

data and specifications

STANDARD FEATURES

Low Water Cut-Off/Level Control—

A McDonnell Miller #150 control automatically maintains proper water level, shutting off the boiler when water supply in the boiler drops below a safe operating level.

Water Level Sight Glass—

Allows constant observation of water level while boiler is in operation.

Main ON/OFF Switch—

Allows manual operation of the boiler operation control circuit.

Pilot Light—

Indicates the boiler's on/off condition.

Integral Power Contactors—

Magnetic contactors for energizing the boiler elements. Integrally mounted in the control unit.

Blowdown/Drain Valves—

Facilitates emptying the boiler pressure vessel and MM 150 water column piping during blowdown sequence.

Long Life Heating Elements—

Industrial grade, heavy duty 0.420" diameter stainless steel heating elements equipped with one piece resistance welded terminations for added strength and safety.

Operating Pressure Control—

Resets automatically to maintain preset pressure within boiler.

Energy Savings and Minimum Maintenance—

Pressure vessel insulation; minimum heat loss and maximum energy savings is insured by fibrous glass material.

Easy Control Maintenance—

All control panel and components are easily accessible. Fully-louvered openings avoid component heat build-up

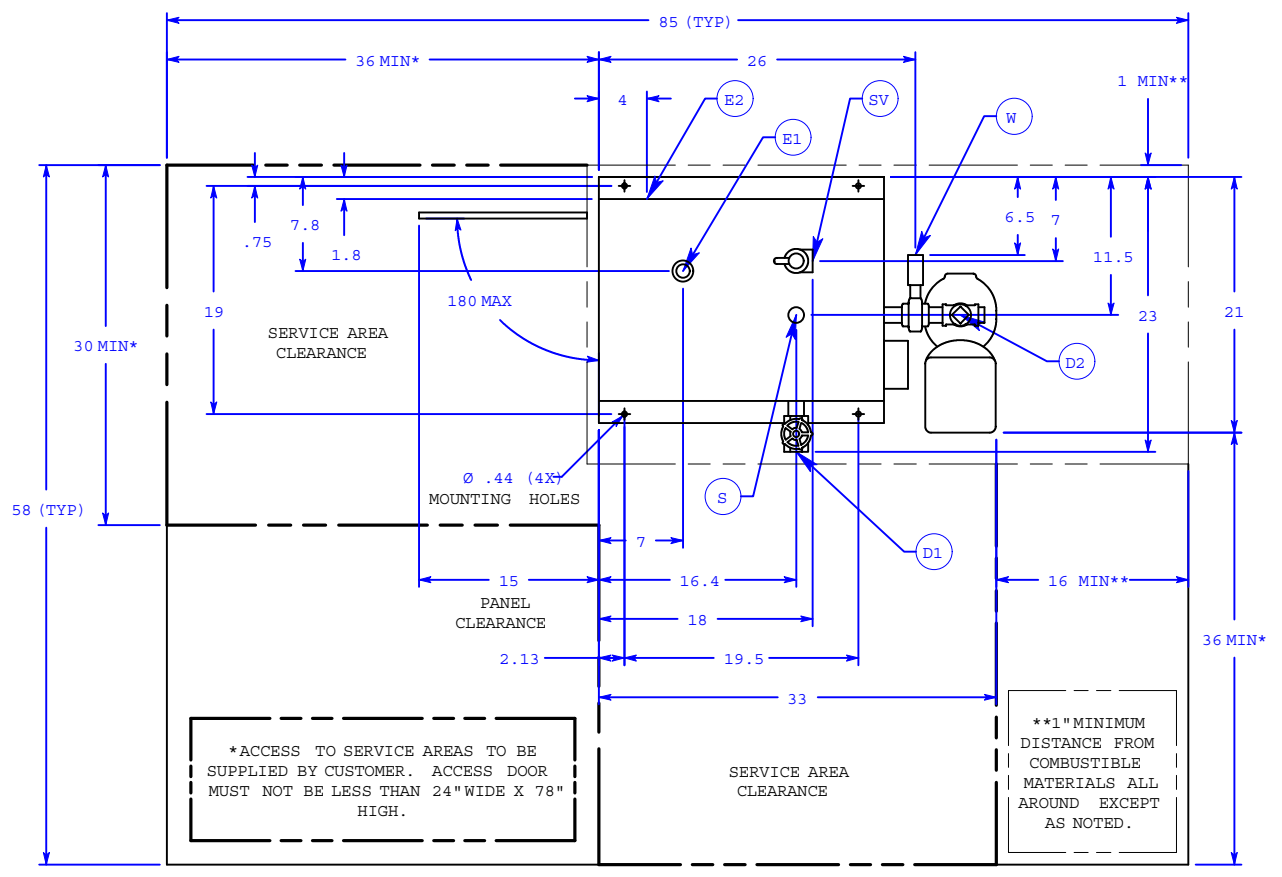
Rugged Construction—

Performance is insured for all typical steam applications

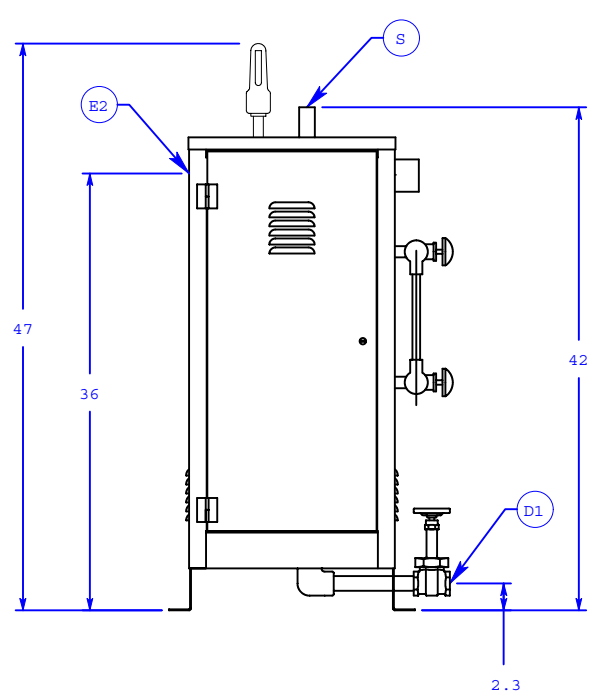
Meeting Code Requirements—

- Pressure vessel rated at 100 PSI to ASME Section 1, Code M. Vessel national Board Registration. Sect 1 Code to 150 PSIG rating available.
- UL Listed. Canadian Standards Association Approved.
- All electrical construction conforms to NEC standards

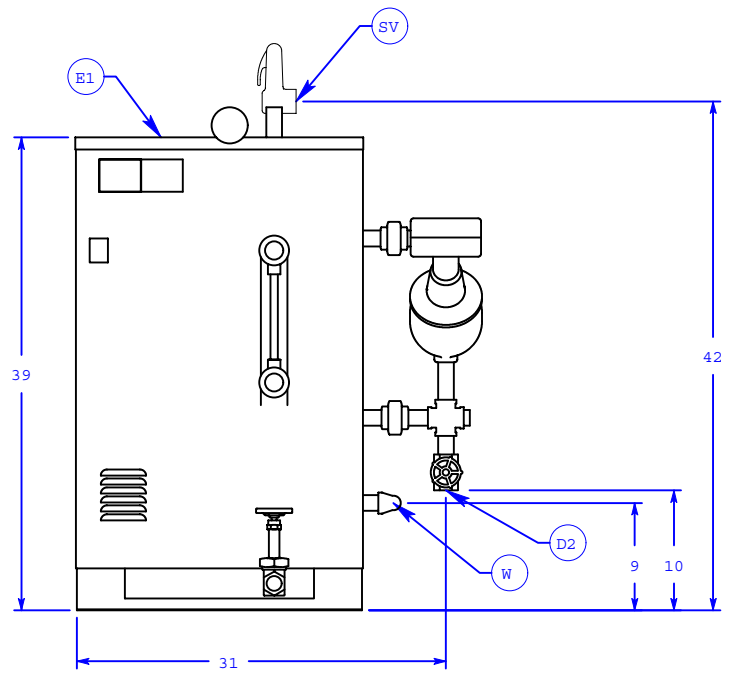
SYM	DATE	REVISION	AUTH
A	04-17-00	RELEASED	FE



PLAN VIEW



SIDE VIEW



FRONT VIEW

TOLERANCE (EXCEPT AS NOTED)			
DECIMAL	.004	SCALE	1:16
FRACTIONAL	.005	DRAWN BY	FE
ANGULAR	.1	APPROVED BY	CM
		TITLE	ELECTRIC BOILER MODELS ES24-ES72
		DATE	04-17-00
		DRAWING NUMBER	ES24-72GC

ELECTRIC BOILER
Model No. ES24-72 (208V, 240V, 480V)

SERVICE

Refer to National and all applicable local codes for specific installation requirements. All piping to be installed by a licensed plumber.

On Unit Connection	Pipe Size To Unit	Pressure Range Dynamic At Unit	Flow Rates					
			ES24	ES30	ES36	ES48	ES60	ES72
W = Water Inlet 1/2" [13] NPT female see note 1	1/2"[13] NPT	100 psig min. [7.0 kg/cm ² min.]	.48 gpm min. [.11 m ³ /Hr min.]	.60 [.14]	.72 [.17]	.96 [.22]	1.20 [.28]	1.44 [.33]
S = Steam Outlet 1" [25] NPT male see note 2	1" [25] NPT	90 psig max. [6.3 kg/cm ² max.]	73 lbs./Hr [34 kg/Hr]	91 [42]	109 [50]	145 [66]	181 [83]	217 [99]
D1 = Drain 1" [25] NPT male	1" [25] NPT	90 psig max. [6.3 kg/cm ² max.]	See note 3					
D2 = Drain 1" [25] NPT male	1" [25] NPT	90 psig max. [6.3 kg/cm ² max.]	See note 3					
SV = Safety Valve Vent 1" [25] NPT female	1" [25] NPT	100 psig [7.0 kg/cm ²]	See note 4					

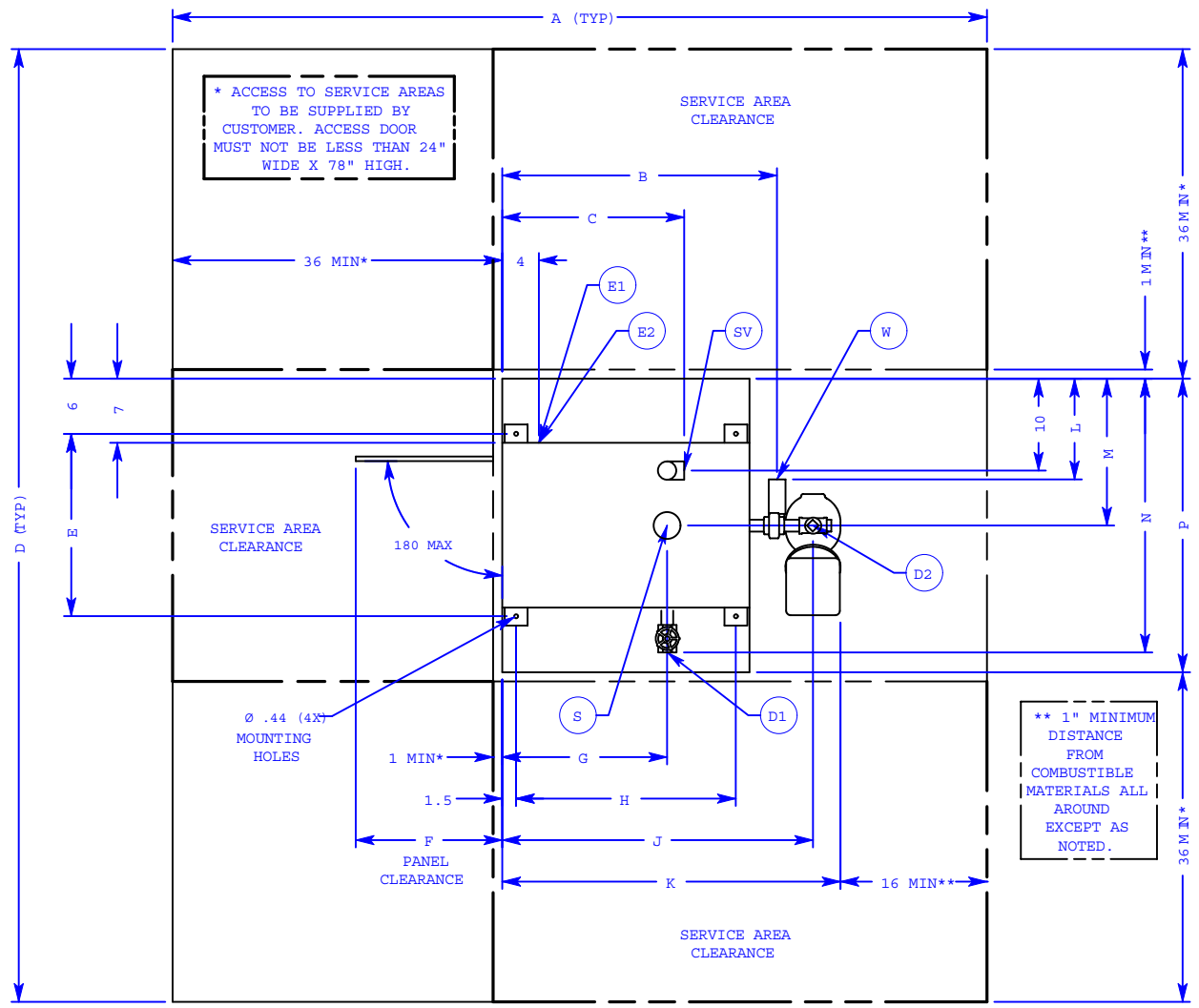
ELECTRICAL SUPPLY

Service	Model No.	Utility	Max. current	Wire Size	Conduit
E1 = Power Circuit	ES24	24 kW, 208V, 60 Hz, 3 Ph	67 Amps	4 GA 90°C CU	1" conduit [25]
		24 kW, 240V, 60 Hz, 3 Ph	58 Amps	4 GA 90°C CU	1" conduit [25]
		24 kW, 480V, 60 Hz, 3 Ph	29 Amps	10 GA 90°C CU	1/2" conduit [13]
	ES30	30 kW, 208V, 60 Hz, 3 Ph	84 Amps	3 GA 90°C CU	1-1/4" conduit [32]
		30 kW, 240V, 60 Hz, 3 Ph	73 Amps	4 GA 90°C CU	1" conduit [25]
		30 kW, 480V, 60 Hz, 3 Ph	37 Amps	8 GA 90°C CU	3/4" conduit [19]
	ES36	36 kW, 208V, 60 Hz, 3 Ph	100 Amps	1 GA 90°C CU	1-1/2" conduit [38]
		36 kW, 240V, 60 Hz, 3 Ph	87 Amps	2 GA 90°C CU	1-1/4" conduit [32]
		36 kW, 480V, 60 Hz, 3 Ph	44 Amps	6 GA 90°C CU	3/4" conduit [19]
	ES48	48 kW, 208V, 60 Hz, 3 Ph	134 Amps	00 GA 90°C CU	2" conduit [51]
		48 kW, 240V, 60 Hz, 3 Ph	116 Amps	0 GA 90°C CU	2" conduit [51]
		48 kW, 480V, 60 Hz, 3 Ph	58 Amps	4 GA 90°C CU	1" conduit [25]
	ES60	60 kW, 208V, 60 Hz, 3 Ph	167 Amps	000 GA 90°C CU	2" conduit [51]
		60 kW, 240V, 60 Hz, 3 Ph	145 Amps	00 GA 90°C CU	2" conduit [51]
		60 kW, 480V, 60 Hz, 3 Ph	73 Amps	4 GA 90°C CU	1" conduit [25]
ES72	72 kW, 208V, 60 Hz, 3 Ph	200 Amps	250 MCM 90°C CU	2-1/2" conduit [64]	
	72 kW, 240V, 60 Hz, 3 Ph	174 Amps	000 GA 90°C CU	2" conduit [51]	
	72 kW, 480V, 60 Hz, 3 Ph	87 Amps	2 GA 90°C CU	1-1/4" conduit [32]	
E2 = Control Circuit see note 5	ES24-72	120V, 60 Hz, 3 Ph	12 Amps	14 GA 90°C CU	1/2" conduit [13]

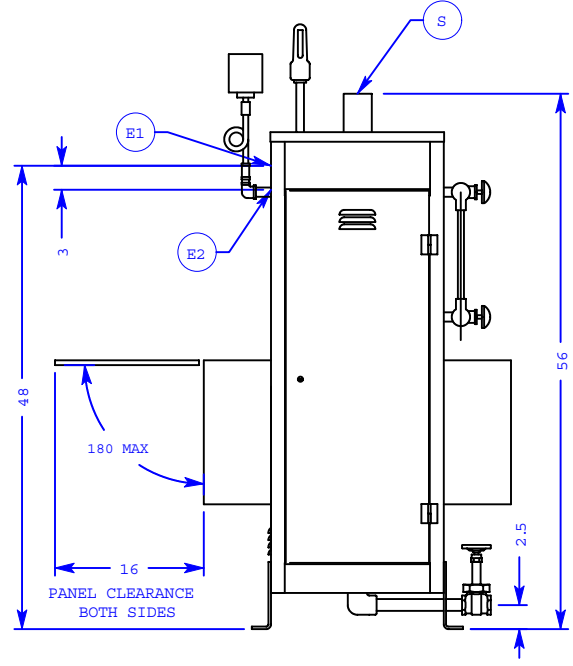
UNIT WEIGHTS AND MEASUREMENTS

Model No.	Weights		Measurements (Crated)		
	Crated	Uncrated	Length	Width	Height
ES24	320 lbs. [145 kg.]	265 lbs. [120 kg.]	31 in. [.79m]	38 in. [.97m]	52 in. [1.32m]
ES30	320 lbs. [145 kg.]	265 lbs. [120 kg.]	31 in. [.79m]	38 in. [.97m]	52 in. [1.32m]
ES36	320 lbs. [145 kg.]	265 lbs. [120 kg.]	31 in. [.79m]	38 in. [.97m]	52 in. [1.32m]
ES48	330 lbs. [150 kg.]	275 lbs. [125 kg.]	31 in. [.79m]	38 in. [.97m]	52 in. [1.32m]
ES60	360 lbs. [164 kg.]	300 lbs. [136 kg.]	31 in. [.79m]	38 in. [.97m]	52 in. [1.32m]
ES72	360 lbs. [164 kg.]	300 lbs. [136 kg.]	31 in. [.79m]	38 in. [.97m]	52 in. [1.32m]

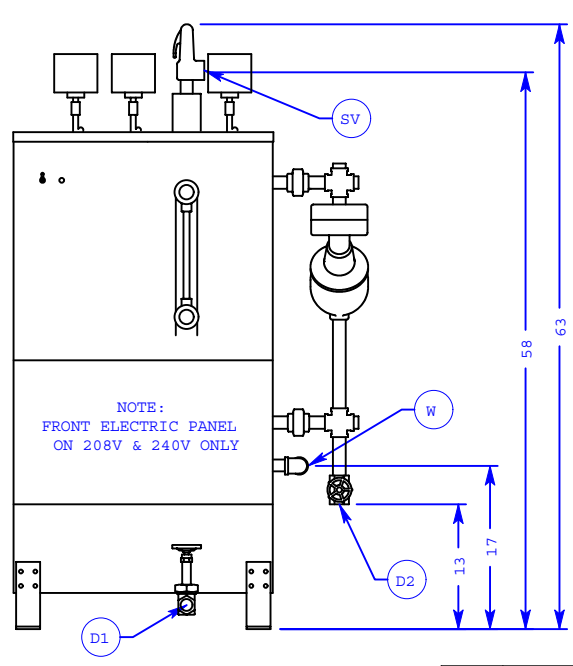
SYM	DATE	REVISION	AUTH
A	06-14-00	RELEASED	FE



PLAN VIEW



SIDE VIEW



FRONT VIEW

TOLERANCES (EXCEPT AS NOTED)		JOB	SCALE	DRAWN BY
DECIMAL	.154	GETN/GE/CASTLE	-	FE
FRACTIONAL	.005			CM
ANGULAR	.1			
DATE	06-14-00	ELECTRIC BOILER MODELS ES100-ES180 (208V, 240V, 480V)		
DRAWING NUMBER		ES100-180GC		

ELECTRIC BOILER
Model No. ES100-180 (208V, 240V, 480V)

DIMENSIONS

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P
ES100	87	28	19	103	18	13	17	22	32	35	10	15	28	31
ES135-ES180	89	30	20	105	20	15	18	24	34	37	11	16	30	33

SERVICE

Refer to National and all applicable local codes for specific installation requirements. All piping to be installed by a licensed plumber.

On Unit Connection	Pipe Size To Unit	Pressure Range Dynamic At Unit	Flow Rates			
			ES100	ES135	ES160	ES180
W = Water Inlet 3/4" [19] NPT female see note 1	1/2" [13] NPT	100 psig min. [7.0 kg/cm ² min.]	.204 gpm min. [.47 m ³ /Hr min.]	2.70 [.62]	3.20 [.73]	3.60 [.82]
S = Steam Outlet see note 2		90 psig max. [6.3 kg/cm ² max.]	308 lbs./Hr [140 kg/Hr]	407 [185]	482 [219]	542 [246]
ES100	1-1/2" [31] NPT male	1-1/2" [31] NPT				
ES135-ES180	2" [51] NPT male	2" [51] NPT				
D1 = Drain 1" [25] NPT male	1" [25] NPT	90 psig max. [6.3 kg/cm ² max.]	See note 3			
D2 = Drain 1" [25] NPT male	1" [25] NPT	90 psig max. [6.3 kg/cm ² max.]	See note 3			
SV = Safety Valve Vent 1-1/4" [32] NPT female	1-1/4" [32] NPT	100 psig [7.0 kg/cm ²]	See note 4			

ELECTRICAL SUPPLY

Service	Model No.	Utility	Max. current	Wire Size	Conduit
E1 = Power Circuit	ES100	102 kW, 208V, 60 Hz, 3 Ph	284 Amps	400 MCM 90°C CU	3" conduit [76]
		102 kW, 240V, 60 Hz, 3 Ph	246 Amps	350 MCM 90°C CU	3" conduit [76]
		102 kW, 480V, 60 Hz, 3 Ph	123 Amps	0 GA 90°C CU	2" conduit [51]
	ES135	135 kW, 208V, 60 Hz, 3 Ph	375 Amps	700 MCM 90°C CU	4" conduit [102]
		135 kW, 240V, 60 Hz, 3 Ph	325 Amps	500 MCM 90°C CU	3" conduit [76]
		135 kW, 480V, 60 Hz, 3 Ph	163 Amps	000 GA 90°C CU	2" conduit [51]
	ES160	160 kW, 208V, 60 Hz, 3 Ph	445 Amps	900 MCM 90°C CU	4" conduit [102]
		160 kW, 240V, 60 Hz, 3 Ph	385 Amps	700 MCM 90°C CU	4" conduit [102]
		160 kW, 480V, 60 Hz, 3 Ph	193 Amps	0000 GA 90°C CU	2" conduit [51]
	ES180	180 kW, 208V, 60 Hz, 3 Ph	500 Amps	1250 MCM 90°C CU	5" conduit [127]
		180 kW, 240V, 60 Hz, 3 Ph	434 Amps	900 MCM 90°C CU	4" conduit [102]
		180 kW, 480V, 60 Hz, 3 Ph	217 Amps	250 MCM 90°C CU	2-1/2" conduit [64]
E2 = Control Circuit see note 5	ES100-180	120V, 60 Hz, 1 Ph	12 Amps	14 GA 90°C CU	1/2" conduit [13]

UNIT WEIGHTS AND MEASUREMENTS

Model No.	Weights		Measurements (Crated)		
	Crated	Uncrated	Length	Width	Height
ES100	600 lbs. [273 kg.]	500 lbs. [227 kg.]	37 in. [.94 m]	43 in. [1.09 m]	67 in. [1.70 m]
ES135	625 lbs. [284 kg.]	545 lbs. [248 kg.]	37 in. [.94 m]	43 in. [1.09 m]	67 in. [1.70 m]
ES160	625 lbs. [284 kg.]	545 lbs. [248 kg.]	37 in. [.94 m]	43 in. [1.09 m]	67 in. [1.70 m]
ES180	625 lbs. [284 kg.]	545 lbs. [248 kg.]	37 in. [.94 m]	43 in. [1.09 m]	67 in. [1.70 m]

ELECTRIC BOILER
Model No. ES24-72 (208V, 240V, 480V)

Notes

- 1) Cold water:
 - a) Steam generator package must come with feedwater pump. Pressure at pump inlet to be 0 psig minimum.
 - b) The optional feedwater pump requires mechanical electrical and plumbing hook-up by customer. A separate electrical service to the water booster pump junction box is necessary.
 - c) If pump and boiler are plumbed within 30 feet (pipe length) a minimum of 2 check valves are required on boiler to avoid damage to pump.
 - d) Water quality information: For optimum results, the feed water supply should be tested prior to initial startup. If the mineral content exceeds the following recommended limits, various external treatment processes (water softener, etc.) may be used to correct the problem. Blow down the boiler at least daily to lower the concentration of impurities and maintain the pH level above 7.0.
 - e) Feedwater quality:

Hardness	0.5 to 5.0 grains/gallon (8-85 ppm)
Resistivity	Not to exceed 50 k ohms/cm
- 2) Steam Outlet:
 - a) For best performance, a 1/2" npt globe valve rated 100 psi minimum steam service should be plumbed as close as practicable to steam outlet pipe.
- 3) Drains:
 - a) It shall be the customer's responsibility to provide a proper drainage system in accordance with applicable local codes.
- 4) Safety Valve:
 - a) Caution must be exercised not to reduce the discharge capacity of the relief valve.
 - b) Check local codes for special requirements.
- 5) Electric:
 - a) It shall be the customer's responsibility to provide generator with control voltage E2.
 - b) An optional transformer is available for 240V/120V or 480V/120V.

ORDERING INFORMATION:

Model ES24 Electric Steam Boiler:	ES24100B3	24 kW 208V 3ph 100 psi
	ES24100C3	24 kW 240V 3ph 100 psi
	ES24100F3	24 kW 480V 3ph 100 psi
Model ES30 Electric Steam Boiler:	ES30100B3	30 kW 208V 3ph 100 psi
	ES30100C3	30 kW 240V 3ph 100 psi
	ES30100F3	30 kW 480V 3ph 100 psi
Model ES36 Electric Steam Boiler:	ES36100B3	36 kW 208V 3ph 100 psi
	ES36100C3	36 kW 240V 3ph 100 psi
	ES36100F3	36 kW 480V 3ph 100 psi
Model ES48 Electric Steam Boiler:	ES48100B3	48 kW 208V 3ph 100 psi
	ES48100C3	48 kW 240V 3ph 100 psi
	ES48100F3	48 kW 480V 3ph 100 psi
Model ES60 Electric Steam Boiler:	ES60100B3	60 kW 208V 3ph 100 psi
	ES60100C3	60 kW 240V 3ph 100 psi
	ES60100F3	60 kW 480V 3ph 100 psi
Model ES72 Electric Steam Boiler:	ES72100B3	72 kW 208V 3ph 100 psi
	ES72100C3	72 kW 240V 3ph 100 psi
	ES72100F3	72 kW 480V 3ph 100 psi
Options: Motor & pump:	ES38002A	1/3 hp 120V 1ph
Transformer:	ES99329C	1kVA 240V / 120V
	ES99329F	1kVA 480V / 120V
Automatic Blowdown System:	ES81600-2	
Auxiliary Low Water Cutoff:	ES81017MR	
Blowdown Separator:	BDT-ASME36	

ELECTRIC BOILER
Model No. ES100-180 (208V, 240V, 480V)

Notes

- 1) Cold water:
 - a) Steam generator package must come with feedwater pump. Pressure at pump inlet to be 0 psig minimum.
 - b) The optional feedwater pump requires mechanical, electrical and plumbing hook-up by customer. A separate electrical service to the water booster pump junction box is necessary.
 - c) If pump and boiler are plumbed within 30 feet (pipe length) a minimum of 2 check valves are required on boiler to avoid damage to pump.
 - d) Water quality information: For optimum results, the feed water supply should be tested prior to initial startup. If the mineral content exceeds the following recommended limits, various external treatment processes (water softener, etc.) may be used to correct the problem. Blow down the boiler at least daily to lower the concentration of impurities and maintain the pH level above 7.0.
 - e) Feedwater quality:

Hardness	0.5 to 5.0 grains/gallon (8-85 ppm)
Resistivity	Not to exceed 50 k ohms/cm
- 2) Steam Outlet:
 - a) For best performance, a 1" npt globe valve rated 100 psi minimum steam service should be plumbed as close as practicable to steam outlet pipe.
- 3) Drains:
 - a) It shall be the customer's responsibility to provide a proper drainage system in accordance with applicable local codes.
- 4) Safety Valve:
 - a) Caution must be exercised not to reduce the discharge capacity of the relief valve.
 - b) Check local codes for special requirements.
- 5) Electric:
 - a) It shall be the customer's responsibility to provide generator with control voltage E2.
 - b) An optional transformer is available for 240V/120V or 480V/120V.

ORDERING INFORMATION:

Model ES100 Electric Steam Boiler:	ES100100B3 ES100100C3 ES100100F3	102 kW 208V 3ph 100 psi 102 kW 240V 3ph 100 psi 102 kW 480V 3ph 100 psi
Model ES135 Electric Steam Boiler:	ES135100B3 ES135100C3 ES135100F3	135 kW 208V 3ph 100 psi 135 kW 240V 3ph 100 psi 135 kW 480V 3ph 100 psi
Model ES160 Electric Steam Boiler:	ES160100B3 ES160100C3 ES160100F3	160 kW 208V 3ph 100 psi 160 kW 240V 3ph 100 psi 160 kW 480V 3ph 100 psi
Model ES180 Electric Steam Boiler:	ES180100B3 ES180100C3 ES180100F3	180 kW 208V 3ph 100 psi 180 kW 240V 3ph 100 psi 180 kW 480V 3ph 100 psi
Options: Motor & pump:	ES38020A	1/2 hp 120V 1ph
Transformer:	ES99335C ES99335F	1-1/2 kVA 240V / 120V 1-1/2 kVA 480V / 120V
Automatic Blowdown System:	ES81600-3 ES81600-4	Autoblowdown for ES100 Autoblowdown for ES135-ES180
Auxiliary Low Water Cutoff:	ES81017MR	
Blowdown Separator:	BDT-ASME42	

SAFETY FEATURES

- Steam Safety Valve— Automatically opens to reduce pressure should excess steam cause pressure build-up.
- Steam Pressure Gauge— Allows visual observation of steam pressure over full range
- Manual Reset Pressure Control— Provides high limit pressure cut-out with manual reset.

STANDARD OPTIONAL EQUIPMENT

A complete complement of optional equipment and other Sussman steam boilers is described in Sussman Product Sheet OES. Options covered are water feed systems, condensate returns, aux. Low-water cut-off controls, progressive sequencers, automatic blowdown systems, blowdown separators and transformers.

