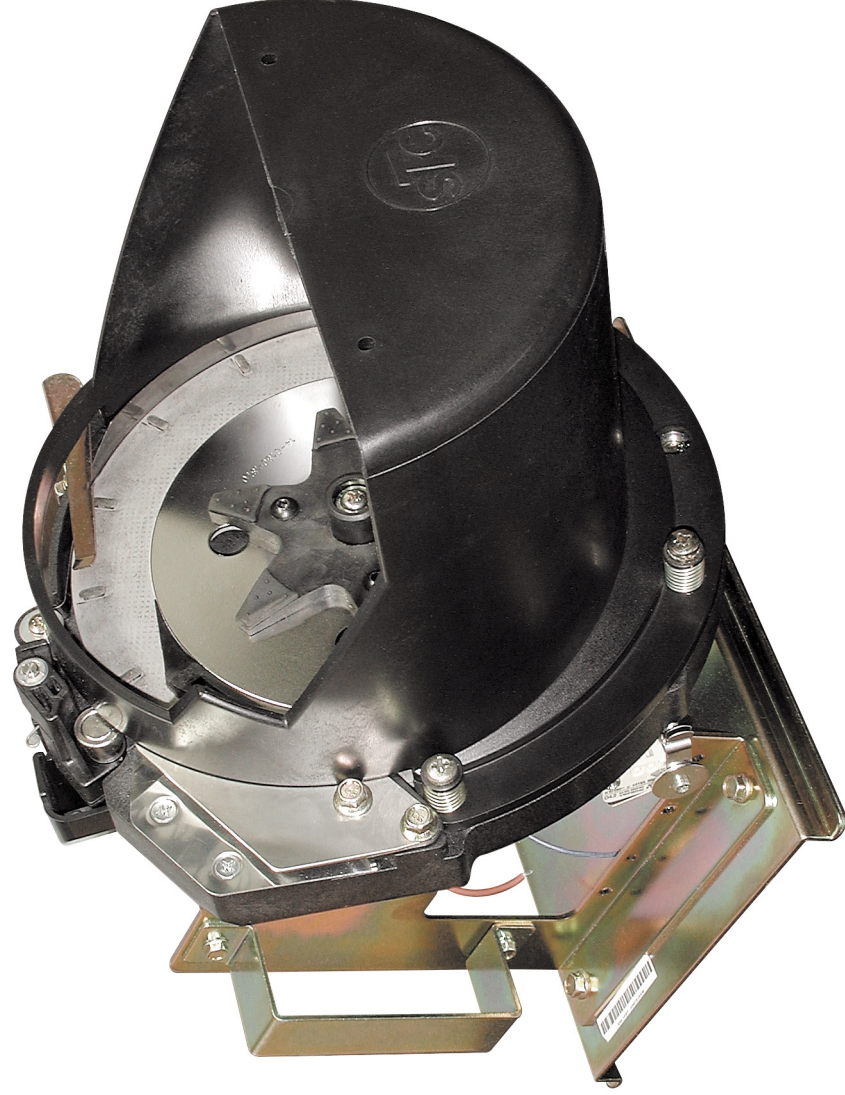


SERVICE MANUAL

excel™ hopper

Version 1.3



Developed by Suzo International

Nearly 25 years of designing and manufacturing Casino Hoppers has resulted in this new product.

Understanding the needs of both casinos and Slot machine manufacturers has led to this extremely durable and World's most service friendly Casino hopper!

New features:

Planetary gearbox system provides following advantages:

- Maximum torque by minimal power consumption.
- Available in 12 or 24VDC
- Silent Operation.
- Unique bayonet connection for easy and economical motor replacement.

Standard optical read out:

- Indirect optical read out. NPN, normally open (n/o).
- Optional: Indirect optical read out. NPN, normally closed (n/c).
- Optional: Second read out in the coin exit.
- Optics protected by cover against light (fraud) and dust.

Other features:

- Easy accessible coin exit.
- Steel bearing offer stable disc rotation.
- Customised frame and cup specifications possible.
- All wear and tear parts such as pin and self wheel are 100% compatible with older generations STC hoppers.
- Easy to integrate for manufacturers who use older generation STC casino Hoppers.
- Applicable coin sizes: 18-38mm – Optional up to 45mm.

Pay out speed: <31mm coins: 450 coins per minute
>31mm coins: 250 coins per minute

All Excel hoppers can be supplied with customised wiring, with choice of strobe pins for low and / or high level detection

Control boards: (optional)

- Part no. 14-0500-1 intelligent control board 24Vdc with direct start mode, logic Hi start mode, pulse mode and RS232 serial mode.
- Part no. 14-0500-2 intelligent control board 24Vdc with direct start mode, logic Lo start mode, pulse mode and RS232 serial mode.
- Part no. 14-0505-1 intelligent control board 12Vdc with direct start mode, logic Hi start mode, pulse mode and RS232 serial mode.
- Part no. 14-0505-1 intelligent control board 12Vdc with direct start mode, logic Hi start mode, pulse mode and RS232 serial mode.
- Part no. 14-0500-4 anti-jam control board 24Vdc to solve most of the possible coin jams during operation.

Periodic maintenance

(Warning: Before removing or installing the hopper make sure that power is switched off!)

Maintenance recommended in six months interval.

1. Clean the optical sensor.
2. Clean the hopper knife and remove all dirt, especially on the route of coins, on the shelf wheel, the pinwheel around the area of the pins and the coin outlet.

Inspection, recommended once in a year

1. Disassembling the coin cup of the hopper, in case of a non-metal cup check for any cracks or brakes.
2. Inspect the hopper knife for wearing and the correct position! For adjustments see fig.1
3. Inspect the hopper wiper for the correct position.
The position of the wiper is very important for a correct payout! If necessary adjust it, see fig. 2
4. Inspect the rubber agitator.
5. Inspect the coin level, check the moment of the switch or check if the coin level probe is securely fastened.
6. Inspect cabling harness for damage, and if necessary tighten cables back on the harness.
7. Assembling coin cup with the 4 screws, springs and bushings back on the wheelhouse.
8. Inspect if the hopper slides gently in and out of the slot machine. Check the hopper and connector for proper function.

Warning!

Do not use any kind of lubrication on the hopper.

After inspection and maintenance check the function of the hopper. For testing using the test mode of the slot- machine. Consult the manual or the slot-manufacturer for further instructions.

Power Consumption:

Voltage	Unloaded	Loaded	Stall auto reverse
• 24VDC	0.25 Amp	0.50 Amp	1.5 Amp
• 12VDC	0.30 Amp	0.70 Amp	1.6 Amp

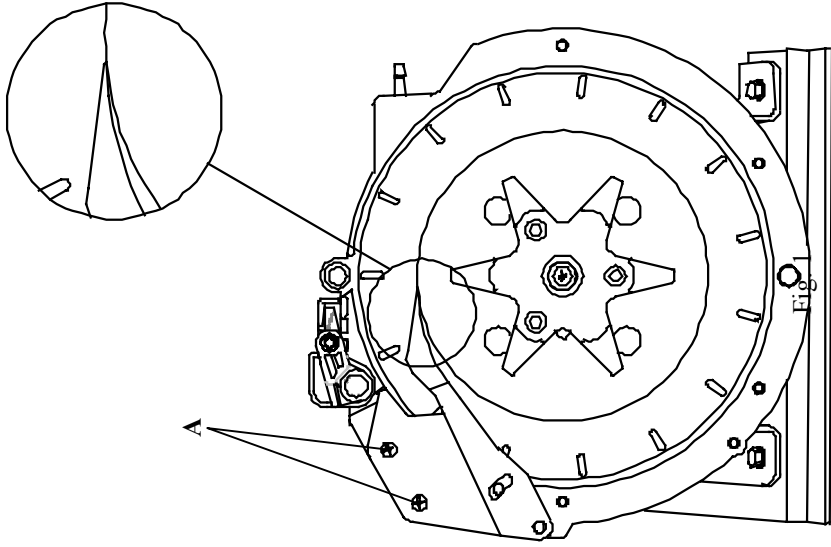
Maximum torque of the motor

- 24V - 31RPM load 6kg N-m
- 24V - 21RPM load 12kg N-m
- 12V - 31RPM load 5kg N-m
- 12V - 21RPM load 11kg N-m

Operating temperature: -10° to + 60°C

This service manual is intended only to assist the reader in the use of this product.

Therefore Suizo international shall not be held liable for any loss or damage whatsoever arising from the use of any information or particulars in or any commission from this manual or any incorrect use of the product.



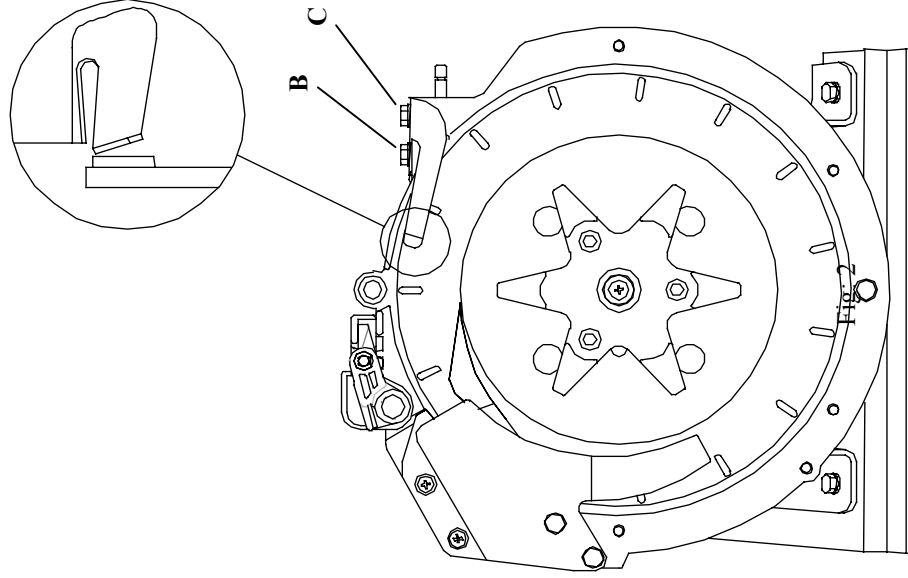
Adjustments of the excel hopper

Adjustment of the hopper with standard knife

Loosen the two screws "A" move the tip of the knife against the pinwheel and the top of the sheifwheel. Lightly hold the knife on the sheifwheel and tighten the two screws "A". Rotate the pinwheel and check there is no space between the sheifwheel and the knife in any position.

Adjustment of the hopper with full metal knife

Loosen the two screws "A" move the tip of the knife against the pinwheel and the top of the sheifwheel. Turn the pinwheel at least one cycle and tighten the two screws "A". Rotate the pinwheel and sheifwheel and the knife in any position.



Adjustment of the coin-wiper

Position a coin under the wiper, make sure that the top of the wiper is equal to the top of the coin.

Slightly loosen the two screws "B and C" - see fig 2.

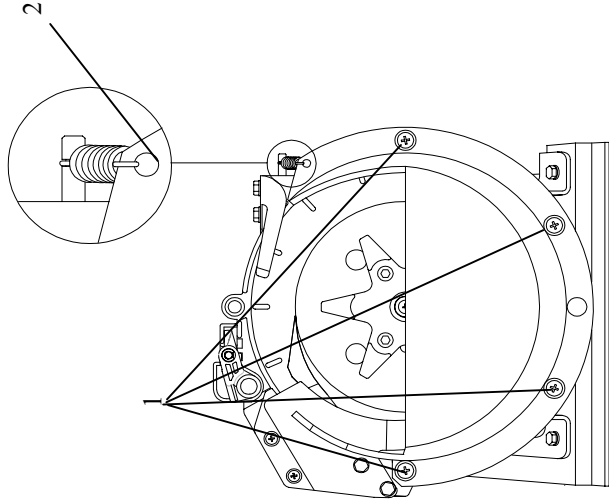
Move the wiper edge up to the coin. The edge should be close to the coin, app. 0,5 mm.

Never let the wiper touch the coin!

Tighten first the screw "B", constantly checking the position of the wiper to the coin.

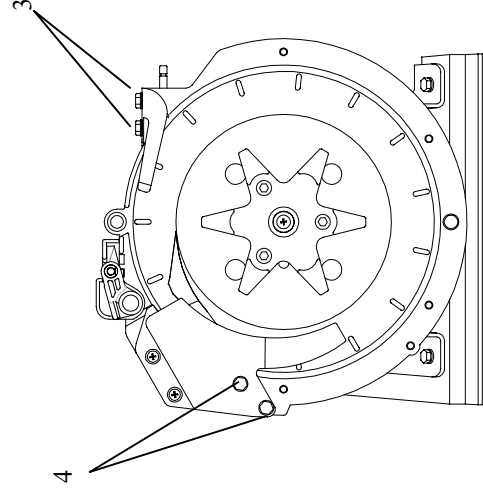
Tighten screw "C" and check the final position.

Do not over-tighten the screws B en C!

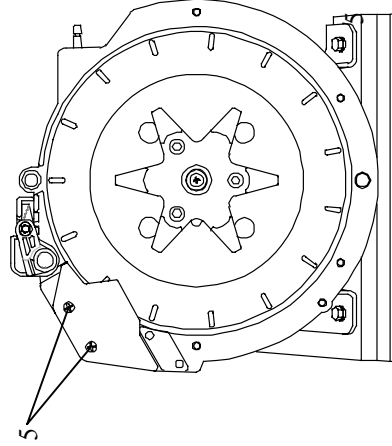


Disassembling the hopper.

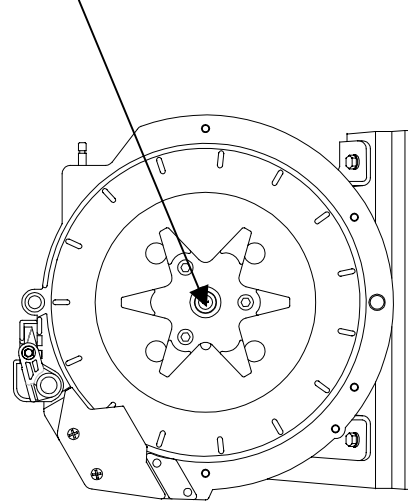
1. Remove the 4 screws, which holds the hopper cup to the wheelhousing.
2. Remove the hopper cup and spring which is mounted on the right side of pivot pin.



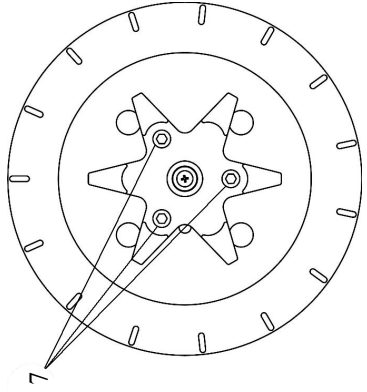
3. Remove the 2 hexagon bolts, which holds the wiper, and remove the wiper.
4. Remove the 2 hexagon bolts, which holds the coin chute, and remove the coin chute and knife.



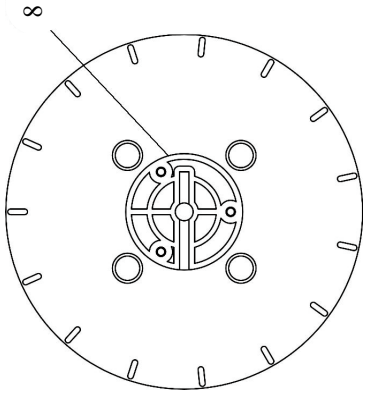
5. Remove the 2 Philips screws, which holds the coin deflector, and remove the coin deflector.



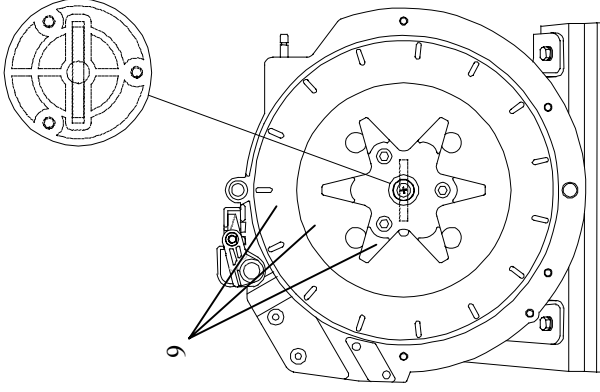
6. Remove the Philips screw, and spring in the centre of the disc. The disc assembly is now free floating in the hopper, remove the assembly by pulling on the agitator and lift it from the motor shaft.



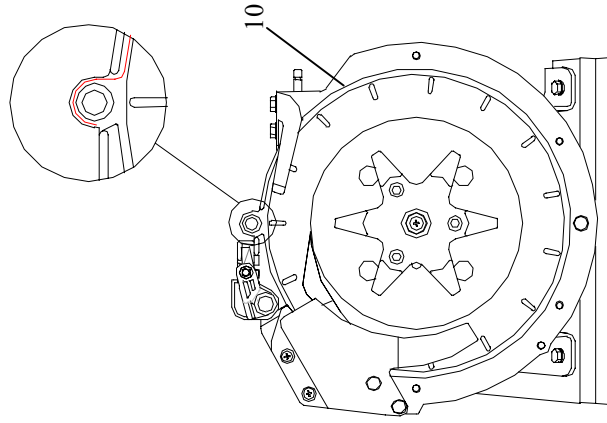
7. Remove the 3 hex key screws, and disassemble the whole disc to make the new requested combination.



8. Take requested pinwheel, shelf-wheel and agitator, and mount the 3 screws back in position.



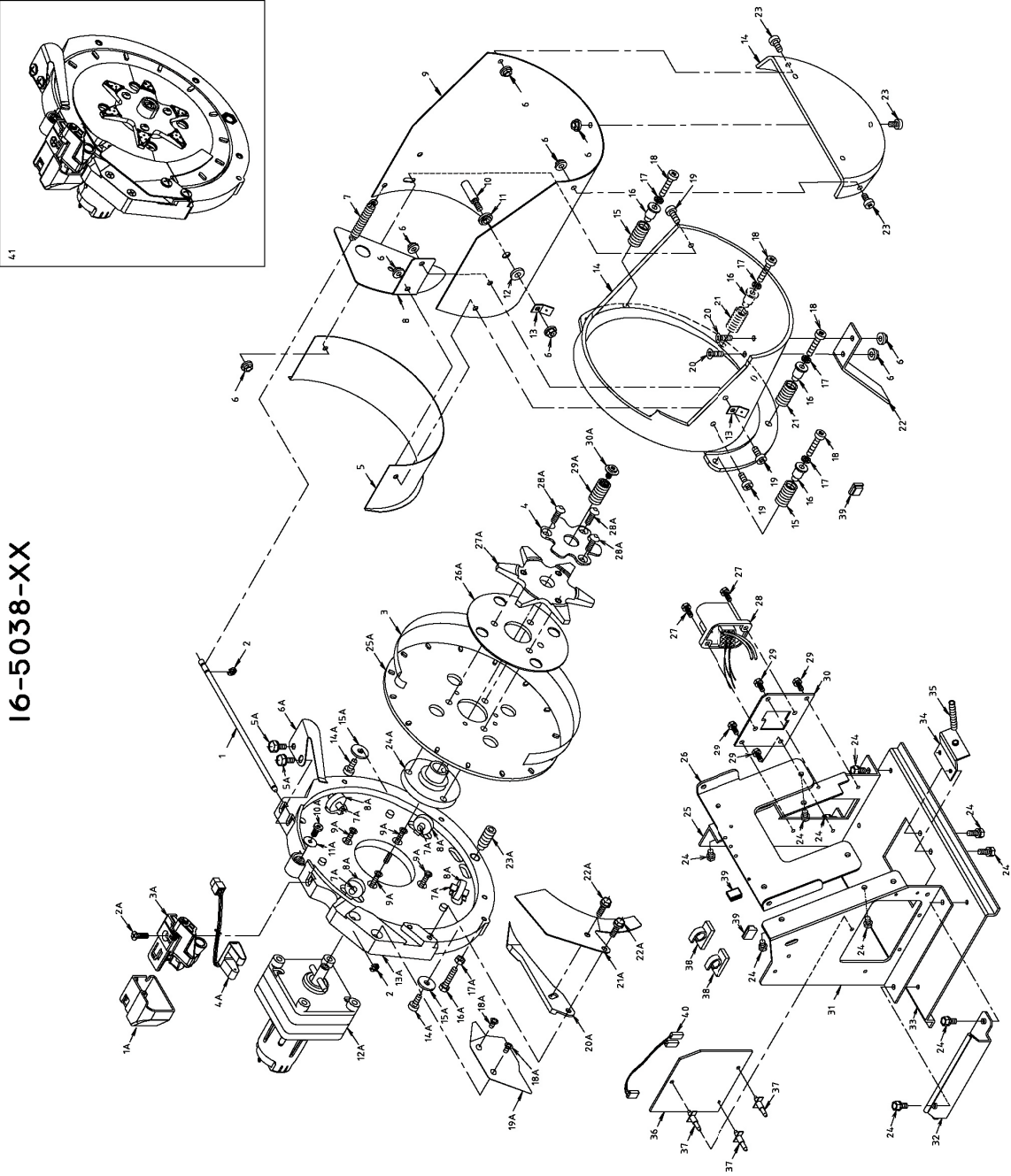
9. Put the disc assembly back on the hopper. The disc only fits 2 ways into the driver pin.



10. Place the spring liner in position around the disc, make sure the end of the spring liner fits correct in the upper part on the wheelhousing.

Finish the reassembling by reversing step 5, 4, 3, 2 and 1 of the disassembling description.

16-5038-XX



02-12-03

16-5038-XX

Version 1.0

2-12-2003

DRAW. NR.	PART NUMBER	DESCRIPTION	PCS	DRW. NR.	PART NUMBER	DESCRIPTION	PCS
1	14-0400	PIVOT ROD	1	22	14-0075	SCOOP SUPPORT BRACKET	1
2	5040-191	E WASHER BLACK (DIN 6799)	2	23	150-010-120	M5X10 SCREW PHILL. PAN HD YELLOW	3
3	14-0140	SPRING LINER	1	24	250-008-700-7	M5X8 BOLT HX. HD. TAPT. FL. YELLOW	10
4	SEE PART LIST G	METAL STAR SUPPORT AGITATOR	1	25	14-0025	RIGHT SIDE MOUNTING BRACKET	1
5	SEE PART LIST H	CUP LINER	1	26	14-0035	PIVOT BRACKET	1
6	1050-242	M5 TENSILOCK NUT	9	27	240-010-700-7	M4X10 BOLT HX. HD. TAPT FL. YELLOW	2
7	14-0345	EXTENSION SPRING	1	28	14-0960-14	CABLE LOOM AINS	1
8	14-0085	COIN BAFFLE	1	29	240-008-700-7	M4X8 BOLT HX. HD. TAPT FL. YELLOW	4
9	14-0890-1	MEDIUM SCOOP EXTENSION AINS	1	30	14-1022	CONNECTOR BRACKET AMP 12 PINS	1
10	14-0470	LEVEL SENSOR PIN	1	31	14-0015	LEFT SIDE MTG BRACKET	1
11	0052-276	ISOLATION SLEEVE 5.2X7.9X1	1	32	14-0051	BOTTOM GRIP	1
12	0081-006	ISOLATION WASHER 8.1X14X1	1	33	14-0009	PLATFORM 2MM	1
13	61-2257-31	TAB 6.3MM BRASS HOLE 5.3MM 45GR	2	34	14-0045	SPRING MOUNT	1
14	14-0720-6	HOPPER CUP 2 PCS STANDARD BLUE	1	35	14-0355	COMPRESSION SPRING	1
15	14-0365	SPRING HEAVY	2	36	14-0500-1	HOPPER CONTROL BOARD	1
16	14-0440	M5 EXT. STAR LOCKWASHER YELLOW	4	37	22-0087	PCB HOLDER	3
17	1051-040	M5 EXT. STAR LOCKWASHER YELLOW	4	38	22-0088-1	SELF ADHESIVE CABLE CLIP 6MM	2
18	150-025-220	M5X25 SCREW PHILL. PAN HD YELLOW	4	39	22-0088-3	SELF ADHESIVE WIRE CLIP 6X2MM	3
19	150-012-120	M5X12 SCREW PHILL. PAN HD YELLOW	3	40	14-0501-2	INTERF CABLE FOR PCB HOPPER PROBE	1
20	150-012-420	M5X12 SCREW PHILL. FLAT HD YELLOW	2	41	14-1175*	EXCEL WHEELHOUSE ASSEMBLY	1
21	14-0335	SPRING LIGHT	2				

* SEE LIST 14-1175

14-1175

Version 1.0

07-11-2003

DRAW. NR.	PART NUMBER	DESCRIPTION	PCS	DRAW. NR.	PART NUMBER	DESCRIPTION	PCS
1A	14-1155	SENSOR COVER	1	16A	150-025-700	M5X25 BOLT HK. HD. YELLOW	1
2A	150-020-422	M5X20 SCREW PH. FL. HD.	1	17A	1050-050	M5 NUT HEX. YELLOW	1
3A	14-1145	ROCK AND ROLLER ASSY	1	18A	140-008-420	M4X8 SCREW PH. FL. HD. YELLOW	2
4A	14-1140	OPTO SENSOR	1	19A	14-0085	COIN REFLECTOR	1
5A	150-012-700-1	M5X12 TENSILOCK BOLT YELLOW	2	20A	14-0281 (PartB)	HOPPER KNIFE	1
6A	14-0070	WIOPER	1	21A	14-0065 (PartC)	OUTLET COVER	1
7A	14-0416	BEARING PIN	4	22A	15-016-700-1	M5X16 TENSILOCK BOLT YELLOW	2
8A	14-0590	BEARING 6X19X6MM	4	23A	199-025-940	M10X25 SCREW HK. HD. IMBUS	1
9A	150-050-422	M5X50 FL. HD MOTOR SCREW	4	24A	14-0110	DRIVING HUB	1
10A	240-008-220	M4X8 SCREW PH. PAN. HD. YELLOW	1	25A	14-0115 (PartD)	PINWHEEL 15 PINS	1
11A	1042-145	M4 WASHER 4.2X14X0.5	1	26A	14-0130-1370 (PartE)	SHELFWHEEL 137MM	1
12A	14-1115 (PartA)	MOTOR ASSY 31RPM-24VDC	1	27A	14-0571	AGITATOR WITH BUSHINGS	1
13A	14-1100	EXCEL WHEELHOUSING	1	28A	150-020-931 (PartF)	M5 SCREW HK HD.	3
14A	150-010-120	M5X10 SCREW PH. PAN. HD. YELLOW	2	29A	14-0365	HUB SPRING	1
15A	1055-160	M5 WOODRASHER YELLOW	2	30A	150-010-223-7	M5X10X13 SCREW PH. HD. FLANGE NICK	1

NR.	MIN	MAX	Part A	Part B	Part C	Part D	Part E	Part F	Part G	Part H	Part J
-XX	mm	mm	motor	knife	Outlet cov.	pinwheel	shelfwheel	M5 Screw	Met. Supp.	cup liner	Coin Deflectot
-1	18.0	18.9	14-1115	14-0281	14-0065	14-0116	14-0130-1505	150-020-931	not used	not used	14-0095
-	19.0	20.0	14-1115	14-0281	14-0065	14-0116	14-0130-1465	150-020-931	not used	not used	14-0095
-8	20.1	22.0	14-1115	14-0281	14-0065	14-0116	14-0130-1425	150-020-931	not used	not used	14-0095
-12	22.1	24.8	14-1115	14-0281	14-0065	14-0115	14-0130-1370	150-020-931	not used	not used	14-0095
-2	24.9	25.8	14-1115	14-0281	14-0065	14-0115	14-0130-1350	150-020-931	not used	not used	14-0095
-5	25.9	27.8	14-1115	14-0281	14-0065	14-0115	14-0130-1310	150-020-931	not used	not used	14-0095
-3	27.9	31.0	14-1115	14-0281	14-0066	14-0115	14-0130-1235	150-020-931	not used	14-0145	14-0095
-7	31.1	31.9	14-1115	14-0281	14-0066	14-0112	14-0130-1205	150-020-931	not used	14-0145	14-0095
-9	32.0	33.0	14-1135	14-0281	14-0066	14-0112	14-0130-1205	150-020-931	not used	14-0145	14-0095
-10	33.1	35.0	14-1135	14-0295	14-0067	14-0112	14-0130-1165	150-020-522	14-0580	14-0145	14-0095
-6	35.1	36.9	14-1135	14-0295	14-0067	14-0012	14-0130-1125	150-020-522	14-0580	14-0145	14-0095
-4	37.0	38.0	14-1135	14-0295	14-0067	14-0112	14-0130-1075	150-020-522	14-0580	14-0145	14-0096

Configuration for Euro coins:**5 € cent (21.25 mm)**

Pinwheel 16 pin for diameter from 18.0 - 22.0 mm 14-0116
 Shelfwheel 142,5mm for coins 20.1 - 22.0 mm 14-0130-1425
 Knife for coins 18.0 - 33.0 mm (metal insert) 14-0281
 Motor 24 VDC 31 RPM 14-1115
 Outlet cover for coins 18.0 - 27.8 mm 14-0065

10 € cent (19.75 mm)

Pinwheel 16 pin for diameter from 18.0 - 22.0 mm 14-0116
 Shelfwheel 146,5mm for coins 19.0 - 20.0mm 14-0130-1465
 Knife for coins 18.0 - 33.0 mm metal inserts 14-0281
 Motor 24 VDC 31 RPM 14-1115
 Outlet cover for coins 18.0 - 27.8 mm 14-0065

20 € cent (22.25 mm), 50 € cent (24.25 mm) and 1 € (23.25mm)

Pinwheel 15 pins for diameter from 22.1 - 31.0 mm 14-0115
 Shelfwheel 136,5mm for coins 22.1 - 24.8 14-0130-1370
 Knife for coins 18.0 - 33.0 mm metal inserts 14-0281
 Motor 24 VDC 31 RPM 14-1115
 Outlet cover for coins 18.0 - 27.8 mm 14-0065

2 € (25.75 mm)

Pinwheel 15 pin for diameter from 22.1 - 31.0 mm 14-0115
 Shelfwheel 135,0mm for coins 24.9 - 25.8mm 14-0130-1350
 Knife for coins 18.0 - 33.0 mm metal inserts 14-0281
 Motor 24 VDC 31 RPM 14-1115
 Outlet cover for coins 18.0 - 27.8 mm 14-0065

Configuration for US coins:**Nickel (21.21mm)**

Pinwheel 16 pin for diameter from 18.0 – 22.0mm 14-0116
 Shelfwheel 142,5 for coin 20.1 – 22.0mm 14-0130-1425
 Knife for coins 18.0 –33.0mm metal inserts 14-0281
 Motor 24 VDC 31 RPM 14-1115
 Outlet cover for coins 18.0 – 27.8mm 14-0065

Quarter (24,23mm)

Pinwheel 15 pin for diameter 22.1 – 31.0mm 14-0115
 Shelfwheel 136,5 for coin 22.1 – 24.8mm 14-0130-1370
 Knife for coins 18.0 –33.0mm metal inserts 14-0281
 Motor 24 VDC 31 RPM 14-1115
 Outlet cover for coins 18.0 – 27.8mm 14-0065

Dollar token (37.2mm)

Pinwheel 12 pin for diameter from 18.0 – 22.0mm 14-0112
 Shelfwheel 107,5 for coin 37.0 – 38.0mm 14-0130-1075
 Metal Knife for coins 18 –38mm 14-0295
 Motor 24 VDC 21 RPM 14-1135
 Outlet cover for coins 33.1> 14-0067
 Cup liner for standard cup, used for coins >27.9mm 14-0145
 Cup liner for wide and narrow cup, used for coin >27.9mm 14-0855
 Metal star on agitator for coins >33.1mm 14-0580

Hopper denomination conversions**Pinwheels:Part no**

16 pin for diameter from 18.0 - 22.0 mm 14-0116
 15 pin for diameter from 22.1 - 31.0 mm 14-0115
 12 pin for diameter from 31.1 - 38.0 mm 14-0112

Shelfwheel:

107.5 mm / coins 37.0 - 38.0 mm 14-0130-1075
 112.5 mm / coins 35.1 - 36.9 mm 14-0130-1125
 116.5 mm / coins 33.1 - 35.0 mm 14-0130-1165
 120.5 mm / coins 32.0 - 33.0 mm 14-0130-1205
 123.5 mm / coins 27.9 - 31.9 mm 14-0130-1235
 131.0 mm / coins 25.9 - 27.8 mm 14-0130-1310
 135.0 mm / coins 24.9 - 25.8 mm 14-0130-1350
 136.5 mm / coins 22.1 - 24.8 mm 14-0130-1370
 142.5 mm / coins 20.1 - 22.0 mm 14-0130-1425
 146.5 mm / coins 19.0 - 20.0 mm 14-0130-1465
 150.5 mm / coins 18.0 - 18.9 mm 14-0130-1505

Motors:

Motor 12V DC 31 RPM / coins 18.0 - 33.0 mm 14-1110
 Motor 12V DC 21 RPM / coins 33.1 - 38.0 mm 14-1130
 Motor 24V DC 31 RPM / coins 18.0 - 33.0 mm 14-1115
 Motor 24V DC 21 RPM / coins 33.1 - 38.0 mm 14-1135

Coin deflector:

Coin deflector 14-0095
 Coin deflector coated 14-0096

Knives:

Knife for coins 18.0 - 33.0 mm 14-0281
 Metal knife for coins 18.0 - 38.0 mm 14-0295

Outlet covers:

Outlet cover for coins 18.0 - 27.8mm 14-0065
 Outlet cover for coins 27.9 - 33.0 mm 14-0066
 Outlet cover for coins 33.1 - 38.0 mm 14-0067

Cup liners:

For standard cup, coins >27.9 mm 14-0145
 For wide and narrow cup, coins >27.9mm 14-0800

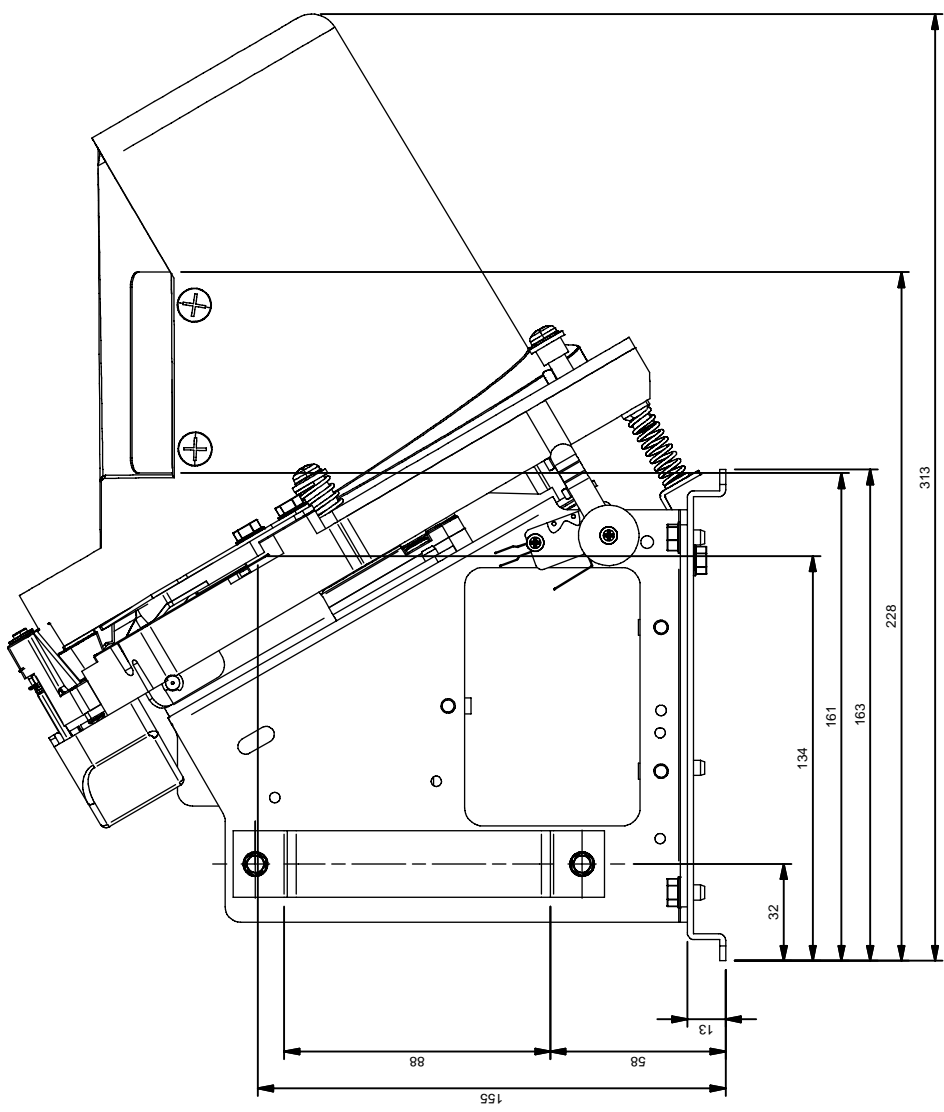
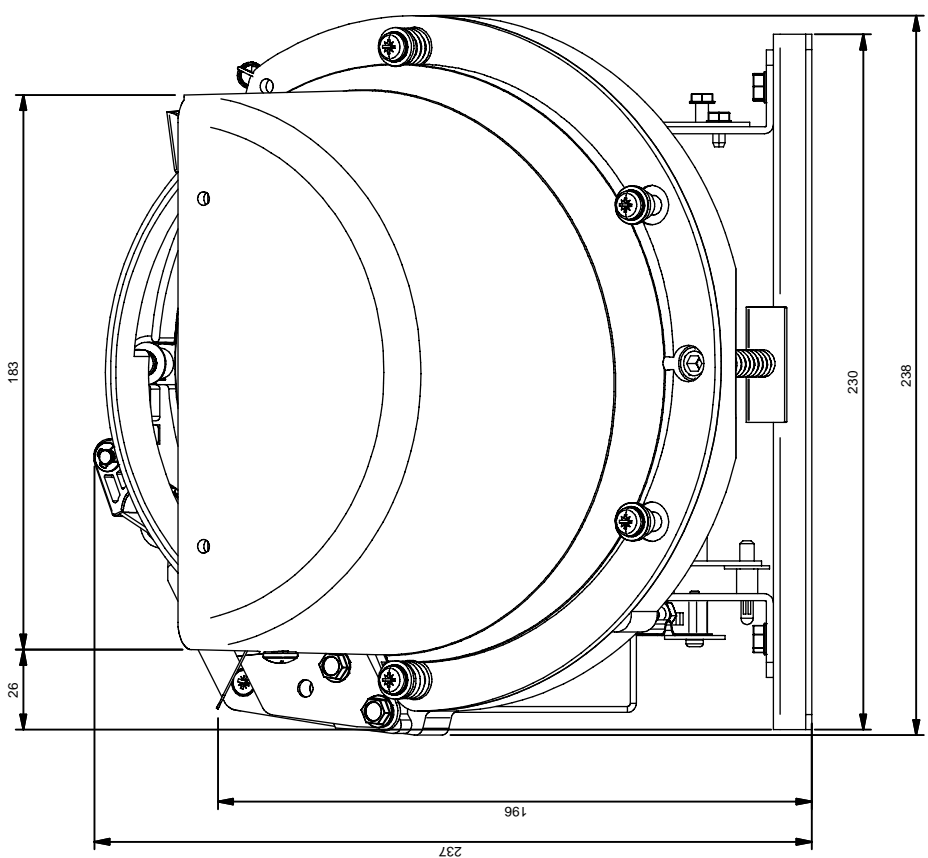
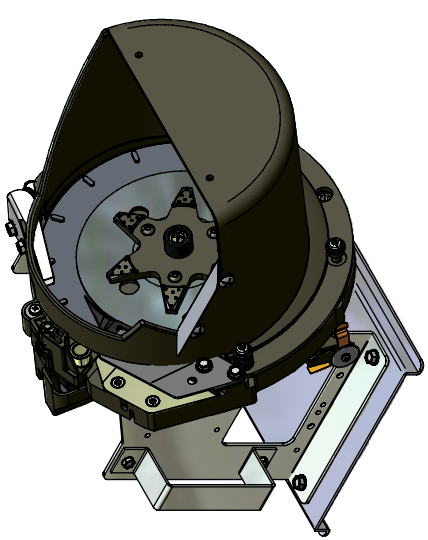
Agitator:

Standard rubber agitator 14-0571

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GAMING, AMUSEMENT AND INDUSTRIAL COMPONENTS

Description: **Excel Hopper Standaard**

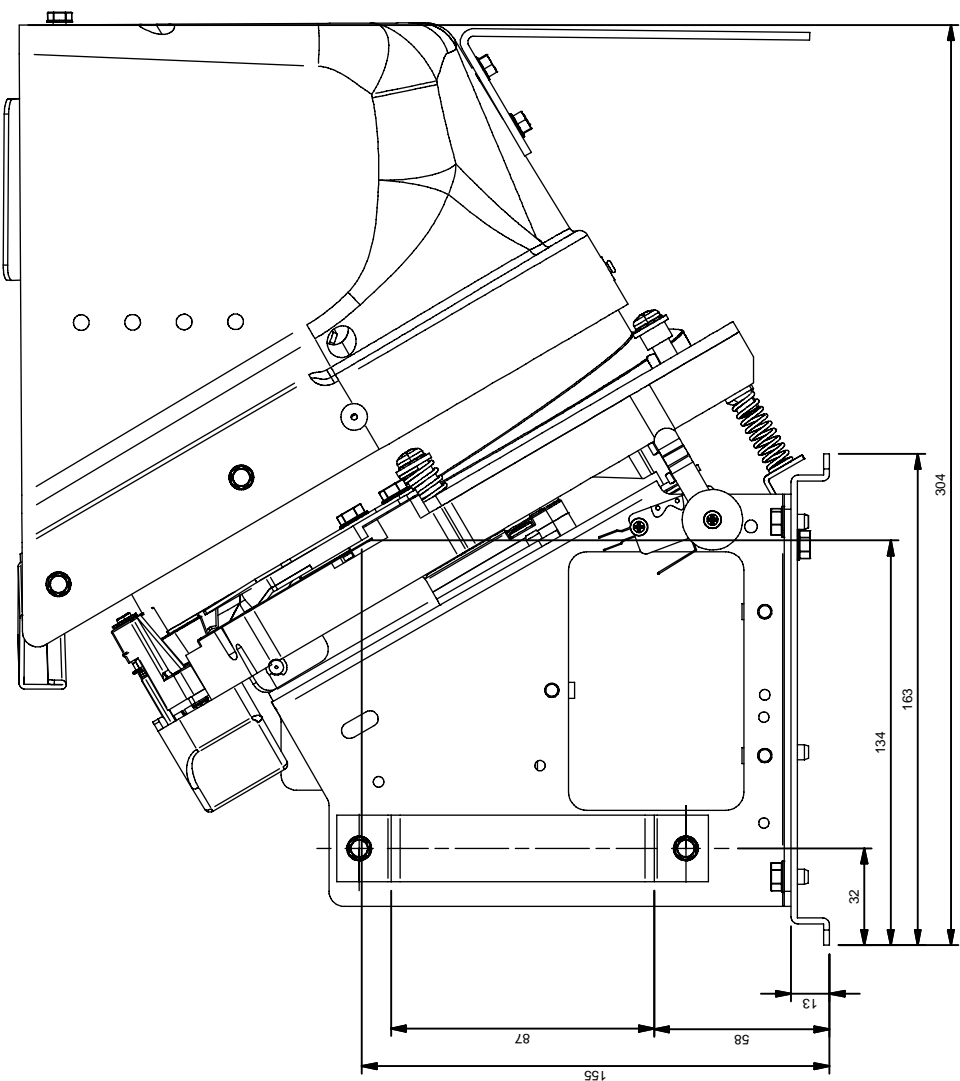
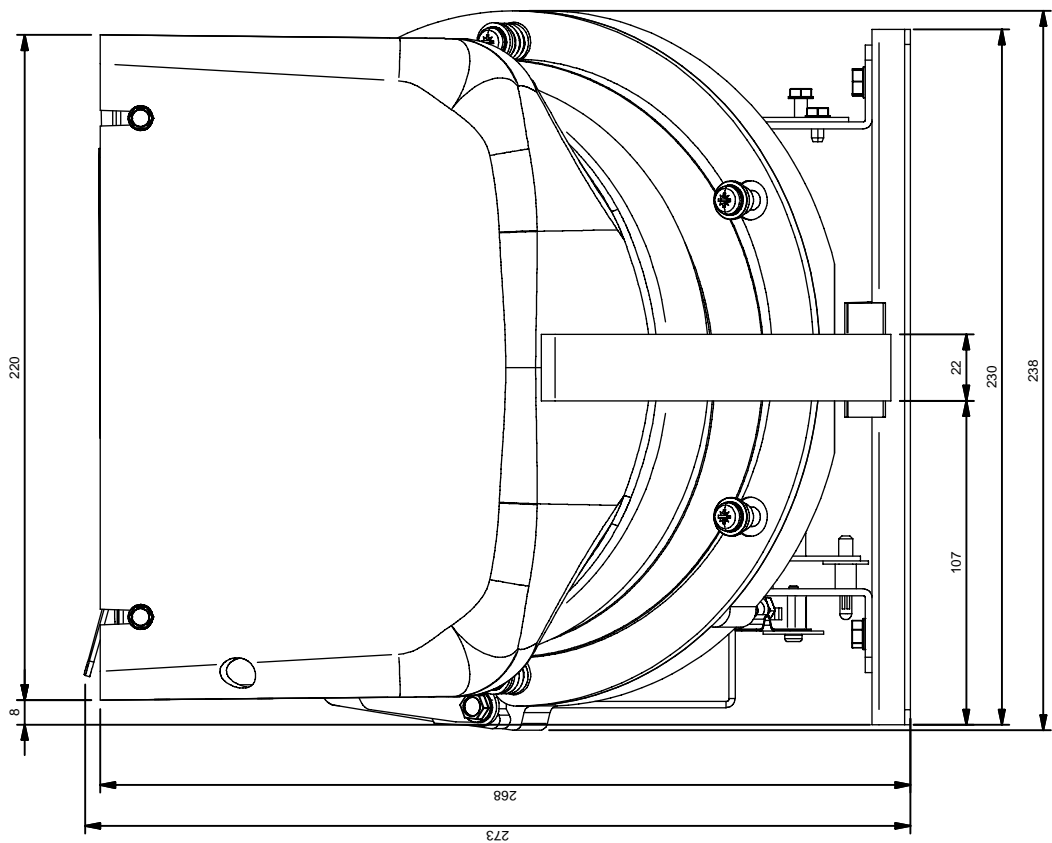
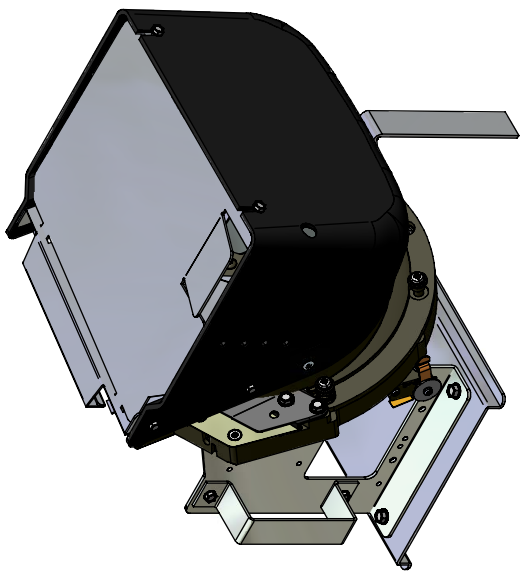
Suzo International (NL) BV
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 Fax. +31 (0)186-643355
 E-mail info@suzo.com

Date: 2-3-2005

Partnumber:

Revision: 00

Size: A3



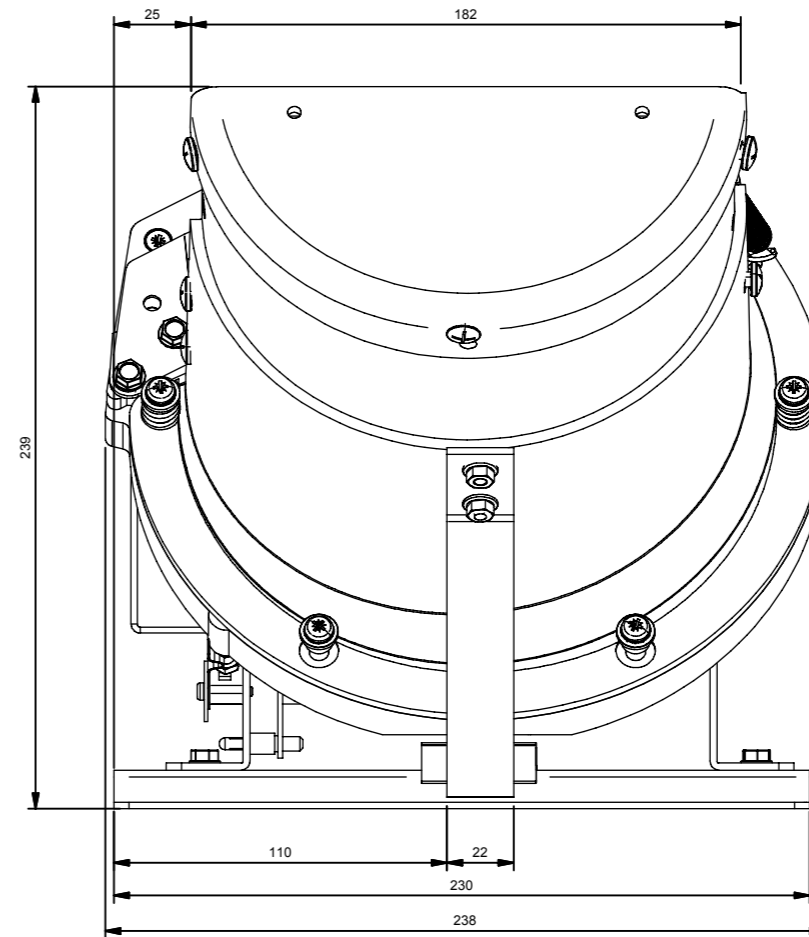
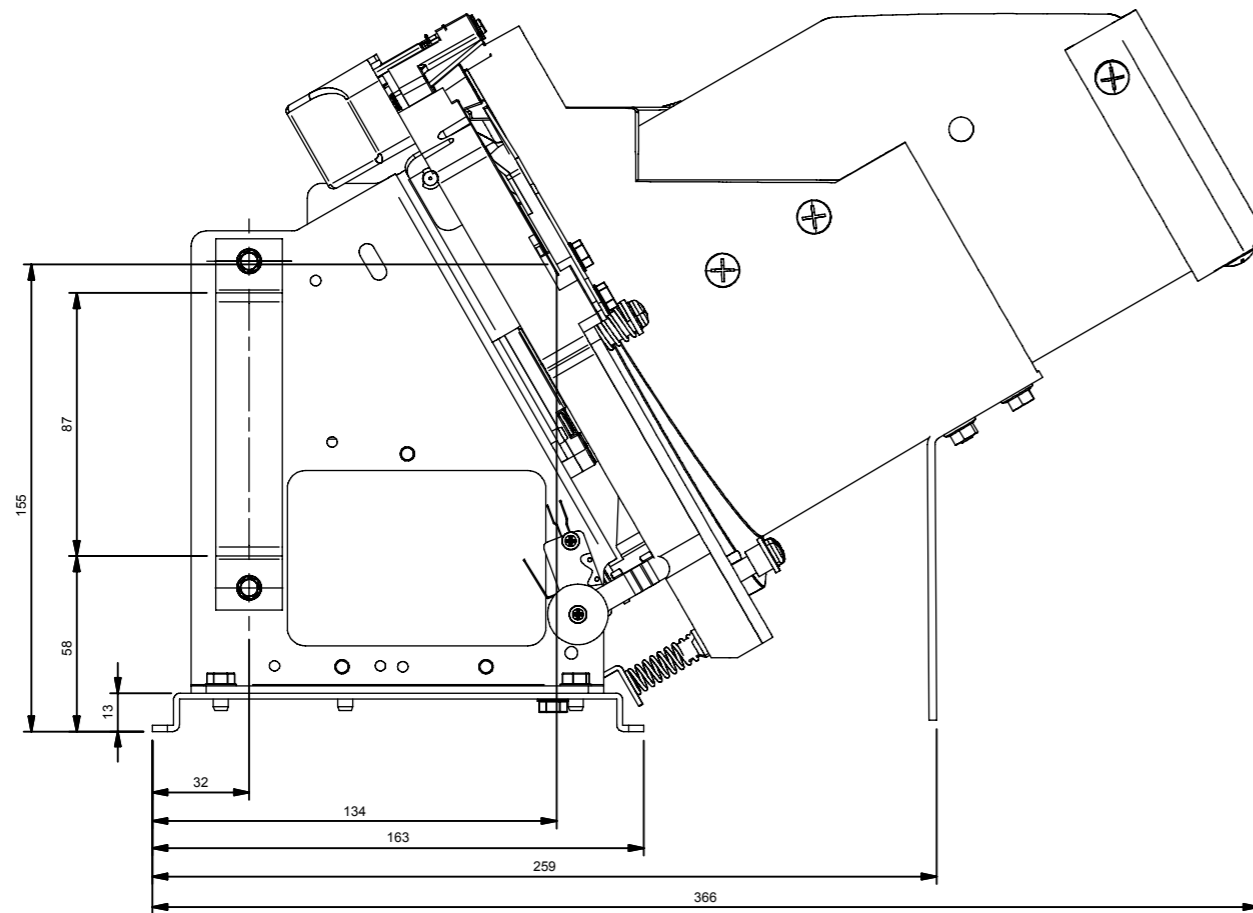
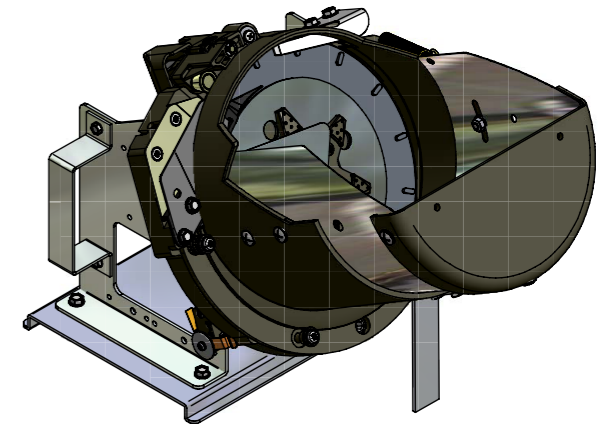
GAMING, AMUSEMENT AND INDUSTRIAL COMPONENTS

Description: **Excel Hopper Narrow cup**

Suzo International (NL) BV
 Antonie van Leeuwenhoekstraat 9
 3261 LT Oud Beijerland
 Tel. +31 (0)186-643333
 Fax. +31 (0)186-643355
 E-mail: info@suzo.com

Date: 2-3-2005
 Partnumber:
 Revision: 00

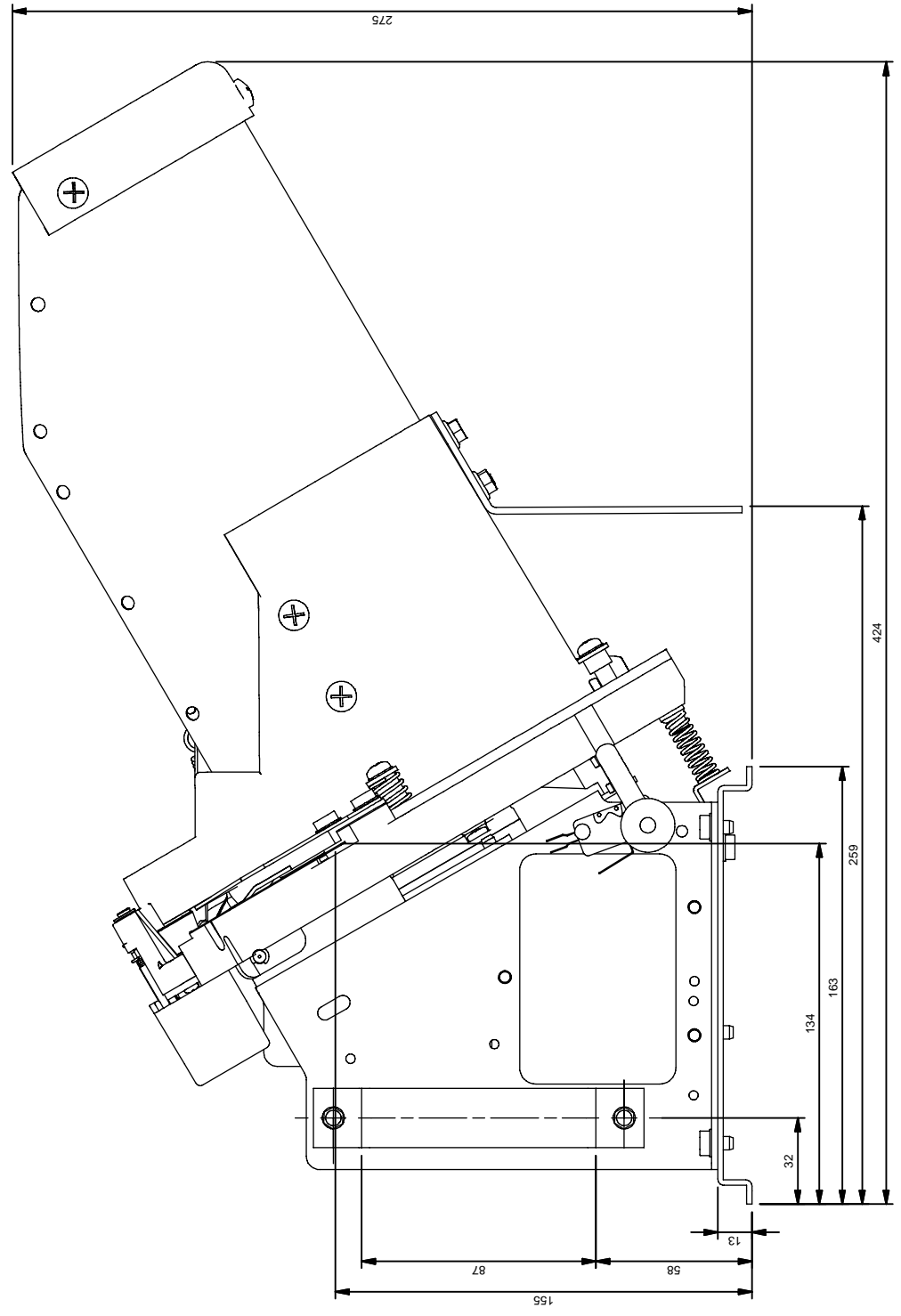
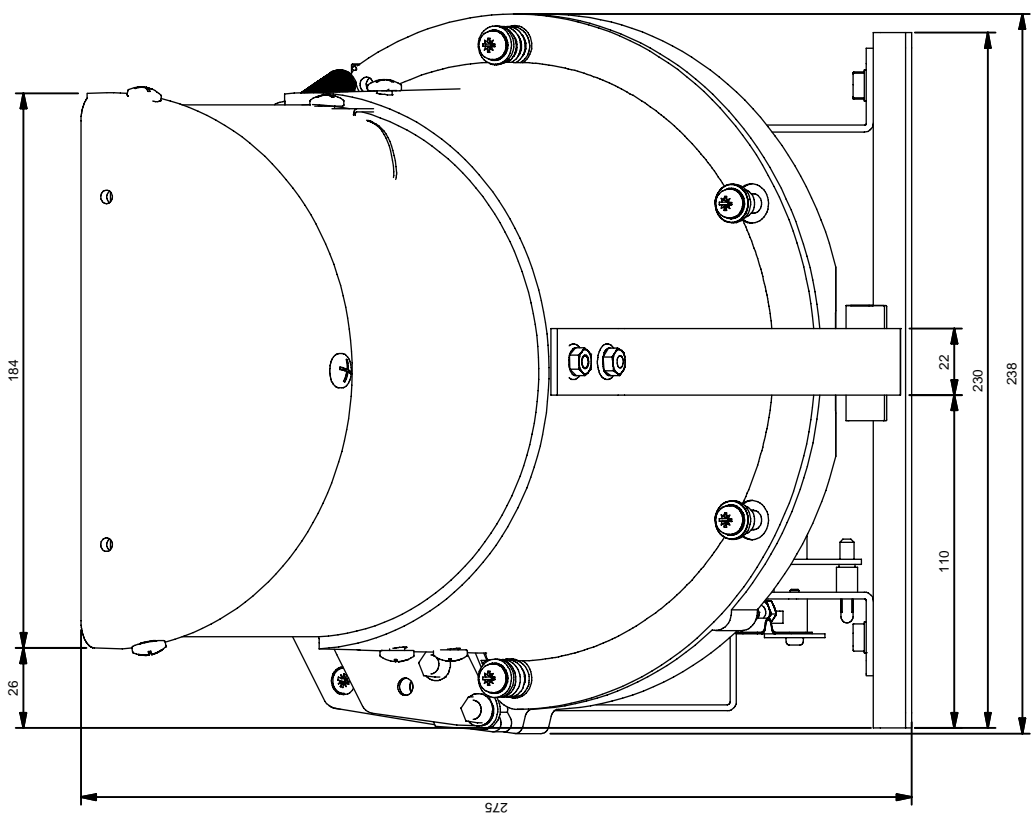
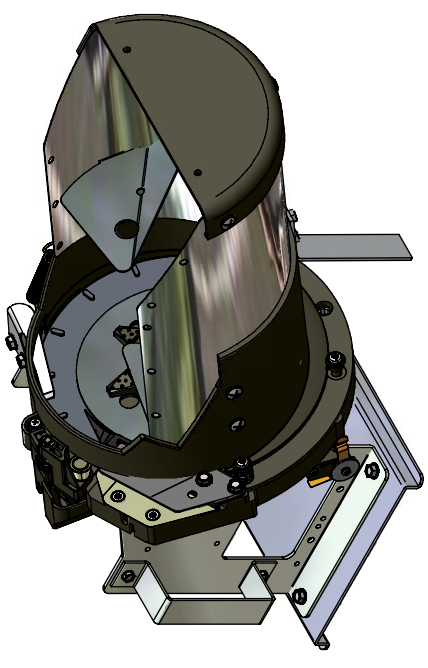
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GAMING, AMUSEMENT AND INDUSTRIAL COMPONENTS

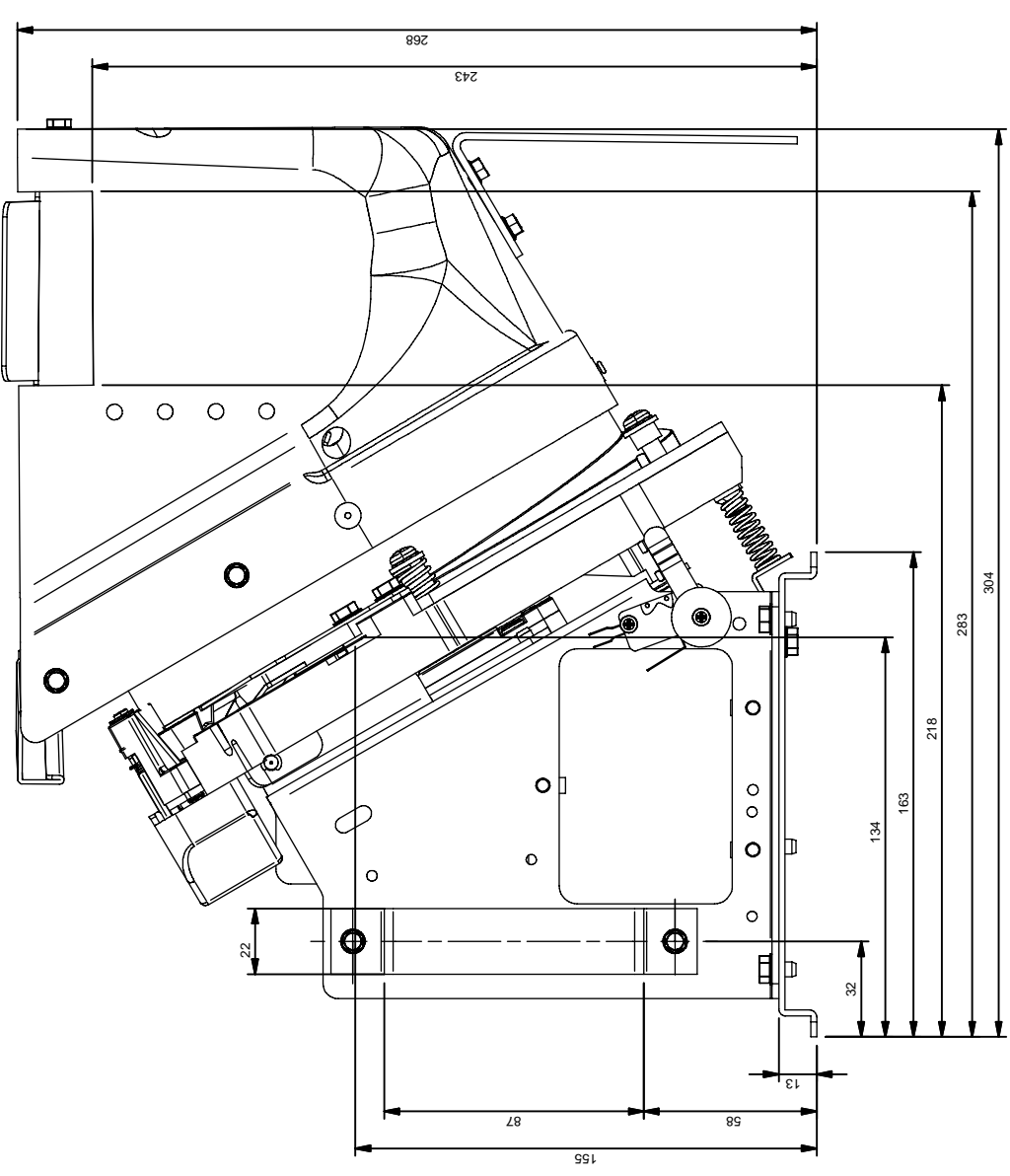
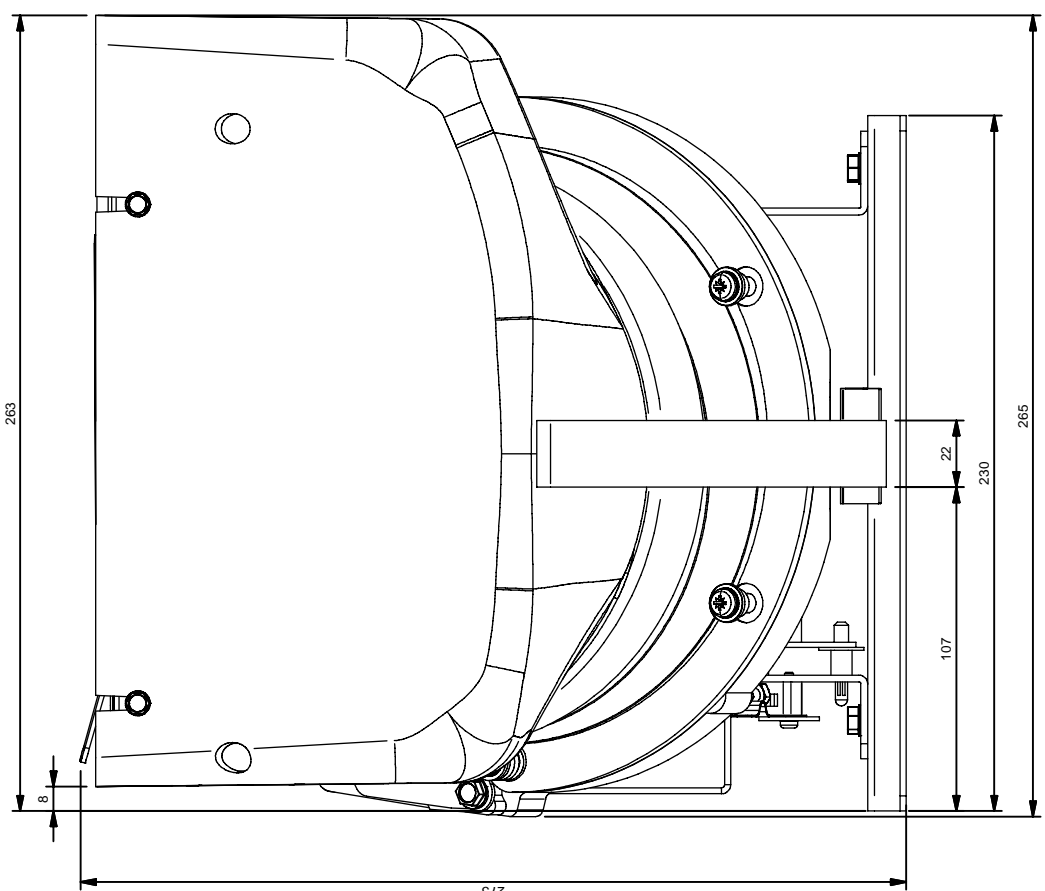
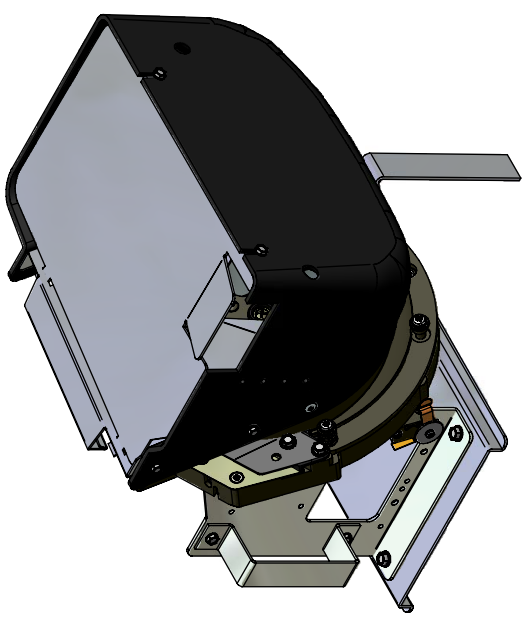
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 3261 LT Oud Beijerland
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 Fax. +31 (0)186-643355
 E-mail info@suzo.com

Description: Excel Hopper Medium cup	Date: 2-3-2005	Partnumber:	Revision: 00	Size: A3
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Description:		Partnumber:		Revision: Size:	
Excel Hopper Extended cup				00 A3	
Date:					
2-3-2005					



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Date: 14-12-2005	Partnumber:	Revision: 00	Size: A3
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Description:
Excel Hopper Wide cup