

CLIF MOCK

# CMC-500 Circulating System

## User Manual

Manual No. 99104500140, Rev. C







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## Description

The CMC-500 Circulating System is designed in accordance with API 8.3, to collect, store, and mix sampled product from a sampling device such as the True-Cut C sampler.

The system consists of a carbon steel receptacle with a 3- or 4-position T-bolt hinged closure. The head and hub of the closure assembly are tapered and fitted with O-rings to provide a leakproof seal. The receptacle assembly, a 1/2-hp explosion-proof motor, a circulating pump, and a stainless steel in-line static mixer are all mounted on a steel skid. The skid and tank assemblies are coated with a baked epoxy. The receptacles are available in 5-, 10-, 20-, and 30-gal sizes, and are available for standard, severe duty, and offshore applications.

## Installation

1. Position the CMC-500 Circulating System upright and as close to the sample device as possible.
2. Ensure that the piping connections slope downward from the sampling device into the receptacle.
3. Connect the drain valve to a sump or back into the pipeline.

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**NOTE: Pipeline pressure must be less than 100 psi when returning collected sample back into the pipeline.**

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4. Install the ON/OFF Switch (supplied by customer) near the CMC-500 Circulating System.
5. Check all electrical connections. All field wiring must conform to the *National Electric Code, NFPA 70*. Local wiring ordinances may also apply. This equipment is for use in non-classified areas only.
6. The motor is wired to turn in a counterclockwise direction at the factory. Refer to field wiring instructions on the back of the electrical cover on the motor.

## Startup Procedures

Perform the following steps before operating the CMC-500 Circulating System. Components are identified by item number in the assembly drawing and Bill of Materials on page 3.

1. Ensure that the motor is OFF.
2. Close the drain valve (item 15B).
3. Close the sample draw-off valve (item 11).
4. Open the pump isolation valve (item 15C) and the recirculation valve (item 15A).
5. Secure the cover on the receptacle.

## Operation

1. After a sample is received into the receptacle, turn the pump motor ON for *at least* 5 (See note below) minutes to circulate the fluid.
  - A 5-gal system requires a minimum circulation time of 5 minutes or until the volume in the receptacle is circulated five times.
  - A 10-gal system requires a minimum circulation time of 10 minutes of circulation or until the volume has been circulated five times.

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**NOTE: The pump is rated at approximately 5.0 gpm at 0 psig backpressure and a fluid viscosity of 100 SUS (21.6 CTS) at 60°F (16°C).**

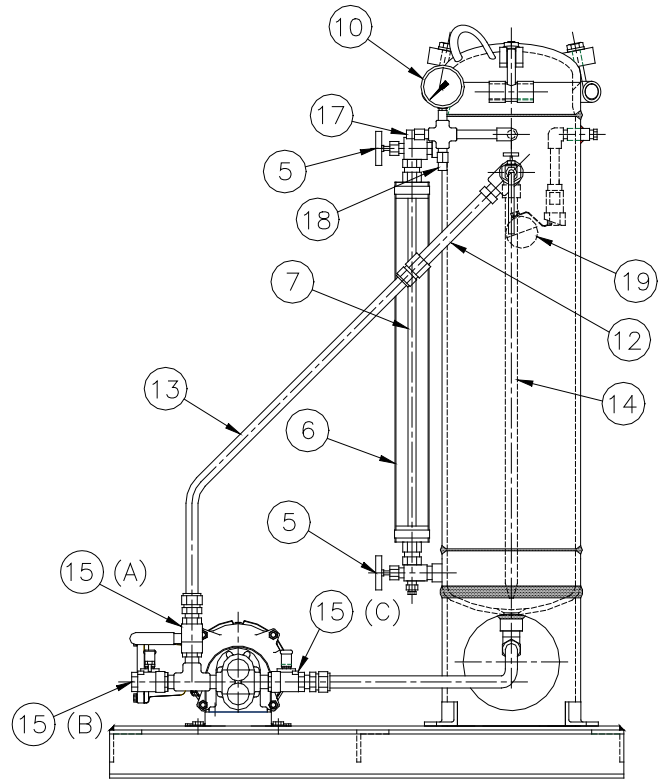
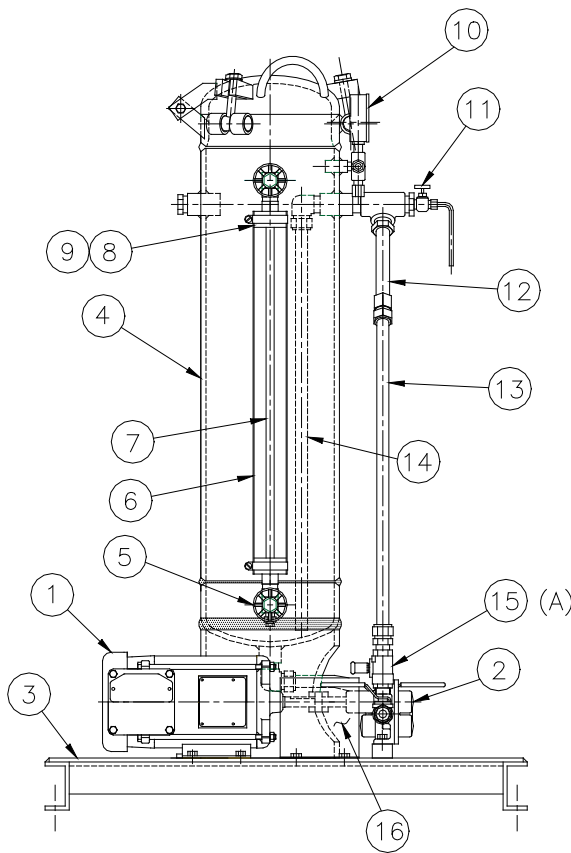
**For most light to medium crude oils ranging up to API 24 with kinematic viscosity less than 160 CTS at 60°F (16°C), 5 minutes of circulation time should adequately mix the tank volume.**

**For most crude oils heavier than API 24, with a kinematic viscosity greater than 160 CTS and temperatures below 60°F (16°C), consider allowing additional circulation time to ensure the tank volume is thoroughly mixed.**

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2. While the circulating pump is ON, open the sample draw-off valve (item 11), allowing the sample to flow directly into laboratory glassware. Close the sample draw-off valve (item 11) and cap the laboratory sample transport receptacle immediately.
3. To drain the (tank) receptacle, perform the following steps:
  - a. Turn the circulating pump ON.
  - b. Close the return valve (item 15A).
  - c. Open the drain valve (item 15B) and the pump isolation valve (item 15 C) and allow the receptacle to drain.
  - d. When the receptacle is empty, close the pump isolation valve (item 15 C) and open the return valve (item 15A) to drain the re-circulating tubing (item 9).
  - e. Turn the pump motor off, and close all valves.
4. To open the cover (closure) on the receptacle, perform the following steps:
  - a. Open the sample draw-off valve (item 11) to relieve pressure from the receptacle.
  - b. After the pressure is relieved, loosen the T-bolts and swing them away from the lugs on the closure.
  - c. Grasp the handle on top of the closure and swing it back towards the hinges to open the closure.
5. Thoroughly clean the receptacle after every sampling batch to prevent cross-contamination of sampled fluids.





## CMC-500 Circulating System Bill of Materials

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	50142307002	Motor, 1/2 HP, 115/230 VAC, Std. Duty
2	1	50142304008	3/4-in. NPT Gear Pump
3	1	50142307831	Skid, 30 in. x 32 in.
4	1	5014230xxxx	Tank Assembly
5	1	50142309500	Gauge Valve Set
6	1	50142307910	2-in. OD Clear Plastic Tubing
7	1	50142307905	Sight Glass, 5/8-in. Dia, Heavy Wall
8	2	50142307911	Grommet, Sponge
9	2	50142307912	Clamps
10	1	50142381037	0-60 psi Liquid Filled Pressure Gauge
11	1	50142208006	Valve, Sample Draw-Off
12	1	50142304100	1/2-in. Static Mixer, SS
13	1	50142302205	Tubing, 3/4-in. OD, SS
14	1	50142302204	Spray Bar, Internal, SS
15	3	50142303642	Ball Valve, 1/2 in.
16	1	50142307353	Guard, Motor Cplg
17	1	50142200334	Valve, Pressure Relief, 5 psi
18	1	50142303543	Valve, Vacuum Relief, 1 psi
19	1	50142310046	Shut-Off, High Level Assy

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