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JISKOOT™ MS-53 Laboratory Mixer

User Manual

Manual No.H08, Rev. 7

Important Safety Information

Symbols used in this manual:

This symbol identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

This symbol indicates actions or procedures which if not performed correctly may lead to personal injury or incorrect function of the instrument or connected equipment.

Terms used in this manual:

Note	**Indicates actions or procedures which may affect instrument operation or may lead to an instrument response which is not planned.**

Technical Support Contact Information:

Sensia LLC
200 Westlake Park Blvd
Houston, TX 77079
+1-866-773-6742
sensiaglobal.com

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6	Recommended Spares List corrected	P.Whittle	N.McGee	07/01/2009
5	Company name updated	P.Whittle	M.A.Jiskoot	02/02/2006
4	Note added regarding maximum product viscosity for standard unit	P.Whittle	M.A.Jiskoot	27/08/2003
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2	Drawing and Parts List references updated	P.Whittle	P.Whittle	25/04/2000
1	-	-	-	-
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1 Introduction

The Jiskoot™ MS-53 Laboratory Mixer is used to ensure that samples of crude oil or other products extracted from a pipeline or a cargo are thoroughly mixed prior to laboratory analysis, to ensure that the small amount of sample is truly representative of the whole.

The sample is normally collected in Jiskoot™ Type PR-23 (9 litre) or PR-53 (18 litre) portable Sample Receivers over a period of some hours. It may be many hours before it is analysed and during this time some of the water will fall out and separate.

The standard Jiskoot™ MS-53 Laboratory Mixer is capable of mixing viscous products of up to 500 Cst (at operating temperature). Alternative motors and pumps may be required for higher viscosity applications.

2 Operating Instructions

The Jiskoot™ MS-53 Laboratory Mixer is simple to operate.

The Mixer must be firmly located on a suitable bench and connected to a suitable electrical supply.

The 3/4" suction and 1/2" discharge hoses must be connected to the appropriate connections of the Sample Receiver. Ensure that the quick release couplings are connected properly by pulling gently on the hoses.

Apply power to the Mixer. Mixing time is a function of gravity, viscosity and various other factors. Tests have shown that the Laboratory Mixer will successfully mix a variety of oils within 5-10 minutes, however, the optimum mixing time will vary depending on the composition of the oil.

When crude oil is sampled at a high temperature, allowed to cool and then reheated, condensation may form in the Sample Receiver. If this occurs, ensure the can is briefly shaken by hand to remove water droplets from the top of the receiver.

In some instances the pump may need assistance in priming. To do this lift the receiver up with the mixer running until the pump primes.

NOTE: To avoid damage to the pump, the Laboratory Mixer should not be operated for periods exceeding 3 minutes if no product available.

When the oil is thoroughly mixed, draw off a sample from the needle valve into laboratory glassware for analysis. Alternatively, a septum may be fitted to the Mixer to enable the sample to be taken using a syringe. It is recommended that the initial 10-20ml of sample be discarded, to ensure all equipment is thoroughly flushed.

When sufficient sample has been obtained, switch off the mixer and thoroughly clean all equipment to prevent cross contamination.

3 Utilities Reference

Electrical Requirements	100/110 or 240/220 Volts, 50 or 60 Hz to suit motor supplied.
Power Requirement	0.5KW
Pneumatic Option	3Barg/45psig lubricated air supply.

4 Full Functional Description

The Jiskoot™ MS-53 Laboratory Mixer consists of a loop drawing oil from the lowest point in the Sample Receiver through the electric motor driven gear pump. The oil is discharged from the pump through the static mixer and returned to the receiver. The return pipe of the Sample Receiver is pointed down, tangentially towards the wall of the receiver to promote extra mixing.

The Laboratory Mixer is fitted with a needle valve to enable the sample to be drawn off into laboratory glassware. In addition, a septum may be fitted to enable a sample to be drawn off via a syringe.

The Jiskoot™ MS-53 Laboratory Mixer is normally supplied with an electric motor, but is also available with a pneumatic motor for applications where electricity is not an available power source.

5 Installation Details

The Laboratory Mixer must be installed and operated in compliance with any applicable electrical hazardous area regulations. The electrical supply should be connected to the motor isolating switch via a suitably certified M20 cable gland, ensuring that earth continuity across the switch is maintained.

6 Maintenance & Troubleshooting

Other than cleaning after use, the Jiskoot™ MS-53 Laboratory Mixer requires minimal maintenance.

The septum rubbers are self-sealing, however if a leakage is noted, they must be replaced with new rubbers.

Both Laboratory Mixer and Sample Receiver must be cleaned to prevent cross-contamination of samples.

The recommended method for cleaning this equipment is to use a solvent and an inert gas (e.g. Nitrogen) as follows:-

1) Remove Sample Receiver from Laboratory Mixer and empty.
2) Re-connect Sample Receiver and run Laboratory Mixer for approximately 15 seconds.
3) Disconnect and empty Sample Receiver.
4) Add 2 litres of solvent (Toluene or Kerosene).
5) Turn on Laboratory Mixer and circulate for one minute.
6) Turn off and remove pump suction hose (3/4" connector)
7) Connect suction to inert gas source (Nitrogen) **NOT** compressed air.
8) Carefully blow out Laboratory Mixer with inert gas. NOTE: The gas pressure will relieve through the Sample Receiver relief valve.
9) Remove Sample Receiver. Clean with solvent and leave inverted with cover removed to drain.

DO NOT UNDER ANY CIRCUMSTANCES:-

1) Use compressed air for purging.
2) Run the Laboratory Mixer with the discharge hose disconnected or shut off - high pressures will build up and may cause the hose to rupture.
3) Run the Laboratory Mixer unprimed or with solvent for long periods

7 Sub Supplier Information

7.1 Electric motor

The electric motor requires no routine maintenance. In the event of a fault, the motor should be replaced or fully overhauled by a qualified repair shop.

7.2 Gear Pump Overhaul

The gear pump has minimal serviceable components. A replacement seal kit is available for site replacement if required, but as any wear on the gears and body faces causes loss of performance, a replacement pump is recommended.

7.3 Pneumatic Motor

Before dismantling the pump, using a broad felt tip marker pen, draw a line on the pump outer casing from the foot/flange casting across the centre body casting to the end cover casting.

1) Slacken and remove the 4 socket head set pins.
2) Remove end cover casting.
3) Remove centre body casting.
4) Remove gears and shafts.
5) Remove dowels.
6) Clean components, removing traces of paint, and/or gasket material from body sides.

7.3.1 Examine:

1) Shafts for signs of wear (a maximum reduction of .002" difference from diameter of unworn part of shaft is acceptable).
2) Gears, tooth form and gear end faces for wear, scuffing or damage, and replace if necessary.
3) Lip Seal/s for damage caused by dirt or metal particles, etc. and replace if necessary.

NOTE: With double lip seal arrangements, ensure that the seals are re-fitted facing exactly the same direction as the seals they replaced.

7.3.2 Reassembly

1) Ensure that all components are clean and free from dirt and paint etc.
2) Measure the body width and gear width and fit paper gaskets to allow a maximum of 0.002" running clearance.
3) Fit dowels.
4) Align the components to the felt marker line and re-assemble in reverse order to the dismantling procedure.
5) Tighten the 4 socket head set pins evenly and diagonally whilst rotating the driveshaft by hand. Ensure that the pump rotates evenly for the full 360^{o} without tightness. Should tightness occur, slacken set pins and try again.
6) If the pump cannot be assembled as indicated, examine gears for damage and, if satisfactory, fit an extra gasket to one face and repeat from 5 above.

8 Product Specific Drawings

8.1.1 Jiskoot™ Laboratory Mixer Type MS53-E (Electrically Driven)

General Arrangement Drawing B18103

Septum Assembly Drawing E16473

8.1.2 Jiskoot™ Laboratory Mixer Type MS53-P (Pneumatically Driven)

General Arrangement Drawing B18602

Septum Assembly Drawing E16473

9 Recommended Spares List

Part/Sub- Assembly	Item No's	Commissioning	1 Year Operation	2 Year Operation
3/4" Quick Release Coupling	3J-48-0476-00	-	1	1
1/2" Quick Release Coupling	3J-48-0516-00	-	1	1
Septum Seals (Quantity required will be determined by degree of usage)	3J-48-0641-00	-	10	10

10 Warranty – Limitation of Liability

Seller warrants only title to the products, software, supplies and materials and that, except as to software, the same are free from defects in workmanship and materials for a period of one (1) year from the date of delivery. Seller does not warranty that software is free from error or that software will run in an uninterrupted fashion. Seller provides all software "as is". THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Seller's liability and Buyer's exclusive remedy in any case of action (whether in contract, tort, breach of warranty or otherwise) arising out of the sale or use of any products, software, supplies, or materials is expressly limited to the replacement of such products, software, supplies, or materials on their return to Seller or, at Seller's option, to the allowance to the customer of credit for the cost of such items. In no event shall Seller be liable for special, incidental, indirect, punitive or consequential damages. Seller does not warrant in any way products, software, supplies and materials not manufactured by Seller, and such will be sold only with the warranties that are given by the manufacturer thereof. Seller will pass only through to its purchaser of such items the warranty granted to it by the manufacturer.

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