har-bus 64
Connector Update

by HARTING
March 1998
The contact density

**former 19'' technique**
- 2 x 96 pins
- max. 180 N

**latest systems**
- 2 x 160 pins + 95 pins
- max. ~400 N
The connector design

new style: five row friendly

old style: no chamfered shroud

*har-*bus female connector
Rack system
acc. IEC 60297-3

System creates a complex chain of tolerances depending on the stiffness of the system!
IEC 60603-2
connector mating conditions
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design approval conditions

• 4° misalignment transversal
  100% more than spec.

• 6° misalignment longitudinal
  50% more than spec.
IEC 60603-2
male connector pins

width
0.7 - 0.15

thickness
0.61 - 0.05

contact length: 4.8 - 5.0 mm
three row / five row

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width

thickness

0.70

0.60

width

thickness

0.59

0.58

0.57

0.57

competitor A

competitor B
three row / five row

width

0,70
0,60

width

0,62
0,59

width

0,66
0,59

thickness

thickness

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competitor C

competitor D
three row / five row

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width
0.70

thickness
0.60

width
0.62

thickness
0.57

width
0.63

thickness
0.56

competitor E

competitor F
Mating problems under worst case

A - misaligned female contacts

B - competitors' thin male contacts

C - max. misalignment due to insufficient stiffness of the system (backplane, guiding rails, rack)
New modified female contact

A: Reduction of contact mating force
B: Maximized contact width
C: Minimized position tolerance (inspected by camera system)

Mating force:
  Specified: ≤ 160N
  Target : ≤ 100N
  Actual : ≤ 82-98N

5 row
3 row
Mating conditions

*har-bus 64 / 3 row competitors male under worst case conditions (4-6° inclination, small connector blade)*

correct mating proven!
Mating conditions

*har-bus 64 / 3 row competitors male under worst case conditions (4-6° inclination, small connector blade)*

correct mating proven!
Identification of new *har-bus* 64 products

Production started in week 11/98

\[ N = \text{new version} \]