

# SteamTeam®

Bell & Gossett®  
McDonnell & Miller®

VOLUME 7 / ISSUE 1 / JANUARY 2020

## Low Pressure Steam Heating System Application and Selection Guide for Residential and Commercial Systems

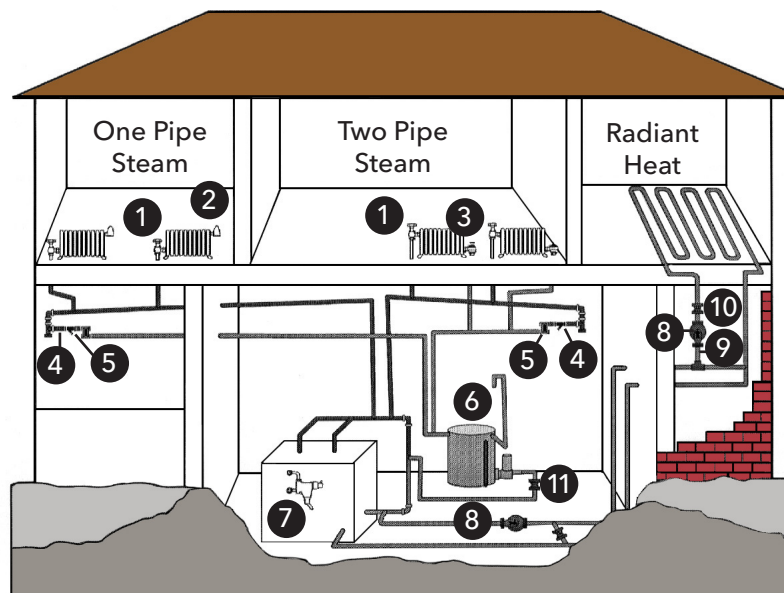
This article is intended to simplify the selection of components for a steam heating system. The majority of steam boilers used in heating systems are rated on the BTU heat output. Selections are based on modern steam boilers, many older steam boilers had sufficient water storage capacity to fill the heating system with steam and then wait for the condensate to return. Modern steam boilers have much less usable water capacity that can cause boiler flooding or low water conditions to occur.

The tables recommend that a boiler feed unit should be used on all boilers over 300,000 BTU. The boiler feed receiver then becomes the reservoir for the system. The net usable storage capacity of the boiler feed receiver should be between 10 and 20 minutes. The minimum capacity shown in the tables is 10

minutes. Single level buildings that are spread out over a large area should be increased to 15 or 20 minutes.

The Xylem "Steam Team" includes a wide range of steam products. When it comes to expanding, upgrading or repairing your steam system it pays to have a partner like Xylem. We make the parts. We build the system, and we know them inside and out.

Our "Steam Team" representatives are experts in steam heating systems and have the answers you need to get the job done right. They're the only ones that handle a full line of products that include Domestic Pump condensate handling equipment, Hoffman Specialty air vents, supply valves and traps, and McDonnell & Miller boiler controls. Consult your local representative for more information.



- |   |   |
|---|---|
| 1. Hoffman Specialty Supply Valves              | 7. McDonnell & Miller Low Water Cut-Off |
| 2. Hoffman Specialty Air Vents                  | 8. Bell & Gossett Circulator Pump       |
| 3. Hoffman Specialty Thermostatic Traps         | 9. Hoffman Specialty Tempering Valve    |
| 4. Hoffman Specialty "Y" Strainers              | 10. Bell & Gossett Circuit Setter       |
| 5. Hoffman Specialty Float & Thermostatic Traps | 11. Bell & Gossett Triple Duty Valve    |
| 6. Hoffman Pump VBF Boiler Feed Unit            |   |

## SteamTeam Products



Hoffman 1A Vent



#40 Vent



1B Vent

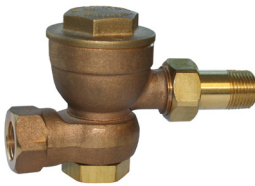


#75 Vent



#76 Vent

## Hoffman Specialty Radiator, Convector and End of Main Vents



17C Thermostatic Trap



Inverted Bucket Trap



F&T Trap

## Hoffman Specialty Steam Traps and Supply Valves



67



47-2



51 Feeder



WFE Feeder

## McDonnell & Miller Pump Controls, Low Water Cut-off's and Make-Up Water Feeders



Watchman Condensate Return Unit



VBF Boiler Feed Unit



HBF Boiler Feed Unit

## Hoffman Pump Condensate Transfer Units and Boiler Feed Units

Useful conversion factors for steam systems.

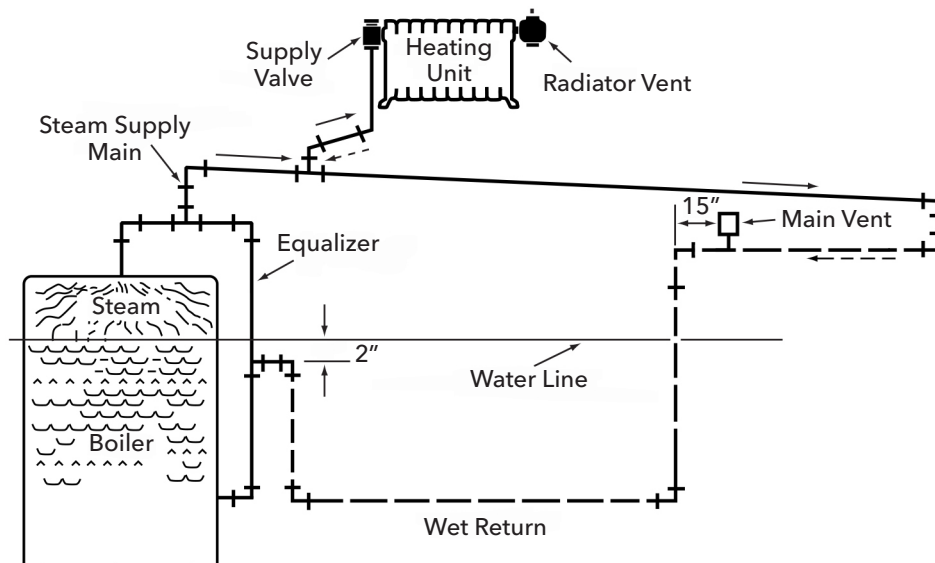
One Boiler Horsepower = 33,600 BTU/hr. = 34.5 lbs./hr.

1,000 EDR = 240 BTU/hr. = .5 GPM Condensate

1,000 EDR = 34.5 lb./hr. = 2 GPM

1 psi = 2.31 feet water column

## Piping layout and suggested product for one pipe gravity return systems based on system size

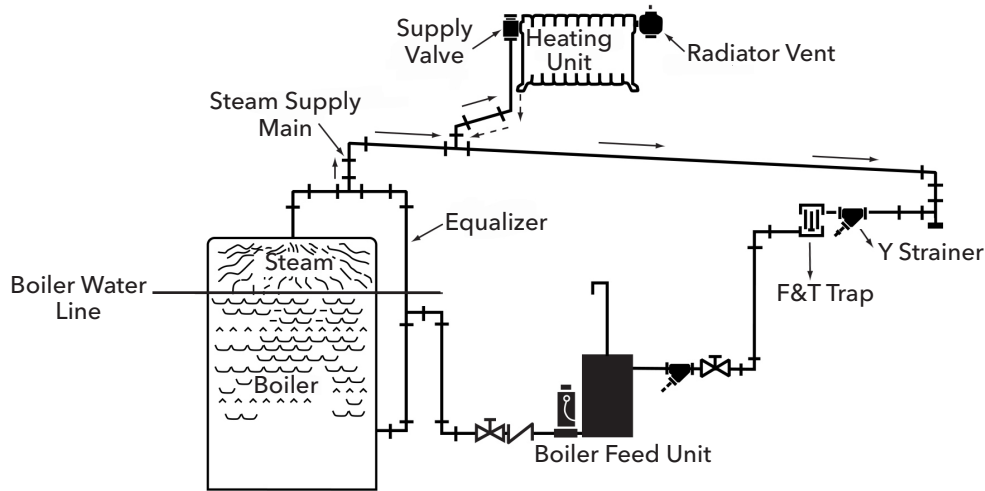


Boiler Rating				Mechanical Make-Up Feeder & Low Water Cut-Off	Float Type Low Water Cut-Off	Probe Type Low Water Cut-Off	Electrical Feeder	Electronic Feeder	End of Main Vent	One Pipe Radiator Vents
BTU	HP	EDR	Lb/hr							
33,475	1	140	34.5	47-2	67	Series PSE-800	101-A	WFE-Uni-Match	4A	40
66,950	2	280	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	51-2		NA	NA	75	1A	
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							

### Gravity Return Systems

- All steam boilers are shipped from the factory with a LWCO. This could be a 67 or a 'PSE' unit, which you can specify when ordering the boiler.
- A 47-2 feeder/LWCO could be installed in place of the factory supplied LWCO on boilers less than 250,000 BTU.
- For boilers over 250,000 BTU, the factory supplied LWCO should be left in place as a secondary LWCO when installing a 47-2 or 51-2 feeder.
- Voltages of feeders, 101A and WFE Uni-Match, should be the same as the voltage at the LWCO cut-off they are being controlled by. For example, purchase and install a WFE-24 for installation on a boiler with a PSE-802-24 LWCO.
- The 67, 64 or series PSE-800 LWCO operates the electrical make-up water feeder and serves as a LWCO.
- We recommend that systems with 10 horsepower or larger boilers use a boiler feed unit.

## Piping layout and suggested product for one pipe pumped return systems based on system size



Boiler Rating				Boiler Feed Unit Steel	End of Main F&T Trap	Radiator Vents	Combination Pump Control & LWCO	Low Water Cut-Off	
BTU	HP	EDR	Lb/hr					Probe Type	Float Type
33,475	1	140	34.5	30VBF or 50HBF	FT015H 3/4"	40	42S-A	Series PSE-800 Series 750	Series 63, 64, 67
66,950	2	280	69		FT015H 1 3/4"				
167,375	5	700	173		FT015H 1 1/2"	1A			
251,063	7.5	1,050	259						
334,750	10	1,400	345						
418,438	12.5	1,750	431		FT015H 2"				
502,125	15	2,100	518						
585,813	17.5	2,450	604		50VBF or 50HBF	FT015X 2"			
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	100VBF or 100HBF					
1,506,375	45	6,300	1,553						
1,673,750	50	7,000	1,725						
2,008,500	60	8,400	2,070						
2,343,250	70	9,800	2,415						
2,678,000	80	11,200	2,760						
3,012,670	90	12,600	3,105						
3,347,500	100	14,000	3,450						

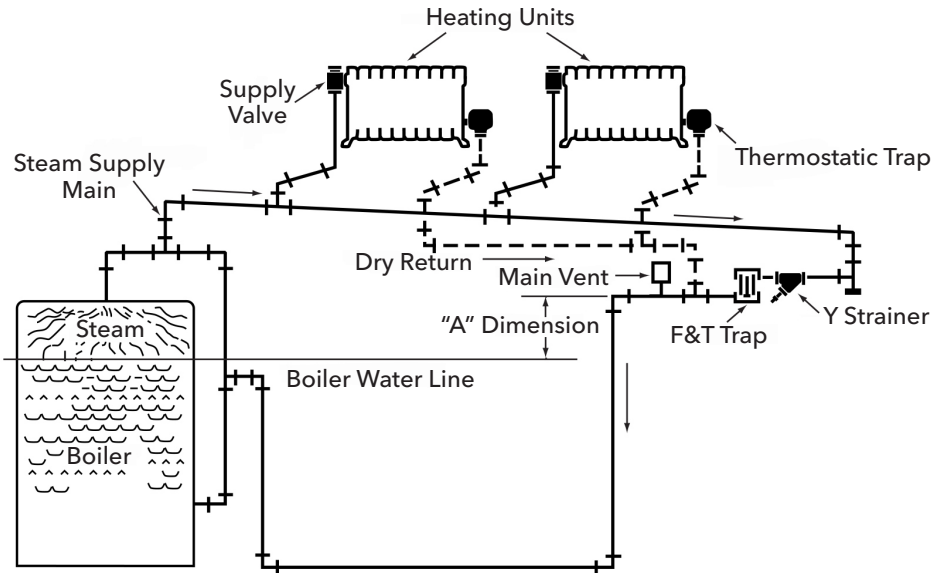
### Pumped Return Systems

- All steam boilers are shipped from the factory with a LWCO. This could be a 67 or a 'PSE' unit, which you can specify when ordering the boiler.
- A 47-A Pump Controller/LWCO can be installed in place of the factory supplied LWCO on boilers less than 250,000 BTU. The 42S-A is connected to the boiler utilizing the sight glass tapplings.
- For boilers over 250,000 BTU, the factory supplied LWCO should be left in place as a secondary LWCO when installing a pump controller/LWCO such as

the 42S-A (sight glass tapping installation) or 42S (equalizing pipe installation).

- For any motor larger than 1/3 HP, a motor starter should be used to stop/start the pump to prolong the life of the switches in the M&M pump controller.
- The boiler feed units are selected for 10-minute storage, some applications may require a larger tank. Horizontal units are also available which provide a lower inlet connection.

## Piping layout and suggested product for two pipe gravity return systems based on system size

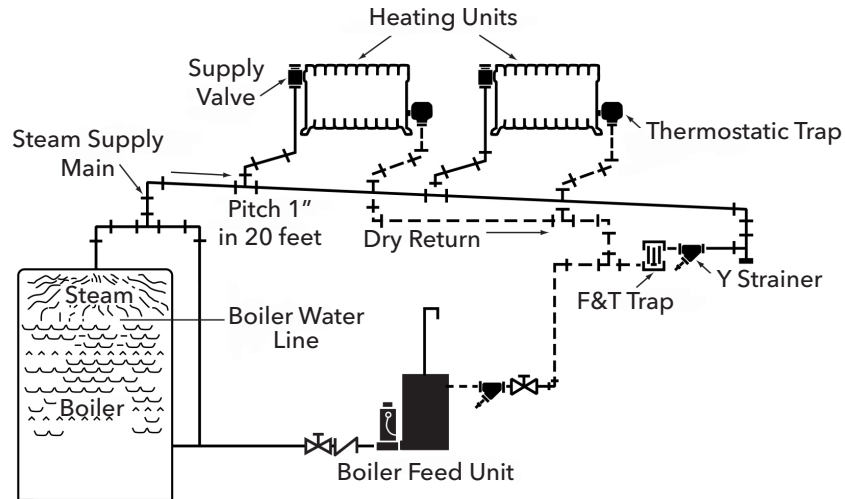


Boiler Rating				Radiator Thermostatic Traps	End of Main F&T Trap	End of Main Vent	Mechanical Feeder & LWCO	Float Type LWCO	Probe Type LWCO	Electronic Water Feeder	Electric Water Feeder
BTU	HP	EDR	Lb/hr								
33,475	1	140	34.5	17C	FT015H 3/4"	4A	47-2	Series 61, 63, 64, 67	Series PSE-800	WFE Uni-Match	101-A
66,950	2	280	69								
100,425	3	420	104								
133,900	4	560	138								
167,375	5	700	173								
251,063	7.5	1,050	259			75	51-2	NA	NA		
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			50	7,000	1,725			
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								
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### Gravity Return Systems

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- A 47-2 feeder/LWCO could be installed in place of the factory supplied LWCO on boilers less than 250,000 BTU.
- For boilers over 250,000 BTU, the factory supplied LWCO should be left in place as a secondary LWCO when installing a 47-2 or 51-2 feeder.
- "A" Dimension. Pressure Drop + Static Head + Safety Factor. Typically 26-28".
- Voltages of feeders, 101A and WFE Uni-Match, should be the same as the voltage at the LWCO cut-off they are being controlled by. For example, purchase and install a WFE-24 for installation on a boiler with a PSE-802-24 LWCO.
- The 67, 64 or series PSE-800 LWCO operates the electrical make-up water feeder and serves as a LWCO.
- We recommend that systems with 10 horsepower or larger boilers use a boiler feed unit.

## Piping layout and suggested product for two pipe pumped return systems based on system size



Boiler Rating				Boiler Feed Unit Steel	Main Drip Trap	Radiator Vents	Combination Pump Control & LWCO	Optional LWCO	
BTU	HP	EDR	Lb/hr					Probe Type	Float Type
33,475	1	140	34.5	30VBF or 50HBF	FT015H 3/4"	40	42S-A	Series PSE-800 Series 750	Series 63, 64, 67
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	50VBF or 50HBF					
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	100VBF or 100HBF					
2,008,500	60	8,400	2,070						
2,343,250	70	9,800	2,415						
2,678,000	80	11,200	2,760						
3,012,670	90	12,600	3,105						
3,347,500	100	14,000	3,450						

### Pumped Return Systems

- All steam boilers are shipped from the factory with a LWCO. This could be a 67 or a 'PSE' unit, which you can specify when ordering the boiler.
- A 42S-A Pump Controller/LWCO can be installed in place of the factory supplied LWCO on boilers less than 250,000 BTU. The 42S-A is connected to the boiler utilizing the sight glass tapplings.
- For boilers over 250,000 BTU, the factory supplied LWCO should be left in place as a secondary LWCO when installing a pump controller/LWCO such as

the 42S-A (sight glass tapping installation) or 42S (equalizing pipe installation).

- For any motor larger than 1/3 HP, a motor starter should be used to stop/start the pump to prolong the life of the switches in the M&M pump controller.
- The boiler feed units are selected for 10-minute storage, some applications may require a larger tank. Horizontal units are also available which provide a lower inlet connection.



## Domestic pump and Hoffman Specialty pump has a complete line of condensate transfer pumps, boiler feed pumps and vacuum return units

Quick selection materials list with part numbers and description.

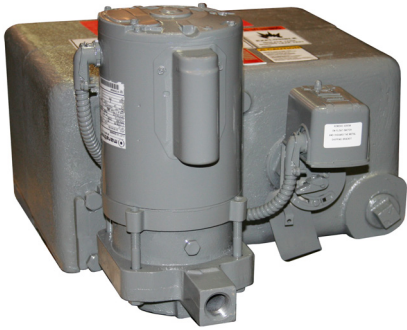
Qty.	Item	Model No.	Part No.	Description
	Radiator Vent	40	401440	Non-adjustable port 1/8" side connection
	Radiator Vent	1A	401422	Adjustable port for true proportional venting 1/8" side connection
	Convector Vent	41	401455	Non-adjustable port 1/8" bottom connection
	Convector Vent	1B	401425	Adjustable port for true proportional venting 1/8" bottom connection
	Main Vent	4A	401413	End of main vent 1/2" x 3/4" connection
	Main Vent	75	401434	End of main vent 1/2" x 3/4" connection
	F&T Trap	FT015H 3/4"	404200	Float and Thermostatic trap, 15 psig, H pattern
	F&T Trap	FT015H 1"	404210	Float and Thermostatic trap, 15 psig, H pattern
	F&T Trap	FT015H 1 1/4"	404220	Float and Thermostatic trap, 15 psig, H pattern
	F&T Trap	FT015H 1 1/2"	401626	Float and Thermostatic trap, 15 psig, H pattern
	F&T Trap	FT015H 2"	401629	Float and Thermostatic trap, 15 psig, H pattern
	F&T Trap	FT015X 2"	404242	Float and Thermostatic trap, 15 psig, H pattern
	Radiator Trap	17C	401536	Angle Pattern, 1/2"
	Radiator Trap	17C	401551	Vertical, 1/2"
	Radiator Trap	17C	401545	Swivel base, 1/2"
	Make-up Valve	47-2	132800	Mechanical water feeder with LWCO switch
	Make-up Valve	51-2	135000	Mechanical water feeder with LWCO switch
	Boiler Control	67	149400	Float type LWCO
	Boiler Control	PSE-802-24	153927	Probe type LWCO, 24-volt
	Boiler Control	PSE-802-M-24	153602	Probe type LWCO w/manual reset
	Boiler Control	PSE-801-120	153827	Probe type LWCO, 120-volt
	Boiler Control	PSE-801-M-120	153601	Probe type LWCO w/manual reset
	Water Feeder	101A-120V	169400	Electrical make-up water feeder 120-volt
	Water Feeder	101A-24V	169500	Electrical make-up water feeder 24-volt
	Water Feeder	WFE-24	169550	Uni-Match water feeder 24-volt w/time delay
	Water Feeder	WFE-120	169560	Uni-Match water feeder 120-volt w/time delay
	Boiler Control	42S-A	129700	Pump control and LWCO w/quick hook up fittings
	Condensate Unit	WC-6-20-B	160029	Condensate Pump. 6,000 EDR 20 PSIG 6 gallon cast iron receiver
	Condensate Unit	WC-8-20-B	160030	Condensate Pump. 8,000 EDR 20 PSIG 9 gallon cast iron receiver
	Condensate Unit	WCD-12-20-BMA	160032	Condensate Pump. Duplex 12,000 EDR 20 PSIG 14 gallon cast iron receiver. Mechanical alternator
	Boiler Feed Unit	30-VBFS-B	161024	Boiler Feed unit w/30 gallon steel receiver, 9 GPM 20 PSIG single pump and built in water feeder
	Boiler Feed Unit	30-VBFD-B	161025	Boiler Feed unit w/30 gallon steel receiver, 9 GPM 20 PSIG duplex pump and built in water feeder
	Boiler Feed Unit	50-VBFS-B	161001	Boiler Feed unit w/50 gallon steel receiver, 15 GPM 20 PSIG single pump and built in water feeder
	Boiler Feed Unit	50-VBFD-B	161002	Boiler Feed unit w/50 gallon steel receiver, 15 GPM 20 PSIG duplex pump and built in water feeder
	Boiler Feed Unit	100-VBFS-B	161003	Boiler Feed unit w/100 gallon steel receiver, 15 GPM 20 PSIG single pump and built in water feeder
	Boiler Feed Unit	100-VBFD-B	161004	Boiler Feed unit w/100 gallon steel receiver, 15 GPM 20 PSIG duplex pump and built in water feeder

\* Consult factory for other sizes or products.

Xylem offers the most complete line of products needed for steam systems. The SteamTeam includes Bell & Gossett Domestic Pump, Hoffman Specialty and McDonnell & Miller.

### **Domestic Pump and Hoffman Specialty**

Provides the full line of condensate transfer equipment including condensate transfer units, boiler feed units, vacuum heating units, clinical vacuum units and low NPSH pumps.



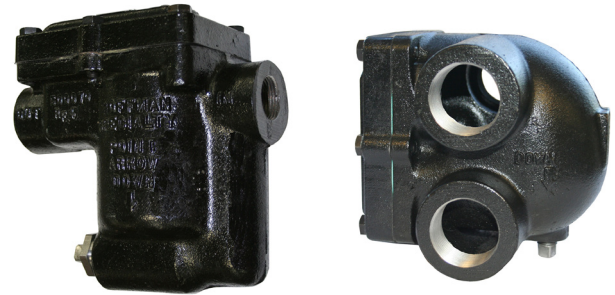
**Domestic Pump Condensate Transfer Units**

### **Hoffman Specialty**

Offers a complete line of steam traps, regulators, vents and accessories.

### **McDonnell & Miller**

Delivers reliable performance and safety in boiler and level control products for over 95 years.



**Hoffman Specialty Steam Traps**



**Hoffman Specialty Temperature Regulators**



**McDonnell & Miller Series 150S Pump Controls**