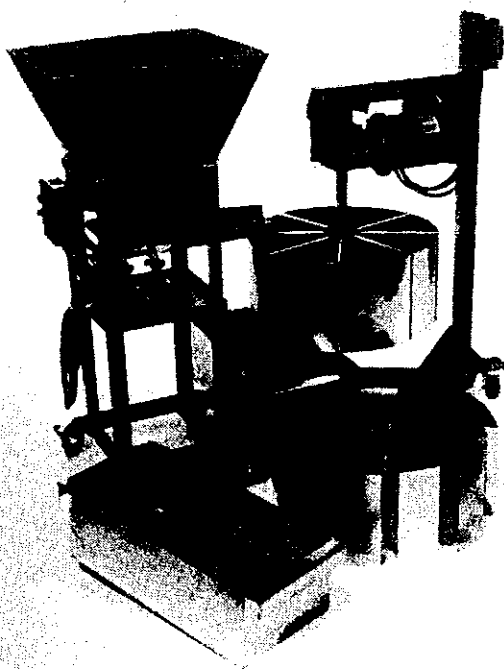


PREISER SCIENTIFIC, INC.

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OPERATING MANUAL FOR THE FRICO ROTARY SAMPLE DIVIDER MODEL RSD 50



MANUFACTURERS AND DISTRIBUTORS OF INSTRUMENTATION, EQUIPMENT AND SUPPLIES
FOR THE COAL, MINERAL AND METALLURGICAL INDUSTRIES

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CERTIFICATION

Preiser Scientific, Inc., certifies that this product was thoroughly inspected and tested at the factory prior to shipment.

LIMITED WARRANTY AND ASSISTANCE

This product of **PREISER SCIENTIFIC, INC.** is warranted against defective material and workmanship for a period of **one (1) year** from the date of shipment. **PREISER SCIENTIFIC, INC.** at our option, will repair or replace without charge all defective equipment returned (transportation charges prepaid) during the warranty period, provided there is no evidence that the equipment has been tampered with, mishandled, or abused. This warranty does not apply to parts or material whose normal life is less than the warranty period, nor is **PREISER SCIENTIFIC, INC.** liable for consequential damages arising out of the use or handling of its product.

In all orders for services, please include a description of the failure and a diagram of the conditions that will allow us to reproduce the failure.

PREISER SCIENTIFIC'S equipment and instruments typically utilize high voltages, extremely high temperatures and pressures, and mechanically advantaged moving parts. If installed, calibrated, maintained, or used improperly by inexperienced, untrained, or unsupervised personnel, serious injury or property damage could result. The buyer assumes all risk of personal injury or property damage as pertains to itself, its employees, agents, contractors, and the general public.

The liability of **PREISER SCIENTIFIC, INC.**, is limited solely to the aforesaid repair or replacement limited warranty.

INTRODUCTION

The FRICO RSD (Rotary Sample Divider) provides fast, accurate, and convenient subdivision of samples and enables individual requirements for throughput rate, nominal sample top size, and division ratio to be met.

The sample division step of the sample preparation process can be a major source of variance depending on the manner in which sample division is performed.

The data presented below, taken from the 1968 paper by A. A. Khan of Bradford University, demonstrates the effectiveness of different division methods.

TABLE
COMPARISON OF SPLITTING METHODS

	Standard Deviation (%)	Estimated Maximum Error (%)
Cone & Quartering	6.81	22.70
Scoop Sampling	5.14	17.10
Table Sampling	2.09	7.00
Chute Riffing	1.01	3.40
Spinning Riffing	0.13	0.42

The data clearly shows the limitations of cone & quartering and scoop sampling methods. Spinning riffing, or rotary sample division, is the preferred and most precise method of sample division for a variety of materials.

Rotary sample dividers are also suitable for mixing samples prior to sub-division, by putting the sample through the Rotary Sample Divider several times until the required mixture is obtained.

In 1992, FRICO, developed a rotary sample divider for splitting bulk samples of coal and minerals. Users are most enthusiastic, citing ease of use, flexibility, labor savings, and more precise sample division as the main benefits.

UNIT SPECIFICATIONS

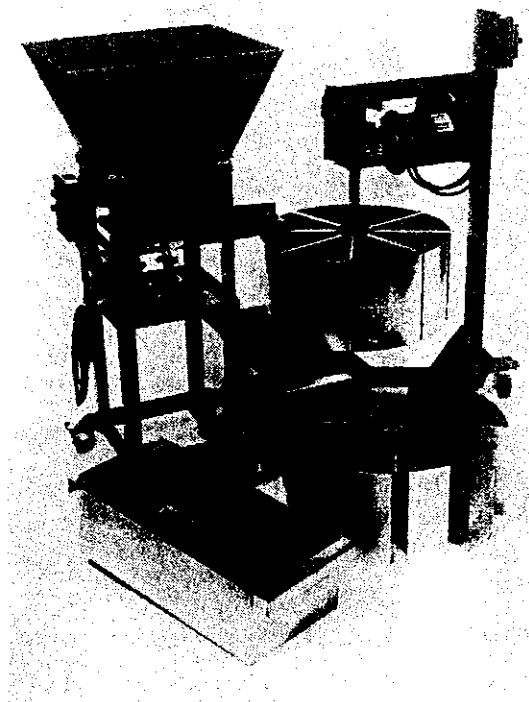
Basic Unit - Hopper Feeder Section and Rotary Drive Section -
(Does Not Include: divider segments,
"U" covers, or overflow pans)

Electrical Requirements: 220 A.C. Volts, 50 Hz, 4.1 Amps.

Overall dimensions: (LxWxH) 56"x33"x44" (142.24 x 83.82 x 111.76 cm)

Weight: 235 lbs. (106.6 kg)

Shipping Weight: Approximately 400 lbs. (181.4 kg) (See individual component weights)
(This weight varies according to configuration - number and sizes of
divider segments, "U" covers, and overflow pans)



INDIVIDUAL COMPONENT SPECIFICATIONS

Hopper Feeder Section -

Electrical Requirements: 230 A.C. Volts, 50 Hz, 0.5 Amps.
Hopper Construction: Stainless Steel
Hopper Capacity: 1.8 cu.ft. (51 liters)
Dimensions: (LxWxH) 24"x21"x44" (60.96 x 53.34 x 111.77 cm)
Weight: 116 lbs. (52.6 kg)

Rotary Drive Section -

Electrical Requirements: 230 A.C. Volts, 50 Hz, 3.6 Amps.
Rotation Speed: Less than 2ft./sec.(0.6 meters/sec.) at drop point in accordance with sampling standards.
Dimensions: (LxWxH) 33"x33"x44" (83.82 x 83.82 x 111.76 cm)
Weight: 119 lbs. (54 kg)

1/4 Divider Segment -

Construction: Stainless Steel
Capacity: .42 cu. ft. (12 Liters)
Weight: 9.25 lbs. (4.2 kg)

1/8 Divider Segment -

Construction: Stainless Steel
Capacity: .21 cu. ft. (6 Liters)
Weight: 6.25 lbs. (2.8 kg)

1/16 Divider Segment -

Construction: Stainless Steel
Capacity: .11 cu. ft. (3 Liters)
Weight: 5.15 lbs. (2.3 kg)

"U" Covers -

Construction: Stainless Steel
Weight: 0.32 lbs. (.15 kg)

Overflow pans -

Construction: Stainless Steel
Dimensions: (LxWxH) 25.25"x 18.125"x7.125" (64.14 x 46.36 x 18.1 cm) including handles
Capacity: .88 cu. ft. (25 Liters)
Weight: 14 lbs. (6.4 kg)

DESCRIPTION AND FEATURES

Components of the FRICO RSD rotary drive and hopper feeder sections are supported in mild steel frames which are mounted on rugged casters for ease of movement. The hopper, vibrator feed tray, "U" covers, divider segments, and overflow pans (all contact parts) are constructed of stainless steel. The RSD can be configured in various ways and can be used to produce from 1 to 16 representative sample splits. The feed rate is adjustable allowing operators to choose the level of sampling precision required by means of the vibratory feeder controller and the height of hopper slide gate. The two sections can be disconnected allowing the hopper feeder section to be used in controlled bulk feeding situations to small jaw crushers and pulverizers.

Hopper Feeder Section:

The 1.8 cu.ft. (51 liter) hopper has a 4" (10.16 cm) wide by 6" (15.24 cm) high gate which allows for an accurate split of samples up to a 1 1/3" (3.39 cm) top size. The gate height is adjustable from the hopper base to 6" (15.24 cm) and the slide gate is held at the desired height by a lock knob. The slide gate and the vibratory feeder controller adjustments allow the operator to adjust the sample feed rate. The hopper feeder stand includes a latching bar which securely connects the hopper feeder section to the rotary drive section.

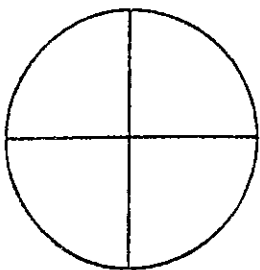
Rotary Drive Section:

The rotary drive section consists of a switch station, drive motor, gearbox, and rotating spindle. The divider segments are connected to the rotating spindle.

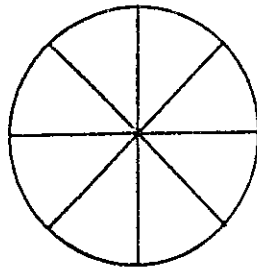
Divider Segments:

Divider segments should be selected on the basis of capacity, nominal top size of sample to be divided, and required sample division ratios. The opening of the divider segment at the point where it intersects the sample stream should be a minimum of three times the nominal top size of the sample being sub-divided. Divider segments are available in 1/4, 1/8, and 1/16 segment sizes. A complete circular divider assembly is equal to (4) 1/4, (8) 1/8, (16) 1/16, or any combination of divider segment sizes which equals (1). Example: An assembly composed of (3) 1/4, (1) 1/8, and (2) 1/16 divider segments when connected to the rotary spindle would form one complete circular divider assembly. The sample division ratios that you require will determine the composition of your complete circular divider assembly.

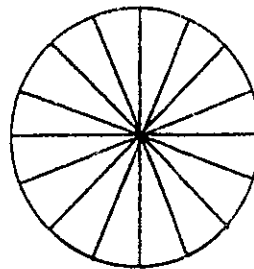
Examples of complete circular divider assemblies:



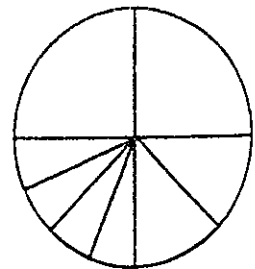
(4) 1/4 segments



(8) 1/8 segments



(16) 1/16 segments



combination of segments
(2) 1/4, (2) 1/8, (4) 1/16

DESCRIPTION AND FEATURES

"U" Covers:

"U" covers are used to cover the top edges of the divider segments when the containers are connected to the rotary spindle. The covers act as cutters as they pass through the sample stream and also prevent sample loss. The number of "U" covers required is equal to the number of divider segments in the configuration. Example: If two 1/4 divider segments, two 1/8 divider segments, and four 1/16 divider segments were connected to the drive spindle, eight "U" covers would be required to complete the configuration.

Overflow Pans:

Overflow pans are positioned beneath the divider segments at the sample drop point. The overflow pans are used when less than total sample division is required. Example: Two 1/16 divider segments are connected to the drive spindle; each container would collect 1/16 of the sample that was put into the hopper. The balance would be collected in the two overflow pans.

SAFETY NOTE:

WHEN USING LESS THAN A COMPLETE CIRCULAR ASSEMBLY OF DIVIDER SEGMENTS, THE CONTAINERS SHOULD BE POSITIONED SO THAT SPINDLE BALANCE IS MAINTAINED. EXAMPLES: IF TWO DIVIDER SEGMENTS ARE USED, POSITION THEM 180 DEGREES APART ON THE SPINDLE. IF FOUR DIVIDER SEGMENTS ARE USED, POSITION THEM 90 DEGREES APART. THIS WILL PREVENT UNNECESSARY STRESS BEING PUT ON THE BEARINGS THAT SUPPORT THE DRIVE SPINDLE.

OPERATION

The purpose of this instruction is to give new owners general guidelines for operating the FRICO RSD.

General Instructions - FRICO Rotary Sample Divider

1. Determine the number and sizes of samples that are required.
2. Place the number and sizes of divider segments as determined in step 1 on the rotating spindle.
3. Pour the gross sample into the hopper [MAXIMUM 1.8 cu. ft. (51 LITERS)].
4. Turn ON the rotator unit.
5. Turn ON the vibrator unit.
6. The vibrator controller should be adjusted to achieve a smooth flow at the lowest setting.
7. The sample flow should be adjusted to where it takes a minimum of 60 revolutions for the hopper to empty - approximately two minutes. If greater sampling precision is required, reduce the sample flow using the vibrator controller adjustment.
8. When the hopper is empty, turn OFF the rotator unit and the vibrator unit.
9. For samples larger than 50 liters, save divided samples in bags or other containers, reconnect the divider segments to the rotator spindle and repeat the above steps.

SAFETY NOTE: ALL PERSONNEL IN THE AREA WHEN THIS EQUIPMENT IS BEING OPERATED SHOULD WEAR RESPIRATORS AND EYE PROTECTION.

SAFETY NOTE: THE MOTOR, SWITCH STATION, AND VIBRATOR CONTROLLER ARE ALL DUST-TIGHT UNITS; THEY ARE NOT EXPLOSION PROOF.

SAFETY NOTE: IF THIS EQUIPMENT IS TO BE USED IN AN ENVIRONMENT WHERE COMBUSTIBLE PARTICLES ARE SUSPENDED IN THE AIR, IT SHOULD BE HARD WIRED TO THE POWER SOURCE. CONSULT LOCAL CODES FOR PROPER ELECTRICAL CONNECTION.

SAFETY NOTE: LOOSE FITTING CLOTHING OR ANYTHING WHICH COULD CATCH ON THE ROTATING SEGMENTS SHOULD BE KEPT CLEAR OF THIS EQUIPMENT.

CALIBRATION PROCEDURE

There are no calibration procedures for this equipment.

The vibratory feeder does not have adjustment. Refer to the vibrator service instructions and the vibrator controller service instructions which are supplied with the equipment at the time of purchase.

Tests can be performed to check the splitting precision of the RSD. Perform the same analysis (such as moisture content, ash content, weight, size distribution, etc.) on each divided sample. Statistical analysis of the results will show the splitting precision of the RSD at the feed rate chosen for the test.

MAINTENANCE

Motor - Refer to the motor installation & maintenance instructions which are supplied with the equipment at the time of purchase.

Vibrating Feeder - Refer to the vibrator service instructions which are supplied with the equipment at the time of purchase.

Vibrating Feeder Controller - Refer to the vibrator controller service instructions which are supplied with the equipment at the time of Controller purchase.

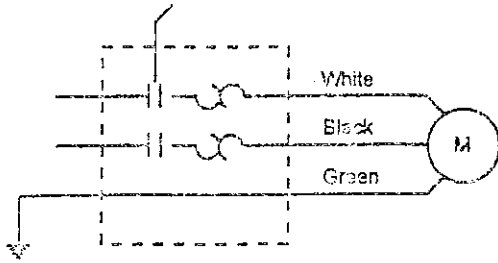
A clean, dry, compressed air supply is recommended for general cleaning of the hopper, segment divider/containers, "U" covers, overflow pans, and steel framework. Water is not recommended.

PARTS LIST

- 440750 Rotary Sample Divider (RSD) - Basic Unit (Does Not Include divider segments, "U" covers, or overflow pans)
- 440760 Drive Motor
- 440770 Gear Reducer
- 440780 Casters
- 440790 Vibratory Feeder
- 440795 Controller for Vibratory Feeder

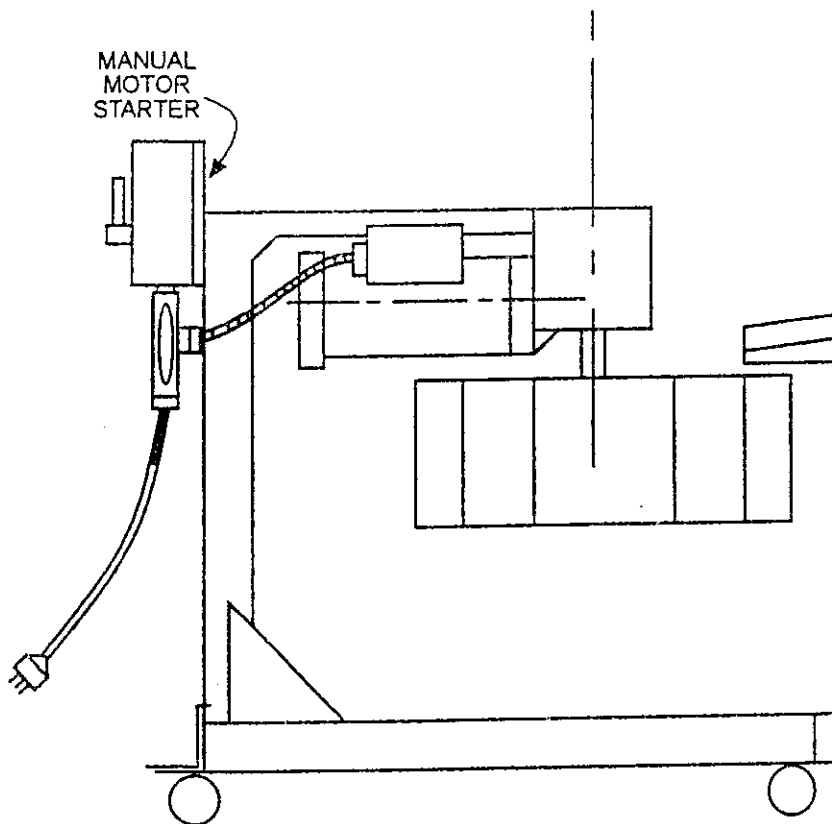
- 440761 1/4 Divider Segment
- 440762 1/8 Divider Segment
- 440763 1/16 Divider Segment
- 440765 "U" Cover
- 440769 Overflow Pan

Wiring Diagram

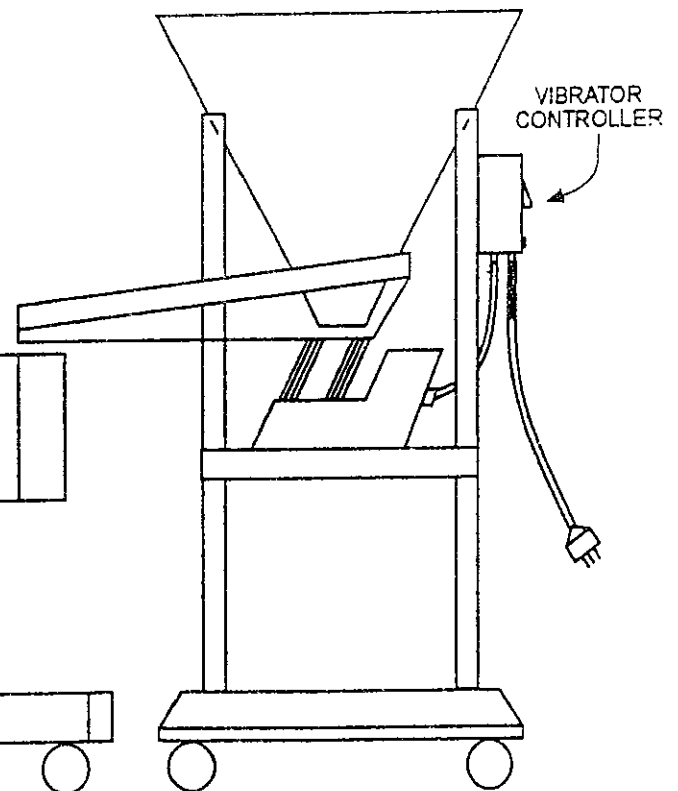


ROTARY DRIVE SECTION SCHEMATIC

HOPPER FEEDER SECTION SCHEMATIC

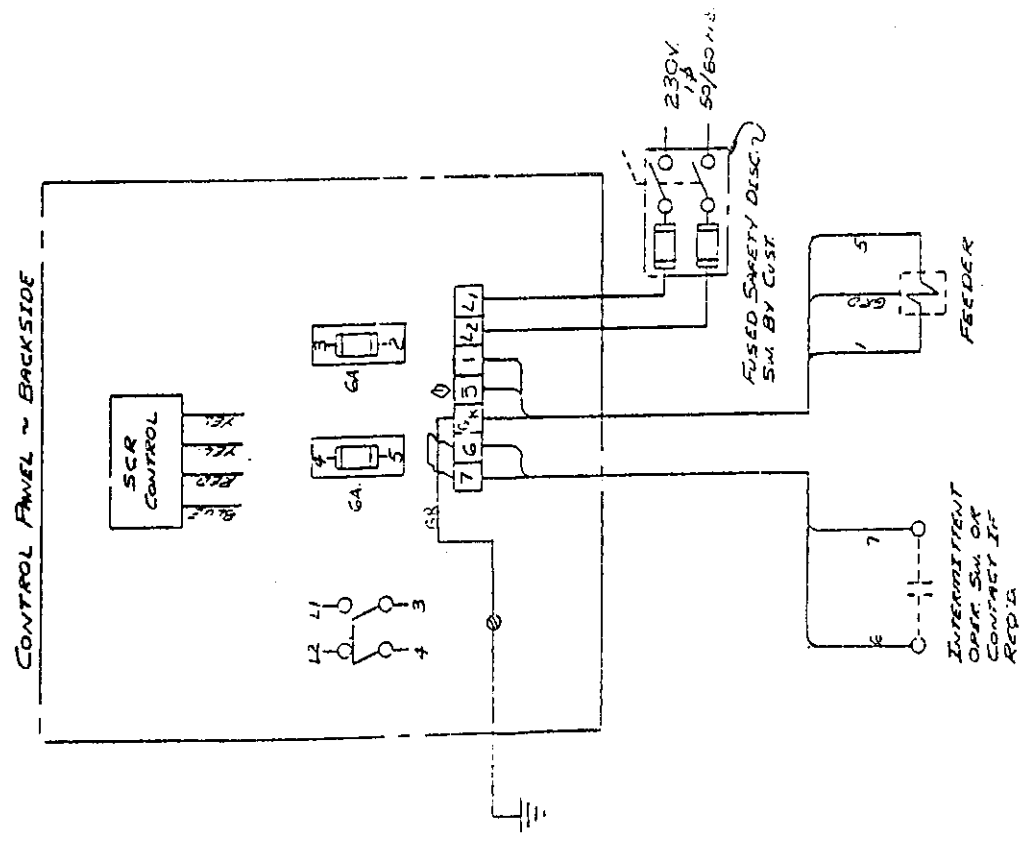
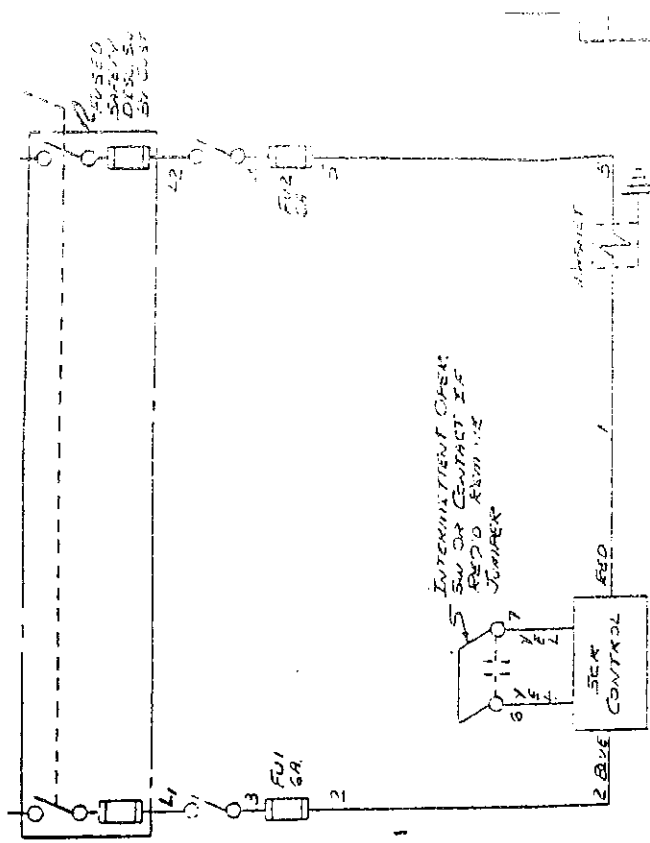


ROTARY DRIVE SECTION PICTORIAL



HOPPER FEEDER SECTION PICTORIAL

230V ~ 1ph ~ 50/60 Hz.



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