Pushing Performance

HARTING *har*-flex® connectors

Transforming customer wishes into concrete solutions

The HARTING Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking, as well as in manufacturing, mechatronics and software creation. The Group uses these skills to develop customized solutions and products such as connectors for energy and data transmission applications including, for example, mechanical engineering, rail technology, wind energy plants, factory automation and the telecommunications sector. In addition, HARTING also produces electro-magnetic components for the automobile industry and offers solutions in the field of Enclosures and Shop Systems.
The HARTING Group currently comprises 36 subsidiary companies and worldwide distributors employing a total of approx. 3,400 staff.

HARTING Subsidiary company HARTING Representatives

We aspire to top performance.

Connectors ensure functionality. As core elements of electrical and optical wiring, connection and infrastructure technologies, they are essential in enabling the modular construction of devices, machines and systems across a very wide range of industrial applications. Their reliability is a crucial factor guaranteeing smooth functioning in the manufacturing area, in telecommunications, applications in medical technology – in fact, connectors are at work in virtually every conceivable application area. Thanks to the consistent further development of our technologies, customers enjoy investment security and benefit from durable, long term functionality.

Always at hand, wherever our customers may be.

Increasing industrialization is creating growing markets characterized by widely diverging demands and requirements. The search for perfection, increasingly efficient processes and reliable technologies is a common factor in all sectors across the globe.

HARTING is providing these technologies – in Europe, America and Asia. The **HARTING** professionals at our international subsidiaries engage in close, partnership based interaction with our customers, right from the very early product development phases, in order to realize customer demands and requirements in the best possible manner.

Our people on location form the interface to the centrally coordinated development and production departments. In this way, our customers can rely on consistently high, superior product quality – worldwide.

Our claim: Pushing Performance.

HARTING provides more than optimally attuned components. In order to serve our customers with the best possible solutions, **HARTING** is able to contribute a great deal more and play a closely integrative role in the value creation process.

From ready assembled cables through to control racks or ready-to-go control desks: Our aim is to generate the maximum benefits for our customers – without compromise!

Quality creates reliability – and warrants trust.

The **HARTING** brand stands for superior quality and reliability – worldwide. The standards we set are the result of consistent, stringent quality management that is subject to regular certifications and audits.

EN ISO 9001, the EU Eco-Audit and ISO 14001:2004 are key elements here. We take a proactive stance to new requirements, which is why **HARTING** ranks among the first companies worldwide to have obtained the new IRIS quality certificate for rail vehicles.

HARTING technology creates added value for customers.
Technologies by **HARTING** are at work worldwide. **HARTING**'s presence stands for smoothly functioning systems, powered by intelligent connectors, smart infrastructure solutions and mature network systems. In the course of many years of close, trust-based cooperation with its customers, the **HARTING** Technology Group has advanced to one of the worldwide leading specialists for connector technology. Extending beyond the basic functionalities demanded, we offer individual customers specific and innovative solutions. These tailored solutions deliver sustained effects, provide investment security and enable customers to achieve strong added value.

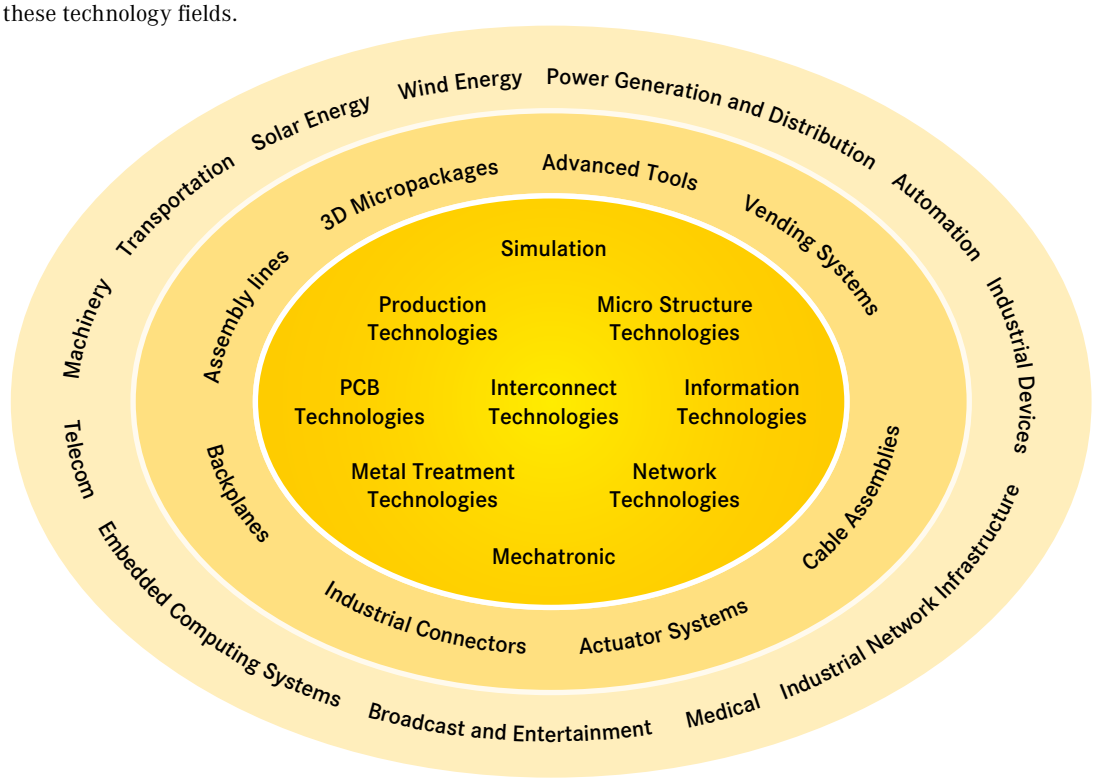
Opting for HARTING opens up an innovative, complex world of concepts and ideas.
In order to develop connectivity and network solutions serving an exceptionally wide range of connector applications and task scopes in a professional and cost optimized manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Over and beyond these capabilities, **HARTING** is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that ensure continuity at the same time. In securing this know-how lead, **HARTING** draws on a wealth of sources from both in-house research and the world of applications alike.
Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and construction technology, as well as high temperature or ultrahigh frequency applications that are finding use in telecommunications or automation networks, in the automotive industry, or in industrial sensor and actuator applications, RFID and wireless technologies, in addition to packaging and housing made of plastics, aluminum or stainless steel.

HARTING solutions extend across technology boundaries.
Drawing on the comprehensive resources of the group's technology pool, **HARTING** devises practical solutions for its customers. Whether this involves industrial networks for manufacturing automation, or hybrid interface solutions for wireless telecommunication infrastructures, 3D circuit carriers with microstructures, or cable assemblies for high-temperature applications in the automotive industry – **HARTING** technologies offer far more than components, and represent mature, comprehensive solutions attuned to individual customer requirements and wishes. The range covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.
In order to ensure the future proof design of RF- and EMC-compatible interface solutions, the central **HARTING** laboratory (certified to EN 45001) provides simulation tools, as well as experimental, testing and diagnostics facilities all the way through to scanning electron microscopes. In the selection of materials and processes, lifecycle and environmental aspects play a key role, in addition to product and process capability considerations.

HARTING knowledge is practical know-how generating synergy effects.

HARTING commands decades of experience with regard to the applications conditions of connectors in telecommunications, computer and network technologies and medical technologies, as well as industrial automation technologies, such as the mechanical engineering and plant engineering areas, in addition to the power generation industry or the transportation sector. HARTING is highly conversant with the specific application areas in all of these technology fields.

The key focus is on applications in every solution approach. In this context, uncompromising, superior quality is our hallmark. Every new solution found will invariably flow back into the HARTING technology pool, thereby enriching our resources. And every new solution we go on to create will draw on this wealth of resources in order to optimize each and every individual solution. In this way, HARTING is synergy in action.



The **HARTING eCatalogue** is an electronic catalogue with a part configuration and 3D components library.

Here you can choose a connector according to your requirements. Afterwards you are able to send your inquiry directly to a HARTING sales partner.

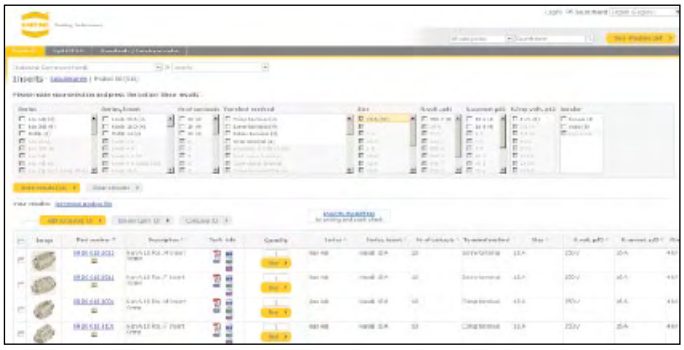
The drawings to every single part are available in PDF-format.

The parts are downloadable in 2D-format (DXF) and 3D-format (IGES, STEP).

The 3D-models can be viewed with a VRML-viewer.

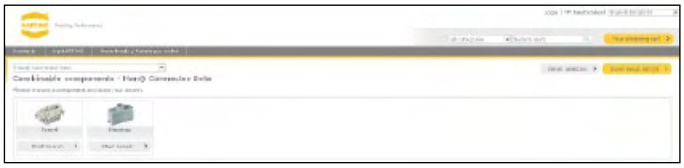
You can find the **HARTING eCatalogue** at **www.HARTING.com**.

Product overview



Product selection

Product configuration



Product combination

Product samples: Fast-track delivery to your desk, free of charge

The new free express sample service in the HARTING eCatalogue allows customers to order samples immediately, easily and completely free of charge. A broad selection from the device connectivity product portfolio is now available. If a product is unavailable, the system offers alternative products with similar features that can be requested at a mouse click.

The free samples are shipped within 48 hours at no cost to you. This service enables tremendous flexibility, especially in the design phase of projects.

General information

It is the customer's responsibility to check whether the components illustrated in this catalogue also comply with different regulations from those stated in special fields of applications.

We reserve the right to modify designs or substance of content in order to improve quality, keep pace with technological advancement or meet particular requirements in production.

No part of this catalogue may be reproduced in any form (print, photocopy, microfilm or any other process) or processed, duplicated or distributed by means of electronic systems without the prior written consent of HARTING Electronics GmbH & Co. KG, Espelkamp. We are bound by the German version only.

har:flex® connectors

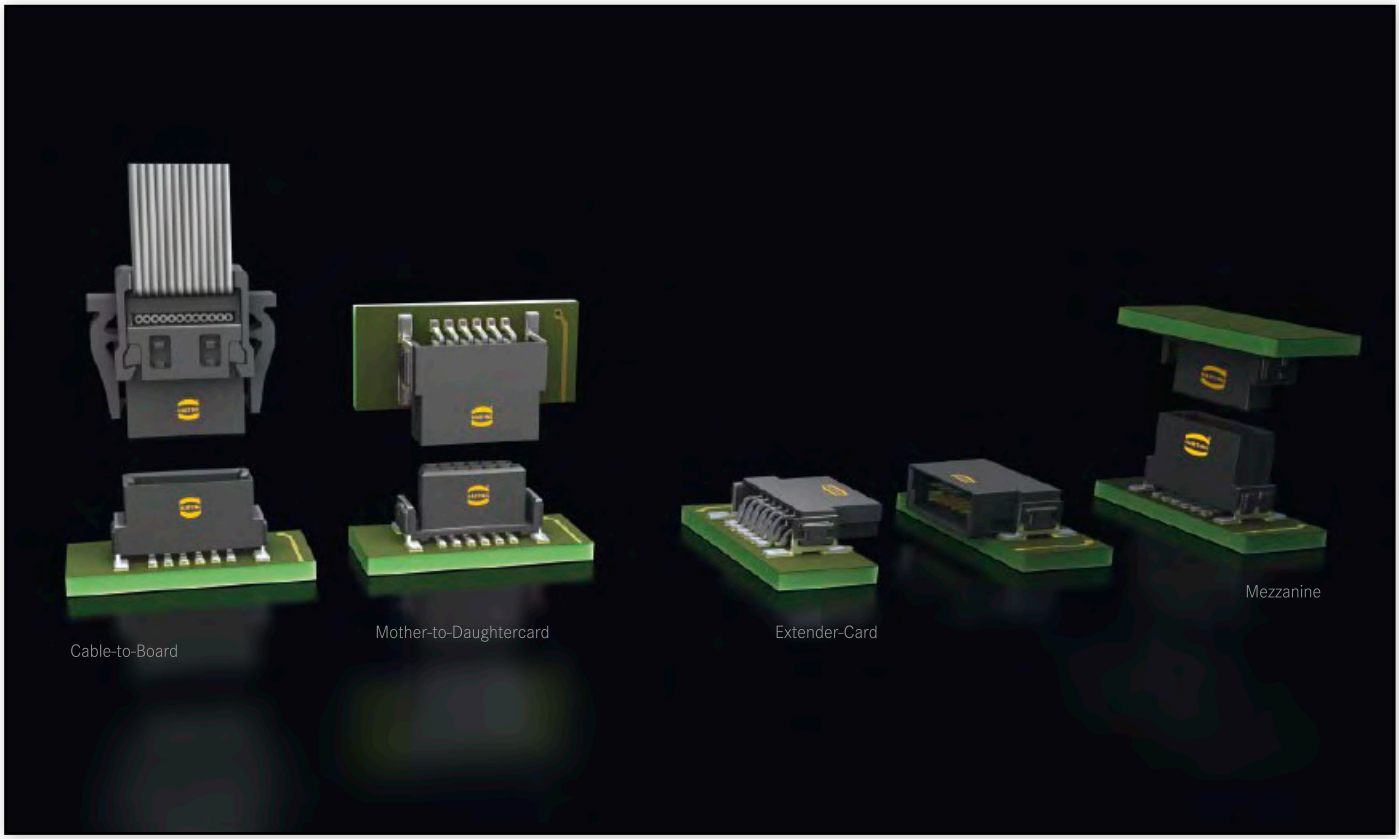
har-flex® CONNECTORS

With *har*-flex®, HARTING has developed a general-purpose PCB connector series for internal and external Device Connectivity. The continuous scalability by an even number of contacts, i.e. from 6 to 100, of the HARTING's *har*-flex® mezzanine connector series is a special feature forming an ideal basis for customized applications. The advantage is clearly evident considering that the connector is always optimized to suit specific applications on the device PCB, while also covering the medium- and small-scale volume range that is typical for the production of industrial devices.

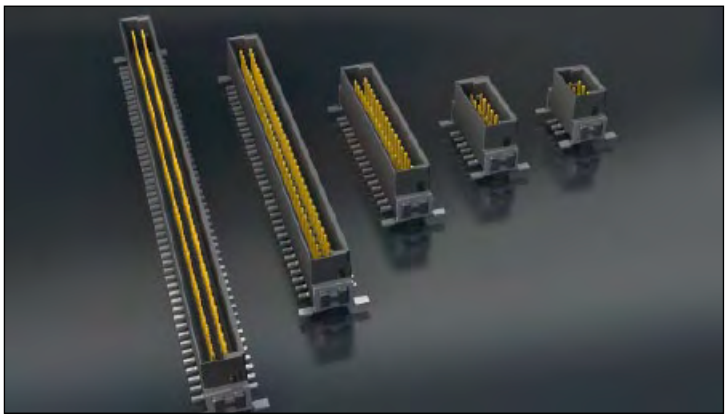
This flexibility is new – HARTING turns an individual design into a standard component. No special tooling changes are needed for customer-specific solutions, thus HARTING can realize a short delivery time.

PRODUCT DIVERSITY

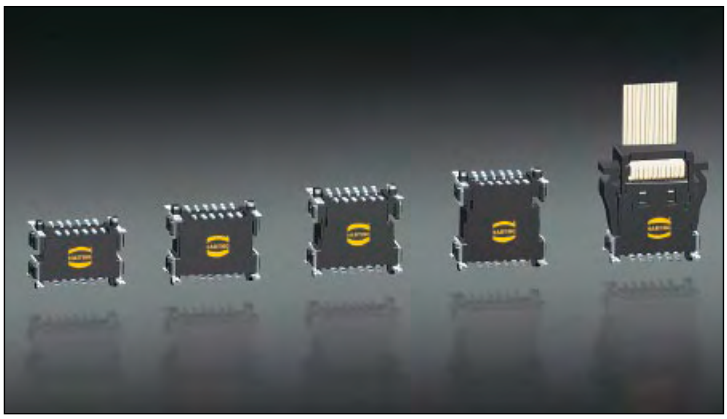
The *har*-flex® product range with SMT termination technology is based on a 1.27 mm grid. With its diverse variants, HARTING provides connectivity solutions for many different board-to-board and cable-to-board applications. For example, two straight connectors are used for the mezzanine application, two angled connectors for PCBs on one level, and a combination allows the well-known pairing of mother and daughter cards. By using the IDC cable connector, two PCBs with large space between can be connected with a flat ribbon cable.



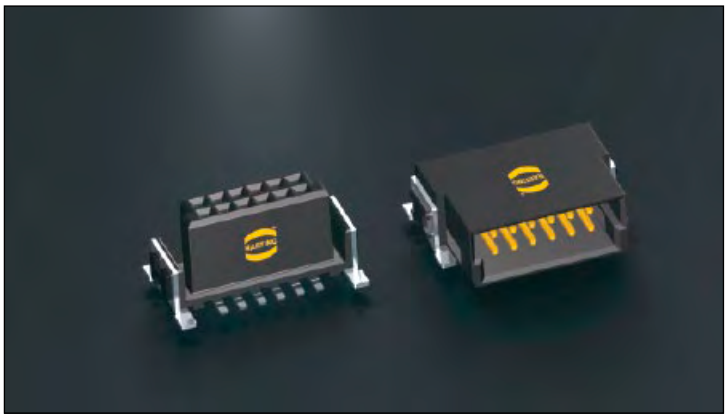
Many pin count options
HARTING has developed a modular tooling concept which offers a broad choice of configurations between 6 and 100 poles in even numbered positions. This flexibility in the choice of number of contacts, combined with high density contact spacing, allow the designer to maximize the use of PCB real estate, thereby achieving overall space savings and cost efficiencies.



Flexible board-to-board distances
HARTING covers mezzanine applications with a range of straight versions for four different stacking heights that can be used to interconnect PCBs arranged in parallel stacks with spacing between 8.0 mm and 13.8 mm. Additional stacking heights are in development. For applications requiring larger spacing between boards HARTING offers compatible cable-to-board connectors with insulation displacement technology.



Robust design
The special SMT fixing ensures a robust and enduring connection to the PCB and helps to absorb mechanical stress on the solder contacts resulting from insertion and removal forces.



Automated processing features
The *har*-flex® SMT connectors meet the highest demands in terms of their processing capabilities. Special blister packaging provides protection during shipping and handling, while the “pick and place“ pads enable automated assembly of the PCBs. The temperature resistant materials of the insulating body, in combination with consistent testing of the coplanarity of contacts, ensure reliable soldering capabilities of the connectors in the reflow process.

Number of contacts	6, 8, 10 … 96, 98, 100
Connector pitch	1.27 mm x 1.27 mm [0.050'' x 0.050'']
Clearance and creepage distance	
Board connectors (SMT)	min. 0.4 mm
Cable connectors (IDC)	
AWG 30/1 (solid)	min. 0.35 mm
AWG 30/7 (stranded)	min. 0.4 mm
Test voltage $U_{r.m.s.}$	500 V
Contact resistance	< 25 mΩ
Insulation resistance	> 10 GΩ
Insertion and withdrawal force	approx. 0.5 N / contact
Working temperature range	– 55 °C … + 125 °C
The higher temperature limit includes the local ambient and heating effects of the contacts under load	
Temperature during reflow soldering (acc. to ECA/IPC/JEDEC J-STD-075 Level PSL R0)	min. 150 s > 217 °C min. 30 s > 240 °C
Electrical termination	
Board connectors	SMT (Surface Mount Technology)
Cable connectors	IDC (Insulation Displacement Connection)
Materials	
Moulding material	LCP
UL approval	UL 94-V0
CTI value (Comparative Tracking Index)	175
Contacts base material	Copper alloy
Contact surface	
Mating side	
Board connectors	Au over PdNi (acc. performance level)
Cable connectors	Au over PdNi (acc. performance level)
Termination side	
Board connectors (SMT)	Sn
Cable connectors (IDC)	Sn
Flat cable requirements for IDC connectors	
PVC flat cables:	AWG 30/1 (solid) AWG 30/7 (stranded)
PTFE flat cables:	AWG 30/1 (solid)
Insulation diameter:	min. 0.55 mm - max. 0.75 mm

Working current acc. to IEC 60512

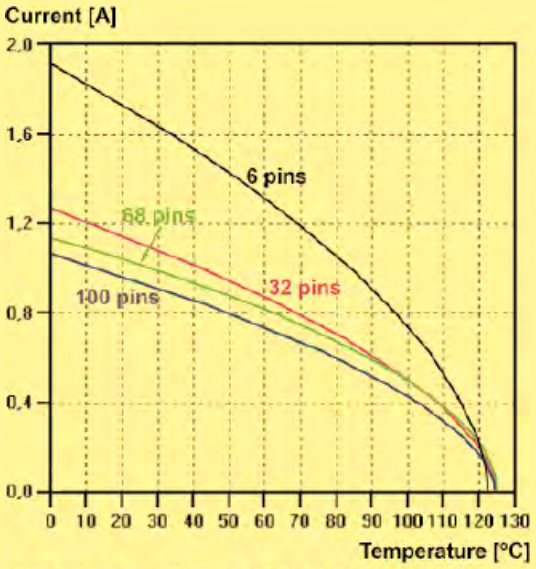
70 °C ambient temperature @ 80 % derating

6 pins	1.2 A
32 pins	0.8 A
68 pins	0.75 A
100 pins	0.7 A

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, not 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 60 512.



Derating curve at I_{max}*0.8 (IEC 60512-5-2)

Durability

Performance level 1 (recommended for majority of applications)

Initial 250 mating cycles, 10 days gas test (25 °C/75 % r.h.) using H_2S 10 ppb, NO_2 200 ppb, CL_2 10 ppb, SO_2 200 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 H_2S 10 ppb, NO_2 200 ppb, CL_2 10 ppb, SO_2 200 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+0.2 µm PdNi.

Part number definition: 15 . . . . . 5 . . . . . .

Working voltage acc. to IEC 60 664-1

The working voltage depends on user specific operational conditions. Depending on the installation category, the degree of pollution and the entire electrical environment, the working voltage is different. The standard IEC 60 664-1 specifies, in general, the minimum insulation distances for equipment. But it can also be used to determine the maximum working voltage with given requirements.

The following table shows the most common conditions applicable for the *har*-flex® connectors and exemplary calculations for the working voltage. For installation category, degree of pollution and other requirements which are not shown in the table we refer to the IEC 60 664-1.

Clearance / Creepage distance	0.4 mm			
CTI-Value	< 400			
Isolation group	III a/b			
Electrical field type	Case A (Inhomogeneous field)		Case B (Homogeneous field)	
Installation category	I	II	I	II
Degree of pollution	1	1	1	1
Working voltage max.	**150 V**	**100 V**	**150 V**	**150 V**

Explanations:

– CTI value and isolation group are fixed values by the *har*-flex® connector characteristics.

– Installation category I: Equipment is intended for use only in appliances or installation parts, in which no overvoltages can occur. Equipment in this installation category in normally operated at extra low voltage.

– Installation category II: Equipment is intended for use in installations or parts of installations, in which lightning overvoltages need not be considered. Overvoltages caused by switching must be taken into account.

– Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

– Pollution degree 2: Only non-conductive pollution occurs. A temporary conductive caused by condensation must be expected occasionally.

Part number definition

The *har*-flex® part numbers have 14 digits and are based on the following scheme:

1	5		X	X		X	X	X		X	X	X	X		X	X	X

15 *har*-flex® family

Connector style
11 straight male connector 1.75 mm stacking height
12 straight male connector 3.25 mm stacking height
15 angled male connector
21 straight female connector 6.25 mm stacking height
22 straight female connector 9.05 mm stacking height
25 angled female connector
29 IDC flat band cable connector / accessories

Number of contacts

Durability
2 performance level 1
5 performance level S4
6 performance level 2

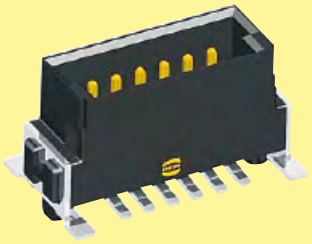
Termination
5 IDC termination
6 SMT termination

Counting number

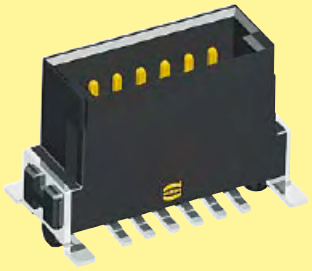
Packaging
000 Tape and reel packaging
Tray packaging for IDC cable connectors
333 Samples

Stacking heights of straight connector versions

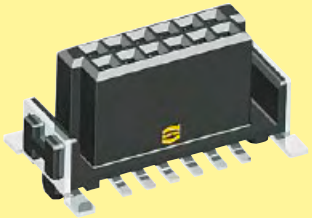
The *har*-flex® connectors cover mezzanine applications with a range of straight versions for four different stacking heights that can be used to interconnect PCBs arranged in parallel stacks with spacing between 8.0 mm and 13.8 mm.



Male 1.75 mm



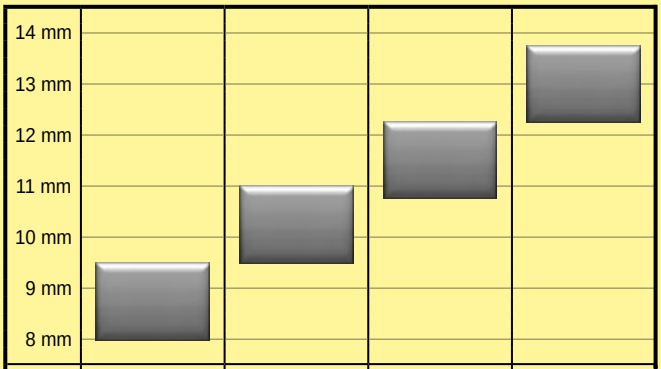
Male 3.25 mm



Female 6.25 mm

Female 9.05 mm

Due to the wiping lengths of 1.5 mm, these four connectors cover the distance of 8 mm to 13.8 mm continuously.

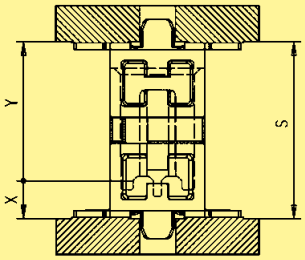


stacking heights	male 1.75 mm female 6.25 mm	male 3.25 mm female 6.25 mm	male 1.75 mm female 9.05 mm	male 3.25 mm female 9.05 mm
PCB distance	8 mm - 9.5 mm	9.5 mm - 11 mm	10.8 mm - 12.3 mm	12.3 mm - 13.8 mm
part numbers	15 11 ... 15 21 ...	15 12 ... 15 21 ...	15 11 ... 15 22 ...	15 12 ... 15 22 ...

Mating options

Mezzanine connection

straight female

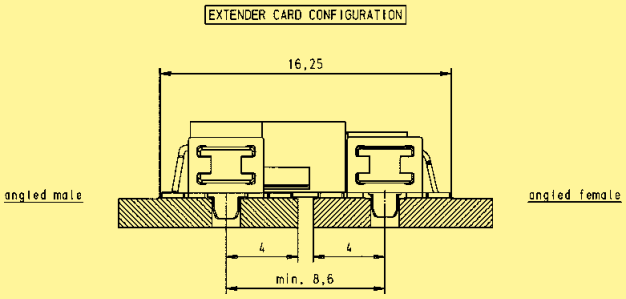


straight male

3.25	9.05	12.3	13.8
1.75	9.05	10.8	12.3
3.25	6.25	9.5	11
1.75	6.25	8	9.5
X	*Y*	*Smin*	* *Smax*

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

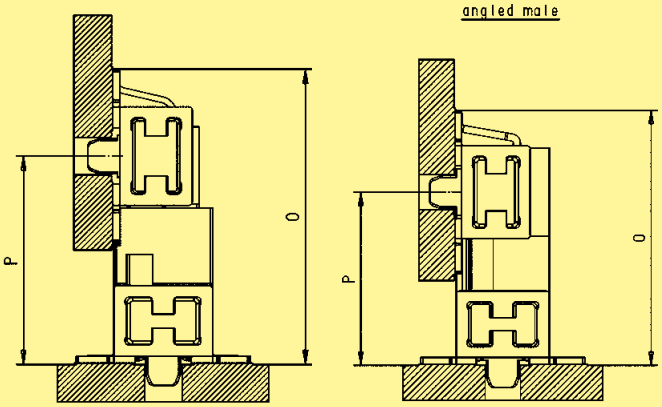
Extender Card connection



Mother-to-Daughtercard connection

angled female

angled male



straight male

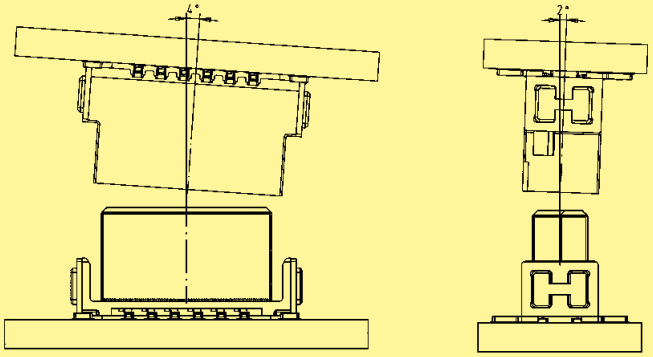
3.25	10.25	14.08
1.75	8.75	12.58
X	*P min.*	*O*

straight female

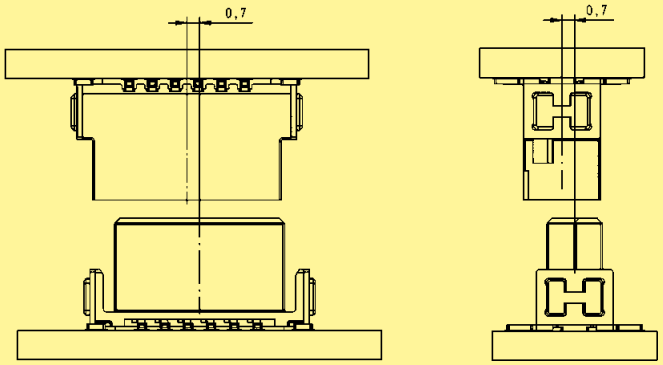
9.05	10.5	14.33
6.25	7.7	11.53
Y	*P min.*	*O*

Mating conditions

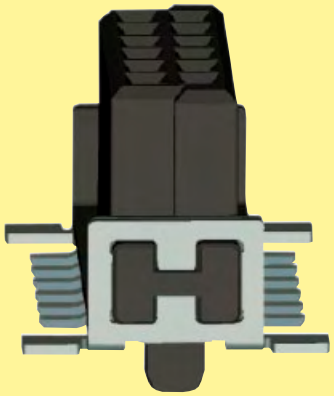
Inclination



Mismating



SMT processing notes



The *har*-flex® SMT connectors meet the highest demands in terms of their processing capabilities.

The connectors are delivered in a tape and reel packaging optimized for automatic assembly machines. A vacuum cover enables the automatic assembly with a vacuum nozzle.

The insulation body material is high temperature resistant, and due to the black colour a secure camera recognition is ensured.

For a reliable SMT solder process, the termination pins are 100 % checked for coplanarity.

Process / Moisture Sensitivity

During the reflow solder process, the connector has to resist extreme variations in temperature. Connectors consist in general of both plastic and metal parts, which have a different behaviour during the solder process. The Process Sensivity and also the Moisture Sensivity are tested according the ECA/IPC/JEDEC J-STD-075 specification.

Process Sensivity:

PSL means Process Sensitivity Level. PSL is a rating used to identify a component that is solder process sensitive. Damages of the connector after three times soldering are not permitted (e.g. melted edges).

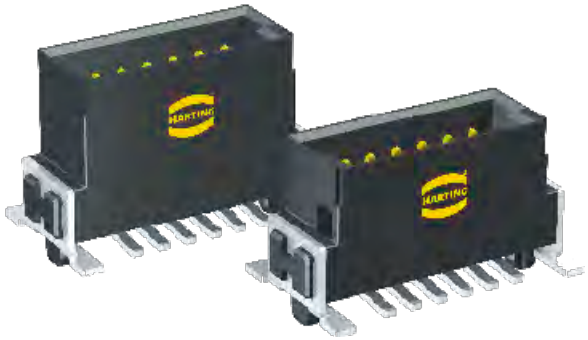
Moisture Sensitivity:

MSL means Moisture Sensitivity Level. MSL is a rating indicating a component's susceptibility to damage due to absorbed moisture during storage. Damages of the connector after storage in damp heat and three times soldering are not permitted (e.g. blisters).

The *har*-flex® connectors are rated with **PSL R0** and **MSL 1**. This is the maximum possible rating in both categories. The *har*-flex® connector resists three times soldering at the following conditions without damages:

- min. 150 s beyond 217 °C (liquidus temperature, the melting point of the solder paste)
- min. 30 s beyond classification temperature (240 °C / 245 °C for *har*-flex®)
- Temperature solder profile according to ECA/IPC/JEDEC J-STD-075
- For MSL test, a storage of 168 hours at 85 °C and 85 % rel. humidity was carried out

As the result, the *har*-flex® connectors are not process sensitive and not moisture sensitive according to ECA/IPC/JEDEC J-STD-075.



Male connectors, straight

Identification	Number of contacts	Part No.	Dimensions in mm

Male connector, straight, stacking heights 1.75 / 3.25 mm

Number of contacts	Part No.
6	15 1 . 006 . 601 . . .
8	15 1 . 008 . 601 . . .
10	15 1 . 010 . 601 . . .
12	15 1 . 012 . 601 . . .
14	15 1 . 014 . 601 . . .
16	15 1 . 016 . 601 . . .
18	15 1 . 018 . 601 . . .
20	15 1 . 020 . 601 . . .
22	15 1 . 022 . 601 . . .
24	15 1 . 024 . 601 . . .
26	15 1 . 026 . 601 . . .
28	15 1 . 028 . 601 . . .
30	15 1 . 030 . 601 . . .
32	15 1 . 032 . 601 . . .
34	15 1 . 034 . 601 . . .
36	15 1 . 036 . 601 . . .
38	15 1 . 038 . 601 . . .
40	15 1 . 040 . 601 . . .
42	15 1 . 042 . 601 . . .
44	15 1 . 044 . 601 . . .
46	15 1 . 046 . 601 . . .
48	15 1 . 048 . 601 . . .
50	15 1 . 050 . 601 . . .
52	15 1 . 052 . 601 . . .
54	15 1 . 054 . 601 . . .
56	15 1 . 056 . 601 . . .
58	15 1 . 058 . 601 . . .
60	15 1 . 060 . 601 . . .
62	15 1 . 062 . 601 . . .
64	15 1 . 064 . 601 . . .
66	15 1 . 066 . 601 . . .
68	15 1 . 068 . 601 . . .
70	15 1 . 070 . 601 . . .
72	15 1 . 072 . 601 . . .
74	15 1 . 074 . 601 . . .
76	15 1 . 076 . 601 . . .
78	15 1 . 078 . 601 . . .
80	15 1 . 080 . 601 . . .
82	15 1 . 082 . 601 . . .
84	15 1 . 084 . 601 . . .
86	15 1 . 086 . 601 . . .
88	15 1 . 088 . 601 . . .
90	15 1 . 090 . 601 . . .
92	15 1 . 092 . 601 . . .
94	15 1 . 094 . 601 . . .
96	15 1 . 096 . 601 . . .
98	15 1 . 098 . 601 . . .
100	15 1 . 100 . 601 . . .

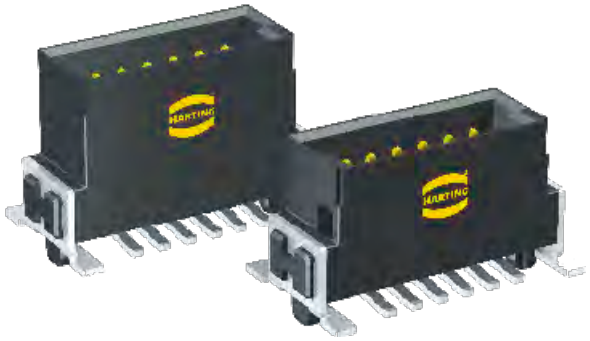
Please insert digit for stacking height

1.75 mm ▶ 1
3.25 mm ▶ 2

A	B	C	D	E	F
2.54	6.96	8.89	5.76	4.76	6.56
3.81	8.23	10.16	7.03	6.03	7.83
5.08	9.50	11.43	8.30	7.30	9.10
6.35	10.77	12.70	9.57	8.57	10.37
7.62	12.04	13.97	10.84	9.84	11.64
8.89	13.31	15.24	12.11	11.11	12.91
10.16	14.58	16.51	13.38	12.38	14.18
11.43	15.85	17.78	14.65	13.65	15.45
12.70	17.12	19.05	15.92	14.92	16.72
13.97	18.39	20.32	17.19	16.19	17.99
15.24	19.66	21.59	18.46	17.46	19.26
16.51	20.93	22.86	19.73	18.73	20.53
17.78	22.20	24.13	21.00	20.00	21.80
19.05	23.47	25.40	22.27	21.27	23.07
20.32	24.74	26.67	23.54	22.54	24.34
21.59	26.01	27.94	24.81	23.81	25.61
22.86	27.28	29.21	26.08	25.08	26.88
24.13	28.55	30.48	27.35	26.35	28.15
25.40	29.82	31.75	28.62	27.62	29.42
26.67	31.09	33.02	29.89	28.89	30.69
27.94	32.36	34.29	31.16	30.16	31.96
29.21	33.63	35.56	32.43	31.43	33.23
30.48	34.90	36.83	33.70	32.70	34.50
31.75	36.17	38.10	34.97	33.97	35.77
33.02	37.44	39.37	36.24	35.24	37.04
34.29	38.71	40.64	37.51	36.51	38.31
35.56	39.98	41.91	38.78	37.78	39.58
36.83	41.25	43.18	40.05	39.05	40.85
38.10	42.52	44.45	41.32	40.32	42.12
39.37	43.79	45.72	42.59	41.59	43.39
40.64	45.06	46.99	43.86	42.86	44.66
41.91	46.33	48.26	45.13	44.13	45.93
43.18	47.60	49.53	46.40	45.40	47.20
44.45	48.87	50.80	47.67	46.67	48.47
45.72	50.14	52.07	48.94	47.94	49.74
46.99	51.41	53.34	50.21	49.21	51.01
48.26	52.68	54.61	51.48	50.48	52.28
49.53	53.95	55.88	52.75	51.75	53.55
50.80	55.22	57.15	54.02	53.02	54.82
52.07	56.49	58.42	55.29	54.29	56.09
53.34	57.76	59.69	56.56	55.56	57.36
54.61	59.03	60.96	57.83	56.83	58.63
55.88	60.30	62.23	59.10	58.10	59.90
57.15	61.57	63.50	60.37	59.37	61.17
58.42	62.84	64.77	61.64	60.64	62.44
59.69	64.11	66.04	62.91	61.91	63.71
60.96	65.38	67.31	64.18	63.18	64.98
62.23	66.65	68.58	65.45	64.45	66.25

for performance level 1 2
for performance level S4 5
for performance level 2 6

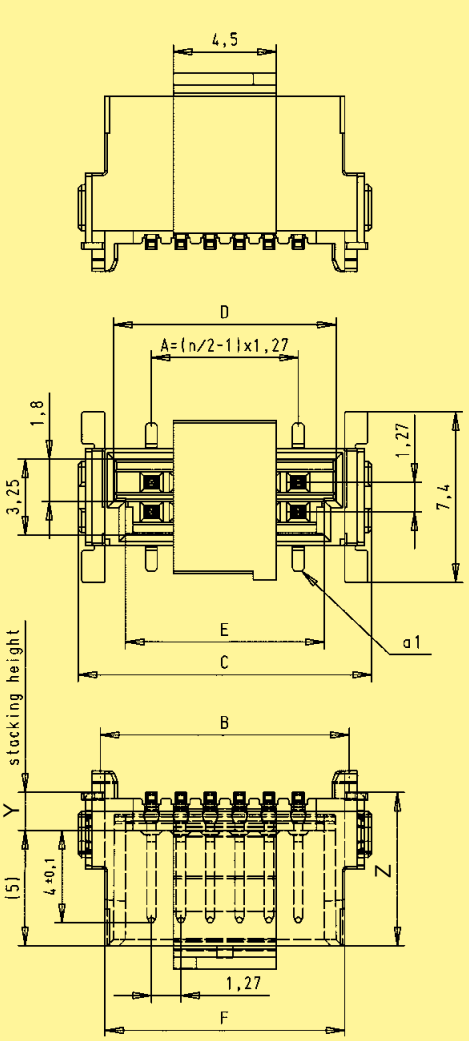
333 000 for samples
for 280 pieces on reel

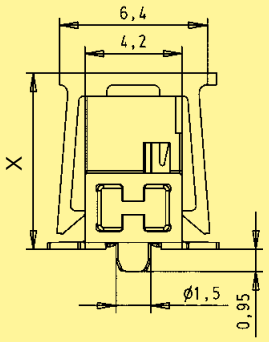


Male connectors, straight

Identification	Drawing	Dimensions in mm

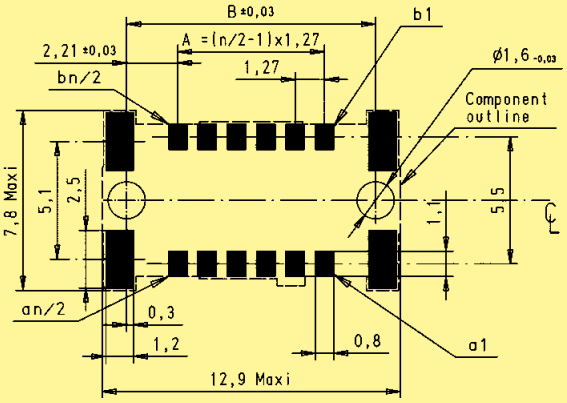
Dimensions





stacking height Y	X	Z
1.75	7.6	6.6
3.25	9.1	8.1

PCB layout



Female connectors, straight

Identification	Number of contacts	Part No.	Dimensions in mm

Female connector, straight, stacking heights 6.25 / 9.05 mm

Number of contacts	Part No.
6	15 2 . 006 . 601 . . .
8	15 2 . 008 . 601 . . .
10	15 2 . 010 . 601 . . .
12	15 2 . 012 . 601 . . .
14	15 2 . 014 . 601 . . .
16	15 2 . 016 . 601 . . .
18	15 2 . 018 . 601 . . .
20	15 2 . 020 . 601 . . .
22	15 2 . 022 . 601 . . .
24	15 2 . 024 . 601 . . .
26	15 2 . 026 . 601 . . .
28	15 2 . 028 . 601 . . .
30	15 2 . 030 . 601 . . .
32	15 2 . 032 . 601 . . .
34	15 2 . 034 . 601 . . .
36	15 2 . 036 . 601 . . .
38	15 2 . 038 . 601 . . .
40	15 2 . 040 . 601 . . .
42	15 2 . 042 . 601 . . .
44	15 2 . 044 . 601 . . .
46	15 2 . 046 . 601 . . .
48	15 2 . 048 . 601 . . .
50	15 2 . 050 . 601 . . .
52	15 2 . 052 . 601 . . .
54	15 2 . 054 . 601 . . .
56	15 2 . 056 . 601 . . .
58	15 2 . 058 . 601 . . .
60	15 2 . 060 . 601 . . .
62	15 2 . 062 . 601 . . .
64	15 2 . 064 . 601 . . .
66	15 2 . 066 . 601 . . .
68	15 2 . 068 . 601 . . .
70	15 2 . 070 . 601 . . .
72	15 2 . 072 . 601 . . .
74	15 2 . 074 . 601 . . .
76	15 2 . 076 . 601 . . .
78	15 2 . 078 . 601 . . .
80	15 2 . 080 . 601 . . .
82	15 2 . 082 . 601 . . .
84	15 2 . 084 . 601 . . .
86	15 2 . 086 . 601 . . .
88	15 2 . 088 . 601 . . .
90	15 2 . 090 . 601 . . .
92	15 2 . 092 . 601 . . .
94	15 2 . 094 . 601 . . .
96	15 2 . 096 . 601 . . .
98	15 2 . 098 . 601 . . .
100	15 2 . 100 . 601 . . .

Please insert digit for stacking height

6.25 mm ▶ 1
9.05 mm ▶ 2

A	B	C	D	E
2.54	6.96	8.89	5.56	4.56
3.81	8.23	10.16	6.83	5.83
5.08	9.50	11.43	8.10	7.10
6.35	10.77	12.70	9.37	8.37
7.62	12.04	13.97	10.64	9.64
8.89	13.31	15.24	11.91	10.91
10.16	14.58	16.51	13.18	12.18
11.43	15.85	17.78	14.45	13.45
12.70	17.12	19.05	15.72	14.72
13.97	18.39	20.32	16.99	15.99
15.24	19.66	21.59	18.26	17.26
16.51	20.93	22.86	19.53	18.53
17.78	22.20	24.13	20.80	19.80
19.05	23.47	25.40	22.07	21.07
20.32	24.74	26.67	23.34	22.34
21.59	26.01	27.94	24.61	23.61
22.86	27.28	29.21	25.88	24.88
24.13	28.55	30.48	27.15	26.15
25.40	29.82	31.75	28.42	27.42
26.67	31.09	33.02	29.69	28.69
27.94	32.36	34.29	30.96	29.96
29.21	33.63	35.56	32.23	31.23
30.48	34.90	36.83	33.50	32.50
31.75	36.17	38.10	34.77	33.77
33.02	37.44	39.37	36.04	35.04
34.29	38.71	40.64	37.31	36.31
35.56	39.98	41.91	38.58	37.58
36.83	41.25	43.18	39.85	38.85
38.10	42.52	44.45	41.12	40.12
39.37	43.79	45.72	42.39	41.39
40.64	45.06	46.99	43.66	42.66
41.91	46.33	48.26	44.93	43.93
43.18	47.60	49.53	46.20	45.20
44.45	48.87	50.80	47.47	46.47
45.72	50.14	52.07	48.74	47.74
46.99	51.41	53.34	50.01	49.01
48.26	52.68	54.61	51.28	50.28
49.53	53.95	55.88	52.55	51.55
50.80	55.22	57.15	53.82	52.82
52.07	56.49	58.42	55.09	54.09
53.34	57.76	59.69	56.36	55.36
54.61	59.03	60.96	57.63	56.63
55.88	60.30	62.23	58.90	57.90
57.15	61.57	63.50	60.17	59.17
58.42	62.84	64.77	61.44	60.44
59.69	64.11	66.04	62.71	61.71
60.96	65.38	67.31	63.98	62.98
62.23	66.65	68.58	65.25	64.25

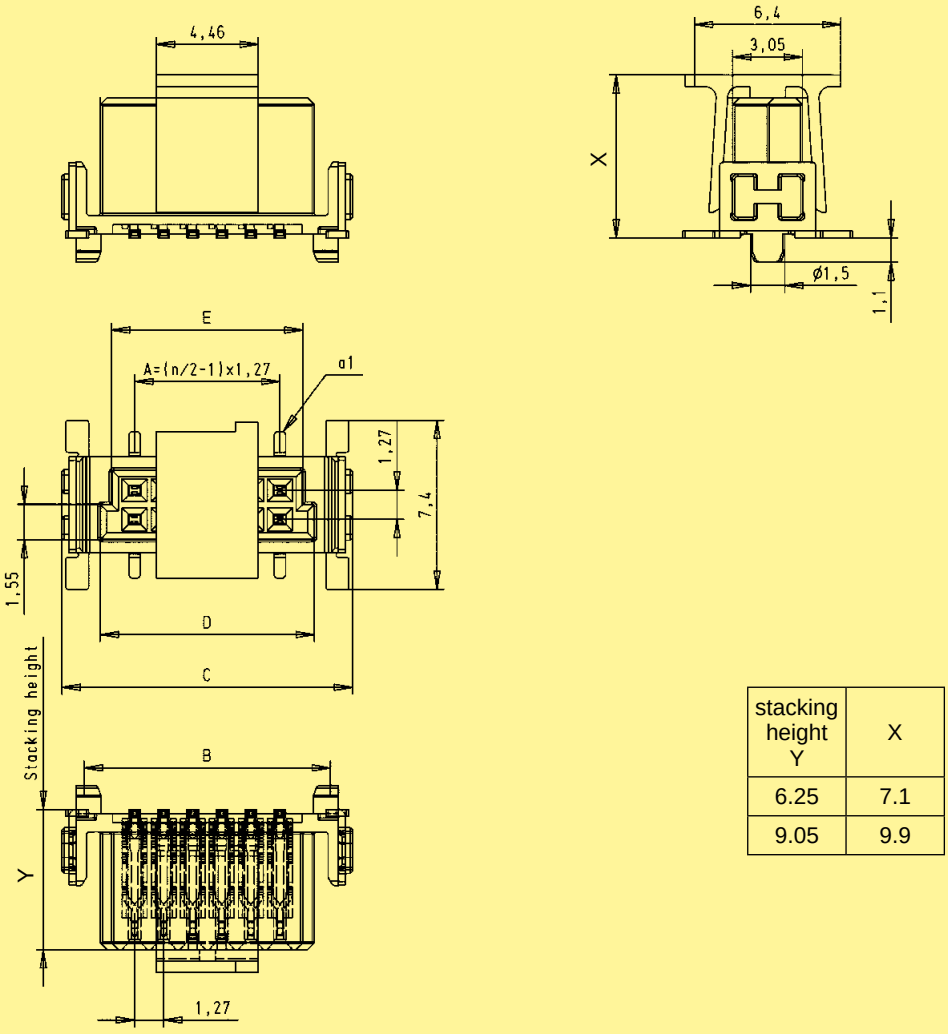
for performance level 1 2
for performance level S4 5
for performance level 2 6

333 000 for samples
for 280 pieces on reel

Female connectors, straight

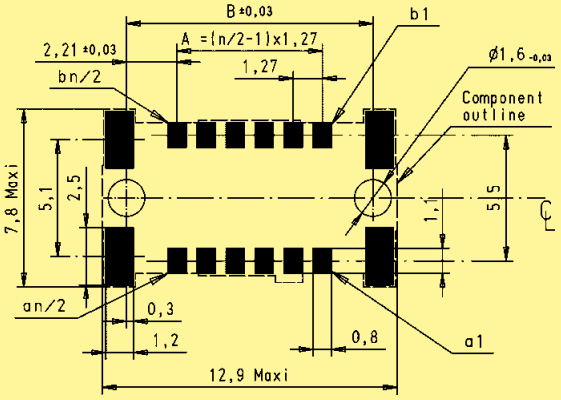
Identification	Drawing	Dimensions in mm

Dimensions



stacking height Y	X
6.25	7.1
9.05	9.9

PCB layout



available Q2 / 2012

Male connectors, angled

Identification	Number of contacts	Part No.	Dimensions in mm

Male connector, angled

Number of contacts	Part No.
6	15 15 006 . 601 . . .
8	15 15 008 . 601 . . .
10	15 15 010 . 601 . . .
12	15 15 012 . 601 . . .
14	15 15 014 . 601 . . .
16	15 15 016 . 601 . . .
18	15 15 018 . 601 . . .
20	15 15 020 . 601 . . .
22	15 15 022 . 601 . . .
24	15 15 024 . 601 . . .
26	15 15 026 . 601 . . .
28	15 15 028 . 601 . . .
30	15 15 030 . 601 . . .
32	15 15 032 . 601 . . .
34	15 15 034 . 601 . . .
36	15 15 036 . 601 . . .
38	15 15 038 . 601 . . .
40	15 15 040 . 601 . . .
42	15 15 042 . 601 . . .
44	15 15 044 . 601 . . .
46	15 15 046 . 601 . . .
48	15 15 048 . 601 . . .
50	15 15 050 . 601 . . .
52	15 15 052 . 601 . . .
54	15 15 054 . 601 . . .
56	15 15 056 . 601 . . .
58	15 15 058 . 601 . . .
60	15 15 060 . 601 . . .
62	15 15 062 . 601 . . .
64	15 15 064 . 601 . . .
66	15 15 066 . 601 . . .
68	15 15 068 . 601 . . .
70	15 15 070 . 601 . . .
72	15 15 072 . 601 . . .
74	15 15 074 . 601 . . .
76	15 15 076 . 601 . . .
78	15 15 078 . 601 . . .
80	15 15 080 . 601 . . .
82	15 15 082 . 601 . . .
84	15 15 084 . 601 . . .
86	15 15 086 . 601 . . .
88	15 15 088 . 601 . . .
90	15 15 090 . 601 . . .
92	15 15 092 . 601 . . .
94	15 15 094 . 601 . . .
96	15 15 096 . 601 . . .
98	15 15 098 . 601 . . .
100	15 15 100 . 601 . . .

A	B	C	D	E
2.54	6.96	8.89	5.76	4.76
3.81	8.23	10.16	7.03	6.03
5.08	9.50	11.43	8.30	7.30
6.35	10.77	12.70	9.57	8.57
7.62	12.04	13.97	10.84	9.84
8.89	13.31	15.24	12.11	11.11
10.16	14.58	16.51	13.38	12.38
11.43	15.85	17.78	14.65	13.65
12.70	17.12	19.05	15.92	14.92
13.97	18.39	20.32	17.19	16.19
15.24	19.66	21.59	18.46	17.46
16.51	20.93	22.86	19.73	18.73
17.78	22.20	24.13	21.00	20.00
19.05	23.47	25.40	22.27	21.27
20.32	24.74	26.67	23.54	22.54
21.59	26.01	27.94	24.81	23.81
22.86	27.28	29.21	26.08	25.08
24.13	28.55	30.48	27.35	26.35
25.40	29.82	31.75	28.62	27.62
26.67	31.09	33.02	29.89	28.89
27.94	32.36	34.29	31.16	30.16
29.21	33.63	35.56	32.43	31.43
30.48	34.90	36.83	33.70	32.70
31.75	36.17	38.10	34.97	33.97
33.02	37.44	39.37	36.24	35.24
34.29	38.71	40.64	37.51	36.51
35.56	39.98	41.91	38.78	37.78
36.83	41.25	43.18	40.05	39.05
38.10	42.52	44.45	41.32	40.32
39.37	43.79	45.72	42.59	41.59
40.64	45.06	46.99	43.86	42.86
41.91	46.33	48.26	45.13	44.13
43.18	47.60	49.53	46.40	45.40
44.45	48.87	50.80	47.67	46.67
45.72	50.14	52.07	48.94	47.94
46.99	51.41	53.34	50.21	49.21
48.26	52.68	54.61	51.48	50.48
49.53	53.95	55.88	52.75	51.75
50.80	55.22	57.15	54.02	53.02
52.07	56.49	58.42	55.29	54.29
53.34	57.76	59.69	56.56	55.56
54.61	59.03	60.96	57.83	56.83
55.88	60.30	62.23	59.10	58.10
57.15	61.57	63.50	60.37	59.37
58.42	62.84	64.77	61.64	60.64
59.69	64.11	66.04	62.91	61.91
60.96	65.38	67.31	64.18	63.18
62.23	66.65	68.58	65.45	64.45

for performance level 1
for performance level S4
for performance level 2

2
5
6

333
000

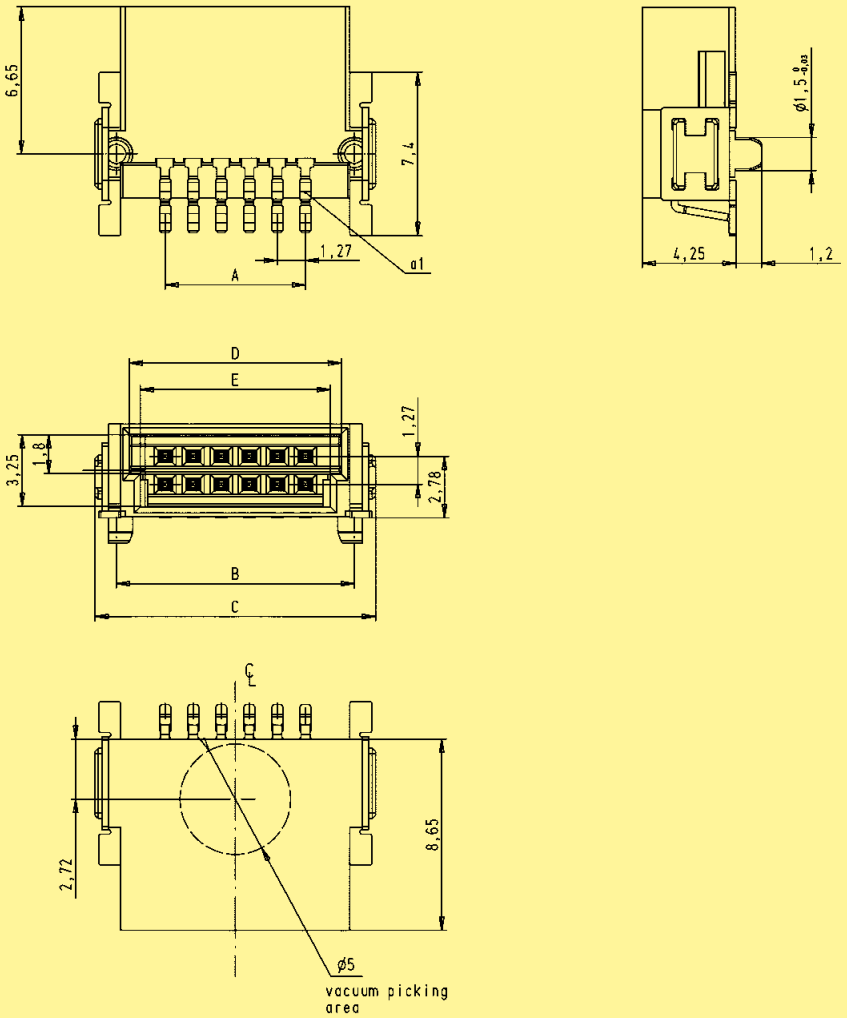
for samples
for 560 pieces on reel

available Q2 / 2012

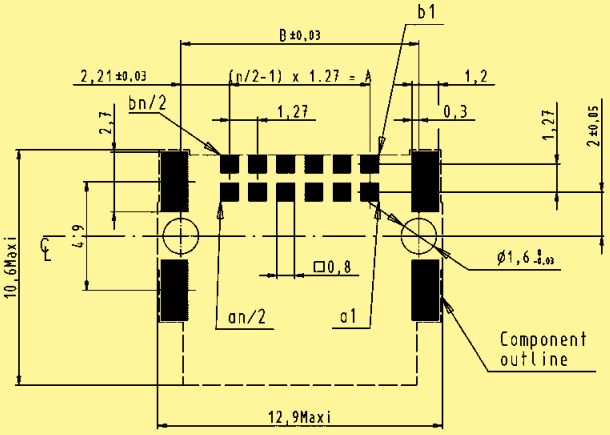
Male connectors, angled

Identification	Drawing	Dimensions in mm

Dimensions



PCB layout



available Q2 / 2012

Female connectors, angled

Identification	Number of contacts	Part No.	Dimensions in mm

Female connector, angled

Number of contacts	Part No.
6	15 25 006 . 601 . . .
8	15 25 008 . 601 . . .
10	15 25 010 . 601 . . .
12	15 25 012 . 601 . . .
14	15 25 014 . 601 . . .
16	15 25 016 . 601 . . .
18	15 25 018 . 601 . . .
20	15 25 020 . 601 . . .
22	15 25 022 . 601 . . .
24	15 25 024 . 601 . . .
26	15 25 026 . 601 . . .
28	15 25 028 . 601 . . .
30	15 25 030 . 601 . . .
32	15 25 032 . 601 . . .
34	15 25 034 . 601 . . .
36	15 25 036 . 601 . . .
38	15 25 038 . 601 . . .
40	15 25 040 . 601 . . .
42	15 25 042 . 601 . . .
44	15 25 044 . 601 . . .
46	15 25 046 . 601 . . .
48	15 25 048 . 601 . . .
50	15 25 050 . 601 . . .
52	15 25 052 . 601 . . .
54	15 25 054 . 601 . . .
56	15 25 056 . 601 . . .
58	15 25 058 . 601 . . .
60	15 25 060 . 601 . . .
62	15 25 062 . 601 . . .
64	15 25 064 . 601 . . .
66	15 25 066 . 601 . . .
68	15 25 068 . 601 . . .
70	15 25 070 . 601 . . .
72	15 25 072 . 601 . . .
74	15 25 074 . 601 . . .
76	15 25 076 . 601 . . .
78	15 25 078 . 601 . . .
80	15 25 080 . 601 . . .
82	15 25 082 . 601 . . .
84	15 25 084 . 601 . . .
86	15 25 086 . 601 . . .
88	15 25 088 . 601 . . .
90	15 25 090 . 601 . . .
92	15 25 092 . 601 . . .
94	15 25 094 . 601 . . .
96	15 25 096 . 601 . . .
98	15 25 098 . 601 . . .
100	15 25 100 . 601 . . .

A	B	C	D	E
2.54	6.96	8.89	5.56	4.56
3.81	8.23	10.16	6.83	5.83
5.08	9.50	11.43	8.10	7.10
6.35	10.77	12.70	9.37	8.37
7.62	12.04	13.97	10.64	9.64
8.89	13.31	15.24	11.91	10.91
10.16	14.58	16.51	13.18	12.18
11.43	15.85	17.78	14.45	13.45
12.70	17.12	19.05	15.72	14.72
13.97	18.39	20.32	16.99	15.99
15.24	19.66	21.59	18.26	17.26
16.51	20.93	22.86	19.53	18.53
17.78	22.20	24.13	20.80	19.80
19.05	23.47	25.40	22.07	21.07
20.32	24.74	26.67	23.34	22.34
21.59	26.01	27.94	24.61	23.61
22.86	27.28	29.21	25.88	24.88
24.13	28.55	30.48	27.15	26.15
25.40	29.82	31.75	28.42	27.42
26.67	31.09	33.02	29.69	28.69
27.94	32.36	34.29	30.96	29.96
29.21	33.63	35.56	32.23	31.23
30.48	34.90	36.83	33.50	32.50
31.75	36.17	38.10	34.77	33.77
33.02	37.44	39.37	36.04	35.04
34.29	38.71	40.64	37.31	36.31
35.56	39.98	41.91	38.58	37.58
36.83	41.25	43.18	39.85	38.85
38.10	42.52	44.45	41.12	40.12
39.37	43.79	45.72	42.39	41.39
40.64	45.06	46.99	43.66	42.66
41.91	46.33	48.26	44.93	43.93
43.18	47.60	49.53	46.20	45.20
44.45	48.87	50.80	47.47	46.47
45.72	50.14	52.07	48.74	47.74
46.99	51.41	53.34	50.01	49.01
48.26	52.68	54.61	51.28	50.28
49.53	53.95	55.88	52.55	51.55
50.80	55.22	57.15	53.82	52.82
52.07	56.49	58.42	55.09	54.09
53.34	57.76	59.69	56.36	55.36
54.61	59.03	60.96	57.63	56.63
55.88	60.30	62.23	58.90	57.90
57.15	61.57	63.50	60.17	59.17
58.42	62.84	64.77	61.44	60.44
59.69	64.11	66.04	62.71	61.71
60.96	65.38	67.31	63.98	62.98
62.23	66.65	68.58	65.25	64.25

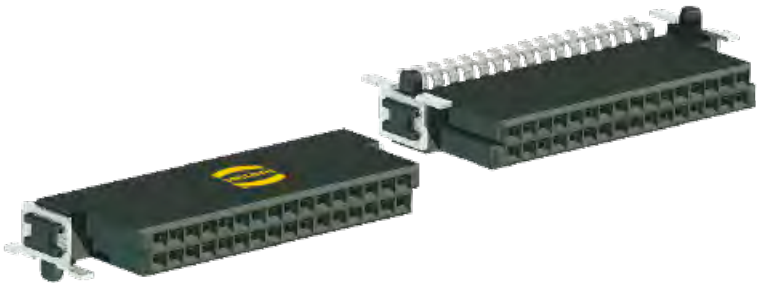
for performance level 1
for performance level S4
for performance level 2

2
5
6

333
000

for samples
for 560 pieces on reel

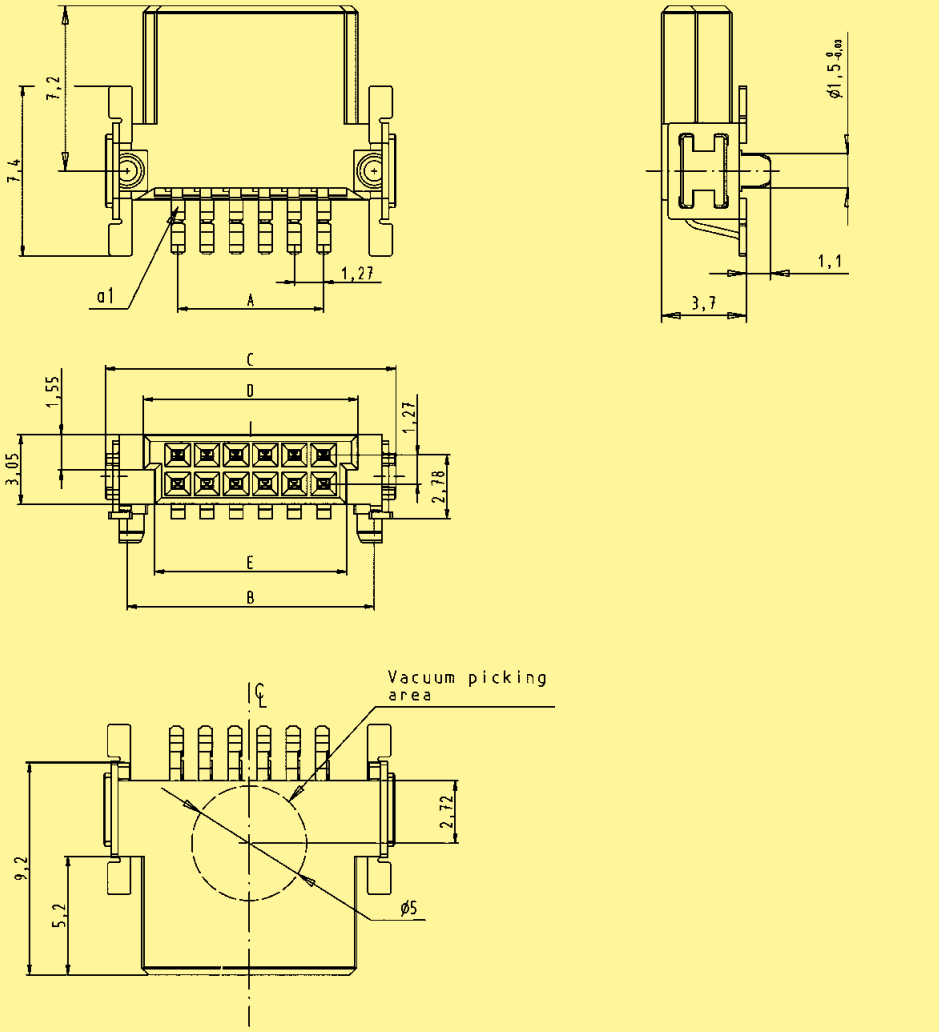
available Q2 / 2012



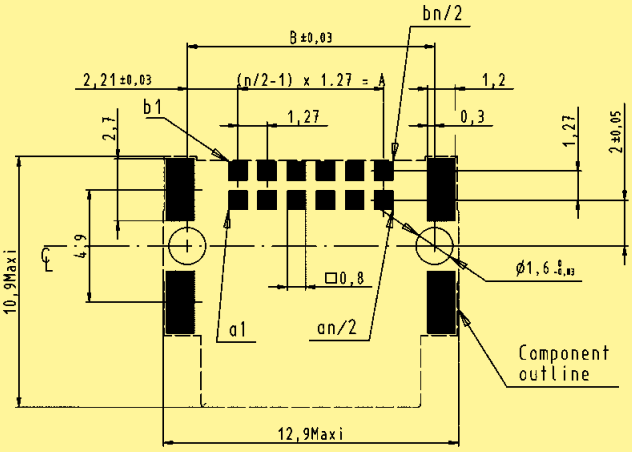
Female connectors, angled

Identification	Drawing	Dimensions in mm

Dimensions



PCB layout



Female connectors, IDC

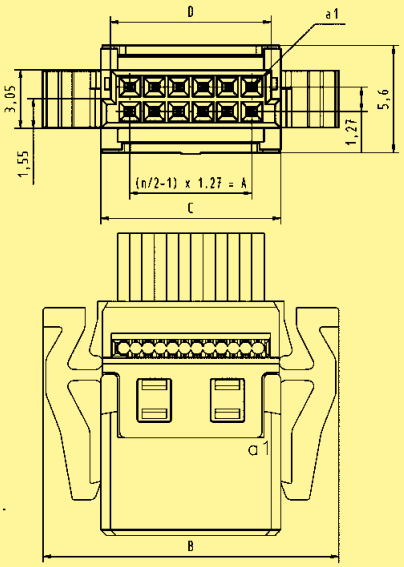
Identification	Number of contacts	Part No.	Dimensions in mm				
			A	B	C	D	E
Female connector, IDC in a tray packaging	6	15 29 006 . 50 . 000	2.54	11.59	5.56	4.56	15.00
	8	15 29 008 . 50 . 000	3.81	12.86	6.83	5.83	15.00
	10	15 29 010 . 50 . 000	5.08	14.13	8.10	7.10	15.00
	12	15 29 012 . 50 . 000	6.35	15.40	9.37	8.37	15.00
	14	15 29 014 . 50 . 000	7.62	16.67	10.64	9.64	15.00
	16	15 29 016 . 50 . 000	8.89	17.94	11.91	10.91	15.00
	18	15 29 018 . 50 . 000	10.16	19.21	13.18	12.18	15.00
	20	15 29 020 . 50 . 000	11.43	20.48	14.45	13.45	15.00
	22	15 29 022 . 50 . 000	12.70	21.75	15.72	14.72	15.00
	24	15 29 024 . 50 . 000	13.97	23.02	16.99	15.99	15.00
	26	15 29 026 . 50 . 000	15.24	24.29	18.26	17.26	15.00
	28	15 29 028 . 50 . 000	16.51	25.56	19.53	18.53	15.00
	30	15 29 030 . 50 . 000	17.78	26.83	20.80	19.80	15.00
	32	15 29 032 . 50 . 000	19.05	28.10	22.07	21.07	15.00
	34	15 29 034 . 50 . 000	20.32	29.37	23.34	22.34	15.00
	36	15 29 036 . 50 . 000	21.59	30.64	24.61	23.61	15.00
	38	15 29 038 . 50 . 000	22.86	31.91	25.88	24.88	15.00
	40	15 29 040 . 50 . 000	24.13	33.18	27.15	26.15	15.00
	42	15 29 042 . 50 . 000	25.40	34.45	28.42	27.42	15.00
	44	15 29 044 . 50 . 000	26.67	35.72	29.69	28.69	15.00
	46	15 29 046 . 50 . 000	27.94	36.99	30.96	29.96	15.00
	48	15 29 048 . 50 . 000	29.21	38.26	32.23	31.23	15.00
	50	15 29 050 . 50 . 000	30.48	39.53	33.50	32.50	15.00
	52	15 29 052 . 50 . 000	31.75	40.80	34.77	33.77	15.00
	54	15 29 054 . 50 . 000	33.02	42.07	36.04	35.04	15.00
	56	15 29 056 . 50 . 000	34.29	43.34	37.31	36.31	15.00
	58	15 29 058 . 50 . 000	35.56	44.61	38.58	37.58	15.00
	60	15 29 060 . 50 . 000	36.83	45.88	39.85	38.85	16.20
	62	15 29 062 . 50 . 000	38.10	47.15	41.12	40.12	16.20
	64	15 29 064 . 50 . 000	39.37	48.42	42.39	41.39	16.20
	66	15 29 066 . 50 . 000	40.64	49.69	43.66	42.66	16.20
	68	15 29 068 . 50 . 000	41.91	50.96	44.93	43.93	16.20
	70	15 29 070 . 50 . 000	43.18	52.23	46.20	45.20	16.20
	72	15 29 072 . 50 . 000	44.45	53.50	47.47	46.47	16.20
	74	15 29 074 . 50 . 000	45.72	54.77	48.74	47.74	16.20
	76	15 29 076 . 50 . 000	46.99	56.04	50.01	49.01	16.20
	78	15 29 078 . 50 . 000	48.26	57.31	51.28	50.28	16.20
	80	15 29 080 . 50 . 000	49.53	58.58	52.55	51.55	16.20
	82	15 29 082 . 50 . 000	50.80	59.85	53.82	52.82	16.20
	84	15 29 084 . 50 . 000	52.07	61.12	55.09	54.09	16.20
	86	15 29 086 . 50 . 000	53.34	62.39	56.36	55.36	16.20
	88	15 29 088 . 50 . 000	54.61	63.66	57.63	56.63	16.20
	90	15 29 090 . 50 . 000	55.88	64.93	58.90	57.90	16.20
	92	15 29 092 . 50 . 000	57.15	66.20	60.17	59.17	16.20
Please insert digit	94	15 29 094 . 50 . 000	58.42	67.47	61.44	60.44	16.20
	96	15 29 096 . 50 . 000	59.69	68.74	62.71	61.71	16.20
	98	15 29 098 . 50 . 000	60.96	70.01	63.98	62.98	16.20
for performance level 1 ▶ 2	100	15 29 100 . 50 . 000	62.23	71.28	65.25	64.25	16.20
for performance level S4 ▶ 5							
for performance level 2 ▶ 6							

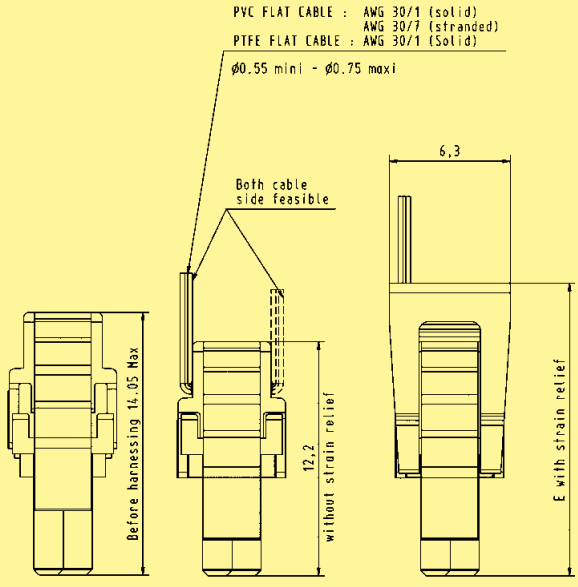
without strain relief 1
with strain relief 2

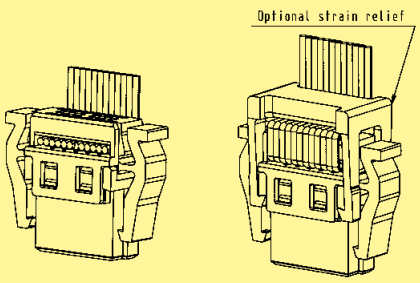
Female connectors, IDC

Identification	Drawing	Dimensions in mm

Dimensions







Strain reliefs for female connectors, IDC

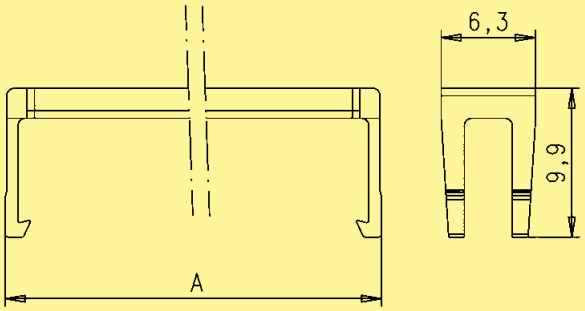
Identification	Number of contacts	Part No.	Dimensions in mm
			A
Strain reliefs for female connectors, IDC	6	15 29 006 0503 000	7.31
	8	15 29 008 0503 000	8.58
	10	15 29 010 0503 000	9.85
	12	15 29 012 0503 000	11.12
	14	15 29 014 0503 000	12.39
	16	15 29 016 0503 000	13.66
	18	15 29 018 0503 000	14.93
	20	15 29 020 0503 000	16.20
	22	15 29 022 0503 000	17.47
	24	15 29 024 0503 000	18.74
	26	15 29 026 0503 000	20.01
	28	15 29 028 0503 000	21.28
	30	15 29 030 0503 000	22.55
	32	15 29 032 0503 000	23.82
	34	15 29 034 0503 000	25.09
	36	15 29 036 0503 000	26.36
	38	15 29 038 0503 000	27.63
	40	15 29 040 0503 000	28.90
	42	15 29 042 0503 000	30.17
	44	15 29 044 0503 000	31.44
	46	15 29 046 0503 000	32.71
	48	15 29 048 0503 000	33.98
	50	15 29 050 0503 000	35.25
	52	15 29 052 0503 000	36.52
	54	15 29 054 0503 000	37.79
	56	15 29 056 0503 000	39.06
	58	15 29 058 0503 000	40.33
	60	15 29 060 0503 000	41.60
	62	15 29 062 0503 000	42.87
	64	15 29 064 0503 000	44.14
	66	15 29 066 0503 000	45.41
	68	15 29 068 0503 000	46.68
	70	15 29 070 0503 000	47.95
	72	15 29 072 0503 000	49.22
	74	15 29 074 0503 000	50.49
	76	15 29 076 0503 000	51.76
	78	15 29 078 0503 000	53.03
	80	15 29 080 0503 000	54.30
	82	15 29 082 0503 000	55.57
	84	15 29 084 0503 000	56.84
	86	15 29 086 0503 000	58.11
	88	15 29 088 0503 000	59.38
	90	15 29 090 0503 000	60.65
	92	15 29 092 0503 000	61.92
	94	15 29 094 0503 000	63.19
	96	15 29 096 0503 000	64.46
	98	15 29 098 0503 000	65.73
	100	15 29 100 0503 000	67.00

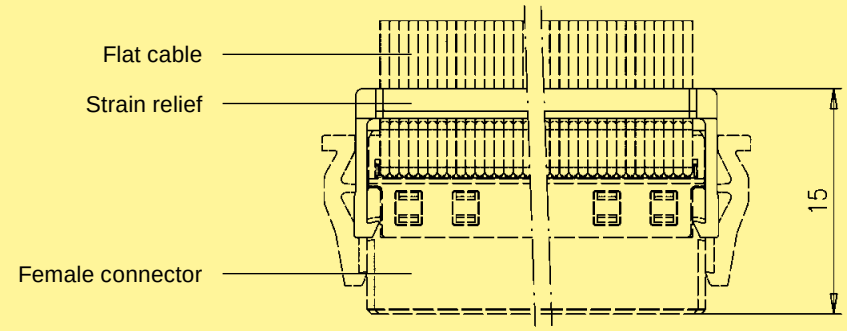
Strain reliefs for female connectors, IDC

Identification	Drawing	Dimensions in mm

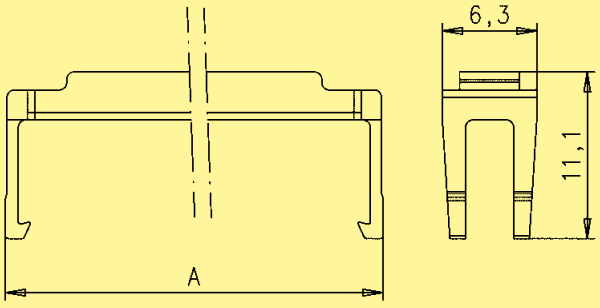
Dimensions

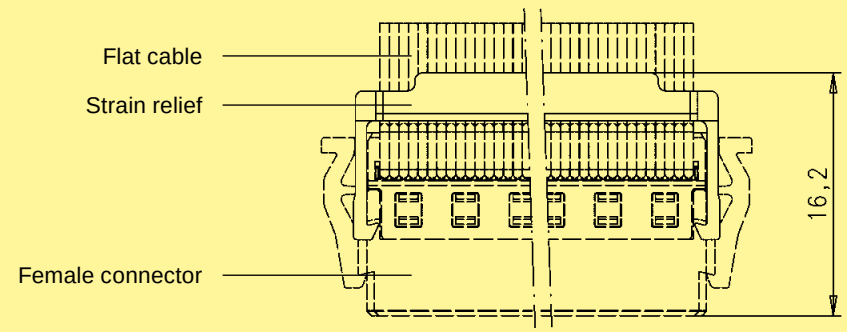
6 – 58 contacts



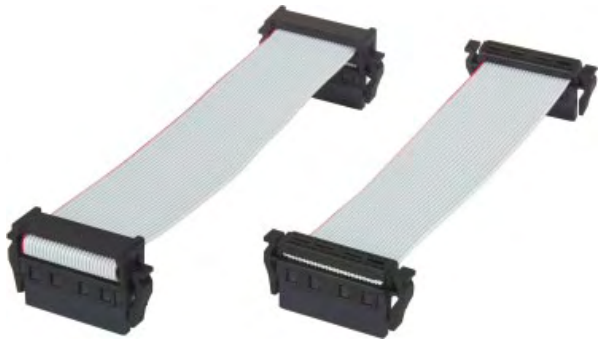


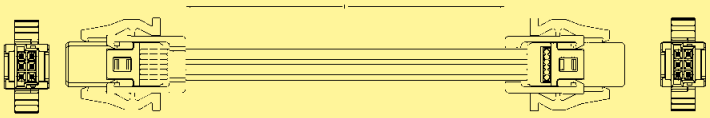
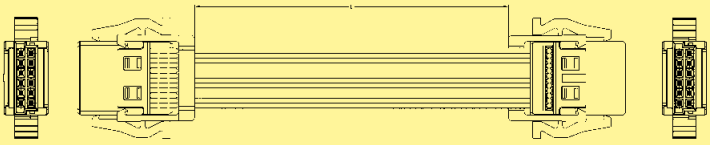
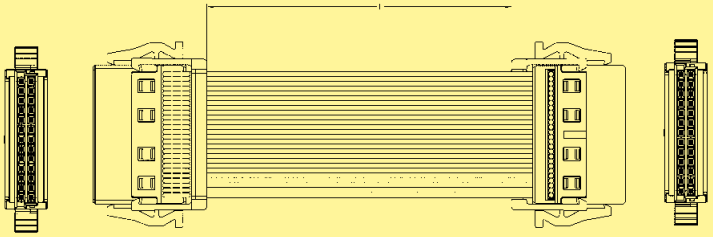
60 – 100 contacts

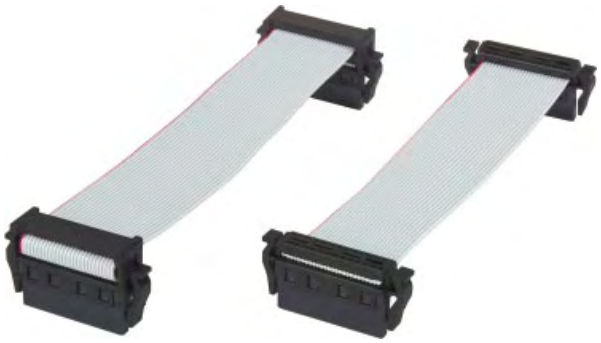




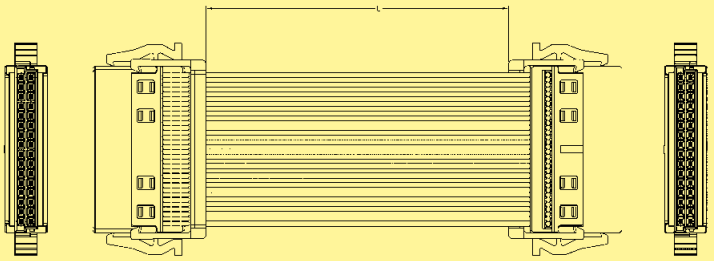
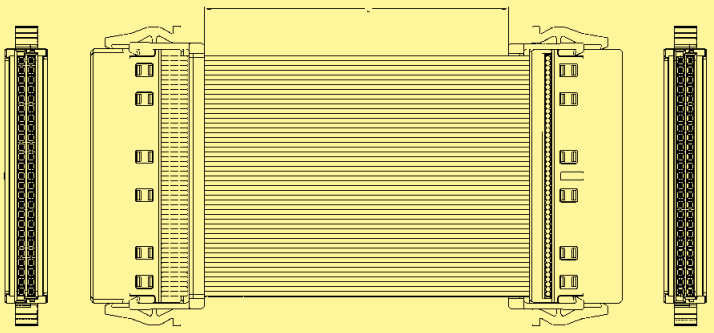
Cable assemblies



Identification	Part No.	Drawing	Dimensions in mm
Cable assembly *har*-flex® 6 pole Cable: Flat cable, 6 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m	33 15 243 0100 001		
L = 0.2 m	33 15 243 0200 002		
L = 0.5 m	33 15 243 0500 003		
Cable assembly *har*-flex® 12 pole Cable: Flat cable, 12 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m	33 15 243 0100 004		
L = 0.2 m	33 15 243 0200 005		
L = 0.5 m	33 15 243 0500 006		
Cable assembly *har*-flex® 26 pole Cable: Flat cable, 26 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m	33 15 243 0100 007		
L = 0.2 m	33 15 243 0200 008		
L = 0.5 m	33 15 243 0500 009		

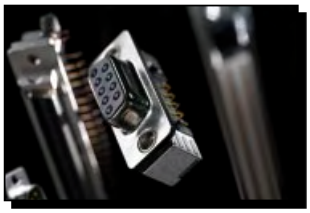


Cable assemblies

Identification	Part No.	Drawing	Dimensions in mm
Cable assembly *har*-flex® 32 pole Cable: Flat cable, 32 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m	33 15 243 0100 010		
L = 0.2 m	33 15 243 0200 011		
L = 0.5 m	33 15 243 0500 012		
Cable assembly *har*-flex® 50 pole Cable: Flat cable, 50 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m	33 15 243 0100 013		
L = 0.2 m	33 15 243 0200 014		
L = 0.5 m	33 15 243 0500 015		

Catalogue order information

Please send me further information:



☐ **Interface Connectors**

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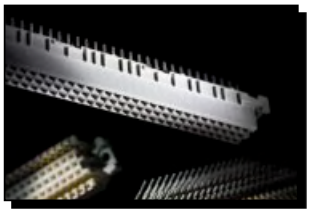

☐ **Connectors DIN 41612**

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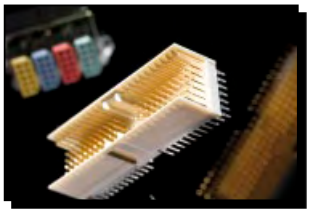
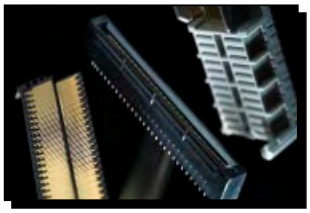
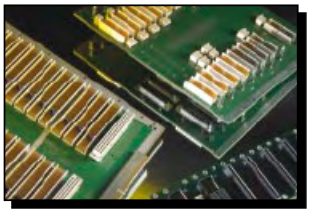


☐ **Coaxial and Metric Connectors**

☐ **Application brochure**



☐ **TCA Connectors**



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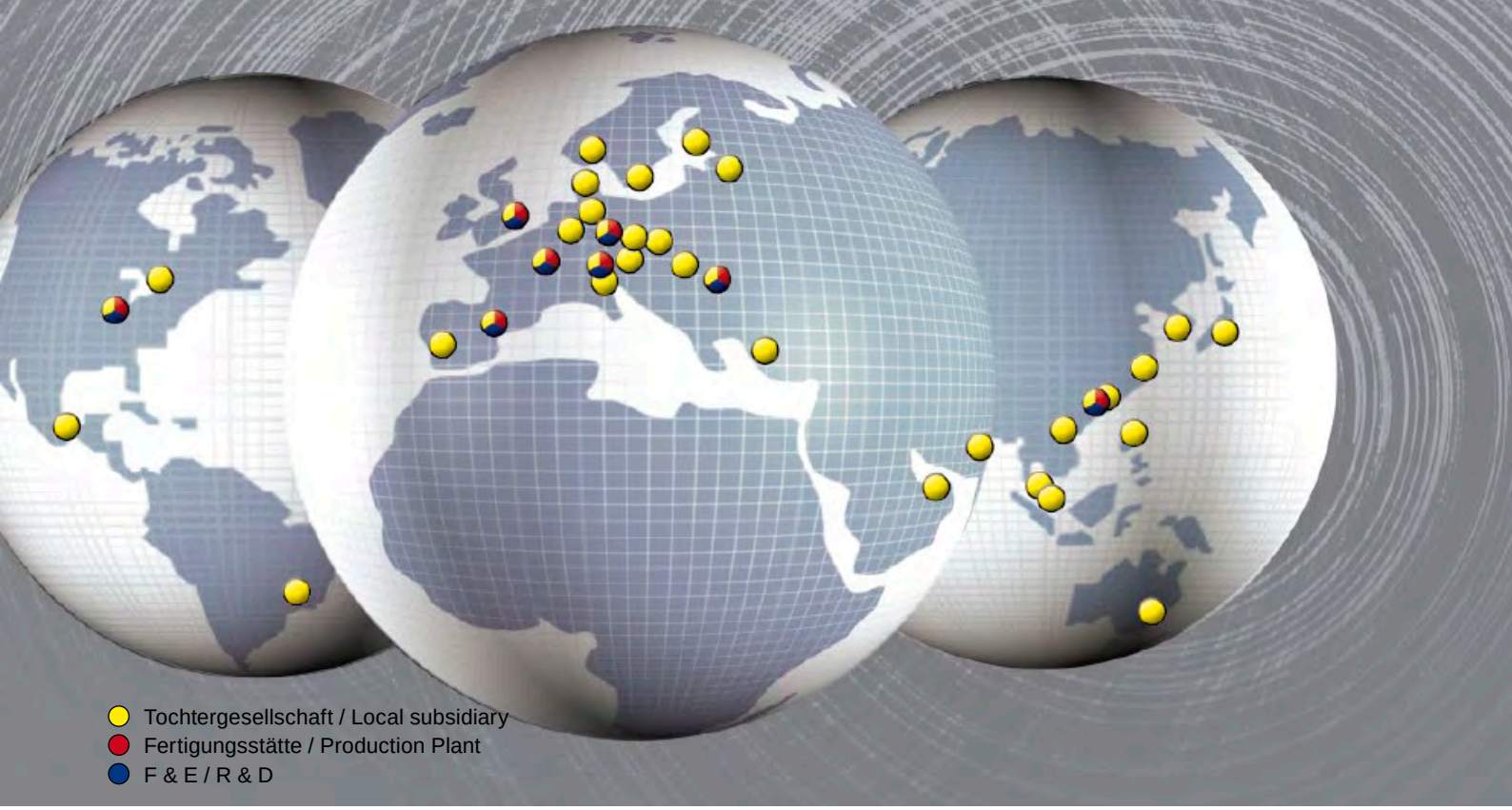

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