



# SPIN150 wafer spinner

for software rev. 3.36 (or higher)

## **Welcome to the SPIN150 all-plastic spin processing system!**

The SPIN150 is a top quality system engineered for ease of use, low maintenance, and long lifetime. Designed, Engineered, and Assembled in our state-of-the-art facility in Germany, the SPIN150 is constructed of high purity semiconductor grade plastics to ensure the ultimate cleanliness. No metal components are in contact with process chemicals, or fumes. This ensures the SPIN150 can accommodate a wide range of process chemicals, with no risk of metals contamination, or system damage.

The aerodynamic design of the lid interior ensures "splashback-free" processing and a direct drain path, while the smooth curved natural polypropylene surfaces of the lid and process chamber directly assist the easy cleaning of the unit. The keyboard and display are chemically resistant.

The system is built using industry-proven quality components ensuring precise repeatable performance, a long lifetime, and zero maintenance. The SPIN150 will perform for you whether your needs are infrequent, with simple programs, continuous processing, or frequent changes using complex programming steps. Operation is intuitive; programming is simple, and up to 20 separate programs can be stored in the system memory. (each program can have up to 99 steps!)

We offer a range of chucks, adapters, and other options to support your process requirements.

Safety features include Lid-Open and No-Vacuum interlocks, Dynamic Braking, Secure Lid Latch, and in-built programming safety interlocks.

Please take the time to read this manual to familiarize yourself with the method of operation, and the installation requirements of your SPIN150 system.

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## Overview, Variants and Options

The SPIN150 WAFER SPINNER is available for Manual Chemical Dispense.



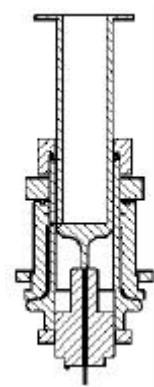
The SPIN150 is delivered with integrated keyboard as a table-top version, including 1" MNPT Drain Connection for 25/32 mm Tube (Tube not included).

**Vacuum Chuck and Small Fragment Adapter are included. Further Chucks and Adapters** are available for **vacuum** and/or mechanical **centering** (see chapter: Chucks).

Optional Manual **Centering Tools** allow centralization of wafers on the chuck. (see chapter: Chucks)

The SPIN150 is suitable for substrates and small parts / fragments up to a size of 150mm / 6 inch diameter and/or 101,6 x 101,6 mm (4" x 4") square.

The SPIN150-v3 includes an adjustable N<sup>2</sup> Diffuser/Syringe Holder in the glass lid. (pic. shows holder incl. Syringe)



## Safety Precautions

Be careful when operating or handling the SPIN150. Internal moving parts in SPIN150, as well as the chemicals in use and fumes can be hazardous.



caution – risk of danger



caution – risk of electric shock



use eye protection



caution – risk of hand injury



caution –moving parts



caution – risk of corrosion

## Operating Requirements / Facilities

### Operating voltage

voltage : 100 -120 VAC or 200 - 240 VAC (auto-select)

frequency: 50 / 60 Hz

max. current : 2,5 / 5 A

power consumption (max.): 500 Watt

### Ambient temperature

The system is designed for an ambient temperature of 15°C – 25°C.

### Emergency shutdown: EMO emergency machine off

The desktop version has a mains power On/Off switch located at the rear.

**Built-in OEM versions must have a separate EMO button installed according to regulations.**

Automatic Emergency system stops the machine to prevent damage (see note page 13).

Opening the lid while the motor is running activates motor brake and causes an abrupt stop.

### Extract / ventilation

It is the user's responsibility to ensure adequate extraction/ventilation is provided where required. Follow the manufacturer's instructions for the chemical/s used.

### - IMPORTANT -

#### CDA (ID 4mm – OD 6mm)

When using liquids (especially chemicals) the connection (INLET CDA) must be connected to a continuous supply of **CLEAN DRY AIR (CDA)**. This maintains an overpressure in the drive shaft bearing to protect against liquid ingress.

Required supply: 20-50kPa or 2 - 5 l/min

This is essential to ensure the long term lifetime and performance of the system.

#### VACUUM (ID 6mm - OD 8mm)

For the correct operation of vacuum chucks and adapters, the vacuum supply requirements are:

Minimum safe vacuum requirement: - **70 kPa (-21 inchHg)**.

*(relative to atmospheric pressure), (1 inchHg = 3,4 kPa)*

Minimum supply line diameter: ID 6mm (¼"), OD 8mm

**DRAIN / Exhaust (1" MNPT external thread)**

The drain comes supplied with a removable cap.

The drain outlet must drain to a chemically compatible drain or drain store.

A TEE for exhaust separation is an available option.

**Programmable RELAY-Contacts (DSub9\* female connector)**

Programmable auxiliary potential-free relay output suitable for external switching.

Contact Ratings (0,5 A/125 VAC - 0,3A/60VDC)

The Spin 150 has a cable with DSub9 female connector.

Pin 1 and 2: Programmable relay contact 1 (normally open).

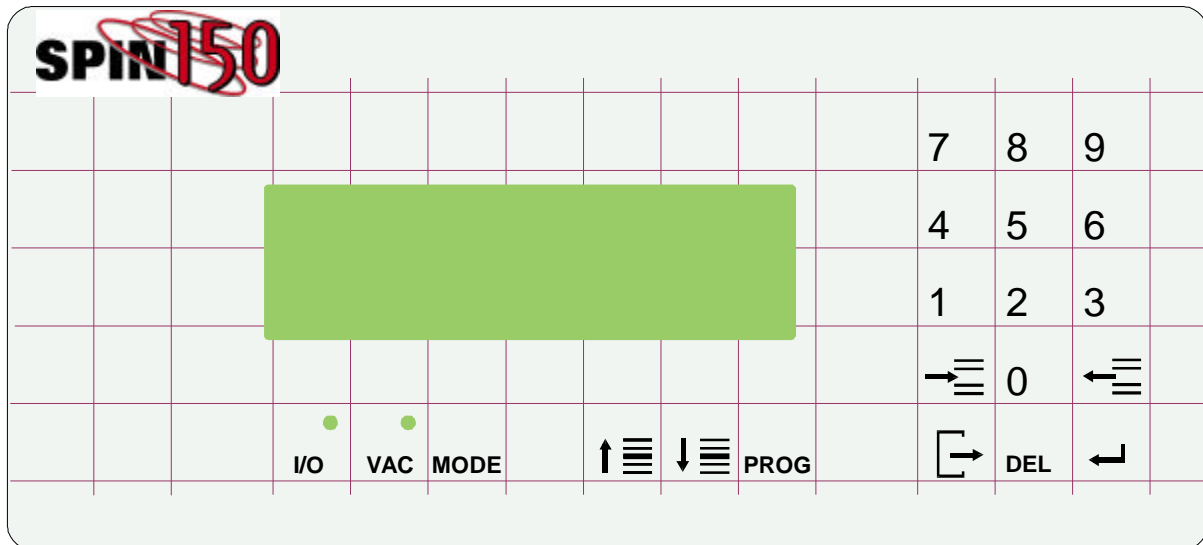
Pin 3 and 4: Programmable relay contact 2 (normally open).

Pin 5 and 6: Programmable relay contact 3 (normally open). (optional)

Pin 5, 6, 7, 8, 9: not connected.

\*DSub9 connectors are similar to the PC serial port but this is **not** a standard serial connection (RS232-485)

## DISPLAY AND KEYBOARD



### Description of keys:

#### **I/O** run / stop

##### mode OPERATION (RUN)

toggles between RUN or STOP of the selected valid program.

Green LED in this key is lit when running.

If VACUUM is selected, the vacuum must be switched on and the internal sensor must detect vacuum before the program can be run.

If a running program is stopped and then started again, the interrupted step will be performed with its full programmed time.

##### mode PROGRAM

selects the last step (END) of the selected program.

#### **VAC** vacuum ON / OFF

##### mode OPERATION (RUN):

toggles between turning VACUUM ON and VACUUM OFF, if VACUUM is selected.

Green LED in this key is lit when vacuum is switched on.

For safety reasons this key is locked during RUN mode.

##### mode PROGRAM:

allows vacuum to be programmed ON/OFF, depending on whether vacuum or non-vacuum chuck is used.

\* To preset **vacuum** selection for all programs select vacuum invariably = 1 in config menu (see pag. 15).



## MODE mode selection

moves to the next mode (RUN, PROGRAM, CONFIGURATION....). This key is not operational during running.



select program step: decrease step no.

mode RUN:

increases the program step by 1. Can be used during running.\*

\* Select step up/down = 0 in config menu to disable.

mode PROGRAM, CONFIGURATION:

change position / line up.



select program step: increase step no.

mode RUN:

increases the program step by 1. Can be used during running.\*

\* Select step up/down = 0 in config menu to disable.

mode PROGRAM, CONFIGURATION:

change position / line down .

**PROG** select program no.

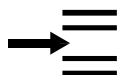


escape / <ESC>



return / enter

**DEL** delete entry



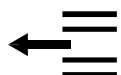
insert / increase

mode CONFIGURATION:

increase value

mode PROGRAM:

insert step in the program



remove / decrease

mode CONFIGURATION:

decrease value

mode PROGRAM:

delete step of the program

**0 .....** 9 numeric input

## SETUP

SPIN150 has a sophisticated design to protect the motor from chemical ingress. To ensure this system works correctly, the connection (INLET CDA) must be supplied with CLEAN DRY AIR. (see: Operating Requirements / Facilities)

SPIN150 is supplied ready for operation after connecting power and facilities: Connect the correct supply voltage for your system, vacuum (if required), CDA, and Drain. Fit the chuck to the motor shaft by hand, holding the "T" bar on the motor shaft, while screwing the chuck onto the shaft head.

The vacuum path in the motor shaft must be protected from any liquids!

### Structure of Programs

The program structure is logical and modifications can be made with only a few steps.

There are three program modes.

1. RUN
2. PROGRAM
3. CONFIGURE

RUN mode and PROGRAM mode are operation modes. CONFIGURE mode is just for changing options.

The system is equipped with a non-volatile memory. Even if the AC power is disconnected, the programs remain valid in memory.

Up to **20 programs** can be stored.

In each program the following parameters can be programmed:

use vacuum	yes / no
acceleration	0...2000 rpm/ sec
number of steps	1...99

A program consists of up to 99 steps. For each step the following parameters can be programmed:

speed	0...10000 rpm
time	0...1000 sec *
active relay	1, 2

\* 999: **timer inactive and waiting for key <IO> or <?> / <?> next/previous step.**  
(or optional signal on input 3).

## Normal Operation

### description:

After power up the controller initializes (system check) and shows the installed software revision and serial number:

```

APT GmbH
                Wafer Spin Processor
                SPIN          Rev: 3.36 IO
                IO-Rev 101  Servo Rev 500
                Serial no. 123456
system check...                press any key...
    
```

The user is requested to press any key to start the vacuum check. Actual barometric pressure will be displayed. Check that the displayed value matches standard atmospheric pressure and then press any key.

```

Actual barometric pressure:    100 kPa

Press any key...
    
```

After a few seconds a test sequence starts, checking the status of the lid. Follow the instructions on the display (OPEN LID / CLOSE LID). Complete the test and the device is ready, the user is requested to press any key:

```

TEST lid switch

Please open lid

TEST OK!          any key
    
```

After that the run mode will be started.

### IMPORTANT!

**Re-check the lid switch in built-in systems which are permanently powered on.** For systems with permanent power on the user takes responsibility to recheck the lid switch before starting a new job.

## Run Mode

In the run mode you can start the spinner with the run/stop key <I/O>, (optional with a pedal switch), choose a programmed step with the keys <- ><^ > or select another program with the key <PROG>.

To select another program press the key <PROG>; the program number displayed on the 1<sup>st</sup> line will be highlighted.

Enter the new program number and confirm with <ENTER> key.

```

mode: RUN                                PROG: 19
step:  1      of 6                        65 sec
time:  20                                3200 rpm
rpm: 1200                                MCD: . .
rpm/sec: 1000
vacuum: -
lid open!
    
```

line 1: Display actual program number. The last actual program (*example shown here is 19*) is selected automatically.

line 2: Display mode: RUN

line 3: The third line shows the selected step and the programmed LAST STEP of the selected program. Program step 1 is displayed by default.

Total remaining time of the actual program. (Displayed if running - I/O LED ON)

line 4: Duration in seconds – the step time the spinner runs for at the specified RPM. Actual speed is displayed if system is running - I/O LED ON.

line 5: The fifth line shows the preprogrammed speed of the selected step in revolutions per minute (RPM).

Relay status (dot = relay contact open, number = relay contact closed)

line 6: The sixth line shows the acceleration. This value is valid for all steps of a program. Deceleration is identical to the acceleration\*. The unit is RPM / sec.

*\*The acceleration capability is affected by the moveable mass. If the chuck and substrate mass is such that it cannot be accelerated at the desired preset value, the system will stop. This is to prevent "false" operation that would give misleading process results. The acceleration setting must then be reduced to a value at which the system will operate. This is typically only an issue when heavy chuck/substrate combinations are used. Automatic shutdown can also occur during braking for the same reasons, (i.e. unachievable deceleration rates).*

line 7: In line seven the vacuum setting is displayed. The vacuum setting is the same for all program steps and needs to be set according to whether the chuck requires vacuum or not.

line 8: Additional status information is displayed (lid open, missing vacuum) in line 8.

To execute a program starting from a step that isn't the first:

- chose the right step by pressing <- > <- > keys
- press <I/O> key to execute the program.(optional with a pedal switch)

Running program can be stopped by pressing <I/O> key.

Don't open the lid before the actual speed displayed in line 4 reach 0.

**Annotation:**

Time out is always final criteria for a step. The system will directly go forward to the next step, if the set time is to short to reach the set speed with the current acceleration. This could cause "false" operation that would give misleading process results.

**MOTORBRAKE**

Opening the lid of the SPIN150 while the motor is running causes an abrupt stop and interrupts current operation.

## Program Mode

The **Program Mode** is entered by pressing the key **<MODE>**.

If program is protected by password insert it and confirm with **<ENTER / RETURN>** or press **<ESC>** to go back in RUN mode.

The last actual program (*example shown here is 19*) is selected automatically.

```

mode: PROGRAM                               New          PROG: 19
step:   1                                   :          END
rpm: 1000                                   :
time:  20                                   :
r/sec2: 1000                                :
vacuum: (on/off press <VAC>):
relay:                                       123
<ESC> escape
    
```

The available settings are accepted with **<ENTER / RETURN>** or new values are entered first and then accepted with **<ENTER / RETURN>**.

Pressing **<ENTER / RETURN>** let the cursor move to the next input field.

Pressing **<?>** or **<?>** let the cursor move to the previous or next input field.

The settings for acceleration and vacuum can only be changed in step 1, this means that the settings for vacuum and acceleration in step 1 apply to all steps of the program.

Vacuum setting can be switched by pressing **<VAC>** key.

The available values for the parameters programmable in each different step are:

use vacuum	yes / no
acceleration	0...2000 rpm/ sec
number of steps	1...99
speed	0...10000 rpm
time	0...6000* sec
active relay	1, 2**

\* **999**: timer inactive and waiting for key **<IO>** or **<?>** / **<?>** next/previous step.

(or optional signal on input 3).

\*\* To activate relay select parameter field and input relay number; an asterisk will appear under the selected relay

**SELECT A STEP**: Another step can be chosen by entering the new step number.

Pressing the key **<IO>** (Cursor in line step) defines the **last step of the program**.

Press **<ESC>** key to leave program mode.

The user is requested to insert password to protect program by unauthorized modification (press **<ESC>** to leave unprotected)

To select another program press the key **<PROG>**; the program number displayed on the 1<sup>st</sup> line will be highlighted.

Enter the new program number and confirm it with **<ENTER / RETURN>** key.

For **INSERT** or **DELETE a STEP** press <? > (insert) or <? > (delete) in the program mode. A short message appears at the bottom of the display:

“step has been deleted” or “step has been inserted”.

Wait until the message disappears before pressing any key.

When all steps are deleted, the program is completely deleted and the system returns automatically to RUN mode.

**COPY A PROGRAM:** if it's necessary press <PROG> in the run mode (stop) to change to the program you want to copy.

then press <PROG> again and <? >. The next display appears.

```
copy from von prog.-no: 1
           to programm-no: 3

<ESC>
```

If the target program already exists, you can decide to overwrite it or abort the copy

<ESC> changes back to RUN Mode.

## Configure Mode

From run mode, by pressing the key <MODE> twice, the password protected **configuration** can be accessed.

Further adjustments for the initial setup can be made in the configure mode. These are the factory presets, and should not need to be changed by the user.

The configure mode is protected by a password (2408). **The configure mode should only be used by trained personnel.** The password protection is to prevent accidental or unauthorized changes in the setup.

The password entry display can be exited with <ESC>.

Pressing <?> or <?> let the cursor move to the previous or next input field.

The available settings are accepted with <ENTER / RETURN> or new values are entered first and then accepted with <ENTER / RETURN>.

MODE CONFIGURATION	vacuum: -60kPa
parameter	actual new
Lang. (ger:0 eng:1)	1
Step up/down (no:0 yes:1)	1
Vacuum ON (kPa)	50
Vacuum OFF (kPa)	50
Vacuum (manual:0 invar.on :1 auto:2)	0
extern. vacuum Sensor invert.(0/1)	0 (not for SPIN150)
pedal switch to start/stop(0/1)	0

**LANGUAGE** - the language of the display can be **german** or **english**. To change language use the <0> key for german, <1> for english.

**STEP UP/DOWN** (default = 1 / yes) allows operator to increase/decrease the program step during running.

**Attention:** If **0 / no** is selected – step up/down is disabled – you can not in-/decrease the program step during running. If you stop by pressing <I/O> key the step can be interrupted. Pressing <I/O> again, the program continues at the actual step with the complete time of the step. **The displayed step no. can differ from actual step no.**



**Vacuum ON default = -48 kPa** (relative to atmospheric pressure)

**Vacuum OFF\* default = -48 kPa** (relative to atmospheric pressure)

Vacuum on and off are the switch values for accept / not accept vacuum level. Programming different values for ON and OFF allows for a hysteresis if there are fluctuations in the vacuum line.

Example: ON value = -55: vacuum pressure lower than -55 kPa is OK.  
OFF value = -50: vacuum pressure higher than -50 kPa is failed.

## VACUUM

Default operation is "0" to select vacuum according to requirements in the first step of each program. To activate/deactivate vacuum press key <vac> before starting.

Mode "1" selects an invariably vacuum mode for all programs.

Vacuum-use parameter will be changed to <YES> in all stored programs.

Mode "2" selects also invariably vacuum mode for all programs and additionally the vacuum will be automatically activated/deactivated depending on the status of the lid switch. The vacuum will be automatically set ON if the lid is closed and it will be set OFF if the lid has been opened.

If nothing more should be changed skip the menu with <ESC>.

*\* Vacuum OFF value **must be lower or equal** than minimum vacuum required: -48 kPa  
Normal atmospheric pressure 101,3 kPa. (1 inchHg = 3,4 kPa)  
Actual vacuum pressure is shown in the first line.*

**pedal switch to start/stop:** this option is set if the value is 0. In this case you can connect a pedal switch to start/stop the program. It has exactly the same function like the <IO> key in the run mode.

## Reset of the system

A reset of the system might be needful when changing/updating the software ROM.

Different reset and basic configurations are available. **This functions should only be used by trained personnel.**

Attention: Starting a reset process will delete all settings and programm data.

To enter the reset menu press <ESC> while booting the system, directly after power up. When system ask for the password enter "200189"

Following menu appears:

```
1.edit device parameters
2.reset default parameters spin
3.reset default parameters Polos MCD
4.reset default parameters Polos ACD
5.reset default programs
```

Use arrow keys <?> / <?> to select an item and press <enter>.

### Edit device parameters (item 1)

To display or change manually the main parameters select menu item 1.

```
Type (POLOS=0 SPIN=1):          0
Option (MCD=0 ACD=1):          1
number of valves:                6
number of relais:                2
CDA option (optional air-pressure test)  0
```

Use again the arrow keys <?> / <?> to select items.

### Reset default parameters for type: Spin / Polos MCD / PolosACD (item 2, 3, 4)

Entering to one of these 3 menu items will directly reset the parameters of your device to the factory settings. Not only the main parameters but also the parameters of the menus "2408" and other basic parameters will be presetted to the selected type.

### Reset default programs (item 5)

With this menu item you delete all the programs and reset them.

Program no. 1 and no. 50 will be preset to standard values.

Program number 1 has 4 steps with different speed and time values. (This default program no. 1 will run on all types of spinners)

Program number 50 has 8 steps with different speed and time values, and different settings for valves and relais. (this program will **not** running on all types)

## Maintenance

The maintenance of SPIN150 consists of cleaning the system exterior, process chamber, and chucks.

## Cleaning

SPIN150 has a sophisticated design to protect the motor from chemical ingress. To ensure this system works correctly, the connection (INLET CDA) must be supplied with CLEAN DRY AIR only! (Do not use N<sub>2</sub>!) (see: Operating Requirements / Facilities)

**This must remain connected during cleaning operations!**

However, ensure vacuum is switched **off** while cleaning so no chemicals enter the vacuum line.

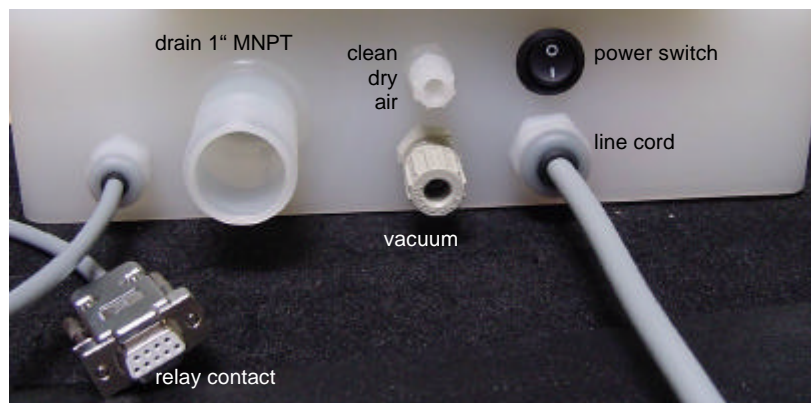
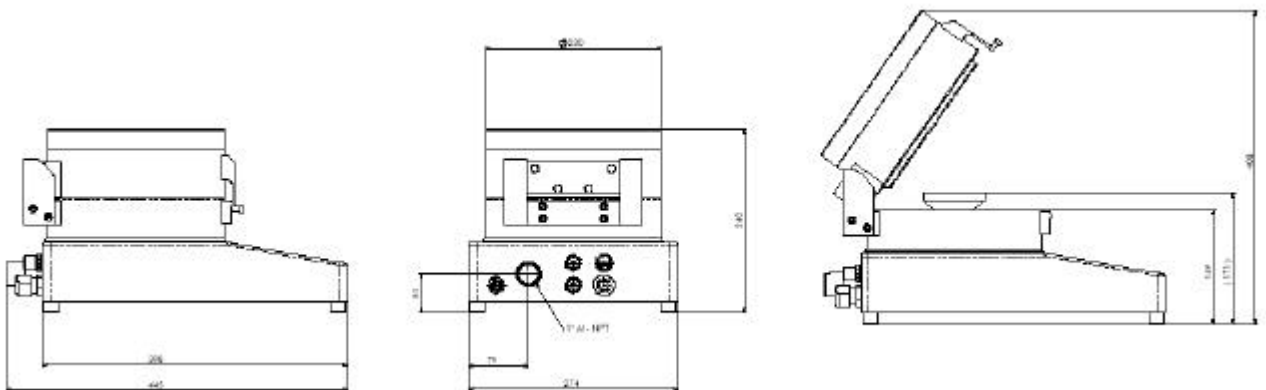
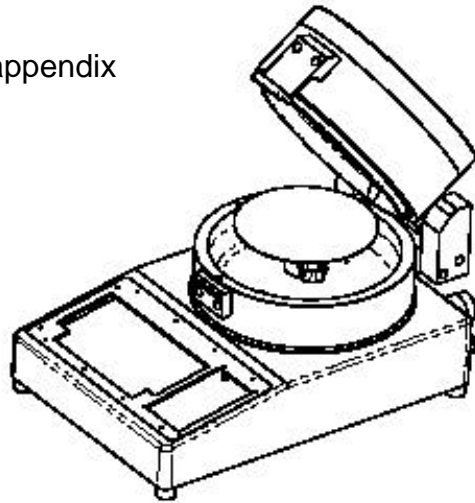
The SPIN150 can be cleaned with a dust and lint free cloth, and IPA as required. The process chamber **must** be cleaned according to the dispensed materials - always ensure cleaning chemicals are fully compatible with the specifications of NPP (Natural Polypropylene).

The keyboard should only be cleaned with a damp cloth.

**Measurement and Weight**

**Weight:** ca. 10 kg

**Measurement:** For detailed drawings see appendix



Pic.: SPIN 150 rear

## Materials, Specifications

### System

The overall system housing, frame components, drain, chucks and adapters are made of **\*NPP (NATURAL POLYPROPYLENE)**.

(Standard NPP chemical resistance specifications are applicable.)

### Lid window

Transparent pane in lid: ESG Float

### Keyboard and display

cover and window are made of POLYESTER

### Drain

drain connection **PP (Natural Polypropylene) 1" MNPT external thread.**

optional drain hose NPP (Natural Polypropylene)

### Protection classification

**IP 50** (CDA overpressure connection active)

see chapter: Operating Requirements

### Hose connections

The gas connections are Polypropylene

DN 06/08 fittings for vacuum and

DN 04/06 for CDA.

### STICKERS and LABELS

The labels and stickers are made from Polyester.

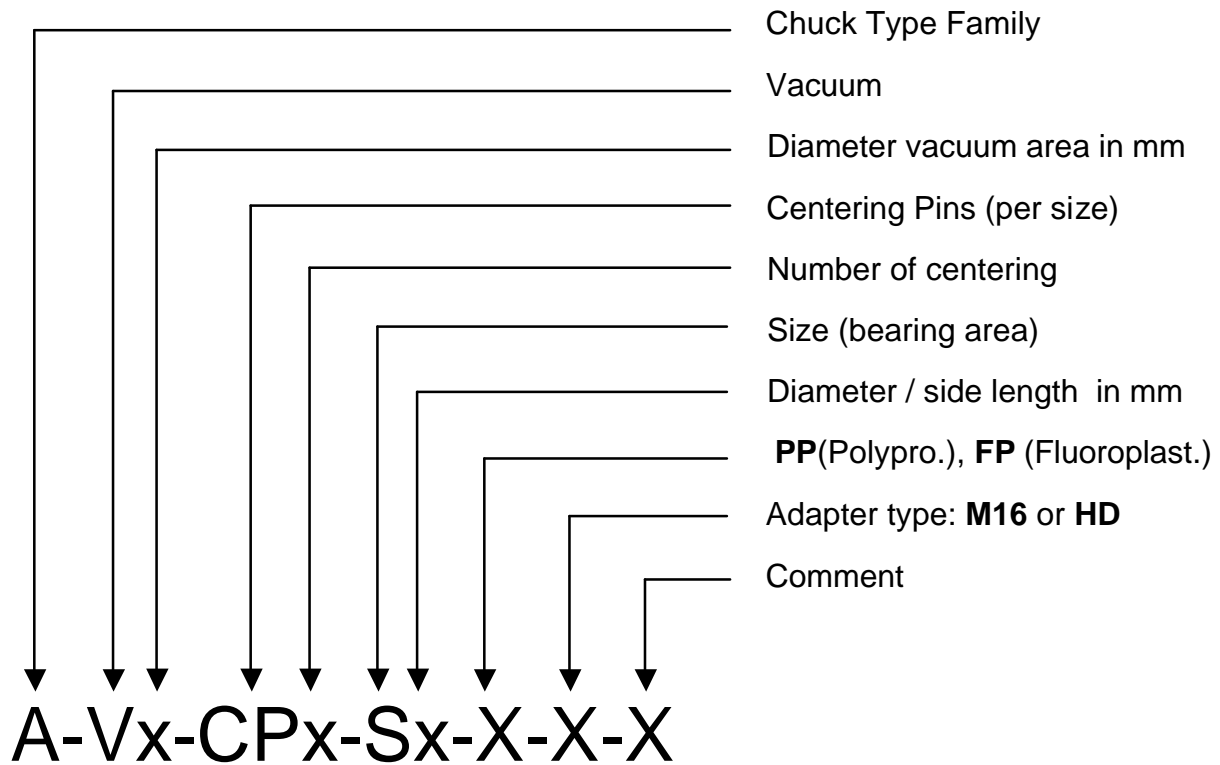
**THREAD CHUCK ADAPTER: M16** (x 2mm pitch)

**Chuck types for SPIN150 with M16 - adapter type**

rv 1.7

when ordering please state adapter type: HD- or M16 adapter type

The maximum speed is depending on the size and weight of the chuck and the used spinner unit. For mechanical chucks with centering pins the max. speed is 3.000 rpm.



**Chuck Type Families:**

- A = Vacuum-Chuck**
- B = Vacuum-Chuck with centering pins for round substrates**
- C = Chuck with centering pins for round substrates**
- D = Fragment-Adaptor**
- E = Chuck with centering pins for square/rectangular substrates**
- F = centering aid (suitable for chucks A-family)**
- G = Vacuum- Chuck with optical / manual centering**
- H = Chuck for cleaning / drying**
- J = foil adaptor**
- K = Vacuum-Chuck for embedded substrates**
- L = Vacuum-Chuck with centering pins for square / rectangular substrates**

**Examples:**

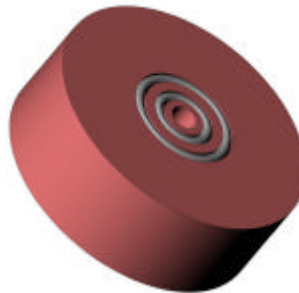
A-V36-S45-PP-M16	Vacuum- Chuck d=45 mm bearing area / d=36 mm vacuum area
A-V87-S96-PP-M16	Vacuum- Chuck d=96 mm bearing area / d=87 mm vacuum area
B-V36-CP4-S100-PP	Chuck with d=36 mm vacuum area and 4 centering pins for 100 mm (4") wafer
B-V87-CP6-S200-PP	Chuck with d=87 mm vacuum area and 6 centering pins for 200 mm (8") wafer
C-CP4-S50-S75-S100-PP	Chuck with 4 centering pins (per size) for 50 mm (2"), 75 mm (3"), 100 mm (4") wafer
C-CP6-S200-PP	Chuck with 6 centering pins for 200 mm (8") -wafer
D-V10-S50-PP	...suitable for A-V36-S45-PP Fragment adaptor d=50mm bearing area d=10mm vacuum to be mounted on A-V36-S45
D-V2.5-S6-PP	...suitable for A-V36-S45-PP Fragment adaptor d=6 mm bearing area d=2.5 mm vacuum to be mounted on A-V36-S45
E-CP6-S101.6-PP	Chuck with 6 centering pins for 101.6 mm (6") - square substrates
E-CP6-S50.8-S76.2-PP	Chuck with 6 centering pins (per size) for 50.8 mm (2"), 76.2 mm (3") - square substrates
F-S150-PP	...suitable for POLOS 200 centering aid for 150 mm (6") wafer (suitable for Chucks A- family / POLOS 200)
H-CP3-S100-S150-PP	Chuck with clearances (spoked wheel) and 3 centering pins (per size) for 100 mm (4"), 150 mm (6") wafer
H-CP3-S200-PP	Chuck with clearances (spoked wheel) and 3 centering pins for 200 mm (8") wafer

**Unit comes standard with A-V36-S45-PP and D-V10-S50-PP or D-V2.5-S6-PP adaptor**

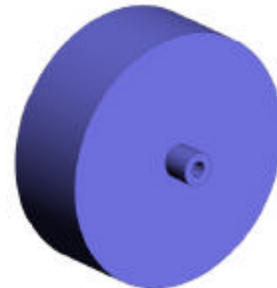
A-V36-S45-PP and adapters



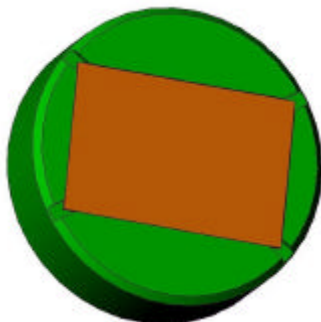
D-V10-S50-PP



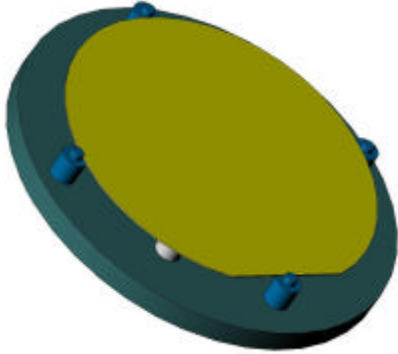
D-V2.5-S6-PP



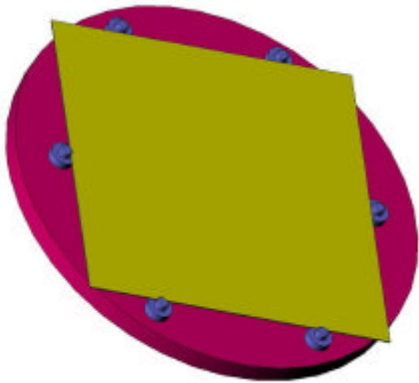
K-V24-S40x60-PP Vacuum chuck for substrates 40x60 mm (embedded)



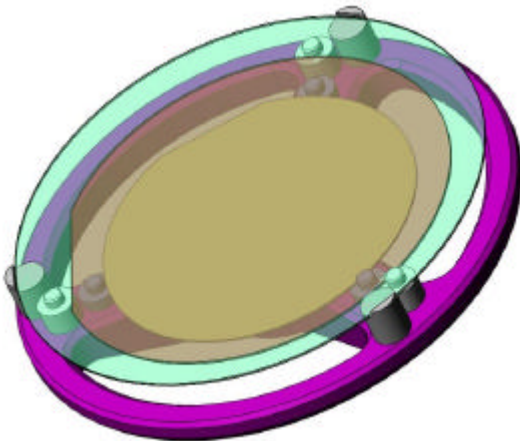
C-CP4-S50-S75-S100-PP-M16 Chuck with 4 centering pins (per size) for 50 mm (2"), 75 mm (3"), 100 mm (4") wafer



E-CP6-S101.6-PP-M16 Chuck with 6 centerg. pins for 101.6 mm (6") – square substrates



H-CP3-S100-S125-S150-PP-M16 Chuck with clearances (spoked wheel) and 3 centering pins (per size) for 100 mm (4"), 125 mm (5") and 150 mm (6") wafer





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APPENDIX: CE – DECLARATION OF CONFORMITY

EG-Konformitätserklärung - CE Declaration of Conformity

nach – with

EG EMV-Richtlinie 2004/108/EG - EU EMC-directive 2004/108/EC

EG Maschinenricht. 2006/42/EG - EU Machinery directive 2006/42/EC

EG Niederspannungsr. 2006/95/EG - EU LowVoltage directive 2006/95/EC



Der Hersteller / The Manufacturer



APT GmbH  
Automation und Produktionstechnik  
Am Klaepenbergr 5  
D-29553 Bienenbüttel

erklärt hiermit, daß folgendes Produkt / hereby declares that the following product

**Wafer Spinner**

**POLOS** MCD, ACD (Rev 3.0 oder höher / or higher)

und / and

**SPIN150** (Rev. 3.0 oder höher / or higher)

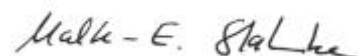
den Bestimmungen der oben bezeichneten Richtlinien entspricht. /  
is in conformity to the above standards.

Bienenbüttel,

Malte-E. Stahnke

26.01.2009

- Geschäftsführer -



(Ort, Datum)  
(place, date)

(Unterzeichner und Angaben zum Unterzeichner)  
(Signer)

(Unterschrift)  
(Signature)

**APPENDIX: WARRANTY – INFORMATION****Warranty Terms****APT/SPS Model Polos Single Wafer Spin Processor**

The Model Polos including its added on Options, is a high quality product that has been manufactured and tested under the APT Quality Assurance System. APT is a qualified ISO9000 manufacturer.

APT provides a limited **Back-to-Base warranty** covering system on malfunctions due to manufacturing defects or faulty materials. APT Warranty period is 24 months ex works manufacturer, commencing on the ex factory date of shipment as noted on the original packing note. Your legal rights are not effected by this warranty.

**Back-to-Base Warranty Conditions:**

- At manufacturer's discretion a faulty system might be repaired or replaced if necessary: to be decided after inspection of the defect cause, at the factory-Germany.
- Return of a system for paid or warranty repair requires a prior to shipment obtained MRA (Material Return Authorization), please check with your distributor.
- System must be returned properly packaged, insured and shipped free house manufacturer: APT GmbH, Am Klaepenbergr 5, D-29553 Bienenbüttel, Germany, transport and duties are excluded from this warranty.
- Warranty claims can only be honored within the warranty period and after inspection at the factory-Germany.
- System defects as result of return transport damage due to incorrect packaging are not covered by the manufacturers warranty.

**Warranty exclusions:**

- Parts and consumables subject to normal operation and process wear and tear.
- Defects caused by use of other chemicals than authorized at purchase.
- System Defects caused by:
  - Use of other than APT original parts.
  - Negligence of system operation instructions.
  - Abnormal environmental conditions.
  - Overload conditions.
  - Incorrect service, installation or maintenance.
  - Unauthorized repairs or system modifications.
- Tampered systems are also excluded from warranty.

System warranty will not be extended nor renewed unless explicitly agreed in writing by the manufacturer. German law will apply to any dispute arising under warranty.

In case of any system defects and other questions, please contact your local distributor and specify: System Type, System S/N, Purchase Order# and Date of Purchase.

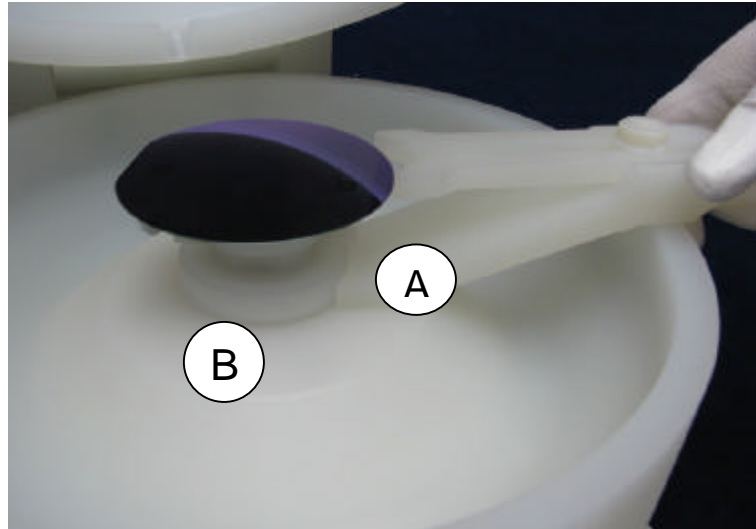
APT GMBH  
Am Klaepenbergr 5  
D-29553 Bienenbüttel



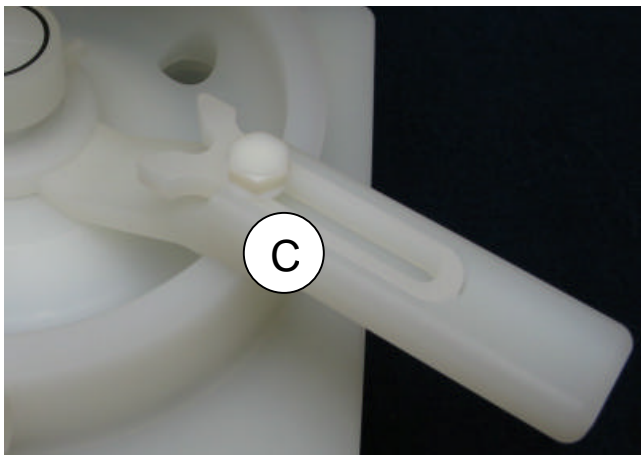
## APPENDIX: USAGE OPTIONAL CENTERING TOOL

Place the centring tool on the border of the process chamber and make sure that the tool end (A) makes close contact with the labyrinth cap (B).

Place the Wafer on the Chuck and check the position of the wafer from different sides until it lies centric on the chuck.



The centring tool is also suitable for square substrates. Please follow the above mentioned steps.



To adjust the slider, please release the screw (C), position the substrate on the chuck and adjust screw again.



**APPENDIX: WORKSHEET PROGRAMMING**

Program No.: \_\_\_\_\_ POLOS / SPIN Serial No.: \_\_\_\_\_

Step No.	Velocity (rpm)	Time (s.)	Acceleration (rpm/sec)	Vacuum (y/n)	Definition output port:									
					Relay						Valve (ACD only)		X=active	
											valve no.		relay no.	
					1	2	3	4	5	6	R1	R2		

**APPENDIX: DIMENSIONED DRAWINGS**

Customer:	Part:	Material:	Form:
	SPIN 150 Desktop	SPIN VT BG 66-0	A 2
Order No.:	Rev.:	Drawn:	Checked:
Scale:	Date:	Project:	Sheet: