

SensiFlex®

Installation & Maintenance Instructions

SENSIFLEX® PILOT INPUT TENSION CONTROL CLUTCH

Patent No. 6,578,691 B1



Catalog Products:

[38SI](#) & [38SI-ULOW](#)

[58SI](#) & [58SI-ULOW](#)

[78SI](#) & [78SI-ULOW](#)

[98SI](#) & [98SI-ULOW](#)

[118SI](#) & [118SI-ULOW](#)

*And non-catalog variations
of this clutch design.*

CLICK on product numbers above to
obtain the product detail sheet which
includes dimensional data helpful
during installation.

Mach III Technical Support

Toll Free: 866-291-0849

International: 001-859-291-0849

Email: engineering@machiii.com

www.machiii.com

Detail sheets and 3D models are available on the Mach III website:

<http://www.machiii.com/Products/Tension-Control/Pneumatic-Clutch/SensiFlex-Shaft-Input-Clutches.asp>

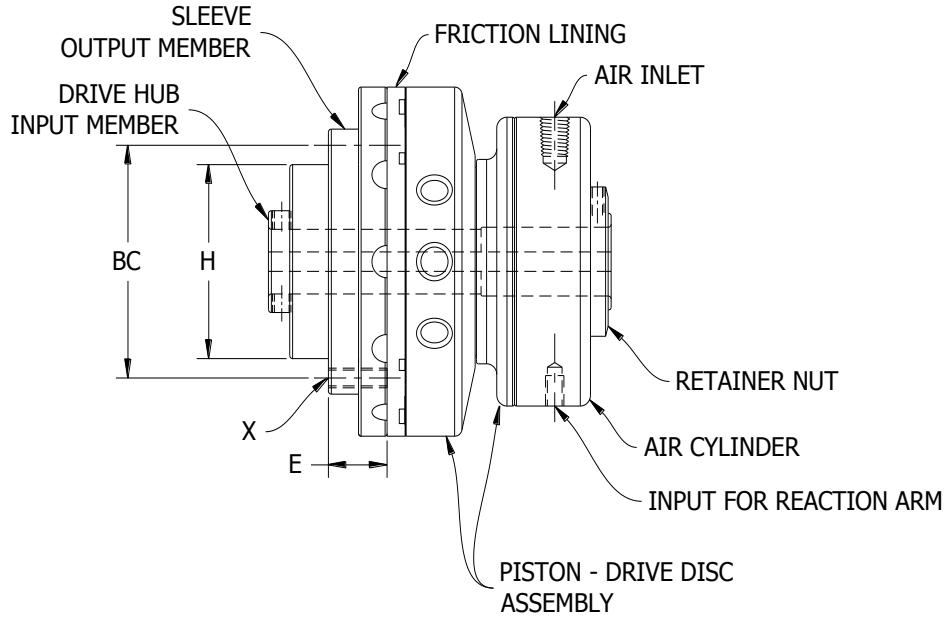
Please contact Mach III to obtain assembly and parts list drawings.



These products include rotating equipment and should be guarded according to OSHA requirements and other Federal, State and local regulations. It is the responsibility of the user to provide the necessary guarding.

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Reference Diagram:



<i>Product#</i>	<i>H</i>	<i>E</i>	<i>X</i>	<i>BC</i>	<i>Air Inlet</i>	<i>Reaction Arm Input</i>
38SI/38SI-ULOW	1.875	0.61	(3) 10 - 24	2.25	1/16" NPT	10 - 24
58SI/58SI-ULOW	2.749	0.87	(3) 1/4 - 20	3.25	1/8" NPT	1/4 - 20
78SI/78SI-ULOW	3.875	1.20	(3) 5/16 - 18	4.50	1/8" NPT	1/4 - 20
98SI/98SI-ULOW	5.000	1.25	(6) 3/8 - 16	5.63	1/8" NPT	1/4 - 20
118SI/118SI-ULOW	6.250	1.50	(6) 7/16 - 14	7.00	1/4" NPT	5/16 - 18

****IMPORTANT****

The gap between the friction and drive surface is factory set between 0.010 and 0.020 Inch.
 This is the ideal clearance for proper performance.
 Increasing this gap may result in air leaks and damage to the diaphragm actuator.
 Decreasing this gap prevents full disengagement of the brake.



I. Installation

A. SHAFT PREPARATION & MOUNTING

Mach III Clutch products are bored to fit a precision plug gauge for the specified bore size and should slide-fit your shaft. Make certain that the shaft is free of burrs or nicks. It may be necessary to file or sand the shaft to assure a slide fit. *Never hammer the clutch onto the shaft.* Hammering on the clutch may cause evident damage or subtle injury that will shorten the wear life of the unit, and will void the warranty. Apply the anti-seize (E-Z Break®) lubricant from the packet provided, or equivalent, to the shaft. Slide the clutch over the key on the shaft, align the pulley or sprocket and tighten the set screws.

B. AIR LINE CONNECTION

Air supply should be both filtered and regulated. Contamination in the air supply will cause damage to the clutch, particularly to the diaphragm actuator. Connect a flexible airline to the air inlet using a thread sealing compound. Do not use rigid piping.

C. ANTI-ROTATION (REACTION) ARM CONNECTION

Install a reaction arm (bolt, rod, or other device) into hole provided. This is necessary to prevent rotation of the air cylinder (due to the drag in the bearings) and to keep pressure off of the air inlet. This arm should not be held rigidly.

Please refer to Mach III's Anti-Rotation (Reaction) Arm Installation Instructions document for illustrations of proper mounting. This document is available from the Mach III website: <http://www.machiii.com/pdf/ReactionArmInstallation.pdf> or by calling Mach III to have a copy sent by email or fax.

D. FINAL INSPECTION & TESTING

Check alignment of the sprocket or pulley. Cycle the clutch with the machine off to check for air leaks and to ensure proper engagement and release. After a short run, check set screws and alignment.

II. Operation:

The SensiFlex® clutch is designed for use in slip applications, typically to maintain tension on a web during rewinding or a similar tension control application.

III. Routine Maintenance:

Friction linings (discs) are a "wear" item and in a constant slip application, periodic replacement of the friction disc will be necessary. The frequency of disc replacement varies with each application. Screws are used to mount the friction disc on the drive disc. Wear of the friction disc should be monitored so that it can be replaced prior to the point at which the heads of the mounting screws would make contact with the input sleeve. See chart below for replacement point recommendations. Mach III Clutch, Inc. should *a/ways* be consulted to assist with selection of a SensiFlex® Clutch to assure that required tension can be maintained while dissipating the heat caused by constant slip.



Friction Disc Replacement Recommendations

Product	Original Thickness of Friction Disc	Replace When Worn To A Thickness Of:
38SI/38SI-ULOW	3/16 Inch	9/64 Inch
58SI/58SI-ULOW	1/4 Inch	1/8 Inch
78SI/78SI-ULOW	5/16 Inch	3/16 Inch
98SI/98SI-ULOW	7/16 Inch	5/16 Inch
118SI/118SI-ULOW	7/16 Inch	5/16 Inch

Repair Parts & Services

Kits Available	Contents	Part Numbers
Facing Kit	Friction Disc & Mounting Screws	38SI-FCGK, 38SI-ULOW-FCGK, 58SI-FCGK, Etc. . . .
Repair Kit	Friction Disc, Mounting Screws, Spring(s), Diaphragm	38SI-RPRK, 38SI-ULOW-RPRK, 58SI-RPRK, Etc. . . .

For part numbers of components not included in the kits above, please contact Mach III Clutch, Inc. or your distributor. Factory repair is also available. A return materials authorization (RMA) number must be obtained prior to sending any unit in for repair. Mach III Clutch is not responsible for products returned without authorization.

IV. Repair Procedure

V.

Tools Needed	Compounds Required
Hex wrench set Retainer (snap) ring pliers Flat head screw driver Scraper (if replacing bearings) 0.010 Inch feeler gauge	Grease O-Ring lubricant Anti-Seize Lubricant

A. DISASSEMBLY

Loosen set screws using appropriate hex wrench and slide the clutch off of the shaft. Place the clutch on a work surface with the air cylinder end of the clutch upward. Loosen the set screw in the retainer nut and remove nut using a wrench or channel lock pliers. The air cylinder bearing is a slide fit on the drive hub. The cylinder, piston and cone assembly should come off of the drive hub together. You may need to strike the hub, or on an object inserted into the hub with a rubber mallet or similar soft face hammer, while pulling the cylinder upwards to remove.

B. DRIVE SURFACE INSPECTION & FRICTION DISC REPLACEMENT

Inspect the drive surface of the cast iron sleeve input member. Grooves in the surface would indicate that the friction disc should have been replaced sooner and the heads of the mounting screws have made contact. This surface must be free from grooves, burrs and foreign materials in order for the clutch to operate properly. If damage is pronounced, please contact Mach III Clutch or your distributor about replacing the sleeve and procedure. In addition, clutch should be inspected for discoloration (turning blue). If discoloration is present, the unit is being operated beyond its capacity and Mach III Clutch should be contacted for assistance. To replace the friction disc, remove brass screws and friction disc, make sure mounting surface is smooth and free from contamination. Mount new friction disc by snugging all screws first then tighten firmly using an alternating sequence. Do not over-tighten.

C. INSPECTION OF BEARINGS

Check bearings for external damage (missing seals, etc.). Make sure the bearings rotate freely and smoothly by hand. If bearing replacement is necessary, consult Mach III or your distributor for the bearing sizes and replacement procedures.

D. DIAPHRAGM INSPECTION & REPLACEMENT

Diaphragm replacement should rarely be necessary if the air supply is regulated and free of contamination and if the gap between the friction and drive disc is properly set.

Separate the air cylinder and piston by pulling apart taking care not to bend pins. Pinch the diaphragm and pull from the grooves which retain it. Make sure that the retaining grooves and surface underneath the diaphragm are clean & free from debris. Lubricate the new diaphragm (if replacement is necessary) with an O-ring lubricant such as Dow Corning® #4. Install with the lips located on the ID and OD of the diaphragm facing downward. Press the lips into the grooves by applying pressure while gliding a finger along each perimeter of the diaphragm. Assure that the lips are fully seated by running your thumb across the surface of the diaphragm in a clockwise motion several times.

E. REASSEMBLY

1. Apply a thin coat of grease (such as Molykote® G-N Metal Assembly Paste) to the hex drive surface of the drive hub. Be sure the spring is in place over drive hub and surrounding the hex portion of the hub. Place piston/drive disc assembly over drive hub. Drive disc assembly should move freely over hex.
- 2.
3. Place cylinder assembly over hub. Align pins in the holes in the piston and manually press the cylinder downward to reconnect with piston. The cylinder assembly will not fully seat until the retaining nut is tightened.
4. Place the adjustment nut on the threads and tighten to a point where a 0.010 - 0.020 gap remains between friction lining and sleeve input member. It is recommended that a 0.010 feeler gauge be used. Sleeve output member should turn freely after reassembly. If you can feel contact between the friction and drive surface when rotating, loosen adjustment nut just enough to provide clearance. Tighten set screw in adjustment nut snugly when proper clearance has been achieved.
5. See "Installation" section on Page 2 of these instructions for the proper procedure for re-installing the clutch.



Technical assistance is available by contacting Mach III Clutch, Inc.

Mach III Product Warranty
<http://www.machiii.com/Resources/Warranty-Info.asp>

Mach III Clutch, Inc.
101 Cummings Drive • Walton, KY 41094
Toll free 866.291.0849 • International 859.291.0849 • Fax 859.655.8362
info@machiii.com • engineering@machiii.com • www.machiii.com