# Skidmore

Bulletin 18-B September, 2007

SCR SERIES CONDENSATE, BOILER FEED AND MAKEUP PUMPS



Corrosion resistant steel receivers

49 gallons - 1000 gallons

Discharge pressures 25 - 250 psi

Low N.P.S.H.R. pump selections

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# GENERAL INFORMATION

The Skidmore® pumping systems described in this brochure are completely assembled, wired and tested at the manufacturing plant. They are designed to provide maximum efficiency, reliability and easy maintenance in compact, space saving configurations.

Manufacturing is done in clean modern facilities by people who take pride in producing dependable products. Each unit is individually factory tested before shipment to assure that the product is ready for service when it is received. Testing includes verification of flow rate, pressure, amperage draw and cut-in/cut-out points of all components. You can specify Skidmore products with confidence, knowing that you will receive the benefits that made the Skidmore name synonymous with quality and pride since 1921.

We invite you to compare the features and specifications of our condensate, boiler-feed and makeup pumps with other units. We're sure Skidmore will be your choice.

#### SKIDMORE CUSTOM ENGINEERING

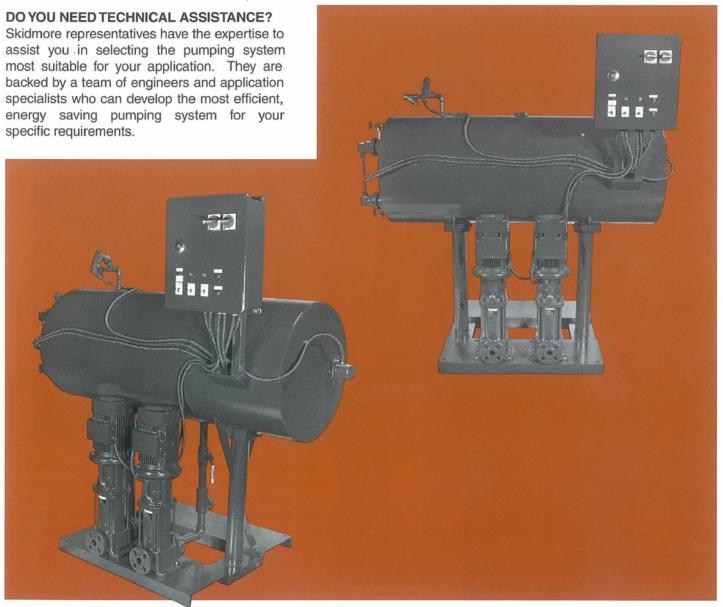
If your installation poses special problems, Skidmore's custom engineering and building capabilities are available without charge as part of our total service.

#### **TECHNICAL MANUALS**

Several technical manuals are available free-of-charge from your Skidmore representative, or they may be obtained by writing directly to the Skidmore sales headquarters in Benton Harbor, Michigan.

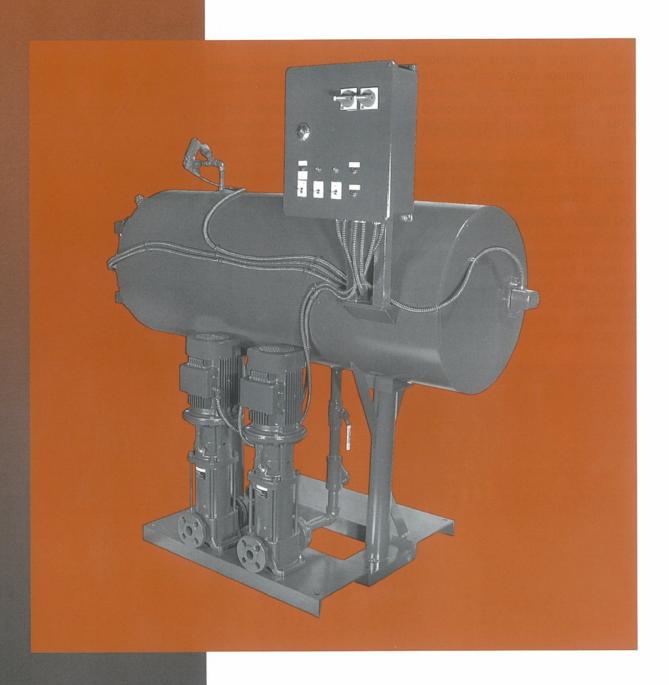
Bulletin 23T-1 contains piping and wiring diagrams, tables, formulas, and terminology.

Bulletin 23T-3 is a selection guide for boiler feed and condensate pumps. It contains the basic information required to understand, select and specify pump systems. Numerous diagrams show a variety of typical installations and piping arrangements.



# **CONDENSATE PUMPS**

Condensate pumps are used in steam heating systems to collect and quickly return condensate to the boiler feed unit. Their pumping action is controlled by the water level in the receiver. Units consist of an electric motor and centrifugal pump mounted on a welded steel storage receiver with a float operated pump control (simplex units — float switch, duplex units — mechanical alternator). Multiple pump units are used when greater pumping capacity or back-up pump protection is required. Note: Condensate pumps do not supply boiler system makeup water.



# BOILER FEED OR MAKEUP PUMPS

Boiler feed pumps are used to pump and precisely control the condensate and makeup water required by the boiler(s). Pumping action is controlled by the fluid level in the boiler. They consist of a welded steel storage receiver equipped with a makeup valve and one or more centrifugal pumps.

Skidmore SCR Series pumping systems are available in simplex, duplex, triplex or quadruplex configurations from 1,000 to 125,000 sq. ft. EDR or 30 to 1,000 boiler HP.

## Skidmore Centrifugal Pumps

Depending on the particular selection, the pump is designed to deliver the flow in GPM and discharge pressure, as noted in the selection tables. Several low N.P.S.H.R. pumps available. Consult Skidmore representative for selections.

Pumps furnished with each package are multi-stage centrifugal type to operate intermittently or continuously at a nominal 3450 RPM. All pumps are of cast iron/stainless steel fitted construction.

Motors are sized to insure the pump is non-overloading when operating at the design conditions. Pump and motor are direct coupled to a standard NEMA C face motor with a 360° rabbeted fit to insure positive alignment. Motors are open drip-proof with a service factor of 1.15.

### Motors

Motors are heavy-duty, ball bearing, T.E.F.C. or open drip-proof type. Most fractional horsepower, single-phase motors have built-in thermal overload protection. Special motors available upon request.

#### Receivers

Receivers are constructed of welded rust resisting steel. Standard sizes to 1,000 gallons. Larger sizes available on special order. Smaller pump sizes (catalog # on selection chart) can be ordered with larger size receivers.

#### **Bases**

Bases are fabricated of channel steel and welded.

# **Control Panels**

Skidmore will provide optional control panels tailored to your specific application requirements. Please refer to Bulletin ACC-700 for additional information, or consult with your local Skidmore representative who will be pleased to assist with your control panel selection. UL approved and labeled panels are available by request on 700 Series control panels.

# SCR SERIES PUMPING SYSTEMS



# **ACCESSORIES AND OPTIONAL EQUIPMENT**

# Condensate Pumps — Standard Equipment

Simplex condensate return units are equipped with a 2-pole, heavy-duty float switch activated by a float. The entire switch mechanism including flange, float and rod is mounted on the end of the receiver, and it can be removed as a complete unit. The mechanism is readily adjustable for various water levels without removal from the receiver.

Duplex return units are equipped with a mechanical alternating float switch which alternates the operation of two pumping units in successive cycles. It consists of two 2-pole switch units in one enclosure, and is operated by one float within the receiver. This device not only alternates the pumping units, but also automatically starts the second pump in case the first pump fails to start or to carry the load.

Tappings for gauge glass and thermometer are standard on all SCR Series receiver tanks. Suction "y" strainer is standard on pump(s).

## Condensate Pumps - Optional Equipment

- Controls
  - Two float switches on duplex units Electric alternator on duplex units
- Gauge glass assembly
- · Gate valve(s)
- Thermometer
- Control cabinet duplex includes magnetic starters with reset buttons and third leg overload protection for three-phase.
   Two hand-off automatic selector switches are optional. Other electrical options available, for further information reference bulletin ACC-700.
- Inlet strainer basket or "y" type
- · Magnesium corrosion inhibitor
- · Tank linings
- High water alarm
- Manhole
- · Split leg flanges

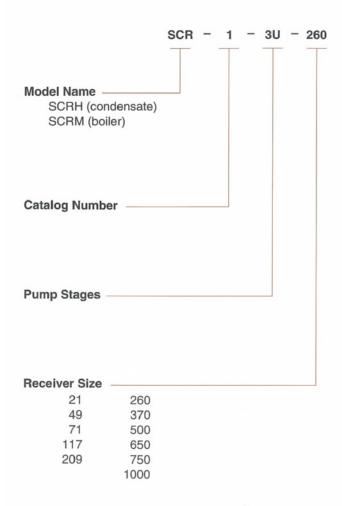
## Boiler Feed Pumps - Standard Equipment

Single and duplex boiler feed units are equipped with a heavy duty float operated makeup valve actuated by a float. The entire mechanism including flange, float and rod is mounted on the end of receiver. It can be removed as a complete unit and is readily adjustable for various water levels. Tappings for gauge glass and thermometer are standard on all SCR series receiver tanks. Suction "y" strainers are standard on pump(s).

#### **Boiler Feed Pumps – Optional Equipment**

- · Solenoid operated makeup valve with float switch
- McDonnell-Miller #21 makeup valve
- McDonnell-Miller #25 makeup valve
- McDonnell-Miller #69 L.W.C.O.
- · Gauge glass assembly
- · Gate valve pump suction
- Thermometer
- Control cabinet duplex includes two starter switches, two reset buttons and third leg overload protection for three-phase.
   Two hand-off automatic selector switches are optional. Other electrical options are available, see bulletin ACC-700 for additional information
- · Magnesium corrosion inhibitor
- Tank linings
- Inlet strainer basket or "y" type
- Preheater
- Manhole
- · Split leg flanges

# **TYPICAL CATALOG CODE DESIGNATION**



#### HOW TO ORDER

R.

# TYPICAL ENGINEERING SPECIFICATIONS

### **SCRM Boiler Feed Unit**

Furnish and install according to plans and manufacturer's instructions the quantity of duplex boiler feed units as shown on drawing. Each unit shall consist of one (1) boiler feed receiver, two (2) suction gate valves, one (1) make-up water valve assembly, electrical controls and accessories.

The boiler feed pumps shall be single or multi-stage, centrifugal design, pump permanently aligned and driven by vertical close coupled drip proof motor with drip cover. The motor and rotating parts shall be removable without disturbing suction or discharge piping. Pump shall be stainless steel fitted with enclosed centrifugal impeller, stainless steel shaft, dripless mechanical seals suitable for 220°F and Ni-Resist faces. Capacities and electrical characteristics shall be as scheduled on the drawings.

The receiver shall be horizontal welded copper bearing, rust resisting steel construction elevated on fabricated steel frame and channel steel base. Receiver shall have a capacity of not less than that shown on drawings and shall be equipped with water level gauge glass, dial thermometer, inlet strainer with bronze screen easily removable for cleaning, and pressure gauge installed in each pump discharge line.

d Control Specificat pacity Schedule Skidmore Model N			
Receiver size			
Quantity			
Boiler feed pumps _	gpm	psig	rpm
HP	volt	_ Hz	Phase
Makeup water supply	y pressure _	psig	

#### **SCRH Condensate Units**

Furnish and install according to plans and manufacturer's instructions the quantity of duplex condensate units as shown on drawing. Each unit shall consist of one (1) condensate receiver, two (2) condensate pumps, two (2) suction gate valves, one (1) mechanical alternator assembly, electrical controls and accessories.

The condensate pumps shall be single or multi-stage centrifugal design, pump permanently aligned and driven by vertical close coupled drip proof motor with drip cover. The motor and rotating parts shall be removable without disturbing suction or discharge piping. Pump shall be stainless steel fitted with enclosed centrifugal impeller, stainless steel shaft, dripless mechanical seals suitable for 220°F and Ni-Resist faces. Capacities and electrical characteristics shall be as scheduled on the drawings.

The receiver shall be horizontal welded copper bearing, rust resisting steel construction elevated on fabricated steel frame and channel steel base. Receiver shall have a capacity of not less than that shown on drawings and shall be equipped with water level gauge glass, dial thermometer, inlet strainer with bronze screen easily removable for cleaning, and pressure gauge installed in each pump discharge line.

dd Control Specifications apacity Schedule Skidmore Model No.		
Receiver size" dia"	long gallons	S
Quantity		
Condensate pumps gpm _	psig r	pm
HP volt Hz	Phase	

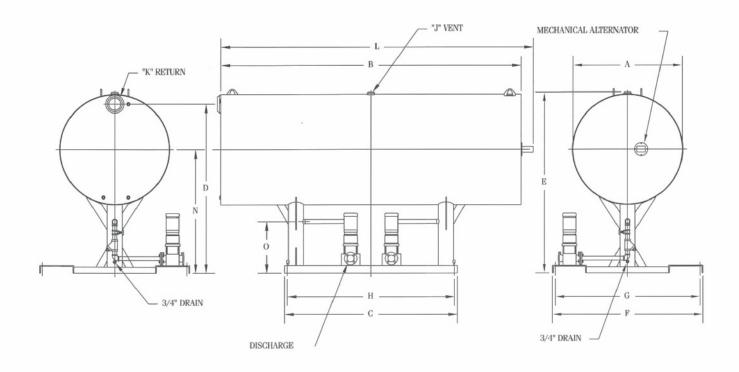
# **SELECTION TABLE - SCR Series**

BOILER	R H.P.	30	50	60	80	125	150	200	250	300	400	500
PUMP (	G.P.M.	6	9	12	15	25	30	35	45	60	75	87
	MENDED TANK	49	49	71	117	117	209	209	260	370	500	500
SIZE G	Model	CR1-3	CR1-3	CR3-3	CR3-3	CR5-3	CR5-3	CR5-4	CR10-3	CR15-2	CR15-2	CR32-2-1
5	Motor H.P.	1/3	1/3	1/2	1/2	1	1	1½	3	5	5	7½
S	Discharge	11/4	11/4	11/4	11/4	11/4	11/4	11/4	2	2	2	21/2
25	Suction	11/4	11/4	11/4	11/4	11/4	11/4	11/4	2	2	2	21/2
	NPSHR (ft.)	CRI-3	5.5	4.4								
	Model										CR15-2	CR32-2-1
SIG	Motor H.P.					-					5	7½
30 P	Discharge Suction										2	2½
.,	NPSHR (ft.)										5.5	4.8
	Model										CR15-2	CR32-2-1
250 PSIG	Motor H.P.										5	7½
	Discharge							11/4		2	2	21/2
	Suction	11/4	11/4	11/4	11/4	11/4	11/4	11/4	2	2	2	21/2
	NPSHR (ft.)	3.0	5.8	5.6	6.3	5.5	4.0	4.3	4.0	4.0	5.0	4.2
	Model				CR3-6						CR15-2	CR32-2-1
SIG	Motor H.P.										5	7½
0 P	Discharge										2	2½
L)	Suction										2	4.0
	NPSHR (ft.) Model										4.5 CR15-3	CR32-2-1
5	Motor H.P.										5	7½
PS	Discharge				•						2	21/2
09	0	11/4	11/4	11/4	11/4	11/4	11/4	11/4	2	2	2	21/2
	NPSHR (ft.)	3.0	5.6	5.6	6.0	5.8	4.0	4.3	4.0	3.2	5.0	4.0
	Model		CR1-8	CR3-7							CR15-3	CR32-3-2
200 PSIG 175 PSIG 150 PSIG 125 PSIG 100 PSIG 75 PSIG 60 PSIG 50 PSIG 30 PSIG 25 PSIG 30 PSIG 3	Motor H.P.										5	10
	Discharge										2	2½
-	Suction										2	2½
	NPSHR (ft.) Model										4.1 CR15-4	4.0 CR32-3
200 PSIG 175 PSIG 125 PSIG 100 PSIG 75 PSIG 60 PSIG 50 PSIG 30 PSIG 25 PSIG 9	Motor H.P.										7½	15
	Discharge										2	21/2
	Suction	11/4	11/4	11/4	11/4	11/4	11/4	11/4	2	2	2	21/2
	NPSHR (ft.)										4.4	4.1
G	Model										CR15-5	CR32-4-2
PSI	Motor H.P.										10	15
125	Discharge Suction										2	21/2
	NPSHR (ft.)										4.1	4.0
	Model (it.)										CR15-6	CR32-5-2
SiG	Motor H.P.										10	20
0 P	Discharge										2	21/2
15	Suction		11/4		11/4		11/4	11/4	2		2	21/2
	NPSHR (ft.)	3.0	5.4	5.6	6.0	5.8	4.0	4.3	4.0	3.6	4.0	4.0
<b>15</b>	Model										CR15-7	CR32-5
SIC	Motor H.P.										15	20
75	Discharge Suction										2	2½
-	NPSHR (ft.)										4.1	4.0
	Model (it.)										CR15-8	CR32-6-2
5	Motor H.P.										15	25
PS C	Discharge										2	21/2
200	Suction										2	21/2
	NPSHR (ft.)	3.0	5.1	5.6	6.1	5.6	4.0	4.3	4.0	3.6	4.0	4.0
<b>1</b> 5	Model										CR15-10	CR32-7
SIC	Motor H.P.										20	30
50 F	Discharge										2	2½
2	Suction NPSHR (ft.)	3.0	5.3	5.6	6.2	3.6	4.0	3.4	4.1	3.6	4.1	4.0
	IN OTH (IL.)	3.0	0.0	5.0	0.2	3.0	4.0	0.4	4.1	3.0	4.1	4.0

Notes:

<sup>1.</sup> For T.E.F.C. Motors consult factory.
2. Based on boiler feed usage.
3. For Lower NPSHR application consult factory.
4. NPSHR is based on listed condition point.
5. For pump selections beyond what is shown consult factory.

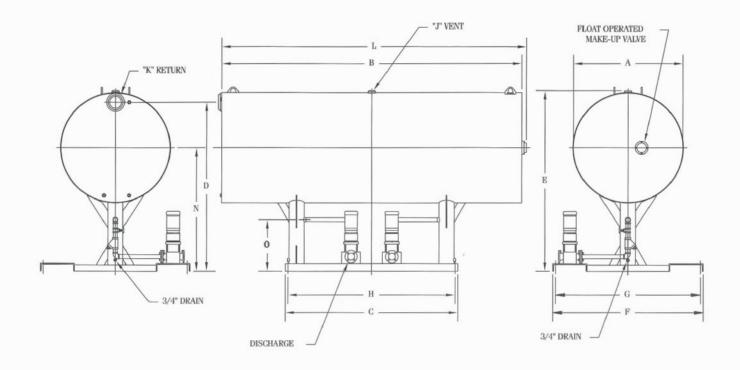
# **DIMENSION DATA - Duplex Condensate Return**



					DI	IMENSI	ONS								
RECEIVER SIZE		APPROXIMATE DIMENSIONS IN INCHES													
GALLONS	Α	В	С	D	E	F*	G*	Н	J	K	L	N	0		
49	22	30	42	49.81	52.81	34	31.5	39.5	11/4	21/2	35.31	41.13	22.94		
71	24	36	44	51.56	54.81	37.5	35	41.5	11/2	3	41.31	42.13	22.94		
117	24	60	44	51	55.13	47.5	45	41.5	2	4	65.31	42.13	22.94		
209	32	60	50	57.88	64.13	60	57.5	47.5	2	5	65.31	46.13	22.6		
260	36	60	50	61.88	67.13	60	57.5	47.5	2	5	65.31	48.13	22.6		
370	36	84	50	61.88	67.13	60	57.5	47.5	2	5	89.31	48.13	22.6		
500	42	84	50	68	73.38	60	57.5	47.5	2	5	89.31	51.25	22.6		
750	48	96	76	74.25	79.38	66	63.5	73.5	2	5	101.31	54.25	22.6		
1000	48	132	76	74.25	79.38	66	63.5	73.5	2	5	137.31	54.25	22.6		

<sup>\*</sup> DIMENSIONS SHOWN ON 49 AND 71 GALLON RECEIVERS ARE FOR 2 HP, ODP MOTORS OR LOWER. FOR ALL OTHER MOTORS, CONSULT FACTORY.

# **DIMENSION DATA - Duplex Boiler Feed**



	DIMENSIONS													
RECEIVER SIZE	APPROXIMATE DIMENSIONS IN INCHES													
GALLONS	Α	В	С	D	E	F*	G*	Н	J	K	L	N	0	
49	22	30	42	49.81	52.81	34	31.5	39.5	11/4	21/2	32	41.13	22.94	
71	24	36	44	51.56	54.81	37.5	35	41.5	1½	3	38	42.13	22.94	
117	24	60	44	51	55.13	47.5	45	41.5	2	4	62	42.13	22.94	
209	32	60	50	57.88	64.13	60	57.5	47.5	2	5	62	46.13	22.6	
260	36	60	50	61.88	67.13	60	57.5	47.5	2	5	62	48.13	22.6	
370	36	84	50	61.88	67.13	60	57.5	47.5	2	5	86	48.13	22.6	
500	42	84	50	68	73.38	60	57.5	47.5	2	5	86	51.25	22.6	
750	48	96	76	74.25	79.38	66	63.5	73.5	2	5	98	54.25	22.6	
1000	48	132	76	74.25	79.38	66	63.5	73.5	2	5	134	54.25	22.6	

<sup>\*</sup> DIMENSIONS SHOWN ON 49 AND 71 GALLON RECEIVERS ARE FOR 2 HP, ODP MOTORS OR LOWER. FOR ALL OTHER MOTORS, CONSULT FACTORY.

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