

1	2	3	4	5	6	7	8																																
HARTING har-flex[®]straight male connector RoHS compliant				RECOMMENDATION FOR SOLDER PROCESSING Solder paste recommendation The har-flex connectors are solderable with established lead-free SAC / SnNi solder but also leaded solder e.g. SnPb40 PCB pad plating The har-flex connectors are solderable on lead-free pad surfaces like HAL, NiAu, Immersion Sn. Stencil recommendation The solder deposition has to be placed on the pad area of the contact solder tines. Ideally, the solder deposition has the same length-to-width ratio and center point like the PCB pads. The size of the solder stencil apertures is depending on the thickness of the stencil. In general, the thinner stencils will need larger apertures to result in the required volume of solder paste. The minimum required solder paste volume for the signal pins is 0,094mm³, for the hold down it is 0,33mm³. For example, this can be achieved with the following stencil data : <table><tr><td></td><td colspan="3">Signal pins</td></tr><tr><td>Stencil thickness</td><td>PCB pad size</td><td>proposal stencil aperture size</td><td>calculated solder paste volume</td></tr><tr><td>120 µm</td><td>1,1 x 0,8 mm</td><td>1,05 x 0,75 mm</td><td>0,095 mm³</td></tr><tr><td>150 µm</td><td>1,1 x 0,8 mm</td><td>0,99 x 0,72 mm</td><td>0,107 mm³</td></tr></table><table><tr><td></td><td colspan="3">Hold-downs</td></tr><tr><td>Stencil thickness</td><td>PCB pad size</td><td>proposal stencil aperture size</td><td>calculated solder paste volume</td></tr><tr><td>120 µm</td><td>2,5 x 1,2 mm</td><td>2,45 x 1,15 mm</td><td>0,338 mm³</td></tr><tr><td>150 µm</td><td>2,5 x 1,2 mm</td><td>2,25 x 1,08 mm</td><td>0,365 mm³</td></tr></table> If a stencil with lower thickness shall be used, please insure the minimum required solder paste volume by enlarging the stencil aperture. Depending on the PCB design, the solder depostion may protrude the PCB pads. But to achieve a good sealing during solder paste printing and to reduce the cleaning interval of the stencil, the aperture should be smaller than the PCB pad about 10% or 25µm encircling.					Signal pins			Stencil thickness	PCB pad size	proposal stencil aperture size	calculated solder paste volume	120 µm	1,1 x 0,8 mm	1,05 x 0,75 mm	0,095 mm ³	150 µm	1,1 x 0,8 mm	0,99 x 0,72 mm	0,107 mm ³		Hold-downs			Stencil thickness	PCB pad size	proposal stencil aperture size	calculated solder paste volume	120 µm	2,5 x 1,2 mm	2,45 x 1,15 mm	0,338 mm ³	150 µm	2,5 x 1,2 mm	2,25 x 1,08 mm	0,365 mm ³
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GENERAL INFORMATIONS No. of contacts from 6 to 100poles, all even numbers Contact spacing 1,27mm x 1,27mm [0,050"x0,050"] Test Voltage 500V Contact resistance < 25 mOhm Insulation resistance ≥ 10x10^9Ω Working current acc. to IEC 60512, at 70°C, 80% derating see derating diagram Working temperature range -55°C ... +125°C Termination technology SMT Reflow processing temperature (acc. to ECA/IPC/JEDEC J-STD-075 Level PSL R0) min. 150s >217°C min. 30s >240°C Clearance & creepage distance 0,4mm min. Insertion force (depending on mating connector) approximately 0,5N/contact Withdrawal force (depending on mating connector) approximately 0,5N/contact Mating cycles PL1 : 500 mating cycles PL2 : 250 mating cycles RoHS - compliant Yes Leadfree Yes Working voltage acc. to to IEC 60664-1 100V / 150V (depending on installation category) UL file acc. UL 1977 ECBT2.E102079 UL file acc. CSA-C22.2 (for Canada) ECBT8.E102079 PSL level acc. ECA/IPC/JEDEC J-STD-075 PSL R0 MSL level acc. ECA/IPC/JEDEC J-STD-020D MSL 1				Coplanarity of contacts All connectors are tested for coplanarity of contacts and are in the range of 6 pin to 80 pin: ≤ 0,1mm 82 pin to 100 pin: ≤ 0,15mm Performance level Performance level 1 (recommended for majority of applications) Initial 250 mating cycles, 10 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 250 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 2 Performance level 2 Initial 125 mating cycles, 4 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 125 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 6 Performance level S4 Defined contact surface of min. 0,06 µm Au over 0,7+0,2µm PdNi Part number definition : 15 5																																			
INSULATOR MATERIAL Material LCP (liquid crystalline polymer) Color Black UL classification UL94-V0 Material group acc. IEC 60664-1 IIIa (175 ≤ CTI < 400)				Coplanarity of contacts All connectors are tested for coplanarity of contacts and are in the range of 6 pin to 80 pin: ≤ 0,1mm 82 pin to 100 pin: ≤ 0,15mm Performance level Performance level 1 (recommended for majority of applications) Initial 250 mating cycles, 10 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 250 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 2 Performance level 2 Initial 125 mating cycles, 4 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 125 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 6 Performance level S4 Defined contact surface of min. 0,06 µm Au over 0,7+0,2µm PdNi Part number definition : 15 5																																			
CONTACT MATERIAL Contact material Copper alloy Plating termination zone Sn Plating contact sliding side Au over PdNi (acc. to Performance level)				Coplanarity of contacts All connectors are tested for coplanarity of contacts and are in the range of 6 pin to 80 pin: ≤ 0,1mm 82 pin to 100 pin: ≤ 0,15mm Performance level Performance level 1 (recommended for majority of applications) Initial 250 mating cycles, 10 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 250 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 2 Performance level 2 Initial 125 mating cycles, 4 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 125 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 6 Performance level S4 Defined contact surface of min. 0,06 µm Au over 0,7+0,2µm PdNi Part number definition : 15 5																																			
DERATING DIAGRAM acc. to IEC 60512-5 (Current carrying capacity) The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature. Control and test procedures according to DIN IEC 60512-5 derating curve at I_{max}*0,8 (IEC 60512-5-2)				Coplanarity of contacts All connectors are tested for coplanarity of contacts and are in the range of 6 pin to 80 pin: ≤ 0,1mm 82 pin to 100 pin: ≤ 0,15mm Performance level Performance level 1 (recommended for majority of applications) Initial 250 mating cycles, 10 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 250 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 2 Performance level 2 Initial 125 mating cycles, 4 days gas test (25°C / 75% r.h.) using H2S 10 ppb, NO2 200 ppb, CL2 10 ppb, SO2 200 ppb. Measurement of contact resistance. The remaining 125 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. Part number definition : 15 6 Performance level S4 Defined contact surface of min. 0,06 µm Au over 0,7+0,2µm PdNi Part number definition : 15 5																																			
HARTING All rights reserved Department EC PD - CN HARTING Electronics GmbH D-32339 Espelkamp Scale 1:1 Free size tol. Created by ZHUANGJ Inspected by LUOK Standardisation HOFFMANN Date 2018-05-21 State Final Release Title har flex male stacking height1.75 and 3.25 Doc-Key / ECM-Nr. 100577896/UGD/001/B 500000135280 Type DS Number 15111100301 Rev. B Page 1/2																																							
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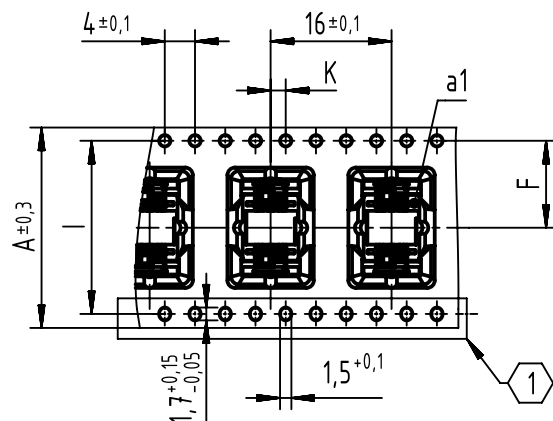
har-flex® straight male connector



TAPE LAYOUT & PACKAGING

Tape acc. to IEC 60286-3

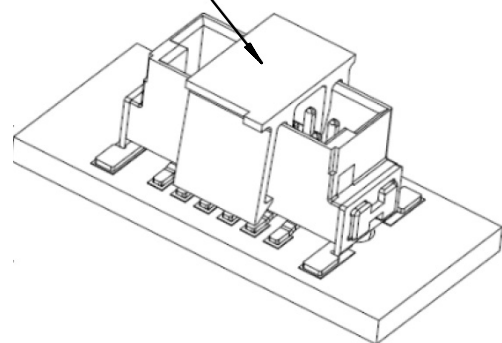
Reel off direction



Tape dimensions:	A	F	I	K
poles 06 to 12	24,0	11,5±0,1	-	2±0,1
poles 14 to 20	32,0	14,2±0,1	28,4	2±0,1
poles 22 to 40	44,0	20,2±0,15	40,4	2±0,15
poles 42 to 56	56,0	26,2±0,15	52,4	2±0,15
poles 58 to 80	72,0	34,2±0,3	68,4	2±0,2
poles 82 to 100	88,0	42,2±0,3	84,4	2±0,2

1 NO DOUBLE SPROCKET HOLES FOR 06, 08, 10 AND 12 POLE NUMBERS (TAPE SIZE 24)

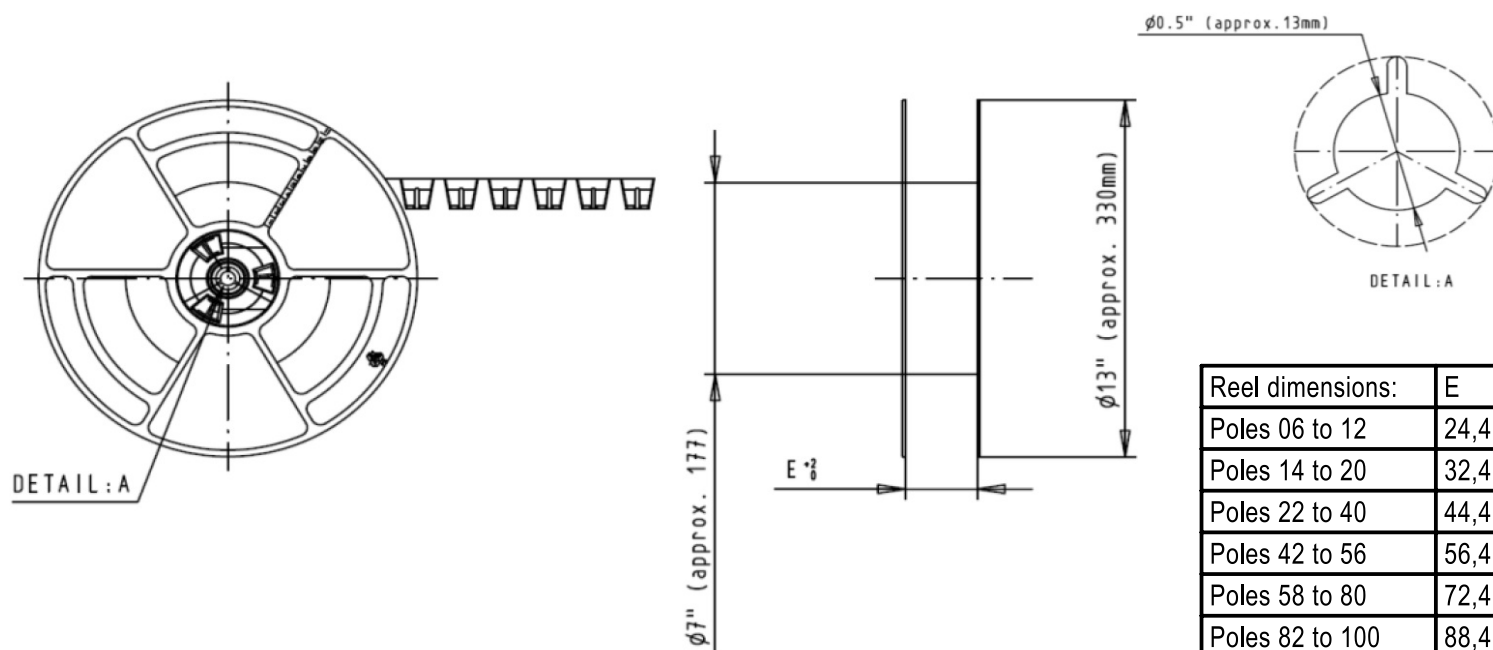
Pick & place pad 6,4±0,1 x 4,5±0,1



Packaging indices ("XXX" in part number)

Index	Packaging unit	Packaging
000	280	Tape & reel
333	1	Tape

REEL DIMENSIONS

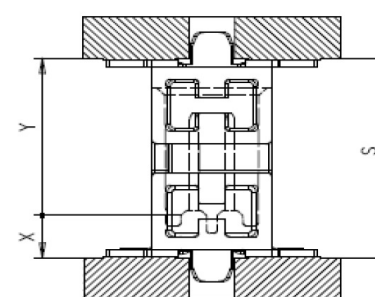


Reel dimensions:	E
Poles 06 to 12	24,4
Poles 14 to 20	32,4
Poles 22 to 40	44,4
Poles 42 to 56	56,4
Poles 58 to 80	72,4
Poles 82 to 100	88,4

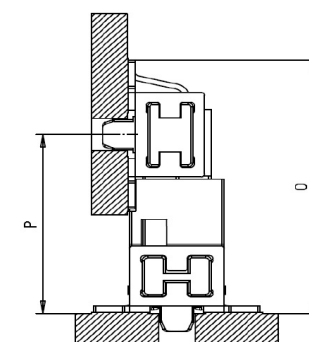
APPLICATION INFORMATION

S	14mm				
	13mm				
	12mm				
	11mm				
	10mm				
	9mm				
	8mm				
X & Y	stacking heights	male 1.75mm female 6.25mm	male 3.25mm female 6.25mm	male 1.75mm female 9.05mm	male 3.25mm female 9.05mm
S	PCB distance	8mm - 9.5mm	9.5mm - 11mm	10.8mm - 12.3mm	12.3mm - 13.8mm
	part numbers	15 11 ... 15 21 ...	15 12 ... 15 21 ...	15 11 ... 15 22 ...	15 12 ... 15 22 ...

straight female



angled female



straight male

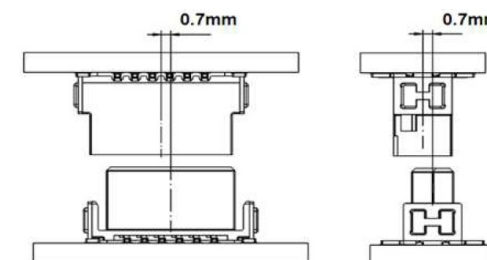
3,25	9,05	12,3	13,8
1,75	9,05	10,8	12,3
3,25	6,5	9,5	11
1,75	6,25	8	9,5
X	Y	Smin	* Smax

straight male

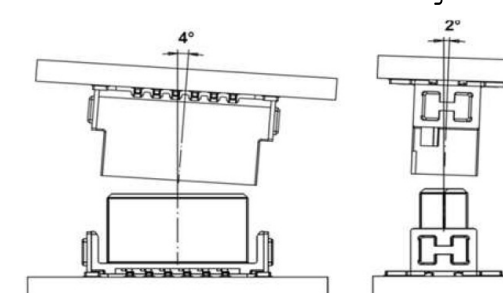
3,25	10,25	14,08
1,75	8,75	12,58
X	P min.	0

*Smax = Smin +1.5 wiping length with additional contact overlap security

Admissible inclination



Admissible mismatching



All Dimensions in mm
Original Size DIN A3

Scale
1:1

Free size tol.

Ref.

Sub.



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Department EC PD - CN

Created by
ZHUANGJ

Inspected by
LUOK

Standardisation
HOFFMANN

Date
2018-05-21

State
Final Release

Title
har flex male stacking height 1.75 and 3.25

Doc-Key / ECM-Nr.
100577896/UGD/001/B
500000135280

HARTING Electronics GmbH

D-32339 Espelkamp

Type
DS

Number
15111100301

Rev.
B

Page
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Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

HARTING:

<u>15111002601000</u>	<u>15121002601000</u>	<u>15110062601000</u>	<u>15110082601000</u>	<u>15110102601000</u>	<u>15110122601000</u>
<u>15110142601000</u>	<u>15110162601000</u>	<u>15110182601000</u>	<u>15110202601000</u>	<u>15110222601000</u>	<u>15110242601000</u>
<u>15110262601000</u>	<u>15110282601000</u>	<u>15110302601000</u>	<u>15110322601000</u>	<u>15110362601000</u>	<u>15110382601000</u>
<u>15110422601000</u>	<u>15110442601000</u>	<u>15110462601000</u>	<u>15110482601000</u>	<u>15110502601000</u>	<u>15110522601000</u>
<u>15110542601000</u>	<u>15110562601000</u>	<u>15110582601000</u>	<u>15110602601000</u>	<u>15110622601000</u>	<u>15110642601000</u>
<u>15110662601000</u>	<u>15110682601000</u>	<u>15110702601000</u>	<u>15110722601000</u>	<u>15110742601000</u>	<u>15110762601000</u>
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<u>15120082601000</u>	<u>15120102601000</u>	<u>15120122601000</u>	<u>15120142601000</u>	<u>15120162601000</u>	<u>15120182601000</u>
<u>15120202601000</u>	<u>15120222601000</u>	<u>15120242601000</u>	<u>15120262601000</u>	<u>15120282601000</u>	<u>15120302601000</u>
<u>15120322601000</u>	<u>15120342601000</u>	<u>15120362601000</u>	<u>15120382601000</u>	<u>15120402601000</u>	<u>15120422601000</u>
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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