INSTALLATION MANUAL
EDDY CURRENT SEPARATORS

TRAMP METAL GROUP

TOLL FREE: 888.582.0821

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Table Of Contents

Eddy Current Specifications

Units are manufactured in standard widths of 24”, 30”, 36”, 48”, 60”, and 80” Special widths will be considered on a specific case basis. Effective widths are as measured between the corrugated sidewall profiles on the materials belt. Units are fabricated from heavy gauge steel laser cut and formed. Side guards are attached with slot head fasteners for ease of removal. All units are fitted with cleaning brushes to help minimize material migration. Shell fabricated from Carbon Fiber .063” thick.

Rotor can be designed as an 8 pole, 12 pole or 16 pole. Magnetic rotor is fabricated from coated N42 through N50 Neodymium Rare Earth magnets (depending on application). These magnets are then affixed to a hardened steel shaft. Rotor is wrapped with “KEVLAR” or sleeved with 304 stainless steel. Rotor is fabricated and dynamically balanced at specified rotational speed.

Drive drum is an internal motorized drive pulley 8” in diameter crowned and lagged.

Materials belt is a very durable polyurethane cover over a cross rigid carcass. Belting is supplied with 1-1/4” high corrugated sidewalls to minimize material migration under the belt. Belt will have (2) 1/2” high cleats. The unit has a cantilevered design to accommodate single piece belt changes. Rear drum is moved forward and back with tube-in-tube take-up assemblies for tensioning and tracking

Bearings: Shell bearings are open type ball bearings. Rotor bearings are high speed flange bearings rated at 4000rpm

All spare parts are obtainable in the US either from Industrial Magnetics, Inc. or as noted later in the manual.

IMPORTANT SAFETY & PRECAUTIONARY ADVISORY

Any Operation, service, maintenance and/or repairs to the Eddy Current Conveyor System components should only be attempted by authorized, trained and qualified personnel familiar with all safety and lock-out / tag-out procedures, and those with employing proper PPE (Personal Protective Equipment). Read and obey ALL Danger, Warning, Safety and other Notification Signs or Labeling on Control Panel(s), Mechanical Equipment(s) to assure all precautions are understood.

Operator Control Instructions

MAIN CONTROL PANEL

The Main Control Panel should be located in close proximity to the Eddy Current Separation Conveyor System. It has the basic control switches on the front face, and the main power disconnects for the system. It also features the ***Emergency Stop (E-Stop)*** to shut power down to the conveyor system.

- Start Button

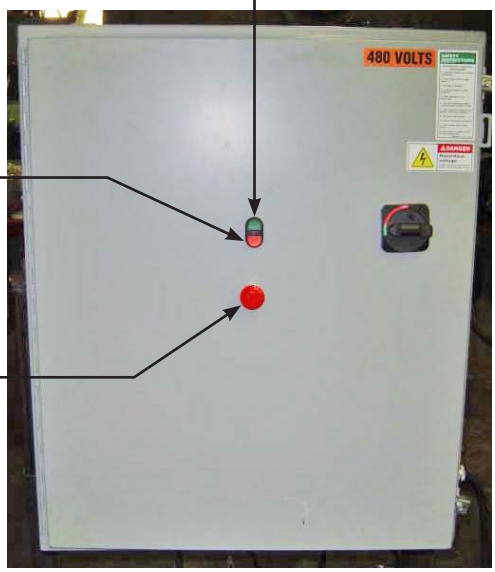
The Main Control Panel has a START Button (Green), which energizes the Eddy Current Separation Conveyor System, and eddy current magnetic field generator rotor simultaneously. The Start Button will start the conveyor moving in the forward direction immediately after being pressed.

- Stop Button

The Main Control Panel has a STOP Button (Red), which will stop the Eddy Current Separation Conveyor System, and eddy current magnetic field generator rotor simultaneously. The Stop Button will stop the conveyor moving in the forward direction immediately after being pressed.

- E-STOP (Emergency Stop)

The Main Control Panel has a Emergency Stop (E-Stop) Button (Red, Mushroom Top), which de-energizes the Eddy Current Separation Conveyor System, and eddy current magnetic field generator rotor simultaneously. The Stop Button will stop the conveyor moving in the forward direction immediately after being pressed. Contact your Supervisor if the Emergency Stop has been used to follow the proper Safety Reporting Protocol.



MAIN CONTROL PANEL (OUTSIDE)

Control Adjustment Instructions

THE USER IS CAUTIONED THAT THE EDDY CURRENT SEPARATION CONVEYOR SYSTEM'S PERFORMANCE IS AFFECTED BY SEVERAL FACTORS AND ADJUSTMENTS OF THESE FACTORS TO 'OPTIMIZE' THEIR SORTING EFFICIENCIES ARE AT BEST ARBITRARY. ADJUSTMENTS TO ONE FACTOR MAY AFFECT ANOTHER, EITHER POSITIVELY OR NEGATIVELY, SO TRIAL AND ERROR IS THE BEST METHOD THAT CAN BE SUGGESTED.

This section of the instruction manual will give the Customer a general overview of the factors affecting how the Eddy Current Separation Conveyor System performs, what basic control adjustments are offered to the user, and what affect each may have on the overall performance of the system.

MAIN CONTROL PANEL (INSIDE)

*The **adjustments to the Eddy Current Separation Conveyor System** will vary depending upon several factors, including:*

- Mix (non-metallic versus non-ferrous) of product(s) sorted
- Overall Mass of product(s) traveling across the conveyor system
- Differential of scrap part size(s)
- Amount of non-ferrous contamination of scrap (grease/oil, dirt or other wastes)
- Adhesion of scrap parts to each other

*The **basic separation processes** can be controlled by three (3) methods on the conveyor system:*

- Conveyor Belt Speed
- Eddy Current (Magnet Array) Rotor Speed
- Splitter Box Chute Angle

- Conveyor Belt Speed Control

The Conveyor Belt Speed controls the speed at which the product is conveyed across the unit. The speed is controlled via a VFD (Variable Frequency Drive) Unit located inside the Main Control Panel. The Speed Control will allow the overall belt speed to be increased or decreased by adjustments to the VFD controls. ***Only authorized, experienced personnel should adjust this control system, as the adjustment will require access inside the Main Control Panel.*** Contact your supervisor prior to making any adjustment(s) to this control feature. The manufacturer's User Manual has been included in the Operator's Manual. Please be sure the latest revision matches your specific unit.

- Eddy Current Rotor Speed

The Eddy Current Rotor Speed controls the speed at which the internal magnet array spins inside the end roller unit. The spinning magnet array is what generates the powerful eddy current that excites the ferrous properties internal to the materials traveling across the conveyor, once they reach close proximity to this energized eddy current field. The RPM (Revolutions-Per-Minute) speed of the magnet array is controlled via a VFD (Variable Frequency Drive) Unit located inside the Main Control Panel. The Speed Control will allow the rotation speed

(RPM) to be increased or decreased by adjustments to the VFD controls. ***Only authorized, experienced personnel should adjust this control system, as the adjustment will require access inside the Main Control Panel.*** Contact your supervisor prior to making any adjustment(s) to this control feature. The manufacturer's User Manual has been included in the Operator's Manual. Please be sure the latest revision matches your specific unit. Do not exceed recommended RPM. It is recommended that a magnetic device i.e. head pulley magnet and/or cross belt or drum magnet be inline prior to discharge onto the Eddy Current. Ferrous material can severely damage the Eddy Current Rotor, Shell and Belt.

- Splitter Box Chute Angle Control

The Splitter Box Chute Angle is simply a mechanical divider, fabricated inside the opening of the splitter box which is used to deflect parts into one of two areas of the chute to assist sorting of parts. The Splitter Box Chute is a mechanical adjustment to meet an arbitrary angle, based on how parts are thrown by the eddy current's magnetic field. The Splitter Box Chute adjustment is facilitated by a simple bolting arrangement where a handle is rotated and then locked into place on a guide plate. This will control the angle or opening of the Splitter Box Chute.

Control Adjustment Instructions Continued

The splitter box is simply a mechanical divider. There is a 2 split model as well as a three split model. The 2 split unit is used where the material is divided into non-ferrous and non-metallic only. The three split model is used in applications where you wish to throw aluminum farther than other non-ferrous metals. Since the eddy current operates on specific gravity and electrical conductivity, aluminum being highly conductive and very light throws farther than copper, zinc, brass lead etc The splitter vanes are used to separate the materials by types. Non-metallic material will fall closest to the rotor; the non-ferrous metal being excited by the eddy currents being generated will lift off of the belt and be deposited farther away from the rotor. The faster the belt is running the farther all of the material of all sizes will throw. The vanes are adjustable so you can rotate them into a position that will optimize your recovery.

This splitter box is to be adjusted in the field at start-up. It should be placed in front of the rotor but not affixed until test runs are done to determine the best placement of the splitter box. For closer adjustments the vanes can be rotated into positions that further pinpoint the divisions sought. These adjustments are made by moving a lever arm to the desired position and then locking that position in place by tightening the clamping nut to the guide.

It should be noted that at initial start-up the machine should be run with no metal in the material in order to set the hood. By doing this you can visually see where the dirt or non-recoverable material is landing. It should be hitting right below the top of the first splitter vane. This adjustment is made by increasing or decreasing the speed of the belt via the VFD. Next you run the desired recoverable material to be sure it throws over the first vane. This is accomplished by adjusting the rotor speed by use of the VFD. It does not necessarily follow that the faster the speed the better separation. The belt and the rotor work in concert with one another. Now is when the speed adjustment balancing takes place as well as fine tuning the box placement and vane rotation.

Particle size is very important in setting the position of the splitter box and adjusting the speed of the belt and rotor. The smaller the piece size the faster the rotor must run. The belt speed may actually be reduced. Also the closer the splitter box and separation vane will be to the rotor.

NOTE: No machine is 100% efficient. Balancing the results of the machines separation is up to what you wish to recover. Typically the choice is made between a higher recovery rate at the expense of some contamination or slightly lower recovery rate with little or no contamination.

Daily Maintenance

1. Remove side inspection plates and check for anything that could jam inside the machine.
2. Blow out the entire machine with compressed air. Wipe off any material stuck to the front of the machine (where the belt goes around the shell)
3. Replace side inspection plates
4. Start machine and let run for 5 minutes to check belt tracking and tensioning.
5. Visually inspect belt to see if there are any splits or holes.
6. Check brushes to make sure they are just touching the belt surface

NOTE: Once per month it is suggested that the shell be removed and the rotor wiped down with a damp cloth to remove any ferrous dirt that may be stuck to the rotor. This will also allow the operator to inspect the shell for any stress marks or cracks.

Start-Up Sequence

1. Make sure all power is energized
2. Start conveyor belt and wait until it has come up to full speed
3. Start rotor and wait until rotor has come up to full speed
4. Begin feeding material slowly onto belt
5. Adjust speed controls and splitter vane to optimum positions if required

Conveyor System Lubrication Maintenance

1. De-Energize ALL Power to the Eddy Current Separation Conveyor System / **NOTE: Electro-Magnetic Fields are present**
2. Follow ALL Lock-Out / Tag-Out Procedures to assure power is OFF and any residual capacity has been neutralized
3. Locate greasing access door on top of the side guard. Open door and proceed with greasing per instructions for the rotor and shell bearings
4. Remove front guard plate on both sides of machine and locate tensioning bearing. Grease per instructions

Rotor Bearings

The rotor bearings supplied are a double row spherical roller bearing Sealmaster Bearings 2-7/16" diameter. The bearings are affixed to the shaft by tightening an eccentric collar over the inner ring via two cap screws. As the cap screws are tightened, the collar compresses onto the bearings inner ring.

The bearings have come pre-lubricated from the factory and are ready for operation. Under normal operating conditions it is normal for a small amount of grease to purge from the seals at initial start-up. This will stop once the optimum fill is reached. New bearings will initially run a little hotter than normal and the temperature will level out after a run in period.

The grease that is recommended for these bearings should be equal to METALON HI-TECH EP 1.5 grease with a temperature range -40 to +570 degrees F. This grease is reversible, which means it will return to its original state when cooled

Shell Bearings

The shell bearings are an open single row ball bearing type. The rotational speed should never exceed 400 rpm. They are press fit into the shell bearing housing. They too come with an initial grease fill but should be greased with the same type of grease as shown above at a frequency of approximately once per month.

NOTE: Relative to greasing frequency the above values are given as guidelines only. Individual operations may require more or less frequent greasing. Keep a close watch on the bearings during initial start-up paying particular attention to heat and noise.

BE SURE NOT TO OVER GREASE THE BEARINGS, AS THIS IS THE SINGLE BIGGEST OFFENDER FOR OVERHEATING

Belt Change Procedures & Instructions

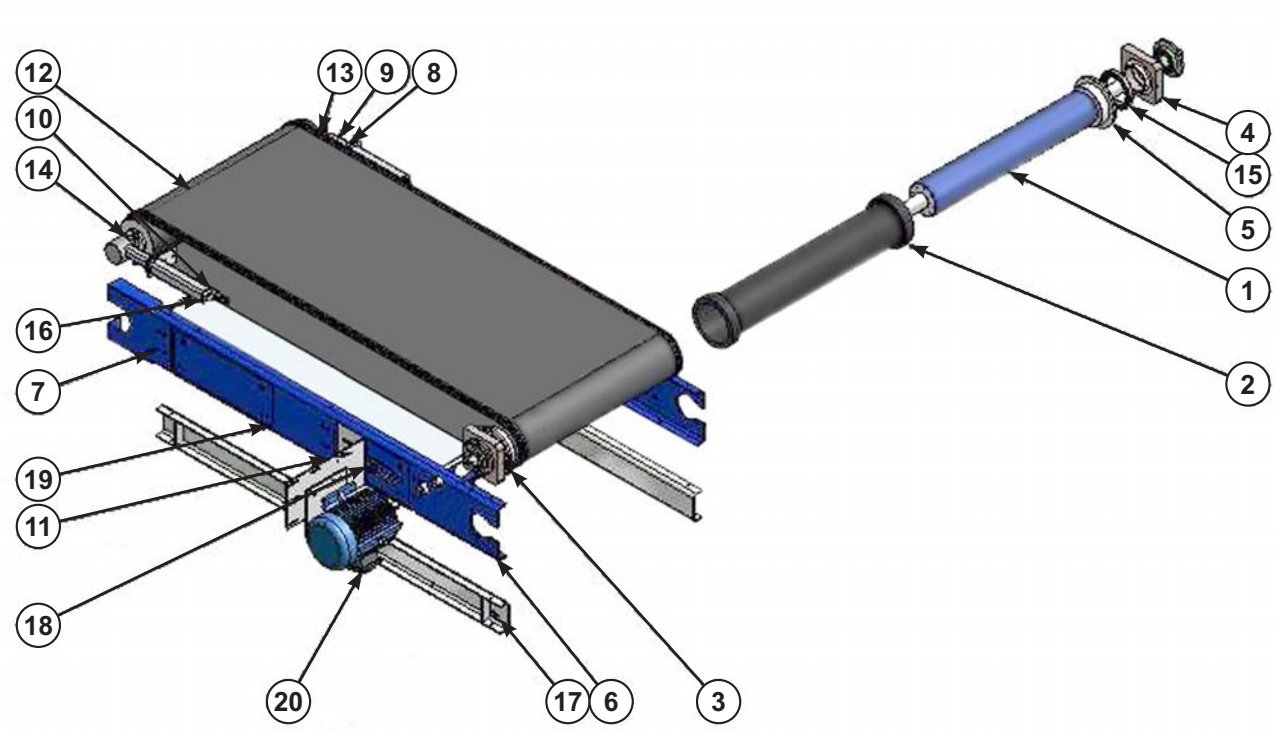
1. De-Energize ALL Power to the Eddy Current Separation Conveyor System.
   NOTE: ELECTRO-MAGNETIC FIELDS ARE PRESENT
2. Follow ALL Lock-Out / Tag-Out Procedures to assure power is OFF and any residual capacity has been neutralized
3. Remove side and front brush guards
4. Remove rear access plates exposing tube in tube take up assemblies
5. Bring rear pulley all the way forward by turning the take-up screws. This loosens the belt
6. Remove the spacer beneath the side guard on the side opposite the motor
7. Pull the old belt over the frame
8. Take new belt, slide it over the frame until it's resting on the front shell and rear drive pulley
9. Screw the take-in's, tightening the belt
10. Replace spacer and bolt into place
11. Start the conveyor portion of the eddy current
12. Track the belt using the tensioning screws
13. When the belt is running true, shut off the power and reassemble the unit by first replacing the access panels and the side brush guards

Shell Change Procedures & Instructions

1. Remove motor coupling
2. Remove both drive side and opposite side rotor bearings. This will allow entire front end including rotor and carbon fiber shell to be taken out of the machine.
3. Using the threaded holes on each end of the shaft, insert eye bolts. Using appropriate lifting apparatus, attach sling to the eye bolts and apply slight upward tension on the sling. Using hand pressure push the rotor assembly forward until it is clear of the eddy current frame
4. Take the assembly to the floor or the maintenance are. **WARNING: DO NOT PUT ASSEMBLY ON OR AROUND ANYTHING THAT IS MAGNETIC!**
5. Set assembly on wood blocks placed under the exposed stub shafts
6. Remove the 4 socket head bolts attaching the shell to the bearing on each end.
7. Place a 3” ID pipe over one end of the shaft and raise this end pivoting the assembly on the off-side of the block.
8. Pull the old shell off the rotor until it is completely resting on the pipe.
9. Lower the rotor back onto the wood blocks.
10. Place the new shell over the pipe.
11. Pivot the assembly enough to allow the shell to slide completely over the rotor & onto the aluminum bearing housing.
12. Lower the assembly onto the wood blocks.
13. Orient the 4 holes in the shell collars to match with the holes on the aluminum housings.
14. Put the socket head screws back into the shell and tighten.
15. Place assembly back into the frame of the unit and slide flange bearings over the shafts and tighten into the steel housing through the frame.

Illustration & Parts List

POSITION	QTY	PART NUMBER	DESCRIPTION	VENDOR
1	1	EC-D01	36” ROTO MAG SHAFT ASSY	CALL
2	1	EC-D02	36” FIBERGLASS TUBE	CALL
3	2	EC-D03	LARGE BEARING DRUM	CALL
4	2	EC-D04	LARGE BEARING PEDESTAL	CALL
5	2	EC-D05	LARGE BEARING DRUM	CALL
6	2	EC-D08	90” LG SIDE RAILS	CALL
7	1	EC-D14	TAIL GUARD CONNECTOR SIDE	CALL
8	1	EC-D16	TAIL GUARD PLANE SIDE	CALL
9	1	EC-D17	TAKE UP SLEEVE	CALL
10	1	EC-D18	TAKE UP SLEEVE ADJUSTMENT	CALL
11	1	EC-D19	MOTOR MOUNT	CALL
12	1	EC-D21	40.5 W X 207 LG BELT	CALL
13	1	EC-D22	DRUM MOUNT	RULMECA
14	1	EC-D23	DRUM MOTOR PULLEY	RULMECA
15	1	EC-D24	BEARING 5 1-2 OPEN TYPE	CALL
16	1	EC-D27	TAKE UP ADJUSTMENT	CALL
17	2	EC-D52	90” LG SUB RAILS	CALL
18	1	EC-D57	SMALL COVER	CALL
19	1	EC-D58	LARGE SIDE COVER	CALL
20	1	EC-D60	BALDOR 213T 7.5 HP MOTOR	BALDOR



Limited Warranty

Industrial Magnetics, Inc. warrants this eddy current separator to be free from defects in material and workmanship under normal operating conditions for a period of one year from date of shipment to original purchaser. One year represents 2080 operating hours. Without limitation, use or service in highly corrosive environments is not deemed normal. Industrial Magnetics, Inc.'s sole obligation under this warranty is limited to repairing or replacing any piece of equipment or part that is determined to have been defective within one year of shipment. Defective parts shall be returned to Industrial Magnetics, Inc., FOB to our shop and a replacement part shall be returned to purchaser FOB our shop. Industrial Magnetics, Inc. does not warrant components manufactured by others, but will submit upon purchaser's request, the warranty of the specific manufacturer. In the case of a motor failure please contact the nearest authorized service center of the motor manufacturer.

The foregoing represents the entire liability of Industrial Magnetics, Inc. to the purchaser. Industrial Magnetics, Inc. makes no other warranties either expressed or implied. In no event will Industrial Magnetics, Inc. be liable for any direct, indirect, incidental or consequential loss or damages or economic loss (including, but not limited to, loss of product, production time or equipment) to any person or property arising form operation of this equipment.

Comments or Concerns?

We believe Industrial Magnetics, Inc. offers the finest Eddy Current Separators available today. Great pride has gone into the design and manufacture of this unit. Any comments or concerns should be directed to our Customer Service Department at 1-888-582-0821. **We appreciate the opportunity to serve you!**

INDUSTRIAL MAGNETICS, INC. 07/10

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AUTOMATION 888-582-0823 MAG-MATE™ 888-582-0822 TRAMP METAL 888-582-0821

Motorized Pulley 220M & 220H, Ø 8.50 in. (216 mm) 60 Hz

Motor		No. Gear Stages	Model	Nominal belt speed[1] at Full Load 60 Hz fpm	Actual belt speed[1] at Full Load 60 Hz fpm	Belt Pull[2] lbs	Max. Radial Load[3] T1 + T2 lbs	Min. RL in	RL Dimension inches (RL>78.74" available on request) Weight in lbs[5]									Type of Bracket
Power HP	No. of Poles								15.75	17.72	19.69	21.65	23.62	25.59	27.56	29.53	31.50	longer than 31.50	
2	6	3	220H	48 60	55 68	1137 928	5620	19.69	-	-	156	163	170	177	184	191	199	See Foot-note[4]	KL41-HD 6YA0K
		2	220M	76	91	690	2585	17.72	-	126*	134	140	148	155	162	169	177		
	4	2	220M	96 120 150 192 240 300 384 480 600	108 137 168 201 256 319 415 501 637	583 460 376 314 247 198 152 126 99	2585	15.75	110*	117	125	132	139	146	154	160	164		
3	4	3	220H	60 76	68 82	1361 1136	5620	19.69	-	-	156*	165	172	179	187	193	201		
		2	220M	96 120 150 192 240 300 384 480 600	108 137 168 201 256 319 415 501 637	855 675 551 460 361 291 223 185 145	2585	17.72	-	126*	134	140	148	155	162	169	177		
4	4	3	220H	96 120	104 129	1216 978	5620	21.65	-	-	-	169	177	183	191	198	201		
		2	220M	150 192 240 300 384 480 600	168 201 256 319 415 501 637	751 627 492 396 304 252 197	2585	19.69	-	-	138	145	153	159	167	173	181		
5.5	2	3	220H	120 150	136 163	1237 1033	5620	21.65	-	-	-	169	177	183	191	198	205		
		2	220M	192 240 300 384 480 600	216 274 336 402 512 636	777 614 501 418 329 264	2585	19.69	-	-	138	145	153	159	167	173	181		
7.5	2	3	220H	192 240 300 384 480 600	202 254 314 408 522 625	1146 909 735 567 443 370	5620	21.65	-	-	-	169	177	183	191	198	205		

Idler Pulley														
	Model UT220M	2585	15.75	59	65	70	74	80	84	90	94	99	See Foot-note[4]	KL41-HD 6YA0K
	Model UT220H	5620	15.75	63	69	74	79	84	89	94	98	104		

1 Use "nominal belt speed" to specify pulley. "Actual belt speed" is presented (for pulley lagged with 1/4" thick rubber) to assist with process design calculations. See Technical Precautions page 77. Note that "actual belt speed" decreases when lagging is not used due to decreased pulley diameter.

2 Belt pull value allows for gearbox loss.

3 Pulley must not be subjected to radial load exceeding "Maximum radial load" defined above. See "Belt Tension" section in Technical Precautions, page 78.

4 Additional Motorized Pulley and Idler Pulley weight, specified per Roller Length:
31.50"≤ RL < 59.06" Wt = 3.7 lbs/in
59.06"≤ RL < 78.74" Wt = 7.1 lbs/in

5 All weights shown above are for pulleys with 1/4" thick lagging. To calculate unlagged pulley weight subtract 0.3 lbs/in of Roller Length from above.

* Special "Short Roller Length" Option

Motorized Pulley 220M, Ø 8.50 in. (216 mm)

Spare parts list and sectional drawings

Pos.	Description
1	Shell
2	End housing with geared rim
3	End housing
8	Geared rim
9	Rotor pinion
10	Input wheel
11	Output pinion
12	Gear box
13	Front shaft
14	Rear shaft
15	Stator complete
15.1	Rotor
16	Terminal box complete
17	Nipple
20	Cover
20.1	Cover with labyrinth groove
23	Rear flange
23.1	rear flange for backstop
23.2	Rear flange for electromagnetic Brake
24	2 dust lip seals at each side
24	Double lip seal at each side for labyrinth option
25	O-ring
26	Bearing
27	Bearing
28	Bearing
29	Bearing (Backstop solution: One-way-bearing)
30	Bearing
31	Bearing
39	Hexagon socket screw
40	Hexagon socket screw
41	Hexagon socket screw
52	Magnetic oil plug
53	Distance washer
53.1	Compression nipple
59	Countersunk head screw
66	Waved spring washer
68	Key
70	Toothed washer
78	Gasket
79	Holding clip or plastic tie
85.1	Intermediate flange for brake assembly
91	Electromagnetic brake
93	Retaining ring
95	Straight connector
96	Elbow connector
101	Key
104	Distance washer
120	Labyrinth cover
121	Set screw
122	O-ring
123	Grease nipple
124	Distance washer
143	O-ring
146	Special shaped compression washer
200	Rubber seal

Compact Terminal Box