

**MODEL 376/379**  
**ELECTRON BEAM SOURCE**  
**CRUCIBLE INDEXER**

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**INSTRUCTION MANUAL**

Part Number 376-0001-2

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## WARRANTY

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The 376/379 Electron Beam Source Crucible Indexer is guaranteed against faulty materials, function, and workmanship for a period of 12 months after delivery from Telemark. Components which are purchased by Telemark from other manufacturers will be guaranteed for any lesser time that such manufacturer warrants its product to Telemark. This warranty is valid only for normal use where regular maintenance is performed as instructed. This warranty shall not apply if repair has been performed or an alteration made by anyone other than an authorized Telemark representative or if a malfunction occurs through abuse, misuse, negligence, or accident. No charge will be made for repairs made under warranty at Telemark's facilities. Freight costs both ways will be at customer's expense. Telemark reserves the right for final warranty adjustment.

## USER RESPONSIBILITY

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The user is responsible for proper operation and ordinary maintenance of the equipment, following procedures described in this manual, including reference documents. Proper operation includes timely replacement of parts that are missing, broken, or plainly worn. If the user has a reasonable doubt about understanding the use or installation of a component, Telemark Technical Service should be called.

It is vitally important that the user properly install the equipment as described in Chapter 3 (Installation) of this manual. **The Warranty will be void if the equipment is improperly installed.**

Alteration of the design or any function of the equipment voids the warranty and is entirely the responsibility of the user.

## SAFETY WARNING

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General Precautions: Human contact with the voltages present within the power supply and vacuum system can be fatal. Make sure that the input power is turned off before opening the doors or removing panels. Short all HV feedthru connections with a grounding hook before accessing the indexer main body.

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# 1

## UNPACKING

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Your Model 376/379 electron beam source crucible indexer is packed into a specially designed double strength box surrounded with rigid foam padding. Since packaging the indexer for safe shipment is otherwise difficult, please save the box in the event that the indexer may ever need to be returned for servicing. We cannot be held liable, and may not be able to fix without charge, indexers which are damaged in transit as a result of improper packaging.

Inside the box will be the indexer, controller and this manual. Please check the items to make sure no damage has occurred in transit. The indexer is ruggedly built and packaged tightly so no damage should occur. In the event of any deficiencies please report them to your vendor immediately. Also take care to read the warranty on page ii as to the limits of our liabilities.



# 2

## DESCRIPTION

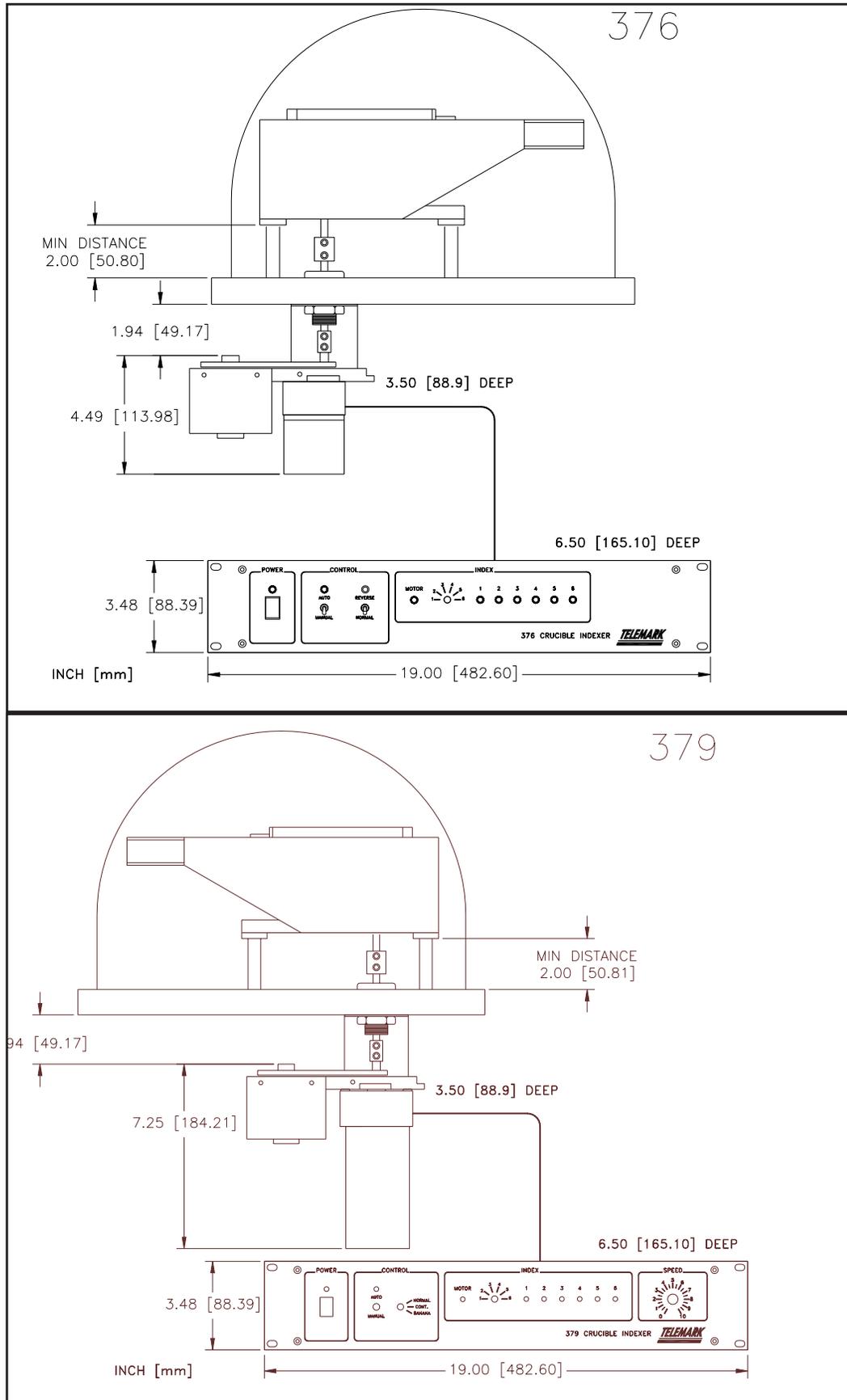
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The Indexer positions the crucibles of a turret-type sources, it also has a position-indicating function. The Indexer features a high torque motor. It is equipped with a coupling to accommodate a feedthrough drive shaft of a 1/4 inch (6.35mm). The controller features crucible pocket selection lights to tell the operator which crucible is in the “evaporate” position.

The model 376/379 electron beam source crucible indexer’s most notable features are the following:

- 1** *Selects, accurately positions, and indicates crucible to be evaporated.*
- 2** *Indexes turret electron beam sources with a 4 to 1 gear ratio.*
- 3** *Other features, such as heavy-duty screws in all important fastening locations, and heavy-duty construction all round, are designed to make the indexer serviceable for years of production.*
- 4** *Remote operation from a PLC (Programmable Logic Control).*
- 5** *Can be tied to the high voltage interlock on the power supply.*
- 6** *Ground stud, to ground the indexer from shorts.*
- 7** *Sweep pattern select output*
- 8** *Continuous and Banana Pocket operation (Model 379).*
- 9** *Speed Control (Model 379)*

**Figure 2-A**  
Crucible  
Indexer  
Reference  
Dimensions



# 3

## INSTALLATION

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### Required Components

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See fig. 3-A

The following is the minimum list of components required for setting up the indexer for safe operation.

- 1** *4 or 6 pocket electron beam source. Source rotation must be in working order.*
- 2** *Vacuum system with adequate external room for indexer mounting (see page 2-2 for dimensions).*
- 3** *19 inch rack with 115/230VAC, 50/60 Hz power to house the controller.*
- 4** *Cable from ground on chamber to ground stud indexer controller.*

### Setting Up

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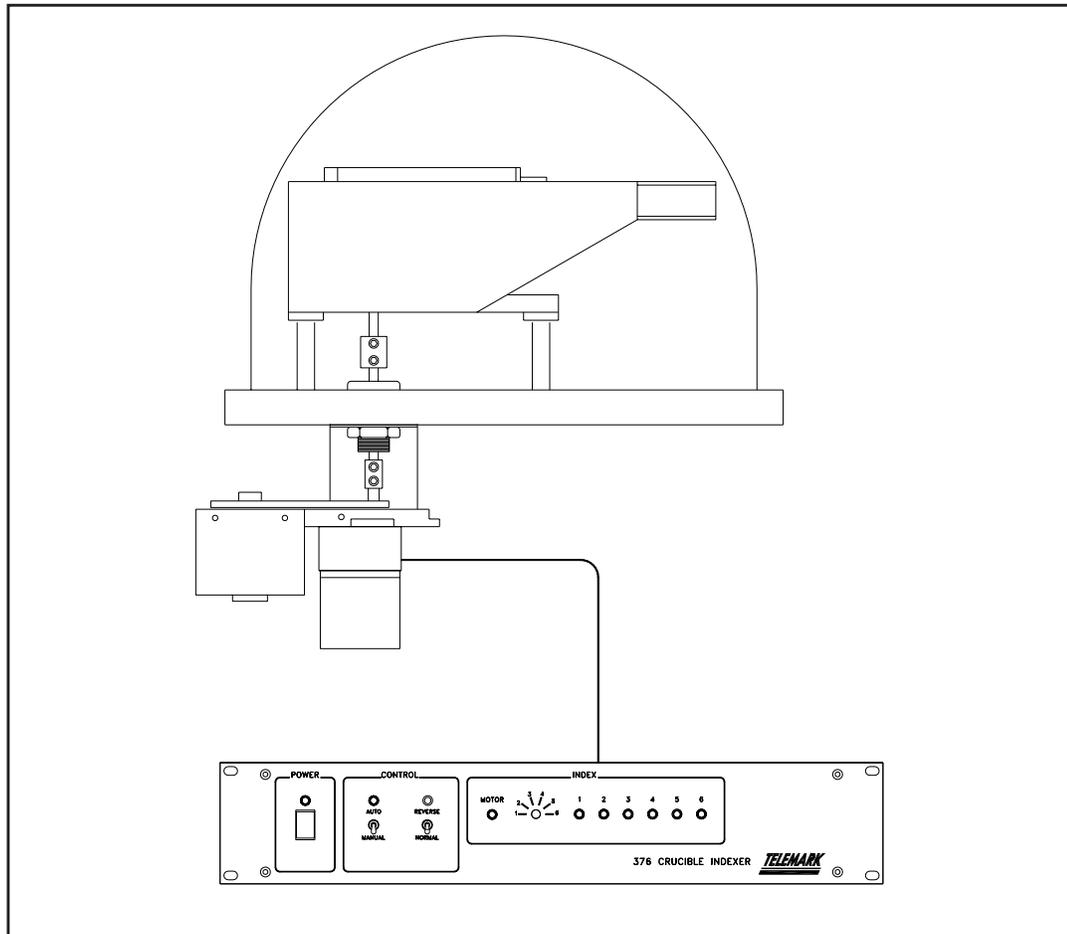
There are many different ways to set up the indexer. The best location and drive connection for your application can only be made after analyzing all the factors. The determining factors for the location of the indexer are; source type (side or bottom drive), free space in the chamber, and free space under the chamber.

The following installation options apply to both side and bottom drive sources.

See Fig. 3-A

The preferred way is a direct drive on each side of the feedthrough, this eliminates the problems associated with gear and chain drive. However the locating holes and bolts of the feedthrough, source, and indexer must be precisely predetermined so the indexer can function properly. The Feedthrough Bracket

**Figure 3-A**  
Suggested  
Installation

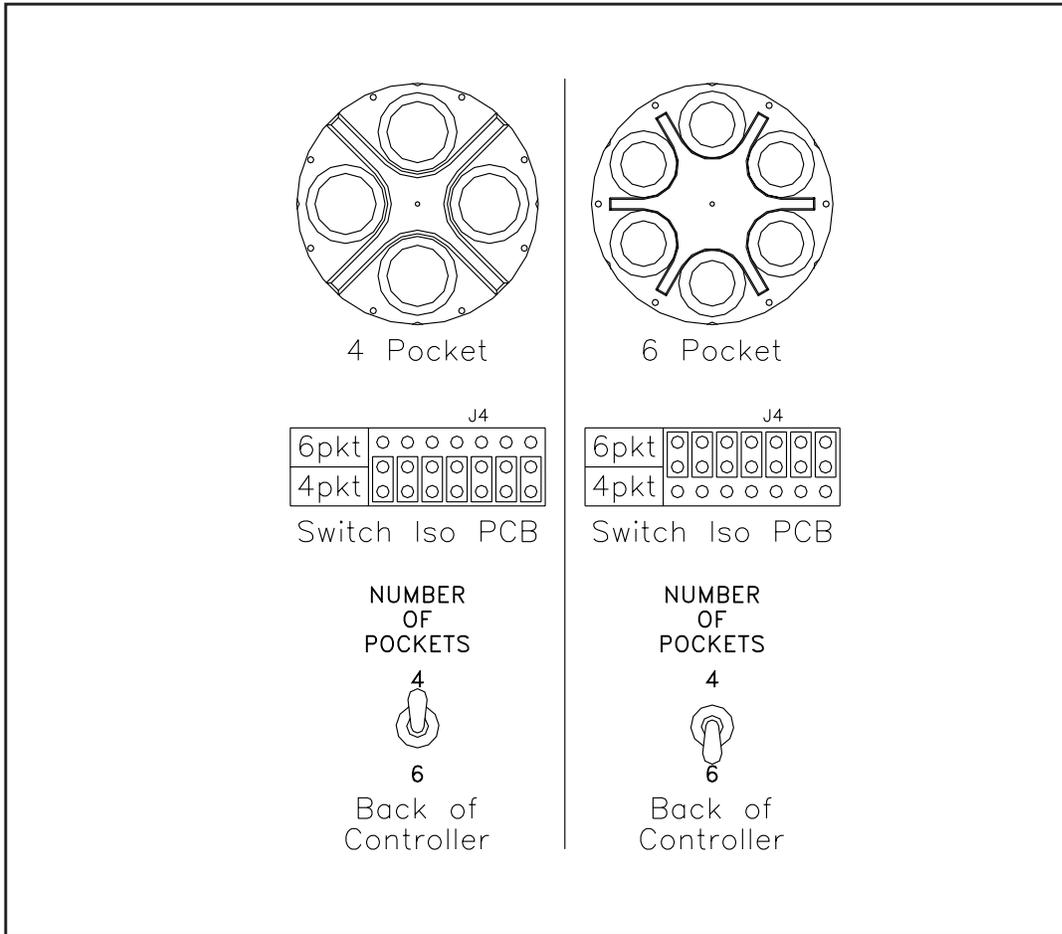


makes it easy to bolt the indexer to the bottom of the chamber with the nut of a 1" feedthru.

With Telemark thru baseplate Sources (231, 238, 267, 268, 277 or 281) the motor can be installed on the motor bracket.

With an internal chain drive the source can lined up so the pocket is in the center of the chamber or new source can be fitted in an existing chamber.

External chain drives can be used when space under the chamber is at a premium, it is best not to mount the indexer farther away than needed.



**Figure 3-B**  
Change  
Number of  
Pockets

### Changing Number of Pockets

See figure 3-B

Indexers are convertible between 4 and 6 pockets. The Switch Cover must be removed. Move the jumper on J4 to the desired number of pockets. All the jumpers on J4 must be across either "4pkt" or "6pkt". The switch on the back panel of the controller must match the jumpers on the Indexer Iso PCB.

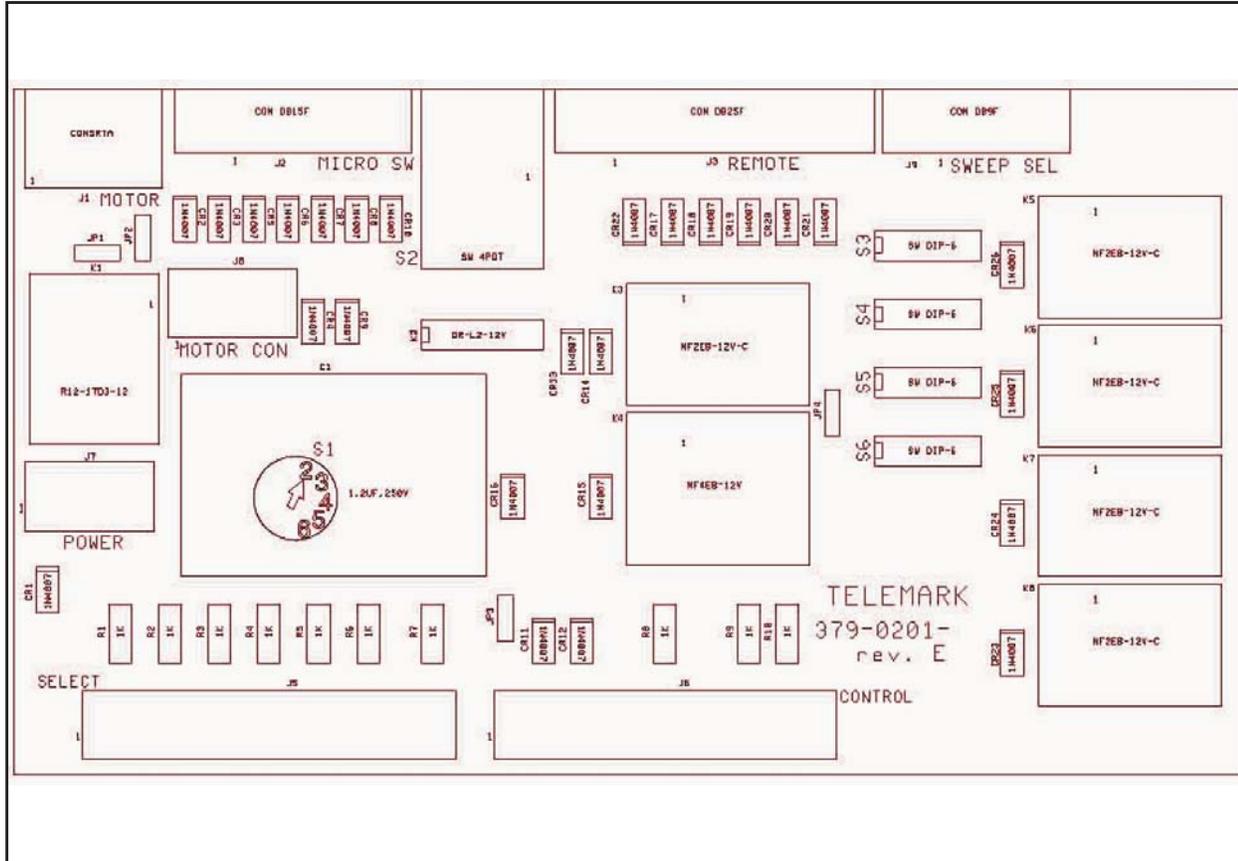
### Control PCB

See figure 3-C

The model 376 has C1 installed and not S1.

The model 379 has S1 installed and not C1. S1 is used to select the end of the banana pocket, as in figure 4-1. The number 2 position is default as shipped from the factory. For banana Pocket setup see operation chapter.

**Figure 3-C**  
Crucible  
Indexer Main  
PCB



### Sweep Select Control

See figures 3-C and 3-D

This option board is used in conjunction with sweepers incorporating pattern preselect, such as the Telemark XY Sweep with the optional Sweep Select Module. Switches S3 - S6 allow four sweep patterns (relay closures on the Sweep Select Control PCB, K5 - K8) to be married to any of the four or six pockets controlled by the indexer. Push the DIP switch "ON" once for each of the pockets.

**EACH INDEXING POSITION (POCKET) MUST HAVE ONLY ONE SWEEP PATTERN SELECTED. SEE FIGURE 3-D**

Four Pocket Sources:

Push the DIP switch ON to connect sweep pattern to connect sweep pattern to pocket, ie. (S3) with all switches on gives you pattern (1) on all pockets. Only one pattern per pocket is allowed. If pocket (1) is selected on S3 it cannot be selected on S4, S5, or S6.

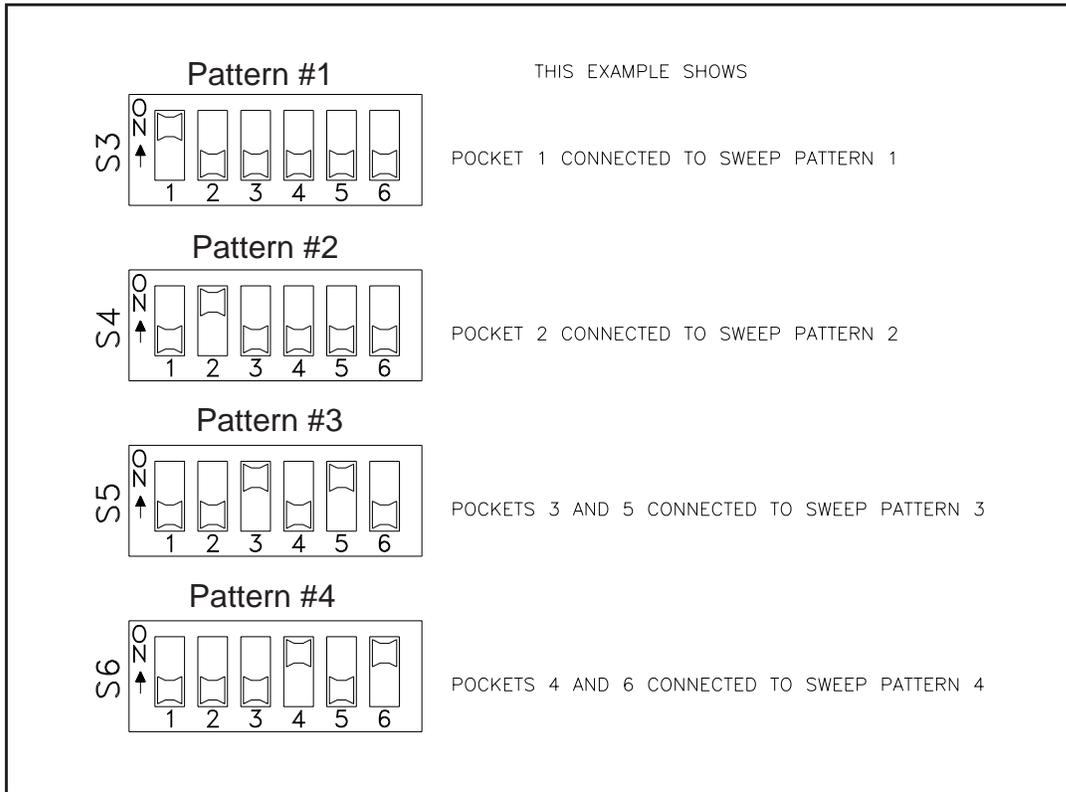
Six Pocket Sources:

With six pockets and four patterns; Pockets (5) and (6) must share a pattern with the other four pockets. see figure 3-E.

## List of Accessories or Supplies

Recommended parts:

Rotary Feedthrough. Right Angle Rotary Feedthrough, Telemark number 275-0006-1 for side drive sources or 1/4" Rotary Feedthrough, number 275-0002-1 for bottom drive sources.



**Figure 3-D**  
Sweep  
Select  
Selection



# 4

## OPERATION

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### General Operation

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Before using, first determine which materials are to be placed in the crucibles.

To set up the indexer, First rotate the switch to pocket one on the indexer controller. Unplug power to the indexer to prevent accidental injuries. Then undo the set screws on the coupler or drive gear. Rotate the crucible till the number one pocket is lined up with the front of the source.

With the pocket lined up and the controller on pocket one, tighten down the set screws on the couplers. Plug in power to the indexer, check to see that it is indexing properly.

To use the desired pocket simply rotate the switch to that pocket. The light will light-up when the selected pocket is reached.

The indexer is ruggedly designed and built, and should last a long time between adjustments.

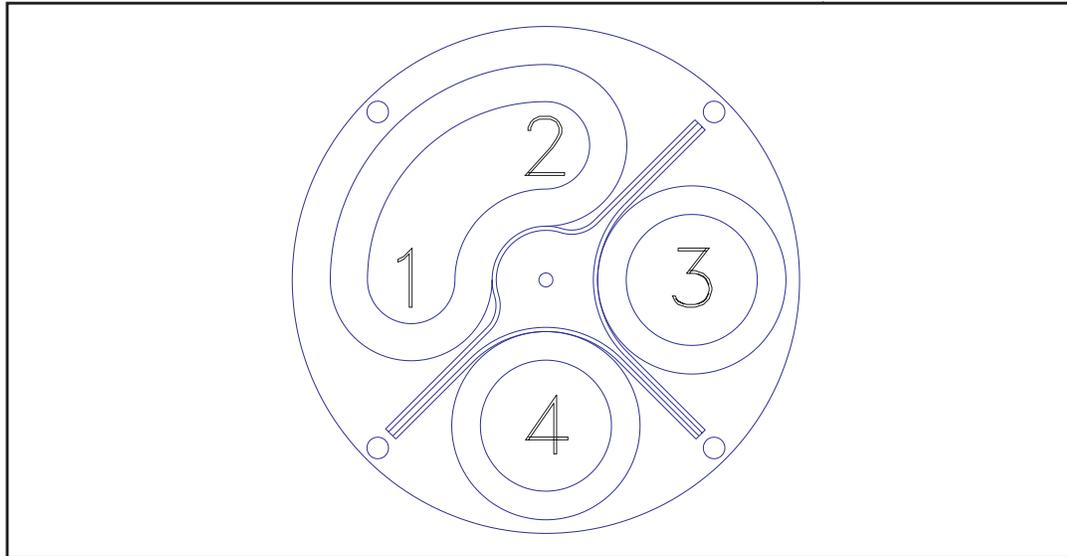
### Model 379 Modes

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The Model 379 Indexer has three modes of operation:

- 1** *Normal - In this mode it operates like a model 376.*

**Figure 4-A**  
Banana  
Pocket



- 2** *Banana - (see figure 4-A) In this mode the pocket will move back and forth under the beam with one end of the pocket being the #1 position and the opposite end being settable in positions two to six. In the drawing the end is position #2. The end position is set by selecting the position on S1 on the PC board in the controller. See figure 3-C.*

Note: 379 indexers are originally programmed at the factory for use with Sources (sources) with a banana pocket that is the same as rotating between two pockets (see figure 4-A, 1 to 2) 90 degrees back and forth. If a greater number of pockets are traveled past then S1 on the main PC board must be reset. Remove the top cover of the controller and with a small flat screwdriver make your selection of S1. See figure 3-C for details on the setting of S1.

- 3** *Continuous - In this mode the crucible rotates continuously (varied by the speed control). This is commonly used with a trough type crucible.*

# 5

## SERVICING

### Motor Drive Assembly

Ref	Part# -8	Part# -9	Description	Qty.
1	271-6030-8	271-6030-8	Soc. Head Cap Screw, #6-32 X 1/4"	9ea.
2	271-6130-8	271-6130-8	Soc. Head Cap Screw, #8-32 X 1-3/4"	4ea.
	271-6171-8	271-6171-8	Soc. Head Cap Screw, #10-32 X3/4"	
3	271-6150-8	271-6150-8	Soc. Head Cap Screw, #10-32 X 1/2"	3ea.
4	376-0085-1		Coupling	1ea.
5		376-0472-2	Motor Stand-off	3ea.
6	376-0620-1	376-0620-1	Pulley, 80 teeth	1ea.
7	376-9061-1	376-9061-1	Pulley, 20 teeth	1ea.
8	379-0203-1	379-0203-1	PCB, Indexer Opto Switch	1ea.
9	379-0204-1	379-0204-1	PCB, Indexer Switch Iso	1ea.
10	379-1001-2	379-1001-2	Switch Bracket	1ea.
11	379-1004-1	379-1004-1	Shutter Disk	1ea.
12	379-1005-2	379-1005-2	Shaft	1ea.
13	379-1006-2	379-1006-2	Feedthru Bracket	1ea.
14	376-1007-1	379-1007-1	Switch Cover	ea.
15	379-1008-1	379-1008-1	Jackscrew	2ea.
16	379-1009-1	379-1009-1	Standoff	4ea.
17	376-9006-1	376-9006-1	Bushings	2ea.
18	376-9009-2	376-9009-2	Motor (376) or	1ea.
	379-9009-2	379-9009-2	Motor (379)	
19	376-9070-2	376-9070-2	Belt	1ea.
20		238-0160-1*	Motor Clamp, 238	1ea.
		267-0160-1*	Motor Clamp, 231, 267	
		281-0160-1*	Motor Clamp, 281	
21		281-0150-2*	Gear, 24 teeth	1ea.

Figure 5-A  
Assembly

\* Part of the Source assembly.

**Figure 5-A**  
Assembly

