MAINTENANCE MANUAL FOR iCAPS MACHINE

REVISION HISTORY			
VERSION	CHANGES	REASON FOR THE CHANGE	DATE
1.0	Creation of document	Initial release	12-MAY-2019
2.0	Add new section 4.1 “How to calibrate the PS2 sensor”	Procedure not present in previous version of this manual	08-JUN-2020

Table of contents

1 Introduction 2
2 Definition of Maintenance levels 2
3 Precautions 2
3.1 Power supply 2
3.2 Compressed air tank 3
4 Maintenance plan 3
4.1 How to calibrate the PS2 sensor 6
4.1.1 THE ZERO POINT 7
4.1.2 THE CALIBRATION OF THE SENSOR 8
5 References 9

1 Introduction

Pharma Technology is playing an active role in the industrial world, by manufacturing and distributing production equipment for the pharmaceutical industry. As such, Pharma Technology intends to deliver each machine with a clear and detailed user manual, and with a consistent Maintenance Manual. The objective for Pharma Technology is to help highly-regulated companies to define consistent program for the prevention of failures and for the reduction of unexpected stops due to malfunctions. Inability to permanently maintain the right working conditions for the use of Pharma Technology equipment could lead to raising downtime costs and low production rates.

Based on FD X 60-000 maintenance levels (refer to §2), Pharma Technology has identified and selected maintenance activities that could easily be transferred into a maintenance plan at the user's location.

2 Definition of Maintenance levels

The identified maintenance items recommended by Pharma Technology are listed in the next chapters and sorted by categories from FD X 60-000 :

Level 1 : Visual inspections, without dismantling of any part of the equipment, of the accessible parts of the machine. Standard replacement of known pieces or consumables identified by the manufacturer of the equipment, easily accessible, without procedure, specific training or competences. Activities such as, but not limited to, bulb replacement, daily grease addition. Examples for iCaps : air filters replacement, visual inspections.

Level 2 : Standard replacement of known pieces or consumables identified by the manufacturer of the equipment, with procedure, specific training and competence required. Easy manual set of components and preventive activities such as, but not limited to, weekly or monthly grease addition, fuses check, hard to reach filters replacement. Example for iCaps : Measurements of flows, pressures, power.

Level 3 : Identification of failures, diagnosis, small repair activities with minor mechanical impact, probes calibration, considered as preventive maintenance. Need for complex procedures, training and competences. Example for iCaps : failure of relays verification.

Level 4 : Important corrective or preventive maintenance, generally out of place, with the use of specific tools and with trained and certified personnel for such activities.

Level 5 : Important revamping or modifications of the design (renovation, reconstruction, installation). Need for external contractor.

No specific personnel qualification is required for Level 1 Maintenance operations.

Qualified personnel for Maintenance operations is required starting from level 2.

3 Precautions

The machine should always be unplugged from power supply and compressed air disconnected prior starting the maintenance!

3.1 Power supply



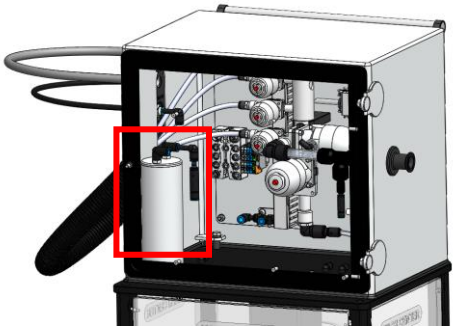
DANGER!

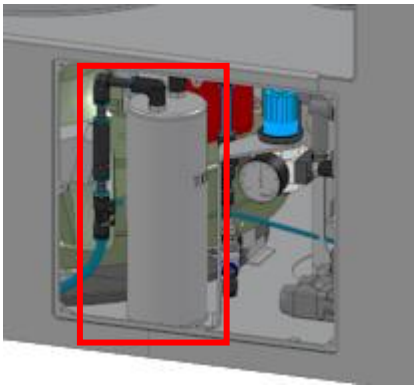
Only an authorized and qualified electrical engineer should be allowed to gain access to the electrical cabinet of the unit.

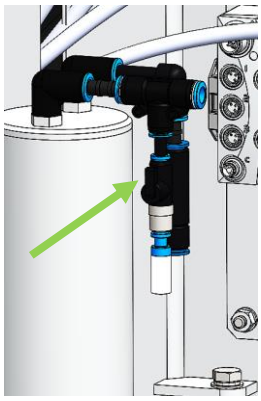
3.2 Compressed air tank

To prevent the unexpected release of stored energy, it is necessary to empty the compressed air tank of the iCaps or washing trolley (red square) when present in the machine.

To do so, open the hand-valve as shown by the green arrow.

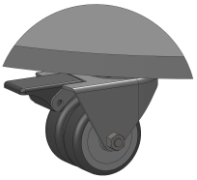


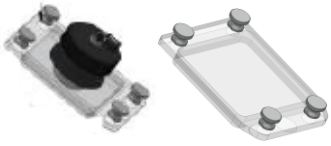
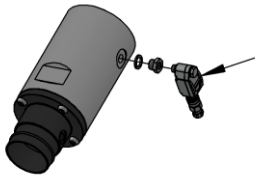
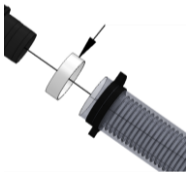
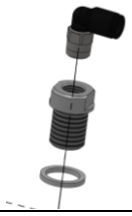




4 Maintenance plan

For the iSeries machine, the following actions are identified. Based on a 20h/day use, and daily cleaning, the recommended frequency for each action are also provided :

Actions to perform			Recommended Frequency (based on 20h/day use)			
			Week	Month	6-months	year
Level 1 – Visual inspection of :						
1	Wheels					•
2	Flex Connect silicone connections (elasticity)		•			
3	Connectors		•			
4	HMI		•			

	Actions to perform		Recommended Frequency (based on 20h/day use)			
			Week	Month	6-months	year
5	Metal detector reject cover		•			
6	Pinch valve silencers				•	
7	LDPE rubber seals		•			
8	Festo pipes to sprays (C& HC)			•		
9	Festo connections (C & HC)		•			
10	Autocheck (springs and screws				•	
	Level 2					
11	Unit handle fixation					•
12	Tri-clamp gasket visual inspection		•			
13	Aspiration window visual inspection		•			

	Actions to perform	Recommended Frequency (based on 20h/day use)			
		Week	Month	6-months	year
14	Ertacetal (POM) adaptors			•	
15	HMI fixation			•	
16	Electrical wiring in cabinets				•
17	Metal detector throughput chute		•		
18	Manual settings of air inlet pressure (PS1)		•		
19	Metal detection calibration (Fe NFe & SS316)	•			
20	Metal detector height adjustment			•	
21	Jam sensor functioning check			•	
22	Pinch valves membranes			•	
23	Metal detector spray seal change			•	
24	HEPA Filter	•			
25	HEPA Filter seals			•	
26	Manual test ball inserter seal			•	
27	Manual test ball inserter operation		•		
28	Pinch valve seal			•	
29	LDPE collar		•		
30	LDPE clamps		•		
31	Festo tube interior connection PV12 support				•
32	Multi-spray connection thread & insert position				•
33	Pneumatic connection (leaks)			•	
34	Seal PTFE (Axle support flange)		•		
35	Upper cap (*igus*) visual inspection		•		
36	Brushes visual inspection	•			
	Level 3				
37	Metal detector piston fixation				•
38	HMI cable protection				•
39	Calibration of PS2				•
40	Wash trolley valve membrane check				•
41	XV1 & XV2 blocks function				•

4.1 How to calibrate the PS2 sensor

First, in order to perform those actions, the customer has to download a program (CCS30) and install it.

Here is the link for the program and manuals :

http://www.keller-druck2.ch/swupdate/InstallerControlCenterSeries30/InstallerControlCenterSeries30.zip

Then, to connect the sensor (41X) to your computer, you will need a *K114B interface cable*. This cable includes an *USB to RS485 Converter* and can be directly connected from the sensor to a computer USB port. The Pharma Technology reference for this cable in case of order is the following one : ***503 344 00 - Convertissor USB to RS 485 5 pins.***

Once the program is installed and the sensor is connected to your computer, you can set the sensor 41X according your own convenience.

4.1.1 *THE ZERO POINT*

Press the button *Search* on the upper right side of the frame to find the device (n°1 on figure 1). To set the zero point, you have to press the button *Configure* (n°3 on figure 1). Then you have to press the button *Run* in the middle right of the frame *Zero / Current Values* (frame n°3 on figure 2).

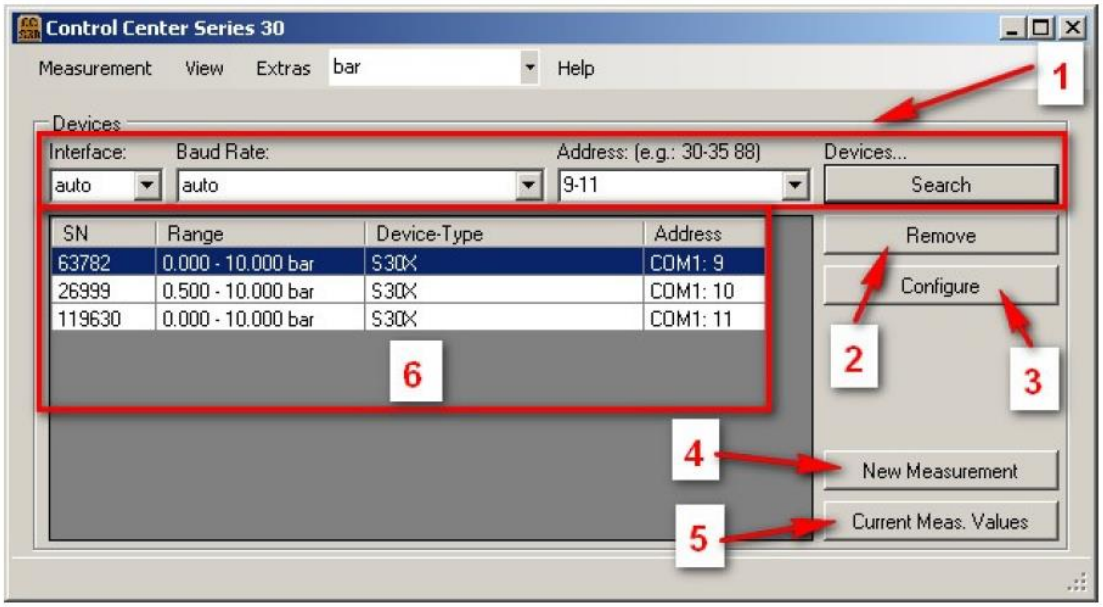


Figure 1

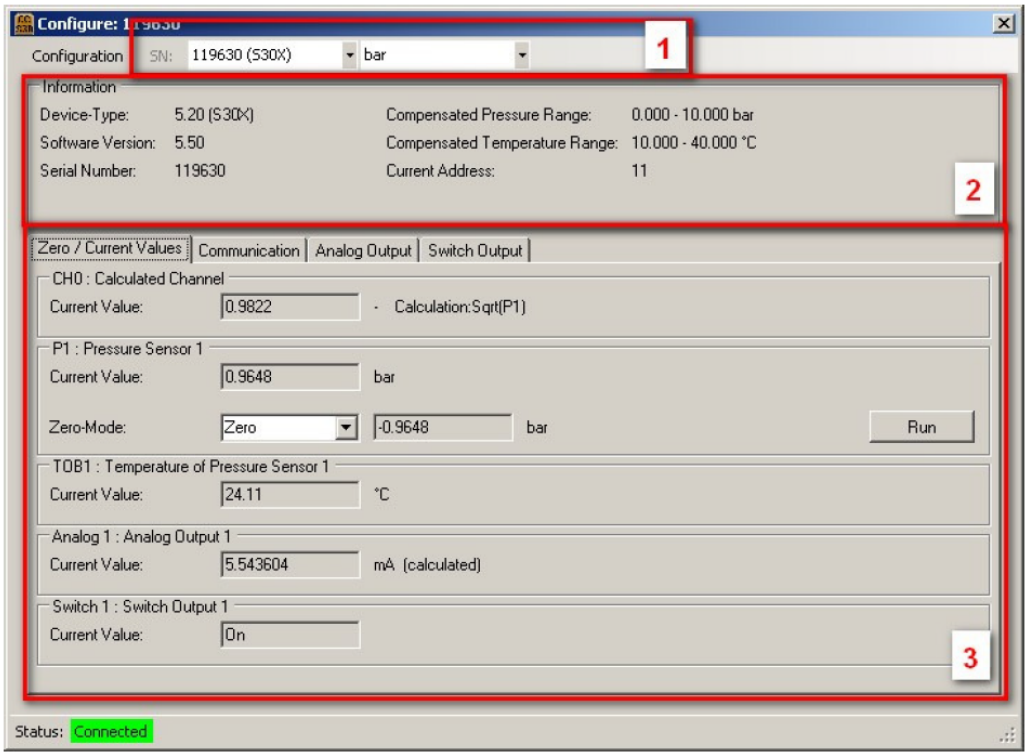


Figure 2

This maneuver will reset the zero value with the external/surrounding conditions. Of course, this need to be done at atmospheric pressure of the environment. No pressure can be artificially applied on the inlet of the sensor when you set the zero point.

4.1.2 THE CALIBRATION OF THE SENSOR

First you have to login to have access to extra menus of the CCS30 program. Click on the menu *Extra* on the upper side of the frame (See figure 3) . Then press *Login*. The password is : **prof**

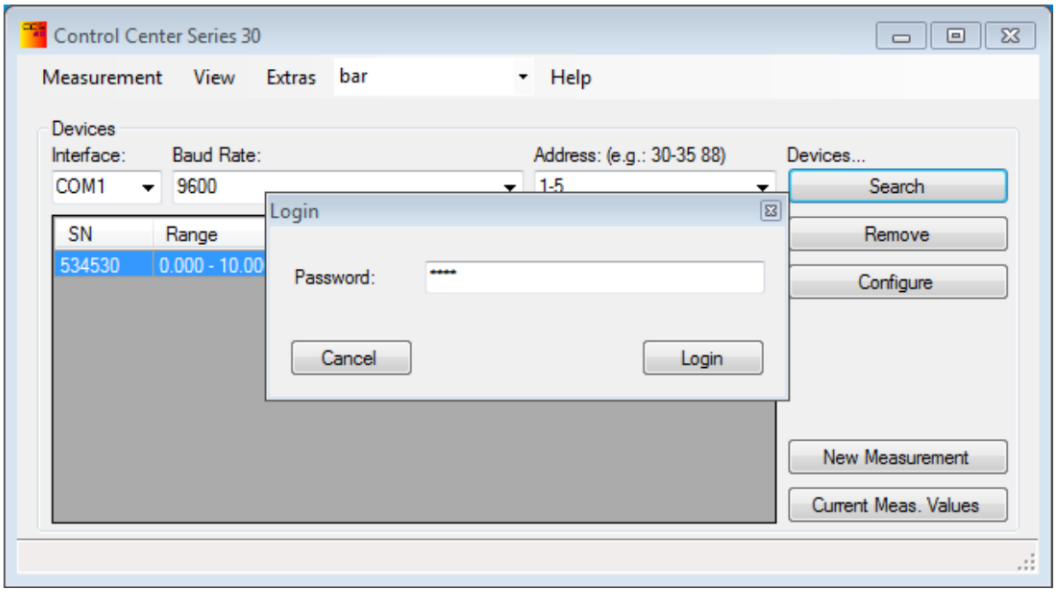


Figure 3

Once you are connected with the login, you have to Press the button *Configure*. Then you will have access to the sub menu CH0. In this sub menu, you have to select the New calculation : *14 – Curve Fitting to Points* (See Figure 4). Complete the desired calibration points in the table next to the chart and perform a measurement for each one.

Note : To perfom this points-calibration, you still need an extra tool : a calibrated reference pressure generator (e.g. : a pump with digital display controler for pressure and depressure).

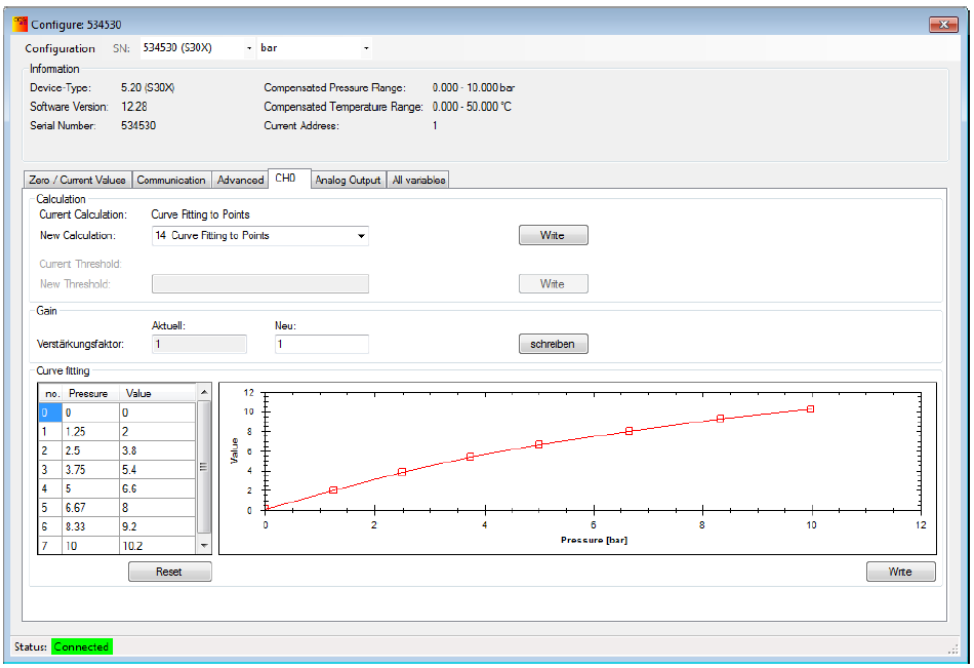


Figure 4

5 References

FD X 60-000 : *Industrial Maintenance – Maintenance function* (AFNOR, 2002).

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