

TO 1400TPH\*

ME36-EV/ES

## TECHNICAL SPECIFICATIONS

**MIDWEST Paragon™ Series**

**RETRACTABLE ENCLOSED VEHICLE**

**LOADING SPOUT** or for

**ENCLOSED VESSEL LOADING**

# TECHNICAL SPECIFICATIONS

## PARAGON™ SERIES

### ENCLOSED RAILCAR OR SHIP LOADER

**DESIGN CRITERIA:** The equipment described in this technical specification is designed to load dry dusty bulk products into enclosed railcars or vessels at high loading rates, and will reduce or eliminate dust in compliance with most federal and local EPA regulations. This equipment is considered by most agencies to be the Best Available Current Technology (BACT) in terms of dust control however, it must be connected to suitable air and dust evacuation equipment.

**DESCRIPTION:** The MIDWEST Paragon™ Series Retractable Bulk Loading Spout is designed for enclosed railcars or vessels, and will accept dry dusty products through a top flanged inlet from an Airflo™ air gravity conveyor, Multiflo™ screw conveyor, belt conveyor, drag conveyor or direct silo or bin withdrawal. The spout has its own reversible electric motor to extend or retract the lower spout discharge. The spout vertical travel is sized to reach the lowest hatch of a railcar or vessel. Dust and displaced air are withdrawn through the annular area between the product column and the Rhinoflex™ Flexible Outer Spout, out through the flanged dust outlet and to a dust collector or scrubber. Consult the factory for a variety of supplemental equipment, options and accessories available. The Retractable Bulk Loading Spout flanged dust outlet must be connected to a dust collector or scrubber which must be sized to place the spout and the vehicle or vessel compartment being loaded under a negative pressure or vacuum as recommended by MIDWEST to evacuate dust and air being displaced by the product.

### MODEL ME36-EV/ES ENCLOSED VEHICLE OR VESSEL LOADER

**MAIN PAN:** ASTM-A-36 carbon steel 1/4" thick all welded box construction with top hinged access door over drive components, and (2) hinged cast aluminum inspection doors for slack cable adjustments (if applicable) and lifting cable inspection. Applicable to MD/V/A 30's and MD/V/A 36's only. Class IIIA, stainless steel and Class IIIA FG, stainless steel food grade available. (Specify 304 or 316)

**PRODUCT INLET:** Flanged 18" diameter with (8) 1/2" diameter N.C. x 1 1/4" fastings, (4) studs and (4) through bolts, allows loader to be bolted to a MIDWEST sliding knife gate, withdrawal valve, Multiflo™ screw conveyor discharge, or MIDWEST Airflo™ air gravity conveyor discharge box or fabricated transition.

**DRIVE:** Electric motor drive winch with totally enclosed motor and gear reducer, factory lubricated, mounted under the main pan for weather protection. (1, 1.5, 2 and 3 HP) motors are used depending upon length of travel and class of construction. A rotating NEMA 4 up/down SPDT (2) position limit switch protects the gear reducer from damage by shutting off the motor at full up or down position. **This switch must be adjusted in the field after installation and before operation begins.** The MIDWEST gear reducer and drive components are not covered by warranty until both up and down adjustments have been completed according to the MIDWEST Instruction Manual. Cable lifting pulleys are precision machined cast ductile steel and are keyed to the reducer shaft with machined steel coupling. A (3) point 1/4" diameter cable lifting system on all ME or (V) 36's provides a robust lifting winch. Machined lifting bolts are provided on the lift ring for final leveling of the spout discharge.

The drive access door on top of retractable spout main pan serves as a maintenance access to all drive components. Cable transfer sheaves are machined steel, oil impregnated bronze brushed, and have keepers to prevent the lifting cable from snarling. Four (4) leveling support lugs are provided on top of main pan for leveling and supporting the main pan during installation. NOTE: Main pan and lower spout lift ring must be level for proper operation.

**\*PRODUCT VENTURI:** The MIDWEST ME36 Venturi is sized to load a maximum of 1400 TPH of 60 PCF product (free falling fines). For throughput capacities other than 1400 TPH consult factory. This is based on a consistent feed rate and entry free fall velocity of product into the spout of a minimum of 12ft/sec. When fully filled with product, the Venturi forms the product into a controlled column reducing dust caused by column acceleration. For specifications on materials of construction, refer to next page.

**VERTICAL USEFUL TRAVEL:** 6 feet to 45 feet standard travels available in 2' increments to 20 feet of travel and 5' increments to 45 feet of travel. Consult factory for travels other than standard.

**FLEXIBLE OUTER SPOUT:** The MIDWEST Rhinoflex™ Flexible Outer Spout is constructed of 17 oz. white cross stitched coated polyester fabric (176° F max. to -45° F min.) and is double lock stitched. 6061-T6 extruded aluminum outer rings and half round 6061-T6 extruded aluminum inner rings are riveted together for strength compressing the fabric into a concave area on the back side of the outer ring. Refer to optional classes of construction for temperature ratings to 1000° F. MIDWEST aluminum extrusions have rounded edges to avoid shearing of fabric. Top and bottom rings are secured to the top of the spout and also the lower lifting ring with (4) 3/8 NC lock bolts. All MIDWEST Rhinoflex™ Flexible Outer Spouts include one (1) 1/8" diameter stainless steel grounding cable riveted to each aluminum outer ring.

**CAUTION:** Each end of the grounding cable includes a lug which must be firmly secured to the lifting ring and the upper main pan to assure continuity and to dissipate static electricity.

**FLANGED DUST OUTLET:** The ME36-EV/ES Retractable Bulk Loading Spout includes one 8" diameter flanged dust outlet which can be installed on either side of the top of the main pan assembly. (Refer to drawing). This flanged dust outlet must be connected to a dust collector or scrubber to obtain successful dust free loading. A second dust outlet can also be provided for special applications. Consult factory for air and dust withdrawal recommendations. Optional use of a front flanged outlet connection is for the installation of the MIDWEST Clean Air Fan, refer to Vacupac™ I MA 30 and 36 series loading spouts with filter modules. NOTE: MIDWEST also offers standard Paragon™ Series compact high efficiency Vacupac™ stand alone duct collectors sized to evacuate displaced air and dust. Consult factory for details.

**LIFTING RING:** Cast machined unpainted aluminum alloy lifting ring includes mounting holes for Lower Scavenger. Consult factory for available alternate materials of construction. Lifting system is robust (3) point cable pick up suitable for rotating trimming spoon (vessel loading applications).

**OUTER SCAVENGER:** The **MIDWEST** Outer Scavenger is flanged to connect to the bottom of the lifting ring with (4) 3/8 NC bolts. Class I Scavengers are constructed of abrasive resistant low density cross linked white polymer. Other outer scavengers are also available, including Class IA fabricated from A36 carbon steel and Class III, fabricated from 316L or 304 stainless steel. Specify Class of construction when ordering.

**INNER CONES:** **MIDWEST** Inner Cones are used for column control. Abrasive resistant cones are available and are attached with 3/16" x 2" flat nylon straps installed approximately 120 degrees apart, or with 1/4" wire rope and clamps, depending upon the travel and materials of construction ordered. These cones control the product column over the full length of travel with the lower cone firmly secured inside cast lifting ring. Specify Class I, IA II, III, or V. (Refer to chart below). Optional (FG) Food Grade double layer white polyester strapping with flat integral grounding cables sewn inside to dissipate static electrical charges available.

**CAUTION:** Class I polymer cones may require a grounding cable to reduce the possibility of static electrical charges in a hazardous area. Consult factory for details.

### CLASSES OF CONSTRUCTION AVAILABLE:

Class I	Abrasive Fines (High-density AR cross-linked polymer) to 176° F and -40° F
Class I (FG)	Abrasive Fines (Same as Class I except White Food Grade)
Class I A	Mildly Abrasive Granules (A36 carbon steel)
Class I B	Contamination Free Fines and Pellets (6061 T6 aluminum)
Class II	Abrasive Granules (250 BHN AR steel)
Class III	Stainless Steel Product Flow Area only (304 furnished as standard, 316 available)
Class III (FG)	Food Grade Products (Same as class III with ground and polished welds.)
Class III A	Stainless Steel all Fabricated Metal Components (304 furnished as standard, 316L available)
Class III A (FG)	Corrosive or Non-Contaminate Environment (Same as Class III A with stainless steel fastings)
Class IV A	High Temperature 177° F to 400° F
Class IV B	High Temperature to 1000° F
Class V	Abrasive Lumps, High Impact (400 BHN AR steel)
Class V A	Abrasive Lumps, High Impact (400 BHN AR steel Venturi, with integral rockbox to reduce wear)
Class V T	Abrasive Lumps, High Impact (Triten™ Hard Coat)

**PAINT:** Mechanical clean with (3) mils white two part white epoxy standard. Consult factory for optional paint systems.

**ASSEMBLY:** The **Paragon™** Series Retractable Bulk Loading Spout is shipped completely assembled up to 8 feet and in sub-assemblies 10 feet to 45 feet. Refer to **MIDWEST** Instruction Manual.

**ESTIMATED MECHANICAL FIELD ERECTION:** Four (4) hours for units shipped completely assembled excluding dust piping. For units over 8 feet of travel approximately (12) to (24) hours are required.

**ESTIMATED ELECTRICAL FIELD WIRING:** One (1) hour with power available within 7 feet and factory prewiring is purchased.

**FIELD SUPERVISION:** Erection and/or start up assistance by **MIDWEST** is available at a per diem cost. Consult factory for prices.

**INSTRUCTION MANUALS:** **MIDWEST** provides two Installation Operating and Maintenance Manuals, one shipped with equipment and one forwarded to the purchasing department at time of shipment. Additional copies can be purchased at additional cost.

**CAUTION:** Many dry bulk products contain explosive dust. **MIDWEST** offers explosion proof (XP) electrics as an option for all electrical components and PLC controls. Intrinsically safe barriers are also available for hazardous areas. Consult factory for additional information and pricing.

### OPTIONS AVAILABLE:

**PREWIRING:** Retractable Bulk Loading Spout accessories are completely prewired to a common NEMA 4X junction box with a numbered terminal strip located on the main pan assembly. Prepiping is also available for pneumatic vibrators if applicable. Wiring is contained inside liquid tight conduit or hard piping if required for (XP) applications. (XP) junction boxes are also available.

**MOTOR PREWIRING:** **MIDWEST** can prewire loading spout drive motor to an independent NEMA 4X or (XP) junction box. NOTE: Usually applies to multiple equipment stackups consisting of loading spout and positioner and/or **Vaculoader™**. **MIDWEST** supplied motor controls (MCC) are also available.

**OPERATOR CONTROLS AND MOTOR CONTROLS (MCC):** Available for all models. Refer to **MIDWEST** Electrical Options. Consult factory for pricing.

### ACCESSORIES AVAILABLE:

NOTE: Accessory items are shipped in kit form to be field installed however, are factory installed if **MIDWEST** prewiring option is purchased.

**LIMIT SWITCH, THIRD INTERMEDIATE POSITION:** Provides an intermediate set point to provide an intermediate electrical signal. Example: A short height above enclosed vehicle hatch when frequent loading is common. This allows spout to not be fully retracted after each vehicle has been loaded to reduce time to raise and lower.

**SLACK CABLE LIMIT SWITCH KIT:** Available for loading enclosed vehicles when spout enclosed vehicle scavenger makes contact with the rim of an enclosed vehicle hatch. This option includes (2) NEMA 4 DPDT lever limit switches which shut off drive motor when contact is made by either switch. Temperature range. (230°F max. to -40°F min).

**AUTOMATIC LEVEL SENSING KIT:** Used to provide a signal to the loading operator that the vehicle is full or can be used to automatically shut off the feed supply gate, valve, or **Airflo™** Air Gravity Conveyor, or to place the withdrawal valve in a "JOG" mode for topping off vehicle. Available with a Type "A" tilt probe, Type "B" pressure switch, Type "C" capacitance probe, or Type "D" infrared sensor. A NEMA 4X controller is included with green "Normal" and red "High Level or Full" indicator lights and (2) position "on"- "off" selector switch. The controller is normally

shipped loose for field installation but can be installed on the spout main pan assembly at additional cost.

**COMBINATION AUTOMATIC RAISING-LEVEL SENSING**

**KIT:** When loading both enclosed and open vehicles with product, an (EV) enclosed vehicle tapered scavenger is used. The Combination Automatic Raising-Level Sensing Kit will allow the loadout operator to select the sensing probe mode, i.e; to sense the level of product in an enclosed vehicle or container as it becomes full or when the automatic raising mode is selected, the spout retracting drive will automatically retract the spout as the product contacts the probe. A NEMA 4X controller is included with green "Normal"(not raising), amber "Raising" and red "High Level or Full", indicator lights and (2) position selector switch for "open vehicles" or "enclosed vehicles". The controller is normally shipped loose for field installation but can be installed on the spout main pan assembly at additional cost. Refer to Prewiring Option. When using this accessory an 18" long (OV) flexible outer skirt is available.

**AIR VIBRATOR KIT:** Two (2) piston type air vibrators can be located on lower lifting ring to vibrate loose product from inside of spout after loading. Vibrators are controlled by a 120 VAC or 240 VAC NEMA 4X solenoid valve located on the main pan.

Vibrators and solenoid valve are connected by a flexible air line festooned down the back of the **Rhinoflex™** Flexible Outer Spout. Air supply and field connection to solenoid valve are customer's responsibility. Plant air consumption 6 CFM @ 45 to 100 PSIG.

**FILTER REGULATOR, LUBRICATOR (VIBRATORS):** Includes .5 in (1/2") NPT pneumatic maintenance valve with lock out feature.

**HATCH ADAPTOR:** To accommodate larger truck or railcar hatches. Standard sizes 42" square or 36" round. Consult factory for details and other sizes. Specify Class of Construction, Class IA, IB, III, or IIIA available.

Technical specifications are subject to change without prior notification

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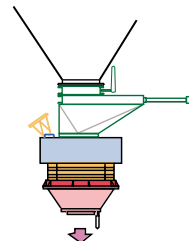
EQUIPMENT INDICATED IN SOLID COLOR IS INCLUDED IN THIS TECHICAL SPECIFICATION.

EQUIPMENT OUTLINED IS AVAILABLE. CONSULT **MIDWEST** FOR DETAILS.

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# TECHNICAL DATA

## ME36-EV PARAGON™ SERIES

### LOADING SPOUT

#### Loading Capacities

PRODUCT	TEMP (F/C)	DENSITY (PCF)	LOAD RATE STPH	MTPH

#### SCREEN ANALYSIS

%  IN/MM   
  %  IN/MM

VERTICAL TRAVEL	RETRACTED HEIGHT	WEIGHT CLASS I	WEIGHT IA,II,IV,V
<input type="checkbox"/> 06' (1.8)	38" (.97)	1145 (520)	1235 (561)
<input type="checkbox"/> 08' (2.5)	41" (1.04)	1210 (550)	1360 (618)
<input type="checkbox"/> 10' (3.0)	44" (1.12)	1250 (568)	1430 (650)
<input type="checkbox"/> 12' (3.5)	48" (1.22)	1305 (594)	1515 (689)
<input type="checkbox"/> 14' (4.2)	51" (1.30)	1340 (609)	1585 (720)
<input type="checkbox"/> 16' (4.8)	53" (1.35)	1385 (630)	1655 (752)
<input type="checkbox"/> 18' (5.5)	57" (1.45)	1425 (648)	1725 (784)
<input type="checkbox"/> 20' (6.0)	60" (1.52)	1465 (666)	1795 (816)
<input type="checkbox"/> 25' (6.0)	70" (1.78)	1590 (723)	2010 (914)
<input type="checkbox"/> 30' (6.0)	76" (1.93)	1705 (775)	2215 (1007)
<input type="checkbox"/> 35' (10.7)	86" (2.18)	1830 (832)	2430 (1105)
<input type="checkbox"/> 40' (12.2)	92" (2.34)	1945 (884)	2635 (1198)
<input type="checkbox"/> 45' (13.7)			
<input type="checkbox"/> OTHER			

#### Classes of Construction Available:

- Class I  **Abrasive or Corrosive Fines:** (High-density AR Cross-Linked Polymer) Temperature Rating: to +176 F, -40 F. Product Flow Area.
- Class IFG  **Abrasive Fines:** Same as Class I except White Food Grade Polymer.
- Class IA  **Non-Abrasive Fines:** A36 Carbon Steel Product Flow Area.
- Class IB  **Contamination Free Fines and Pellets:** Aluminum Construction 6061-T6 Castings, Extrusions and/or Machined (spun).
- Class II  **Abrasive Granules:** 250 BHN AR Steel, Product Flow Area.
- Class III  **Corrosive Fines, Granules, Soft Lumps:** Stainless Steel Product Flow Area, 304 SS, 316 SS, 316 L (2B or 4B) available (specify).
- Class III FG  **Food Grade Products:** Same Construction as Class III with Ground and Polished Welds.
- Class IIIA  **Corrosive or Non-Contaminate Environment:** Stainless Steel Fabricated Components 304 SS, 316 SS, 316 L 2B and 4B available (specify) Non-Product Flow Area.
- Class IIIA/FG  **Corrosive or Non-Contaminate Environment:** Same as Class IIIA with Stainless Steel Fastenings. Non-Product Flow Area.
- Class IVA  **Hot Materials:** Temperature of Product being loaded, 177 F to 400 F, High Temp Rhinoflex™ Flexible Outer Spout "Orange" Color.
- Class IVB  **Hot Materials:** To 1000 F, Rhinoflex™ Fiberglass, "White" Color.
- Class V  **Abrasive Granules and Lumps with Sharp Edges:** High Impact 400 BHN AR Steel.
- Class VA  **Abrasive Granules and Lumps with Sharp Edges:** High Impact 400 BHN AR Steel with Rock Box. Applicable to Loading Spout Venturies or (NSP) Inlet Transitions Only.
- Class VT  **Abrasive Lumps and High impact:** Triten™ Hard Coat.

**CAUTION:** Many dry bulk products contain explosive dust. Midwest offers explosion proof (XP) electrics as an option for all electrical components and PLC controls. Intrinsically safe barriers are also available for hazardous areas. Consult factory for additional information and pricing.

NOTE: All standard fastenings are zinc plated to resist surface rust. Stainless steel and grade 8 high strength fastenings are available. Standard loading spout lift rings are cast 6061T6 machined aluminum alloy and are unpainted. Cast malleable steel (painted) and cast stainless steel available. Contact factory for (NSP) cost.

#### Important

*Loading capacities are based on product bulk density of 60 PCF fines and 12 FT/SEC vertical entry velocity. Variations in density and lump size will affect loading capacity. Variations in entry velocity and trajectories other than vertical product entry could cause premature wear in product flow areas. Midwest recommendations for classes of construction are based on product samples supplied. Midwest loading spouts are designed to load product only in the plumb (vertical) position. Consult Midwest for horizontal spout positioners available.*

#### Drive Winch Data

- 1/4" (6.35) or 3/8" (9.52) diameter lift cables, as applicable (3) point pickup 14 FPM lifting velocity (Average)
- 1.0 (1) HP Brake Motor, TEFC Enclosure, 1750 RPM. Reducer 162:1 ratio 5,951 IN/LBS Torque,  Safety Factor
  - 2.0 (2) HP Brake Motor, TEFC Enclosure, 1750 RPM. Reducer 267:1 ratio 19,700 IN/LBS Torque,  Safety Factor
  - 3.0 (3) HP Brake Motor, TEFC Enclosure, 1750 RPM. Reducer 250/34:1 ratio 27,417 IN/LBS Torque,   Safety Factor
  - Special or (NSP)

#### Dust Outlet Data(1400 STPH, 60 PCF Product = 2526 CFM)

- 8" Diameter: Maximum Throughput 800 STPH=1444@4147 FMP/V
  - 9" Diameter: Maximum Throughput 1000 STPH=1444@4147 FMP/V
  - 10" Diameter: Maximum Throughput 1400 STPH=1444@4147 FMP/V
- NOTE: (2) Dust Outlets Available

#### Accessories

- Limit Switch, Third Intermediate Position
- Slack Cable Limit Switch Kit: DPDT NEMA 4 Standard
- Automatic Level Sensing Kit: NEMA  Type   VAC
- Air Vibrator Kit: (6 CFM, 45/80 PSI Required) NEMA  Solenoid Valve  VAC
- Pneumatic Filter, Regulator, Lubricator  NPT (Vibrators)
- Combination Automatic Raising/Level Sensing Kit: NEMA  Type
- Hatch Adaptor:  Square  Round Class
- Operator Controls: NEMA  IP
- Motor Controls: NEMA  IP
- Special Paint:

#### Options

- (NSP) Dust Outlet:  Refer to Chart (8" dia. Standard)
- Explosion Proof (XP) Electrics, NEMA
- Accessory Prewiring, NEMA
- Motor Prewire:  Motor(s)
- Intrinsically Safe Barrier (For XP Controls)

#### Air Withdrawal Guide

Consult Midwest for verification on ME36-EV. NOTE: Do not exceed 1800 CFM (5184 FPM) through loading spout.

\*Based on 60 PCF fines. Add air gravity conveyor aeration

and 50% of silo aeration air if applicable. 1400 STPH, 60

PCF materials equals 2720 CFM.

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