

## KPC: Key Product Characteristics

### Guide for suppliers of Allied Motion Dordrecht B.V. only

#### Intro

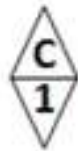
At Allied Motion Dordrecht B.V. Key Product Characteristics will be identified on drawings with a symbol. This document serves as a guide for suppliers of Allied Motion Dordrecht B.V. only and describes how to interpret and work with the KPC's on the drawings. Please note that other Allied Motion entities have other requirements for KPC's which the supplier must adhere to.

#### KPC symbols

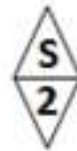
The symbol that shall identify a Key Product Characteristic is a diamond shape box that contains a "C" for critical or an "S" for significant with a corresponding numeric value (n). The number is used to specifically identify each KPC.

The symbols of Allied Motion Dordrecht:

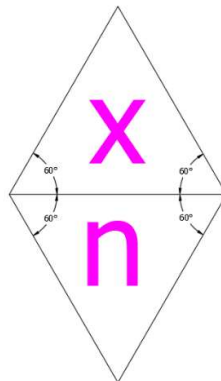
Critical Characteristic



Significant Characteristic



The sizing of the KPC can differ (scale) however the shape of the KPC will always be the same.



Note that these symbols are available in the various CAD systems.

#### KPC Definitions

A motor or part dimension, specification or feature shall be identified as Key Product Characteristic when reasonably anticipated variation of the dimension, specification or feature could affect safety or compliance with regulations, motor or part fit, function or performance, or subsequent processing of the motor or part.

Within Allied motion two types of KPC's are identified, namely Critical Characteristic and Significant Characteristic. Within Allied Motion Dordrecht we do not apply Safety Characteristics and as such are not mentioned on our drawings.

**Critical Characteristics (CC)** are dimensions, specification or features where reasonably anticipated variation could significantly affect product safety or compliance to government standards or regulations. Potential considerations for critical characteristics are Failure Mode & Effect Analysis (FMEA) items that have been identified with severity ratings of 9 or 10.

The standard for Allied Motion Dordrecht is that a dimension, specification or feature indicated with a Critical Characteristic must achieve a Process Capability Index (Cpk) rating greater than 1.33. If a critical characteristic falls below 1.33 Cpk, the supplier must take corrective actions that may include 100% inspection until the desired 1.33 Cpk is achieved.

In case Allied Motion Dordrecht requires a higher Cpk rating of greater than 1.67 it will be communicated and agreed between the supplier and Allied Motion Dordrecht. A dimension, specification or feature indicated with a Significant Characteristic may have various quality requirements; these may include, but not limited to, a specified Cpk index or a 100% inspection or other process measures to ensure that product variation falls within acceptable limits.

**Significant Characteristics (SC)** are dimensions, specifications or features where reasonably anticipated variation could significantly affect fit, form, or performance of the product. Potential considerations for significant characteristics are FMEA items that have been identified with severity ratings of 7 or 8, or cascaded down customer specified dimensions, specifications or features. A dimension, specification or feature indicated with a Significant Characteristic must achieve a Process Capability Index (Cpk) rating greater than 1.00. If a significant characteristic falls below 1.00 Cpk, the supplier must take corrective actions that may include 100% inspection until the desired 1.00 Cpk is achieved.

A dimension, specification or feature shall not be designated with a KPC simply because it meets a certain FMEA severity rating.

A dimension, specification or features shall also not be designated with a KPC because it is important that the dimension, specification or feature meets the specification/tolerance, since all specifications/tolerances must be met. Allied Motion takes the responsibility to determine which features (if any) qualify for KPC designation for which statistical analysis will be used.

In addition to this please note the following:

- A Cpk of 1.00 is corresponding to a process yield of 99.73% (Standard SC rating of Allied Motion Dordrecht)
- A Cpk of 1.33 is corresponding to a process yield of 99.99% (Standard CC rating of Allied Motion Dordrecht)
- A Cpk of 1.67 is corresponding to a process yield of 99.9999% (To be agreed upon request)

## Usage of KPC

In the Allied Motion Dordrecht B.V. technical product documentation, the KPC's will be indicated on the supplier documentation. The part drawings (110 sheets) will have KPC symbols. Allied Motion will be responsible to pass down these quality requirements to the supplier and request the data to support the inspection method.

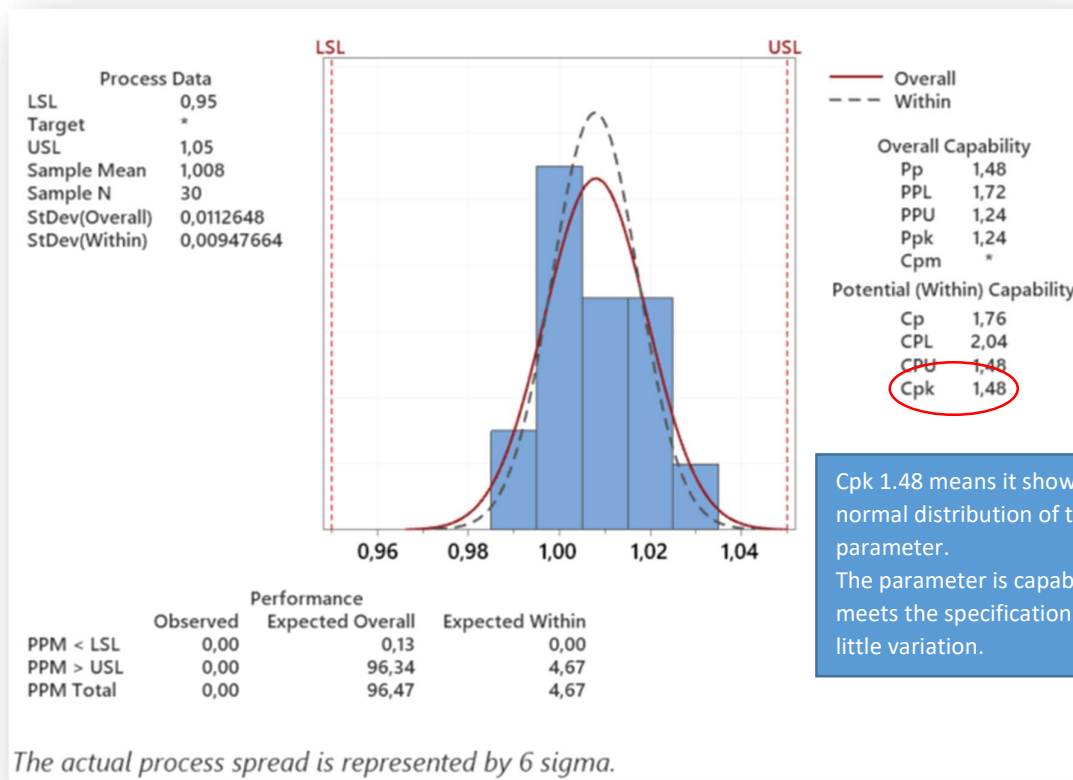
All drawings with KPC's shall have a note, indicating the type and number of KPC's indicated on that drawing.

### Example

Cpk example of a parameter  $1.00 \pm 0.05$ . N=30 sample measurements.

In this example the requirement for the parameter is  $Cpk > 1.33$ .

The graph is represented by Minitab, one of the statistical software programs which can be used to calculate the Cpk.



For any additional information or questions, please contact the Quality department at Allied Motion Dordrecht B.V.

### Document revision history

Name	Date	Status	Version	
P. Lusse	16-03-2022	Released	1.1	First issue of this document

### RACI table

Function →	ENG	PUR	QA
<b>Activity ↓</b>			
Document management	C	C	R/A
Define KPC's on drawing	R/A	I	C
Support supplier with calculation Cpk / method	C	C	R/A
Communication & agreement with supplier	C	R/A	C

R Responsible Resp. for the activity  
 A Accountable End resp.  
 C Consulted Advice  
 I Informed