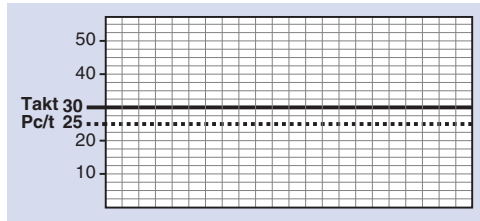


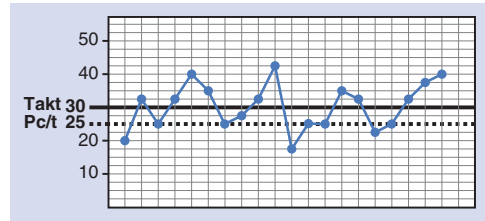
Drawing a Run Chart, Step by Step

Step 1: Draw in the target times



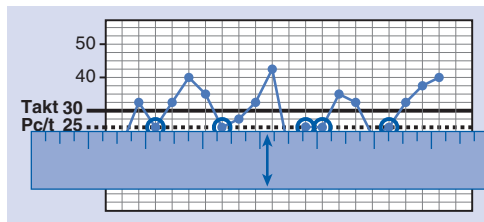
- 1 If you have a takt time and a planned cycle time for the process, draw horizontal lines for them on the graph.
If you don't have a TT or Pc/t, simply draw a line for the exit cycle time or rate you'd like to have. These numbers can be adjusted later if necessary.

Step 2: Add the data points



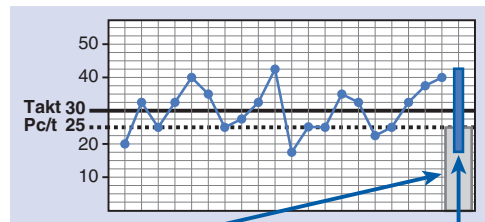
- 2 Plot & connect the data points.
Notes:
 - Do not use any averages because they obscure variation.
 - Include all data points, even outliers. Try to depict the real situation.

Step 3: Find the lowest repeatable time



- 3 Find the "lowest repeatable time" by moving a ruler up from the bottom until the data points start repeating.
The lowest repeatable time in this example is approximately 25 seconds.

Steps 4 & 5: Summarize the amount of variation



- 4 Draw a wide bar ("the candle") to show the lowest repeatable time.
Draw a thin bar ("the wick") to show the range of variation (highest point to lowest point).
Range here = 18–43 seconds

- 5 Calculate the amount of positive and negative variation relative to the Pc/t

Positive Variation:
 $(\text{Highest point} - \text{Pc/t}) + \text{Pc/t}$
 $(43 \text{ sec} - 25 \text{ sec}) + 25 \text{ sec}$
 % pos variation here = 72%

Negative Variation:
 $(\text{Lowest point} - \text{Pc/t}) + \text{Pc/t}$
 $(18 \text{ sec} - 25 \text{ sec}) + 25 \text{ sec}$
 % neg variation here = 28%



Interpretation for this Example: (Op 3 Final Assembly)

The lowest repeatable cycle time is approximately 25 seconds, with 72% positive variation and 28% negative variation relative to the planned cycle time.

Note: The helpful "candle" and "wick" terminology used here comes from Brandon Brown and Bill Kraus.