

## Hot Water Boilers

McDonnell & Miller Low Water cut-offs are specially designed to protect hot water boilers from the hazards of a low water condition. In operation they will interrupt the electrical current to the firing device, if the water in the system drops below the boiler manufacturer's minimum safe water level.

Our low water cut-offs also provide an additional circuit for a low water alarm, should you desire to install one, for additional protection.

### How to Select Low Water Cut-Offs for Hot Water Boilers

Boiler pressure and the method of mounting are the primary factors to consider when selecting a low water cut-off.

Maximum Boiler Pressure psi (kg/cm <sup>2</sup> )	Method of Installation		Product Series	Size NPT	Blow Down Valve	
	Directly into Boiler Tappings OR on the Boiler Supply Riser*	To Piping Above the Boiler with 1" (25mm) Equalizing Piping			Required	Provided with Low Water Cut-Off
50 (3.5)	X		RB-24	3/4	No	N/A
		X	63	1	Yes	No
		X	64	1	Yes	No
	X		64-A	1/2	Yes	Yes
	X		764	2 1/2	Yes	No
160 (11)	X		850	3/4	No	N/A
	X		RB-120	3/4	No	N/A
	X		RB-122	3/4	No	N/A
160 - 250 (11-18)	X		750/750P	3/4 - 1	No	N/A

\* Use the tapping designated by the boiler manufacturer for low water cut-off installation.

## Steam Boilers

McDonnell & Miller Low Water Cut-offs are specially designed to protect steam boilers from the hazards of a low water condition. In operation they will interrupt the electrical current to the firing device, if the water in the system drops below the boiler manufacturers' minimum safe water level.

Our low water cut-offs also provide an additional circuit for a water feeder or a low water alarm, should you desire to install one, for additional protection.

We recommend that secondary (redundant) Low Water Cut-Off controls be installed on all steam boilers with heat input greater than 400,000 BTU/hour or operating above 15 psi of steam pressure. At least two controls should be connected in series with the burner control circuit to provide safety redundancy protection should the boiler experience a low water condition. Moreover, at each annual outage, the low water cut-offs should be dismantled, inspected, cleaned, and checked for proper calibration and performance.

### How to Select Low Water Cut-Offs for Steam Boilers

Boiler pressure and the method of installation are the primary factors to consider when selecting a low water cut-off.

Maximum Boiler Pressure psi (kg/cm <sup>2</sup> )	Method of Installation		Product Series	Size NPT	Blow Down Valve	
	Directly into Boiler Tappings*	Connect to the Boiler with 1" Equalizing Piping			Required	Provided with Low Water Cut-Off
15 (1)	X		PS-800	3/4	No	N/A
	X		750/P	3/4	No	N/A
20 (1.4)		X	61	1	Yes	No
	X		67	1/2	Yes	Yes
	X		767	2 1/2	Yes	Yes
	X		69	2 1/2	No	N/A
	X		70	2 1/2	Yes	No
	X		70-B	2 1/2	Yes	Yes
50 (3.5)		X	63	1	Yes	No
		X	64	1	Yes	No
	X		64-A	1/2	Yes	Yes
	X		764	2 1/2	Yes	No
150 (10.5)		X	93/193	1	Yes	No
		X	150/150S/150E	1	Yes	No
		X	157/157S/157E	1	Yes	No
250 (18)		1 1/4	94/194	1 1/4	Yes	No
		X	750B-C3/C4	1	Yes	No

\* Use the tapping designated by the boiler manufacturer for low water cut-off installation.

## How to Select Controls

### STEAM BOILERS

**Steam Heating Boilers** are classified as boilers in closed heating systems where all condensate is returned to the boiler. Best recommendation for all automatically fired boilers is a feeder cut-off combination. It adds water as needed to maintain a safe operating level, and stands by to interrupt circuit to burner if water level drops into emergency zone.

**Steam Process Boilers** are classified as boilers in systems where not all the condensate is returned, and some make-up water is needed. A separate feeder and separate cut-off are recommended, so operating levels can be set for the wider differential required in such service.

Selection of the correct feeder cut-off combination, or feeder depends upon:

1. Maximum boiler pressure.
2. Differential between water supply pressure and the pressure setting of the steam safety valve.

3. Boiler size

### HOT WATER BOILERS

Best recommendation for all automatically fired boilers is a feeder cut-off combination. It adds water if needed to match the discharge capacity of the relief valve, and stands by to interrupt circuit to burner if water level drops into emergency zone.

Selection of the correct feeder cut-off combination, or feeder depends upon:

1. Maximum boiler pressure.
2. Differential between water supply pressure and the pressure setting of the safety relief valve.

3. Boiler size

Boiler Rating			
BTU	HP	EDR	Cond. Lb./Hr
33,475	1	140	34.5
66,950	2	280	69
167,375	5	700	173
251,063	7.5	1,050	259
334,750	10	1,400	345
418,438	12.5	1,750	431
502,125	15	2,100	518
585,813	17.5	2,450	604
669,500	20	2,800	690
836,875	25	3,500	863
1,004,250	30	4,200	1,035
1,171,625	35	4,900	1,208
1,339,000	40	5,600	1,380
1,506,375	45	6,300	1,553
1,673,750	50	7,000	1,725

## Conversion Factors

$$\text{Boiler Horsepower (BHP)} = \frac{\text{EDR}}{139}$$

$$\text{Gallons of Water} = \frac{\text{Lbs. of Water}}{8.33}$$

$$\text{BTUH} = \text{EDR} \times 240$$

$$\text{EDR} = \frac{\text{BTUH}}{240}$$

$$\text{BTUH} = \text{BHP} \times 33,479$$

## Boiler Steaming Rate (Gallons Per Minute)

$$\text{GPM} = \frac{\text{EDR}}{2000}$$

$$\text{GPM} = (\text{BHP}) \times 0.069$$

$$\text{GPM} = \frac{\text{BTU}}{480,000}$$

$$\text{GPM} = \text{EDR} \times 0.000496$$

$$\text{Pounds of condensate per hour} = \frac{\text{EDR}}{4}$$

## Water Feeders and Combination Water Feeders/Low Water Cut-Offs

McDonnell & Miller Boiler Water Feeders and Feeder Cut-Off Combinations are used to provide automatic operation, and to safeguard steam and hot water boilers against the hazards of a low water condition.

A feeder cut-off combination mechanically adds water as needed to maintain the required minimum water level, and electrically stops the firing device in case of an emergency.

## How to Select Water Feeders (continued)

### Steam Boilers

Series	Characteristics	Maximum Boiler Pressure psi (kg/cm <sup>2</sup> )	Boiler Size (Mfr. Gross Rating Sq. Ft. of EDR)						
			*Differential Pressure psi (kg/cm <sup>2</sup> )						
			10 (.7)	20 (1.4)	30 (2.1)	40 (2.8)	50 (3.5)	60 (4.2)	70 (4.9)
Uni-Match®	For Automatic Fired Heating Boilers	15 (1.0)	All Boilers up to 2,000 sq. ft.						
101A	For Automatic Fired Heating Boilers	25 (1.8)	All Boilers up to 5,000 sq. ft.						
47	For Heating or Process Boilers	25 (1.8)	All Boilers up to 5,000 sq. ft.						
47-2	For Automatic Fired Heating Boilers	25 (1.8)	All Boilers up to 5,000 sq. ft.						
247	For Heating or Process Boilers	30 (2.1)	All Boilers up to 5,000 sq. ft.						
247-2	For Automatic Fired Heating Boilers	30 (2.1)	All Boilers up to 5,000 sq. ft.						
51	For Heating or Process Boilers	35 (2.5)	8,600	12,000	15,000	17,600	20,000	21,800	23,400
51-2	For Automatic Fired Heating Boilers	35 (2.5)	8,600	12,000	15,000	17,600	20,000	21,800	23,400
51S	For Heating or Process Boilers	35 (2.5)	10,500	17,500	22,400	26,500	30,000	32,600	35,000
51S-2	For Automatic Fired Heating Boilers	35 (2.5)	10,500	17,500	22,400	26,500	30,000	32,600	35,000
53	For Heating or Process Boilers	75 (5.3)	8,600	11,600	14,600	17,000	18,800	20,600	22,100
53-2	For Automatic Fired Heating Boilers	75 (5.3)	8,600	11,600	14,600	17,000	18,800	20,600	22,100

\*Differential pressure should be based on water supply pressure at boiler, minus pressure setting of steam safety valve

# Low Water Cut-Offs – Electronic For Hot Water and Steam Boilers

## Series 750



### Low Water Cut-Offs with Remote Sensor

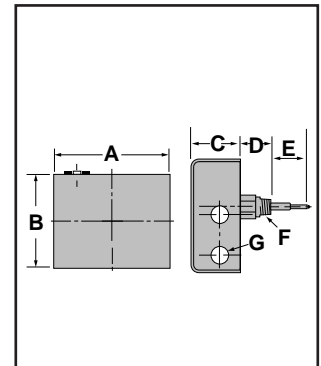
- For commercial or industrial applications
- Primary or secondary control on hot water boilers
- Secondary control (manual reset models only) on steam boilers
- Manual reset models meet the requirements of **ASME Standard CSD-1**. If the control is in a low water condition when there is an interruption of power, the control will remain in a low water condition when power is restored. The reset button will need to be pressed when the water level is restored to a level above the probe to allow the burner to fire.
- Green LED power indicating light
- Red LED low water indicating light
- Test switch
- 20,000 ohms sensitivity
- Knockouts on rear of chassis for direct mounting
- Options:
  - Manual reset button
  - 750P-MT model includes PA-800 probe
  - 750P-MT-U model includes PA-800-U probe
- NEMA 1 enclosure
- Maximum ambient temperature 120°F (49°C)



### Ordering Information

(Remote sensor must be ordered separately (see page 82-85))

Model Number	Part Number	Description	Weight lbs. (kg)
750-T-120	176206	Auto reset	2 (.9)
750-MT-120	176207	Manual reset	2 (.9)
750P-MT-120	176234	Manual reset and PA-800 probe	2.5 (.9)
750P-MT-U-120	176214	Manual reset and PA-800-U probe	2.5 (.9)



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.2	43.2	125 VA at 120 or 240 VAC 50 or 60 Hz
240 VAC	3.6	21.6	

### Dimensions, in. (mm)

A	B	C	D		E		F NPT	G
			Std.	U	Std.	U		
6 <sup>3</sup> / <sub>16</sub> (162)	5 <sup>1</sup> / <sub>8</sub> (130)	2 <sup>9</sup> / <sub>16</sub> (65)	1 <sup>9</sup> / <sub>16</sub> (40)	3 <sup>1</sup> / <sub>16</sub> (78)	2 <sup>1</sup> / <sub>8</sub> (54)	1 <sup>9</sup> / <sub>16</sub> (40)	<sup>3</sup> / <sub>4</sub>	<sup>3</sup> / <sub>4</sub> (20)

# Low Water Cut-Offs – Electronic For Hot Water and Steam Boilers

**NEW**

## Series 750B Conductance Actuated Level Controls



- For commercial or industrial applications
- Low water cut-off, pump on, pump off, or high level alarm
- 24 VAC and 120 VAC models
- Panel and plug-in modular mount electronics
  - LWCO
  - Feed Water/Pump Control
  - Dual and Tri-Functions
- Automatic or manual reset option on each board
- Maximum circuit board ambient temperature 150°F (51°C)
- 26,000 ohm sensitivity
- Manual reset models meet the requirements of **ASME Standard CSD-1**. If the control is in a low water condition when there is an interruption of power, the control will remain in a low water condition when power is restored. The reset button will need to be pressed when the water level is restored to a level above the probe to allow the burner to fire.

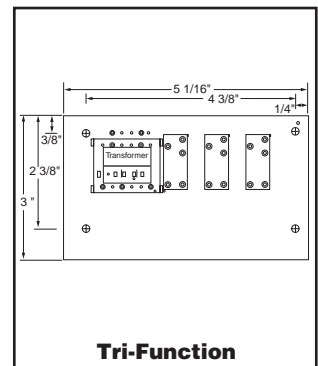
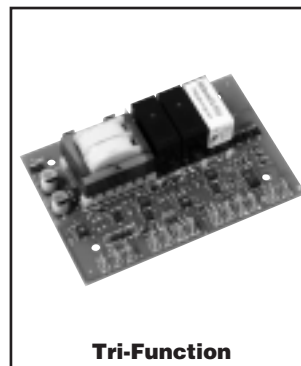
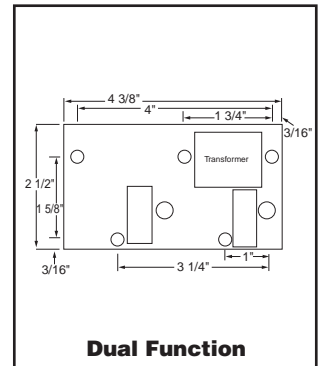
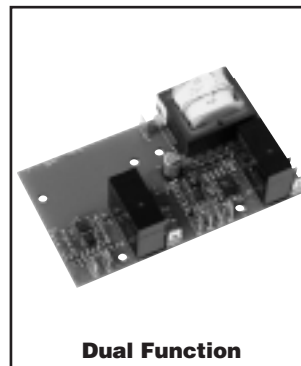
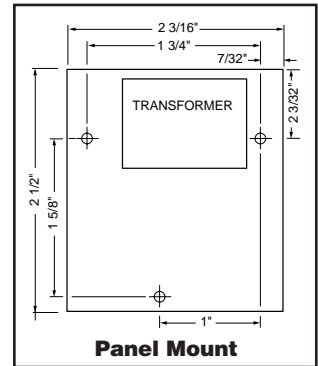
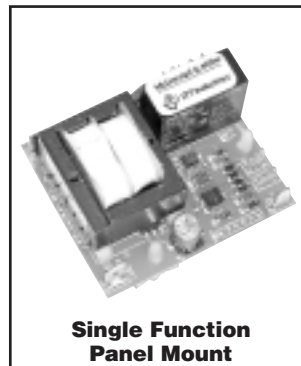
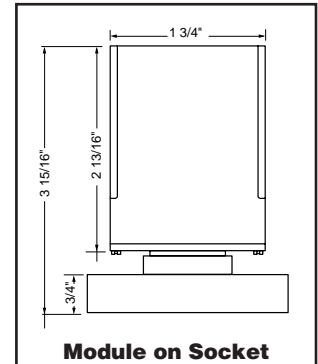
### Ordering Information

1. Select and order panel mount or plug-in module 750B control unit.
  2. Select and order appropriate chamber based on the number of levels to be sensed.
- (Order sensor chamber and probes separately (see page 82-85))

Model Number	Part Number	Description	Weight lbs. (kg)
<b>Panel Mount</b>			
750B-L-24-C-03	176300	Low water cut-off	0.5 (0.2)
750B-L-120-C-03	176302	Low water cut-off	0.5 (0.2)
750B-P-120-CI	176304	Pump controller	0.5 (0.2)
750B-DLP-120-CI-03	176314	Dual LWCO & Pump controller	0.6 (0.3)
750B-LP-120-CI-03	176312	LWCO & Pump controller	0.6 (0.3)
<b>Plug-In Module</b>			
750BM-L-24-C-03	176305	Low water cut-off	0.6 (0.3)
750BM-L-120-C-03	176307	Low water cut-off	0.6 (0.3)
750BM-P-120-CI	176309	Pump controller	0.6 (0.3)
<b>Plug-In Module Sockets</b>			
750BM-8PS	176310	Eight pin socket	0.3 (0.1)
750BM-11PS	176311	Eleven pin socket	0.3 (0.1)
Adaptor-750	176320	PCB adaptor plate kit	0.3 (0.1)

### Electrical Ratings

Model	Voltage	Switch Contact Ratings	
		Full Load	Locked Rotor
24 VAC	24 VAC	—	—
120 VAC	120 VAC	7.2	43.2
	240 VAC	3.75	21.6



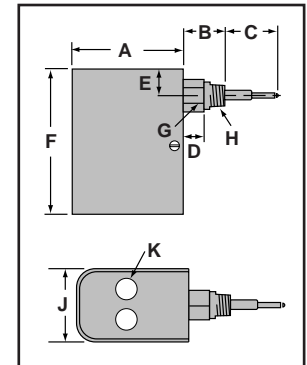
BOILER CONTROLS

## Low Water Cut-Offs – Electronic For Steam Boilers

**New and Improved Series PS-800 Low Water Cut-Offs**



- For residential and commercial applications
- Electronic operation
- New Features:**
  - User-friendly diagnostics
    - Red low water and shorted probe LED
    - Green power and test LED
  - Higher probe sensitivity: 7,000 ohms
  - No lock out with loss of power if probe is in water
  - Delay on Make (DOM) feature (15 seconds)
  - Delay on Break (DOB) feature (10 seconds)
  - No blow down of control required when mounted directly into boiler tapings
  - Test button standard on all models
  - Options available include
    - Manual reset
    - Extended barrel, remote and short probe models
    - 120 volt and 24 volt models (24 volt models meet ANSI specification Z21.13a)
  - Power consumption 1.7 VA
  - Provisions to add alarm or automatic water feeder
  - Maximum ambient temperature 120°F (49°C)
  - Maximum steam pressure 15 psi (1 kg/cm<sup>2</sup>)
  - Maximum water temperature 250°F (121°C)



### Electrical Ratings

Model	Voltage	Motor Switch Rating (Amperes)		Pilot Duty
		Full Load	Locked Rotor	
24 VAC	24 VAC	—	—	50 VA at 24 VAC
120 VAC	120 VAC	7.5	43.2	125 VA at 120 or 240 VAC 50 or 60 Hz
	240 VAC	3.75	21.6	

### Dimensions, in. (mm)

A	B		C				D	E	F	G	H		J	K
	All	U	Std	SP	RX2	U					All	RX		
4¼ (108)	1⅞ (40)	3⅞ (78)	2⅞ (54)	1⅜ (35)	2⅞ (54)	1⅞ (40)	¾ (20)	1⅜ (21)	5⅜ (148)	1⅜ (35)	¾ NPT	½ NPT	2⅞ (73)	⅞ (22)

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
PS-801-120	153875	Low water cut-off 120V	2.7 (1.2)
PS-801-M-120	153880	PS-801-120 w/manual reset	2.7 (1.2)
PS-801-U-120	153876	PS-801-120 w/ext. barrel	2.7 (1.2)
PS-801-M-U-120	153925	PS-801-120 w/ext. barrel & manual reset	2.7 (1.2)
PS-802-24	153917	Low water cut-off 24V	2.7 (1.2)
PS-802-M-24	153913	PS-802-24 w/manual reset	2.7 (1.2)
PS-802-U-24	153916	PS-802-24 w/ext. barrel	2.7 (1.2)
PS-802-M-U-24	153924	PS-802-24 w/ext. barrel & manual reset	2.7 (1.2)
PS-802-RX2-24	153914	PS-802-24 w/remote sensor	2.7 (1.2)

### CAUTION

**Do not use “manual reset” models with electric automatic water feeders. Failure to follow this caution can cause flooding and property damage.**

# Low Water Cut-Offs – Electronic For Hot Water Boilers

**New and Improved**

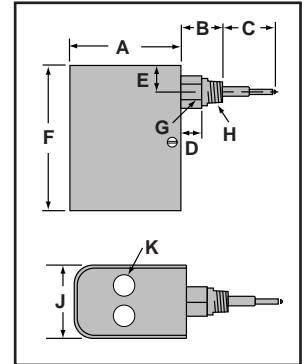
## Series PS-850 Low Water Cut-Offs



- For residential, commercial and industrial applications
- Electronic operation

**New Features:**

- User-friendly diagnostics
  - Red low water and shorted probe LED
  - Green power and test LED
- Higher probe sensitivity: 7,000 ohms
- No lock out with loss of power if probe is in water
- No blow down of control required when mounted directly into boiler tappings
- Test button standard on all models
- Options available include
  - Manual reset
  - Extended barrel, remote and short probe models
  - 120 volt and 24 volt models (24 volt models meet ANSI specification Z21.13a)
- Power consumption 1.7 VA
- Provisions to add alarm
- Maximum ambient temperature 120°F (49°C)
- Maximum water pressure 160 psi (11.2 kg/cm<sup>2</sup>)
- Maximum water temperature 250°F (121°C)



### Electrical Ratings

Model	Voltage	Switch Rating (Amperes)		Pilot Duty
		Full Load	Locked Rotor	
24 VAC	24 VAC	—	—	50 VA at 24 VAC
120 VAC	120 VAC	7.5	43.2	125 VA at 120 or 240 VAC 50 or 60 Hz
	240 VAC	3.75	21.6	

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
PS-851-120	153895	Low water cut-off 120V	2.7 (1.2)
PS-851-U-120	153887	PS-851-120 w/extended barrel	2.7 (1.2)
PS-851-M-120	153896	PS-851-120 w/manual reset	2.7 (1.2)
PS-851-M-U-120	153884	PS-851-120 w/extended barrel & manual reset	2.7 (1.2)
PS-851-RX2-120	158421	PS-851-120 w/remote probe & manual reset	2.7 (1.2)
PS-851-M-RX2-120	153901	PS-851-120 w/remote probe & manual reset	2.7 (1.2)
PS-851-SP-120	153920	PS-851-120 w/short probe & manual reset	2.7 (1.2)
PS-851-SP-M-120	153921	PS-851-120 w/short probe & manual reset	2.7 (1.2)
PS-852-24	153919	Low water cut-off 24V	2.7 (1.2)
PS-852-M-24	153918	PS-852-24 w/manual reset	2.7 (1.2)
PS-852-SP-24	153922	PS-852-24 w/short probe	2.7 (1.2)
PS-852-SP-M-24	153923	PS-852-24 w/short probe & manual reset	2.7 (1.2)

### Dimensions, in. (mm)

A	B		C				D	E	F	G	H		J	K
	All	U	Std	SP	RX2	U					All	RX		
4¼ (108)	1⅞ (40)	3⅞ (78)	2⅝ (54)	1⅞ (35)	2⅞ (54)	1⅞ (40)	¾ (20)	1⅜ (21)	5⅞ (148)	1⅞ (35)	¾ (20)	½ (25)	2⅞ (73)	⅞ (22)



### CAUTION

Do not use “manual reset” models with electric automatic water feeders. Failure to follow this caution can cause flooding and property damage.



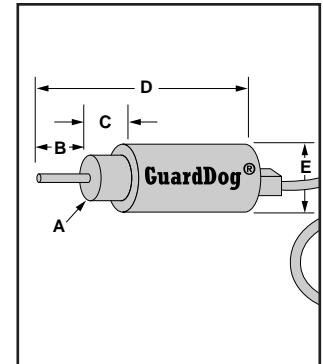
## Low Water Cut-Offs – Electronic For Hot Water Boilers

### RB-24



#### Low Water Cut-Offs

- For residential applications
- Compact size
- Easy to install and wire
- Automatic reset feature resumes operation after a power outage when water is on probe
- Green power on indicating LED
- Red low water indicating LED
- Solid state operation
- 15,000 ohms probe sensitivity
- Maximum ambient temperature 120°F (49°C)
- Maximum water temperature 250°F (121°C)
- Maximum water pressure 50 psi (3.5 kg/cm<sup>2</sup>)
- 3 ft. harness cable included



### Electrical Ratings

Voltage	Power Consumption	Load Switching
24 VAC	2.5 VA	2 A at 24 VAC

Note:  
A 15 mA minimum current draw is required.

### Dimensions, in. (mm)

A	B	C	D	E
NPT				
3/4	3/4 (19)	3/4 (19)	3 (76)	1 3/4 (19)

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
RB-24	144685	Residential low water cut-off	.7 (.32)

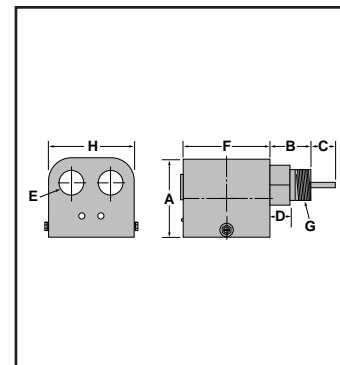
## Low Water Cut-Offs – Electronic For Hot Water Boilers

### RB-122



#### Low Water Cut-Offs

- For residential and (where codes allow) commercial applications
- Electronic operation
- Easy to install and wire
- Red low water indicating LED
- Green power indicating LED
- Automatic reset
- No blow down required
- 15,000 ohms probe sensitivity
- Maximum ambient temperature 120°F (49°C)
- Maximum water temperature 250°F (121°C)
- Maximum water pressure 160 psi (11.2 kg/cm<sup>2</sup>)



#### Electrical Ratings

Voltage	Power Consumption	Load Switching
120 VAC	15 VA	5.8 A at 120 VAC

#### Dimensions, in. (mm)

A	B	C	D	E	F	G NPT	H
2 <sup>3</sup> / <sub>4</sub> (70)	1 <sup>5</sup> / <sub>8</sub> (51)	1 <sup>3</sup> / <sub>8</sub> (35)	3/4 (20)	7/8 (22)	3 <sup>7</sup> / <sub>16</sub> (87)	3/4	3 <sup>3</sup> / <sub>16</sub> (81)

#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
RB-122	144676	Low water cut-off	1.7 (.78)

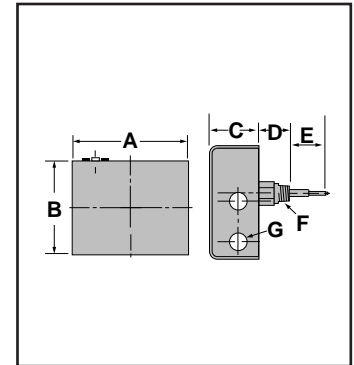
# Low Water Cut-Offs – Electronic For Hot Water Boilers

## RB-120



### Low Water Cut-Offs

- For residential and (where codes allow) commercial applications
- Electro-mechanical operation
- Automatic reset feature resumes operation after a power outage when water is on probe
- No blow down required
- 6,000 ohms probe sensitivity
- Maximum ambient temperature 120°F (49°C)
- Maximum water temperature 250°F (121°C)
- Maximum water pressure 160 psi (11.2 kg/cm<sup>2</sup>)



### Electrical Ratings

Voltage	Power Consumption	Load Switching
120 VAC	15 VA	5.8 A at 120 VAC

### Dimensions, in. (mm)

A	B	C	D	E	F	G NPT
6 <sup>3</sup> / <sub>8</sub> (162)	5 <sup>1</sup> / <sub>8</sub> (130)	2 <sup>9</sup> / <sub>16</sub> (65)	1 <sup>5</sup> / <sub>8</sub> (41)	1 <sup>3</sup> / <sub>8</sub> (35)	3/4 (20)	7/8

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
RB-120	144675	Low water cut-off	3.8 (1.7)

BOILER CONTROLS

# Low Water Cut-Offs – Electronic Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

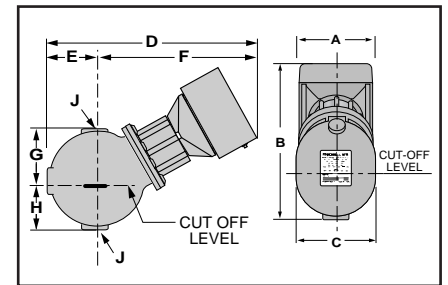
**Series 150E** NEW



- Primary and secondary low water fuel cut-off protection and pump control for commercial and industrial steam boilers
- Motorized valve controller, low water cut-off, high water cut-off, and alarm actuators for boilers, vessels and tanks
- Set points and differentials remain constant throughout pressure range
- Diagnostic features incorporated in the control include:
  - High ambient temperature protection
  - Internal LEDs that indicate water position and condition
  - External LEDs that indicate control activity
- Replacement head assemblies available for Model 150 and 150S Series upgrade
- Control unit can be mounted remotely from probes
- Adjustable 60-second burner-off time delays
- Adjustable 3/4" or 1-3/16" pump differentials
- 1 HP burner and pump relays
- NEMA 1 enclosure
- Maximum ambient temperature 135°F (57°C)
- Maximum operating pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum operating temperature 366°F (185°C) at probes
- Manual reset models meet the requirements of **ASME Standard CSD-1**. If the control is in a low water condition when there is an interruption of power, the control will remain in a low water condition when power is restored. The reset button will need to be pressed when the water level is restored to a level above the probe to allow the burner to fire.



**Series 150E**



### Series 150E Dimensions, in. (mm)

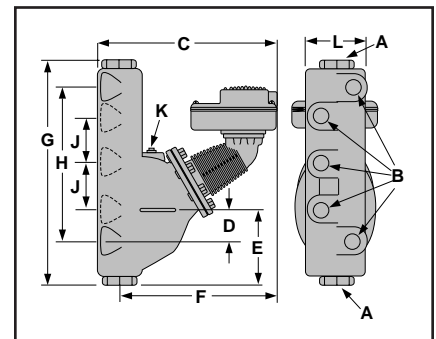
A	B	C	D	E
6 <sup>11</sup> / <sub>16</sub> (169)	11 <sup>5</sup> / <sub>16</sub> (286)	6 (152)	14 <sup>3</sup> / <sub>16</sub> (359)	3 <sup>5</sup> / <sub>16</sub> (84)
F	G	H	J	NPT
10 <sup>7</sup> / <sub>8</sub> (275)	4 <sup>1</sup> / <sub>8</sub> (105)	3 <sup>7</sup> / <sub>16</sub> (87)	1	

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg.)
150E	171600	Combination low water cut-off/pump controller	22.9 (10.4)
150E-M	171610	150E w/manual reset	22.9 (10.4)
157E	171620	150E w/water column	36.9 (16.7)
157E-M	171630	157E w/manual reset	36.9 (16.7)



**Series 157E**



### Series 157E Dimensions, in. (mm)

A	B	C	D	E	
NPT	NPT				
1	1/2	14 <sup>5</sup> / <sub>16</sub> (362)	2 <sup>5</sup> / <sub>16</sub> (59)	4 <sup>15</sup> / <sub>16</sub> (125)	
F	G	H	J	K	L
				NPT	
12 <sup>5</sup> / <sub>8</sub> (319)	16 (406)	11 <sup>1</sup> / <sub>2</sub> (292)	3 <sup>1</sup> / <sub>2</sub> (89)	3/4	5 <sup>7</sup> / <sub>8</sub> (149)

### Electrical Rating and Switch Ratings

Supply Voltage	Probe Voltage	Full load (Amps) NO (NC), (VAC)	Locked Rotor (Amps) NO (NC), (VAC)	Pilot Duty (VA) NO (NC), (VAC)	Motor (HP) NO (NC), (VAC)
120 VAC	5 VAC	16 (5.8), 120	96 (34.8), 120	470 (290), 120	1 (1/4), 120
50/60Hz	Maximum	8 (4.9), 240	48 (17.4), 240	470 (290), 240	2 (1/2), 240

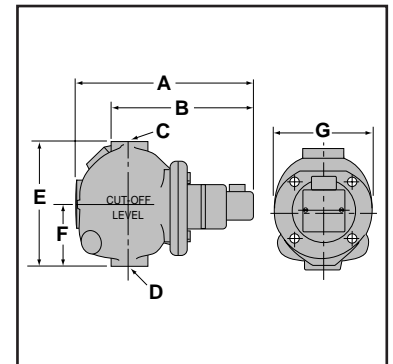
# Low Water Cut-Offs – Mechanical For Steam Boilers

## Series 61

### Low Water Cut-Offs



- For residential and commercial low pressure steam boiler applications
- For boilers of any steaming capacity
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and alarm or electric water feeder
- Packless bellows
- 1" NPT equalizing pipes and blow down valve required
- Maximum steam pressure 20 psi (1.4 kg/cm<sup>2</sup>)



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes) 120 VDC .3 Amp, 240 VDC .15 Amp		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

### Dimensions, in. (mm)

A	B	C NPT	D NPT	E	F	G
9 <sup>15</sup> / <sub>16</sub> (252)	7 <sup>7</sup> / <sub>16</sub> (189)	1	1	6 <sup>1</sup> / <sub>2</sub> (165)	3 <sup>1</sup> / <sub>8</sub> (79)	5 <sup>1</sup> / <sub>8</sub> (130)

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
61	140100	Low water cut-off	13.5 (6.1)
61-J	140200	61 w/BSPT threads	15.0 (6.8)

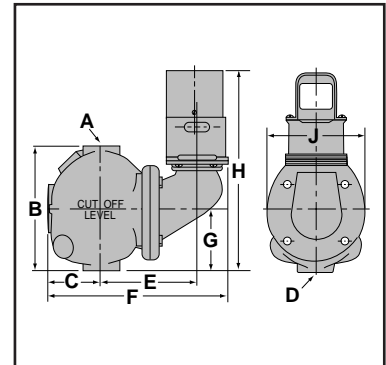
## Low Water Cut-Offs – Mechanical For Steam and Hot Water Boilers

### Series 63



#### Low Water Cut-Offs

- For residential, commercial, and industrial applications
- Heavy duty
- Includes No. 2 switch
- Optional manual reset available
- Maximum boiler pressure 50 psi (3.5 kg/cm<sup>2</sup>)
- Use with TC-4 on hot water systems



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes) 120 VDC .5 Amp		Pilot Duty 125 VA at 120 or 240 VAC 60 Hz
	Full Load	Locked Rotor	
120 VAC	10.2	61.2	
240 VAC	5.1	30.6	

### Dimensions, in. (mm)

A NPT	B	C	D NPT	E	F	G	H	J
1	6½ (165)	2 <sup>9</sup> / <sub>16</sub> (65)	1	5 <sup>5</sup> / <sub>32</sub> (131)	9 <sup>3</sup> / <sub>8</sub> (238)	3 <sup>1</sup> / <sub>8</sub> (79)	10½ (267)	5 <sup>1</sup> / <sub>8</sub> (130)

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
63	142400	Low water cut-off	13.5 (6.1)
63-B	142700	63 w/ float block	15.0 (6.8)
63-BM	143300	63 w/float block & manual reset	15.0 (6.8)
63-E	142500	63 w/BSPT threads	14.0 (6.4)
63-EM	142800	63-E w/manual reset	14.0 (6.4)
63-EP	142850	63-E w/1" NPT plug	14.0 (6.4)
63-M	143100	63 w/manual reset	14.0 (6.4)
E-28	142900	63 w/DPDT switch	14.3 (6.5)

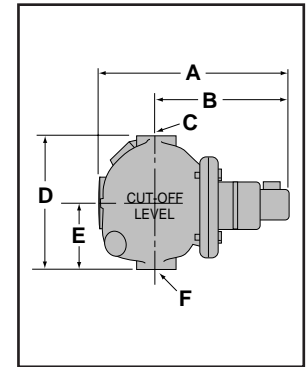
# Low Water Cut-Offs – Mechanical For Steam and Hot Water Boilers

## Series 64



### Low Water Cut-Offs

- For residential, commercial, and industrial boiler applications of any steaming capacity
- Heavy Duty
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and alarm or electric water feeder
- Packless bellows
- Optional manual reset available
- 1" (25mm) NPT equalizing pipes required
- Maximum boiler pressure 50 psi (3.5 kg/cm<sup>2</sup>)
- Use with TC-4 on hot water systems



### Dimensions, in. (mm)

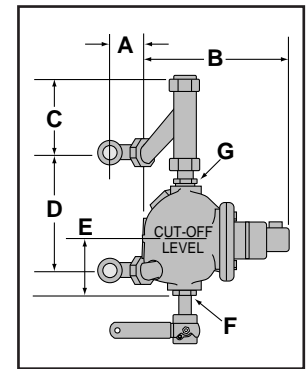
A	B	C NPT	D	E	F NPT
9 <sup>15</sup> / <sub>16</sub> (252)	7 <sup>7</sup> / <sub>16</sub> (65)	1	6 <sup>1</sup> / <sub>2</sub> (165)	3 <sup>1</sup> / <sub>8</sub> (79)	1

## Model 64-A



### Low Water Cut-Offs

- Quick hook-up fittings provided for installation directly into gauge glass tapplings



### Dimensions, in. (mm)

A	B	C	D		E	F NPT	G NPT
			min.	max.			
2 <sup>5</sup> / <sub>8</sub> (66)	9 <sup>15</sup> / <sub>16</sub> (252)	4 <sup>1</sup> / <sub>2</sub> (113)	6 <sup>7</sup> / <sub>8</sub> (172)	13 <sup>3</sup> / <sub>8</sub> (339)	3 <sup>1</sup> / <sub>8</sub> (79)	1	1

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
64	143600	Low water cut-off	11.3 (5.1)
64-A	143700	64 w/quick hook-up fittings	18.3 (8.3)
64-B	143800	64 w/float block	11.5 (5.2)
64-M	144250	64 w/manual reset	12.5 (5.7)

### Electrical Ratings

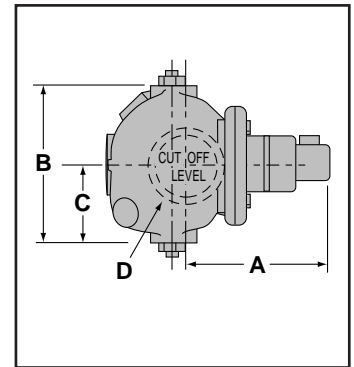
Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

## Low Water Cut-Offs – Mechanical For Steam and Hot Water Boilers

### Series 764 Low Water Cut-Offs



- For residential, commercial, and industrial boiler applications of any steaming capacity
- Heavy duty
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and alarm or electric water feeder
- Packless bellows
- 2½" NPT side tapping provided for installation with close nipple
- Maximum boiler pressure 50 psi (3.5 kg/cm<sup>2</sup>)



**BOILER CONTROLS**

### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

### Dimensions, in. (mm)

A	B	C	D NPT
6⅞ (175)	6½ (165)	3⅞ (79)	2½

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
764	144500	Low water cut-off	12.5 (5.7)



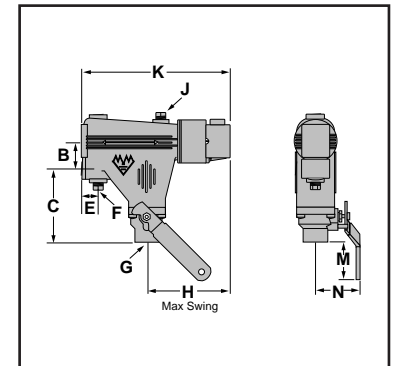
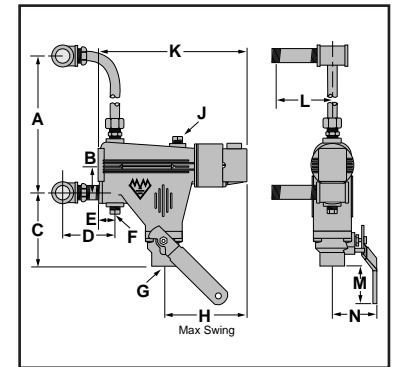
# Low Water Cut-Offs – Mechanical For Steam Boilers

## Series 67



### Low Water Cut-Offs

- For residential and commercial applications
- For boilers of any steaming capacity
- Quick hook-up fittings provided
- Lever-operated, full port ball valve for easy blow down
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and alarm or electric water feeder
- Optional features
  - Low voltage switches for self-generating millivolt circuits
  - Manual reset switch
- Large float chamber
- Maximum steam pressure 20 psi (1.4 kg/cm<sup>2</sup>)



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

### Dimensions, in. (mm)

A		B	C	D	E	F	G	H	J	K	L	M	N
min.	max.					NPT	NPT		NPT				
6½ (165)	14 (356)	1¾ (45)	4¾ (121)	3¾ (86)	1⅛ (29)	¾	¾	5½ (140)	¼	9 <sup>23</sup> / <sub>32</sub> (247)	3 <sup>9</sup> / <sub>16</sub> (90)	2½ (64)	2 <sup>13</sup> / <sub>16</sub> (71)

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
67	149400	Low water cut-off	10 (4.5)
67-G	149600	67 for millivolt service	10 (4.5)
67-LQHU	149500	67 without quick hook-up fittings	8 (3.6)
67-M	149700	67 w/manual reset	10 (4.5)

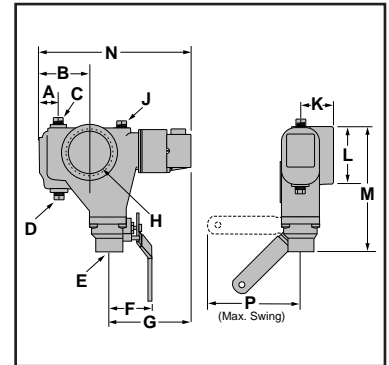
BOILER CONTROLS

## Low Water Cut-Offs – Mechanical For Steam Boilers

### Series 767 Low Water Cut-Offs



- For residential and commercial low pressure boiler applications
- For boilers of any steaming capacity
- 2½" NPT body tapping for side mounting on boilers
- Lever-operated, full port ball valve for easy blow down
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and alarm or electric water feeder
- Large float chamber
- Maximum steam pressure 20 psi (1.4 kg/cm<sup>2</sup>)



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

### Dimensions, in. (mm)

A	B	C NPT	D NPT	E NPT	F	G	H NPT	J NPT	K	L	M	N	P
1½ <sub>32</sub> (29.3)	3 <sup>13</sup> / <sub>32</sub> (186.5)	¾	¾	¾	2 <sup>13</sup> / <sub>16</sub> (71)	5 <sup>3</sup> / <sub>8</sub> (137)	2½	¼	2 <sup>3</sup> / <sub>64</sub> (51.9)	3 <sup>5</sup> / <sub>8</sub> (92)	8 <sup>5</sup> / <sub>32</sub> (207)	9 <sup>11</sup> / <sub>16</sub> (246.6)	5½ (140)

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
767	153700	Low water cut-off	8.5 (3.9)

# Low Water Cut-Offs – Mechanical For Steam Boilers

## Series 69

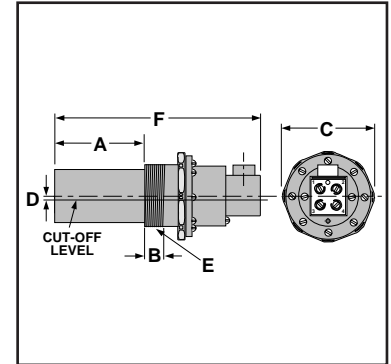


### Built-in Low Water Cut-Offs

- For residential and commercial low pressure steam boiler applications
- For boilers of any steaming capacity
- For mounting in 2½" NPT boiler side tapings
- Insertion lengths available in 1¾" - 4¼" (30-105mm)
- Packless bellows
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and an alarm or electric water feeder
- Optional low voltage switches for self-generating millivolt circuits
- Maximum steam pressure 20 psi (1.4 kg/cm<sup>2</sup>)



**Series 69**



## Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

## Dimensions, in. (mm)

Model	A	B	C	D	E	F
	Insertion Length					
69	4¼ (105)	1 (25)	4¼ (105)	¼ (3)	2½	9½ (241)
169	3¼ (79)					
269	2¼ (57)					
369	1¾ (45)					
469, 569	1¾ (30)					

## Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
69	153900	Low water cut-off w/4¼" (105mm) insertion length	3.7 (1.7)
69-J	154210	69 w/BSPT threads	3.7 (1.7)
69-MV-P	155000	69 w/millivolt switch	4.0 (1.8)
169	155100	69 w/3¼" (79mm) insertion length	4.0 (1.8)
269	155200	69 w/2¼" (57mm) insertion length	4.0 (1.8)
369	155300	69 w/1¾" (45mm) insertion length	4.0 (1.8)
369-MV	155400	369 w/millivolt switch	4.0 (1.8)
469	155500	69 w/1¾" (30mm) insertion length	4.0 (1.8)
569	155700	469 w/1¾" (30mm) insertion length w/¼" NPT tapping	4.0 (1.8)

## Low Water Cut-Offs – Mechanical For Steam Boilers

### Series 70

**Built-in Low Water Cut-Offs**

- For residential and commercial low pressure boiler applications
- For boilers of any steaming capacity
- For mounting in 2½" NPT boiler side tapplings
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and alarm or electric water feeder
- Float chamber provided
- ¼" NPT pressure control tapping provided
- Maximum steam pressure 20 psi (1.4 kg/cm<sup>2</sup>)

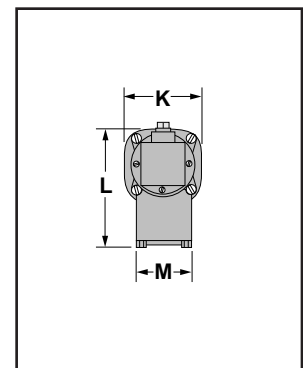
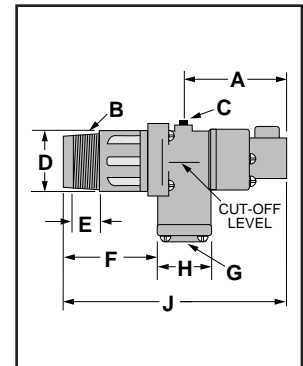
#### Dimensions, in. (mm)

A	B NPT	C NPT	D	E	F	G NPT
4½ (114)	2½	¼	3 (76)	1 (25)	4⅛ (105)	¾

H	J	K	L	M
2⅜ (60)	9 <sup>13</sup> / <sub>16</sub> (249)	3¼ (83)	5 <sup>1</sup> / <sub>16</sub> (129)	2⅜ (60)



**Series 70**



### Model 70-B

**Low Water Cut-Offs**

- Lever-operated, full port ball valve for easy blow down

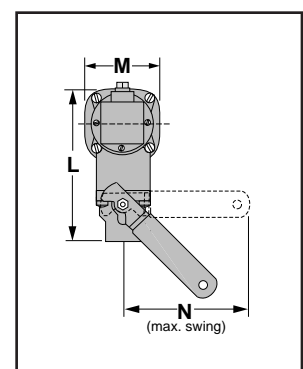
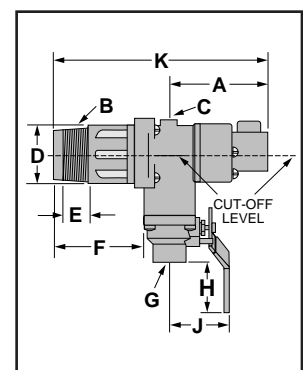
#### Dimensions, in. (mm)

A	B NPT	C NPT	D	E	F	G NPT
4½ (114)	2½	¼	3 (76)	1 (25)	4⅛ (105)	¾

H	J	K	L	M	N
2½ (64)	2 <sup>13</sup> / <sub>16</sub> (71)	9 <sup>13</sup> / <sub>16</sub> (249)	7 (178)	3¼ (83)	5½ (140)



**Model 70-B**



#### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
70	155800	Low water cut-off	6.7 (3.0)
70-B	155900	70 w/blow down valve	8.0 (3.6)

# Low Water Cut-Offs – Mechanical Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

## Series 42



### Low Water Cut-Off/Pump Controllers

- For residential, commercial, and industrial low and medium pressure steam boilers with a separate water column
- For boilers of any steaming capacity
- Monel bellows provides corrosion resistance
- Single pole, single throw mercury switches
- Enclosed junction box protects switches
- Optional features
  - Quick hook-up fittings
  - Gauge glass connector
  - BSPT threads
- Maximum pressure 50 psi (3.5 kg/cm<sup>2</sup>)

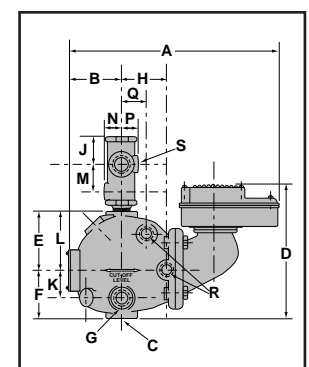
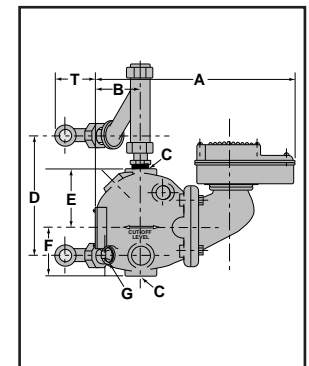
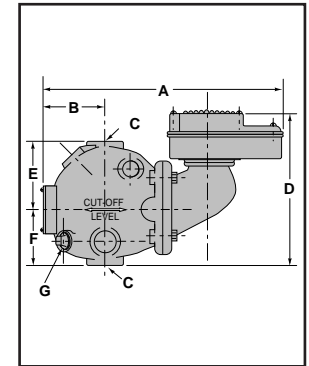
### Electrical Ratings

Voltage	Pump Circuit Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	345 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

Alarm Circuit Rating (Amperes)	
Voltage	Amps
120 VAC	1
240 VAC	1/2

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
42	129300	Combination low water cut-off/pump controller	15.5 (7.0)
42-A	129700	42 w/quick hook-up fittings	21.3 (9.7)
42-J	129400	42 w/BSPT threads	15.5 (7.0)
42-N	129800	42 w/glass connector	21.3 (9.7)



### Dimensions, in. (mm)

Model	A	B	C NPT	D	E	F	G NPT
42	12¼ (311)	2 <sup>9</sup> / <sub>16</sub> (65)	1	8 <sup>7</sup> / <sub>8</sub> (225)	3 <sup>11</sup> / <sub>16</sub> (94)	3 <sup>1</sup> / <sub>8</sub> (79)	½
42-A	12¼ (311)	2 <sup>9</sup> / <sub>16</sub> (65)	1	7¼-16 <sup>11</sup> / <sub>16</sub> (184-347)	2 <sup>3</sup> / <sub>4</sub> (45)	3 <sup>1</sup> / <sub>8</sub> (79)	½
42-N	12¼ (311)	2 <sup>9</sup> / <sub>16</sub> (65)	1	8 <sup>7</sup> / <sub>8</sub> (225)	3 <sup>11</sup> / <sub>16</sub> (94)	3 <sup>1</sup> / <sub>8</sub> (79)	½

Model	H	J	K	L	M	N	P	Q	R NPT	S NPT	T
42-N	2 <sup>9</sup> / <sub>16</sub> (65)	2 <sup>9</sup> / <sub>16</sub> (65)	1 <sup>3</sup> / <sub>4</sub> (45)	3 <sup>11</sup> / <sub>16</sub> (94)	1 <sup>13</sup> / <sub>16</sub> (46)	1 <sup>1</sup> / <sub>16</sub> (27)	1 <sup>1</sup> / <sub>16</sub> (27)	1½ (38)	3 <sup>3</sup> / <sub>8</sub>	¼	2 <sup>5</sup> / <sub>8</sub> (67)

# Low Water Cut-Offs

## Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

### Series 42S



### Low Water Cut-Off/Pump Controllers

- For residential, commercial, and industrial low and medium pressure steam boilers with a separate water column
- For boilers of any steaming capacity
- Monel bellows provides corrosion resistance
- Single pole, single throw snap action switches
- Enclosed junction box protects switches
- Optional features
  - Quick hook-up fittings
  - Gauge glass connector
- Maximum pressure 50 psi (3.5 kg/cm<sup>2</sup>)

### Electrical Ratings

Voltage	Pump Circuit Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	345 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

Alarm Circuit Rating (Amperes)	
Voltage	Amps
120 VAC	1
240 VAC	1/2

### Ordering Information

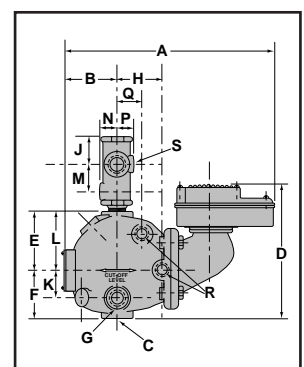
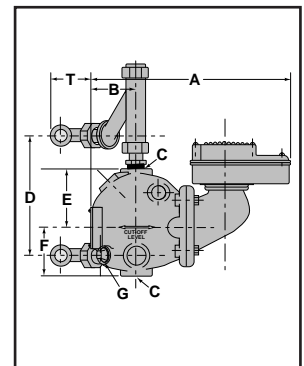
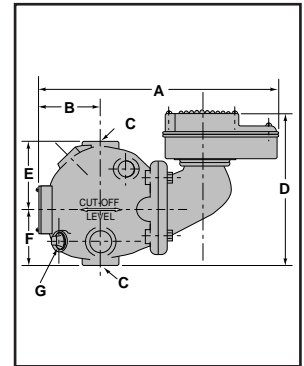
Model Number	Part Number	Description	Weight lbs. (kg)
42S	129302	Combination low water cut-off/pump controller	15.5 (7.0)
42S-J	129402	42S w/1" BSPT threads	15.5 (7.0)
42S-A	129702	42S w/quick hook-up fittings	21.3 (9.7)
42S-N	129802	42S w/glass connector	21.3 (9.7)

### Dimensions, in. (mm)

Model	A	B	C NPT	D	E	F	G NPT
42S	12¼ (311)	2⅞ (65)	1	8⅞ (225)	3⅛ (94)	3⅞ (79)	½
42S-A	12¼ (311)	2⅞ (65)	1	7¼-16⅛ (184-347)	2¾ (45)	3⅞ (79)	½
42S-N	12¼ (311)	2⅞ (65)	1	8⅞ (225)	3⅛ (94)	3⅞ (79)	½

Model	H	J	K	L	M	N	P	Q	R NPT	S NPT	T
42S-N	2⅞ (65)	2⅞ (65)	1¾ (45)	3⅛ (94)	1⅜ (46)	1⅛ (27)	1⅛ (27)	1½ (38)	⅜	¼	2⅝ (67)

with  
MERCURY FREE  
Snap-Action Switches



BOILER CONTROLS

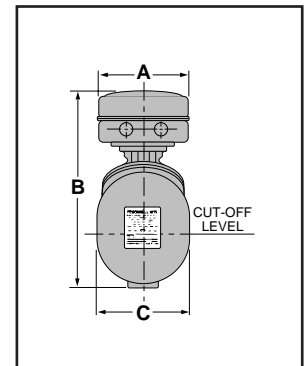
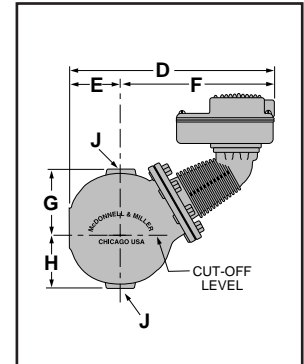
# Low Water Cut-Offs – Mechanical For Steam Boilers

**Series 150**   
**Low Water Cut-Off/Pump Controllers**

- For commercial and industrial low or high pressure boiler applications
- For boilers of any steaming capacity
- Monel bellows provides corrosion resistance
- Mercury switches for high temperature service
  - 1 Single pole, single throw switch for pump control
  - 1 Single pole, double throw switch for low water cut-off and alarm actuation
- Optional features
  - Manual reset
  - 2 Single pole, single throw switches
  - 2 Single pole, double throw switches
  - Float block
  - BSPT threads
- Maximum pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- For new electronic 150E Series see page 41

## Model 150-MD

- Maximum differential operation**
- Prevents nuisance burner shutdowns in **low pressure** applications
  - Maximum operating pressure 50 psi (3.5 kg/cm<sup>2</sup>)
  - For additional information see page 56



## Electrical Ratings

Voltage	Cut-off and Pump Circuits Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	345 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

Alarm Circuit Rating (Amperes)	
Voltage	Amps
120 VAC	1
240 VAC	1/2

## Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
150	171700	Combination low water cut-off/pump controller	24.7 (11.2)
150-B	171900	150 w/float block	24.7 (11.2)
150-B-M	172100	150-B w/manual reset	24.7 (11.2)
150-J	172600	150 w/BSPT threads	24.7 (11.2)
<b>150-MD</b>	<b>171800</b>	<b>150 w/maximum differential</b>	<b>24.7 (11.2)</b>
150-M	172700	150 w/manual reset	24.7 (11.2)
<b>150-M-MD</b>	<b>172800</b>	<b>150-M w/maximum differential</b>	<b>24.7 (11.2)</b>
150-MJ	172900	150-M w/BSPT threads	24.7 (11.2)
158	178400	150 w/2 SPDT switches	26.3 (11.9)
158-M	178500	158 w/manual reset	27.3 (12.4)
159	178800	150 w/2 SPST switches	26.0 (11.8)
150BMD	172000	150 w/float block and max. diff.	24.7 (11.2)
150BM-MD	172200	150BMD w/manual reset	24.7 (11.2)

## Dimensions, in. (mm)

A	B	C	D	E
5 <sup>7</sup> / <sub>8</sub> (149)	12 <sup>17</sup> / <sub>16</sub> (316)	6 (152)	13 <sup>1</sup> / <sub>4</sub> (337)	3 <sup>5</sup> / <sub>16</sub> (84)
F	G	H	J	
9 <sup>15</sup> / <sub>16</sub> (252)	4 <sup>1</sup> / <sub>8</sub> (105)	3 <sup>7</sup> / <sub>16</sub> (87)	1 NPT	

## Low Water Cut-Offs – Mechanical For Steam Boilers

### Series 157



### Low Water Cut-Off/Pump Controllers

- For residential, commercial and industrial low or high pressure boiler applications
- For boilers of any steaming capacity
- Monel bellows provides corrosion resistance
- Float chamber with integral water column provided
- Mercury for high temperature service
  - 1 Single pole, single throw switch for pump control
  - 1 Single pole, double throw switch for low water cut-off and alarm actuation
- Optional features
  - Manual reset
  - Integral conductance probes for additional levels and greater operating differential-Model 157-RBP-MD
  - 1" or 1¼" NPT equalizing tappings
  - ½" or ¾" NPT tappings for gauge glass/tri-cock installations
  - BSPT threads
- Maximum pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- For new electronic 150E Series see page 41

### Model 157-MD

#### Maximum differential operation

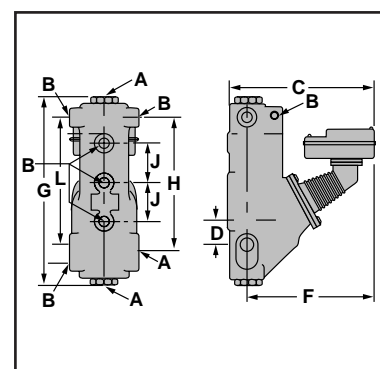
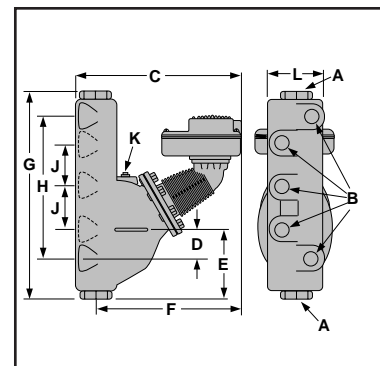
- Prevents nuisance burner shutdowns in low pressure applications
- Maximum operating pressure 50 psi (3.5 kg/cm<sup>2</sup>)
- For additional information see page 56

### Electrical Ratings

Voltage	Cut-off and Pump Circuits Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	345 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
157	173500	150 low water cut-off w/water column	39.7 (18.0)
<b>157-MD</b>	<b>173600</b>	<b>157 w/maximum differential</b>	<b>39.7 (18.0)</b>
157-A	173700	157 w/alternate tappings	39.5 (17.9)
157-A-M	173800	157-A w/manual reset	39.5 (17.9)
157-M	175400	157 w/manual reset	39.7 (18.0)
<b>157-M-MD</b>	<b>175410</b>	<b>157-M w/maximum differential</b>	<b>39.7 (18.0)</b>
157-R	176200	157 w/alternate tappings	42.0 (19.0)
157-R-M	177300	157-R w/manual reset	42.0 (19.0)
<b>157-RBP-MD</b>	<b>176501</b>	<b>157 w/2 integral conductance probes</b>	<b>51.0 (23.1)</b>
157-RL	176900	157 w/alternate tappings	42.0 (19.0)
157-RL-M	177000	157-RL w/manual reset	42.0 (19.0)



Alarm Circuit Rating (Amperes)	
Voltage	Amps
120 VAC	1
240 VAC	1/2

### Dimensions, in. (mm)

Model	A NPT	B NPT	C	D	E
157	1	½	13⅜ (339)	2 <sup>5</sup> / <sub>16</sub> (59)	4 <sup>15</sup> / <sub>16</sub> (125)
157-A	1¼	¾	13⅜ (339)	2 <sup>5</sup> / <sub>16</sub> (59)	4 <sup>15</sup> / <sub>16</sub> (125)
157-R	1	½	13⅜ (339)	2¼ (57)	5 <sup>7</sup> / <sub>8</sub> (149)
157-RL	1¼	½	13 <sup>9</sup> / <sub>16</sub> (345)	3½ (89)	5 <sup>7</sup> / <sub>8</sub> (149)

Model	F	G	H	J	K NPT	L
157	11¾ (298)	16 (406)	11½ (292)	3½ (89)	¾	5 <sup>7</sup> / <sub>8</sub> (149)
157-A	11¾ (298)	16 (406)	11½ (292)	3½ (89)	¾	5 <sup>7</sup> / <sub>8</sub> (149)
157-R	11¾ (298)	17 (432)	11½ (292)	3½ (89)	¾	6¼ (159)
157-RL	11¾ (298)	17 (432)	12 <sup>3</sup> / <sub>4</sub> (324)	3½ (89)	¾	6¼ (159)



# Low Water Cut-Offs – Mechanical For Steam Boilers

## Series 150S



### Low Water Cut-Off/Pump Controllers

- For commercial and industrial low or high pressure boiler applications
- For boilers of any steaming capacity
- Monel bellows provides corrosion resistance
- Snap action switches for high temperature service
  - 1 Single pole, single throw switch for pump control
  - 1 Single pole, double throw switch for low water cut-off and alarm actuation
- Optional features
  - Manual reset
  - 2 Single pole, single throw switches
  - 2 Single pole, double throw switches
  - Float block
  - BSPT threads
- Maximum pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- For new electronic 150E Series see page 41

## Model 150S-MD

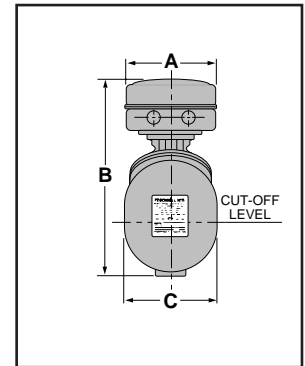
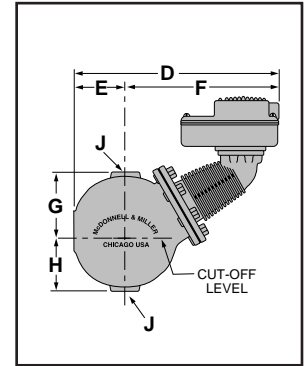
### Maximum differential operation

- Prevents nuisance burner shutdowns in low pressure applications
- Maximum operating pressure 50 psi (3.5 kg/cm<sup>2</sup>)
- For additional information see page 56



**Series 150S**

with MERCURY FREE Snap-Action Switches



## Electrical Ratings

Voltage	Pump Circuit Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	345 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

Alarm Circuit Rating (Amperes)	
Voltage	Amps
120 VAC	1
240 VAC	1/2

## Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
150S	171702	Combination low water cut-off/pump controller	24.7 (11.2)
150S-B	171903	150S w/float block	24.7 (11.2)
150S-B-M	172104	150S-B w/manual reset	24.7 (11.2)
150S-BMD	172002	150S w/float block and max. dif.	24.7 (11.2)
150S-BM-MD	172201	150S-BMD w/manual reset	24.7 (11.2)
150S-J	172601	150S w/BSPT threads	24.7 (11.2)
<b>150S-MD</b>	<b>171802</b>	<b>150S w/maximum differential</b>	<b>24.7 (11.2)</b>
150S-M	172702	150S w/manual reset	24.7 (11.2)
<b>150S-M-MD</b>	<b>172802</b>	<b>150S-M w/maximum differential</b>	<b>24.7 (11.2)</b>
150S-MJ	172901	150S-M w/BSPT threads	24.7 (11.2)
158S	178402	150S w/2 SPDT switches	26.3 (11.9)
158S-M	178502	158S w/manual reset	27.3 (12.4)
159S	178802	150S w/2 SPST switches	26.0 (11.8)

## Dimensions, in. (mm)

A	B	C	D	
5 <sup>7</sup> / <sub>8</sub> (149)	12 <sup>17</sup> / <sub>16</sub> (316)	6 (152)	13 <sup>1</sup> / <sub>4</sub> (337)	
E	F	G	H	J
3 <sup>5</sup> / <sub>16</sub> (84)	9 <sup>15</sup> / <sub>16</sub> (252)	4 <sup>1</sup> / <sub>8</sub> (105)	3 <sup>7</sup> / <sub>16</sub> (87)	1 NPT

## Low Water Cut-Offs – Mechanical For Steam Boilers

### Series 157S



### Low Water Cut-Off/Pump Controllers

- For residential, commercial and industrial low or high pressure boiler applications
- For boilers of any steaming capacity
- Monel bellows provides corrosion resistance
- Float chamber with integral water column provided
- Snap action for high temperature service
  - 1 Single pole, single throw switch for pump control
  - 1 Single pole, double throw switch for low water cut-off and alarm actuation
- Optional features
  - Manual reset
  - Integral conductance probes for additional levels and greater operating differential-Model 157S-RBP-MD
  - 1" or 1¼" NPT equalizing tappings
  - ½" or ¾" NPT tappings for gauge glass/tri-cock installations
  - BSPT threads
- Maximum pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- For new electronic 150E Series see page 41

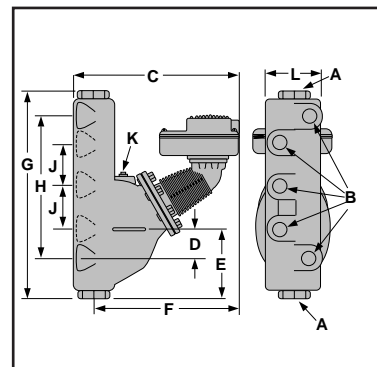
### Model 157S-MD

#### Maximum differential operation

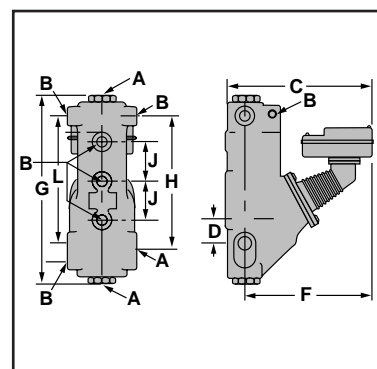
- Prevents nuisance burner shutdowns in **low pressure** applications
- Maximum operating pressure 50 psi (3.5 kg/cm<sup>2</sup>)
- For additional information see page 56



Series 157S



Model 157S-RBP-MD



### Electrical Ratings

Voltage	Cut-off and Pump Circuits Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	345 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

Alarm Circuit Rating (Amperes)	
Voltage	Amps
120 VAC	1
240 VAC	1/2

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
157S	173502	150S low water cut-off w/water column	39.7 (18.0)
<b>157S-MD</b>	<b>173603</b>	<b>157S w/maximum differential</b>	<b>39.7 (18.0)</b>
157S-A	173702	157S w/alternate tappings	39.5 (17.9)
157S-A-M	173802	157S-A w/manual reset	39.5 (17.9)
157S-M	175402	157S w/manual reset	39.7 (18.0)
<b>157S-M-MD</b>	<b>175412</b>	<b>157S-M w/maximum differential</b>	<b>39.7 (18.0)</b>
157S-R	176220	157S w/alternate tappings	42.0 (19.0)
157S-R-M	177306	157S-R w/manual reset	42.0 (19.0)
<b>157S-RBP-MD</b>	<b>176503</b>	<b>157S w/2 integral conductance probes</b>	<b>51.0 (23.1)</b>
157S-RL	176902	157S w/alternate tappings	42.0 (19.0)
157S-RL-M	177006	157S-RL w/manual reset	42.0 (19.0)

### Dimensions, in. (mm)

Model	A NPT	B NPT	C	D	E	F	G	H	J	K NPT	L
157S	1	½	13⅜ (339)	2⅝ (59)	4 <sup>15</sup> / <sub>16</sub> (125)	11¾ (298)	16 (406)	11½ (292)	3½ (89)	¾	5⅞ (149)
157S-A	1¼	¾	13⅜ (339)	2⅝ (59)	4 <sup>15</sup> / <sub>16</sub> (125)	11¾ (298)	16 (406)	11½ (292)	3½ (89)	¾	5⅞ (149)
157S-R	1	½	13⅜ (339)	2¼ (57)	5⅞ (149)	11¾ (298)	17 (432)	11½ (292)	3½ (89)	¾	6¼ (159)
157S-RL	1¼	½	13⅜ (345)	3½ (89)	5⅞ (149)	11¾ (298)	17 (432)	12¾ (324)	3½ (89)	¾	6¼ (159)
157S-RBP-MD	1	½	13⅜ (345)	2¼ (57)	5⅞ (149)	11¾ (298)	17 (432)	11½ (292)	3½ (89)	NA	12¼ (324)

## MD Model Setpoints

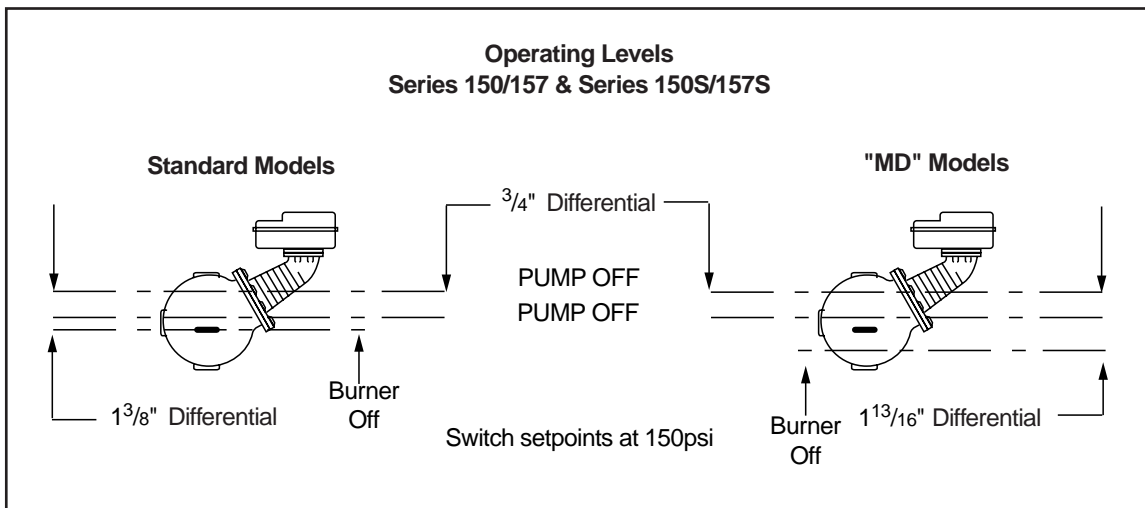
The bellows on the 150 units are sensitive to pressure. At higher pressures the bellows is stiffer requiring more force to move it. At lower pressures the bellows is more pliable (less stiff) requiring less force to move it. Consequently, the on/off points tend to narrow at lower pressures. (Less distance between on and off).

Early versions of the 150 mercury bulb units were able to be adjusted. These units had knurled adjustment screws that could be used to raise, lower or widen the setpoints. Although the available adjustment was small (usually  $\frac{1}{16}$ " to  $\frac{1}{8}$ " total), it was enough to compensate in the field for lower pressure systems.

Later versions of the 150 mercury bulb units and all snap switch units are not adjustable in the field. The 'MD' models were created to provide a 150 control with factory settings to compensate for the narrowing of setpoints on new and existing installations.

On 'MD' models the distance between pump off and burner off is increased by approximately  $\frac{7}{16}$ ". Note that the pump on/off differential on both standard and 'MD' models is set at  $\frac{3}{4}$ ".

This larger differential is accomplished by lowering the burner off setpoint  $\frac{3}{8}$ " below the casting line on 'MD' models when setting the burner on/off points at 150 psi. This compensates for the narrowing of the setpoints at lower operating pressures because the burner off point will move upward (closer to the casting line) at lower pressures.



## Blow Down Piping

### SERIES 150/150S, 150E AND SERIES 93/94 CONTROLS

Larger LWCO/Pump controller units are installed on equalizing lines. The piping must be full size and include cross connections where pipes change direction. Each control should include its own blow down piping and valves.

These controls should be blown down daily when installed on commercial/industrial boilers and weekly in residential applications. Regular blow down keeps the control free of sediment and ensures it operates properly.

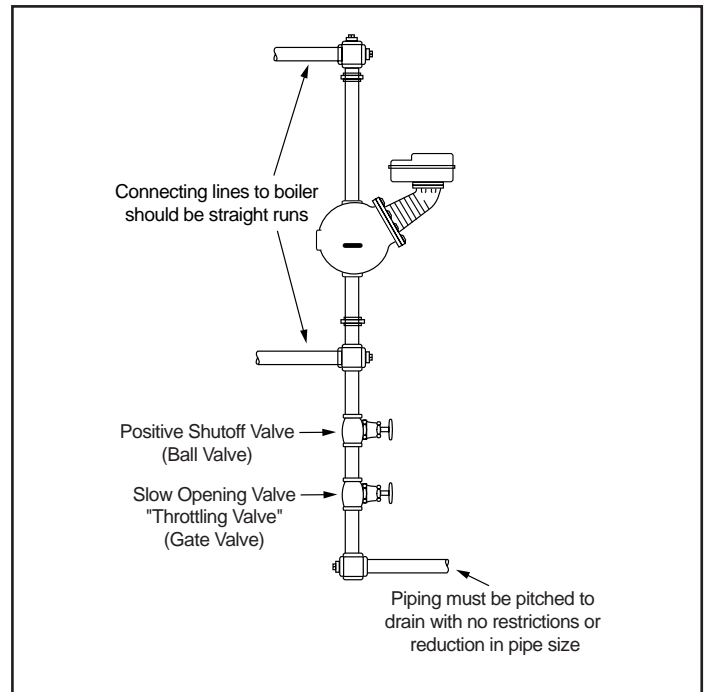
When blowing down a control at pressure, the blow down valve should be opened slowly. The piping needs to be warmed up and stagnant water in the drain piping needs to be pushed out. Suddenly opening a blow down valve causes steam to condense, which creates water hammer. Crushed floats and damaged linkages can occur when water hammer occurs due to improper blow down piping.

For these reasons, McDonnell & Miller recommends a dual valve blow-down system for each control.

#### Proper Blow-down Procedure: (Using dual valve system)

1. With water in the boiler at its normal level, open "Positive Shut-off Ball Valve".
2. Open "Throttling Gate Valve" slowly until drain piping heats up and then open fully. Observe that the water level starts falling in the gauge glass.
3. Close "Throttling Gate Valve" after verifying that the pump contacts have closed and the burner contacts have opened thus shutting down the boiler.  
**Note:** If this does not happen, immediately close all valves, turn off burner and correct the problem.
4. Close "Positive Shut-off Ball Valve".
5. Observe that the water level returns to its normal level before leaving site.

Recommended Dual Valve Blow-Down Piping



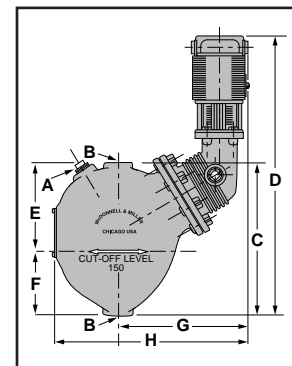
# Low Water Cut-Offs – Mechanical Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

## Series 93



### Low Water Cut-Off/Pump Controllers

- For commercial and industrial low or high pressure steam boilers
- Maintains consistent water level regardless of pressure
- For boilers of any steaming capacity
- No. 5 Switch included
- Magnetic repulsion eliminates need for bellows
- Optional features
  - Manual reset
  - On/Off or proportional control switch to maintain constant boiler water level
  - BSPT threads
- 1" NPT connections
- Maximum pressure 150 psi (10.5 kg/cm<sup>2</sup>)



## Electrical Ratings

345 VA at 120 or 240 VAC

## Dimensions, in. (mm)

A	B	C	D	E	F	G	H
NPT	NPT						
¾	1	10 <sup>1</sup> / <sub>16</sub> (256)	18 <sup>5</sup> / <sub>8</sub> (473)	4 <sup>15</sup> / <sub>32</sub> (113.5)	5 <sup>19</sup> / <sub>32</sub> (142)	8 <sup>7</sup> / <sub>8</sub> (225)	12 <sup>7</sup> / <sub>8</sub> (327)

## Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
93	162300	Combination low water cut-off/pump controller w/No. 5 switch	35.0 (15.9)
93-J	162325	93 w/BSPT threads	35.0 (15.9)
93-J-7B	162330	93 w/BSPT threads & No. 7-B switch	35.5 (16.0)
93-M	162500	93 w/manual reset	35.0 (15.9)
93-MJ	162525	93-M w/BSPT threads	35.0 (15.9)
93-7B	163000	93 w/No. 7B switch	35.5 (16.0)
93-7B-M	163100	93-7B W/manual reset	35.5 (16.0)

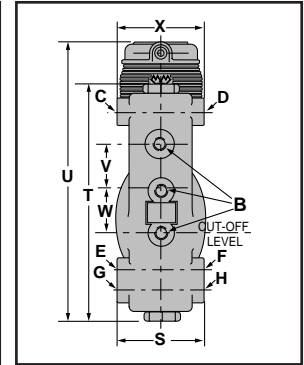
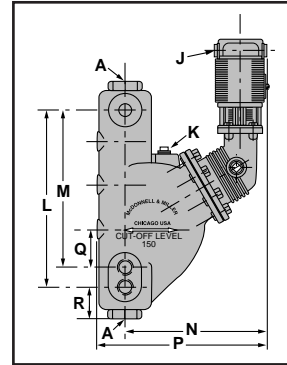
# Low Water Cut-Offs – Mechanical Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

## Series 193



### Low Water Cut-Off/Pump Controllers

- For commercial and industrial low or high pressure steam boilers
- Maintains consistent water level regardless of pressure
- Water column with integral tapplings for gauge glass and tri-cock installations
- For boilers of any steaming capacity
- No. 5 Switch included
- Magnetic repulsion eliminates need for bellows
- Optional features
  - Manual reset
  - On/Off or proportional control switch to maintain constant boiler output
- 1" NPT connections
- Maximum pressure 150 psi (10.5 kg/cm<sup>2</sup>)



### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
193	163400	Combination low water cut-off/pump controller w/No. 5 switch	52.5 (23.8)
193-A	163500	193 w/alternate tapplings	52.5 (23.8)
193-A-7B	164500	193-A w/No. 7B switch	52.5 (23.8)
193-A-7BM	164600	193-A-7B w/manual reset	52.5 (23.8)
193-A-M	164200	193-A w/manual reset	52.5 (23.8)
193-B	163600	193 w/alternate tapplings	52.5 (23.8)
193-B-M	164300	193-B w/manual reset	52.5 (23.8)
193-B-7B	164700	193-B w/No. 7B switch	52.5 (23.8)
193-D	163900	193 w/alternate tapplings	52.5 (23.8)
193-D-7B	163903	193-D w/No. 7B switch	52.5 (23.8)
193-M	164100	193 w/manual reset	52.5 (23.8)
193-7B	164400	193 w/No. 7B switch	52.5 (23.8)
193-7BM	164525	193-7B w/manual reset	52.5 (23.8)
193-D-M	163902	193-D w/manual reset	52.5 (23.8)
193-G	164760	193 w/alternate tapplings	52.5 (23.8)

### Electrical Ratings

345 VA at 120 or 240 VAC

### Dimensions, in. (mm)

Model	A NPT	B NPT	C NPT	D NPT	E NPT	F NPT	G NPT	H NPT	J NPT	K NPT
193	1	1/2	1/2	1/2	–	–	1/2	1/2	1/2	3/4
193-A	1	1/2	1/2	1/2	1/2	1/2	–	–	1/2	3/4
193-B	1 1/4	3/4	3/4	3/4	–	–	3/4	3/4	1/2	3/4
193-D	1	1/2	1	1/2	1	1/2	–	–	1/2	3/4
193-G	1	1/2	–	1/2	1	1/2	–	–	1/2	3/4

Model	L	M	N	P	Q	R
193	12 3/4 (324)	–	10 13/16 (274)	13 (330)	–	2 7/8 (73)
193-A	–	11 1/2 (292)	10 13/16 (274)	13 (330)	2 1/4 (57)	–
193-B	12 3/4 (324)	–	10 13/16 (274)	13 (330)	–	2 7/8 (73)
193-D	–	11 1/2 (292)	10 13/16 (274)	13 (330)	2 1/4 (57)	–
193-G	–	11 1/2 (292)	10 13/16 (274)	13 (330)	2 1/4 (57)	–

Model	S	T	U	V	W	X
193	6 3/4 (171.4)	17 1/2 (445)	20 1/2 (521)	3 1/2 (89)	3 1/2 (89)	6 (152)
193-A	6 3/4 (171.4)	17 1/2 (445)	20 1/2 (521)	3 1/2 (89)	3 1/2 (89)	6 (152)
193-B	6 3/4 (171.4)	17 1/2 (445)	20 1/2 (521)	3 1/2 (89)	3 1/2 (89)	6 (152)
193-D	6 3/4 (171.4)	17 1/2 (445)	20 1/2 (521)	3 1/2 (89)	3 1/2 (89)	6 (152)
193-G	6 3/4 (171.4)	17 1/2 (445)	20 1/2 (521)	3 1/2 (89)	3 1/2 (89)	6 (152)

BOILER CONTROLS

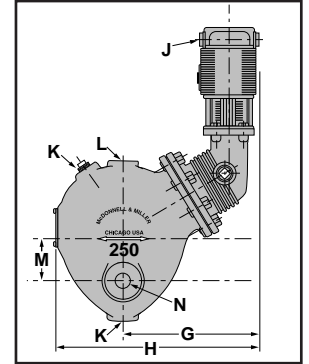
# Low Water Cut-Offs – Mechanical Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

## Series 94



### Low Water Cut-Off/Pump Controllers

- For commercial and industrial low or high pressure steam boilers
- Maintains consistent water level regardless of pressure
- For boilers of any steaming capacity
- No. 5 Switch included
- Magnetic repulsion eliminates need for bellows
- Optional features
  - Manual reset
  - On/Off or proportional control switch to maintain constant boiler water level
  - BSPT threads
- 1¼" NPT connections
- Maximum pressure 250 psi (17.6 kg/cm<sup>2</sup>)

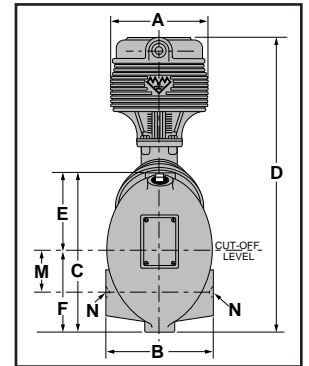


### Electrical Ratings

345 VA at 120 or 240 VAC

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
94	165200	Combination low water cut-off/pump controller w/No. 5 switch	52.5 (23.8)
94-A	165500	94 w/alternate tapplings	50.3 (22.8)
94-AM	165800	94-A w/manual reset	50.3 (22.8)
94-A-7B	165700	94-AM w/No. 7B switch	52.5 (23.8)
94-J	165850	94 w/BSPT threads	52.5 (23.8)
94-J-7B	165875	94-7B w/BSPT threads	52.0 (23.6)
94-M	165900	94 w/manual reset	52.5 (23.8)
94-7B	166300	94 w/No. 7B switch	52.0 (23.6)



### Dimensions, in. (mm)

Model	A	B	C	D
94	6 (152)	7 (178)	10 <sup>9</sup> / <sub>16</sub> (268)	18 <sup>13</sup> / <sub>16</sub> (478)
94-A	6 (152)	7 (178)	10 <sup>9</sup> / <sub>16</sub> (268)	18 <sup>13</sup> / <sub>16</sub> (478)

Model	E	F	G	H
94	5 <sup>7</sup> / <sub>8</sub> (149)	4 <sup>11</sup> / <sub>16</sub> (119)	8 <sup>3</sup> / <sub>4</sub> (222)	12 <sup>15</sup> / <sub>16</sub> (328.6)
94-A	5 <sup>7</sup> / <sub>8</sub> (149)	4 <sup>11</sup> / <sub>16</sub> (119)	8 <sup>3</sup> / <sub>4</sub> (222)	12 <sup>15</sup> / <sub>16</sub> (328.6)

Model	J	K NPT	L NPT	M	N
94	½ (15)	1¼	1¼	–	–
94-A	½ (15)	1¼	1¼	2 <sup>1</sup> / <sub>16</sub> (52)	1¼ (32)

BOILER CONTROLS

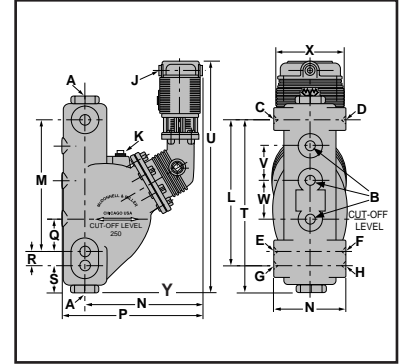
# Low Water Cut-Offs – Mechanical Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

## Series 194



### Low Water Cut-Off/Pump Controllers

- For commercial, and industrial low or high pressure steam boilers
- Maintains consistent water level regardless of pressure
- For boilers of any steaming capacity
- Water column with integral tapplings for gauge glass and tri-cock installations
- No. 5 Switch included
- Magnetic repulsion eliminates need for bellows
- Optional features
  - Manual reset
  - No. 7-B On/Off or proportional control switch to maintain constant boiler water level
- 1¼" NPT connections
- Maximum pressure 250 psi (17.6 kg/cm<sup>2</sup>)



### Electrical Ratings

345 VA at 120 or 240 VAC

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
194	166600	Combination low water cut-off/pump controller w/Series 5 switch	72.0 (32.7)
194-A	166700	194 w/alternate tapplings	72.0 (32.7)
194-A-7B	167100	194-A w/Series 7B switch	72.0 (32.7)
194-M	166900	194 w/manual reset	72.0 (32.7)
194-7B	167200	194 w/Series 7B switch	72.0 (32.7)
194-7BM	167300	194-7B w/manual reset	72.0 (32.7)
194-B	166701	194 w/alternate tapplings	72.0 (32.7)

### Dimensions, in. (mm)

Model	A NPT	B NPT	C NPT	D NPT	E NPT	F NPT	G NPT	H NPT	J NPT	K NPT
194	1¼	½	½	½	½	½	–	–	½	¾
194-A	1¼	½	½	½	–	–	½	½	½	¾
194-B	1¼	¾	¾	¾	–	–	¾	¾	½	¾

Model	L	M	N	P	Q	R	S
194	–	11 <sup>5</sup> / <sub>8</sub> (295)	6 <sup>3</sup> / <sub>4</sub> (171.4)	13 <sup>1</sup> / <sub>16</sub> (332)	2 <sup>13</sup> / <sub>16</sub> (71)	1¼ (32)	2 <sup>3</sup> / <sub>8</sub> (60)
194-A	12 <sup>7</sup> / <sub>8</sub> (327)	–	6 <sup>3</sup> / <sub>4</sub> (171.4)	13 <sup>1</sup> / <sub>16</sub> (332)	2 <sup>13</sup> / <sub>16</sub> (71)	1¼ (32)	2 <sup>3</sup> / <sub>8</sub> (60)
194-B	12 <sup>7</sup> / <sub>8</sub> (327)	–	6 <sup>3</sup> / <sub>4</sub> (171.4)	13 <sup>1</sup> / <sub>16</sub> (332)	2 <sup>13</sup> / <sub>16</sub> (71)	1¼ (32)	2 <sup>3</sup> / <sub>8</sub> (60)

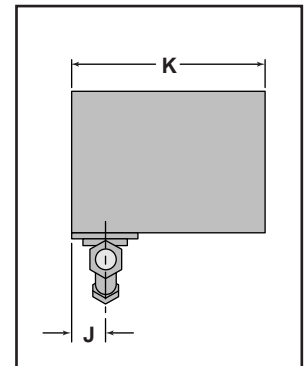
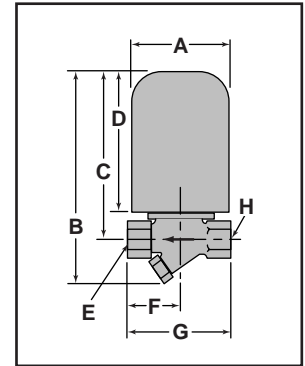
Model	T	U	V	W	X	Y
194	17¼ (438)	20½ (521)	3 (76)	3 (76)	6 (152)	10 <sup>13</sup> / <sub>16</sub> (274)
194-A	17¼ (438)	20½ (521)	3 (76)	3 (76)	6 (152)	10 <sup>13</sup> / <sub>16</sub> (274)
194-B	17¼ (438)	20½ (521)	3 (76)	3 (76)	6 (152)	10 <sup>13</sup> / <sub>16</sub> (274)



## Water Feeders – Electric

### Series WF Uni-Match® Electric Water Feeders

- For low pressure steam boilers with **cold water feed**
- Three position slide switch allows the timing cycle to be matched to that of the major low water cut-off manufacturers
- Field adaptable feed rate – 1, 2, or 4 gpm (3.8, 7.6, or 15.1 lpm)
- Electronic operation provides consistent, accurate cycle-to-cycle repeatability
- Universal design simplifies selection and reduces stock
- Can be used with mechanical or electronic low water cut-off controls
- Manual feed button
- Includes 3/8" NPT thread x 1/2" (13mm) tubing adapters for quick installation with 1/2" (13mm) copper tubing
- Easy to clean strainer
- Maximum water pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum boiler pressure 15 psi (1 kg/cm<sup>2</sup>)
- Maximum water temperature 120°F (49°C)
- Maximum ambient temperature 100°F (38°C)
- Maximum power consumption (during water feed only)
  - 15 VA at 24 VAC
  - 20 VA at 120 VAC (50 or 60 Hz)



### Dimensions, in. (mm)

A	B	C	D	E NPT	F	G	H NPT	J	K
2 <sup>7</sup> / <sub>8</sub> (73)	6 <sup>1</sup> / <sub>4</sub> (159)	4 <sup>7</sup> / <sub>8</sub> (124)	4 <sup>1</sup> / <sub>4</sub> (108)	3/8	1 <sup>17</sup> / <sub>32</sub> (39)	3 <sup>1</sup> / <sub>16</sub> (78)	3/8	1 <sup>1</sup> / <sub>32</sub> (26)	5 <sup>13</sup> / <sub>16</sub> (148)

### Ordering Information

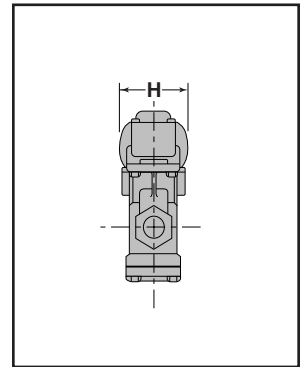
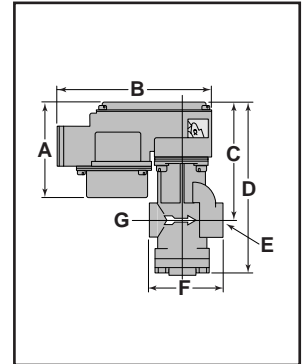
Model Number	Part Number	Description	Weight lbs. (kg)
WF-2-U-24	169550	Electric Water Feeder, 24V	2.8 (1.3)
WF-2-U-120	169560	Electric Water Feeder, 120V	2.8 (1.3)

## Water Feeders – Electric

### Series 101-A

**Electric Water Feeders**

- For low pressure steam boilers with **cold water feed**
- Eliminates necessity to manually add water to the boiler
- Can be used with mechanical or electronic low water cut-off controls
- Quick-change replaceable cartridge valve and strainer
- Manual feed button
- Model 101-A features a 120 VAC solenoid
- Model 101-A-24 features a 24 VAC solenoid and a separate 50VA transformer
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum boiler pressure 25 psi (1.8 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum power consumption
  - 40 VA at 24 VAC
  - 40 VA at 120 VAC



### Flow Data

Pressure Differential psi (kg/cm <sup>2</sup> )	Flow Rate gpm (lpm)
5 (.4)	1.4 (5.3)
10 (.7)	1.7 (6.4)
20 (1.4)	2.1 (7.9)
40 (2.8)	2.9 (11.0)
60 (4.2)	3.4 (12.9)
80 (5.6)	4.0 (15.1)

### Dimensions, in. (mm)

A	B	C	D	E NPT	F	G NPT	H
4 <sup>1</sup> / <sub>16</sub> (103)	6 <sup>7</sup> / <sub>8</sub> (175)	5 <sup>1</sup> / <sub>8</sub> (130)	7 <sup>9</sup> / <sub>16</sub> (192)	½	3 <sup>5</sup> / <sub>16</sub>	½	3 (76)

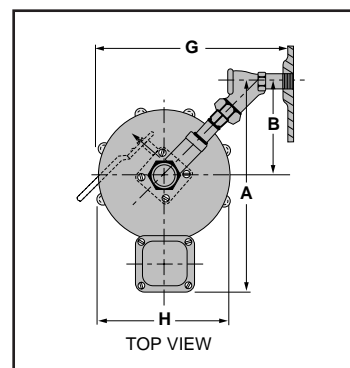
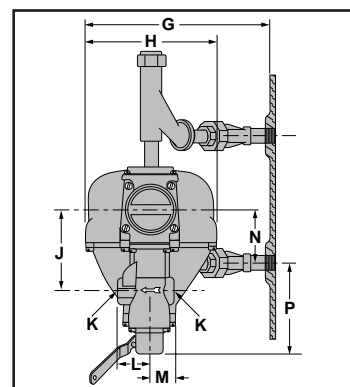
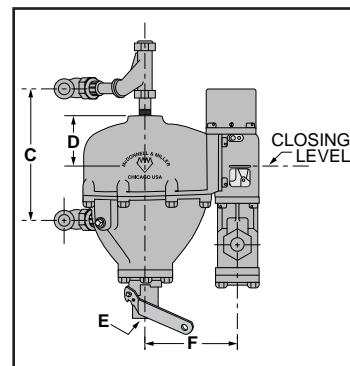
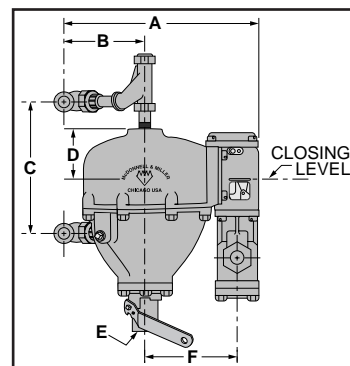
### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
101A	169400	Electric water feeder, 120V	2.8 (1.3)
101A-24V	169500	Electric water feeder, 24V	2.8 (1.3)

## Water Feeders – Mechanical

### Series 47/47-2 Mechanical Water Feeders/Low Water Cut-Offs

- For steam and hot water boilers with **cold water feed**
- Continuous maintenance of **minimum safe water level**, independent of electrical service
- Proportional feed action
- Quick hook-up fittings provided
- Quick-change replaceable cartridge valve and strainer
- Optional features
  - No. 2 switch
  - Manual reset
- Model 47 can be field upgraded with a No. 2 switch to add low water cut-off function
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum boiler pressure 25 psi (1.8 kg/cm<sup>2</sup>)



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	10.2	61.2	125 VA at 120 or 240 VAC 60 Hz
240 VAC	5.1	30.6	

### Dimensions, in. (mm)

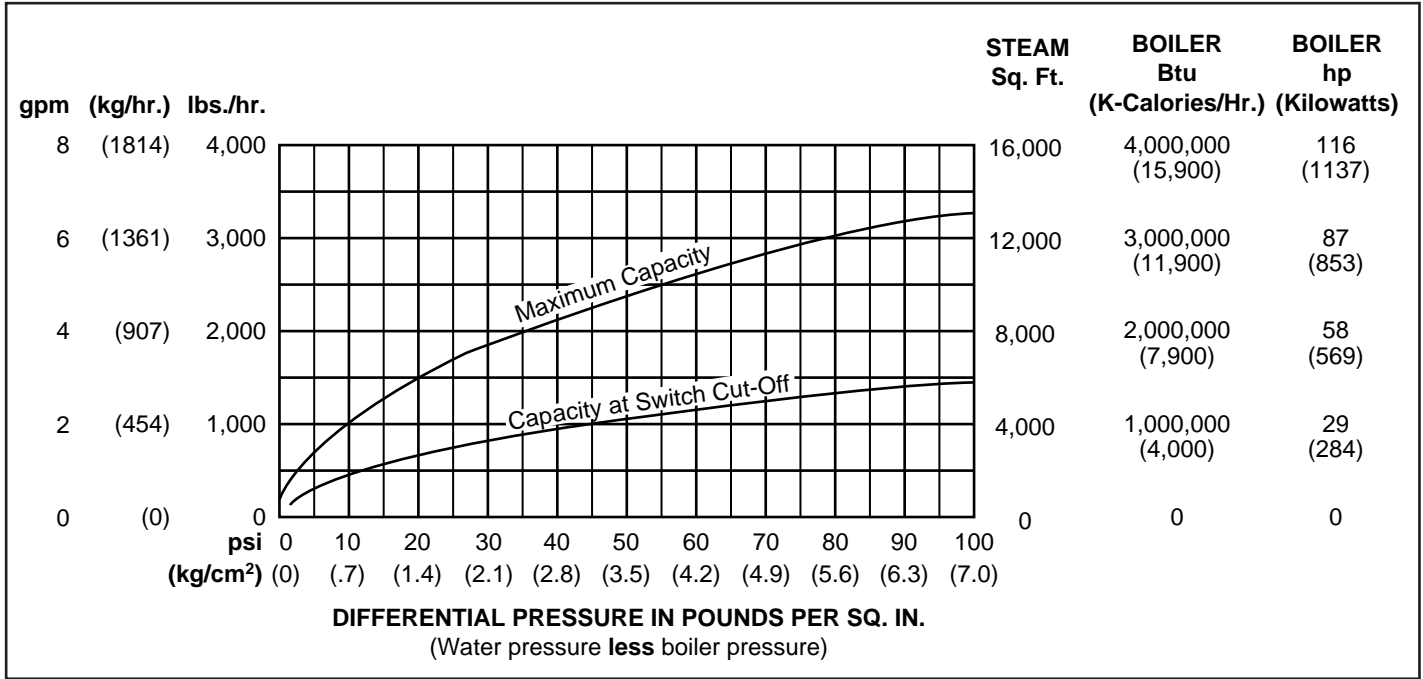
A	B	C	D	E NPT	F	G
11 <sup>7</sup> / <sub>16</sub> (302)	5 <sup>1</sup> / <sub>4</sub> (133)	7 <sup>3</sup> / <sub>8</sub> (187) min. 14 (356) max.	2 <sup>5</sup> / <sub>8</sub> (67)	<sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub> (130)	10 <sup>5</sup> / <sub>8</sub> (270)
H	J	K NPT	L	M	N	P
7 <sup>5</sup> / <sub>16</sub> (186)	4 <sup>5</sup> / <sub>8</sub> (117)	<sup>1</sup> / <sub>2</sub>	1 <sup>29</sup> / <sub>32</sub> (58.4)	1 <sup>13</sup> / <sub>32</sub> (35.7)	3 (76)	5 <sup>5</sup> / <sub>16</sub> (135)

## Water Feeders – Mechanical

### Series 47 (continued)

#### Mechanical Water Feeders

#### Capacities



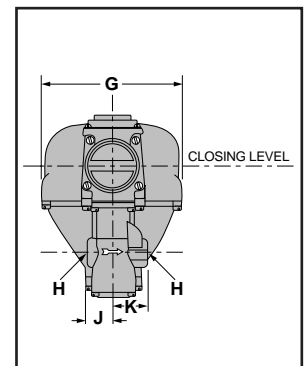
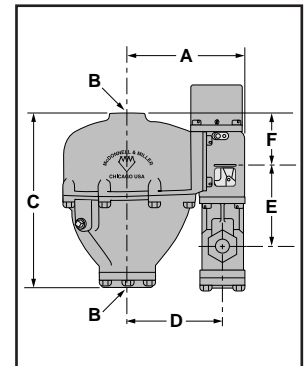
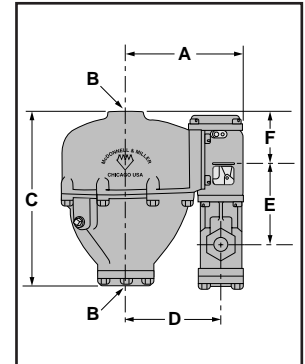
#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
47	132700	Mechanical water feeder	27.5 (12.5)
47-2	132800	47 w/No. 2 switch	28.5 (13.0)
47-2-M	132900	47-2 w/manual reset	28.5 (13.0)
47-X	133400	47 w/o quick hook-up fittings	25.0 (11.4)
47-2X	176212	47-2 w/o quick hook-up fittings	26.0 (11.8)

## Water Feeders – Mechanical

### Series 247/247-2 Mechanical Water Feeders/Low Water Cut-Offs

- For steam and hot water boilers with **cold water feed**
- Continuous maintenance of **minimum safe water level**, independent of electrical service
- Proportional feed action
- Quick-change replaceable cartridge valve and strainer
- Quiet, durable operation
- Isolated feed valve minimizes lime and scale build-up
- Optional features
  - No. 2 switch
  - Manual reset
- Model 247 can be field upgraded with a No. 2 switch to add low water cut-off function
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 30 psi (2.1 kg/cm<sup>2</sup>)



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	10.2	61.2	125 VA at 120 or 240 VAC 60 Hz
240 VAC	5.1	30.6	

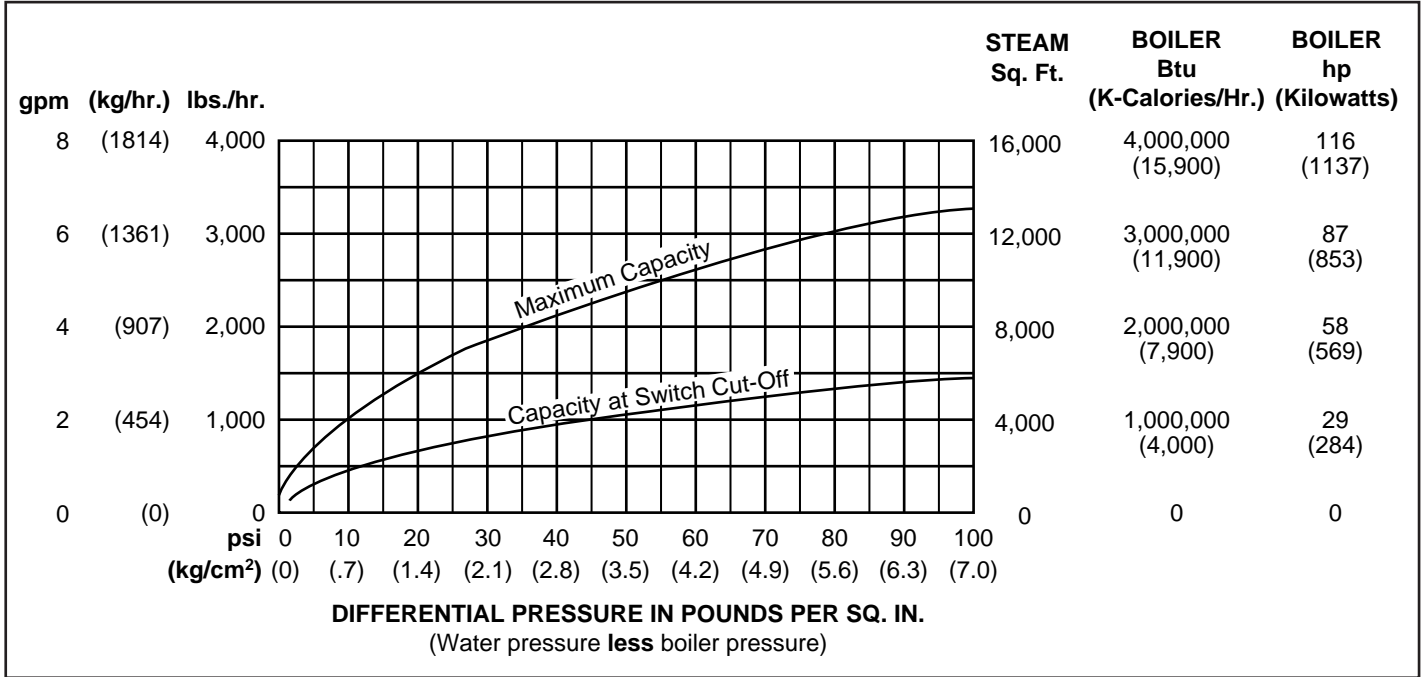
### Dimensions, in. (mm)

A	B NPT	C	D	E	F	G	H NPT	J	K
6½ (165)	1	9⅞ (232)	5⅞ (130)	4⅝ (117)	2⅝ (67)	7⅝ <sub>16</sub> (186)	½	1⅓ <sub>32</sub> (35.7)	1 <sup>29</sup> / <sub>32</sub> (48.4)

## Water Feeders – Mechanical

### Series 247 (continued) Mechanical Water Feeders

#### Capacities



#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
247	133700	Mechanical water feeder	22.0 (10.0)
247-2	133800	247 w/No. 2 switch	22.5 (10.2)
247-2-M	133900	247-2 w/manual reset	22.5 (10.2)

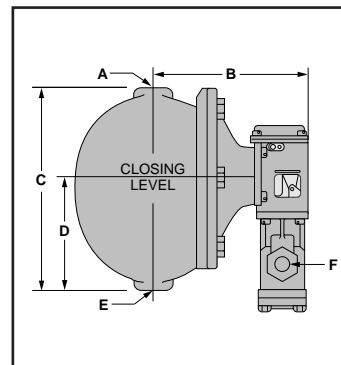
## Water Feeders – Mechanical

### Series 51/51-2 Mechanical Water Feeders/Low Water Cut-Offs

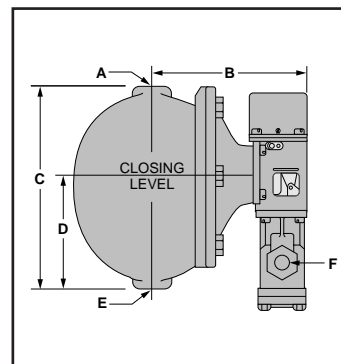
- For low pressure steam and hot water boilers larger than 5,000 sq. ft. (465m<sup>2</sup>) capacity with **cold water feed**
- Quick-change replaceable cartridge valve and strainer
- Optional features
  - No. 2 switch
  - Manual reset
  - Float block
- Proportional feed action
- Model 51 can be field upgraded with a No. 2 switch to add low water cut-off function
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 35 psi (2.5 kg/cm<sup>2</sup>)



**Series 51**



**Series 51-2**



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	10.2	61.2	125 VA at 120 or 240 VAC 60 Hz
240 VAC	5.1	30.6	

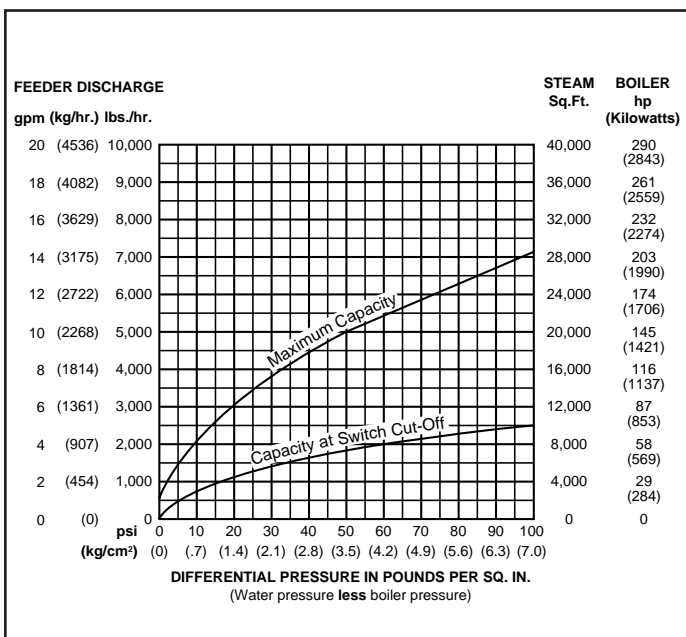
### Dimensions, in. (mm)

A	B	C	D	E	F
NPT				NPT	NPT
1	8 (203)	10 <sup>3</sup> / <sub>8</sub> (264)	5 <sup>3</sup> / <sub>4</sub> (146)	1	<sup>3</sup> / <sub>4</sub>

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
51	134700	Mechanical water feeder	35.3 (16.0)
51-B	134800	51 w/float block	38.5 (17.5)
51-B-2	135400	51-B w/Series 2 switch	38.3 (17.4)
51-B-2-M	135500	51-B-2 w/manual reset	38.3 (17.4)
51-2	135000	51 w/Series 2 switch	35.8 (16.2)
51-2-M	135200	51-2 w/manual reset	35.7 (16.2)

### Capacities



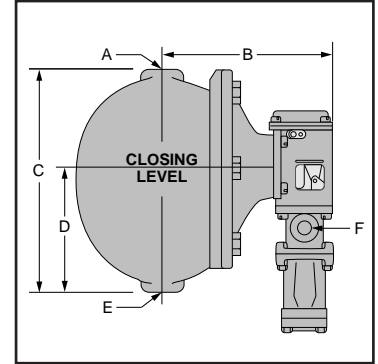
# Water Feeders – Mechanical

## Series 51-S/51-S-2 Mechanical Water Feeders/Low Water Cut-Offs

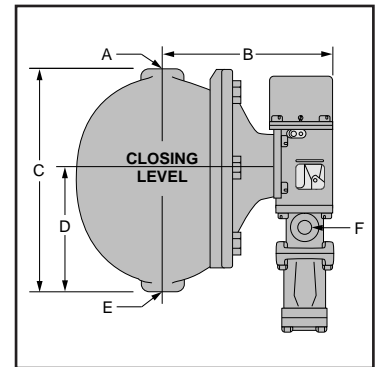
- For high capacity [up to 35,000 sq. ft. (3250m<sup>2</sup>)] low pressure steam and hot water boilers with **cold water feed**
- Optional features
  - No. 2 switch
  - Manual reset
  - Float block
- Proportional feed action
- Maximum water supply pressure 100 psi (7 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 35 psi (2.5 kg/cm<sup>2</sup>)



**Series 51-S**



**Series 51-S-2**



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	10.2	61.2	125 VA at 120 or 240 VAC 60 Hz
240 VAC	5.1	30.6	

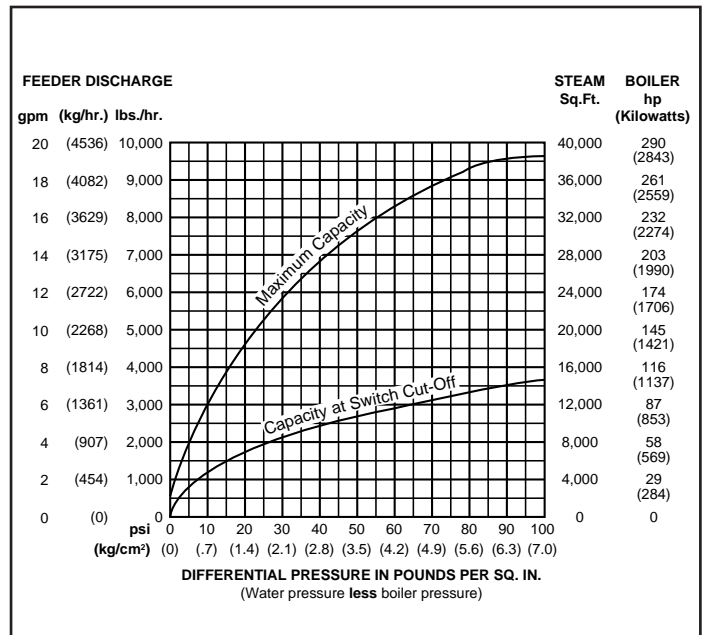
### Dimensions, in. (mm)

A	B	C	D	E	F
NPT				NPT	NPT
1	8 1/8 (203)	10 3/8 (264)	5 3/4 (146)	1	3/4

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
51-S	135600	Mechanical water feeder	36.5 (16.6)
51-S-2	135900	51-S w/No. 2 switch	37.3 (16.9)
51-S-2-M	136000	51-S-2 w/manual reset	37.3 (16.9)
51-SB	135700	51-S w/float block	41.8 (19.0)
51-SB-2	136300	51-SB w/No. 2 switch	41.8 (19.0)
51-SB-2-M	136100	51-SB-2 w/manual reset	43.7 (19.8)

### Capacities



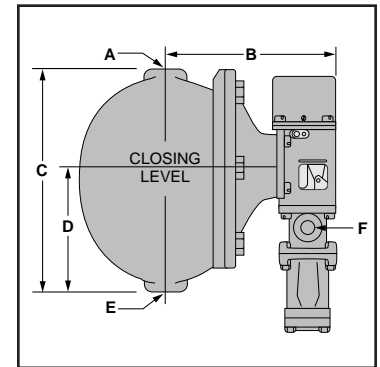
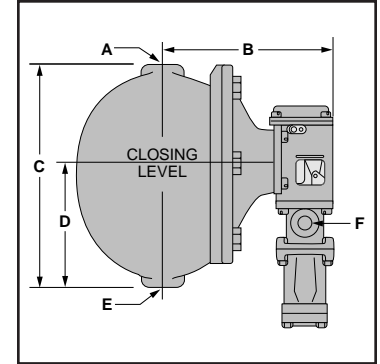
BOILER CONTROLS



## Water Feeders – Mechanical

### Series 53/53-2 Mechanical Water Feeders/Low Water Cut-Offs

- For low pressure steam and hot water boilers larger than 5,000 sq. ft. (465m<sup>2</sup>) with hot or cold water feed
- Optional features
  - No. 2 switch
  - Manual reset
  - Float block
- Proportional feed action
- Model 53 can be field upgraded with a No. 2 switch to add low water cut-off function
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 75 psi (5.3 kg/cm<sup>2</sup>)



### Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	10.2	61.2	125 VA at 120 or 240 VAC 60 Hz
240 VAC	5.1	30.6	

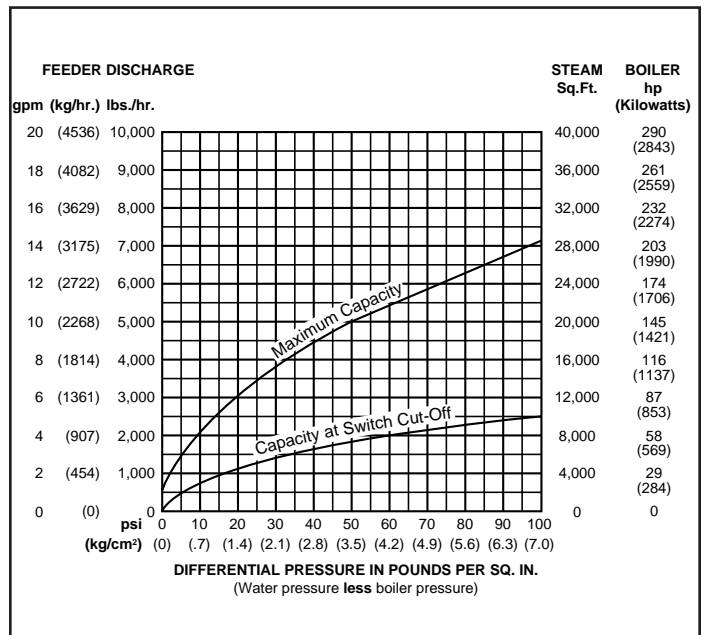
### Dimensions, in. (mm)

A	B	C	D	E	F
NPT				NPT	NPT
1	8 <sup>1</sup> / <sub>8</sub> (206)	10 <sup>3</sup> / <sub>8</sub> (264)	5 <sup>3</sup> / <sub>4</sub> (146)	1	3/4

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
53	136900	Mechanical water feeder	38.0 (17.2)
53-B	137400	53 w/float block	42.0 (19.0)
53-B-2	137500	53-B w/No. 2 switch	42.0 (19.0)
53-B-2-M	137600	53-B w/No. 2 switch & manual reset	42.0 (19.0)
53-2	137100	53 w/No. 2 switch	38.5 (17.5)
53-2-M	137200	53-2 w/manual reset	38.5 (17.5)

### Capacities



## Make-Up Water Feeders

In boiler feed systems with higher pressures, a make-up feeder is usually provided on the condensate receiver. It adds water to the receiver when necessary so there is always an adequate supply for boiler demand.

ITT McDonnell & Miller Make-up feeders provide large feeding capacity. Unless otherwise stated, valves and seats are of stainless steel and protected by a large integral strainer. Positive alignment of the valve is assured by cam & roller, straight thrust action. These feeders can be used for many other liquid control applications such as:

- Pharmaceutical
- Laboratory
- Industrial
- Distillation equipment
- Receiver tanks
- Evaporative coolers
- Humidifiers
- Aquariums
- Steam baths
- Wet and dry hygrometers

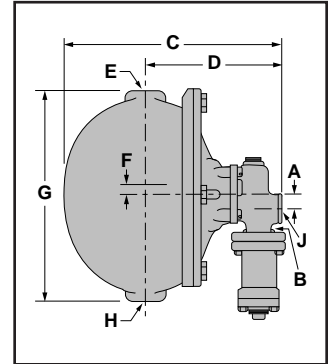
### Water Feeding Capacity lbs./hr. (kg/hr.)

Model Number	City Water Supply Pressure with 3/4" NPT Pipe and No Tank Pressure, 0 psi (kg/cm <sup>2</sup> )								
	10 (.7)	20 (1.4)	30 (2.1)	40 (2.8)	50 (3.5)	60 (4.1)	70 (4.8)	80 (5.5)	90 (6.2)
<b>25-A</b>	3100 (1406)	4500 (2041)	5600 (2540)	6550 (2971)	7400 (3357)	8150 (3697)	8800 (3992)	9400 (4264)	10200 (4627)
<b>21 &amp; 221</b>	4100 (1860)	6000 (2722)	7500 (3402)	8600 (3901)	9600 (4355)	10500 (4763)	11300 (5126)	12000 (5443)	13200 (5988)
<b>847</b>	1000 (454)	1500 (680)	1800 (816)	2100 (953)	2400 (1089)	2600 (1179)	2800 (1270)	3000 (1361)	3300 (1497)
<b>851</b>	2000 (907)	3000 (1361)	3700 (1678)	4300 (1850)	4800 (2177)	—	—	—	—
<b>851-S</b>	3000 (1361)	4000 (1814)	5000 (2268)	6200 (2812)	—	—	—	—	—
<b>551-S</b>	2500 (1134)	3600 (1633)	4500 (2041)	5200 (2359)	5800 (2631)	6500 (2948)	7000 (3175)	7600 (3447)	8800 (3992)

# Water Feeders – Make-Up

## Series 25-A Make-Up Water Feeder

- For boiler receiver tanks
- Float operated
- Proportional feed action
- Soft seat provides positive seal
- Seal between float chamber and valve chamber is not a positive seal
- Maximum water supply pressure 100 psi (7 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 35 psi (2.5 kg/cm<sup>2</sup>)



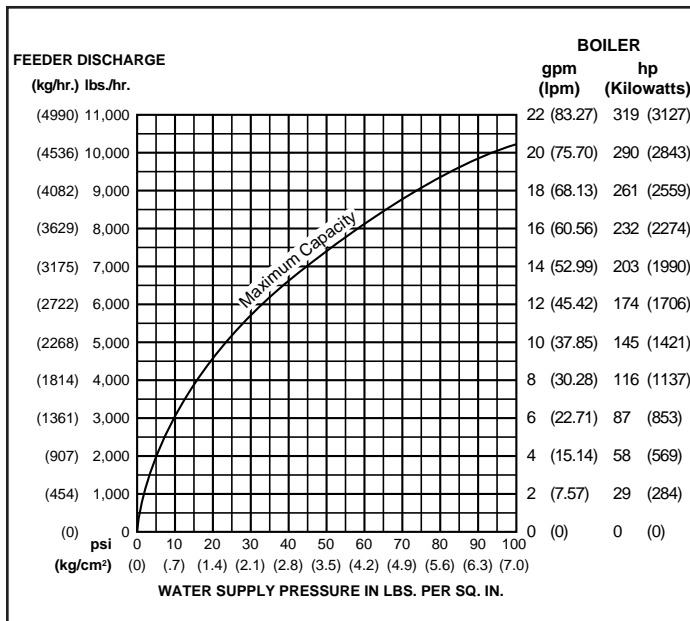
### Dimensions, in. (mm)

A	B NPT	C	D	E NPT	F	G	H NPT	J NPT
13/16 (21)	3/4	12 1/4 (311)	8 1/8 (206)	1	1/2 (12.7)	10 3/8 (264)	1	3/4

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
25-A	126800	Make-up water feeder	37.5 (17)
25-AB	126900	25-A w/float block	41.8 (19)

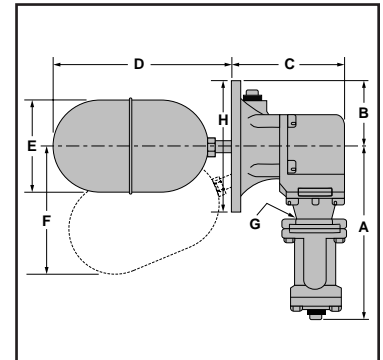
### Capacities



## Water Feeders – Make-Up

### Series 21 Make-Up Water Feeder

- For boiler receiver tanks
- Direct mounting eliminates need for equalizing connections
- Proportional feed action
- Mounting Flange – six  $\frac{7}{16}$ " (11.1mm) bolt holes on a  $5\frac{3}{4}$ " (146mm) bolt circle
- Soft seat provides positive seal
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 35 psi (2.5 kg/cm<sup>2</sup>)

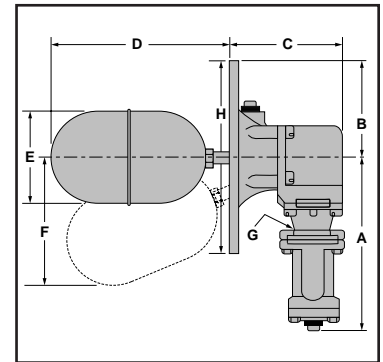


#### Dimensions, in. (mm)

A	B	C	D	E	F	G NPT	H
8½ (216)	3 <sup>5</sup> / <sub>16</sub> (84)	5 <sup>5</sup> / <sub>8</sub> (143)	8 <sup>13</sup> / <sub>16</sub> (224)	4¾ (121)	6¼ (159)	¾	6 <sup>11</sup> / <sub>16</sub> (170)

### Series 221 Make-Up Water Feeder

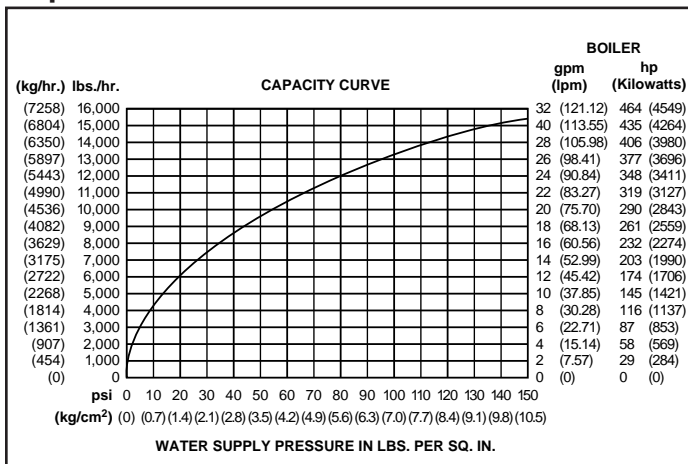
- For boiler receiver tanks
- Direct mounting eliminates need for equalizing connections
- Proportional feed action
- Mounting Flange – six  $\frac{17}{32}$ " (13.5mm) bolt holes on a  $8\frac{1}{2}$ " (216mm) bolt circle
- Soft seat provides positive seal
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 35 psi (2.5 kg/cm<sup>2</sup>)



#### Dimensions, in. (mm)

A	B	C	D	E	F	G NPT	H
8½ (216)	4 <sup>11</sup> / <sub>16</sub> (84)	5 <sup>5</sup> / <sub>8</sub> (143)	8 <sup>13</sup> / <sub>16</sub> (224)	4¾ (121)	6¼ (159)	¾ (20)	9½ (241)

#### Capacities



#### Ordering Information

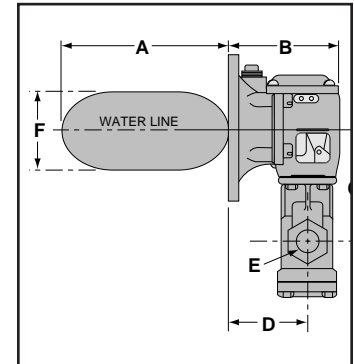
Model Number	Part Number	Description	Weight lbs. (kg)
21	126400	Make-up water feeder	15.3 (6.9)
221	126600	Make-up water feeder	21.3 (9.7)

BOILER CONTROLS

## Water Feeders – Make-Up

### Series 847 Make-Up Water Feeder

- For receiver tanks in commercial or industrial applications
- Mounts directly on the receiver, eliminating need for equalizing connections
- Quick-change replaceable cartridge valve and strainer
- Proportional feed action
- Mounting Flange – six  $\frac{7}{16}$ " (11.1mm) bolt holes on a  $5\frac{3}{4}$ " (146mm) bolt circle
- Optional features
  - No. 2 switch
  - Alternate valve orientation
- Maximum supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum receiver pressure 25 psi (1.8 kg/cm<sup>2</sup>)



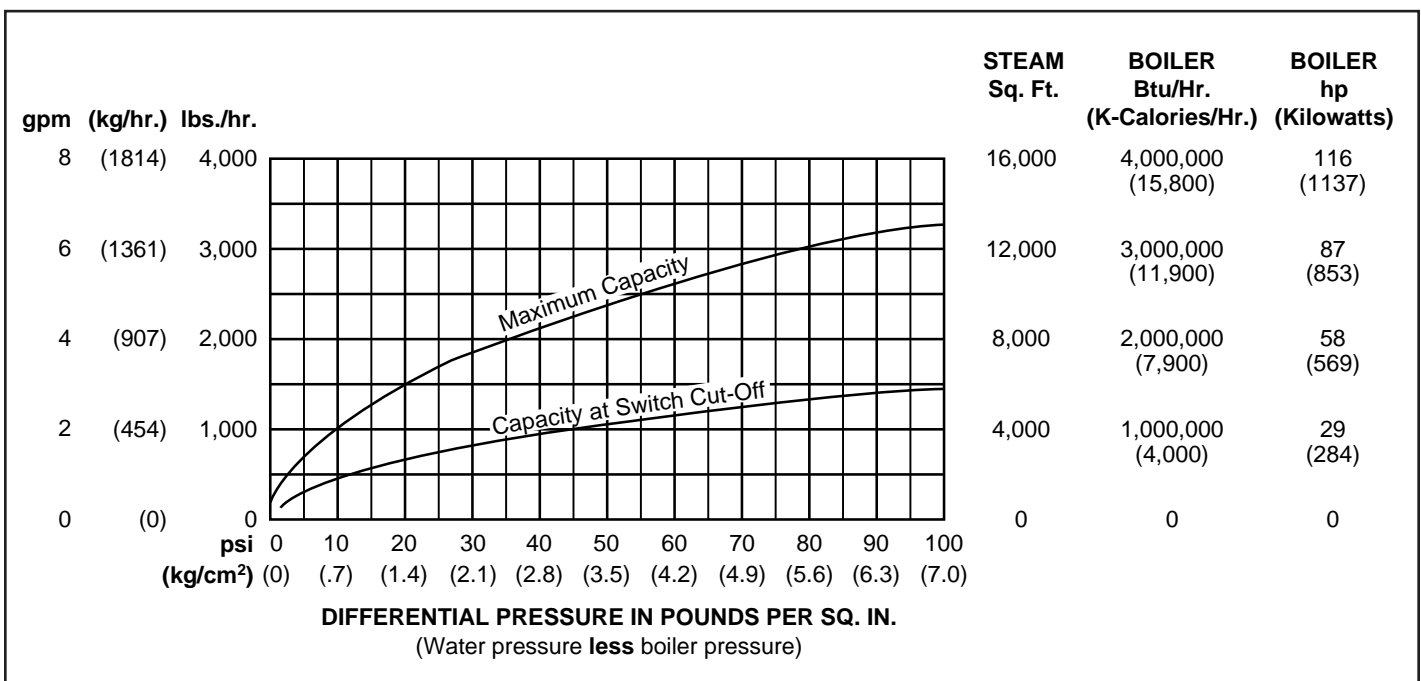
#### Dimensions, in. (mm)

A	B	C	D	E	F
$7\frac{5}{16}$ (186)	$4\frac{15}{16}$ (125)	$4\frac{5}{8}$ (117)	$3\frac{9}{16}$ (90)	$\frac{1}{2}$ NPT	$3\frac{7}{16}$ (87)

#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
847	134300	Make-up water feeder	11 (5.0)
847-C	134350	847 w/alternate valve orientation	12 (5.4)
847-C-2	134400	847-C w/No. 2 switch	12 (5.4)

#### Capacities



## Water Feeders – Make-Up

### Series 851 Make-Up Water Feeder

- For receiver tanks in commercial or industrial applications
- Mounts directly on the receiver, eliminating need for equalizing connections
- Quick-change replaceable cartridge valve and strainer
- Proportional feed action
- Mounting Flange – six 7/16" (11.1mm) bolt holes on a 5 3/4" (146mm) bolt circle
- Maximum water supply pressure 150 psi (10.5 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum receiver pressure 35 psi (2.5 kg/cm<sup>2</sup>)

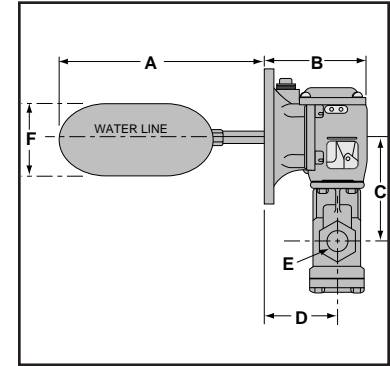
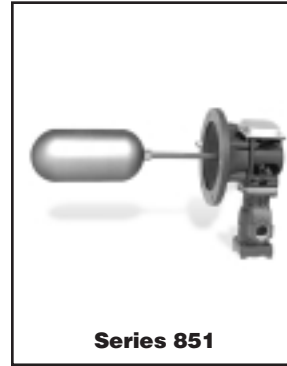
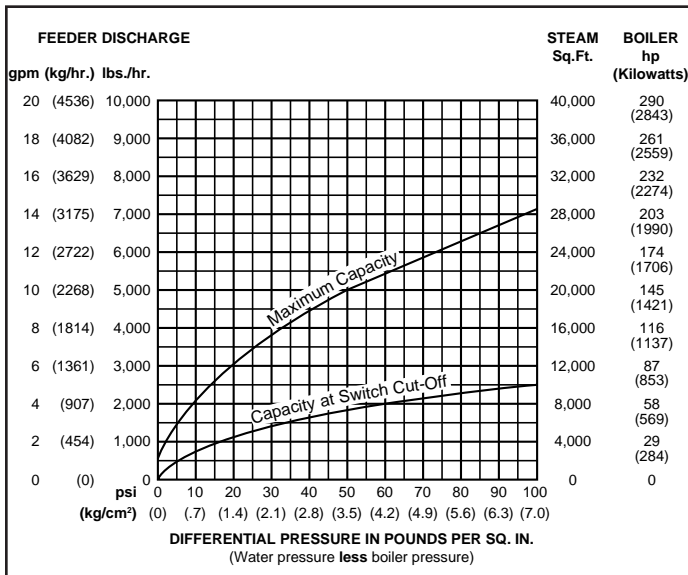
### Model 851-S Make-Up Water Feeder

- Extended float and rod assembly
- Wider operating range
- Maximum water supply pressure 100 psi (7 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum receiver pressure 35 psi (2.5 kg/cm<sup>2</sup>)

#### Ordering Information

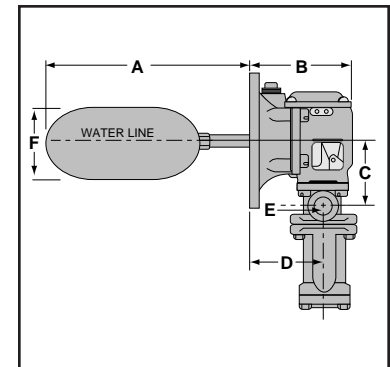
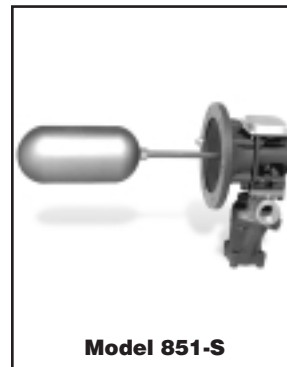
Model Number	Part Number	Description	Weight lbs. (kg)
851	136700	Make-up water feeder	14 (6.4)
851-S	136800	851 w/extended float & rod assy.	16 (7.3)

#### Capacities – Model 851



#### Dimensions, in. (mm)

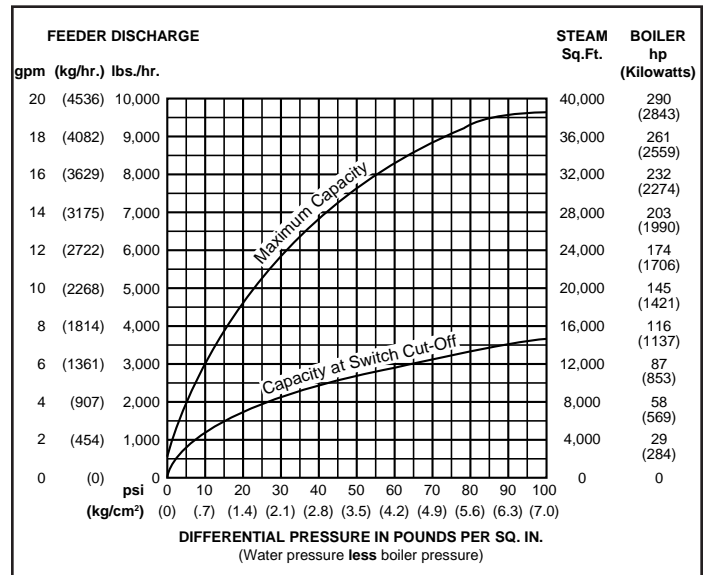
A	B	C	D	E NPT	F
11 3/4 (298)	4 15/16 (125)	4 5/8 (117)	3 9/16 (90)	3/4	3 7/16 (87)



#### Dimensions, in. (mm)

A	B	C	D	E NPT	F
11 3/4 (298)	4 15/16 (125)	3 3/16 (81)	3 9/16 (90)	3/4	3 7/16 (87)

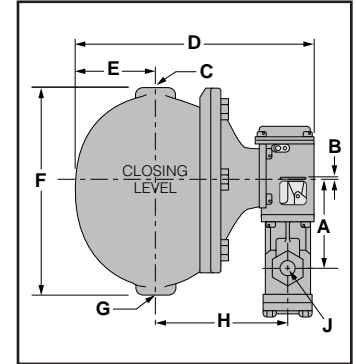
#### Capacities – Model 851-S



## Water Feeders – Make-Up

### Series 551-S Make-Up Water Feeder

- For applications where water is added to steam separators, receivers, tanks, or other vessels
- Proportional feed action
- Quick-change replaceable cartridge valve and strainer
- Optional features
  - Float Block
- Maximum water supply pressure 75 psi (5.3 kg/cm<sup>2</sup>)
- Maximum inlet water temperature 120°F (49°C)
- Maximum vessel pressure 25 psi (1.8 kg/cm<sup>2</sup>)



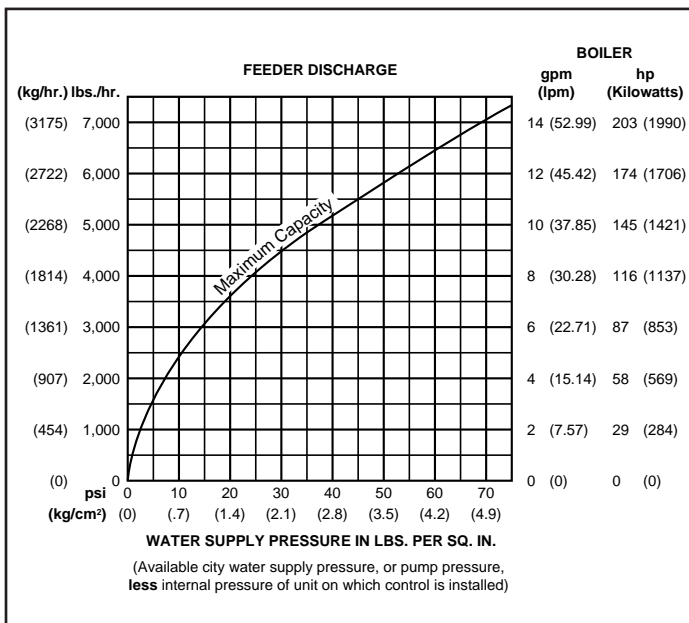
#### Dimensions, in. (mm)

A	B	C NPT	D	E	F	G NPT	H	J NPT
4 <sup>5</sup> / <sub>8</sub> (117)	1 <sup>1</sup> / <sub>8</sub> (3.2)	1	12 <sup>1</sup> / <sub>4</sub> (311)	4 <sup>1</sup> / <sub>8</sub> (105)	10 <sup>3</sup> / <sub>8</sub> (264)	1	6 <sup>11</sup> / <sub>16</sub> (170)	3 <sup>3</sup> / <sub>4</sub>

#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
551-S	136400	Make-up water feeder	35.8 (16.2)
551-SB	136500	551-S w/float block	35.8 (16.2)

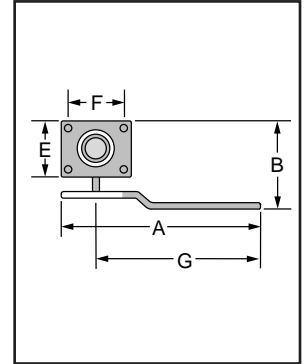
#### Capacities



## Valves

### Series 14-B Ball Type Blow Down Valve

- For McDonnell & Miller Series 47, 67 and 70 boiler control blow down valve replacement
- Full-ported ball action valve
- Teflon® seats provide bind free, leak tight ball movement
- Easy open handle keeps hands away from hot water and steam
- Gasket and mounting screws included
- Maximum pressure 30 psi (1.8 kg/cm<sup>2</sup>)
- See page 152 for blow-down information

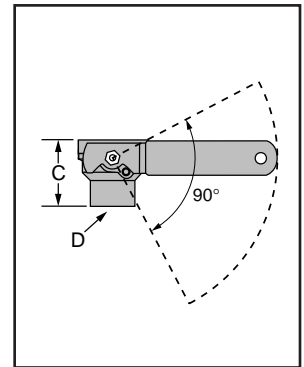


#### Dimensions, in. (mm)

A	B	C	D NPT	E	F	G
6¾ (171.4)	4 (102)	2¼ (57)	¾	2⅝ (60)	2½ (64)	5¾ (146)

#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
14-B	310447	Blow down valve	1 (.5)



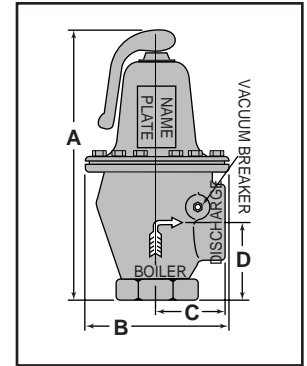
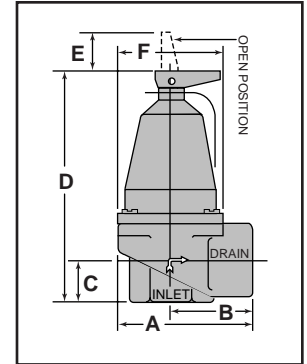
BOILER CONTROLS



# Valves

## Series 250 Pressure Relief Valves

- For tanks and hydronic heating systems
- Protects against over-pressure
- Minimizes hammering with flash steam
- Low differential pressure – 3 psi (.21 kg/cm<sup>2</sup>) between opening and closing
- Meets ASME Pressure Vessel and Boiler Code, Section IV
- Sizes and material
  - 3/4" - 1" NPT – bronze body and seat
  - 2" NPT – cast iron body, brass seat
- EPDM rubber diaphragm and seat disc
- Maximum temperature 250°F (121°C)
- Maximum operating pressure range 30 - 125 psig (2.1 - 8.8 kg/cm<sup>2</sup>)



### Dimensions, in. (mm)

Size NPT	A	B	C	D	E	F
3/4	2 9/16 (65)	1 1/2 (38)	3/4 (20)	4 9/16 (116)	1 1/32 (26)	2 3/32 (53.2)
1	2 7/8 (73)	1 3/4 (45)	7/8 (22)	4 15/16 (125)	1 1/32 (26)	2 1/4 (57)
2	6 (152)	2 7/8 (73)	3 1/4 (83)	11 (279)	—	—

BOILER CONTROLS

**Series 250**  
**Pressure Relief Valves**

**Performance**

Model Number	Opening Pressure psig (kg/cm <sup>2</sup> )	ASME Rating BTUH (K-Calories)
250-3/4IN-15	15 (1)	515,000 (2,043)
250-3/4IN-30	30 (2.1)	790,000 (3,134)
250-3/4IN-36	36 (2.5)	900,000 (3,571)
250-3/4IN-40	40 (2.8)	973,000 (3,861)
250-3/4IN-45	45 (3.2)	1,065,000 (4,226)
250-3/4IN-50	50 (3.5)	1,160,000 (4,603)
250-3/4IN-60	60 (4.2)	1,252,000 (4,968)
250-3/4IN-75	75 (5.3)	1,615,000 (6,409)
250-3/4IN-100	100 (7)	2,075,000 (8,234)
250-3/4IN-125	125 (8.8)	2,535,000 (11,059)
250-1IN-15	15 (1)	770,000 (3,056)
250-1IN-30	30 (2.1)	1,170,000 (4,642)
250-1IN-36	36 (2.5)	1,330,000 (5,278)
250-1IN-40	40 (2.8)	1,437,000 (5,702)
250-1IN-45	45 (3.2)	1,575,000 (6,250)
250-1IN-50	50 (3.5)	1,710,000 (6,786)
250-1IN-65	65 (4.6)	2,110,000 (8,373)
250-1IN-75	75 (5.3)	2,385,000 (9,464)
250-1IN-100	100 (7)	3,060,000 (12,142)
250-1IN-125	125 (8.8)	3,735,000 (14,821)
250-2IN-30	30 (2.1)	4,100,000 (16,270)
250-2IN-36	36 (2.5)	4,600,000 (18,254)
250-2IN-40	40 (2.8)	5,000,000 (19,841)
250-2IN-45	45 (3.2)	5,500,000 (21,825)
250-2IN-50	50 (3.5)	5,900,000 (23,412)

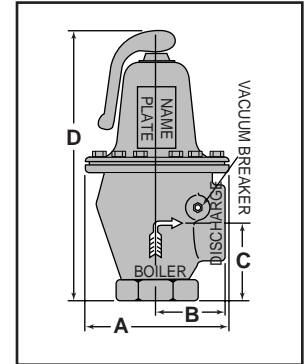
**Ordering Information**

Model Number	Part Number	Description	Weight lbs. (kg)
250-3/4IN-15	181220	Relief Valve 3/4 NPT, 15 psi (1 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-30	181225	Relief Valve 3/4 NPT, 30 psi (2.1 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-36	181325	Relief Valve 3/4 NPT, 36 psi (2.5 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-40	181405	Relief Valve 3/4 NPT, 40 psi (2.8 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-45	181425	Relief Valve 3/4 NPT, 45 psi (3.2 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-50	181525	Relief Valve 3/4 NPT, 50 psi (3.5 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-60	181905	Relief Valve 3/4 NPT, 60 psi (4.2 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-75	181625	Relief Valve 3/4 NPT, 75 psi (5.3 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-100	181725	Relief Valve 3/4 NPT, 100 psi (7 kg/cm <sup>2</sup> )	1.3 (.6)
250-3/4IN-125	181825	Relief Valve 3/4 NPT, 125 psi (8.8 kg/cm <sup>2</sup> )	1.3 (.6)
250-1IN-15	181920	Relief Valve 1 NPT, 15 psi (1 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-30	181925	Relief Valve 1 NPT, 30 psi (2.1 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-36	182025	Relief Valve 1 NPT, 36 psi (2.5 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-40	182030	Relief Valve 1 NPT, 40 psi (2.8 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-45	182125	Relief Valve 1 NPT, 45 psi (3.2 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-50	182225	Relief Valve 1 NPT, 50 psi (3.5 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-65	182235	Relief Valve 1 NPT, 65 psi (4.6 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-75	182325	Relief Valve 1 NPT, 75 psi (5.3 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-100	182425	Relief Valve 1 NPT, 100 psi (7 kg/cm <sup>2</sup> )	1.5 (.7)
250-1IN-125	182525	Relief Valve 1 NPT, 125 psi (8.8 kg/cm <sup>2</sup> )	1.5 (.7)
250-2IN-30	183025	Relief Valve 2 NPT, 30 psi (2.1 kg/cm <sup>2</sup> )	17.3 (7.8)
250-2IN-36	183125	Relief Valve 2 NPT, 36 psi (2.5 kg/cm <sup>2</sup> )	17.3 (7.8)
250-2IN-40	183175	Relief Valve 2 NPT, 40 psi (2.8 kg/cm <sup>2</sup> )	17.3 (7.8)
250-2IN-45	183225	Relief Valve 2 NPT, 45 psi (3.2 kg/cm <sup>2</sup> )	17.3 (7.8)
250-2IN-50	183325	Relief Valve 2 NPT, 50 psi (3.5 kg/cm <sup>2</sup> )	17.3 (7.8)

# Valves

## Series 260 Pressure Relief Valves

- For water tanks and hydronic heating systems
- Protects against over-pressure
- Minimizes hammering with flash steam
- Low differential pressure – 3 psi (.21 kg/cm<sup>2</sup>) between opening and closing
- Meets ASME Pressure Vessel and Boiler Code, Section IV
- Sealed spring chamber prevents scale or sediment build-up around seal
- 1½" NPT Inlet and 2" NPT Discharge
- Cast iron body, brass seat
- Maximum temperature 250°F (121°C)
- Maximum operating pressure range 30 - 50 psig (2.1 - 3.5 kg/cm<sup>2</sup>)



BOILER CONTROLS

### Dimensions, in. (mm)

Size		A	B	C	D
NPT Inlet	NPT Outlet				
1½	2	6 (152)	2⅞ (73)	3¼ (83)	11 (279)

### Performance

Model Number	Opening Pressure psig (kg/cm <sup>2</sup> )	ASME Rating BTUH (K-Calories)
260-1 1/2IN-30	30 (2.1)	3,300,000 (13,095)
260-1 1/2IN-36	36 (2.5)	3,800,000 (15,079)
260-1 1/2IN-40	40 (2.8)	4,100,000 (16,270)
260-1 1/2IN-45	45 (3.2)	4,500,000 (17,857)
260-1 1/2IN-50	50 (3.5)	4,900,000 (19,444)

### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
260-1 1/2IN-30	182625	Relief Valve 1½ NPT, 30 psi (2.1 kg/cm <sup>2</sup> )	17.3 (7.8)
260-1 1/2IN-36	182725	Relief Valve 1½ NPT, 36 psi (2.5 kg/cm <sup>2</sup> )	17.3 (7.8)
260-1 1/2IN-40	182730	Relief Valve 1½ NPT, 40 psi (2.8 kg/cm <sup>2</sup> )	17.3 (7.8)
260-1 1/2IN-45	182825	Relief Valve 1½ NPT, 45 psi (3.2 kg/cm <sup>2</sup> )	17.3 (7.8)
260-1 1/2IN-50	182925	Relief Valve 1½ NPT, 50 psi (3.5 kg/cm <sup>2</sup> )	17.3 (7.8)

# Valves

## Series TC-4 Test-N-Check® Valves



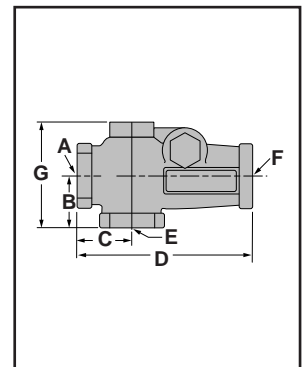
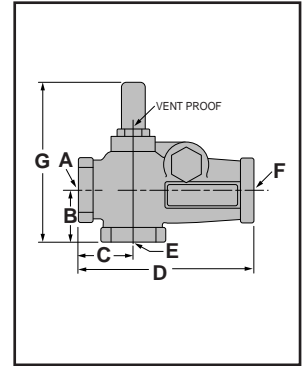
- For hot water boilers
- Simplifies ASME CSD-1a. code mandated testing of low water cut-offs by eliminating the need to drain the system
- Includes one upper and one lower valve for mounting at crosses in equalizing lines
- Restricts water flow when the low water cut-off's blow down valve is open
- Adjustable built-in vacuum breaker in upper valve provides rapid evacuation of water from the float chamber
- 1" NPT
- Maximum temperature 250°F (121°C)
- Maximum pressure 160 psi (11 kg/cm<sup>2</sup>)

### Dimensions, in. (mm)

A NPT	B	C	D
1	1½ (38)	1½ (38)	5 (125)

E NPT	F NPT	G	
		Upper	Lower
1	1	5¼ (133)	3¼ (78)



### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
TC-4	195000	Test-N-Check Valves, set of 2	5.3 (.4)

BOILER CONTROLS