Electrically adjustable desks, new test equipment

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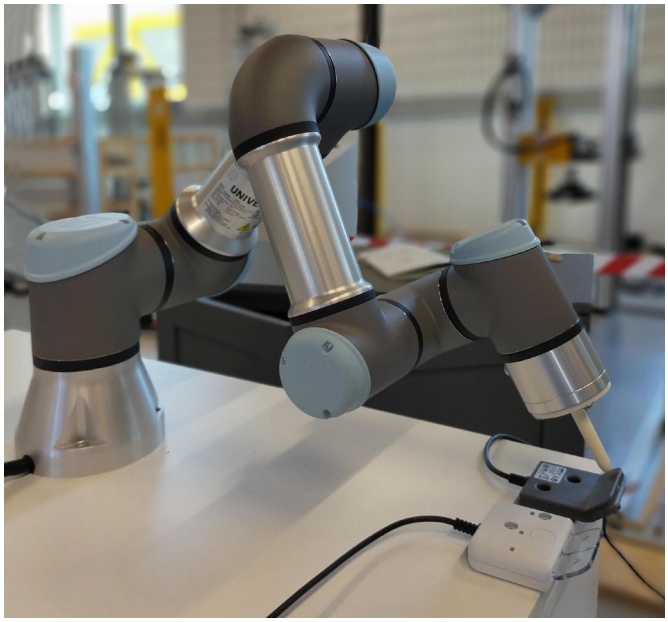
May 2020

The use of "sit-stand" desks in the office that allow people to switch from sitting to standing posture is increasingly widespread, also due to the awareness that movement is fundamental in our life and, even in the office, it is a source of well-being and health.



As a result, the number of test requests at CATAS has increased significantly, mainly according to the European EN 527 and American ANSI BIFMA X5.5 standards.

These two standards provide for durability tests of the electric height adjustment mechanisms, described below:

EN 527-2:

	Load on top	Load distribution	Number of cycles	Height adjustment
Step A:	50 kg	20 kg at the front corner, 30 kg at the center	1 250	Entire range of motion
Step B:	50 kg	50 kg at the center	2 500	Entire range of motion
Step C:	50 kg	20 kg at the rear corner, 30 kg at the center	1 250	Entire range of motion

ANSI/BIFMA X5.5:

	Load on top	Load distribution	Number of cycles	Height adjustment
Step A:	45 kg	At the front left corner	1 000	From lowest point up to 25% of range of motion
Step B:	45 kg	At the front left corner	1 000	From 25% to 50% of range of motion
Step C:	45 kg	At the front right corner	1 000	From 50% to 75% of range of motion
Step D:	45 kg	At the front right corner	1 000	From 75% up to the higher point of range of motion

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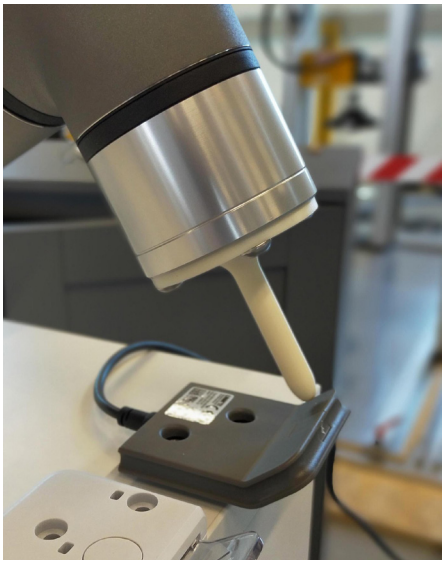
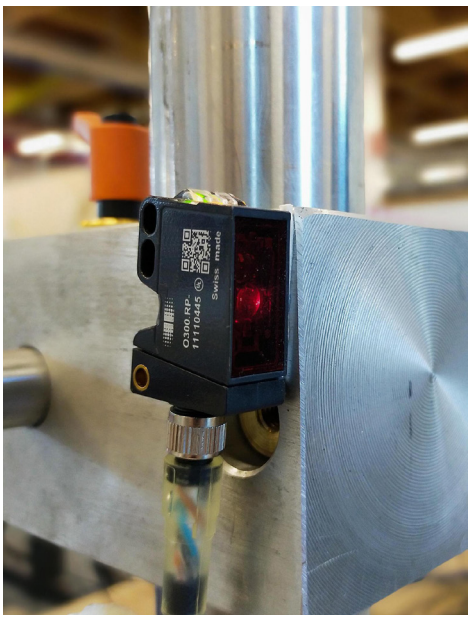
From the tables above it can be seen that the EN 527 standard provides for a total of 5,000 cycles and the ANSI BIFMA X5.5 a total of 4,000 cycles with a pause, which can even exceed five minutes, defined by the manufacturer of the mechanism in order to avoid overheating of the actuators which would block the mechanism.



Detail of the feeler pin

In addition to the number of cycles, the factor that significantly increases the test time is therefore the pauses, which can take up more than a month. In order to cope with the numerous requests from clients and to avoid construction of other test equipment, the laboratory has bought a collaborative anthropomorphic arm (max. force 3 kg on the wrist) which, duly programmed, can manage multiple desks simultaneously, also following different test methods.

We have designed and built with the 3D printer a probe which goes to operate the keyboards of the desks by activating the up and down movements. Taking advantage of the set pause times, the probe, moving from one keyboard to another, can simultaneously operate more desks.
The operating force of the keyboard is measured with a dynamometer and then set in the arm program, which goes to apply it constantly using the integrated load cell, thus avoiding excessive and uncontrolled stress.



Detail of the laser sensor

The range of motion of the desk in height, both up and down, is controlled by laser sensors that detect its presence, thus allowing correct application of the standard, especially according to ANSI BIFMA X5.5 which provides for the subdivision of the test into four steps with different range of motion.
The sensor, in addition to precisely regulating the range of motion, also allows a control of the test, since if for a certain period of time the movement is not detected and therefore there is a system malfunction, the test stops warning the operator.

The use of this equipment therefore allows us to carry out the tests following the parameters required by the standards, and to optimize customer response times by making the best use of actuation and pause times.

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