

Review on SaguaroX

The CT laboratory of Robert Bosch, spol. s.r.o. in České Budějovice (RBCB) was looking for a solution to speed up the processes and, thus, fulfil one of the main ideas of our company for a continuous improvement. One of such solutions is the SaguaroX. It is a motorized XY manipulator intended for a wireless positioning of the sample into the center of the rotation from the outside of the CT cabinet.

We have been using this manipulator continuously for almost one year, five days a week, in a two-shift operation. We calculated an annual time-saving of 130 human hours per device. Furthermore, there is no need to repeatedly turn the X-ray on/off and open the cabinet which results in a saving of material.

Except for some specific tasks requiring a single-purpose tool, the XY manipulator can be used for the whole RBCB's production from a "sturdy" assembly of the DNOX (equipment for reducing nitrogen oxide emissions in exhaust gases) to small fuel return line components. From this perspective, the manipulator is more likely convenient for a scanning of various samples with frequent changes of a CNC's position. For this purpose, it is optionally equipped with the practical set of universal sample adapters. These adapters have a magnetic plate providing a rock-solid fixing and allow the operator to fix samples of various shapes and sizes. Even though the manipulator is massive, the adapters are high enough to allow the approach without the risk of a collision with the X-ray tube (the manipulator is located under the tube).

The positioning itself is realized wirelessly via a super user-friendly software that must be installed on the acquisition computer from the attached USB storage device. The manipulator can operate in two modes with different speed, for a fast (rabbit) and a slow (tortoise) manipulation. The so-called "tortoise mode" is especially appreciated in the case of a small voxel size used when a sample is close to the X-ray tube.

Since the manipulator is powered by a battery stage, its current utilization in RBCB requires one to two charges per week. The battery status is displayed directly on the screen of the acquisition station, therefore, the operator can easily check its state. The charging itself is usually performed overnight.

From the operator's point of view, a robust construction could be perceived as a disadvantage. The weight of the manipulator (9 kg) is appreciable when handling it into or out of the CT cabinet, e.g. for the purpose of recharging. Because of the external dimensions, the operator must keep an eye on a potential collision with the detector during CNC positioning. The size of the manipulator, thus, slightly reduces the scanning range.

After a long-term using, we can confirm that this manipulator is a useful and a user-friendly tool, helping the CT operator to speed up the process of positioning. Besides saving time, it also reduces the number of turning the X-ray source off and on again.

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