

Description: The document explains the procedure for setting-up the pallet clamping check, which has to be executed after replacing the Kracht volume encoder or the Kübler counter.

Particularities: The values measured during commissioning can sometimes shift. This is due to the absence of a vent line and the drift in the values caused by the slowly escaping air.

Function description:

The pallet clamping check is checked by volume flow. An encoder module in the hydraulic line (Kracht) transfers digital pulses to an evaluation unit (Kübler). This unit is able to count digital signals and forward them to the PLC via 2 outputs. In the PLC program, the Kübler counter outputs are compared for the respective function and responded to depending on the situation. The volume flow counter is located in the unclamping line and requires only one defined switching threshold, independent of the clamp and unclamp functions. Output 1 of the counter indicates an clamped/unclamped pallet in the work area. Output 2 of the counter indicates overlift of the swivel clamp or clamping without pallet. This is to ensure that it is recognised if the pallet is wrongly set down on the swivel clamp.

Determining the clamping/unclamping values:

The clamping/unclamping values should be determined when the machine is cold and the remaining air in the system is removed by clamping and unclamping the swivel clamp ten times. The values between clamping and unclamping should not differ by more than 5 points; if they do, the swivel clamp must again be clamped and unclamped ten times.

Programming the KÜBLER counter:

The KÜBLER counter is configured prior to delivery. Only two pre-selections PR1 and PR2 are specific to each machine. The procedure for determining the pre-selection and setting of the counter is as described in **Commissioning**.

Note:

Not all values can be programmed as preselections!

Inputting values that are too low can cause a collision between the pallet and the swivel clamps!

Preselection:

The preselections must be programmed with the following values prior to the clamping check being commissioned.

- Pre-selection **PR1** (clamping/unclamping) = **1000**
- Pre-selection **PR2** (tolerance exceeded) = **1000**

Programming:

- Press Program / Mode key to enter the input mode of preselection **PR1**.
- Press program/mode again to select Edit mode.
- Set the desired pre-selection value using the decadent keys.
- Press the prog/mode key to confirm and save the value
- Set pre-selection **PR2**.(same procedure)
- Press Program / Mode key to switch between the preselections and check the set values.

**Commissioning the clamping check:**

- Program pre-selections PR1 and PR2 as described in **Pre-selection**.
 - Select the Individual functions option and then [Pallet change]. (Mode: jog).
 - Press softkey [Unclamp pallet in work area], note down the PR 1 value.
 - Press red key on KÜBLER counter (to set the counter to zero).
 - Press softkey [Clamp pallet in work area], note down the PR 1 value.
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- Press softkey [Unclamp pallet in work area].
 - Press softkey [Unlock pallet at setting station].
 - Press softkey [Raise swivel traverse].
 - Press approval key (collision monitoring off !) and softkey [Clamp pallet in work area]. Note down displayed value. (switching value for maximum lift = tolerance exceeded)
 - Press red key on KÜBLER counter (to set the counter to zero).
 - Press approval key (collision monitoring off !) and softkey [Unclamp pallet in work area]. Note down displayed value. (Switching value for maximum travel = tolerance exceeded)
 - Press red key on KÜBLER counter (to set the counter to zero).
 - Return pallet changer to its home position.

Calculate the pre-selections as follows and program in the counter:

$$\begin{aligned} \text{PR1 (clamp/unclamp)} &= (\text{VALUE PR1}) - 6 \\ \text{PR2 (tolerance exceeded)} &= (\text{switching value for maximum lift}) - 6 \end{aligned}$$

- Execute 5 x pallet changes and note down PR 1 value
- Calculate the pre-selections as follows and program in the counter:

$$\text{PR1 (clamp/unclamp)} = (\text{AVERAGE1}) - 5$$
- Check by performing several pallet changes.