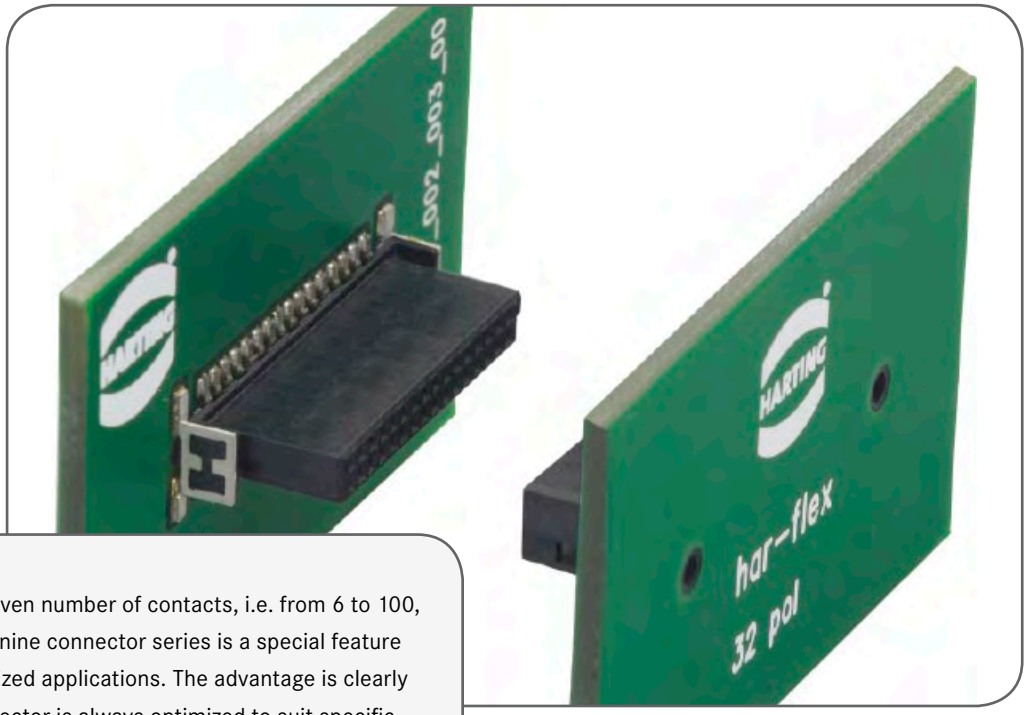


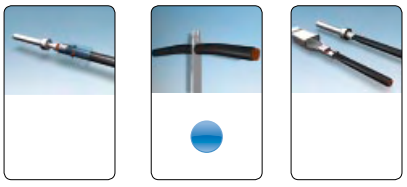
The continuous scalability by an even number of contacts, i.e. from 6 to 100, of the HARTING's *har*-flex® mezzanine connector series is a special feature forming an ideal basis for customized applications. The advantage is clearly evident considering that the connector is always optimized to suit specific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

Application profile:

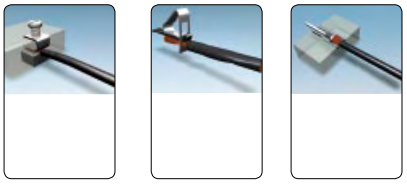
CONNECTION TYPE		ENVIRONMENT		APPLICATION						
Board to Board	Cable/ Wire to Board	IP 20	IP 65 / IP 67	Data	Signal	Power	high performance			
							Data transfer rate	Shielding	Number of contacts, contact density	Voltage, working current
●	●	●		●	●				●	

Cable termination

Han-Quick Lock® | *IDC* | *Crimp*

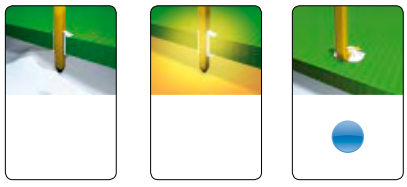


Screw | *Cage clamp* | *Axial screw*

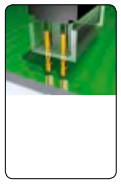


PCB termination

THT | *SMC* | *SMT*



Press-in

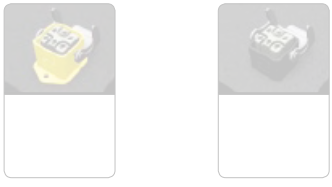


Application standard

SCSI

Housing integration

Separate housing | *Integrated housing*



CONTENTS

harflex® tooling see chapter 20

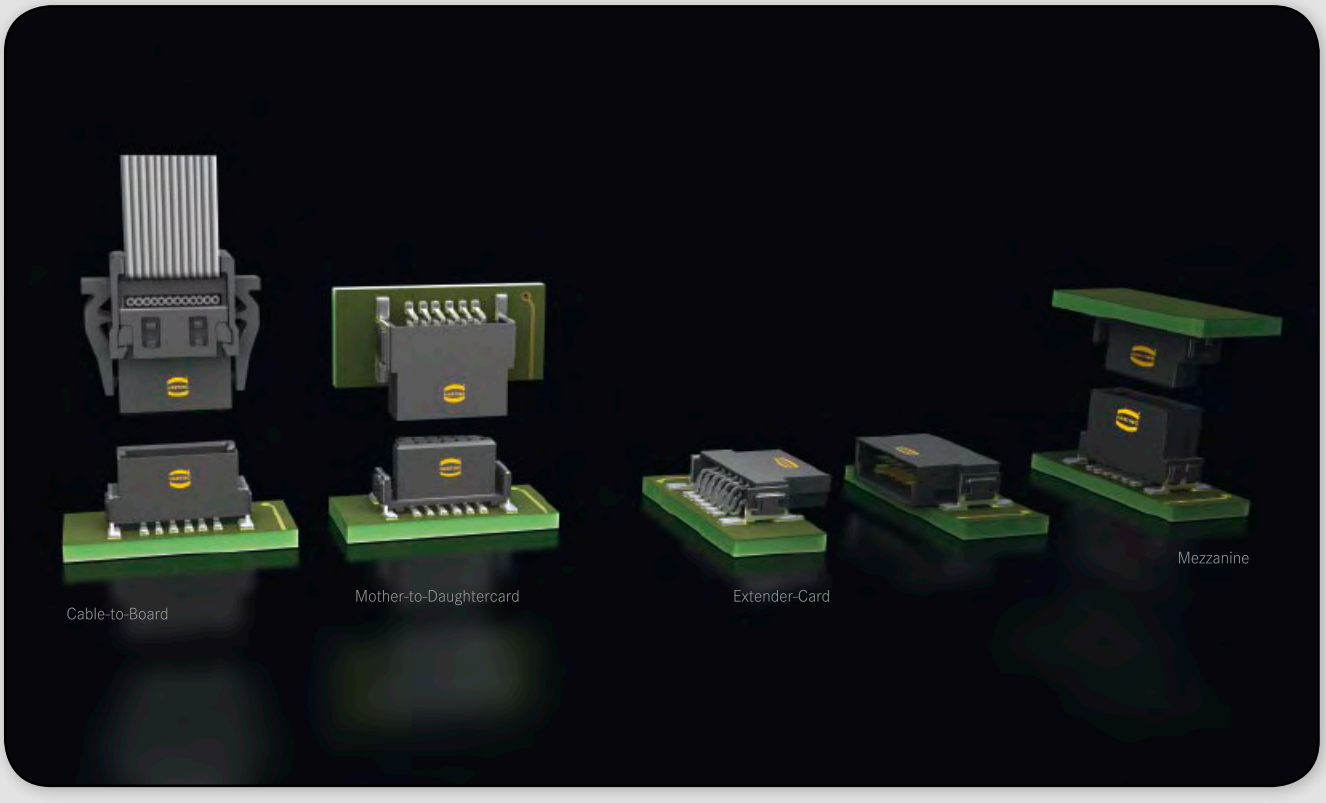
har-flex® CONNECTORS

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.

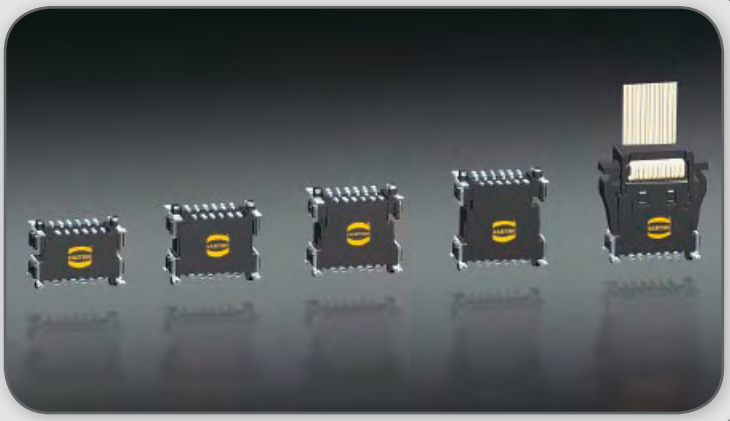
PRODUCT DIVERSITY

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.

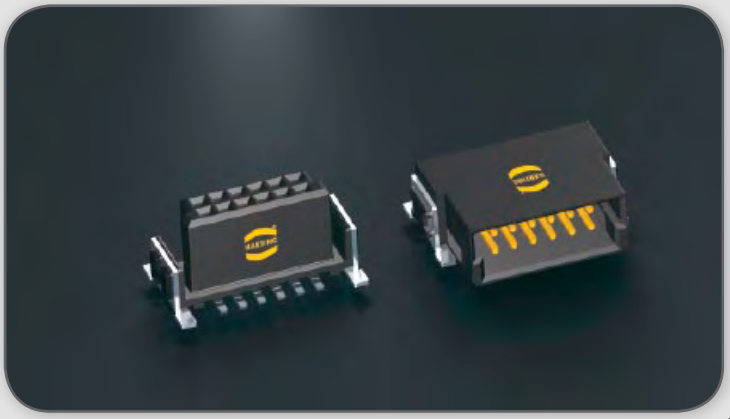


Many pin count options
HARTING has developed a modular tooling concept which offers a broad choice of configurations between 6 and 100 poles in even numbered positions. This flexibility in the choice of number of contacts, combined with high density contact spacing, allow the designer to maximize the 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

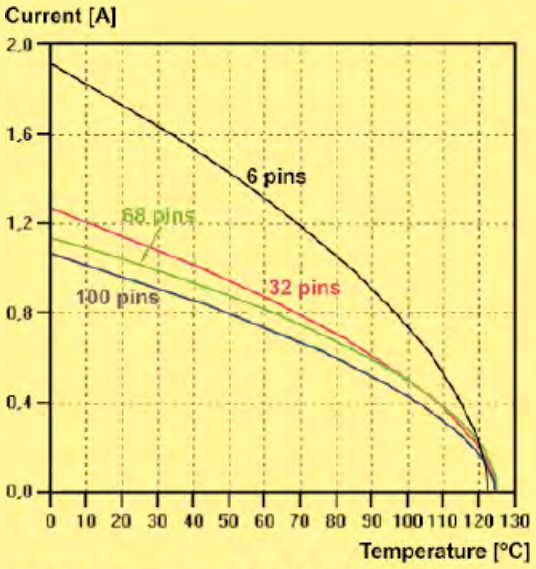
70 °C ambient temperature @ 80 % derating

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 . . . . . .

Betriebsspannung nach IEC 60664-1

Die Betriebsspannung ist von benutzerspezifischen Betriebsbedingungen abhängig. In Abhängigkeit von der Überspannungskategorie, dem Verschmutzungsgrad und der gesamten elektrischen Umgebung kann die Betriebsspannung ebenfalls variieren. In der IEC 60664-1 wird der generelle, minimale Isolationsabstand für Komponenten definiert, kann allerdings auch herangezogen werden um die maximal zulässige Betriebsspannung unter gegebenen Bedingungen zu ermitteln.

Die nachfolgende Tabelle zeigt die gebräuchlichsten Bedingungen für *har*-flex® Steckverbinder und exemplarisch die Berechnung der Betriebsspannung. Für Überspannungskategorien, Verschmutzungsgrade und anderen Bedingungen die nicht in der Tabelle gezeigt werden, beziehen wir uns auf die IEC 60664-1.

Luft- und Kriechstrecke	0,4 mm			
CTI-Wert	< 400			
Isolationsgruppen	III a/b			
Art des elektrischen Feldes	Fall A (Inhomogenes Feld)		Fall B (Homogenes Feld)	
Überspannungskategorie	I	II	I	II
Verschmutzungsgrad	1	1	1	1
Betriebsspannung max.	**150 V**	**100 V**	**150 V**	**150 V**

Erklärung:

– CTI-Wert und Isolationsgruppe sind feste Größen der *har*-flex® Steckverbinderbaureihe.

– Überspannungskategorie I: Betriebsmittel, bestimmt zur Anwendung in Geräten oder Teilen von Anlagen, in denen keine Überspannungen auftreten können. Die Betriebsmittel dieser Überspannungskategorie werden vorwiegend mit Kleinspannung betrieben.

– Überspannungskategorie II: Betriebsmittel, bestimmt zur Anwendung in Anlagen oder Teilen von diesen, in denen Blitzüberspannungen nicht berücksichtigt werden müssen, jedoch Überspannungen durch Schaltvorgänge auftreten.

– Verschmutzungsgrad 1: Es tritt keine oder nur trockene, nichtleitfähige Verschmutzung auf. Die Verschmutzung hat keinen Einfluss.

– Verschmutzungsgrad 2: Es tritt nur nichtleitfähige Verschmutzung auf. Gelegentlich muss mit vorübergehender Leitfähigkeit durch Betauung gerechnet werden.

Definition der Bestell-Nummer

Die *har*-flex® Bestell-Nummern haben 14 Stellen und unterliegen folgendem Schema:

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

15 *har*-flex® Familie

Steckverbinderart
- 11 Messerleiste gerade 1,75 mm Stapelhöhe
- 12 Messerleiste gerade 3,25 mm Stapelhöhe
- 15 Messerleiste gewinkelt
- 21 Federleiste gerade 6,25 mm Stapelhöhe
- 22 Federleiste gerade 9,05 mm Stapelhöhe
- 25 Federleiste gewinkelt
- 29 IDC Kabelsteck-verbinder / Zubehör

Kontaktzahlen

Steckzyklen
- 2 Anforderungs-stufe 1
- 5 Anforderungs-stufe S4
- 6 Anforderungs-stufe 2

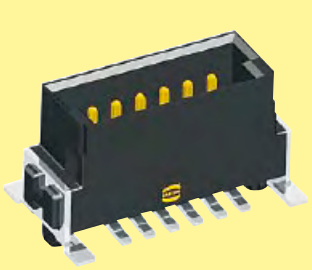
Anschluss
- 5 IDC
- 6 SMT

Zählnummer

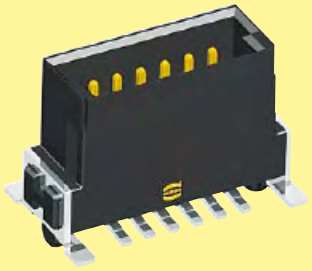
Verpackung
- 000 Tape & Reel Verpackung Tray Verpackung für IDC Kabel-Steckverbinder
- 333 Muster

Stacking heights of straight connector versions

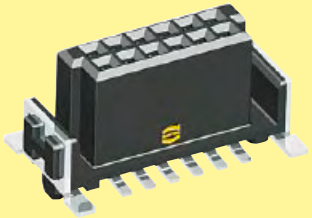
The *har*-flex® connectors cover mezzanine applications with a range of straight versions for four different stacking heights that can be used to interconnect PCBs arranged in parallel stacks with spacing between 8.0 mm and 13.8 mm.



Male 1.75 mm



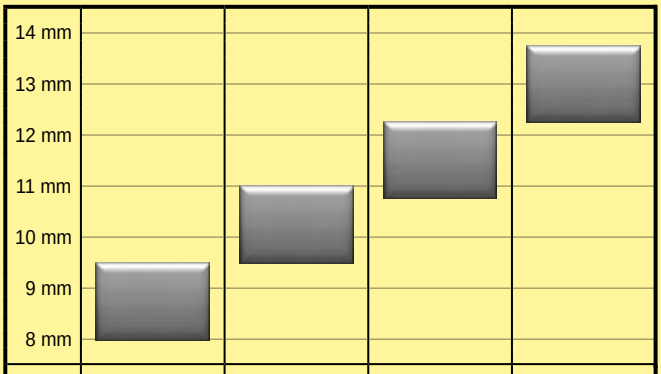
Male 3.25 mm



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.

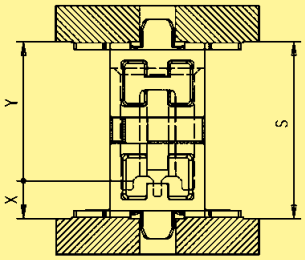


stacking heights	male 1.75 mm female 6.25 mm	male 3.25 mm female 6.25 mm	male 1.75 mm female 9.05 mm	male 3.25 mm female 9.05 mm
PCB distance	8 mm - 9.5 mm	9.5 mm - 11 mm	10.8 mm - 12.3 mm	12.3 mm - 13.8 mm
part numbers	15 11 ... 15 21 ...	15 12 ... 15 21 ...	15 11 ... 15 22 ...	15 12 ... 15 22 ...

Mating options

Mezzanine connection

straight female

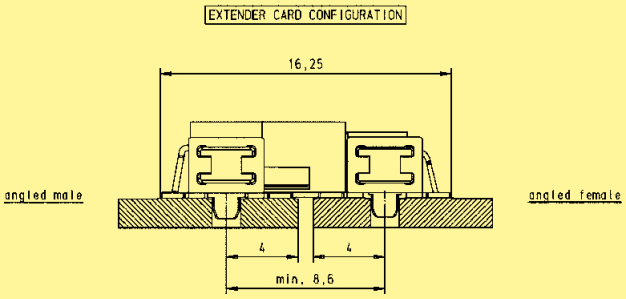


straight male

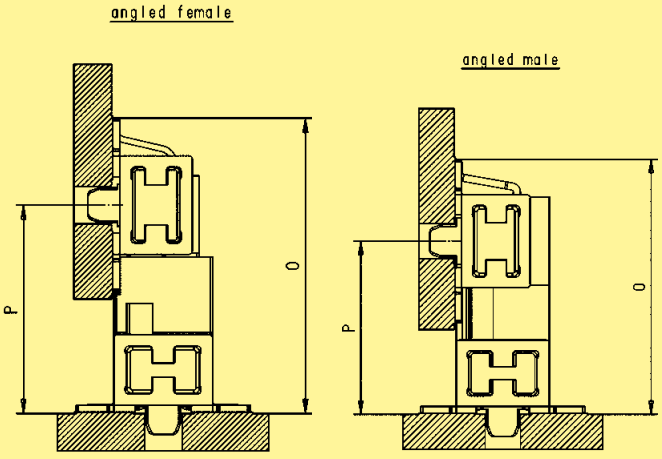
3.25	9.05	12.3	13.8
1.75	9.05	10.8	12.3
3.25	6.25	9.5	11
1.75	6.25	8	9.5
X	*Y*	*Smin*	* *Smax*

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

Extender Card connection



Mother-to-Daughtercard connection



straight male

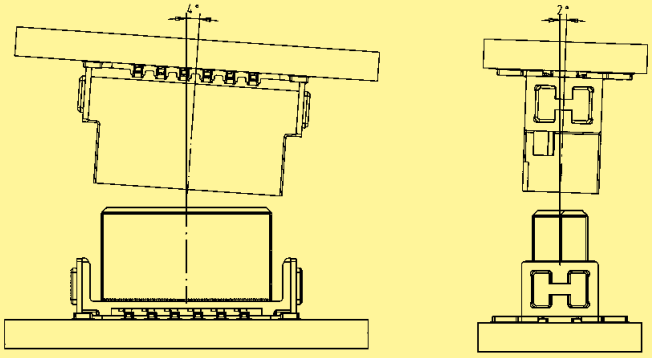
3.25	10.25	14.08
1.75	8.75	12.58
X	*P min.*	*O*

straight female

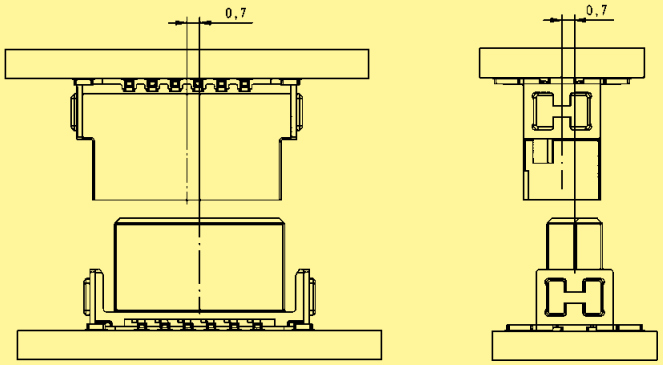
9.05	10.5	14.33
6.25	7.7	11.53
Y	*P min.*	*O*

Mating conditions

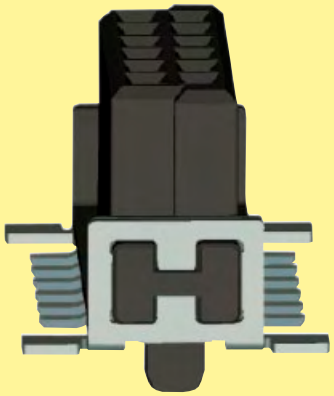
Inclination



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).

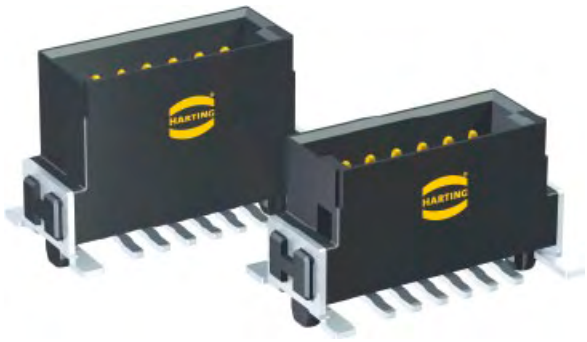
Moisture Sensitivity:

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.
Male connector, straight, stacking heights 1.75 / 3.25 mm	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

Dimensions in mm

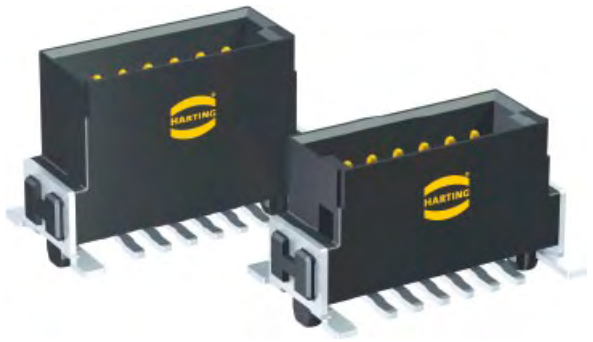
A	B	C	D	E	F
2.54	6.96	8.89	5.76	4.76	6.56
3.81	8.23	10.16	7.03	6.03	7.83
5.08	9.50	11.43	8.30	7.30	9.10
6.35	10.77	12.70	9.57	8.57	10.37
7.62	12.04	13.97	10.84	9.84	11.64
8.89	13.31	15.24	12.11	11.11	12.91
10.16	14.58	16.51	13.38	12.38	14.18
11.43	15.85	17.78	14.65	13.65	15.45
12.70	17.12	19.05	15.92	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
for performance level S4
for performance level 2

2
5
6

333
000

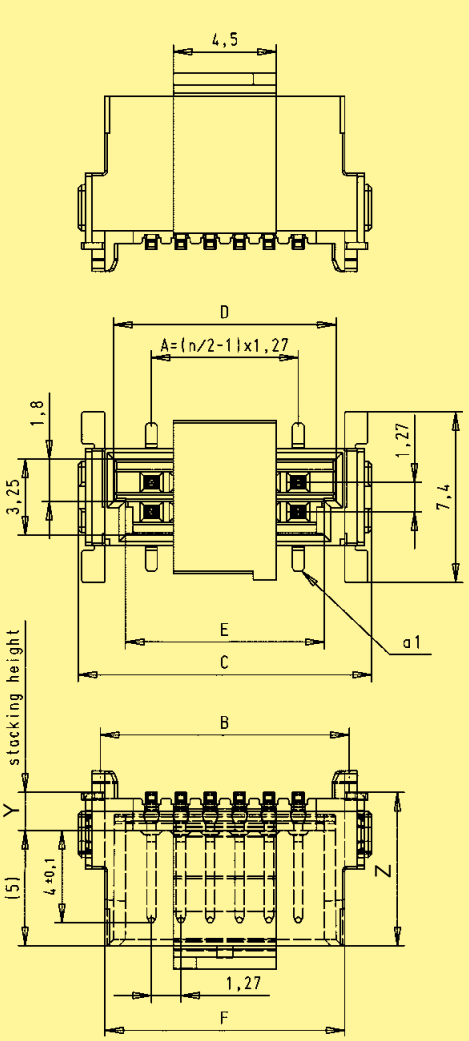
for samples
for 280 pieces on reel

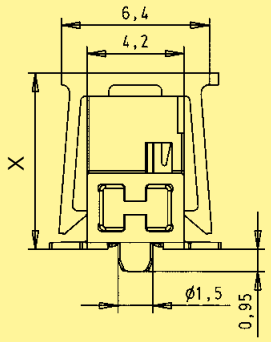


Male connectors, straight

Identification	Drawing	Dimensions in mm

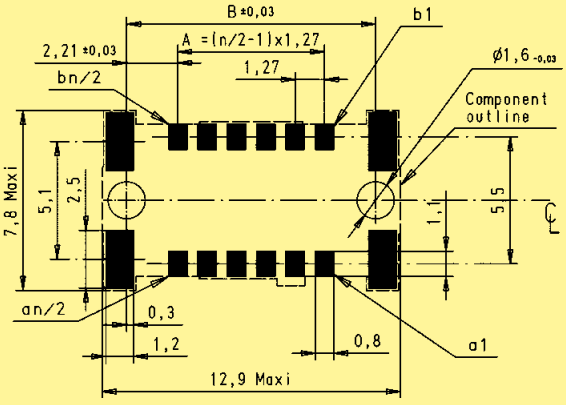
Dimensions





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

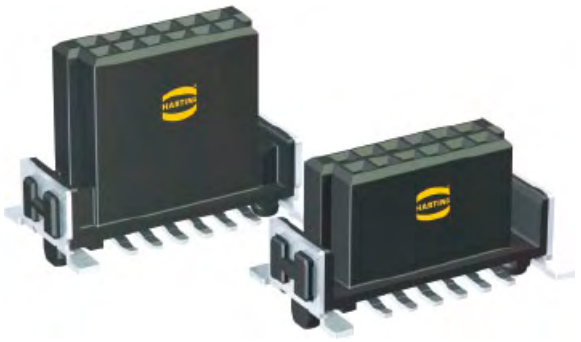
A	B	C	D	E
2.54	6.96	8.89	5.56	4.56
3.81	8.23	10.16	6.83	5.83
5.08	9.50	11.43	8.10	7.10
6.35	10.77	12.70	9.37	8.37
7.62	12.04	13.97	10.64	9.64
8.89	13.31	15.24	11.91	10.91
10.16	14.58	16.51	13.18	12.18
11.43	15.85	17.78	14.45	13.45
12.70	17.12	19.05	15.72	14.72
13.97	18.39	20.32	16.99	15.99
15.24	19.66	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
for performance level S4
for performance level 2

2
5
6

333
000

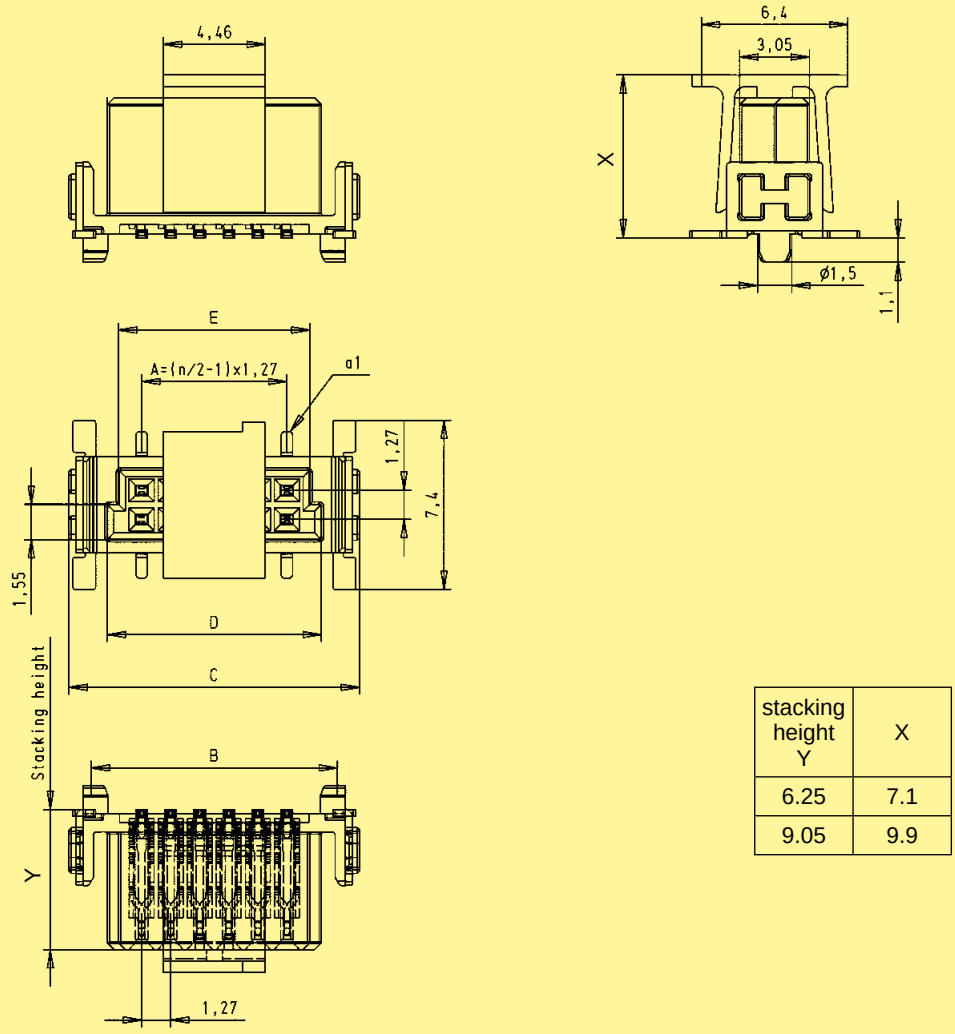
for samples
for 280 pieces on reel



Female connectors, straight

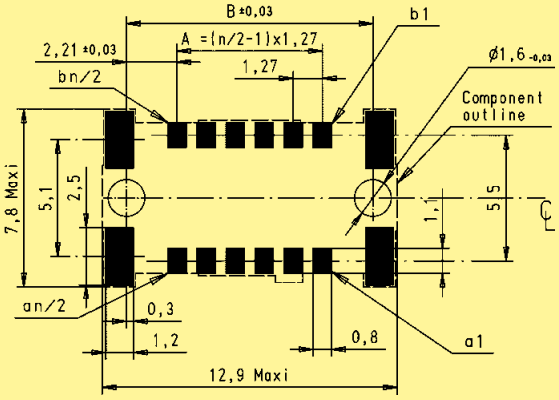
Identification	Drawing	Dimensions in mm

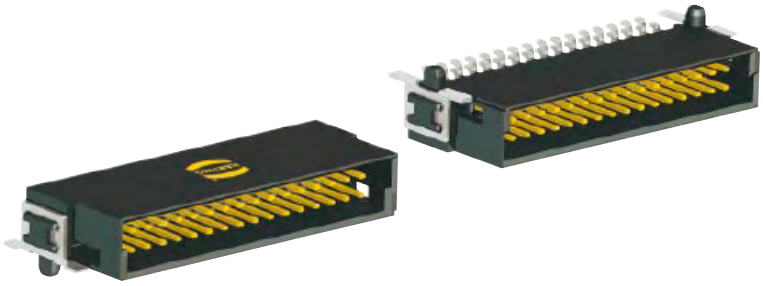
Dimensions



stacking height Y	X
6.25	7.1
9.05	9.9

PCB layout





Male connectors, angled

Identification	Number of contacts	Part No.	Dimensions in mm				
			A	B	C	D	E
Male connector, angled	6	15 15 006 . 601 . . .	2.54	6.96	8.89	5.76	4.76
	8	15 15 008 . 601 . . .	3.81	8.23	10.16	7.03	6.03
	10	15 15 010 . 601 . . .	5.08	9.50	11.43	8.30	7.30
	12	15 15 012 . 601 . . .	6.35	10.77	12.70	9.57	8.57
	14	15 15 014 . 601 . . .	7.62	12.04	13.97	10.84	9.84
	16	15 15 016 . 601 . . .	8.89	13.31	15.24	12.11	11.11
	18	15 15 018 . 601 . . .	10.16	14.58	16.51	13.38	12.38
	20	15 15 020 . 601 . . .	11.43	15.85	17.78	14.65	13.65
	22	15 15 022 . 601 . . .	12.70	17.12	19.05	15.92	14.92
	24	15 15 024 . 601 . . .	13.97	18.39	20.32	17.19	16.19
	26	15 15 026 . 601 . . .	15.24	19.66	21.59	18.46	17.46
	28	15 15 028 . 601 . . .	16.51	20.93	22.86	19.73	18.73
	30	15 15 030 . 601 . . .	17.78	22.20	24.13	21.00	20.00
	32	15 15 032 . 601 . . .	19.05	23.47	25.40	22.27	21.27
	34	15 15 034 . 601 . . .	20.32	24.74	26.67	23.54	22.54
	36	15 15 036 . 601 . . .	21.59	26.01	27.94	24.81	23.81
	38	15 15 038 . 601 . . .	22.86	27.28	29.21	26.08	25.08
	40	15 15 040 . 601 . . .	24.13	28.55	30.48	27.35	26.35
	42	15 15 042 . 601 . . .	25.40	29.82	31.75	28.62	27.62
	44	15 15 044 . 601 . . .	26.67	31.09	33.02	29.89	28.89
	46	15 15 046 . 601 . . .	27.94	32.36	34.29	31.16	30.16
	48	15 15 048 . 601 . . .	29.21	33.63	35.56	32.43	31.43
	50	15 15 050 . 601 . . .	30.48	34.90	36.83	33.70	32.70
	52	15 15 052 . 601 . . .	31.75	36.17	38.10	34.97	33.97
	54	15 15 054 . 601 . . .	33.02	37.44	39.37	36.24	35.24
	56	15 15 056 . 601 . . .	34.29	38.71	40.64	37.51	36.51
	58	15 15 058 . 601 . . .	35.56	39.98	41.91	38.78	37.78
	60	15 15 060 . 601 . . .	36.83	41.25	43.18	40.05	39.05
	62	15 15 062 . 601 . . .	38.10	42.52	44.45	41.32	40.32
	64	15 15 064 . 601 . . .	39.37	43.79	45.72	42.59	41.59
	66	15 15 066 . 601 . . .	40.64	45.06	46.99	43.86	42.86
	68	15 15 068 . 601 . . .	41.91	46.33	48.26	45.13	44.13
	70	15 15 070 . 601 . . .	43.18	47.60	49.53	46.40	45.40
	72	15 15 072 . 601 . . .	44.45	48.87	50.80	47.67	46.67
	74	15 15 074 . 601 . . .	45.72	50.14	52.07	48.94	47.94
	76	15 15 076 . 601 . . .	46.99	51.41	53.34	50.21	49.21
	78	15 15 078 . 601 . . .	48.26	52.68	54.61	51.48	50.48
	80	15 15 080 . 601 . . .	49.53	53.95	55.88	52.75	51.75
	82	15 15 082 . 601 . . .	50.80	55.22	57.15	54.02	53.02
	84	15 15 084 . 601 . . .	52.07	56.49	58.42	55.29	54.29
	86	15 15 086 . 601 . . .	53.34	57.76	59.69	56.56	55.56
	88	15 15 088 . 601 . . .	54.61	59.03	60.96	57.83	56.83
	90	15 15 090 . 601 . . .	55.88	60.30	62.23	59.10	58.10
	92	15 15 092 . 601 . . .	57.15	61.57	63.50	60.37	59.37
	94	15 15 094 . 601 . . .	58.42	62.84	64.77	61.64	60.64
	96	15 15 096 . 601 . . .	59.69	64.11	66.04	62.91	61.91
	98	15 15 098 . 601 . . .	60.96	65.38	67.31	64.18	63.18
	100	15 15 100 . 601 . . .	62.23	66.65	68.58	65.45	64.45

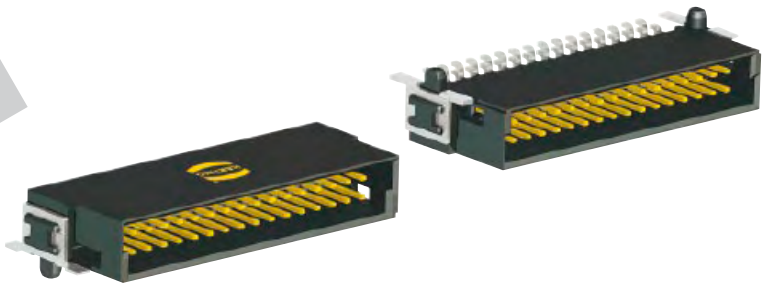
for performance level 1
for performance level S4
for performance level 2

2
5
6

333
000

for samples
for 560 pieces on reel

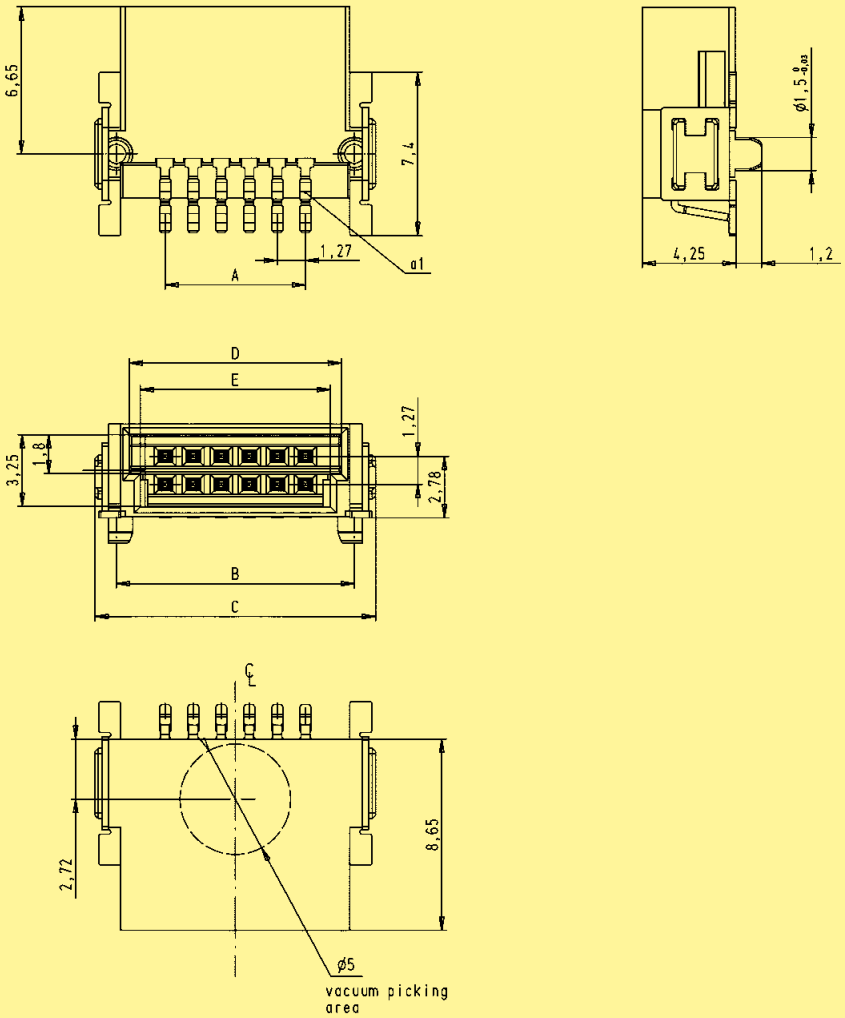
available Q1/2012



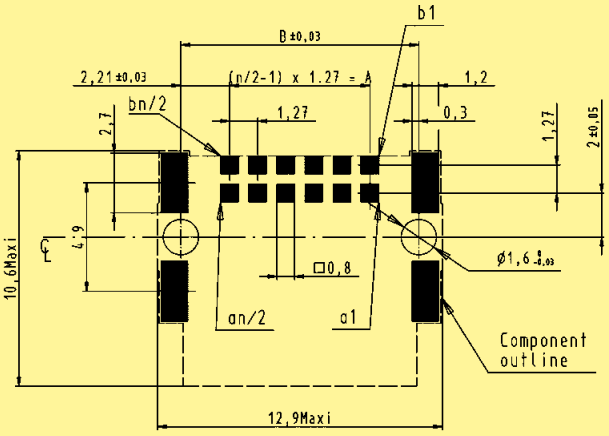
Male connectors, angled

Identification	Drawing	Dimensions in mm

Dimensions



PCB layout



Female connectors, angled

Identification	Number of contacts	Part No.	Dimensions in mm

Female connector, angled

Number of contacts	Part No.	A	B	C	D	E
6	15 25 006 . 601 . . .	2.54	6.96	8.89	5.56	4.56
8	15 25 008 . 601 . . .	3.81	8.23	10.16	6.83	5.83
10	15 25 010 . 601 . . .	5.08	9.50	11.43	8.10	7.10
12	15 25 012 . 601 . . .	6.35	10.77	12.70	9.37	8.37
14	15 25 014 . 601 . . .	7.62	12.04	13.97	10.64	9.64
16	15 25 016 . 601 . . .	8.89	13.31	15.24	11.91	10.91
18	15 25 018 . 601 . . .	10.16	14.58	16.51	13.18	12.18
20	15 25 020 . 601 . . .	11.43	15.85	17.78	14.45	13.45
22	15 25 022 . 601 . . .	12.70	17.12	19.05	15.72	14.72
24	15 25 024 . 601 . . .	13.97	18.39	20.32	16.99	15.99
26	15 25 026 . 601 . . .	15.24	19.66	21.59	18.26	17.26
28	15 25 028 . 601 . . .	16.51	20.93	22.86	19.53	18.53
30	15 25 030 . 601 . . .	17.78	22.20	24.13	20.80	19.80
32	15 25 032 . 601 . . .	19.05	23.47	25.40	22.07	21.07
34	15 25 034 . 601 . . .	20.32	24.74	26.67	23.34	22.34
36	15 25 036 . 601 . . .	21.59	26.01	27.94	24.61	23.61
38	15 25 038 . 601 . . .	22.86	27.28	29.21	25.88	24.88
40	15 25 040 . 601 . . .	24.13	28.55	30.48	27.15	26.15
42	15 25 042 . 601 . . .	25.40	29.82	31.75	28.42	27.42
44	15 25 044 . 601 . . .	26.67	31.09	33.02	29.69	28.69
46	15 25 046 . 601 . . .	27.94	32.36	34.29	30.96	29.96
48	15 25 048 . 601 . . .	29.21	33.63	35.56	32.23	31.23
50	15 25 050 . 601 . . .	30.48	34.90	36.83	33.50	32.50
52	15 25 052 . 601 . . .	31.75	36.17	38.10	34.77	33.77
54	15 25 054 . 601 . . .	33.02	37.44	39.37	36.04	35.04
56	15 25 056 . 601 . . .	34.29	38.71	40.64	37.31	36.31
58	15 25 058 . 601 . . .	35.56	39.98	41.91	38.58	37.58
60	15 25 060 . 601 . . .	36.83	41.25	43.18	39.85	38.85
62	15 25 062 . 601 . . .	38.10	42.52	44.45	41.12	40.12
64	15 25 064 . 601 . . .	39.37	43.79	45.72	42.39	41.39
66	15 25 066 . 601 . . .	40.64	45.06	46.99	43.66	42.66
68	15 25 068 . 601 . . .	41.91	46.33	48.26	44.93	43.93
70	15 25 070 . 601 . . .	43.18	47.60	49.53	46.20	45.20
72	15 25 072 . 601 . . .	44.45	48.87	50.80	47.47	46.47
74	15 25 074 . 601 . . .	45.72	50.14	52.07	48.74	47.74
76	15 25 076 . 601 . . .	46.99	51.41	53.34	50.01	49.01
78	15 25 078 . 601 . . .	48.26	52.68	54.61	51.28	50.28
80	15 25 080 . 601 . . .	49.53	53.95	55.88	52.55	51.55
82	15 25 082 . 601 . . .	50.80	55.22	57.15	53.82	52.82
84	15 25 084 . 601 . . .	52.07	56.49	58.42	55.09	54.09
86	15 25 086 . 601 . . .	53.34	57.76	59.69	56.36	55.36
88	15 25 088 . 601 . . .	54.61	59.03	60.96	57.63	56.63
90	15 25 090 . 601 . . .	55.88	60.30	62.23	58.90	57.90
92	15 25 092 . 601 . . .	57.15	61.57	63.50	60.17	59.17
94	15 25 094 . 601 . . .	58.42	62.84	64.77	61.44	60.44
96	15 25 096 . 601 . . .	59.69	64.11	66.04	62.71	61.71
98	15 25 098 . 601 . . .	60.96	65.38	67.31	63.98	62.98
100	15 25 100 . 601 . . .	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

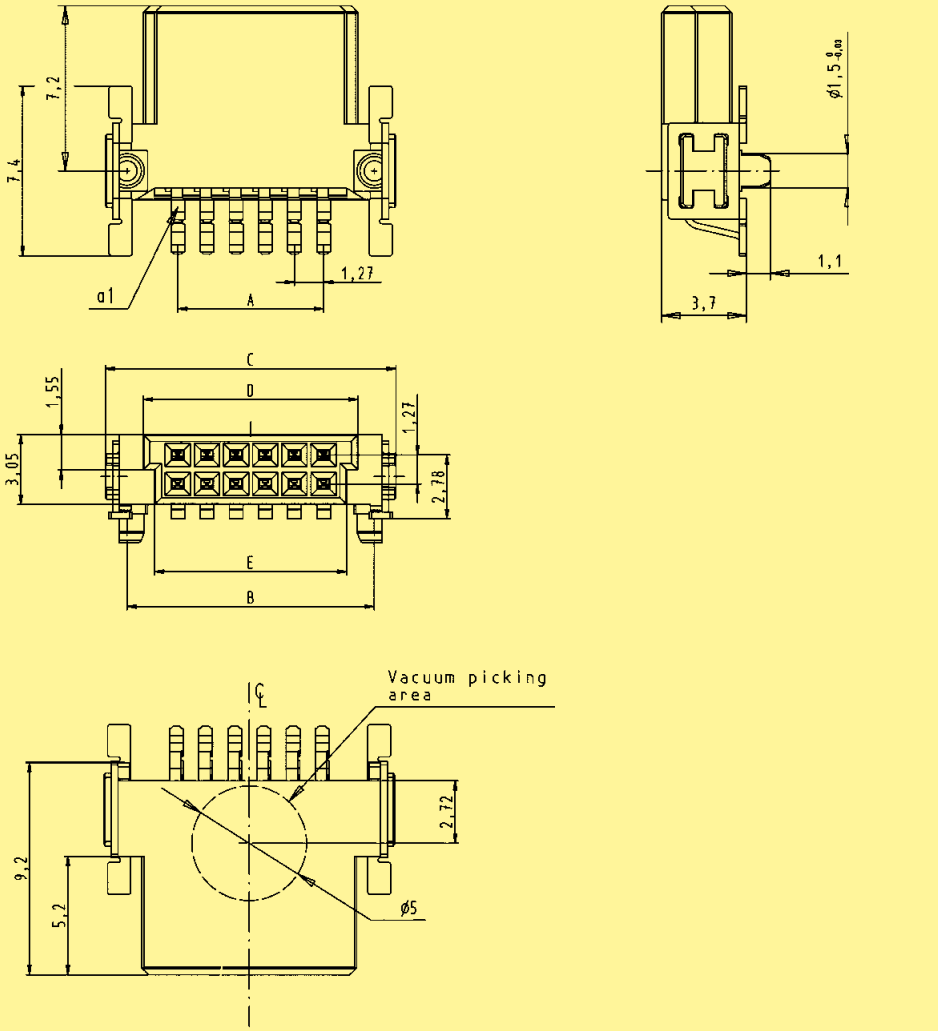
for samples
for 560 pieces on reel

available Q2/2012

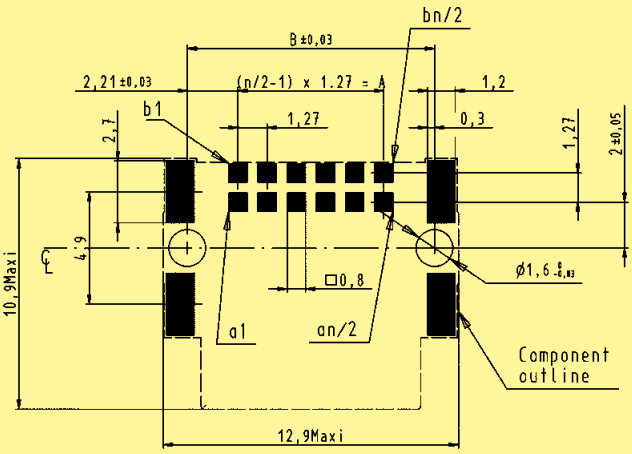
Female connectors, angled

Identification	Drawing	Dimensions in mm

Dimensions



PCB layout



Female connectors, IDC

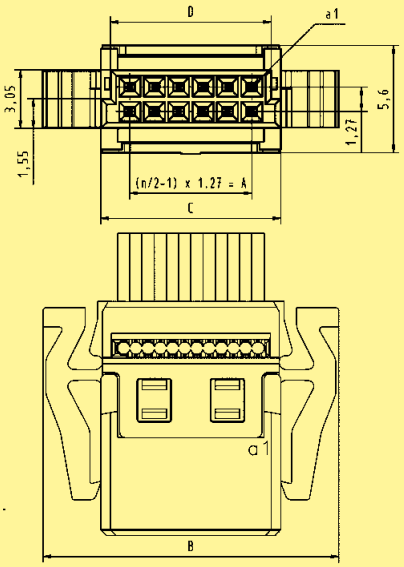
Identification	Number of contacts	Part No.	Dimensions in mm				
			A	B	C	D	E
Female connector, IDC in a tray packaging	6	15 29 006 . 50 . 000	2.54	11.59	5.56	4.56	15.00
	8	15 29 008 . 50 . 000	3.81	12.86	6.83	5.83	15.00
	10	15 29 010 . 50 . 000	5.08	14.13	8.10	7.10	15.00
	12	15 29 012 . 50 . 000	6.35	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							

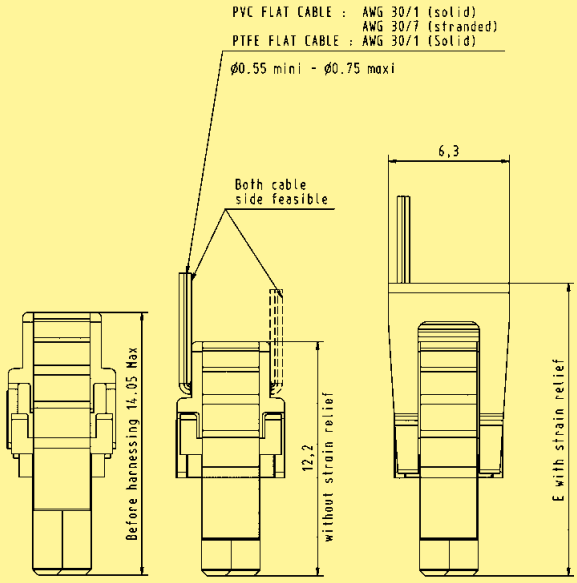
without strain relief 1
with strain relief 2

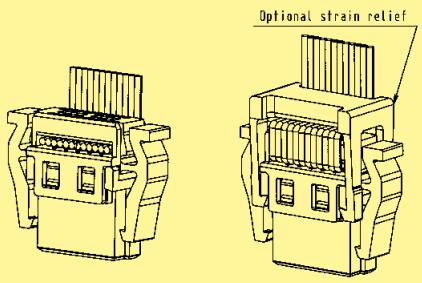
Female connectors, IDC

Identification	Drawing	Dimensions in mm

Dimensions







Strain reliefs for female connectors, IDC

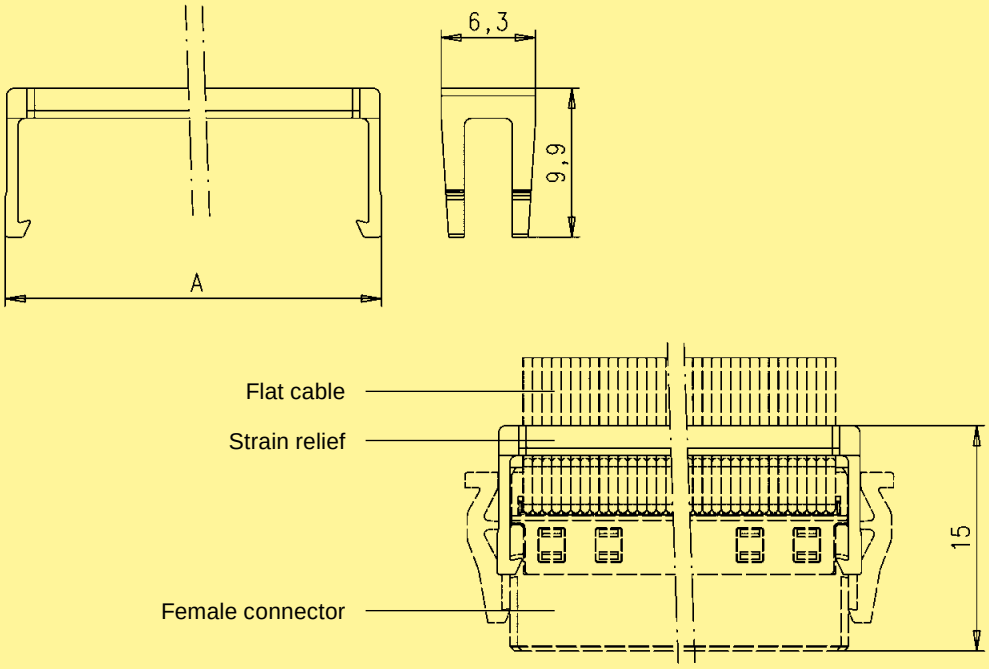
Identification	Number of contacts	Part No.	Dimensions in mm
			A
Strain reliefs for female connectors, IDC	6	15 29 006 0503 000	7.31
	8	15 29 008 0503 000	8.58
	10	15 29 010 0503 000	9.85
	12	15 29 012 0503 000	11.12
	14	15 29 014 0503 000	12.39
	16	15 29 016 0503 000	13.66
	18	15 29 018 0503 000	14.93
	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

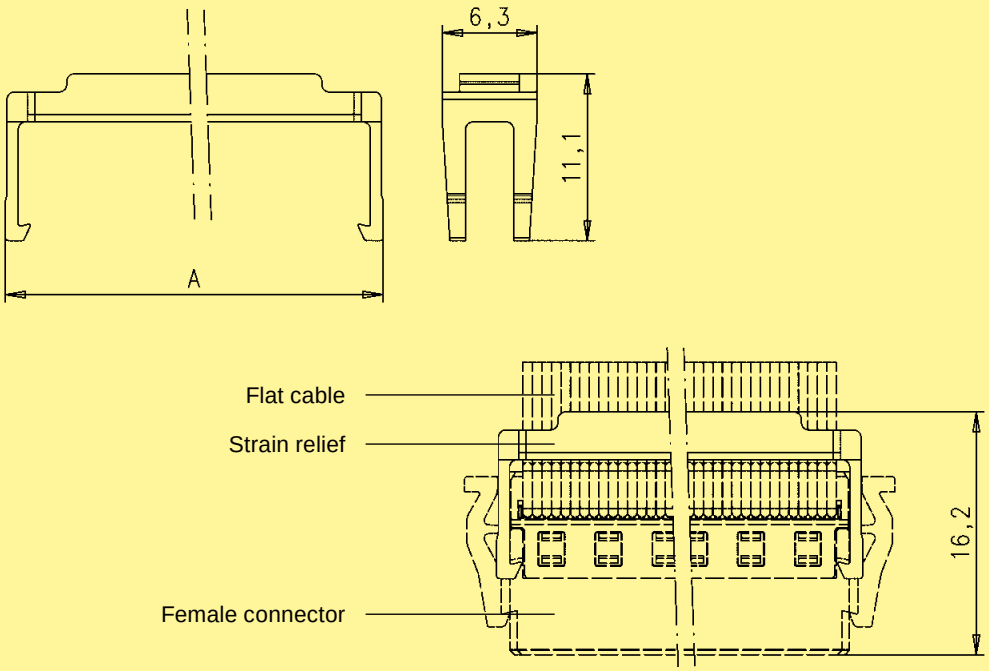
Identification	Drawing	Dimensions in mm

Dimensions

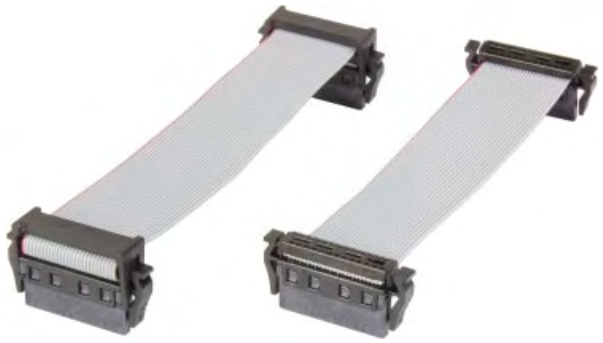
6 – 58 contacts

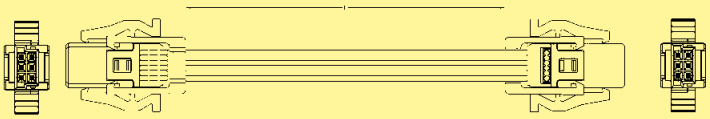
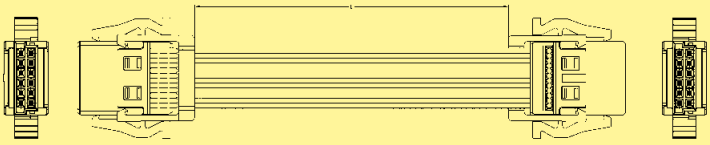
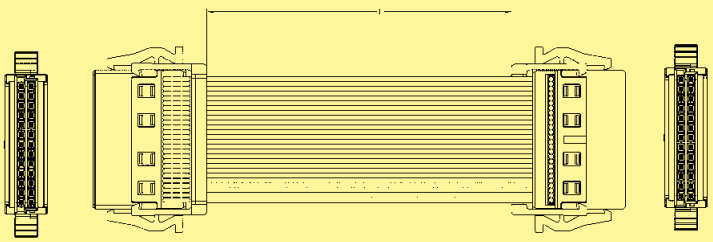


60 – 100 contacts

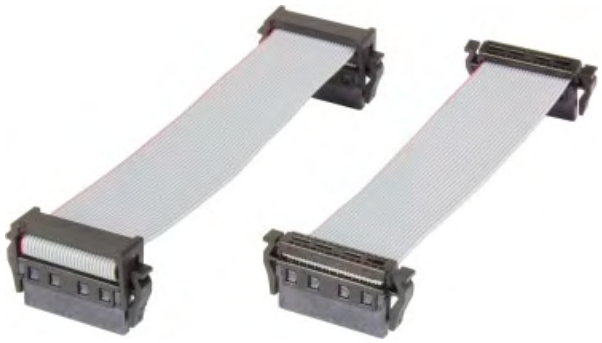


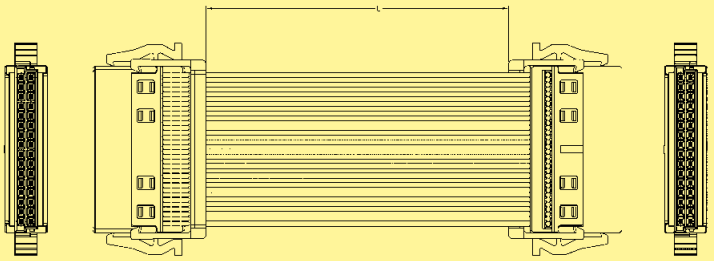
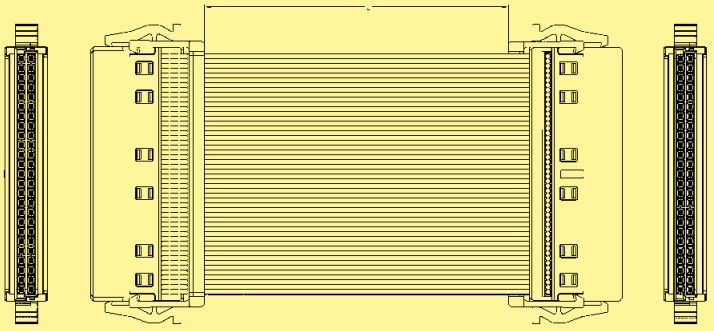
Cable assemblies



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		