

## ICS Series:

ICS-20

20 HP

Vertical Tubeless Steam Boiler



Fulton's Classic ICS boiler has been a reliable choice for steam applications for more than 70 years. The ICS features a highly efficient 2-pass design, which uses a downward cyclonic flame. The high velocity flue gases travel over a cylindrical grid of heat convection fins, transferring additional heat evenly to the water in the vessel. This contributes to high efficiencies while still maintaining a durable pressure vessel design, making the ICS a dependable boiler for a variety of applications.

### STANDARD FEATURES:

- Vertical heat exchanger
- Thick wall construction
- Never needs re-tubing
- 150 PSIG maximum allowable working pressure
- Can be trimmed 15-150 PSIG
- Compact footprint
- Integral on/off burner
- Fuels available: natural gas, propane, #2 oil
- Full factory fire test and control programming
- Operating and high pressure limit switches
- Two (2) low water cut off probes,
  - (1) with auto reset,
  - (1) with manual reset
- NEMA 1 enclosure with locking electrical panel
- CSD-1/CSA gas train
- Emergency-stop contacts
- 5 year pressure vessel warranty expandable up to 10 years\*\*
- 1 year burner warranty
- Single phase feed pump motor starter (Single phase boilers only)

### OPTIONS:

- Stainless steel jacket
- Conductivity based surface blowdown
- Timer based bottom blowdown
- Control panel with non-fused disconnect
- High water overflow protection
- Reflex type sight glass
- Boiler alarm package
- Boiler gauge kit
- Remote E-stop
- MM-150 ALWCO
- MM-157 PWLCO and pump control
- MM-193-7B PWLCO modulating level control
- On/off motorized FW valve & 3-valve bypass
- On/off FW solenoid valve
- Differential pressure level control
- Modbus integration gateway
- BACnet integration gateway
- Low NOx emissions (<20ppm)
- Fully modulating 2:1 turndown burner
- Night setback/low pressure control
- FM compliant fuel train components
- High pressure gas train
- Up to 300 psig design pressure
- 3-phase supply power
- 3-phase pump motor starter

### PROJECT DETAILS:

Project Name	
Date Submitted	
Fulton Representative	

City, State (Province)	
Engineer of Record	
Contractor	

### LISTINGS & COMPLIANCE:

- ASME Section I
- UL approved to UL-795 (Gas) or UL-726 (#2 Oil)
- CSD-1 and CSA Controls and Fuel Train
- GAPS Compliant; Supersedes IRI

### TRIM KIT ITEMS:

- ASME Safety Relief Valve
- Pressure Gauge
- Installation, Operation and Maintenance Manual
- Gauge Glass and Protector Rods
- Touch-up Spray Paint

### NOTE:

Information provided in this document is based on standard boiler configurations only. Custom configurations may result in deviations.

\*\* With engineering system per Fulton Warranty Statement

**CAPACITIES: STANDARD NATURAL GAS: APPLIES TO ELEVATIONS UP TO 2,000 FT**

ICS		ICS-20
Rated Input at High Fire	<b>BTU/hr</b>	<b>807,000</b>
	<i>kWh</i>	234
Rated Output (At 0 psig operating pressure and 212F feedwater temperature)	<b>BTU/hr</b>	<b>670,000</b>
	Boiler HP	20
	lbs/hr	690
	kg/hr	313
	<i>kWh</i>	196

**CONNECTION SIZES:**

ICS		ICS-20
Steam Outlet Operating at >75 psig	<b>inches</b>	<b>1 1/2</b>
	<i>mm</i>	38
Steam Outlet Operating at <=75 psig	<b>inches</b>	<b>3</b>
	<i>mm</i>	76
Feedwater Inlet	<b>inches</b>	<b>1</b>
	<i>mm</i>	25
Bottom Blowdown	<b>inches</b>	<b>1 1/4</b>
	<i>mm</i>	32
High Water Protection	<b>inches</b>	<b>3/4</b>
	<i>mm</i>	19
Natural Gas Train Inlet	<b>inches</b>	<b>1 1/4</b>
	<i>mm</i>	32
Stack Connection	<b>inches</b>	<b>10</b>
	<i>mm</i>	254
Water Column Drain	<b>inches</b>	<b>1</b>
	<i>mm</i>	25
Surface Blowdown	<b>inches</b>	<b>3/4</b>
	<i>mm</i>	19
Sight Glass Drain	<b>inches</b>	<b>1/4</b>
	<i>mm</i>	6
Safety Valve Inlet x Outlet 15 psi trim	<b>inches</b>	<b>1 1/4 x 1 1/2</b>
	<i>mm</i>	32 x 38
Safety Valve Inlet x Outlet 150 psi trim	<b>inches</b>	<b>3/4 x 1</b>
	<i>mm</i>	19 x 25

**FUEL REQUIREMENTS: PRESSURE REQUIREMENTS AT RATED INPUT**

ICS		ICS-20
Fuel Usage at Rated Input (Natural Gas)*	<b>SCFH</b> <i>m<sup>3</sup>/hr</i>	<b>807</b> 23
Fuel Usage at Rated Input (Propane)**	<b>SCFH</b> <i>m<sup>3</sup>/hr</i>	<b>323</b> 9.1
Fuel Usage at Rated Input (#2 Oil)***	<b>GPH</b> <i>lph</i>	<b>6</b> 22.7
Maximum Gas Pressure Propane	<b>in W.C.</b> <i>kPa</i>	<b>13.8</b> 3.4
Minimum Gas Pressure Propane	<b>in W.C.</b> <i>kPa</i>	<b>11</b> 2.7
Maximum Gas Pressure Natural Gas	<b>in W.C.</b> <i>kPa</i>	<b>13.8</b> 3.4
Minimum Gas Pressure Natural Gas	<b>in W.C.</b> <i>kPa</i>	<b>7</b> 1.7

\*SCFH based on 1,000 BTU/ft<sup>3</sup>\*\*SCFH based on 2,500 BTU/ft<sup>3</sup>

\*\*\*GPH based on 140,000 BTU/gallon

**ELECTRICAL REQUIREMENTS GAS: APPLIES TO STANDARD BLOWER MOTOR AND CONTROL OPTION \* Does not include feed pump starter \***

ICS		ICS-20					
Electrical Supply	<b>Volts</b>	<b>120</b>	<b>240</b>	<b>208</b>	<b>240</b>	<b>480</b>	<b>575</b>
	Ø	1	1	3	3	3	3
	Hz	60	60	60	60	60	60
Short Circuit Current Rating	<b>Amps</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>
NEMA Rating		<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Full Load Amps (FLA)	<b>Amps</b>	<b>13.2</b>	<b>9.6</b>	<b>7.2</b>	<b>5.5</b>	<b>2.7</b>	<b>2.2</b>

**ELECTRICAL REQUIREMENTS OIL: APPLIES TO STANDARD BLOWER MOTOR AND CONTROL OPTION \* Does not include feed pump starter \***

ICS		ICS-20					
Electrical Supply	<b>Volts</b>	<b>120</b>	<b>240</b>	<b>208</b>	<b>240</b>	<b>480</b>	<b>575</b>
	Ø	1	1	3	3	3	3
	Hz	60	60	60	60	60	60
Short Circuit Current Rating	<b>Amps</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>
NEMA Rating		<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Full Load Amps (FLA)	<b>Amps</b>	<b>13.2</b>	<b>9.6</b>	<b>7.2</b>	<b>5.5</b>	<b>2.7</b>	<b>2.2</b>

**WEIGHTS AND VOLUMES:**

ICS		ICS-20
Dry Weight	<b>lbs</b>	<b>3,750</b>
	<i>kg</i>	<i>1,701</i>
Operating Weight at Normal Working Level	<b>lbs</b>	<b>4,395</b>
	<i>kg</i>	<i>1,994</i>
Water Volume at Normal Working Level	<b>gallons</b>	<b>77</b>
	<i>liters</i>	<i>292</i>

**VENTING REQUIREMENTS:**

ICS		ICS-20
Typical Combustion Air Intake Flow Rate	<b>SCFM</b>	<b>158</b>
	<i>m<sup>3</sup>/hr</i>	<i>269</i>
Flue Gas Exhaust Flow Rate	<b>SCFM</b>	<b>171</b>
	<i>m<sup>3</sup>/hr</i>	<i>291</i>
Minimum Allowable Draft Pressure	<b>in W.C.</b>	<b>-0.04</b>
	<i>kPa</i>	<i>-0.01</i>
Maximum Allowable Draft Pressure	<b>in W.C.</b>	<b>-0.02</b>
	<i>kPa</i>	<i>-0.005</i>

**MINIMUM CLEARANCES: LOCAL CODES MAY SUPERSEDE FULTON REQUIREMENTS**

ICS		ICS-20
Side Clearance from Boiler Jacket:	<b>in</b>	<b>24</b>
	<i>mm</i>	<i>609</i>
Total Installed Height Required for Burner Removal:	<b>in</b>	<b>96</b>
	<i>mm</i>	<i>2,438</i>

**SOUND DATA: MEASUREMENTS TAKEN FROM FIVE FOOT FROM THE FRONT OF THE BOILER**

ICS		ICS-20
Sound Level at High Fire	<b>dBa</b>	<b>71</b>

**DIMENSIONS:**

Refer to the Product Data Submittal Drawing for dimensions.