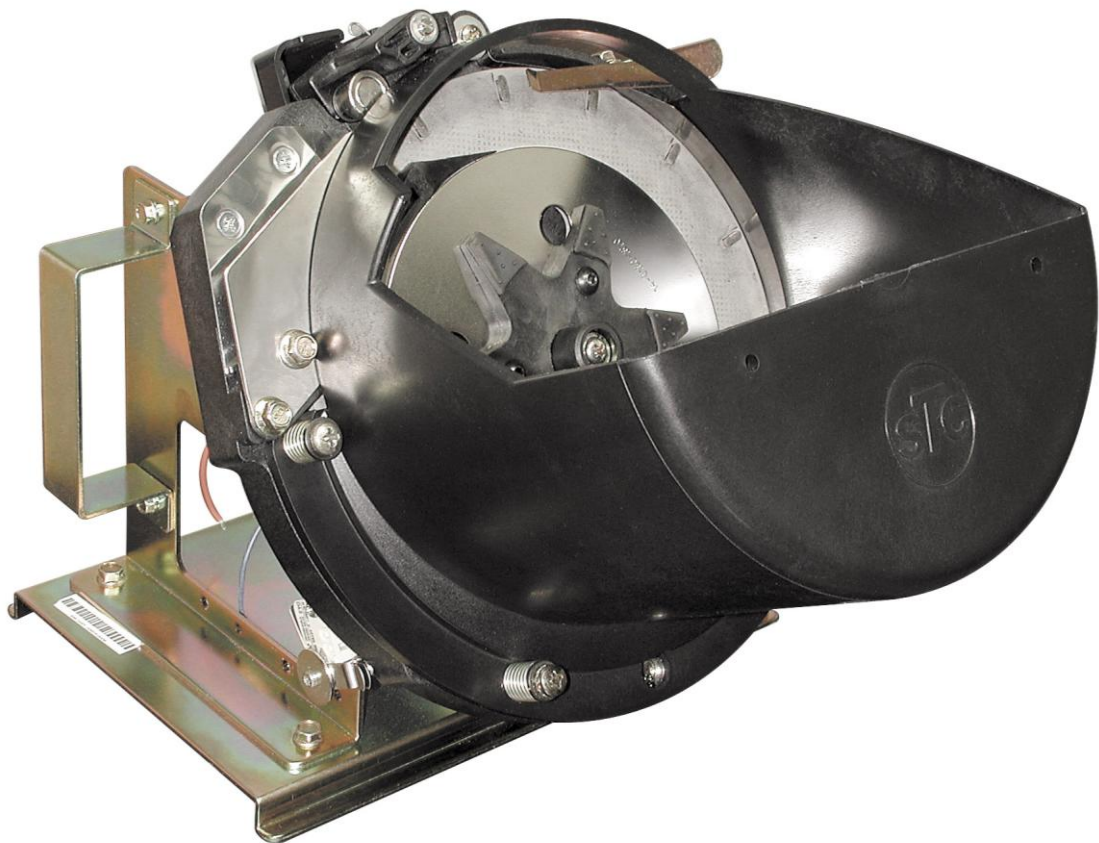


SERVICE MANUAL

excel™ hopper

Version 1.5



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 shelf wheel are 100% compatible with older generations STC hoppers.
- Easy to integrate for manufacturers who use older generation STC casino Hoppers.
- Applicable coin sizes: 18.00-38.09mm

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 Suzo 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.

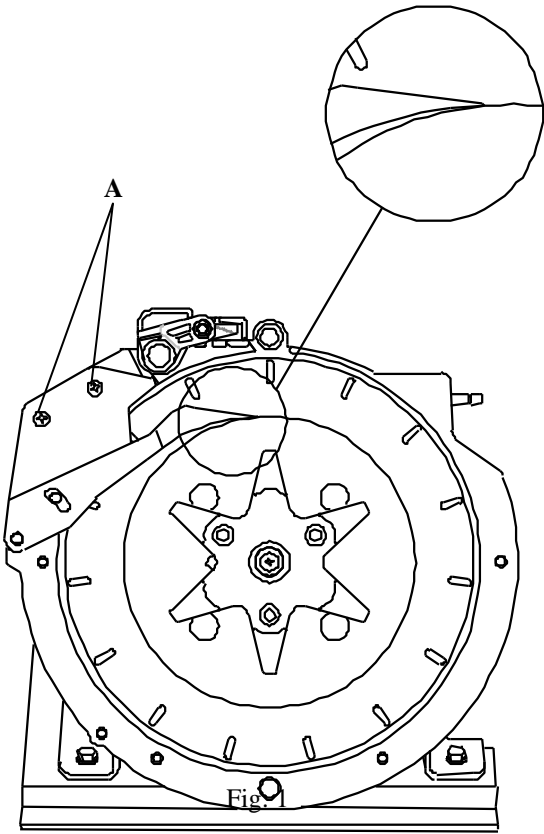
Adjustments of the excel hopper

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 shelfwheel. Lightly hold the knife on the shelfwheel and tighten the two screws "A" 5,5 Newton. Rotate the pinwheel and check there is no space between the shelfwheel 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 shelfwheel. Turn the pinwheel at least one cycle and tighten the two screws "A" 5,5 Newton. Rotate the pinwheel and shelfwheel 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.

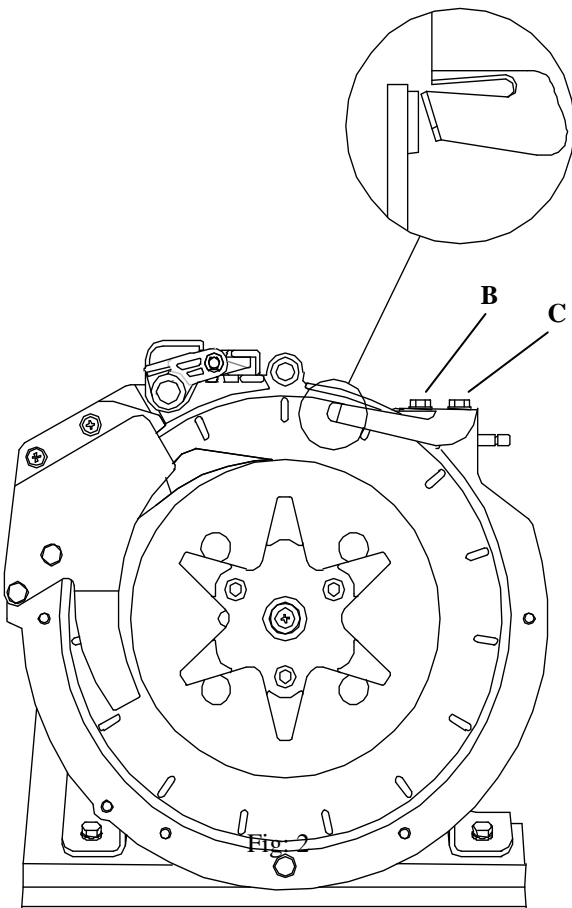
Move the wiper edge up to the coin. The edge should be close to the coin, app. 0,5 mm.

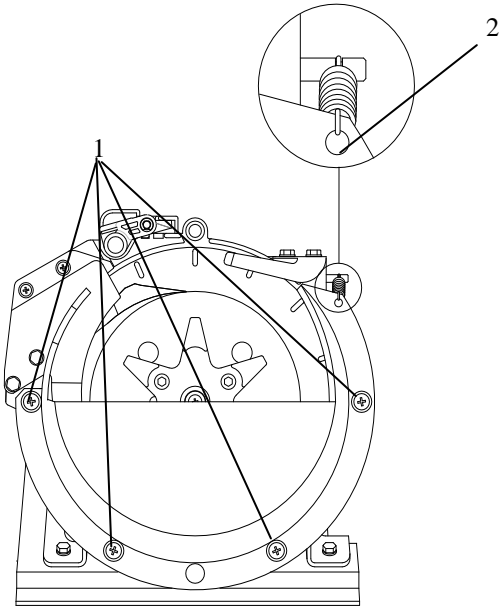
Never let the wiper touch the coin!

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!

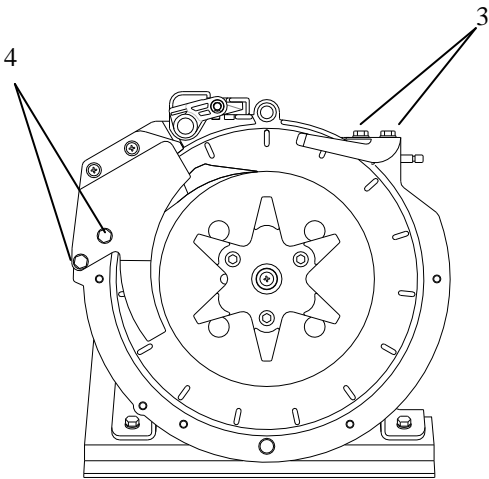




Disassembling the hopper.

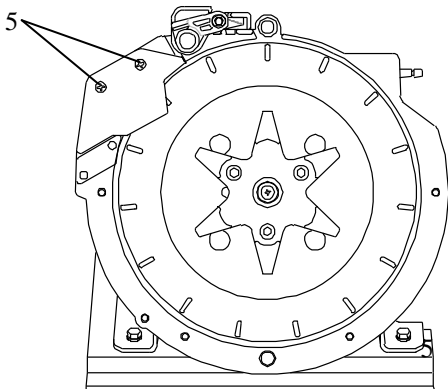
1. Remove the 4 screws, which holds the hopper cup to the wheelhousing.

2. Remove the hopper cup and spring which is mounted on the right side of pivot pin.

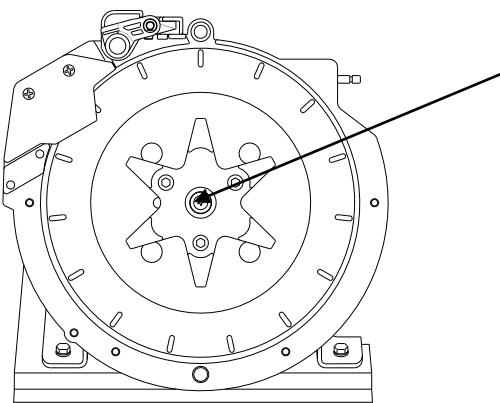


3. Remove the 2 hexagon bolts, which holds the wiper, and remove the wiper.

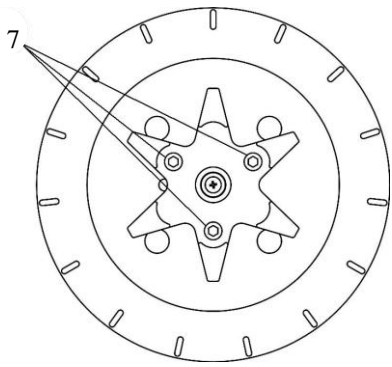
4. Remove the 2 hexagon bolts, which holds the coin chute, and remove the coin chute and knife.



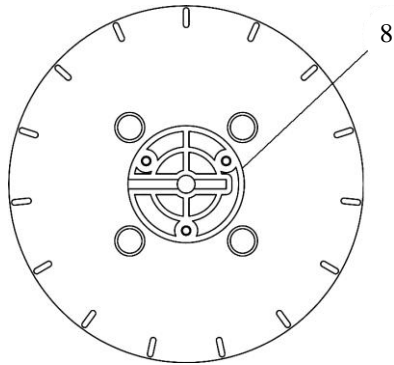
5. Remove the 2 Philips screws, which holds the coin deflector, and remove the coin deflector.



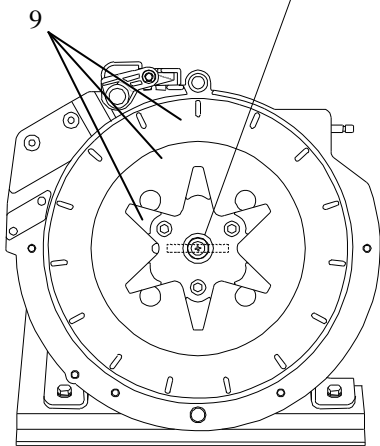
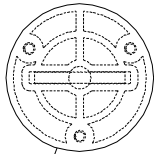
6. Remove the Philips screw, and spring in the centre of the disc. The disc assembly is now free floating in the hopper, remove the assembly by pulling on the agitator and lift it from the motor shaft.



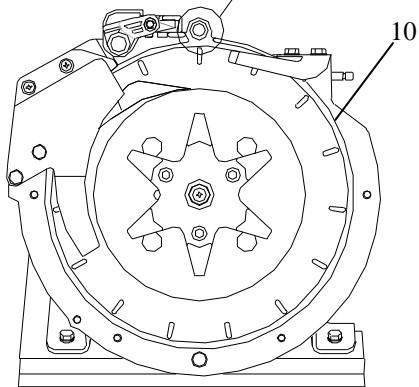
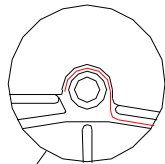
7. Remove the 3 hex key screws, and disassemble the whole disc to make the new requested combination.



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



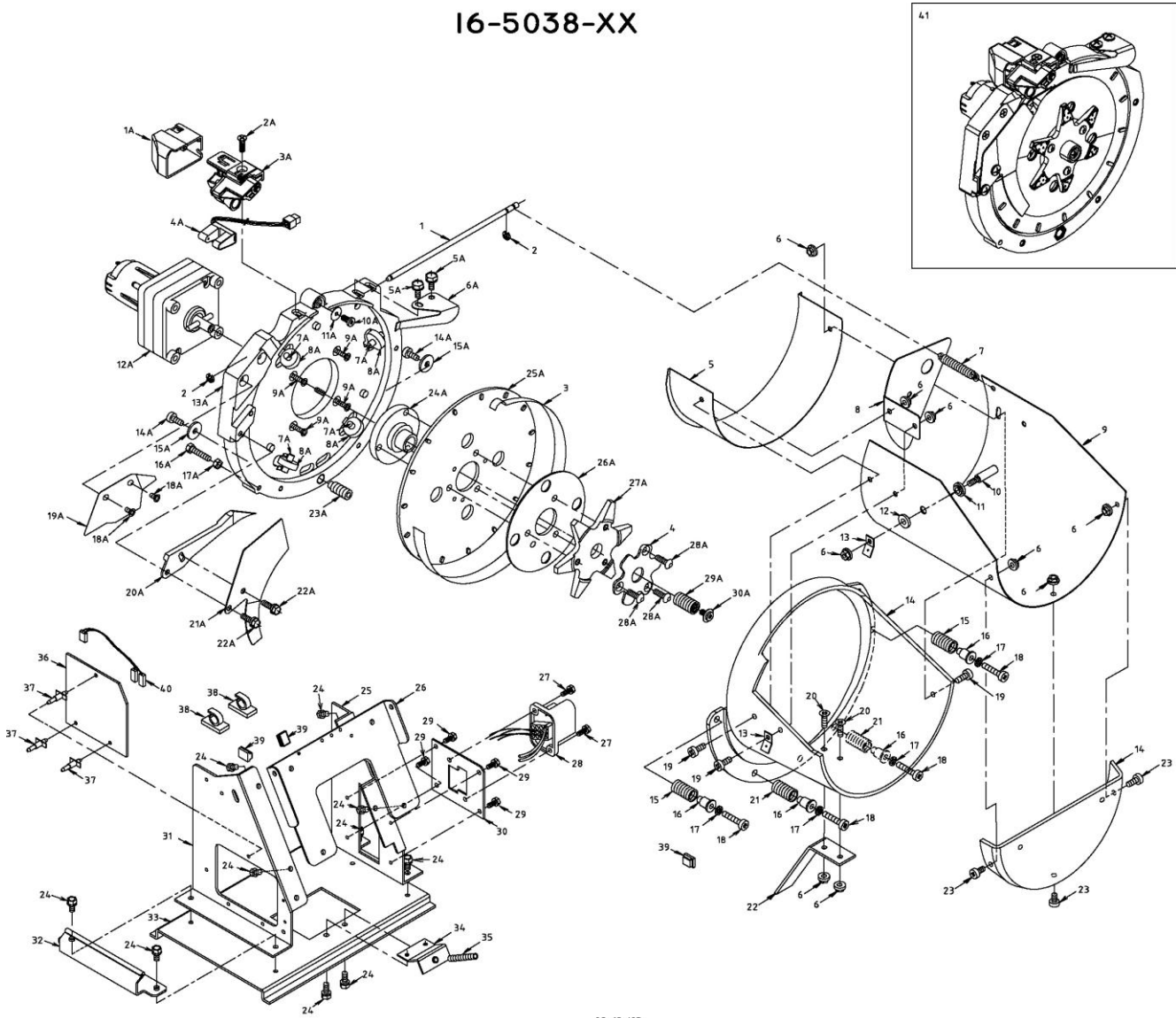
9. Put the disc assembly back on the hopper. The disc only fits 2 ways into the driver pin.



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	DRAW. 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	LEVELSENSOR 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	MOUNT	4	37	22-0087	PCB HOLDER	3
17	1051-040	M5 EXT. STAR LOCKWASHER YELLOW	4	38	22-0068-1	SELF ADHESIVE CABLE CLIP 6MM	2
18	150-025-220	M5X25 SCREW PHILL. PAN HD YELLOW	4	39	22-0068-3	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	14-1175-1*	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 HX. 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	14-0095	COIN DEFLECTOR	1
5A	150-012-700-1	M5x12 TENSILOCK BOLT YELLOW	2	20A	See part list B	HOPPER KNIFE	1
6A	14-0070	WIPER	1	21A	See part list C	OUTLET COVER	1
7A	14-0416	BEARING PIN	4	22A	15-016-700-1	M5X16 TENSILOCK BOLT YLLOW	2
8A	14-0590	BEARING 6X19X6MM	4	23A	199-025-040	M10X25 SCREW HX.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	See part list D	PINWHEEL	1
11A	1042-145	M4 WASHER 4,2X14X0,5	1	26A	See part list E	SHELFWHEEL	1
12A	See part list A	MOTOR ASSY 24VDC	1	27A	14-0571	AGITATOR WITH BUSHINGS	1
13A	14-1100	EXCEL WHEELHOUSING	1	28A	See part list F	M5 SCREW HX HD.	3
14A	150-010-120	M5X10 SCREW PH. PAN. HD.YELLOW	2	29A	14-0365	HUB SPRING	1
15A	1055-160	M5 WOODWASHER 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
-XX	mm	mm	motor	knife	Outlet cov.	pinwheel	shelfwheel	M5 Screw	Met. Supp.	cup liner
-1	18.00	18.99	14-1115	14-0281	14-0065	14-0116	14-0130-1505	150-020-931	not used	not used
-	19.00	20.09	14-1115	14-0281	14-0065	14-0116	14-0130-1465	150-020-931	not used	not used
-8	20.10	22.09	14-1115	14-0281	14-0065	14-0116	14-0130-1425	150-020-931	not used	not used
-12	22.10	24.89	14-1115	14-0281	14-0065	14-0115	14-0130-1370	150-020-931	not used	not used
-2	24.90	25.89	14-1115	14-0281	14-0065	14-0115	14-0130-1350	150-020-931	not used	not used
-5	25.90	27.89	14-1115	14-0281	14-0065	14-0115	14-0130-1310	150-020-931	not used	not used
-3	27.90	31.09	14-1115	14-0281	14-0066	14-0115	14-0130-1235	150-020-931	not used	14-0145
-7	31.10	31.99	14-1115	14-0281	14-0066	14-0112	14-0130-1235	150-020-931	not used	14-0145
-9	32.00	33.09	14-1115	14-0281	14-0066	14-0112	14-0130-1205	150-020-931	not used	14-0145
-10	33.10	35.09	14-1135	14-0296	14-0067	14-0112	14-0130-1165	150-025-522	14-0580	14-0145
-6	35.10	36.99	14-1135	14-0296	14-0067	14-0012	14-0130-1125	150-025-522	14-0580	14-0145
-4	37.00	38.09	14-1135	14-0296	14-0067	14-0112	14-0130-1075	150-025-522	14-0580	14-0145

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

	Part no.
Pinwheel 16 pin for diameter from 18.00 - 22.09 mm	14-0116
Shelfwheel 142,5mm for coins 20.10 - 22.09 mm	14-0130-1425
Knife for coins 18.0 - 33.09 mm (metal insert)	14-0281
Motor 24 VDC 31 RPM	14-1115
Outlet cover for coins 18.00 - 27.89 mm	14-0065

10 € cent (19.75 mm)

Pinwheel 16 pin for diameter from 18.00 - 22.09 mm	14-0116
Shelfwheel 146.5mm for coins 19.0 - 20.0mm	14-0130-1465
Knife for coins 18.00 - 33.09 mm metal inserts	14-0281
Motor 24 VDC 31 RPM	14-1115
Outlet cover for coins 18.00 - 27.89 mm	14-0065

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

Pinwheel 15 pins for diameter from 22.10 - 31.09 mm	14-0115
Shelfwheel 136.5mm for coins 22.10 - 24.89	14-0130-1370
Knife for coins 18.00 - 33.09 mm metal inserts	14-0281
Motor 24 VDC 31 RPM	14-1115
Outlet cover for coins 18.00 - 27.89 mm	14-0065

2 € (25.75 mm)

Pinwheel 15 pin for diameter from 22.10 - 31.09 mm	14-0115
Shelfwheel 135.0mm for coins 24.90 - 25.89mm	14-0130-1350
Knife for coins 18.00 - 33.09 mm metal inserts	14-0281
Motor 24 VDC 31 RPM	14-1115
Outlet cover for coins 18.00 - 27.89 mm	14-0065

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

Pinwheel 16 pin for diameter from 18.00 – 22.09mm	14-0116
Shelfwheel 142,5 for coin 20.10 – 22.09mm	14-0130-1425
Knife for coins 18.00 –33.09mm metal inserts	14-0281
Motor 24 VDC 31 RPM	14-1115
Outlet cover for coins 18.00 – 27.89mm	14-0065

Quarter (24,23mm)

Pinwheel 15 pin for diameter 22.10 – 31.09mm	14-0115
Shelfwheel 136,5 for coin 22.10 – 24.89mm	14-0130-1370
Knife for coins 18.00 –33.09mm metal inserts	14-0281
Motor 24 VDC 31 RPM	14-1115
Outlet cover for coins 18.09 – 27.89mm	14-0065

Dollar token (37.2mm)

Pinwheel 12 pin for diameter from 31.10 – 38.09mm	14-0112
Shelfwheel 107,5 for coin 37.00 – 38.09mm	14-0130-1075
Metal Knife for coins 33.10 –38.09mm	14-0296
Motor 24 VDC 21 RPM	14-1135
Outlet cover for coins 33.10>	14-0067
Cup liner for standard cup, used for coins >27.90mm	14-0145
Metal star on agitator for coins >33.10mm	14-0580

Hopper denomination conversions**Pinwheels:Part no**

16 pin for diameter from 18.00 - 22.09 mm	14-0116
15 pin for diameter from 22.10 - 31.09 mm	14-0115
12 pin for diameter from 31.10 - 38.00 mm	14-0112

Shelfwheel:

107.5 mm / coins 37.00 - 38.00 mm	14-0130-1075
112.5 mm / coins 35.10 - 36.99 mm	14-0130-1125
116.5 mm / coins 33.10 - 35.09 mm	14-0130-1165
120.5 mm / coins 32.00 - 33.09 mm	14-0130-1205
123.5 mm / coins 27.90 - 31.99 mm	14-0130-1235
131.0 mm / coins 25.90 - 27.89 mm	14-0130-1310
135.0 mm / coins 24.09 - 25.89 mm	14-0130-1350
136.5 mm / coins 22.10 - 24.89 mm	14-0130-1370
142.5 mm / coins 20.10 - 22.09 mm	14-0130-1425
146.5 mm / coins 19.00 - 20.09 mm	14-0130-1465
150.5 mm / coins 18.00 - 18.99 mm	14-0130-1505

Motors:

Motor 12V DC 31 RPM / coins 18.00 - 33.09 mm	14-1110
Motor 12V DC 21 RPM / coins 33.10 - 38.09 mm	14-1130
Motor 24V DC 31 RPM / coins 18.00 - 33.09 mm	14-1115
Motor 24V DC 21 RPM / coins 33.10 - 38.09 mm	14-1135

Knives:

Knife for coins 18.00 - 33.09 mm	14-0281
Metal knife for coins 33.10 - 38.09 mm	14-0296

Outlet covers:

Outlet cover for coins 18.00 - 27.89mm	14-0065
Outlet cover for coins 27.90 - 33.09 mm	14-0066
Outlet cover for coins 33.10 - 38.09 mm	14-0067

Cup liner:

For standard cup, coins >27.90 mm	14-0145
For wide and narrow cup, coins >27.90mm	14-0800

Agitator:

Standard rubber agitator	14-0571
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