

Connectors that comply with DIN 41 612 have been in use for years for both board-to-board applications and cable-to-board applications. Their robustness and universality are legendary. The classic signal connectors are supplemented by power solutions for allowing insertion of up to 40 A. Plastic, metallized and full metal housings, used in combination with shielded or unshielded cables with a high number of poles, are available for cable-to-board connectors. HARTING offers a wide range of DIN 41 612 connectors and accessories. The following catalogue pages contain an extract from the DIN 41 612 connector program. The complete DIN 41 612 connector program for data, signals and power can be found in the complete DIN 41 612 catalogue.

Application profile:

CONNECTION TYPE		ENVIRONMENT		APPLICATION						
Board to Board	Cable/Wire to Board	IP20	IP65 / IP67	Data	Signal	Power	high performance			
				Data transfer rate	Shielding	Number of contacts, contact density	Voltage, working current			
Cable termination			PCB termination			Application standard				
<i>Han-Quick Lock®</i>	<i>IDC</i>	<i>Crimp</i>	<i>THT</i>	<i>SMC</i>	<i>SMT</i>					
<i>Screw</i>	<i>Cage clamp</i>	<i>Axial screw</i>	<i>Press-in</i>							
Housing integration										
<i>Separate housing</i>	<i>Integrated housing</i>									

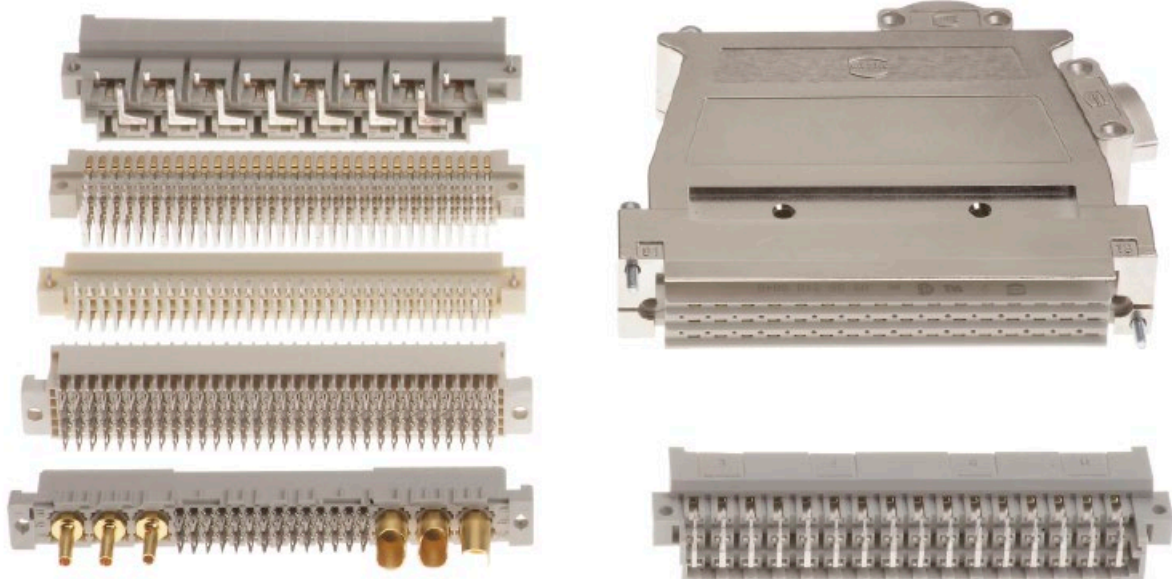
Contents

	Page
Overview DIN Signal	09.04
Overview <i>har-bus</i> [®] 64	09.06
Application examples	09.07
Overview DIN Power	09.08
Overview shell housings	09.10
Male and female connectors with pcb fixings	09.11

In devices for industrial automation and measurement techniques, the DIN 41 612 connector is the standard for board-to-board and cable-to-board connections as both data and power connectors. HARTING offers a wide range of standard connectors complying with DIN 41 612 and IEC 60 603-2, as well as a great selection of complementary types and customer specific solutions. Depending on the application, the 3 to 160 way connectors are offered with various termination methods, each contact capable of carrying from 2 A to 40 A.

HARTING differentiates between DIN Signal and DIN Power connectors depending on the maximum allowed working current per contact: up to 2 A for DIN Signal and over 2 A for DIN Power connectors.

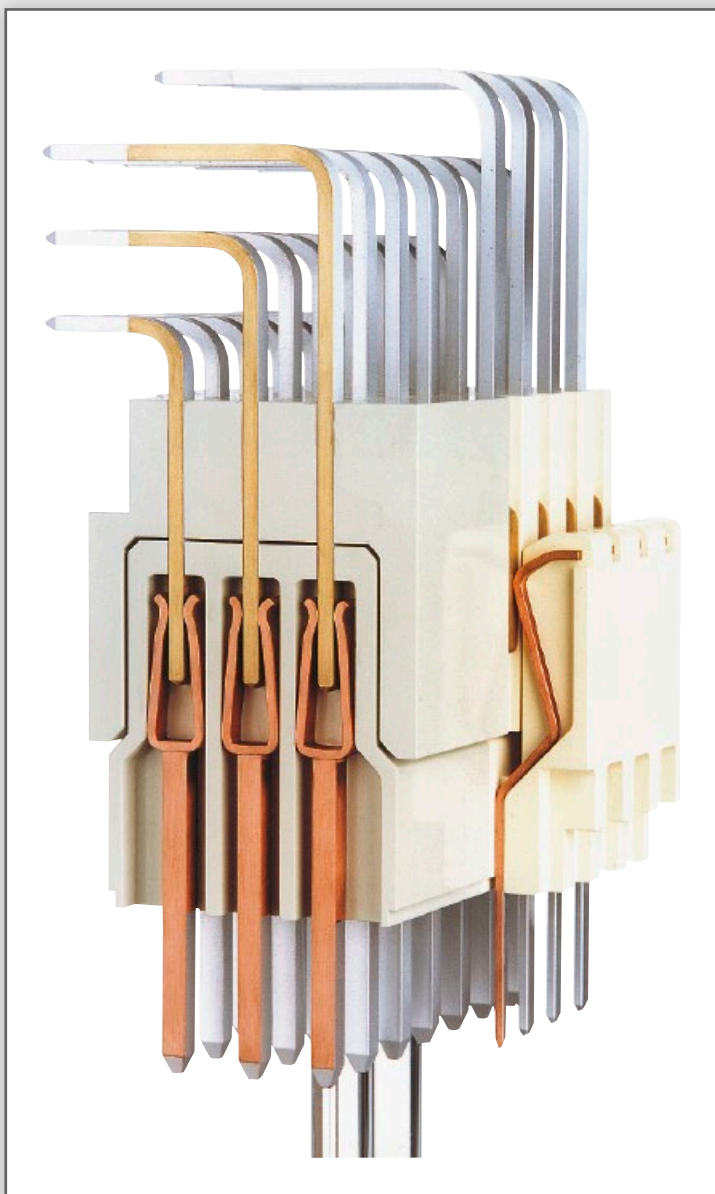
HARTING's range *har-bus*[®] 64 features 160 contacts and is an extension of the 3 row 96 way DIN 41 612 C type range with 2 additional rows. The 5 row *har-bus*[®] 64 connector is 100 % forwards and backwards compatible with the type C connectors according to DIN 41 612. The design of male and female connectors allows the mating of any combination of the 5 or the 3 row variants.



The design of the *har-bus*[®] 64 female allows mating of any combinations of the 5 or 3 row standard male connectors. It is also possible to mate 5 row male connectors with 3 row female connectors.

This kind of backwards compatibility allows the user the staged transition to a higher performance category and simultaneous use of daughter cards in the slots of the previous generation.

Therefore all existing bus systems, for which the 3 row C96 pin connectors are no longer sufficient, can be adapted to the latest requirements without a complete system redesign.



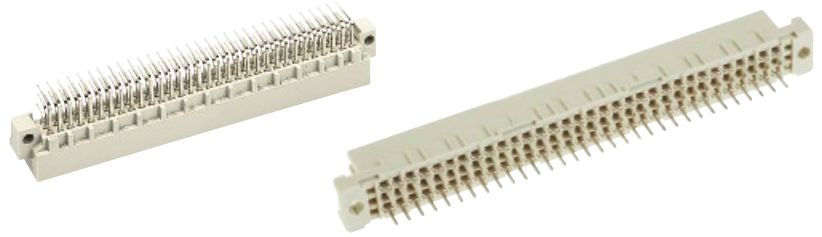
DIN
41612

Variety of DIN 41 612 types

Due to the large variety of complementary types, accessories and different kinds of shell housings which are available in plastic, metallized plastic and full metal, DIN 41 612 connector range is considered to be ideal for your robust, reliable and cost-efficient connectivity solution.

The special requirements of industrial electronics can be satisfied with standard types.



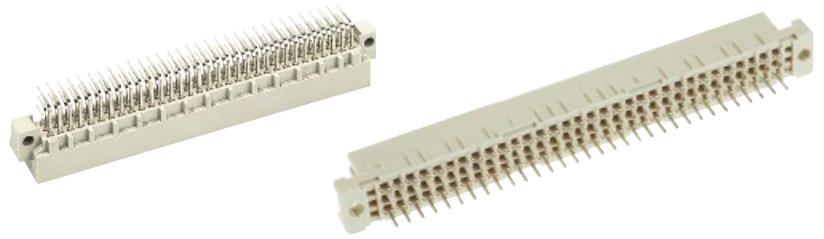


For detailed information see catalogue DIN 41 612 or www.HARTING.com

Type	Maximum number of contacts	Image	Gender	Termination						
				Solder	Reflow Soldering (SMC)	Solder lug	Press-in	Crimp	Wire wrap	IDC
B	64		male	3.0 mm	3.0 mm					
			female	2.9 mm 4.5 mm 13.0 mm	2.9 mm 4.5 mm	X	4.5 mm 13.2 mm	X	13.0 mm	X
2 B	32		male	3.0 mm	3.0 mm					
			female	2.9 mm 4.5 mm	2.9 mm 4.5 mm		4.5 mm		13.0 mm	
3 B*	20		male	3.0 mm	3.0 mm					
			female	2.9 mm 4.5 mm	2.9 mm		4.5 mm			
C	96		male	3.0 mm	3.0 mm					
			female	2.9 mm 4.5 mm 13.0 mm	2.9 mm 4.5 mm	X	4.5 mm 13.2 mm 17.0 mm	X	13.0 mm	X
2 C	48		male	3.0 mm	3.0 mm					
			female	2.9 mm 4.5 mm 13.0 mm	2.9 mm 4.5 mm	X	3.7 mm 4.5 mm	X	13.0 mm	
3 C*	30		male	3.0 mm	3.0 mm					
			female	2.9 mm 4.5 mm	2.9 mm		4.5 mm	X		
M	78 + 2 60 + 4 42 + 6 24 + 8		male	3.0 mm						
			female	2.9 mm 4.5 mm			4.5 mm			

* Available with and without flange

DIN 41 612

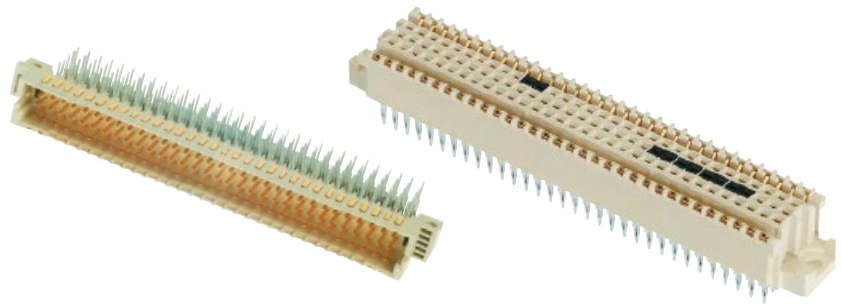


For detailed information see catalogue DIN 41612 or www.HARTING.com

Type	Maximum number of contacts	Image		Termination						
				Solder	Reflow Soldering (SMC)	Solder lug	Press-in	Crimp	Wire wrap	IDC
M flat	78 + 2 60 + 4 42 + 6 24 + 8		female	2.9 mm 4.5 mm			4.5 mm			
M inverse	78 + 2 60 + 4 42 + 6 24 + 8 6 + 10		male	2.5 mm 4.0 mm			5.5 mm 13.0 mm		13.0 mm	
			female	3.0 mm						
Q	64		male	2.5 mm 4.0 mm 13.0 mm			5.0 mm 13.0 mm		13.0 mm 17.0 mm	
			female	3.0 mm						
2 Q	32		male	2.5 mm 4.0 mm 13.0 mm			5.0 mm		13.0 mm	
			female	3.0 mm						
3 Q*	20		male	2.5 mm 4.0 mm 13.0 mm	2.5 mm 4.0 mm 13.0 mm		5.0 mm 13.0 mm		13.0 mm	
R	96		male	2.5 mm 4.0 mm 13.0 mm	2.5 mm 4.0 mm 13.0 mm		5.0 mm 13.0 mm		13.0 mm	
			female	2.8 mm	2.8 mm					
R (HE 11)	96		male	2.5 mm 4.0 mm					13.0 mm	
			female	2.9 mm						
RM	96		male				5.0 mm 13.0 mm			
2 R	48		male	2.5 mm 4.0 mm 13.0 mm	2.5 mm 4.0 mm 13.0 mm		5.0 mm 13.0 mm		13.0 mm	
			female	3.0 mm						
3 R*	30		male	2.5 mm 4.0 mm 13.0 mm	2.5 mm 4.0 mm 13.0 mm		5.0 mm 13.0 mm		13.0 mm	

DIN 41612

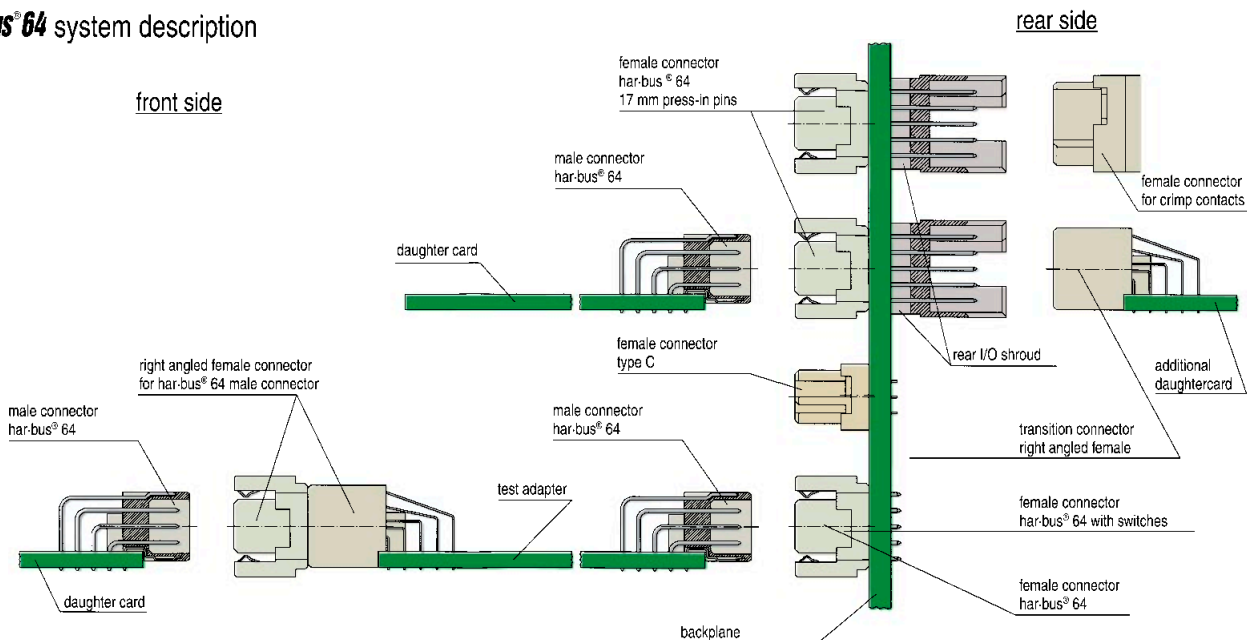
* Available with and without flange



For detailed information see catalogue DIN 41 612 or www.HARTING.com

Type	Maximum number of contacts		Termination							
			Solder	Reflow Soldering (SMC)	Solder lug	Press-in	Crimp	Wire wrap	IDC	
harbus® 64	160		male	3.0 mm	3.0 mm					
			female	2.9 mm			3.7 mm 5.0 mm 17.0 mm	X		
			female with switches					4.5 / 5.0 mm		

harbus® 64 system description



Technical characteristics DIN Signal / harbus® 64

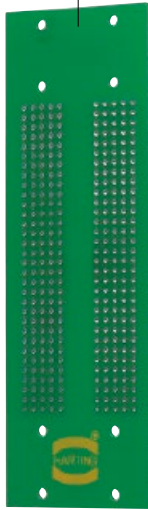
Number of contacts	16 – 160	Insertion and withdrawal force	16-pol. ≤ 15 N 30-pol. ≤ 30 N 32-pol. ≤ 30 N 48-pol. ≤ 45 N 64-pol. ≤ 60 N 96-pol. ≤ 90 N 160-pol. ≤ 160 N
Contact spacing	2.54	Materials	thermoplastic resin, glass-fibre filled, UL 94-V0 Liquid Cristal Polymer (LCP), UL 94-V0
Working current (all contacts are loaded)	2 A 1 A for harbus® 64 at 70 °C 1 A with insulation displacement 40 A max. type M	Mouldings	Poly Cyclohexylene Terephthalate (PCT), UL 94-V0 NFF classification up to F1/I2 copper alloy
Test voltage $U_{r.m.s}$	1 KV	Contacts	
Contact resistance	≤ 15 mΩ for solder and wire wrap connection ≤ 20 mΩ for crimp connection ≤ 20 mΩ harbus® 64 rows a,b,c ≤ 30 mΩ harbus® 64 rows z,d	Contact surface	
Insulation resistance	≥ 10 ¹⁰ Ω harbus® 64 ≥ 10 ¹² Ω DIN Signal	Contact zone	selectively plated according to performance level
Temperature range	-40 °C ... +105 °C for press-in connectors -55 °C ... +125 °C max. +240 °C for 15 s during reflow soldering (only SMC)		

Application 1

Female connector
09 03 296 6861



Backplane



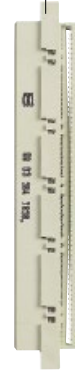
Pin shroud
09 03 000 9957



Locking lever
09 03 000 9914



Female connector
09 03 264 6828



Female connector
09 03 096 3214

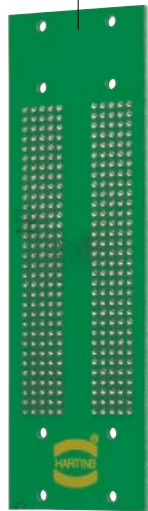


Application 2

Female connector
09 03 296 6862



Backplane



Pin shroud
09 03 000 9953



Locking lever
09 03 000 9913



Female connector
09 73 296 6801



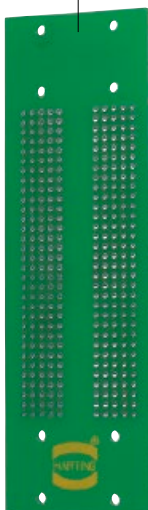
Daughtercard

Application 3

Female connector
09 03 296 6861



Backplane



Pin shroud
09 03 000 9957



Fixing brackets
09 03 000 9921



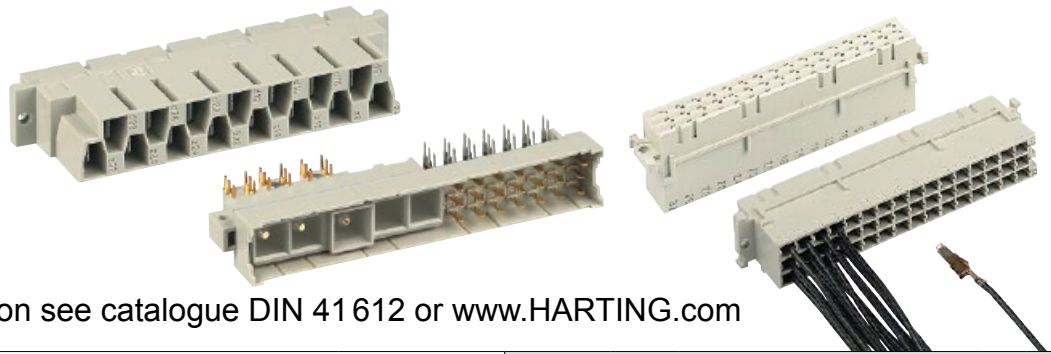
Female connector
09 03 096 3214



Locking levers
left 09 02 000 9902
right 09 02 000 9903

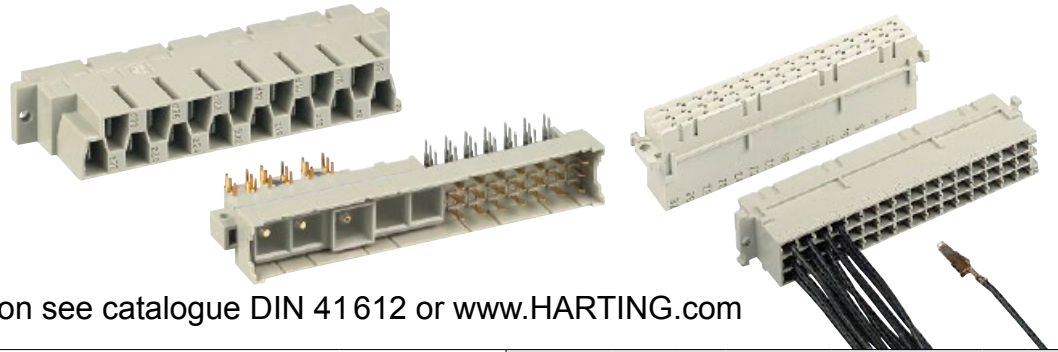
Shell housing C
09 03 096 0501

DIN
41612



For detailed information see catalogue DIN 41 612 or www.HARTING.com

Type	Maximum number of contacts			Termination								
				Solder	Reflow Soldering (SMC)	Solder lug	Press-in	Crimp	Wire wrap	Faston	Cage clamp	
D	32		male	3.0 mm	X							
			female	2.9 mm 4.5 mm		X		X	20.0 mm			
E	48		male	3.0 mm	X							
			female	2.9 mm 4.5 mm		X	4.5 mm 11.5 mm	X	20.0 mm			
			Interface connector I	4.0 mm								
F	48		male	3.0 mm	X							
			female	3.7 mm 4.5 mm		X		X	22.0 mm			
F Low profile	48		female	3.7 mm 4.5 mm			4.5 mm 13.0 mm					
			Interface connector I	3.5 mm				X	22.0 mm			
F 9	9		male					X				
			female					X				
FM	45		male	3.0 mm				X				
			female	4.5 mm				X	22.0 mm			
2 F	24		female					X				
			Interface connector I					X				



For detailed information see catalogue DIN 41612 or www.HARTING.com

Type	Maximum number of contacts	Image		Termination								
				Solder	Reflow Soldering (SMC)	Solder lug	Press-in	Crimp	Wire wrap	Faston	Cage clamp	
H	15		male	3.0 mm							X	
			female	2.7 mm 4.0 mm 5.5 mm 7.0 mm 10.0 mm			3.6 mm				X	X
H	16		male	3.0 mm								
			female								X	
H 3	3		male	3.0 mm								
			female	4.0 mm								
MH	24 + 7		male	3.0 mm							X	
			female	4.5 mm				X	22.0 mm			
MH	21 + 5		male	3.1 mm								
			female	3.2 mm								

DIN 41612

Technical characteristics DIN Power

Number of contacts	3 – 48	Insertion and withdrawal force	
Contact spacing	5.08 mm; 2.54 mm	Type D, E	32-pol. ≤ 40 N 48-pol. ≤ 75 N
Working current (all contacts are loaded)	Type D, E, F, F9, FM, 2F	Type F, F9, FM, 2F	24-pol. ≤ 37 N 32-pol. ≤ 50 N 45-pol. ≤ 70 N 48-pol. ≤ 75 N
	Type H, H 3	Type H	≤ 90 N
		Type H 3	≤ 20 N
Test voltage $U_{r.m.s}$	Type D, E, F, F9, FM, 2F	Materials	
	Type H	Mouldings	thermoplastic resin, glass-fibre filled, UL 94-V0 Poly Cyclohexylene Terephthalate (PCT), UL 94-V0
	Type H 3	Contacts	NFF classification up to F1/I2 copper alloy
Contact resistance	≤ 15 mΩ Solder and Wire wrap connection ≤ 20 mΩ Crimp connection	Contact surface	
Insulation resistance	≥ 10 ¹² Ω	Contact zone	selectively plated according to performance level hard silver plated or gold plated
Temperature range	-40 °C ... +105 °C Press-in connector -55 °C ... +125 °C max. + 240 °C for 15 s during reflow soldering (only SMC)		



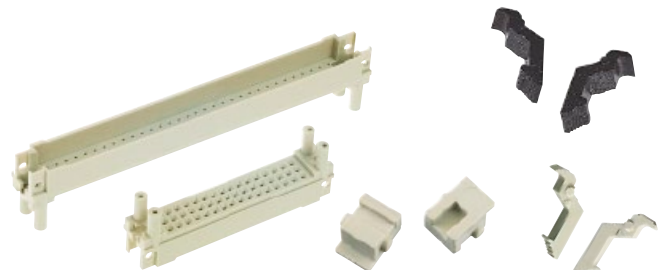
For detailed information see catalogue DIN 41 612 or www.HARTING.com



DIN 41 612

	Shell housings											Open hood			Junction element O	Locking lever O
	A	B	C	2C	3C	D15	D20	D20 metallized	D20 metal	A for 2F	2F	G				
Number of cable entries	2	4	4	3	3	2	4	4	4	1	2	4	2	2		
for screw fixing	X	X	X	X	X	X	X	X	X	X	X	X	X			
for fixing with locking lever	X	X	X	X	X	X								X		
for straight pcb connector			X	X	X											
for front side of the rack	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
for pin shrouds			X	X												
for Interface connector I or U	X	X	X			X				X	X	X	X			
EMC								X	X							
IP20	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Coding included in shell housing							X	X	X							
for types	B / Q			X												
	2C / 2R				X											
	3C / 3R					X										
	C / R			X												
	<i>harbus 64</i>			X												
	D			X												
	E			X								X				
	F	X	X				X	X	X	X		X	X	X	X	
	2F									X	X					
H		X				X	X	X	X		X	X	X	X		
MH		X				X	X	X	X		X	X	X	X		

Pin shrouds	for types						
	C	2C	R	2R	<i>harbus 64</i>	E	F
screw fixing	X	X	X	X			X
press-in fixing	X	X	X	X	X	X	X



Snap-in clips

In the soldering process, all component terminations including the snap-in clips are soldered and therefore mechanically secured. This provides mechanical protection for the soldered contacts during mating and unmating of the connector.

Mouldings with snap-in clips offer the following advantages:

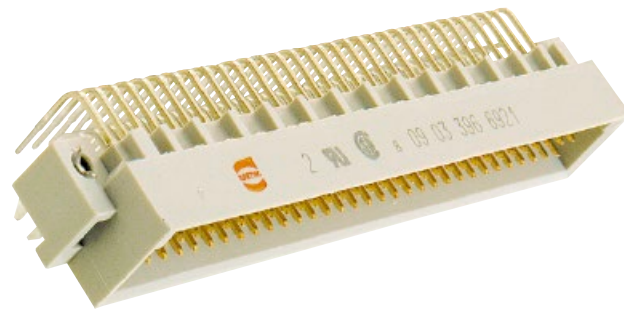
- Cost reduction when compared with the screw or rivet assembly methods due to the soldering of the clip along with other components in one process.

- The orientation of the clip after soldering in the plated through hole provides mechanical protection against the tensile forces arising from the mating and unmating of the connector.

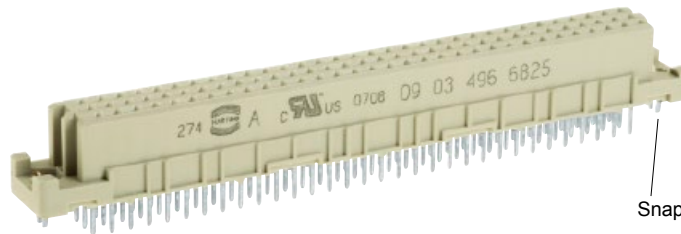
It is possible to supply the majority of male and female connectors with solder termination with snap-in clips.

For pcb thickness
 $1.6 \pm 0.2 \text{ mm}$
 $\varnothing = 2.8^{+0.1} \text{ mm}$

For pcb thickness
 $1.6 - 4.0 \text{ mm}$
 $\varnothing = 2.8^{+0.1} \text{ mm}$



Mounting force
 40 - 60 N

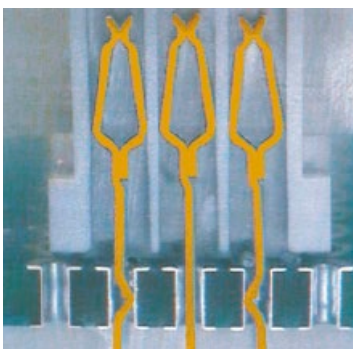
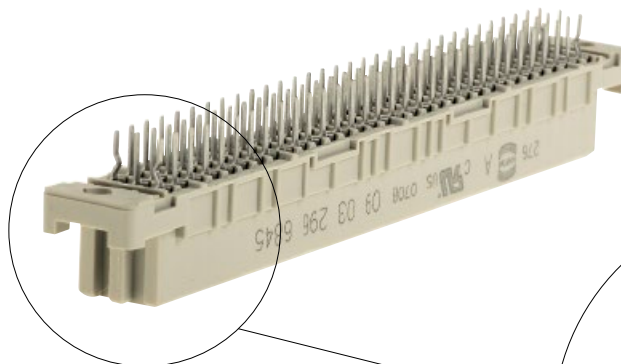
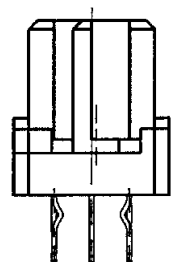


Snap-in clip

Kinked pins

Before and during soldering, the connectors are fixed onto the pcb with four kinked contacts located in the rows a and c, e.g. the positions a1, c1, a32 and c32 for a fully loaded connector.

Connectors with kinked pins are a reliable alternative for female connectors with straight terminations because no additional elements like screws, rivets or clips are necessary.



Cross section of a connector with kinked contacts assembled to a pcb