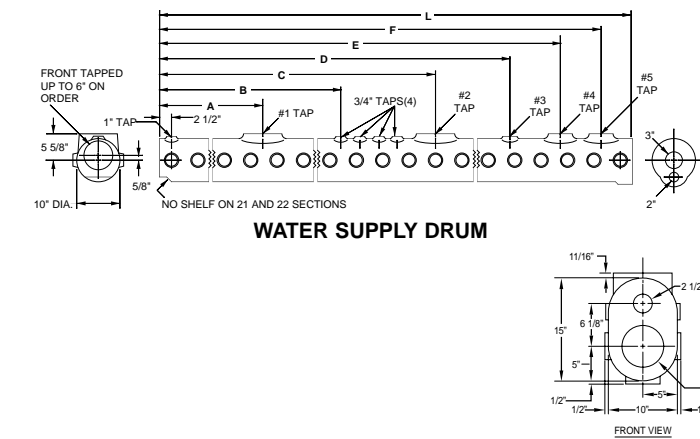
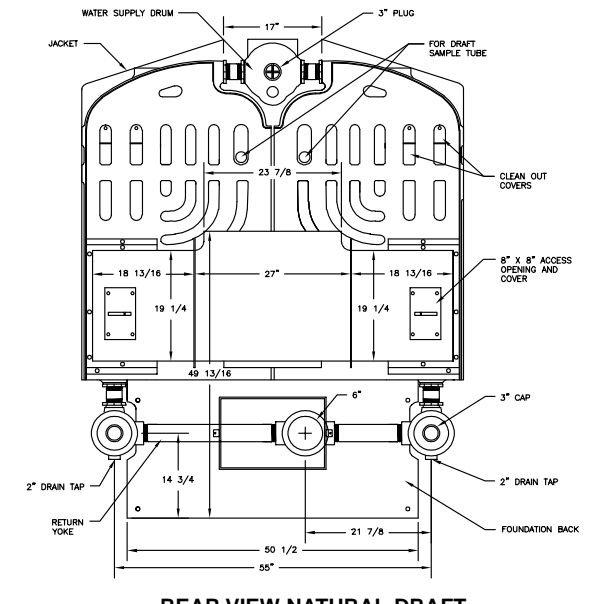
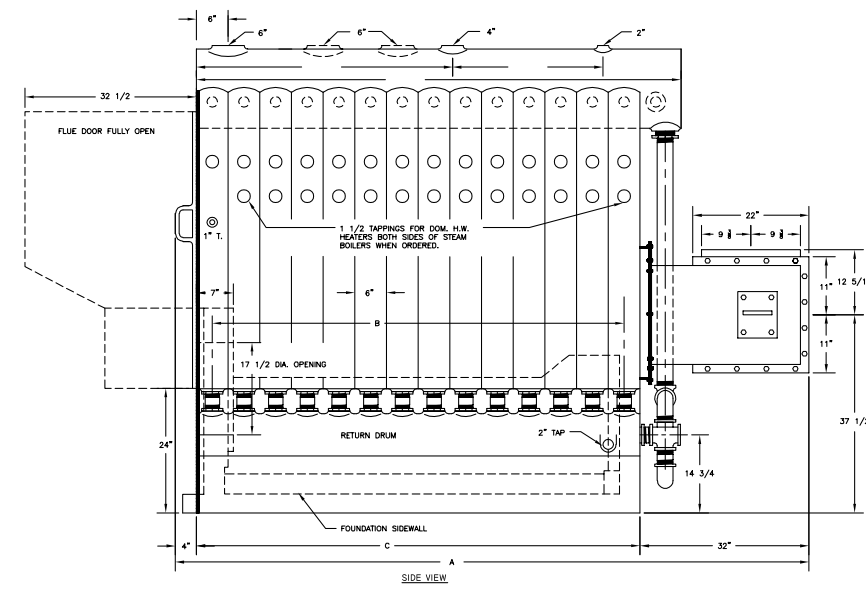
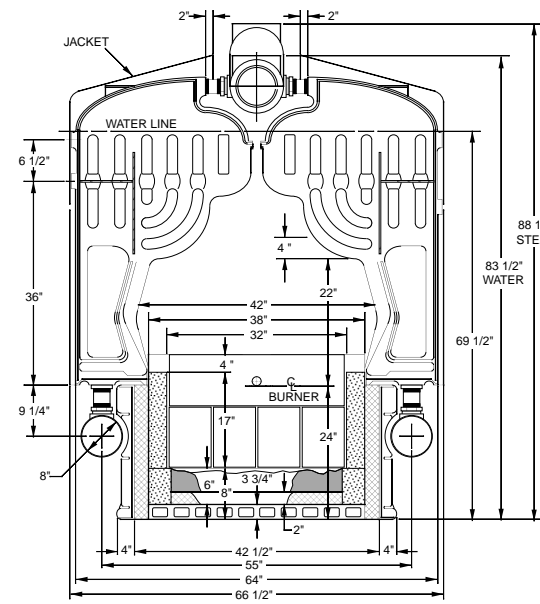
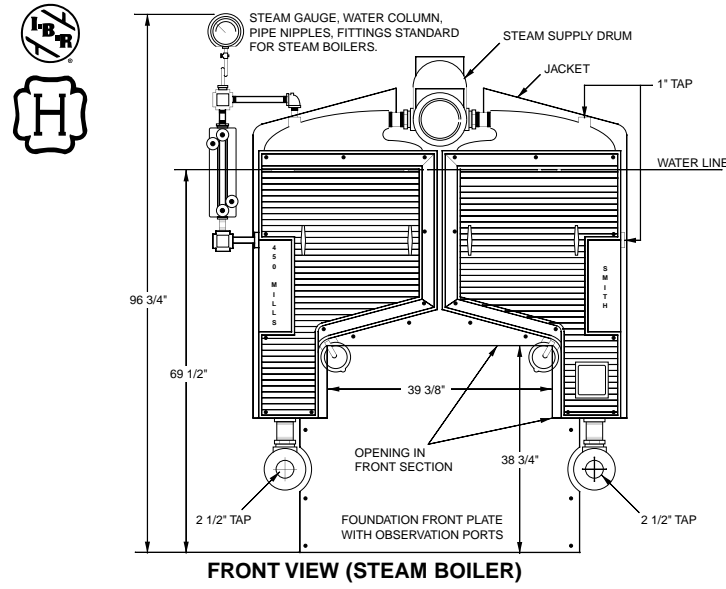
- Combustion chamber with block insulation and hollow tile. See drawing below.
- Prefabricated water return yoke with flexible seals. See drawing below.
- Air elimination dip tube for water boilers.
- Foundation back plate with rear foundation access door and special return yoke
- Combination pressure-altitude gauge
- Low water cutoffs
- Automatic water feeder
- Induced draft fans (Auburn and Auburn Axial) — see following pages.



# OIL OR GAS - FIRED

I=B=R Ratings: 2,449 to 5,852 MBH

## CAST - IRON WATER TUBE BOILER



### I=B=R Ratings, Burner Capacities, Chimney Sizes

Maximum Allowable working pressure 15 psi Steam and 80 psi Water. All Boilers hydrostatically tested- A.S.M.E.

Boiler Number	Boiler Horsepower	I=B=R Gross Output MBH	Net I=B=R Ratings		I=B=R Burner Capacity		I=B=R Chimney Size (Note 5)		Inside Dimensions Smoke Pipe To Fit Over Smokehood Outlet (In.)	Heating Surface (Sq. Ft.)	Furnace Volume (Cu. Ft.)	Covering Surface Including Drums (Sq. Ft.)	I=B=R Combustion Efficiency (%)		Induced Draft Fan Catalog Number		Induced Draft Fan Motor HP			
			Steam		Water		Size (Inches)	Height (Feet)					Oil	Gas	Auburn Axial Fan to fit Smokehood	Auburn Fan & Smokehood to fit Boiler	Auburn Axial	Auburn (Note 6)		
			Sq. Ft.	MBH (Note 1)	MBH (Note 2)	Light (Note 3)													Heavy (Note 4)	Gas MBH
M450A-Δ-10	73.16	2,449	7,921	1,901	2,130	21.0	19.6	3,031	20 x 20	29	15 x 19	411.1	46.11	84	86.3	83.7	45B-50	16B 50	1/2	1/2
M450A-Δ-11	81.58	2,733	8,842	2,122	2,377	23.5	22.0	3,380	20 x 24	33	19 x 19	454.4	51.87	91	86.0	83.4	45B-50	16B 50	1/2	1/2
M450A-Δ-12	90.04	3,016	9,758	2,342	2,623	26.0	24.0	3,729	20 x 24	37	19 x 19	497.0	57.62	98	85.8	83.2	45B-75	16B 75	3/4	3/4
M450A-Δ-13	98.46	3,300	10,675	2,562	2,870	28.5	26.0	4,077	24 x 24	40	19 x 19	540.3	63.38	105	85.6	83.0	45B-75	16B 75	3/4	3/4
M450A-Δ-14	106.92	3,583	11,592	2,782	3,116	30.5	28.5	4,426	24 x 24	44	24 x 19	581.9	69.14	112	85.4	82.9	45B-100	16B 100	1	1
M450A-Δ-15	115.34	3,867	12,508	3,002	3,363	33.0	30.5	4,775	24 x 24	47	24 x 19	626.1	74.89	119	85.3	82.7	45B-100	16B 100	1	1
M450A-Δ-16	123.79	4,151	13,429	3,223	3,610	35.5	33.0	5,124	24 x 28	53	24 x 19	668.7	80.65	126	85.2	82.6	45B-150	16B 100	1 1/2	1
M450A-Δ-17	132.22	4,434	14,346	3,443	3,856	38.0	35.0	5,473	24 x 28	59	24 x 19	712.0	86.41	126	85.1	82.5	45B-150	18B 100	1 1/2	1
M450A-Δ-18	140.64	4,718	15,263	3,663	4,103	40.5	37.5	5,821	24 x 28	65	24 x 19	754.6	92.17	140	85.0	82.4	45B-150	18B 100	1 1/2	1
M450A-Δ-19	149.10	5,001	16,179	3,883	4,349	43.0	39.5	6,170	28 x 28	71	24 x 19	797.2	97.92	147	84.9	82.4	45B-150	18B 150	1 1/2	1 1/2
M450A-Δ-20	157.52	5,285	17,096	4,103	4,596	45.0	41.5	6,519	28 x 28	77	24 x 19	839.8	103.68	154	84.8	82.3	45B-200	18B 150	2	1 1/2
M450A-Δ-21	165.97	5,568	18,013	4,323	4,842	47.5	44.0	6,868	28 x 28	82	24 x 24	883.1	109.44	161	84.8	82.2	45B-200	18B 200	2	2
M450A-Δ-22	174.40	5,852	18,929	4,543	5,089	50.0	46.0	7,216	28 x 28	88	24 x 24	926.4	115.19	168	84.8	82.2	45B-300	18B 200	3	2

(Δ) Insert "S" for Steam, "W" for Water. Example. M450A-S-10 is a 10 section MILLS M450A boiler for steam.  
 (Note 1) The Net I=B=R Steam Ratings shown are based on piping and pick-up allowance of 1.288.  
 (Note 2) The Net I=B=R Water Ratings shown are based on an allowance of 1.15.  
 (Note 3) Light Oil having heat content of 140,000 BTU/Gal.  
 (Note 4) Heavy Oil having heat content of 150,000 BTU/Gal.  
 (Note 5) If the oil burner being used requires a draft over the fire greater than .06", the chimney height should be adjusted accordingly.  
 (Note 6) Auburn fans are available with either single-phase 115/230 volt

### Dimensions — MILLS M450A

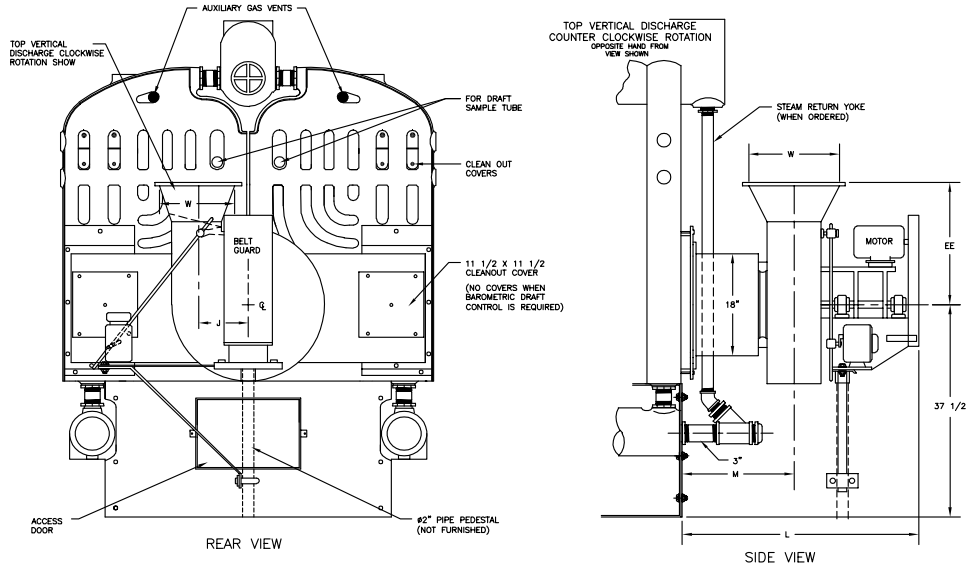
Overall Length (Inches)		Furnace Lgth (In.)	Foundation Lgth (In.)	Water Supply Drum																Steam Supply Drum							
Natural Draft	Auburn Axial Fan			Auburn Fan	Tapping Size (NPT)					Tapping Location (Inches)											Tapping Size (NPT)		Tapping Location (Inches)				
A	A1	A2	B	C	I	2	3	4	5	A	B	C	D	E	F	L	A	B	C	D	E	F	G	L			
92	108 1/2	102 1/4	54	60	-	5	-	-	3	-	18 1/2	38 1/2	-	-	52 1/2	59 1/2	-	-	-	-	-	30 1/2	-	67 3/4			
98	114 1/2	108 1/4	60	66	-	6	-	-	4	-	24 1/2	44 1/2	-	-	56 1/2	65 1/2	-	-	-	-	-	36 1/2	-	73 3/4			
104	119 1/2	114 1/4	66	72	-	6	-	-	4	-	24 1/2	44 1/2	-	-	62 1/2	71 1/2	-	-	-	-	-	42 1/2	-	79 3/4			
110	126 1/2	120 1/4	72	78	-	6	2	-	4	-	30 1/2	50 1/2	59 1/2	-	68 1/2	77 1/2	-	-	-	-	-	42 1/2	-	85 3/4			
116	132 1/2	130	78	84	-	6	2	2	4	-	24 1/2	44 1/2	56 1/2	65 1/2	74 1/2	83 1/2	6	-	-	24	-	48 1/2	-	91 3/4			
122	138 1/2	136	84	90	6	6	2	2	4	23 1/2	30 1/2	50 1/2	62 1/2	71 1/2	80 1/2	89 1/2	6	-	-	24	-	54 1/4	-	97 3/4			
128	144 1/2	142	90	96	6	6	2	4	2	32 1/2	42 1/2	62 1/2	71 1/2	80 1/2	89 1/2	95 1/2	6	-	-	24	-	54 1/2	-	103 3/4			
134	150 1/2	148	96	102	6	6	2	4	2	32 1/2	48 1/2	68 1/2	77 1/2	86 1/2	95 1/2	101 1/2	6	-	-	24	-	60 1/2	-	109 3/4			
140	156 1/2	154	102	108	6	6	2	4	2	32 1/2	48 1/2	68 1/2	80 1/2	92 1/2	101 1/2	107 1/2	6	6	-	24	48	66 1/2	-	115 3/4			
146	162 1/2	160	108	114	6	6	2	4	2	32 1/2	54 1/2	74 1/2	86 1/2	98 1/2	107 1/2	113 1/2	6	6	2	24	48	67 1/2	79 1/2	121 3/4			
152	168 1/2	166	114	120	6	6	2	4	3	32 1/2	54 1/2	74 1/2	91 1/2	103 1/2	112 1/2	119 1/2	6	6	2	24	48	73 1/2	85 1/2	127 3/4			
158	174 1/2	172	120	126	6	6	2	4	3	50 1/2	60 1/2	80 1/2	97 1/2	109 1/2	118 1/2	125 1/2	6	6	2	24	48	79 1/2	91 1/2	133 3/4			
164	180 1/2	178	126	132	6	6	2	4	3	56 1/2	66 1/2	80 1/2	103 1/2	115 1/2	124 1/2	131 1/2	6	6	2	24	48	85 1/2	97 1/2	139 3/4			

The manufacturer should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping, etc. For forced hot water heating systems where the boiler and all piping are within the area to be heated, the boiler may be selected on the basis of its Gross Output.  
 (Note) Dimensions are approximate. Should not be used to "rough-in" equipment.

# OPTIONAL SMOKEHOOD ASSEMBLIES FOR INDUCED DRAFT INSTALLATION WITH AUBURN FAN

The M450A Mills Boiler may be furnished for induced draft operation.  
A special smokehood to accommodate the Auburn induced draft fan is supplied.

The combinations of fan and draft control dampers, including the damper linkage as shown, can be furnished by Smith. The motor operator and the connection to the damper linkage should be specified as part of the Burner Control System.



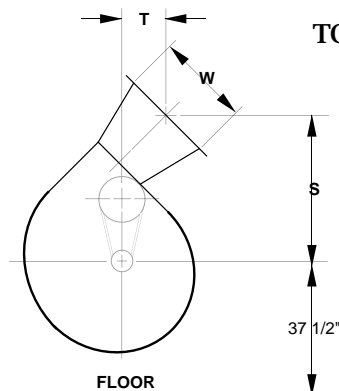
### AUBURN INDUCED DRAFT FAN INSTALLATION

Special field barometric Type Dampers can be supplied, eliminating the clean-out covers and damper linkage shown.

AUBURN FAN DIMENSIONS (INCHES)							
Boiler No.	J	L	M	S	T	W	EE
M450A-10 - 16	11 3/8	42	20	22 7/8	7	16	21
M450A-17 - 22	13 1/4	46 1/4	21	27	8 1/2	18	25

Chimney height shall be sufficient to avoid creating a nuisance. See chart, page 6, for inside dimensions of chimney for induced draft.

### OPTIONAL DISCHARGE POSITION — AUBURN INDUCED DRAFT FAN



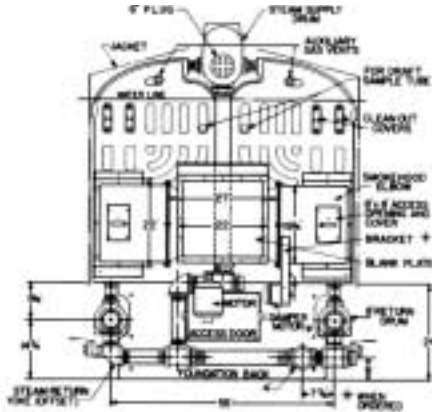
**TOP 45° DISCHARGE —**  
Clockwise Rotation View  
from back of boiler

(Opposite hand from view above  
for counter clockwise rotation)

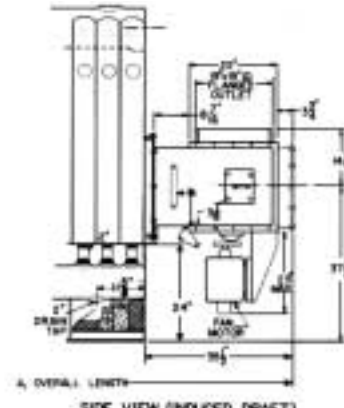
# OPTIONAL SMOKEHOOD ASSEMBLIES FOR INDUCED DRAFT INSTALLATION WITH AUBURN AXIAL FAN

The M450A Mills Boiler may be furnished for induced draft operation. The smokehood is designed to receive and support the Auburn Axial induced draft fan without the addition of supplemental bracing.

The combinations of fan draft control dampers, including the damper linkage as shown, can be furnished by Smith. The motor operator and the connection to the damper linkage should be specified as part of the Burner Control



**REAR VIEW  
AUBURN AXIAL FAN - STEAM BOILER**



**SIDE VIEW (INDUCED DRAFT)  
\* SHUTTER DAMPERS AND LINKAGE SUPPLIED WHEN ORDERED**

## AUBURN AXIAL INDUCED DRAFT FAN INSTALLATION

INDUCED DRAFT FAN SPECIFICATIONS										
Boiler Number	Draft Loss Thru Boiler Ins. W.C.	Overfire Draft Ins. W.C. (Note 1)	Total Draft at Smokehood Outlet Ins. W.C.	I.D. Fan Capacity CFM (Note 2)	Numbers of Auburn Axial I.D. Fan to Fit Smokehood with Corresponding Smith Numbers		Inside Dimensions (Inches) of Lined Chimney with Induced Draft (Note 3)			
							Round		Rectangular	
					Auburn Axial	Smith	Min.	Opt.	Min.	Opt.
M450A-10	0.06	0.06	0.12	1,560	19D-1/3C	45-13/45-33	16	18	14 x 14	16 x 17
M450A-11	0.08	0.06	0.14	1,730			17	19	15 x 16	17 x 18
M450A-12	0.10	0.06	0.16	1,910	19D-1/2C	45-15/45-35	17	20	15 x 16	18 x 19
M450A-13	0.11	0.06	0.17	2,090			17	20	15 x 16	18 x 19
M450A-14	0.13	0.06	0.19	2,270			18	21	16 x 17	19 x 19
M450A-15	0.15	0.06	0.21	2,450	19D-3/4C	45-175/45-375	19	22	17 x 18	20 x 22
M450A-16	0.17	0.07	0.24	2,630			19	23	17 x 18	20 x 22
M450A-17	0.18	0.07	0.25	2,810	19D-1C	45-3100	19	23	17 x 18	20 x 22
M450A-18	0.20	0.08	0.28	2,990			19	24	17 x 18	20 x 22
M450A-19	0.22	0.08	0.30	3,175	19D-1 1/2C	45-3150	20	24	18 x 19	22 x 22
M450A-20	0.24	0.09	0.33	3,355			21	25	19 x 19	22 x 24
M450A-21	0.25	0.10	0.35	3,535			21	25	19 x 19	22 x 24
M450A-22	0.27	0.10	0.37	3,715			21	25	19 x 19	22 x 24

- (Note 1) Average figure. Check exact requirements for the particular burner to be installed.
- (Note 2) Based on 80 cfm per gallon of oil to provide safety factor for average maintenance and operating conditions.
- (Note 3) Lined with standard clay chimney tile. Use these columns for smooth sheet metal, smooth transite or similar types of material.

In all cases chimney height shall be sufficient to avoid creating a nuisance. Breaching size shall in no case be smaller than the corresponding chimney size given.  
Auburn Axial fans are available with constant speed motor with adjustable sheaves; single phase 110/220, or three phase 208/220/240 volts.

# Smith

CAST IRON

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[www.smithboiler.com](http://www.smithboiler.com)

