

# MANURHIN K'MX NEWSLETTER

Innovative technology

## IF THE MACHINE IS TUNED CORRECTLY THE CHIP CAN BE ALWAYS BROKEN!

From 11th to 13th April 2022, with the participation of Mr. Makoto Yamadate from **FANUC** all axial motors of **MANURHIN K'MX 632 DUO** machine were tuned in TAJMAC-ZPS in order to maximize as much as possible the effectivity of **Servo learning oscillation (SLO)**, or simply the frequency chip breaking.

It is a sinusoidal oscillation which is using the servo learning function from FANUC, which minimizes positional deviation and prevents the occurrence of uncontrolled vibrations of the machine.

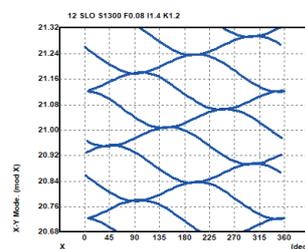
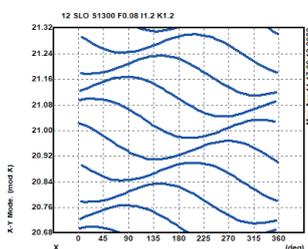
**Sinusoidal (not sawtooth) oscillation minimizes the damage** - even after 400,000,000 oscillations on FANUC test benches there was not noticed any damage on the ball screws.

After factory tuning of the machine (it is unique for each separate MANURHIN K'MX model – and remains unchanged after tuning) the user can set himself the frequency and amplitude for each individual technology (workpiece), depending on the nature of the material and the chips formed. Using the SLO function may require a reduction of feed for the finishing chip if the surface roughness is required to be the same as without this function.

1. Come not only to view, but also to set yourself the parameters of the SLO function during **Customer days in TAJMAC-ZPS on 28.-29. 4. 2022**
2. For those interested, we are preparing, together with FANUC, **training with practical examples of chip breaking on the machine MANURHIN K'MX** in late May/early June
3. We are preparing deliveries of the machine in a **"SLO ready" configuration as standard** for customers
4. In cooperation with FANUC Czech, we are preparing the possibility of testing SLO on "SLO ready" MANURHIN K'MX machines with the customer for a **free trial period**

**FANUC**

Below are pictures from the tuning of SLO function on the MANURHIN K'MX 632 DUO machine dated 11 April 2022, namely for the Z1 axis, test workpiece, rpm S1300, feed per revolution F0.08:



In the first case (parameters I1.2, K1.2) the oscillation is not breaking the chip

In the second case (I1.4, K1.2) the chip is already broken. Parameters I (frequency) and K (amplitude) are programmed by function G8.5

This graphical visualization for setting parameters I and K is planned in the next SW version of the FANUC control system as standard on the screen of the CNC system, so it will be possible to set the conditions for chip breaking even without physical machining.

Contact us for more information about training and testing options for SLO on your machine:

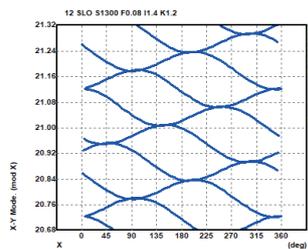
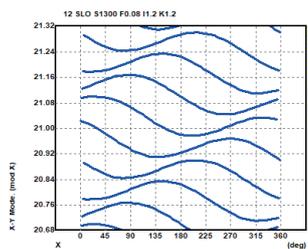
**Tomas Dederle**

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## MACHINES ON WHICH CAN BE APPLIED SLO FUNCTION (CHIP BREAKING)

Below are pictures from the Servo Learning Oscillation (SLO) tuning on the MANURHIN K'MX 632 DUO machine from April 11, 2022, specifically for Z1 axis, test workpiece, speed S1300, speed feed F0.08:



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### HARDWARE AND SOFTWARE PURCHASE

Machine Model	Starting from Serial Number	Exceptions (not possible)	SLO axes / Limitations
MANURHIN K'MX 632	V106L0267		3 / max 3× OT
MANURHIN K'MX 632 DUO	V116L0292	V116L0293	3
MANURHIN K'MX 732 EVO	V117L0282		3 / max 2× OT
MANURHIN K'MX 1032	V111L0312		4 / max 2× OT

### SOFTWARE ONLY PURCHASE

Machine Model	Starting from Serial Number	Exceptions (not possible)	SLO axes
MANURHIN K'MX 413	V113L0419	V113L0425, V113L0426	4
MANURHIN K'MX 432	V104L0307		4
MANURHIN K'MX 532 TREND	V115L0296	V115L0297	4
MANURHIN K'MX 632	New production orders		4
MANURHIN K'MX 632 DUO	New production orders		4
MANURHIN K'MX 732 EVO	V117L0338		4
MANURHIN K'MX 832 EVO	V118L0333		4
MANURHIN K'MX 816 CLEVER	V120L0054		6
MANURHIN K'MX 916 CLEVER	V120L0056		6
MANURHIN K'MX 1032	V111L0345		6

**Explanation:**

**SLO axes** Number of axes that can be set in the machine parameters at one time. Change settings can be changed (enabled) other axes, eg Z1, Z2, X1 or Z1, Z2, U1.

**Limitations** The restriction can be partially influenced (reduced) by reducing the number of SLO axes.

Contact us for more information about the training and options for testing SLO on your machine:

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