

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
- 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)

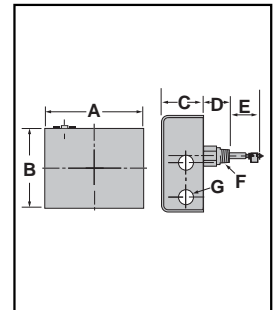
**NOW WITH
SELF-CLEANING
PROBE!**



Series 750
Control Unit



750P-MT-120
750P-MT-U-120



Ordering Information

(Remote sensor must be ordered separately ((see page 72-74)

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 ³ / ₈ (162)	5 ¹ / ₈ (130)	2 ⁹ / ₁₆ (65)	1 ⁹ / ₁₆ (40)	3 ¹ / ₁₆ (78)	2 ¹ / ₈ (54)	1 ⁹ / ₁₆ (40)	³ / ₄	³ / ₄ (20)

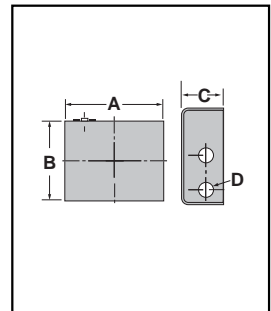
High Water Cut-Offs – Electronic For Steam Boilers

NEW

 Model 750-HW-MT-120   

The 750-HW-MT-120 control provides continuous protection against a **HIGH WATER** condition in steam boilers and other water level applications. It can be wired to provide alarm, turn off boiler or turn off water feeder pumps when a **HIGH WATER** condition occurs. The manual reset function will require the unit be reset after water has dropped below the level of the probe.

- For commercial or industrial applications
- Primary or secondary control on hot water boilers
- Green LED power indicating light
- Red LED **HIGH WATER** indicating light
- Manual Reset
- Test switch
- 20,000 ohms sensitivity
- NEMA 1 enclosure
- Maximum ambient temperature 120°F (49°C)


 Model 750-HW-MT-120
Control Unit


Ordering Information

(Remote sensor must be ordered separately (see page 72-74))

Model Number	Part Number	Description	Weight lbs. (kg)
750-HW-MT-120	176236	Manual reset	2 (.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
6 ³ / ₈ (162)	5 ¹ / ₈ (130)	2 ⁹ / ₁₆ (65)	3/4 (20)

Low Water Cut-Offs – Electronic For Steam Boilers

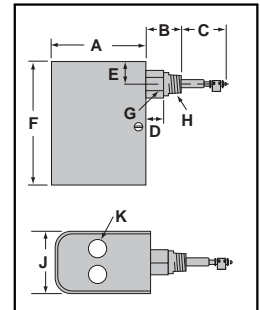
New and Improved

Series PS-800 Low Water Cut-Offs



NOW WITH SELF-CLEANING PROBE!

- For residential and commercial applications
 - Electronic operation
- New Features:
- User-friendly diagnostics
 - Red low water and shorted probe LED
 - Green power and test LED
 - 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 tappings
 - Test button standard on all models
 - Options available include
 - Manual reset
 - Extended barrel and remote sensor 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/cm²)
 - 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		
4 1/4 (108)	1 1/16 (40)	3 1/16 (78)	2 1/8 (54)	1 3/8 (35)	2 1/8 (54)	1 7/16 (40)	3/4 (20)	1 3/16 (21)	5 13/16 (148)	1 3/8 (35)	3/4 NPT	1/2 NPT	2 7/8 (73)	7/8 (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



NOW WITH
SELF-CLEANING
PROBE!

- 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/cm²)
- 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	

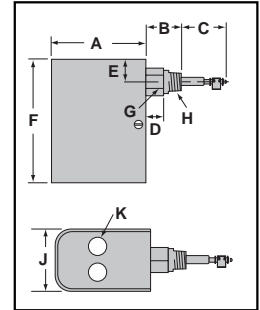
Dimensions, in. (mm)

A	B		C				D	E	F	G	H		J	K
	All	U	Std	SP	RX2	U					All	RX		
4¼ (108)	1⅞ (40)	3⅞ (78)	2½ (54)	1⅞ (35)	2⅞ (54)	1⅞ (40)	¾ (20)	1⅜ (21)	5⅜ (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.



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	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	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)

Low Water Cut-Offs – Electronic

RB-24E

Low Water Cut-Offs



- Brass threads enable a secure and trouble-free installation
- Test button to confirm proper operation
- Universal wiring harness fits 100% of today's gas boilers
- -S, -A and -L models provide “plug & play” installation with most residential boilers
- Compact size
- Easy to install and wire
- Automatic reset feature resumes operations after a power outage when water is on probe
- Green LED indicating power is on
- Red LED indicating low water condition
- 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 of 160 psi (11.2 kg/cm3)

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)

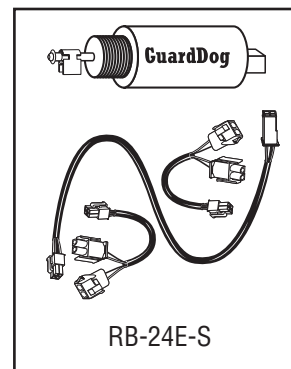
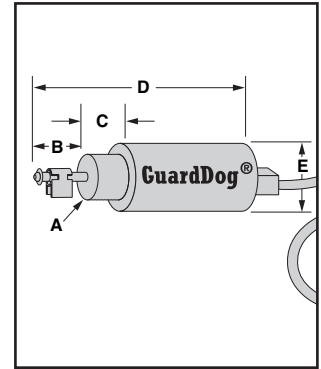
A NPT	B	C	D	E
3/4	1 3/16 (30.2)	1 3/16 (30.2)	5 3/4 (180)	1 7/8 (47.6)

Ordering Information

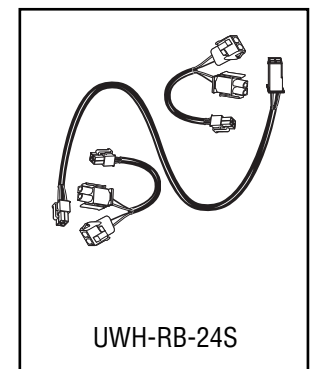
Model Number	Part Number	Description
RB-24E	144692	Residential LWCO
RB-24E-A	144694	Residential LWCO w/vent damper harness
RB-24E-S	144693	Residential LWCO w/control board harness
RB-24E-L	144690	Residential LWCO w/burner control harness
UWH-RB-24A	144681	Replacement cable for RB-24E-A
UWH-RB-24S	144682	Replacement cable for RB-24E-S
UWH-RB-24L	144691	Replacement cable for RB-24E-L



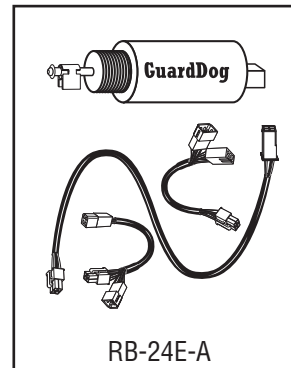
RB-24E



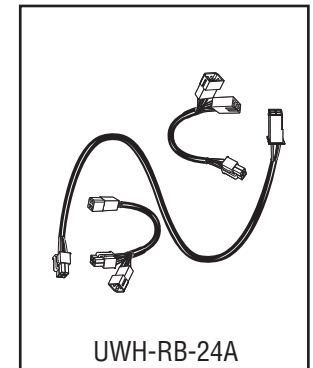
RB-24E-S



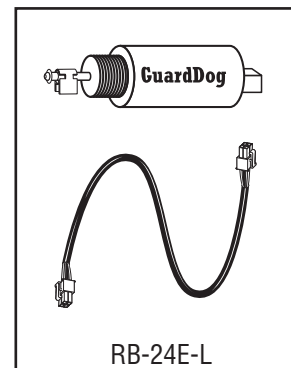
UWH-RB-24S



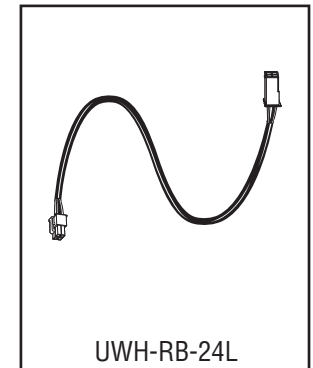
RB-24E-A



UWH-RB-24A



RB-24E-L



UWH-RB-24L

Low Water Cut-Offs – Electronic For Hot Water Boilers

NEW

RB-122-E Low Water Cut-Offs

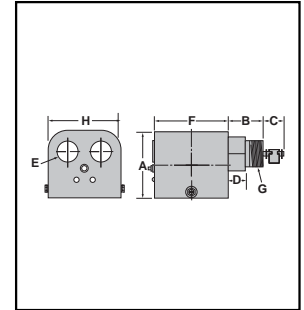


- For residential applications
- Electronic operation
- Easy to install and wire
- Red low water indicating LED
- Green power indicating LED
- Now with test button
- Automatic reset
- No blow down required
- 20,000 ohms probe sensitivity
- Maximum ambient temperature 120°F (49°C)
- Maximum water temperature 250°F (121°C)
- Maximum water pressure 160 psi (11.2 kg/cm²)

**NOW WITH
SELF-CLEANING
PROBE!**



Series RB-122-E



Electrical Ratings

Voltage	Power Consumption	Load Switching
120 VAC	3.1 VA	5.8 A at 120 VAC

Dimensions, in. (mm)

A	B	C	D	E	F	G NPT	H
2 ³ / ₄ (70)	1 ⁵ / ₈ (51)	1 ³ / ₈ (35)	3 ⁴ / ₄ (20)	7 ⁸ / ₈ (22)	3 ¹³ / ₁₆ (99)	3 ⁴ / ₄	3 ³ / ₁₆ (81)

Ordering Information

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

**NOW WITH
SELF-CLEANING
PROBE!**

Low Water Cut-Offs – Electronic For Hot Water Boilers

RB-120



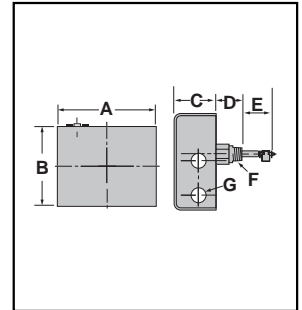
Low Water Cut-Offs



- 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/cm²)



Series RB-120



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 ³ / ₈ (162)	5 ¹ / ₈ (130)	2 ⁹ / ₁₆ (65)	1 ⁵ / ₈ (41)	1 ³ / ₈ (35)	³ / ₄ (20)	⁷ / ₈

Ordering Information

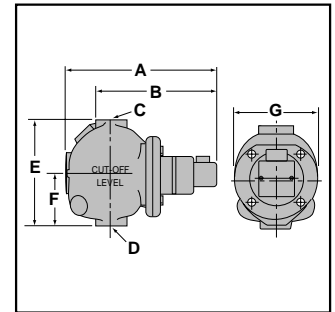
Model Number	Part Number	Description	Weight lbs. (kg)
RB-120	144675	Low water cut-off	3.8 (1.7)

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/cm²)



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 ¹⁵ / ₁₆ (252)	7 ¹ / ₁₆ (189)	1	1	6 ¹ / ₂ (165)	3 ¹ / ₁₆ (79)	5 ¹ / ₁₆ (130)

Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
61	140100	Low water cut-off	13.5 (6.1)

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

Series 63

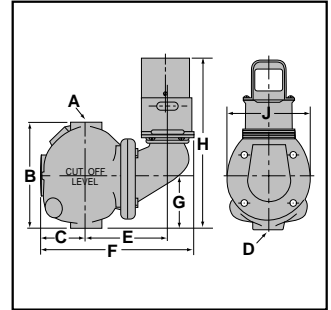
Low Water Cut-Offs



- For residential, commercial, and industrial applications
- Heavy duty
- Includes No. 2 switch
- Optional manual reset available
- Maximum boiler pressure 50 psi (3.5 kg/cm²)
- Use with TC-4 on hot water systems



Series 63



Electrical Ratings

Voltage	Motor Switch Rating (Amperes) 120 VDC .5 Amp		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	G	H	J
1 NPT	6½ (165)	2¾ (65)	1 NPT	5 ⁵ / ₃₂ (131)	9 ³ / ₈ (238)	3 ¹ / ₈ (79)	10½ (267)	5 ¹ / ₈ (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-M	143100	63 w/manual reset	14.0 (6.4)

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

Series 64

Low Water Cut-Offs

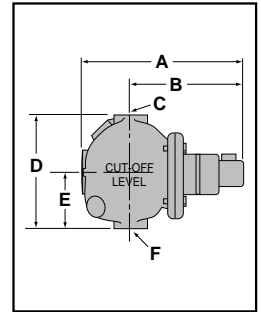

- For residential, commercial, and industrial boiler applications of any steaming capacity
- Heavy Duty
- Adjustable BX outlet for easy installation
- Dual precision switches for dependable operation of the low water cut-off and alarm or electric water feeder
- Packless bellows
- Optional manual reset available
- 1" (25mm) NPT equalizing pipes required
- Maximum boiler pressure 50 psi (3.5 kg/cm²)
- Use with TC-4 on hot water systems

Dimensions, in. (mm)

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



SERIES 64



Model 64-A


Low Water Cut-Offs

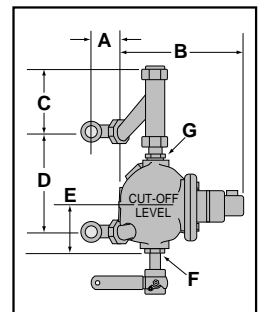
- Quick hook-up fittings provided for installation directly into gauge glass tapings

Dimensions, in. (mm)

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



Model 64-A



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

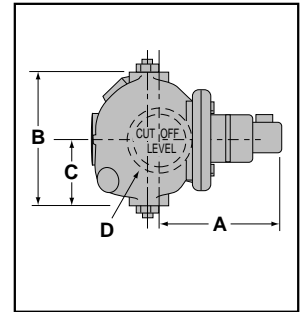
Voltage	Motor Switch Rating (Amperes)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC
240 VAC	3.7	22.2	

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/cm²)



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

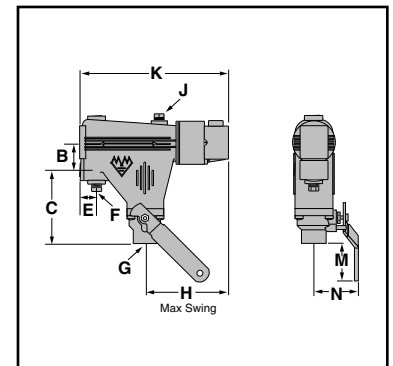
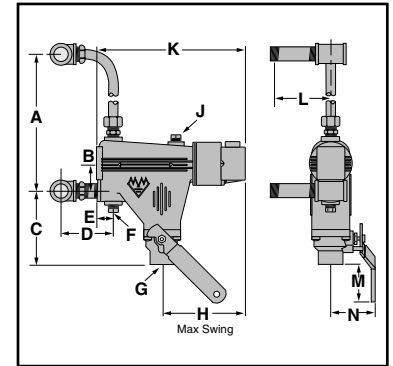
Model Number	Part Number	Description	Weight lbs. (kg)
764	144500	Low water cut-off	12.5 (5.7)

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/cm²)



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)	3⅜ (86)	1⅛ (29)	⅜	¾	5½ (140)	¼	9 ²³ / ₃₂ (247)	3 ⁹ / ₁₆ (90)	2½ (64)	2 ¹³ / ₁₆ (71)

Ordering Information

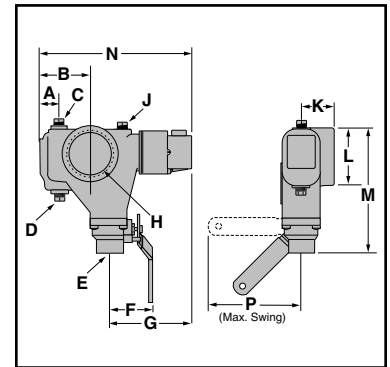
Model Number	Part Number	Description	Weight lbs. (kg)
67	149400	Low water cut-off	10 (4.5)
67-G	149600	67 for millivolt service	10 (4.5)
67-LQHU	149500	67 without quick hook-up fittings	8 (3.6)
67-M	149700	67 w/manual reset	10 (4.5)

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/cm²)



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 NPT	D NPT	E NPT	F	G	H NPT	J NPT	K	L	M	N	P
1½/32 (29.3)	3¹³/₃₂ (186.5)	¾	¾	¾	2¹³/₁₆ (71)	5³/₈ (137)	2½	¼	2³/₆₄ (51.9)	3⁵/₈ (92)	8⁵/₃₂ (207)	9¹¹/₁₆ (246.6)	5½ (140)

Ordering Information

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

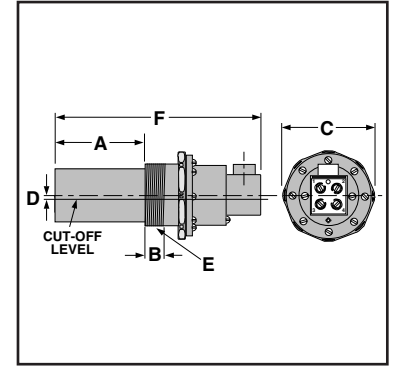
Low Water Cut-Offs – Mechanical For Steam Boilers

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 tapplings
- Insertion lengths available in 1⅜" - 4⅛" (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/cm²)



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	4⅛ (105)	1 (25)	4⅛ (105)	⅜ (3)	2½	9½ (241)
169	3⅛ (79)					
269	2¼ (57)					
369	1¾ (45)					
469, 569	1⅜ (30)					

Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
69	153900	Low water cut-off w/4⅛" (105mm) insertion length	3.7 (1.7)
69-MV-P	155000	69 w/millivolt switch	4.0 (1.8)
169	155100	69 w/3⅛" (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/1⅜" (30mm) insertion length	4.0 (1.8)
569	155700	469 w/1⅜" (30mm) insertion length w/¼" NPT tapping	4.0 (1.8)

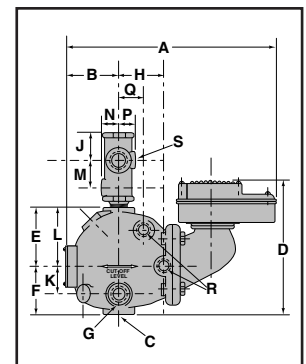
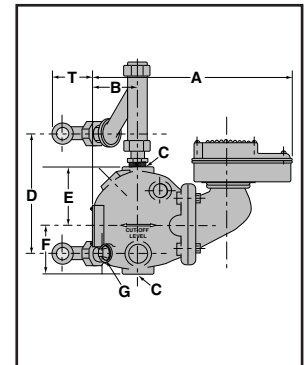
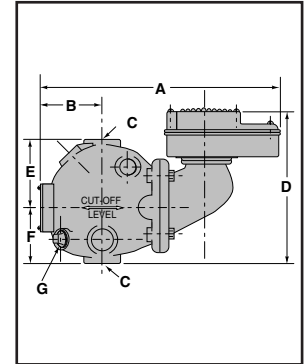
Low Water Cut-Offs Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

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/cm²)

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)
42S	129302	Combination low water cut-off/pump controller	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)

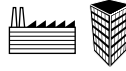
Dimensions, in. (mm)

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

Model	H	J	K	L	M	N	P	Q	R NPT	S NPT	T
42S-N	2 ⁹ / ₁₆ (65)	2 ⁹ / ₁₆ (65)	1¾ (45)	3 ¹¹ / ₁₆ (94)	1 ¹³ / ₁₆ (46)	1 ¹ / ₁₆ (27)	1 ¹ / ₁₆ (27)	1½ (38)	¾	¼	2 ⁵ / ₈ (67)

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/cm²)
- For new electronic 150E Series see page 37

Model 150S-MD

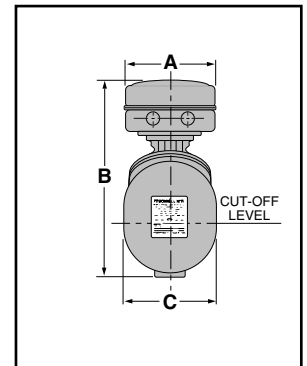
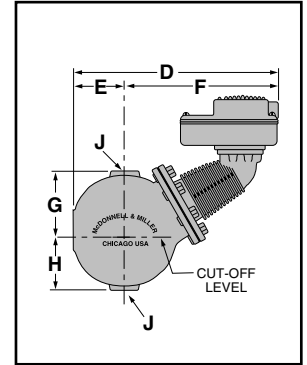
Maximum differential operation

- Prevents nuisance burner shutdowns in low pressure applications
- Maximum operating pressure 50 psi (3.5 kg/cm²)
- For additional information see page 48



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
240 VAC	3.7	22.2	120 or 240 VAC

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-MD	171802	150S w/maximum differential	24.7 (11.2)
150S-M	172702	150S w/manual reset	24.7 (11.2)
150S-M-MD	172802	150S-M w/maximum differential	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 ⁷ / ₈ (149)	12 ⁷ / ₁₆ (316)	6 (152)	13 ¹ / ₄ (337)

E	F	G	H	J
3 ⁵ / ₁₆ (84)	9 ¹⁵ / ₁₆ (252)	4 ¹ / ₈ (105)	3 ⁷ / ₁₆ (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 1 1/4" NPT equalizing tappings
 - 1/2" or 3/4" NPT tappings for gauge glass/tri-cock installations
 - BSPT threads
- Maximum pressure 150 psi (10.5 kg/cm²)
- For new electronic 150E Series see page 37

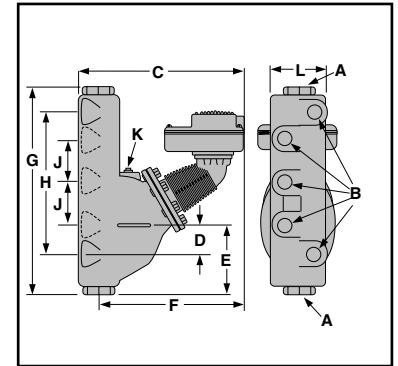
Model 157S-MD

Maximum differential operation

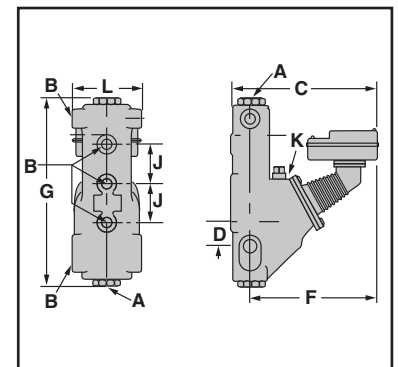
- Prevents nuisance burner shutdowns in **low pressure** applications
- Maximum operating pressure 50 psi (3.5 kg/cm²)
- For additional information see page 48



Series 157S



Model 157S-R



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

Dimensions, in. (mm)

Model	A NPT	B NPT	C	D	E	F	G	H	J	K NPT	L
157S	1	1/2	13 3/8 (339)	2 5/16 (59)	4 15/16 (125)	11 3/4 (298)	16 (406)	11 1/2 (292)	3 1/2 (89)	3/4	5 7/8 (149)
157S-A	1 1/4	3/4	13 3/8 (339)	2 5/16 (59)	4 15/16 (125)	11 3/4 (298)	16 (406)	11 1/2 (292)	3 1/2 (89)	3/4	5 7/8 (149)
157S-R	1	1/2	13 3/8 (339)	2 1/4 (57)	5 7/8 (149)	11 3/4 (298)	17 (432)	11 1/2 (292)	3 1/2 (89)	3/4	6 1/4 (159)
157S-RL	1 1/4	1/2	13 3/8 (345)	3 1/2 (89)	5 7/8 (149)	11 3/4 (298)	17 (432)	12 3/4 (324)	3 1/2 (89)	3/4	6 1/4 (159)

Ordering Information

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

MD Model Setpoints

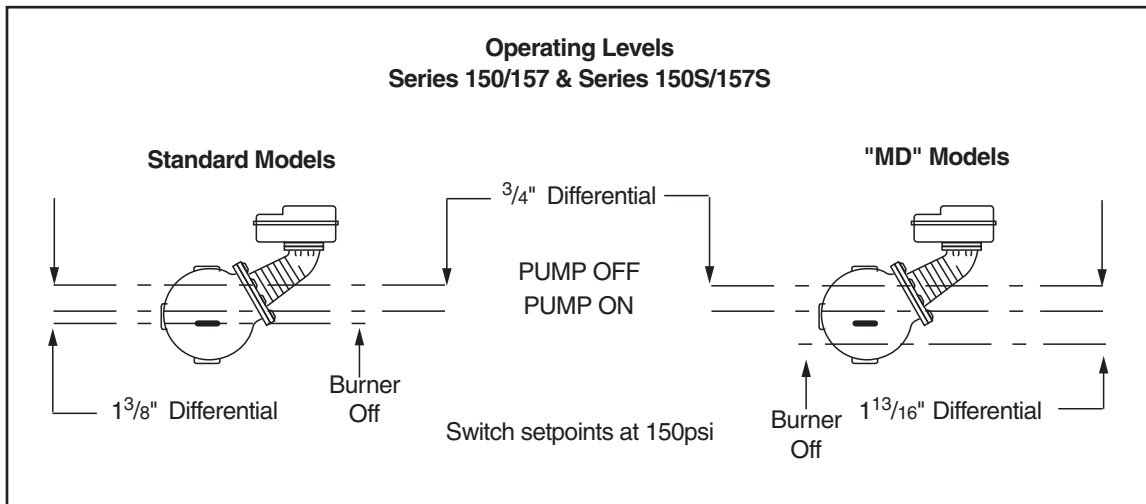
The bellows on the 150 units are sensitive to pressure. At higher pressures the bellows is stiffer requiring more force to move it. At lower pressures the bellows is more pliable (less stiff) requiring less force to move it. Consequently, the on/off points tend to narrow at lower pressures. (Less distance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

Early versions of the 150 units with mercury bulb switches 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 with mercury bulb switches 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 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.

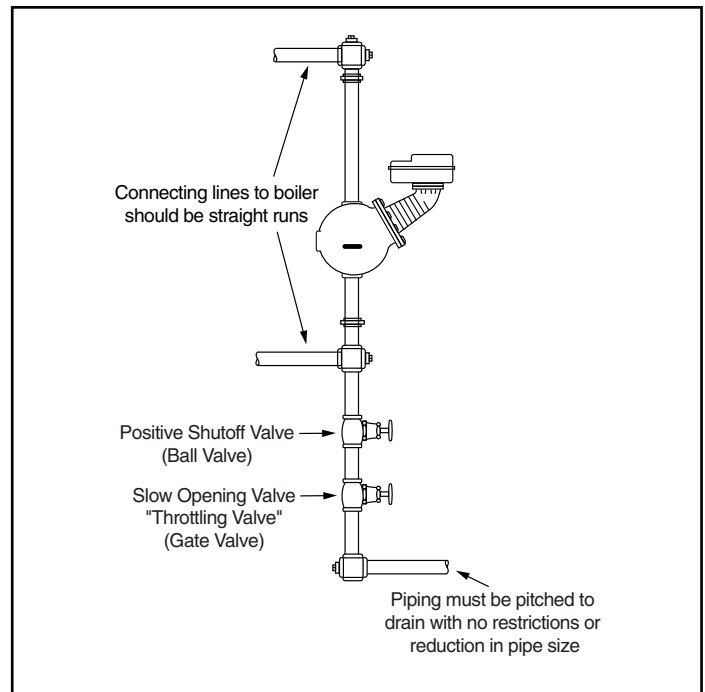
When blowing down a control at pressure, the blow down valve should be opened slowly. The piping needs to be warmed up and stagnant water in the drain piping needs to be pushed out. Suddenly opening a blow down valve causes steam to condense, which creates water hammer. Crushed floats and damaged linkages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



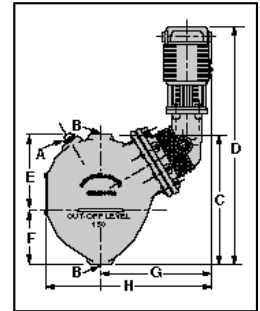
Low Water Cut-Offs – Mechanical Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

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
- 7B switch (135ohm proportional control signal) to maintain constant boiler water level
- 1" NPT connections
- Maximum pressure 150 psi (10.5 kg/cm²)



Electrical Ratings

345 VA at 120 or 240 VAC

Dimensions, in. (mm)

A NPT	B NPT	C	D	E	F	G	H
3/4	1	10 1/16 (256)	18 5/8 (473)	5 19/32 (142)	4 15/32 (113.5)	8 7/8 (225)	12 7/8 (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-M	162500	93 w/manual reset	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
- 7B switch (135ohm proportional control signal) to maintain constant boiler water level
- 1" NPT connections
- Maximum pressure 150 psi (10.5 kg/cm²)

Electrical Ratings

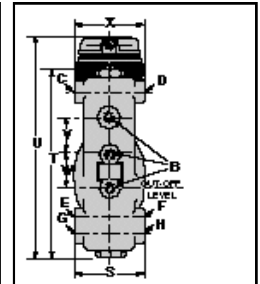
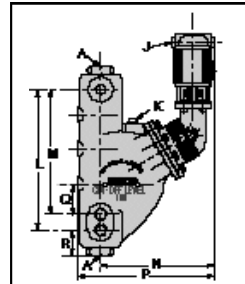
345 VA at 120 or 240 VAC

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	½	½	½	–	–	½	½	½	¾
193-A	1	½	½	½	½	½	–	–	½	¾
193-B	1¼	¾	¾	¾	–	–	¾	¾	½	¾
193-D	1	½	1	½	1	½	–	–	½	¾
193-G	1	½	–	½	1	½	–	–	½	¾

Model	L	M	N	P	Q	R
193	12¾ (324)	–	10 ¹³ / ₁₆ (274)	13 (330)	–	2 ⁷ / ₈ (73)
193-A	–	11½ (292)	10 ¹³ / ₁₆ (274)	13 (330)	2¼ (57)	–
193-B	12¾ (324)	–	10 ¹³ / ₁₆ (274)	13 (330)	–	2 ⁷ / ₈ (73)
193-D	–	11½ (292)	10 ¹³ / ₁₆ (274)	13 (330)	2¼ (57)	–
193-G	–	11½ (292)	10 ¹³ / ₁₆ (274)	13 (330)	2¼ (57)	–

Model	S	T	U	V	W	X
193	6¾ (171.4)	17½ (445)	20½ (521)	3½ (89)	3½ (89)	6 (152)
193-A	6¾ (171.4)	17½ (445)	20½ (521)	3½ (89)	3½ (89)	6 (152)
193-B	6¾ (171.4)	17½ (445)	20½ (521)	3½ (89)	3½ (89)	6 (152)
193-D	6¾ (171.4)	17½ (445)	20½ (521)	3½ (89)	3½ (89)	6 (152)
193-G	6¾ (171.4)	17½ (445)	20½ (521)	3½ (89)	3½ (89)	6 (152)



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)

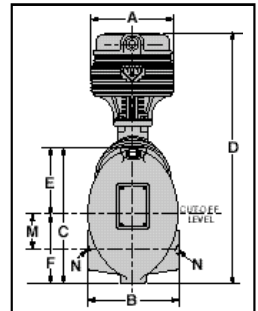
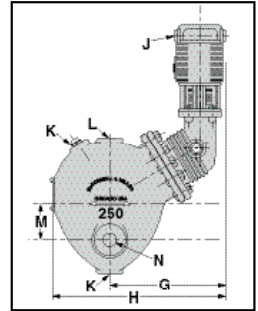
Low Water Cut-Offs – Mechanical Combination Low Water Cut-Off/Pump Controllers for Steam Boilers

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
- 7B switch (135ohm proportional control signal) to maintain constant boiler water level
 - BSPT threads
- 1¼" NPT connections
- Maximum pressure 250 psi (17.6 kg/cm²)
- Ten bolt flange



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 tapings	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-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 ⁹ / ₁₆ (268)	18 ¹³ / ₁₆ (478)
94-A	6 (152)	7 (178)	10 ⁹ / ₁₆ (268)	18 ¹³ / ₁₆ (478)

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

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

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

Series 194

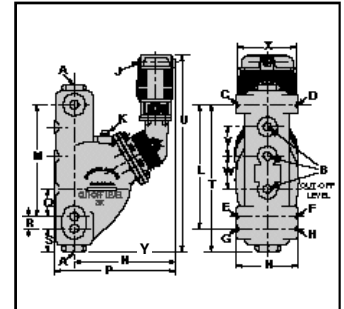


Low Water Cut-Off/Pump Controllers

- 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 tappings for gauge glass and tri-cock installations
- No. 5 Switch included
- Magnetic repulsion eliminates need for bellows
- Optional features
 - Manual reset
 - 7B switch proportional 0-135 ohm control to maintain constant boiler water level
- 1 1/4" NPT connections
- Maximum pressure 250 psi (17.6 kg/cm²)
- Ten bolt flange



SERIES 194



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 tappings	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 tappings	72.0 (32.7)

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
194	1 1/4	1/2	1/2	1/2	1/2	1/2	–	–	1/2	3/4
194-A	1 1/4	1/2	1/2	1/2	–	–	1/2	1/2	1/2	3/4
194-B	1 1/4	3/4	3/4	3/4	–	–	3/4	3/4	1/2	3/4

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

Model	T	U	V	W	X	Y
194	17 1/4 (438)	20 1/2 (521)	3 (76)	3 (76)	6 (152)	10 13/16 (274)
194-A	17 1/4 (438)	20 1/2 (521)	3 (76)	3 (76)	6 (152)	10 13/16 (274)
194-B	17 1/4 (438)	20 1/2 (521)	3 (76)	3 (76)	6 (152)	10 13/16 (274)