

# Mechanical Divider

## Installation and Operation Manual

PNEG-2168

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PNEG-2168

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**All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.**

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## 1. Introduction

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This manual covers the installation and operation for the Mechanical Divider. This manual provides guidelines for installing the product. You must retain a qualified contractor to provide on-site expertise. INTERSYSTEMS IS NOT RESPONSIBLE FOR THE INSTALLATION OF THIS PRODUCT.

InterSystems reserves the right to improve its product whenever possible and practical to do so. We reserve the right to change, improve and modify products at any time without obligation to make changes, improvements and modifications on equipment sold previously.

### General Safety Statements

1. The Mechanical Divider system is designed and manufactured with operator safety in mind. However, residual hazards remain due to the nature of material handling, and specific material hazards. Use extreme caution at all times.
2. Modifications to equipment may cause extremely dangerous situations that could result in damage to the equipment as well as serious injury or death. Never modify the equipment.
3. InterSystems recommends that you contact the local power company to have a representative survey the installation to ensure wiring is compatible with their system and adequate power is supplied to the unit.
4. Consult InterSystems before making any changes to the microsystem or its operating environment. Careless changes could result in death or serious injury to people and reduce the performance and service life of the equipment.
5. Never perform any service on this equipment or any powered equipment until all power has been shut off and locked out so that it cannot be restored without the consent and knowledge of the person who interrupted power includes electrical, fluid, mechanical or pneumatic energy.
6. Never perform any service on this equipment without utilizing the required PPE (Personal Protective Equipment). Refer to the MSDS (s) (Material Safety Data Sheet (s)), on all products to which this equipment is in contact to determine what PPE is required.



***This equipment is to be operated only on the voltage designated on the certified electrical drawings. Fire or explosion may result, which can cause death, serious injury and extensive damage to equipment. Do not connect to voltages other than designated.***

### Scope

The certified drawings list the non-standard components that have been incorporated into the equipment. InterSystems, Inc. normally stocks non-fabricated parts and non-custom OEM parts. Replacement parts for any other components, including fabricated parts and custom OEM components can be supplied upon request.

### Ordering Parts

Direct parts orders or requests for technical assistance to your sales representative or to:

**InterSystems, Inc.**

13330 "I" St.

Omaha, NE. 68137

Phone: (402) 330-1500

FAX: (402) 330-3350

Please have available the MODEL NUMBER, SERIAL NUMBER and CUSTOMER ORDER NUMBER of the equipment in question as well as the location where the sampler is INSTALLED.

### Replacement Parts

The InterSystems, Inc. sampler is a quality built piece of machinery. As with any machine, parts do wear out and fail. It is InterSystems recommendation that a small supply of spare parts be kept on hand to cover any minor breakdowns. A separate priced Spare Parts List will be sent identifying the suggested spare parts. It is also necessary to check the certified drawings, which will list any special or custom components utilized on this equipment.

### Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Save these safety guidelines for future reference.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in **SERIOUS INJURY** or **DEATH**.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

**ST-0001-3**

## Cautionary Symbol Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.



This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**



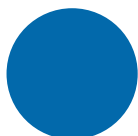
This symbol is used to address practices not related to personal injury.



This symbol indicates a general hazard.



This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

### Safety Cautions

#### Use Personal Protective Equipment

- Use appropriate personal protective equipment:

**Eye Protection**



**Respiratory Protection**



**Foot Protection**



**Hearing Protection**



**Head Protection**



**Fall Protection**



**Hand Protection**



- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

#### Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.



ST-0002-1



### Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.



ST-0003-1

### Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment.
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which could crush personnel and cause serious injury or death.



ST-0047-1

### Sharp Edge Hazard

- This product has sharp edges, which can cause serious injury.
- To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment



ST-0036-2

## 2. Safety

### Install and Operate Electrical Equipment Properly

- Electrical controls must be installed by a qualified electrician and must meet the standards set by applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe).
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Make sure all equipment and bins are properly grounded.



ST-0075-1

### Stay Clear of Moving Parts

- Stay clear - machine can start without warning.
- Entanglement in gate will cause serious injury.
- Keep all shields and covers in place at all times.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.



ST-0070-1



### 3. Specifications

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#### **Constructions**

I-S Mechanical Dividers are normally fabricated from a standard heavy gauge sheet steel. The bearings are sealed for permanent lubrications.

#### **Motor**

120 VAC, 0.6A, 50/60 Hz, Class II, Group EFG

#### **Output Torque**

250 oz. inches @ 72 RPM

### Installation

Select a location (as described on the System Installation Sheet).

1. From the sampler to the divider.

- **Method A:** Attach flexible tubing from the sampler to the inlet hose adapter with a hose clamp at each end.
- **Method B:** Bolt directly to a hopper which is mounted to and extending downward from the sampler.
- **Method C:** In such case where the divider is mounted in a sample cabinet or located some distance from the sampler, ridge conduit may be required. Attach conduit to divider inlet with a conduit clamp or rubber sleeve.

2. From sample adapter.

- Attach a 2" O.D. aluminum sample tube (if required) with a rubber sleeve.

3. From excess sample outlet.

- Attach 3" O.D. flexible tubing with a hose clamp.

### Operation

Material enters the divider by gravity flow and passes through a swing-flow diverter valve that continuously oscillates over a sample receiving adapter. The number of samples you receive depends on the receiving adapter attached to the divider. One-sample, two-sample, three-sample and 50-50 sample receiving adapters are available and interchangeable for each Model Divider (i.e. MD-100 etc.).

Samples flow by gravity or pneumatic conveying to a sample collection point. Excess sample material is then discharged through an outlet on the lower end of the Divider. Material collected is returned to the material stream by gravity, Mechanical equipment or by pneumatic conveying.

## 5. Maintenance

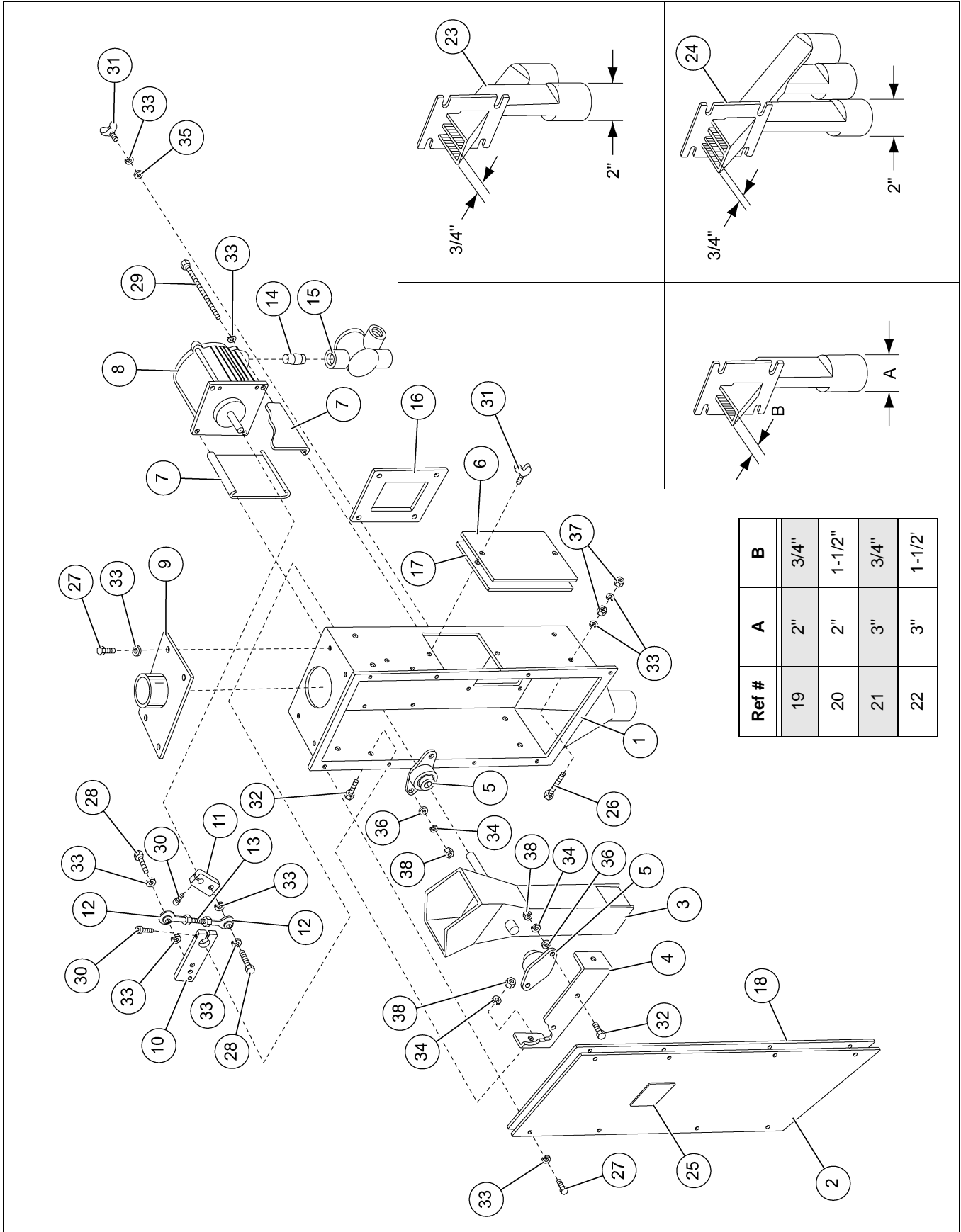
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The divider must be inspected each week or per USDA requirements. Open inspection door and remove any material build-up.

1. MD 100 Parts - *(See Pages 16 and 17.)*
2. MD 200 Parts - *(See Pages 18 and 19.)*
3. MD 300 Parts - *(See Pages 20 and 21.)*

# 6. Parts List

## MD 100 Parts



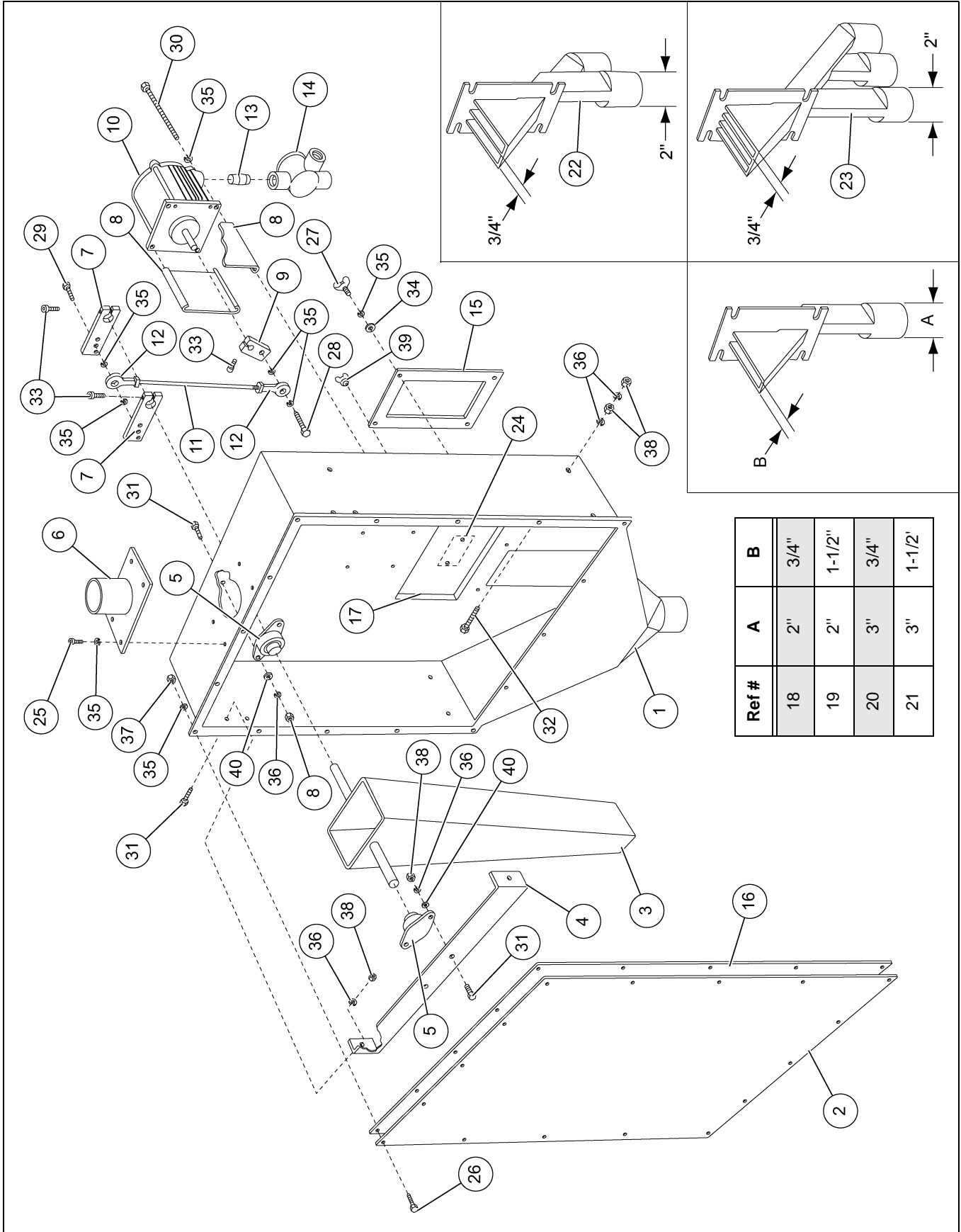


## MD 100 Parts List

Ref #	Part #	Description	Qty
1	34676	Housing 3" O.D. Outlet	1
2	34687	Housing Cover	1
3	34224	Diverter Valve	1
4	34679	Bearing Support	1
5	34262	Bearing Diverter Valve	2
6	34688	Inspection Door	1
7	34657	Motor Spacer	2
8	34040	X250-1024U Motor Nema 9	1
9	34961	Hose Adapter 3" Diameter	1
10	34015	Diverter Drive Arm	1
11	34014	Motor Drive Arm	1
12	34764	Drive Linkage Bearing	1
13	35273-220	Treaded Rod 1/4"-28 x 2-1/2"	1
14	34444	Close Nipple 1/2" NPT	1
15	34147	Junction Box Nema 9	1
16	34093	Gasket, Sample Adapter	1
17	34091	Gasket, Inspection Door	1
18	34092	Gasket, Cover Plate	1
19	34232	Sample Adapter, Single Discharge	A/R
20	34143	Sample Adapter, Single Discharge	A/R
21	34144	Sample Adapter, Single Discharge	A/R
22	34145	Sample Adapter, Single Discharge	A/R
23	34225	Sample Adapter, Double Discharge	A/R
24	34146	Sample Adapter, Triple Discharge	A/R
25	34089	Serial Number Plate	1
26	35273-35	Screw, RD HD 1/4"-20 x 1-1/2"	8
27	35273-30	Screw, Hex HD 1/4"-20 x 1/2"	12
28	35273-33	Screw, Hex HD 1/4"-20 x 1"	2
29	35273-42	Screw, Hex 1/4"-20 x 3-1/4"	4
30	35273-47	Screw, Socket HD 1/4"-20 x 1"	2
31	35273-48	Screw, Wing 1/4"-20 x 3/4"	4
32	35273-51	Screw, Hex HD 5/16"-18 x 3/4"	6
33	35273-102	Lock Washer 1/4"	13
34	35273-103	Lock Washer 5/16"	6
35	35273-121	Flat Washer 1/4"	4
36	35273-122	Flat Washer 5/16"	4
37	35273-3	Hex Nut 1/4"-20	16
38	35273-5	Hex Nut 5/16"-18	6

# 6. Parts List

## MD 200 Parts



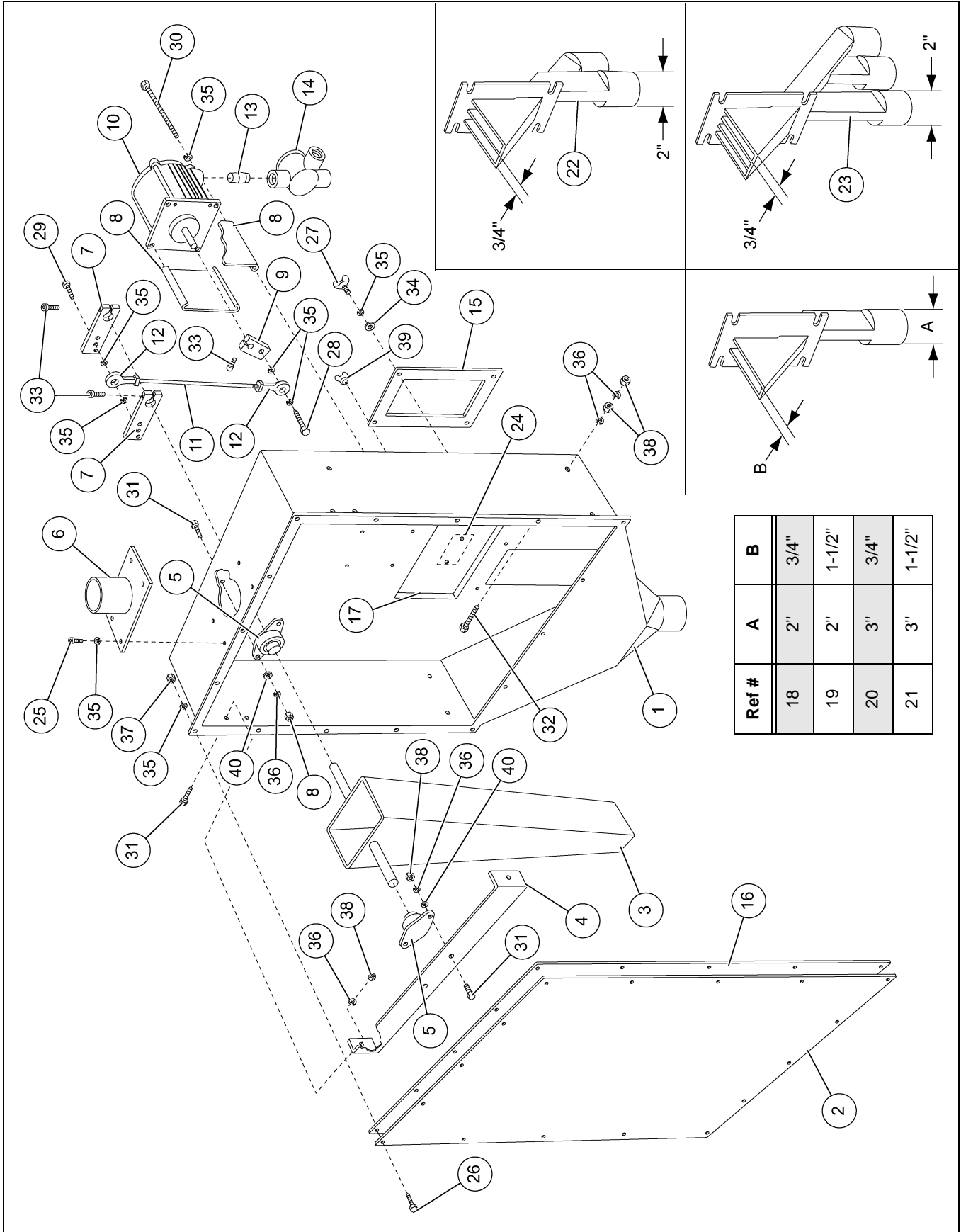
Ref #	A	B
18	2"	3/4"
19	2"	1-1/2"
20	3"	3/4"
21	3"	1-1/2"

## MD 200 Parts List

Ref #	Part #	Description	Qty
1	35347	Housing 3" O.D. Outlet	1
2	35348	Housing Cover	1
3	34349	Diverter Valve	1
4	35350	Bearing Support	1
5	34262	Bearing Diverter Valve	2
6	34961	Hose Adapter 3" Diameter	1
7	34015	Diverter Drive Arm	2
8	34657	Motor Spacer	2
9	34014	Motor Drive Arm	1
10	34040	X250-1024U Motor Nema 9	1
11	35273-220	Treaded Rod 1/4"-28 x 4-3/8"	1
12	34764	Drive Linkage Bearing	2
13	34444	Close Nipple 1/2" NPT	1
14	34147	Junction Box Nema 9	1
15	34355	Gasket, Sample Adapter (2.3')	1
16	34355	Gasket, Cover Plate (7')	1
17	34185	Gasket, Inspection Door (2')	1
18	34238	Sample Adapter, Single Discharge 2" x 3/4"	A/R
19	35306	Sample Adapter, Single Discharge 2" x 1-1/2"	A/R
20	34216	Sample Adapter, Single Discharge 3" x 3/4"	A/R
21	35307	Sample Adapter, Single Discharge 3" x 1-1/2"	A/R
22	34235	Sample Adapter, Double Discharge 2" x 3/4"	A/R
23	35308	Sample Adapter, Triple Discharge 2" x 3/4"	A/R
24	34089	Serial Number Plate	1
25	35273-3	Screw, RD HD 1/4"-20 x 1/2"	4
26	35273-31	Screw, Hex HD 1/4"-20 x 5/8"	12
27	35273-48	Screw, Hex HD 1/4"-20 x 3/4"	4
28	35273-33	Screw, Hex 1/4"-20 x 1"	1
29	35273-34	Screw, Socket HD 1/4"-20 x 1-1/4"	1
30	35273-42	Screw, Wing 1/4"-20 x 3-1/4"	4
31	35273-51	Screw, Hex HD 5/16"-18 x 3/4"	6
32	35273-203	Screw, Hex HD 5/16"-18 x 1-3/4"	8
33	35273-47	Screw, Socket Cap 1/4"-20 x 1"	3
34	35273-121	Flat Washer 1/4"	4
35	35273-102	Lock Washer 1/4"	28
36	35273-103	Lock Washer 5/16"	22
37	35273-3	Hex Nut 1/4"-20	9
38	35273-5	Hex Nut 5/16"-18	6
39	35273-19	Wing Nut 1/4"-20	2
40	35273-122	Flat Washer 5/16"	4

# 6. Parts List

## MD 300 Parts



Ref #	A	B
18	2"	3/4"
19	2"	1-1/2"
20	3"	3/4"
21	3"	1-1/2"

## MD 300 Parts List

Ref #	Part #	Description	Qty
1	34233	Housing 3" O.D. Outlet	1
2	34234	Housing Cover	1
3	34236	Diverter Valve	1
4	34172	Bearing Support	1
5	34262	Bearing Diverter Valve	2
6	34961	Hose Adapter 3" Diameter	1
7	34015	Diverter Drive Arm	2
8	34657	Motor Spacer	2
9	34014	Motor Drive Arm	1
10	34040	X250-1024U Motor Nema 9	1
11	35273-220	Treaded Rod 1/4"-28 x 10-3/8"	1
12	34764	Drive Linkage Bearing	2
13	34444	Close Nipple 1/2" NPT	1
14	34147	Junction Box Nema 9	1
15	34355	Gasket, Sample Adapter (2.3')	1
16	34355	Gasket, Cover Plate (9')	1
17	34185	Gasket, Inspection Door (2')	1
18	34238	Sample Adapter, Single Discharge 2" x 3/4"	A/R
19	35306	Sample Adapter, Single Discharge 2" x 1-1/2"	A/R
20	34216	Sample Adapter, Single Discharge 3" x 3/4"	A/R
21	35307	Sample Adapter, Single Discharge 3" x 1-1/2"	A/R
22	34235	Sample Adapter, Double Discharge 2" x 3/4"	A/R
23	35308	Sample Adapter, Triple Discharge 2" x 3/4"	A/R
24	34089	Serial Number Plate	1
25	35273-3	Screw, RD HD 1/4"-20 x 1/2"	4
26	35273-31	Screw, Hex HD 1/4"-20 x 5/8"	16
27	35273-48	Screw, Hex HD 1/4"-20 x 3/4"	4
28	35273-33	Screw, Hex 1/4"-20 x 1"	1
29	35273-34	Screw, Socket HD 1/4"-20 x 1-1/4"	1
30	35273-42	Screw, Wing 1/4"-20 x 3-1/4"	4
31	35273-51	Screw, Hex HD 5/16"-18 x 3/4"	6
32	35273-203	Screw, Hex HD 5/16"-18 x 1-3/4"	8
33	35273-47	Screw, Socket Cap 1/4"-20 x 1"	3
34	35273-121	Flat Washer 1/4"	4
35	35273-102	Lock Washer 1/4"	32
36	35273-103	Lock Washer 5/16"	22
37	35273-3	Hex Nut 1/4"-20	13
38	35273-5	Hex Nut 5/16"-18	6
39	35273-19	Wing Nut 1/4"-20	2
40	35273-122	Flat Washer 5/16"	4

# InterSystem Electric Mechanical Divider

## Model MD 1000

InterSystem manufactured various size and models of Mechanical Material Dividers. The MD 1000 Rotary Divider has an adjustable range of 25-1 to 100-1 dividing ratio. With the wide range of adjustable timers and counters available in IS control panels, the MD 1000 Material Divider will satisfy most material dividing requirements in high volume systems. In general, the MD 1000 Rotary Divider is used with samplers where flow rates is at least 10,000 bushels per hour and sample lot size is 10,000 bushels or more. Custom made Mechanical Dividers can be manufactured when required as flow rates, type of installation, structural and space limitations may be factors in construction of a Material Divider.

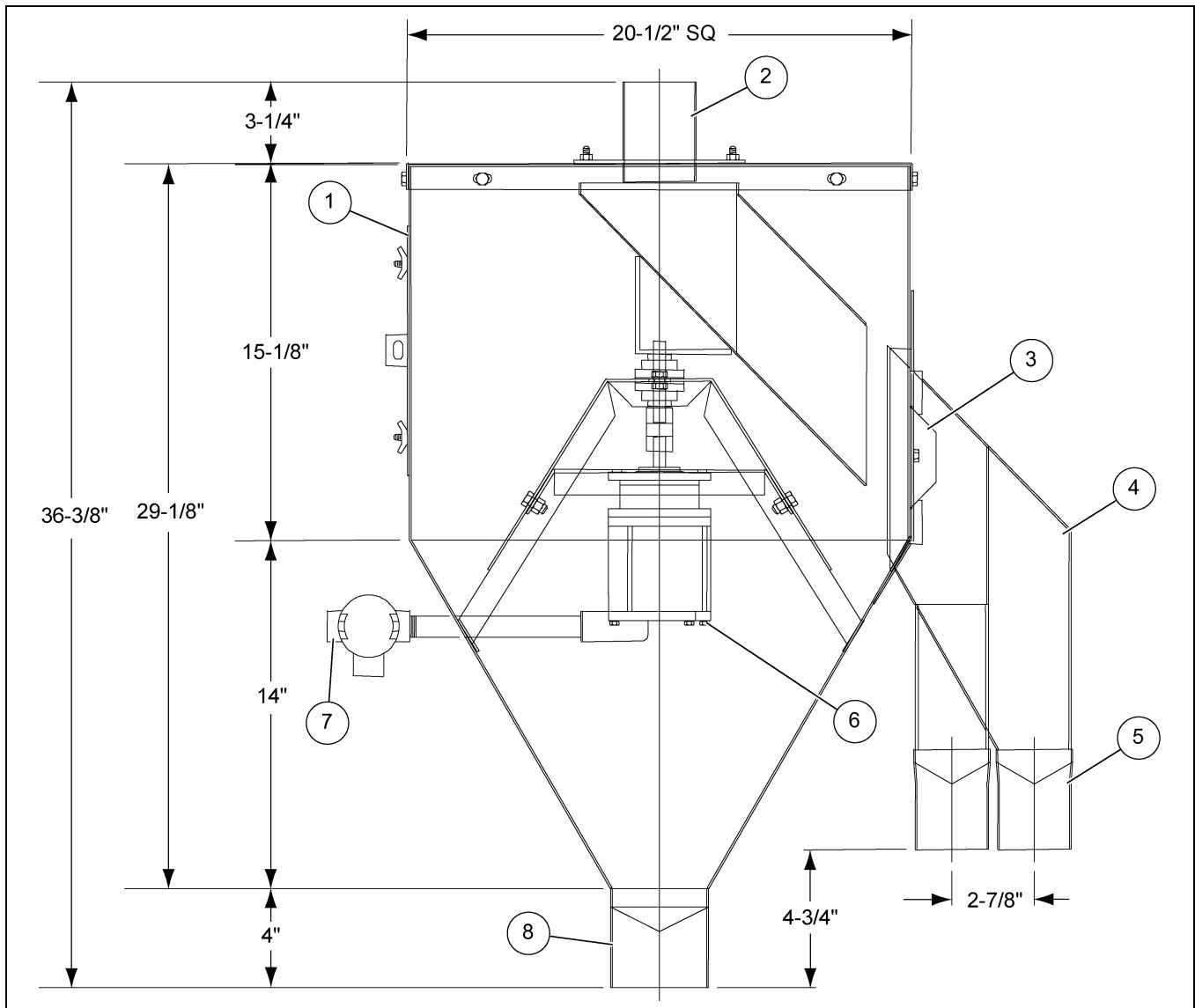
## Operation of MD 1000 Dividers

Material enters the IS Rotary Material Divider by gravity flow and passes through a rotary valve that moves at a constant speed over sample receiving adapters. To adjust flow, loosen set screw (21), adjust up/open for more flow, adjust down/closed for less flow. Once the desired flow is reached, tighten set screw. One-sample, two-sample or three-sample receiving adapters are available as standard equipment. Samples flow by gravity or pneumatic conveying to a sample collection point. Excess sample is discharged through an outlet on the lower end of the divider. Excess material is returned to the material stream by gravity, mechanical equipment or by pneumatic conveying.

## Construction of MD 1000 Dividers

Standard MD 1000 Mechanical Dividers are constructed of #10 gauge, #12 gauge and #14 gauge steel. Optional at extra cost, IS Mechanical Dividers may be constructed of heavier gauge steel than standard. Aluminum, stainless steel or other material may also be substituted. Bearings on the rotary valve shaft are permanent, sealed type. The standard motor is 120V - 0.6 amp - 1 phase - 250 oz. Inch explosion-proof type. When required, other motor types are available. Weight - 130 lbs.

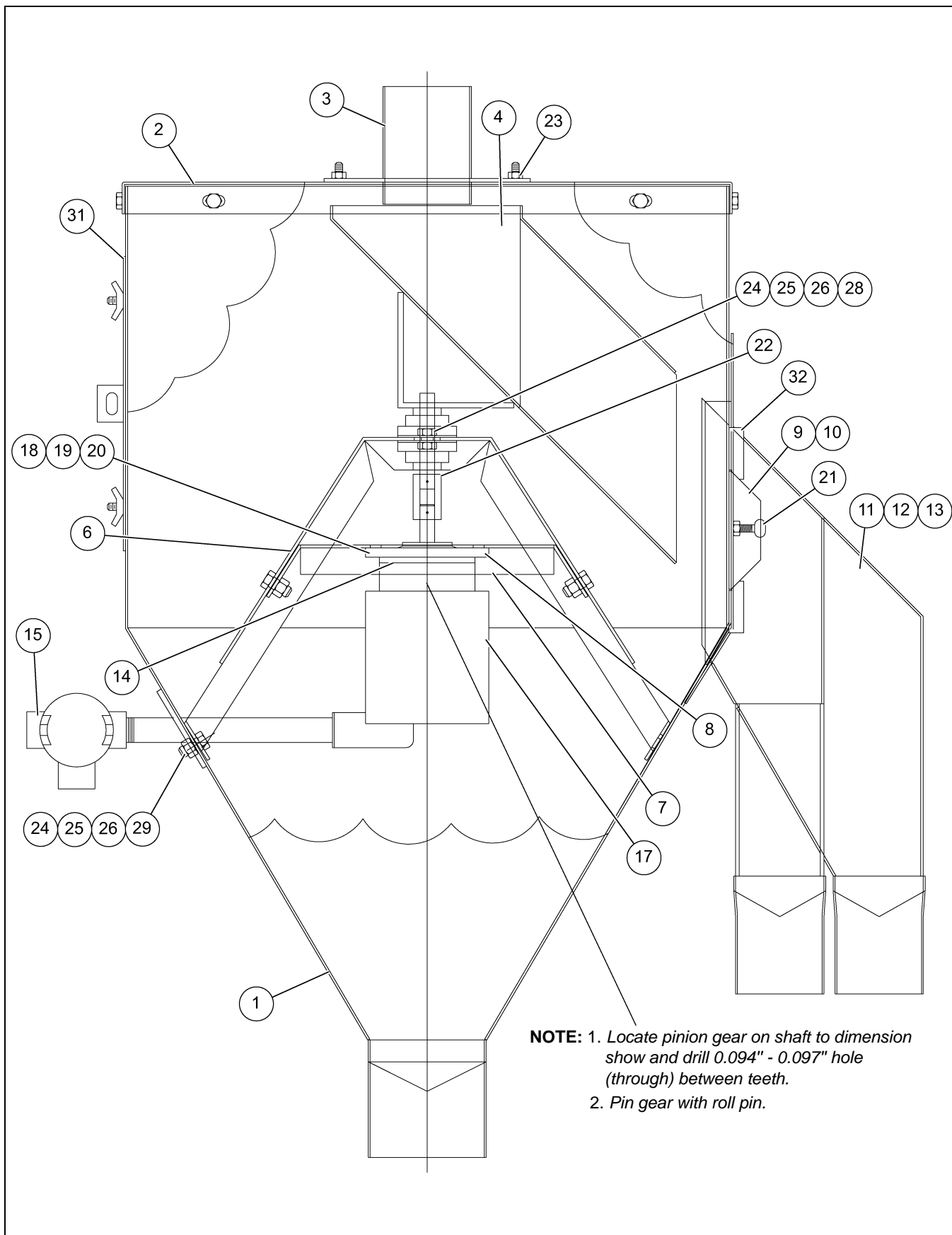
## RMD 1000 Standard Rotary Sampler Divider



**RMD 1000 Standard Rotary Sampler Divider**

Ref #	Description
1	Lockable Hinged Inspection Door
2	3" O.D. Inlet 4" Available Hopper Top Optional
3	Rotio Adjustment Plates
4	Sampler Adaptor. <b>NOTE:</b> Two sample adaptor can be installed this side and each side except inspection door side.
5	2" O.D. Sample Discharge Adaptor, 3" O.D. Optional
6	Motor Class II Group EF and G 120V - 1 PH - 0.6 AMP - 55°C Conduit Duty
7	Nema 9 Conduit Body
8	4.00" O.D. Excess Sample Discharge

# MD 1000 Rotary Sampler Divider Parts



**NOTE:** 1. Locate pinion gear on shaft to dimension show and drill 0.094" - 0.097" hole (through) between teeth.  
 2. Pin gear with roll pin.



## MD 1000 Rotary Sampler Divider Parts List

Ref #	Part #	Description	Qty
1	35366	Housing Rotary Divider	1
2	35370	Housing Cover	1
3	35376	Inlet, 3" RD.	1
4	35409	Diverter, Rotary (Original 35367 Obsolete)	1
5	35373	Sleeve, Gap Adjustment (not required on 35409)	4
6	35371	Bracket, Bearing Mount	1
7	35372	Bracket, Motor Mount	1
8	35391	Shim UHMW	1
9	25374	Plate Slide - Left	A/R
10	35375	Plate Slide - Right	A/R
11	35369	Adapter, Single	A/R
12	35368	Adapter, 2 Sample	A/R
13	Special	Adapter, 3 Sample	A/R
14	525189	Planetary Drive - G4 Gear *	1
14A	525190	Planetary Drive - G4 Gear Adapter Kit *	1
15	34147	Junction Box, NEMA 9	1
16	35390	Conduit 1/2" x 8" Pipe	1
17	34040	X250-1034U Motor, Nema 9 *	1
18	35273-33	Screw, RD. 1/4"-20 x 1"	A/R
19	35273-102	Lock Washer 1/4"	A/R
20	35273-3	Hex Nut 1/4"-20	A/R
21	35273-315	Thumb Screw, 1/4"-20 x 3/4"	A/R
22	35377	Coupling	1
23	35273-19	Wing Nut 1/4"-20	6
24	35273-5	Hex Nut 5/16"-18	A/R
25	35273-103	Lock Washer 5/16"	A/R
26	35273-122	Flat Washer 5/16"	A/R
27	35360	Seal Plate Electrical Opening	1
28	35273-52	Screw, Hex RD. 5/16"-18 x 1"	A/R
29	35273-51	Screw, Hex RD. 5/16"-18 x 3/4"	A/R
30	34262	Bearing	2
31	34355	1/16" x 1/2" Gasket (6)	1
32	35359	Guide for Slide Plate	A/R
	523169	* Motor and Planetary Gear Assembly	



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# NOTES

InterSystems, Inc. reserves the right to make changes in design or in construction of equipment and components without obligation to incorporate such changes in equipment and components previously ordered.

**WARRANTY, LIMITATION OF LIABILITY, DISCLAIMER OF IMPLIED WARRANTIES:** InterSystems, Inc. manufactured equipment and components are guaranteed against defects in workmanship or materials for one year from date of shipment. The obligation of InterSystems, Inc. with respect to any goods is limited to replacement or repair of defective parts and equipment provided those parts are returned, shipping costs prepaid, to InterSystems' factory and provided the product has not been subject to misuse, negligence, or accident, or repaired or altered outside of our factory, or other than by an Authorized Service Representative. This warranty does not cover the replacement of parts inoperative because of wear occasioned by use, the cost of replacing parts by a person other than an InterSystems employee or an Authorized Service Representative, or the adjustment of a product where the product was improperly adjusted by the purchaser. In addition, this warranty does not cover components manufactured by others such as motors, drives, clutches, cylinders, valves, blowers, and the like. On those components the standard Manufacturers' warranty applies. In any event, liability is limited to the purchase price paid, and InterSystems, Inc. will, under no circumstances, be responsible for special or consequential damages, or for incidental damages.

**INTERSYSTEMS, INC. NEITHER MAKES NOR AUTHORIZES ANY WARRANTY OTHER THAN AS HEREIN CONTAINED. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



**InterSystems**  
9575 N. 109<sup>th</sup> Ave.  
Omaha, Nebraska 68142  
Toll Free: (800) 228-1483  
[www.gsiag.com](http://www.gsiag.com)



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