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1 INTRODUCTION

This maintenance manual covers the Mitech IR Sampler range. The IR Sampler is used on liquids, slurries and dry powder applications. This sampler is powered by a pneumatic anodised aluminium linear piston actuator (25² inch or 50² inch). The body sleeve, shaft, pistons and flanges are made of 316 stainless steel whilst the protective end cap is made from tungsten carbide or 316 stainless steel. The seals are made from polyurethane.

Please consult the General Arrangement Drawing on page 6 in regards to the numbering of the sampler parts.

2 INSTALLATION

2.1 It is very important to ensure that the lower piston and end cap are not protruding into the line when the sampler is not in operation. This prevents damage to the piston and seals the sampling tube from the media in the pipeline.

2.2 The flange adapter is welded to the media pipeline. A minimum distance of three pipe diameters from a bend should be allowed when positioning the sampler.

2.3 When installing the sampler into the line the sample inlet hole should face towards the flow of the media in the line. This is irrespective of whether the line is horizontal or vertical

3 ROUTINE MAINTENANCE

It is important to operate the actuator on a regular basis. If the normal duties do not require the actuator to operate regularly we recommend that a procedure be introduced to stroke the actuator and sampler on a weekly basis. The advantage of this is that cylinder lubrication is achieved and any possible problems that may occur are identified before consequential damage can result

4 DISASSEMBLY OF THE ACTUATOR AND THE SAMPLER

Should the actuator or sampler require stripping for any reason, the following procedure should be followed

- The line must be made safe for work and drained if necessary.
- Remove all air connections to actuator.
- Remove the assembled actuator and sampler from the line.

4.1 The actuator may be removed completely from the sampler for servicing only once the sampler has been removed from the line. The nuts holding the bottom flange (10) onto the sampler adaptor (22) must be undone.

4.2 Remove the spring cover bolts (39) then the spring cover (37).

4.3 Unscrew the central nylok locknut (36) and withdraw the spring pack.

4.4 Disassemble the actuator from the sampler by undoing the M10 nuts (2), and remove the studs.

4.5 Remove the lower grub screw from the actuator stem (4).

4.6 Loosen the top locknut (9) and unscrew the sampler shaft from the actuator stem.

4.7 Loosen the bottom lock nut (9) and slide the piston seals (12) and support washers (11) off the sampler shaft (14).
4.8 Remove the sampler spacer (13), lower support washer and lower piston seals.
4.9 Remove the selok pin (23) then unscrew the sampler end cap (17) from the sampler shaft (14).
4.10 Remove cap spacer (15) and end seal (16).
4.11 Measure and record the gap between the ends of the cylinder cap circlip (44).
4.12 Remove the cylinder cap circlip and remove the cylinder cap (43).
4.13 Remove the piston (26) and the actuator stem (4) by sliding it out of the cylinder (1).
4.14 Remove the selok pin (27) from the actuator stem. Clamp the stem in a soft jaw vice. Using a spanner on the machined flats, loosen and remove the connecting stem (28).
4.15 Remove the stem "O" ring (32) from between the stem bushings (24). Only remove the stem bushings if necessary. Use a scribe to achieve this.
4.16 Using the same scribe, remove the stem bush (40) and “O” ring (41).

5 COMPONENT INSPECTION

5.1 Check the actuator cylinder (1) for any signs of internal scoring and external damage to the nylon coating.
5.2 Check the actuator stem (4) for any visible damage that may have been caused by galling or scoring.
5.3 Check the bore of the sampler adaptor (22) and body sleeve (8) for any signs of scoring.
5.4 Check the sampler support washer (11) and cap spacer (15) for any visible damage.
5.5 Check the end seal (16) and sampler end cap (17) are not damaged.
5.6 Clean all metal components with a suitable solvent.

6 REASSEMBLY OF THE ACTUATOR

- The following parts should always be replaced
  - Piston "O" ring (31).
  - Cylinder cap "O" ring (42).
  - Piston stem "O" ring (25).
  - Actuator stem "O" ring (32).
  - Sampler piston seals (12).
  - Stem “O” ring (41).

- If the stem bushings were removed: -
  - Roughen the surface of the stem bushes (24) slightly to improve adhesion of loctite.
  - Apply loctite primer and a thin coat of loctite adhesive "601" to the first bush and press it right to the shoulder of the actuator stem (neck).
  - Insert the actuator stem "O" ring (32).
  - Repeat the same procedure on the second bush and make sure it does not press too tightly on the "O" ring. The top of the bush should be flush with cylinder face.
  - Check if the actuator stem (4) slides freely through the bushes and "O" ring.

6.1 Hold the actuator stem on the flats in a soft jaw vice. Fit the piston stem "O" ring (25) and assemble the piston (26) to the actuator stem.
6.2 Screw the connecting stem (28) onto the actuator stem. Replace the selok pin (27).
6.3 Put light smear of silicon grease on the piston "O" ring (31) and fit to the piston.
6.4 Apply liberal coating of grease to the bore of the cylinder (1).
6.5 Fit piston and actuator stem into the cylinder. Be careful when inserting the actuator stem through bushes and “O” ring. Ensure that it moves freely without fouling.
6.6 Fit the cylinder cap "O" ring (25) to the cap (26) with a light smear of grease, and then fit the stem “O” ring (41) and stem bush (40) into the cylinder cap as well.
6.7 Fit the cap to the cylinder, taking care not to damage the "O" ring on the cylinder. Pass the cap over the end of the connecting stem.
6.8 Insert the circlip (44) and tap it to ensure that it is properly seated. Measure the gap; it should correspond to the measurement taken when disassembling.
6.9 Attach the tension rod (30) on to the connecting stem. Secure with grub screw (29).
6.10 Fit spring pack onto tension rod and replace nylok nut (36).
6.11 Replace the spring cover (37) and secure with spring cover bolt (39) and washer (38).
6.12 Check cylinder operation using airline. Pressure should be approximately 5 Bar.
6.13 Check for leaks at cap end by pouring soap water onto the cap and pressurising cylinder using hole nearest the cap.
6.14 Pour water into the cylinder neck and check for leaks at this end by pressurising the cylinder using the hole nearest the neck. If the "O" ring (30) on this side leaks, the cylinder must be dismantled and the second bush pressed further in, to compress the "O" ring slightly.

7 REASSEMBLY OF THE SAMPLER BODY

7.1 To assemble the sampler piston, first screw the sampler end cap (17) onto the sampler shaft (14) then insert the selok pin (23). All other parts in the assembly must be inserted over the sampler shaft and be built from bottom up. The following sequence must be followed:

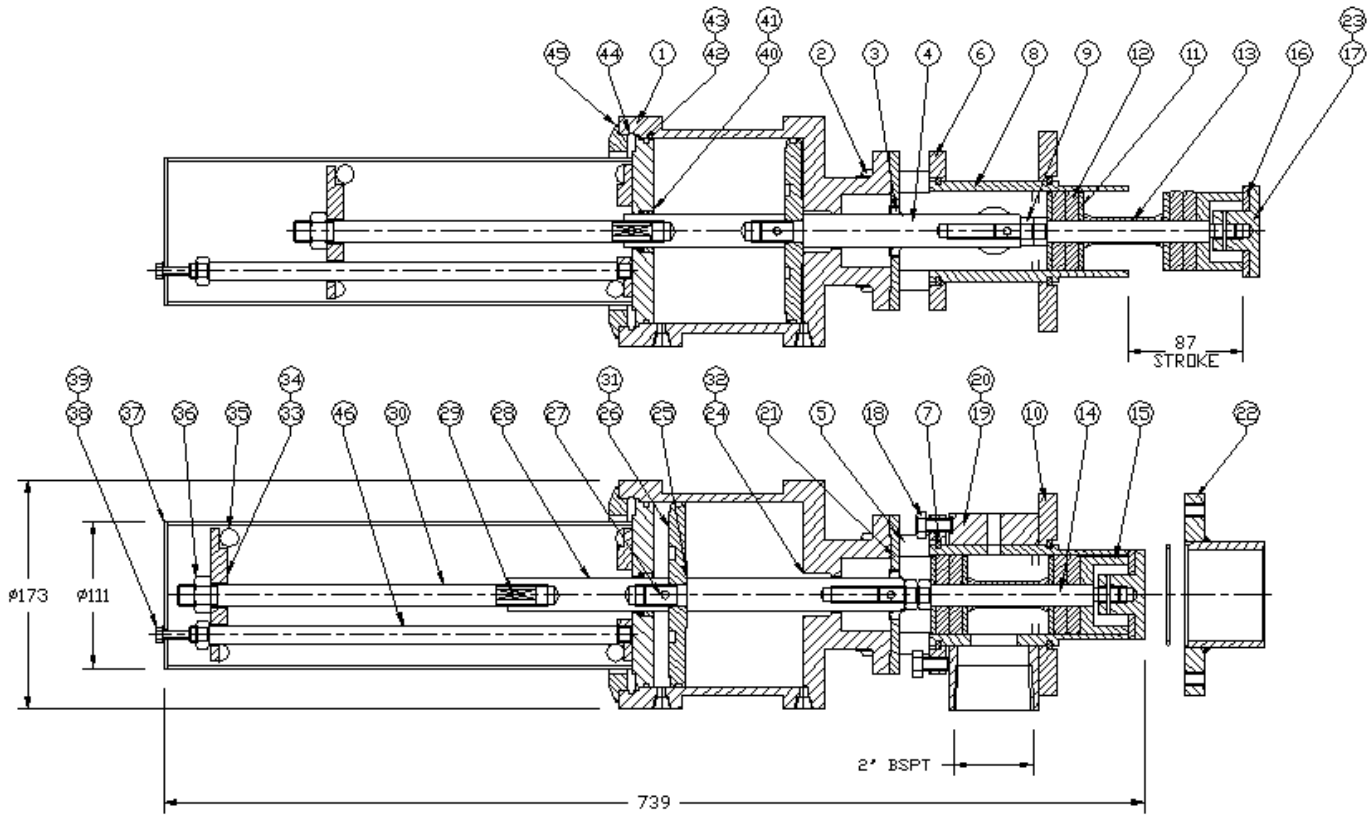
- End Seal (16)
- Sampler End Cap (17)
- Cap spacer (15)
- 2x piston seals (12)
- 1x support washer (11)
- Sampler spacer (13)
- 1x support washer (11)
- 2x piston seals (12)
- 1x support washer (11)

7.2 Hand tighten the bottom lock nut (9) onto the piston.
7.3 Screw the mounting studs (5) into the top flange (6) and tighten. Insert the mounting spacers (5) onto the studs.
7.4 Place the body sleeve (8) and the bottom flange (10) in place.
7.5 Re-bolt the M10 nuts (2) onto the studs.
7.6 Using a press fit the rod wiper seal (3) into the top flange.
7.7 Assemble the actuator and piston assembly to the sampler body taking care that the piston seals are not damaged when sliding them into the sampler body.
7.8 Tighten the four M10 nuts (2).
7.9 Screw the piston assembly onto the actuator stem and tighten the top locknut (9). And bottom locknut (9).

7.10 Insert and tighten the grub screw.
7.11 Stroke the actuator to ensure smooth operation of the actuator and sampler.

CAUTION: When stroking the actuator, make sure that your hands are clear of the sampler ports and other moving parts

Appendix1 : IR SAMPLER GENERAL ARRANGEMENT DRAWING



Appendix 2 : PARTS LIST

ITEM No.	DESCRIPTION
1	ACTUATOR CYLINDER
2	NUT - M10
3	ROD WIPER
4	ACTUATOR STEM
5	MOUNTING BAR
6	TOP FLANGE
7	HALF RING SET
8	BODY SLEEVE
9	NUT M12
10	BOTTOM FLANGE
11	SUPPORT WASHER
12	PISTON SEAL - SAMPLER
13	SAMPLER SPACER
14	SAMPLER SHAFT
15	CAP SPACER
16	END SEAL
17	SAMPLER END CAP
18	BOLT (SET) M10 x 20
19	2" BSPT CHUTE
20	BOLT M8 x 45
21	MOUNTING FLANGE
22	SAMPLER ADAPTOR
23	SELOK PIN ø3 x 25 LONG.

ITEM No.	DESCRIPTION
24	ACTUATOR STEM BUSH
25	PISTON STEM “O” RING
26	PISTON
27	SELOK PIN
28	CONNECTING STEM
29	GRUB SCREW
30	TENSION ROD
31	PISTON “O” RING
32	ACTUATOR STEM “O” RING
33	SPRING BUTTON TOP
34	SPRING BUTTON BOTTOM
35	SPRING
36	NYLOK NUT
37	SPRING COVER
38	SPRING COVER WASHER
39	SPRING COVER BOLT
40	STEM BUSH
41	STEM “O” RING
42	CYLINDER CAP “O” RING
43	CYLINDER CAP
44	CIRCLIP
45	COVER RING
46	TIE BAR