

CLIF MOCK

# M20-3 Mixing System

## User Manual



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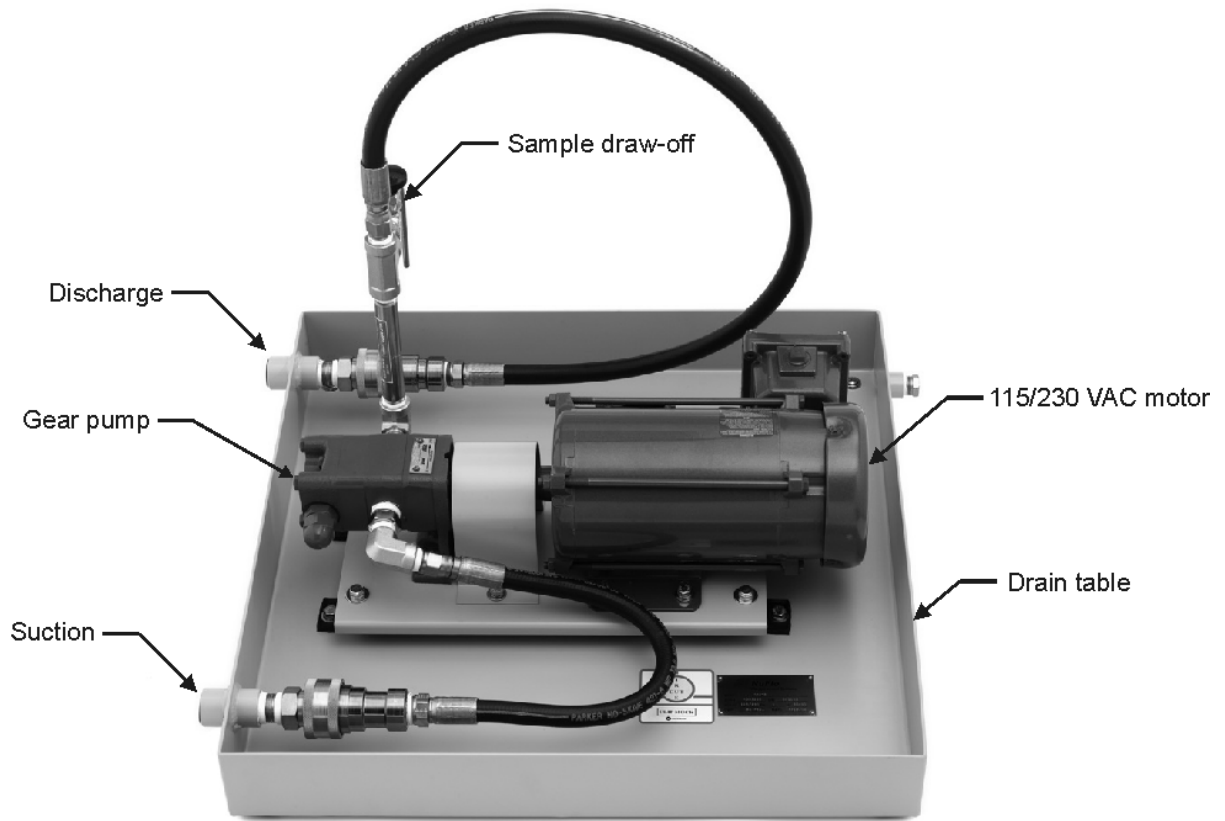
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# Nomenclature



## General Description

The M20-3 Mixing System and R Series receptacles are designed in accordance with API 8.3, to thoroughly mix crude oil samples. The receptacle ensures proper handling of the sample during transport from the sampling location to the laboratory; the M20-3 Mixing System ensures that the sample is properly mixed.

The M20-3 Mixing System can be used with the following portable receptacles:

- R20-4 (5 gallon)
- R8-4 (2 gallon)
- R4-4 (1 gallon)

The M20-3 Mixing System consists of a 1/2-hp explosion-proof motor, a 3/4-in. gear pump, and a 1/2-in. inline static mixer mounted on a carbon steel drain table. The drain table is coated with a baked-on epoxy paint. Also included are two flex hoses, each with 3/4-in. quick-disconnect (QD) couplings on one end for quick and easy connections to all R Series receptacles.

## Installation

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**Caution—The M20-3 Mixing System is designed for use in non-classified areas only.**

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Installation of the M20-3 Mixing System requires the following items to be furnished by the customer:

- electrical power supply
- piping to receptacle drain, inlet flush, and table drain
- a container and/or sump for the receptacle drain and table drain
- a container and/or sump for the inlet flush
- an ON/OFF switch

Install the system as follows:

1. Position the M20-3 Mixing System on a flat surface, such as a table or bench.
2. Connect one end of the sump/discharge piping to the table/receptacle drain connector on the outside of the drain table, and the other end to the product container that is furnished by the customer. This is a permanent installation.
3. Connect one end of the suction piping to the cleaning product container and the other to the flush inlet (suction ) connector on the outside of the drain table. This is a permanent installation.
4. Install the ON/OFF switch near the M20-3 Mixing System.

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**Important—All field wiring must conform to the National Electric Code, NFPA 70. Local wiring ordinances may also apply.**

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5. Wire the motor to turn in a counterclockwise direction, following the wiring instructions supplied with the motor.

## Operation

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

For most light- to medium-weight crude oils ranging up to API 24 with a kinematics viscosity less than 160 CTS at 60°F (16°C), the receptacle volume should be circulated approximately five times.

For most crude oils heavier than API 24 with a kinematics viscosity greater than 160 CTS and temperatures below 60°F (16°C), additional circulation time should be considered to ensure thorough mixing.

To operate the system, perform the following steps:

1. Place the filled receptacle near the M20-3 table in large available space.
2. Verify that the sample draw-off valve is CLOSED.
3. Verify that the power switch for the motor is OFF.
4. Remove the discharge hose QD coupler from the drain outlet nose inside the drain table, and connect it to the discharge connection on the top of the receptacle (Figure 1).
5. Remove the suction hose QD coupler from the flush inlet nose inside the drain table, and connect it to the suction connection at the bottom of the receptacle (Figure 1).
6. Turn the power switch ON to start mixing.
7. Mix the sample per API / ISO 3171 recommendations.
8. Open the sample draw-off valve to collect the mixed sample.
9. Close the sample draw-off valve.
10. Turn the power switch OFF.

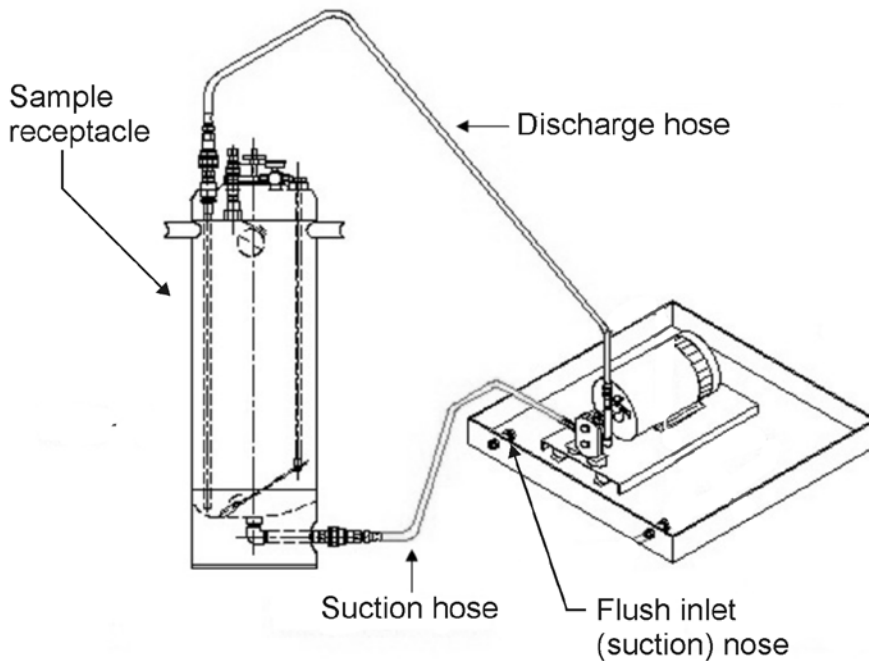


Figure 1—Hose connections for mixing a sample

## Cleaning the System

Cleaning the system is a four-step process involving draining sample product from the receptacle, filling the receptacle with cleaning product, circulating cleaning product through the system, and draining the cleaning product. The sample (“R” series) receptacle must be cleaned after each use.

See the following procedure for step-by-step instructions.

1. Drain the sample product from the receptacle (R20-4, R8-4, R4-4) as follows:
  - a. Remove the discharge hose QD coupler from the discharge line at the top of the receptacle and connect it to the drain outlet nose inside the drain table (Figure 2)
  - b. Turn the power switch ON and allow the receptacle to drain. The level gauge should indicate when receptacle is empty.
  - c. Turn the power switch OFF,
  - d. Remove the discharge hose QD coupler from the drain outlet nose and connect it to the discharge line on the receptacle.



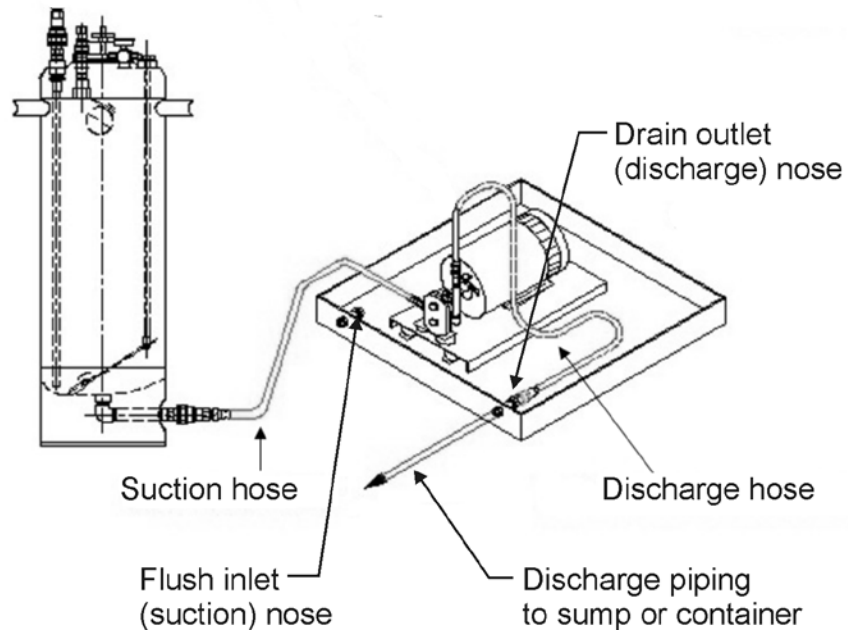


Figure 2—Hose connections for draining sample product or cleaning product

2. Fill the receptacle (R20-4, R8-4, R4-4) with cleaning product as follows:
  - a. Remove the suction hose QD coupler from the suction line of the receptacle and connect it to the flush inlet nose.
  - b. OPEN the flush inlet valve (customer-supplied) between the suction inlet nose and the container of cleaning fluid.
  - c. Turn the power switch ON and fill the receptacle with cleaning product.
  - d. When the receptacle is half full, turn the power switch OFF and CLOSE the flush inlet valve.

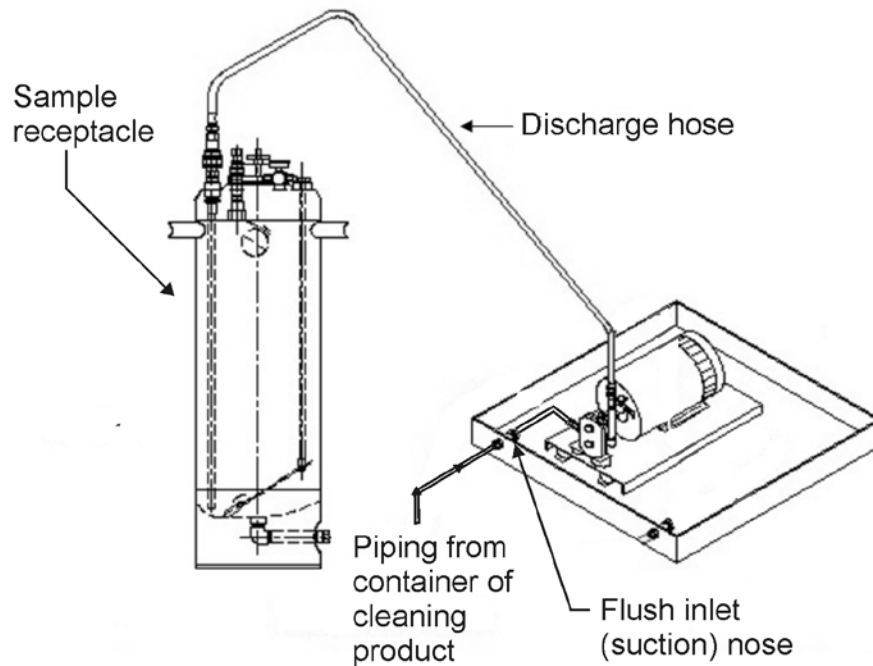
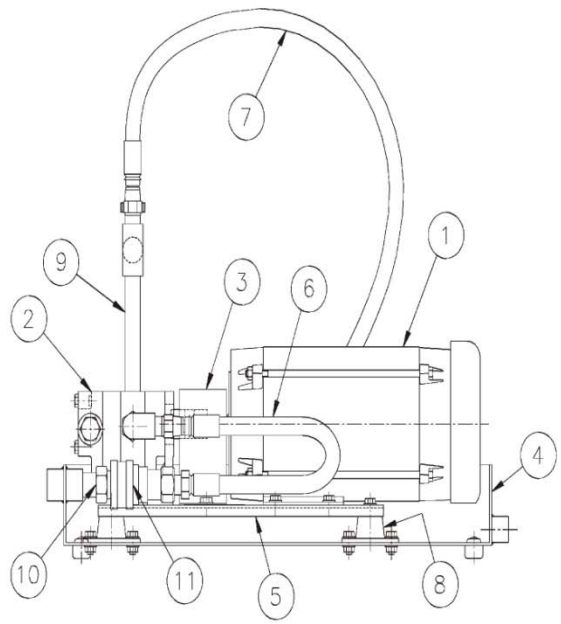
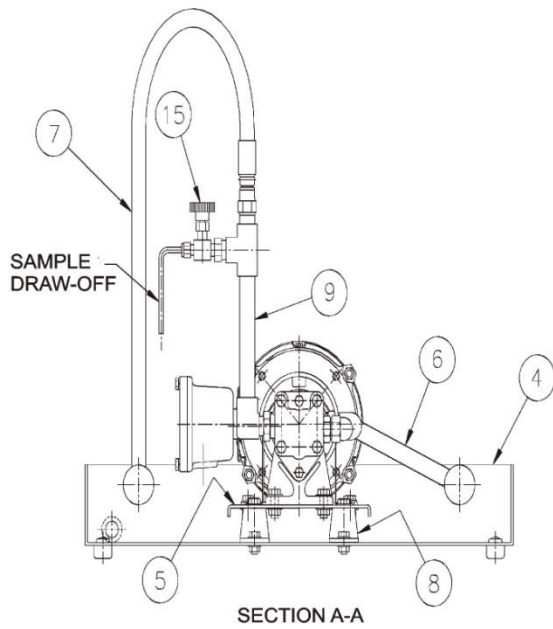
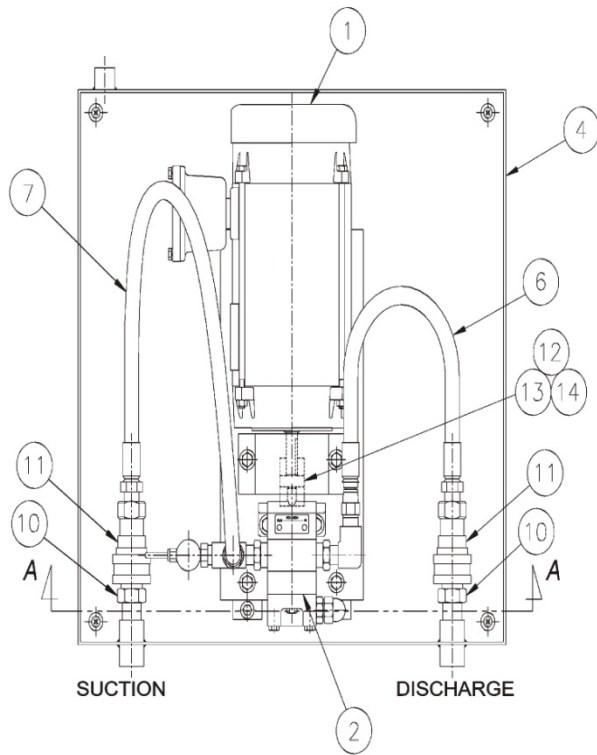


Figure 3—Hose connections for filling the receptacle with cleaning product

3. Circulate the cleaning product as follows:
  - a. Remove the suction hose QD coupler from the flush inlet nose and connect it to the suction connection of the receptacle. (Proper hose connections are the same as those for mixing, shown in Figure 1.)
  - b. Turn the power switch ON.
  - c. Circulate the cleaning product through the system for 5 minutes.
  - d. Turn the power switch OFF.
  
4. Drain cleaning product from the system as follows:
  - a. Remove the discharge hose QD coupler from the discharge connection on the receptacle and connect it to the drain outlet nose to drain the cleaning product (Figure 2).
  - b. Turn the power switch ON.
  - c. Open the sample draw-off valve slightly to clean.
  - d. Continue to drain cleaning product until the receptacle is completely empty.
  - e. Turn the power switch OFF.
  - f. Close the sample draw-off valve. The system is clean and ready for the next sample.

## Bill of Materials

Item	Qty.	Part No.	Description
1	1	50142307002	Motor, 1/2 HP, 115/230 VAC, Std Duty
2	1	50142304008	Gear Pump, 3/4"
3	1	50142307353	Guard, Motor Coupling
4	1	50142310060	Drain Table, 24" x 24"
5	1	50142310063	Motor Channel
6	1	50142310070	Hose, 3/4" x 1/2" x 22" Lg.
7	1	50142310066	Hose, 3/4" x 1/2" x 48" Lg.
8	4	50142310101	Vibration Mount
9	1	50142384100	1/2" Static Mixer
10	2	50142310075	QD Nose, 3/4"
11	2	50142310080	QD Coupler, 3/4"
12	1	50142307311	Motor Coupling, 1/2"
13	1	50142307312	Motor Coupling, 5/8"
14	1	50142307312	Spider
15	1	50142208006	Valve, Sample Draw-off



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