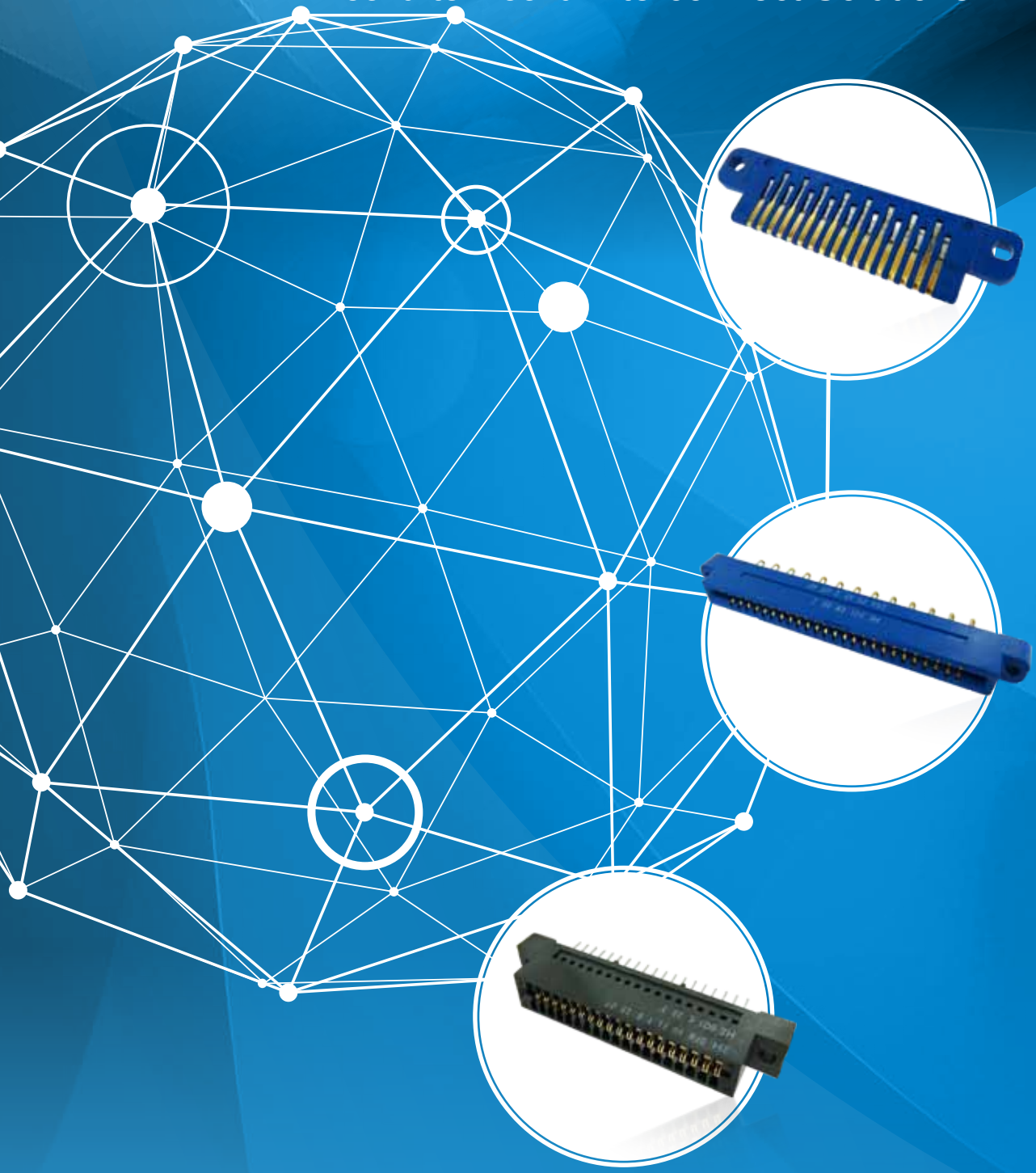
Amphenol SOCAPEX

254 Series
HE701/HE901

Board to Board Interconnect Solutions



Amphenol in brief

Amphenol is one of the largest manufacturers of interconnect products in the world. The Company designs, manufactures and markets electrical, electronic and fiber optic connectors, coaxial and flat-ribbon cable, and interconnect systems.

The primary end markets for the Company's products are communications and information processing markets, including cable television, cellular telephone and data communication and information processing systems; aerospace and military electronics; and automotive, rail and other transportation and industrial applications.

Amphenol Socapex in brief

Amphenol Socapex is part of Amphenol Corporate. The company has subsidiaries in France, India, China, and in the United States. Amphenol Socapex is a market leader of MIL-DTL-38999 and derived products, high density board level connectors, field bus and rugged Ethernet solutions, harsh environment optical connectors, MIL-DTL-26482 Series I rugged industrial solutions and EN2997 connectors.

Amphenol Socapex is able to meet customer satisfaction through:

- Agile & Lean Organization
- Global Sourcing
- State-of-the-Art Manufacturing
- Custom design capability
- Competitive Independent Workshops

Amphenol Socapex is aware of environmental issues. Indeed, most of our product solutions are compliant with the European RoHS directive concerning electrical and electronic equipment.

Amphenol Socapex Markets

Military & Aerospace markets:

- Military and commercial avionics and airframe: engines, airframes, cockpit, landing gears…
- C4ISR Land: communication systems, radio…
- Ground vehicles
- Marine applications
- Weapons / Munitions
- Space: communications satellites

Industrial markets:

- Oil & Gas: geophysics, drilling, production
- Small Urban Electrical Vehicle
- Mining: surface and underground mining, …
- Factory Automation: Machine tool, Networks, Field Buses,…
- Railway: Signaling, Ground and On Board Equipments,…
- Homeland security: CCTV (video), access control,…
- Entertainment

254 DF / HE901

Double-sided connectors for PCB

The 254 series is a double sided, 2,54 [.100] pitch, range of connectors for printed circuit boards.
Both direct or indirect connections could be made:
- For direct connection, the female receptacle mates with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- For indirect connection, the female receptacle mates with the male plugs

A well-proven technology

- The 254 series uses a 2,54[.100] pitch, double sided.
- The arrangements available are from 2x13 contacts to 2 x 55 contacts.
- The contact technology is based on a turning fork concept.

A simple choice of solutions, adaptable to all type of configurations

- For motherboard: female receptacles with straight PC tails (Y).
- For extender boards: female extender with right angle PC tails (YC).
- For mounting on cables: female receptacle with solder cup contacts (Z).

- In case of direct connection: the female receptacle mates directly with a 1,6 [.063] printed circuit board.
- In case of indirect connection, the male plug with SMT contacts (U) is used.

- Various polarization system are available (for both direct or indirect connection).

The 254 series complies with here below standards:

NFC/UTE 93-423
HE901

QUICK SELECTION GUIDE

Connector 254 DFN / HE901				
Signal contacts		**Number of contacts**		**Polarization system**
Female	**Male**			
Sraight PC tails Y Solder cup Z Right angle PC tails (YC, for extender)	SMT (U)	2 x 13 2 x 19 2 x 25 2 x 31 2 x 37 2 x 43 2 x 49 2 x 50 2 x 55	+	For direct connection For indirect connection 254DFD
Page 8	Page 8	Page 10 to 12		Page 13

All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 DF / HE901 Series

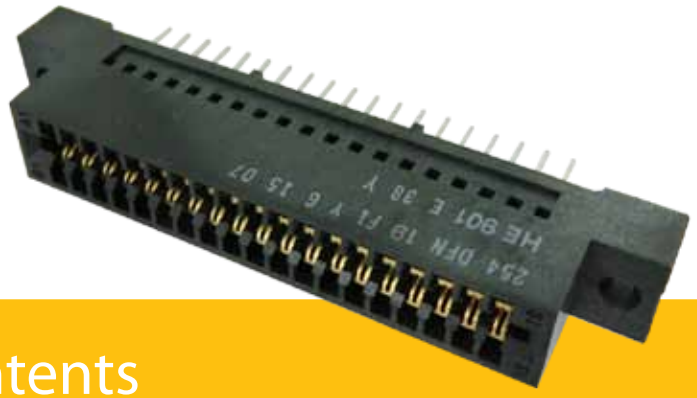


Table of contents

The 254 DF/ HE9 series serves various **markets**, including :

Security & Defense

Navy

Industrial

254 DF / HE901 >>> GENERAL SPECIFICATIONS

MEDIUM DENSITY

- 2,54[.100] pitch
- Proven and reliable double-sided PCB connectors
- Direct connection: female receptacle mates with 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Indirect connection: female receptacle mates with male plug

Main characteristics

- 2 x 13 to 2 x 55 signal contacts
- 3A per signal contact
- Fully compatible with all the standard connectors HE901 on the market

Markets

Standard

NFC/UTE 93/423
HE901

How to order

Series (see pages 10 to 13)	
254 DFN	Female receptacle or male plug
254 DFD	Polarising system for plug or receptacle

Type / Gender (See pages 8 to 9)		
254 DFN	**F1**	Female receptacle
	M1	Male plug
254 DFD	**E**	For female receptacle
	B	For male plug

254 DF- -- - --

Number of signal contacts (see pages 10 to 13)		
254 DFN connectors		254 DFD Polarising system
Female receptacle (F1)	Male plug (M1)	For female receptacle (E) For male plug (B)
13		
19	**19**	
25	**25**	**25**
31	**31**	**31**
37	**37**	**37**
43	**43**	**43**
49	**49**	**49**
50		
55	**55**	

Signal contacts (see page 8)			
254 DFN connectors	Female receptacle (F1)	**Z6**	Solder on wire
		Y6	Straight PC tail
	Male plug (M1)	**YC6**	Right angle PC tail
		U6	SMT double sided
254 DFD Polarising system	For female receptacle (E) For male plug (B)	**Blank**	

Series (see pages 10 to 12)	
HE901	254 DFN series Female receptacle or male plug

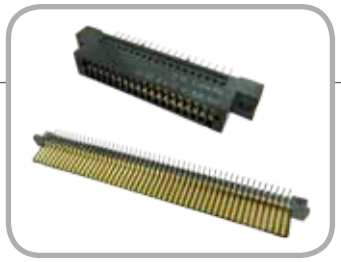
Type / Gender (See page 8)	
E	Female receptacle
F	Male plug

HE901 - -- -

Number of signal contacts (see pages 10 to 12)
38
50
62
74
86
98

Signal contacts (see page 8)		
Female receptacle (E)	**Z**	Solder on wire
	Y	Straight PC tail
Male plug (F)	**U**	SMT double sided

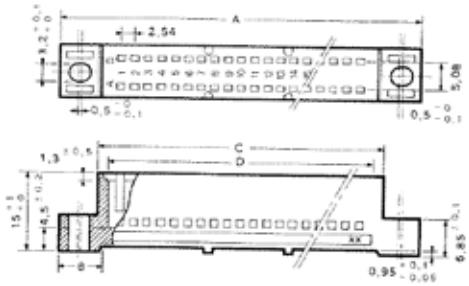
All dimensions are given for information only and are in mm [inch], except as otherwise specified



254 DF / HE901 >>> GENERAL SPECIFICATIONS

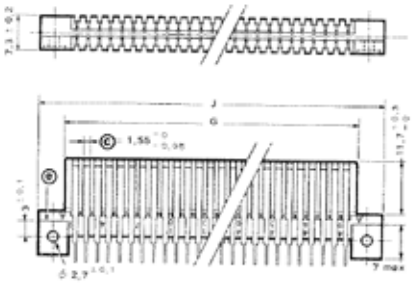
Dimensional characteristics

Receptacle



A = 53,8 [2.118] to 160,40 [6.315]
B = 10 [.394]
H = 15 [.591]

Plug



J = 62,58 [2.464] to 154,02 [6.064]
B = 7,3 [.287]
H = XXX[ ]

Female contact

Bifurcated top removable contact (Y & Z)
Material

- Copper alloy

Plating

- Terminations: tin lead
- Active contact area: gold over **XXX**

Male contact

Material

- Copper alloy

Plating

- Terminations: tin lead
- Active contact area: gold over XXX

Materials

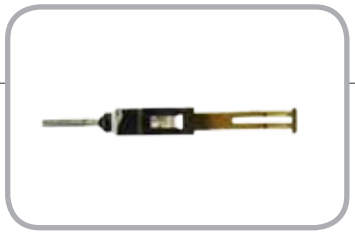
- **Polarising key:** thermoplastic
- **Polarizing system for indirect connection:** PBT, glass loaded
- **Plastic insert:** self extinguishing thermoset

MECHANICAL CHARACTERISTICS	254 DF / HE901
Backoff[1] (mm)	1.25 MAX
Mating force per contact (N) **Unmating force** per contact (N)	2.7 MAX
Contact retention in housing (N)	
Solder on wire	40 MIN
Stright PC tail / SMT	20 MIN
ENVIRONMENTAL CHARACTERISTICS	
Thermal shocks (°C)	-55 / +125
Salt Spray (hours)	96
ELECTRICAL CHARACTERISTICS	
Current rating per contacts (A)	3
Insulation resistance (GΩ)	5 MIN
Contact resistance (mΩ)	10 MAX
Dielectric Withstanding Voltage (Vrms)	1000
Capacitance between contacts (pF)	5 MAX
Service voltage at 50Hz	250

[1]: When both connectors are fully mated, the backoff is the maximum distance the connectors can be unmated while functioning properly

All dimensions are given for information only and are in mm [inch], except as otherwise specified

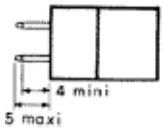
254 DF / HE901 >>> GENERAL SPECIFICATIONS (1)



Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)

FEMALE CONTACTS

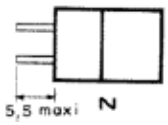
Straight PC tail



- Thru hole soldering
- Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Used for indirect connection: mate with male plug
- Mother board
- PCB thickness: 3,2 $_{MAX}$ [.126]
- To order the contact alone: 049508

Termination style	254 DF / HE901	Y6 / Y

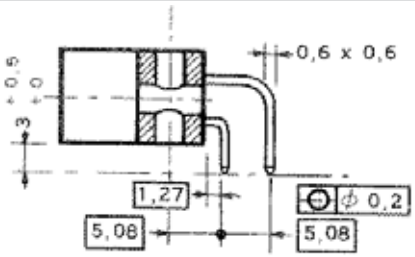
Solder cup



- Hard-soldering on wire
- Ø: 0,55 MAX [.022] on core section
- Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Used for indirect connection: mate with male plug
- To order the contact alone: 049509

Termination style	254 DF / HE901	Z6 / Z

Right angle PC tail

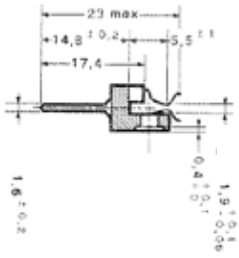


- Thru hole soldering
- Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Used for indirect connection: mate with male plug
- Extender board
- Termination section: 0,6 x 0,6 [.024 x .024]

Termination style	254 DF	YC6

MALE CONTACTS

SMT double side



- SMT soldering
- Used for indirect connection: mate with female receptacle
- Double side daughter board
- PCB thickness: 1,6 ± 0,2 [.063 ± .008]

Termination style	254 DF / HE901	U6 / U

*** Except for crimp contacts* * Consult us*

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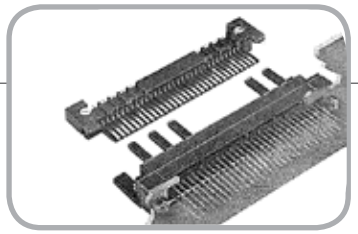
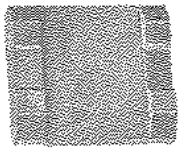
254 DF / HE901 >>> POLARIZATION



FOR DIRECT CONNECTION

Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board

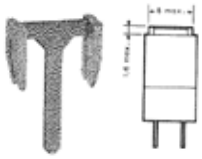
With a loss of contacts



- A polarizing key is mounted in place of a contact pair, with a corresponding cut-out in the circuit board

Part number: Width 1 $_{MAX}$ [.039] Width 1,2 $_{MAX}$ [.047]	**049534** **021736**

With a loss of contacts



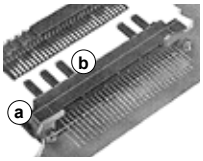
- A polarizing key is mounted on the barrier between two contact cavities, with a corresponding cut-out in the circuit board
- **1:** Polarising key mounted in a receptacle

Width 0,7 $_{MAX}$ [.028]	**020917**

FOR INDIRECT CONNECTION

Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)
The polarizing system is done by:
A polarization part, mounted on the plug
A polarization part mounted on the receptacle
Polarization is made without loss of contacts

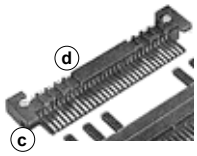
For female receptacle



- 2 guides **(a)**
- 10 keying fingers **(b)**
- 5 identified by letters, from A to E on one side
- 5 identified by figures, from 1 to 5 on the other side
- To key the connection, break off 1 to 3 fingers on each side (no matter the position)
- It is preferable to keep at least 2 fingers on each side, corresponding to the opened cavities on the plug system

Part number	**254 DFD**E**

For male plug



- 2 posts **(c)** for guiding
- 10 closed cavities **(d)**
- 5 identified by letters, from A to E on one side
- 5 identified by figures, from 1 to 5 on the other side
- To key the connection, open 1 to 4 cavities on each side (no matter the position) corresponding to the remaining fingers on the receptacle system

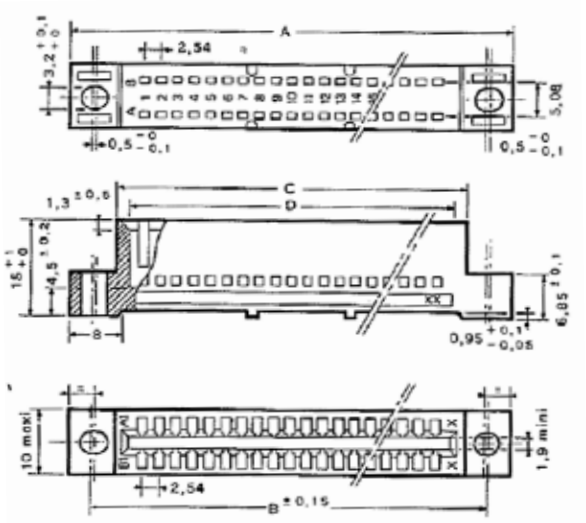
Part number	**254 DFD**B**

254 DF / HE901 >>> TYPICAL ARRANGEMENTS

FEMALE RECEPTACLES

Equipped with straight PC tails or solder cup contacts (Y or Z)

External dimensions



**: number of contacts
*: type of contacts (Z or Y)

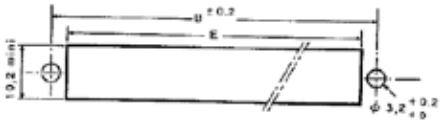
Part number	254 DFN** F1 *6 HE901 E ** *

Mother board layout

- Female receptacle equipped with straight PC tails (Y)
- The positional tolerance of the holes is 0,1 [.004] from the theoretical position

Part number	254 DFN ** F1 Y6 HE901 E ** Y

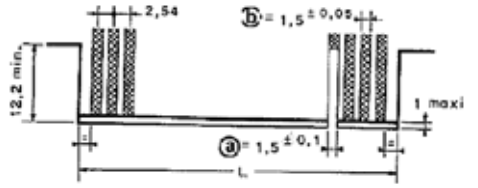
Panel cut outs



- Female receptacle equipped with solder cup contacts (Z)

Part number	254 DFN ** F1 Z6 HE901 E ** Z

Daughterboard layout (for direct connection only)



- Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Daughterboard cut outs
- **(a)** Slot for polarizing key 049534 or 021736
- **(b)** Track width

Number of contacts	A $^{-0}_{-1}$	B	C $^{-0}_{-0,5}$	D $^{+0,2}_{+0}$	E $_{MIN}$	L $^{-0}_{-0,2}$	Weight (g)
2 x 13	53,8 [2.118]	46,7 [1.839]	39,5 [1.555]	35,4 [1.394]	41,2 [1.622]	35,3 [1.390]	9
2 x 19	69,00 [2.716]	62,00 [2.441]	54,70 [2.154]	50,60 [1.992]	56,40 [2.220]	50,50 [1.988]	12
2 x 25	84,20 [3.315]	77,20 [3,039]	70,00 [2.756]	65,90 [2.594]	71,60 [2.819]	65,80 [2.591]	15
2 x 31	99,50 [3.917]	92,50 [3.642]	85,20 [3.354]	81,10 [3.193]	86,90 [3.421]	81,00 [3.189]	19
2 x 37	114,70 [4.516]	107,70 [4.240]	100,50 [3.957]	96,40 [3.795]	102,10 [4.020]	96,30 [3.791]	22
2 x 43	129,90 [5.114]	122,90 [4.839]	115,70 [4.555]	111,60 [4.394]	117,30 [4.618]	111,50 [4.390]	25
2 x 49	145,20 [5.717]	138,20 [5.441]	131,00 [5.157]	126,80 [4.992]	132,60 [5.220]	126,70 [4.988]	28
2 x 50	147,74 [5.817]	140,74 [5.541]	133,54 [5.257]	129,34 [5.092]	135,34 [5.328]	129,24 [5.088]	29
2 x 55	160,40 [6.315]	153,40 [6.039]	146,20 [5.756]	142,10 [5.594]	147,80 [5.819]	142,00 [5,591]	32

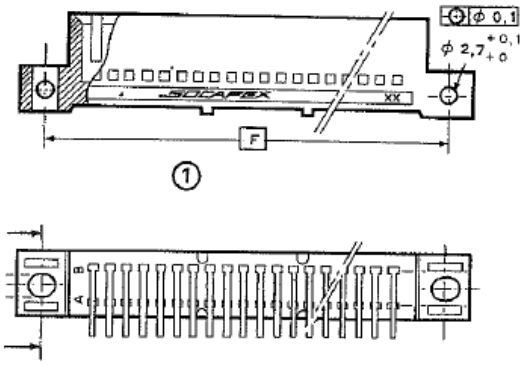
All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 DF / HE901 >>> TYPICAL ARRANGEMENTS

FEMALE EXTENDER

Equipped with right angle PC tails (YC6)

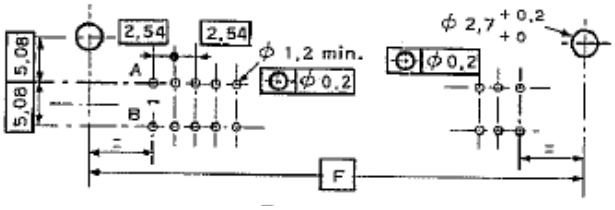
External dimensions



- **: number of contacts
- For other dimensions, see page 10, female receptacles
- The axis of the board soldered to the extender is offset with respect to the connecting board by 5 [1.772] + e/2, where e is the thickness of the board soldered to the extender

Part number	254 DFN** F1/YC6

External board layout



- Female receptacle equipped with right angle PC tails (YC)
- The marking of rows A and B and contact 1 are given by way of indication

Part number	254 DFN** F1/YC6

Number of contacts	F ± 0.15	Weight (g)
2 x 19	61,5 [2.421]	14
2 x 25	76,7 [3.020]	17
2 x 31	92 [3.622]	20
2 x 37	107,2 [4.220]	24
2 x 43	122,4 [4.819]	27
2 x 49	137,7 [5.421]	31
2 x 50	104,24 [4.104]	32

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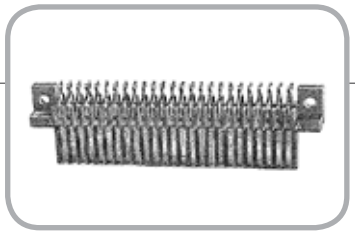
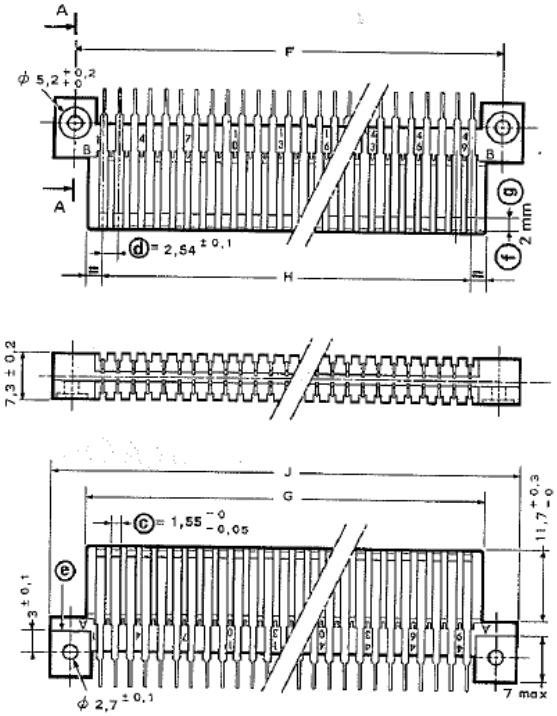
254 DF / HE901 >>> TYPICAL ARRANGEMENTS



MALE PLUG

Equipped with SMT contacts (U)

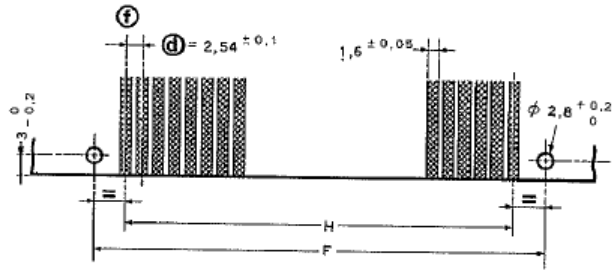
External dimensions



- **: number of contacts
- **(a)** moulding board slot
- **(b)** over contacts
- **(c)** over contacts
- **(d)** non cumulative tolerance
- **(e)** board edge
- **(f)** end of the standard contact
- **(g)** and of the short contact

Part number	254 DFN ** M1 U6 HE901 F** U

Daughterboard layout (for indirect connection only)



- Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)
- Daughterboard cut out
- **(d)** non cumulative tolerance
- **(f)** reference axis

Part number	254 DFN ** M1 U6 HE901 F** U

Number of contacts	F ± 0,2 [.008]	H ± 0,1 [.004]	J^{-0}_{-1}	$G^{-0}_{-0,2}$	Weight (g)
2 x 19	55,88 [2.200]	45,72 [1.800]	62,58 [2,464]	50,50 [1.988]	9
2 x 25	71,12 [2.800]	60,96 [2.400]	77,82 [3.064]	65,80 [2.591]	11
2 x 31	86,36 [3.400]	76,20 [3.000]	93,06 [3.664]	81,00 [3.189]	13
2 x 37	101,6 [4.000]	91,44 [3.600]	108,30 [4.264]	96,30 [3.791]	15
2 x 43	116,84 [4.600]	106,68 [4.200]	123,54 [4.864]	111,50 [4.390]	17
2 x 49	132,08 [5.200]	121,92 [4.800]	138,78 [4.464]	126,7 [4.988]	19
2 x 55	147,32 [5.800]	137,16 [5.400]	154,02 [6.064]	141,98 [5.590]	21

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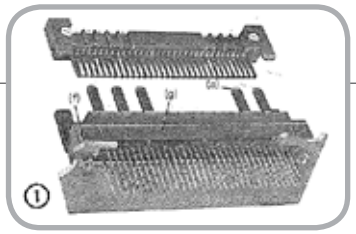
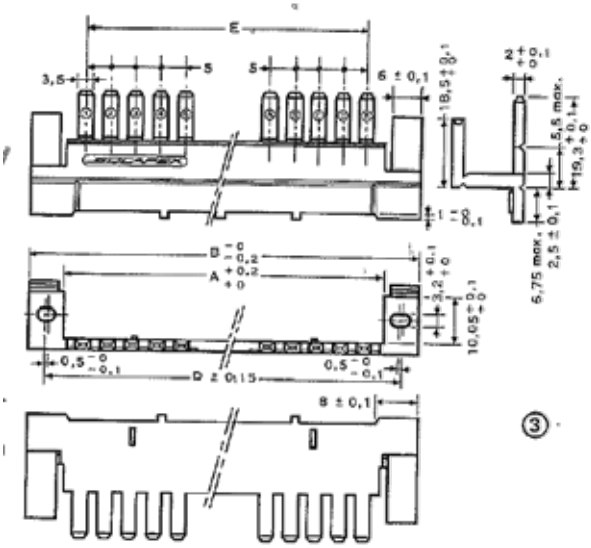
254 DF / HE901 >>> TYPICAL ARRANGEMENTS



POLARIZATION SYSTEM FOR INDIRECT CONNECTION

Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)

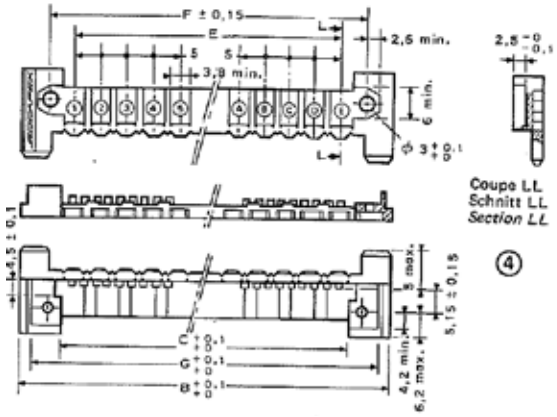
External dimensions - receptacle polarization system



- **: number of contacts
- Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)
- Polarization system for receptacle equipped with straight PC tails (Y) or solder cup contacts (Z)
- *Receptacle mounting details:*
  - *15,24 [.600] spacing, enabling both orientation and polarization*
  - *12,7 [.500] spacing, with orientation only, all fingers **(a)** in figure **(1)** removed*
  - *Mounting from front of panel*
    1. *See standard panel cut out detail page 10*
    2. *The polarizing system is fitted directly on to the receptacle, as in figure **(1)**, and secured simultaneously*
  - *Mounting from rear of panel*
    1. *Maximum panel thickness: 2,5 [.098]*
    2. *See standard panel cut out detail page 10*
    3. *Break the skirts **(f)** + **(g)** on the polarizing system. The finger support abuts on the panel.*
    4. *Cut out greater than 14,5 [.571]. Break off the corner **(f)** of the polarizing system skirt.*
- *The receptacle is mounted from the rear of the panel, the polarizing system from the front, as shown in **(2)**. The assembly is fixed together at either end.*

Part number	254 DFD ** E

External dimensions - plug polarization system



- **: number of contacts
- Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)
- Polarization system for plug equipped with SMT contacts (U)
- Plug mounting details

*1. The polarizing system fits on the plug as shown in figure **(1)** using the nuts and bolts supplied with the plug*

Part number	254 DFD ** B

Number of contacts	A	B	C	D	E	F	G
2 x 19	55 [2.165]	68 [2.677]	50,40 [1.984]	62 [2.441]	46,60 [1.835]	55,88 [2.200]	63 [2.480]
2 x 25	70,24 [2.765]	83,24 [3.277]	65,64 [2.584]	77,24 [3.041]	61,84 [2.435]	71,12 [2.800]	78,24 [3.080]
2 x 31	85,48 [3.365]	98,48 [3.877]	80,88 [3.184]	92,48 [3.641]	77,08 [3.035]	86,36 [3.400]	93,48 [3.680]
2 x 37	100,72 [3.965]	113,72 [4.477]	96,12 [3.784]	107,72 [4.241]	92,32 [3.635]	101,60 [4.000]	108,72 [4.280]
2 x 43	115,96 [4.565]	128,96 [5.077]	111,36 [4.384]	122,96 [4.841]	107,56 [4.235]	116,84 [4.600]	123,96 [4.880]
2 x 49	131,20 [5.165]	144,20 [5.677]	126,60 [4.984	138,20 [5.441]	122,80 [4.835]	132,08 [5.200]	139,20 [5.480]

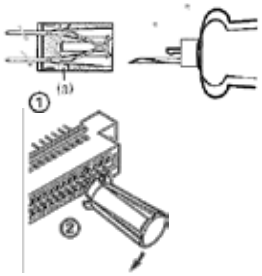
All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 DF / HE901 >>> TOOLING

REMOVAL TOOLS

WARNING: a contact extracted must not be used again

49532

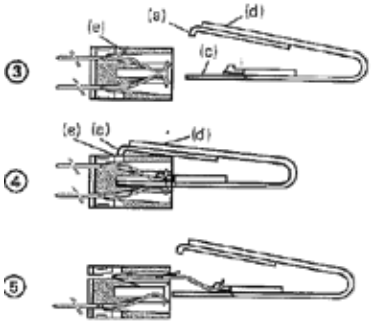


- Contact removal tool for receptacles mounted one against the other
- Straight PC tails (Y) or solder cup contacts (Z)
- Front release

*1. Insert the tool in the cavity, between the contact and the edge of the moulding, perpendicular to the mating face **(1)**. The tip of the tool should be visible through the window in the moulding **(a)***
*2. Push the tool home, keeping it perpendicular until it contacts the moulding **(2)***
*3. Push the tool right over towards the outer edge of the mounting **(2)***
4. Pull the tool out, the contact will come with it

Part number	049532

20300

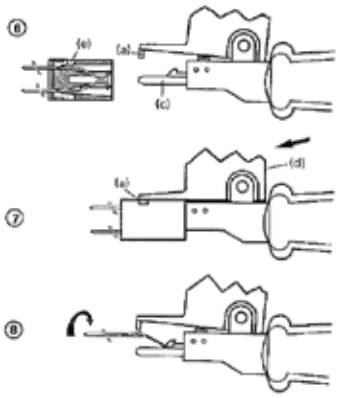


- Contact removal tool for receptacles mounted on 15,24 [.600] centres
- Straight PC tails (Y) or solder cup contacts (Z)
- Front release

***(3)**: Respective position of tool and receptacle*
*1. Push the tool as for as it will go **(4)***
*- The guide **(c)** abuts the bottom of the moulding*
*- The spigot **(a)** is opposite the slot **(e)***
*2. Press on part **(d)** of the tool, the contact tongue is disengaged from its place*
*3. Cease pressing on part **(d)***
*4. Withdraw tool and the imprisoned contact **(5)***

Part number	020300

20188



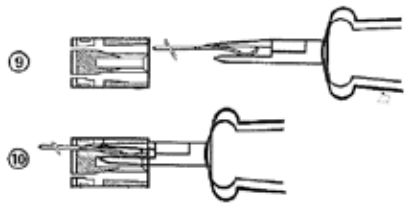
Contact removal tool for receptacles mounted on 12,7 [.500] centres
Straight PC tails (Y) or solder cup contacts (Z)
Front release

(6): Respective positions of tool and receptacle (guide ***(c)*** along the axis of the connector)
1. Push the tool home ***(7)***
- The guide ***(c)*** goes to the bottom of the moulding
- The spigot ***(a)*** is opposite the hole ***(e)***
2. Press on part (d) of the tool, in the direction indicated by the arrow ***(7)***. The contact retention is released
3. Release pressure ***(d)***
4. Pull back the tool with contact attached ***(8)***
5. Remove the contact by turning it through 90°

Part number	020188

INSERTION TOOLS

49533



- Contact insertion tool for receptacles
- Straight PC tails (Y) or solder cup contacts (Z)

1. Insert the contact into the tool ***(9)***
2. Insert the tool and contact together in the moulding cavity, from the board side, in the position shown on the figure ***(9)***
3. Press the tool right home. The contact tongue positions itself in its slot ***(10)***
4. Withdraw tool. The contact held by the tongue should remain in recess

Part number	049533

All dimensions are given for information only and are in mm [inch], except as otherwise specified

NOTES

254 / HE701

Single-sided connectors for PCB

The 254 series is a single sided, 2,54 [.100] pitch, range of connectors for printed circuit boards.
Both direct or indirect connections could be made:
- For direct connection, the female receptacle mates with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- For indirect connection, the female receptacle mates with the male plugs

A well-proven technology

- The 254 series uses a 2,54[.100] pitch, single sided
- The arrangements available are from 11 contacts to 47 contacts for 254 series and 6 contacts to 24 contacts for 508 series

A simple choice of solutions, adaptable to all type of configurations

- 2 receptacle versions are available:
  - Type A:
    - Floating contacts
    - Terminations in two rows, 2,54[.100] pitch
  - Type B:
    - Removable contacts
    - Terminations in two rows, 5,08[.200] pitch

- For motherboard: female receptacle with straight PC tails (Y)
- For mounting on cables: female receptacle with solder cup contacts (Z)

- For extender boards
  - Female extender with right angle PC tails (YC)
  - Type B only
    - Removable contacts
    - Terminations in two rows, 5,08[.200] pitch

- In case of direct connection: the female receptacle mates directly with a 1,6 ± 0,2 [.063 ± .008] printed circuit board

- In case of indirect connection, the male plug with right angle PC tails is used. 3 versions are available
  A: standard types as per norm B: open ended mounting ears C: without mounting ears

- Various polarization system are available (for both direct or indirect connection)
- The 508 series is a derivate version of the standardized range, with only odd-numbered contacts mounted

The 254 series complies with here below standards:

NFC/UTE 93-421
HE701

Series	Gender	Signal contacts	Number of contacts		Polarization system
245 series or 508 series	**Female receptacle** Type A Type B	Sraight PC tails Y Solder cup Z Right angle PC tails (YC, for extender)	From 6 to 47	+	For direct connection For indirect connection
	Male plug Type A Type B Type C	Right angle PC tails			
Pages 18 & 27	Pages 23 to 25	Pages 20 & 21	Pages 23 to 25		Page 26

All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 / HE701 Series

Table of contents

The 254 / HE7 series serves various **markets**, including :

Security & Defense

Navy

Industrial

254 / HE701 >>> GENERAL SPECIFICATIONS

MEDIUM DENSITY

- 2,54[.100] pitch
- Proven and reliable double-sided PCB connectors
- Direct connection: female receptacle mates with 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Indirect connection: female receptacle mates with male plug

Main characteristics

- 2 x 13 to 2 x 55 signal contacts
- 3A per signal contact
- Fully compatible with all the standard connectors HE701 on the market

Markets

Standard

NFC/UTE 93/421
HE701

How to order

Series (see page 19)	
254	254 series (2.54 [.100] pitch)
508	508 series (5.08 [.200] pitch)

Type / Gender (See pages 22 to 25)	
Receptacle	Plug
AF Female type A	AM Male type A
BF Female type B	BM Male type B
	CM Male type C

254 -- -- --

Series (see page 19)	
HE701	254 series

Type / Gender (See pages 22 to 25)	
Receptacle	Plug
EN Female type A	F Male type A
EV Female type B	

HE701 -- -- --

Number of signal contacts (see pages 22 to 25 & 27)								
254 series		508 series						
Female type AF Male type AM, BM, or CM	Female type BF	Female receptacle				Male plug		
		AF Y	AF Z	BF Y	BF Z	AM	BM	CM
			6			6		
			8			8		8
11		9	9	9		9	9	9
17	17	12	12					
23	23		13	13		13		
25	25	14						14
29	29	15		15		15	15	15
35	35	17	17					17
41	41	18	18	18	18	18	18	18
47	47		21	21		21		
		23	23					23
		24	24			24	24	24

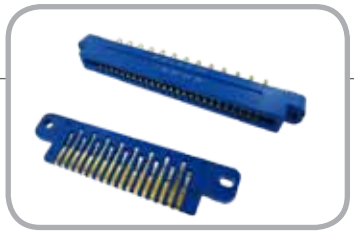
Signal contacts (see pages 20 to 21)				
Female receptacle	254	AF	Z	Solder cup
			Y	Straight PC tails
		BF	Z	Solder cup
			Y	Straight PC tails
			YC 01	Right angle PC tails
	508	AF BF	Z	Solder cup
			Y	Straight PC tails
Male plug 254 ou 508		AM BM CM	Vide	Right angle PC tails

Number of signal contacts (see pages 22 to 25)	
Female receptacle type A (EN) Male plug type A (F)	Female receptacle type B (EV)
11	
17	17
23	23
29	29
35	35
41	41
47	47

Signal contacts (see pages 20 to 21)				
Female receptacle	254	AF	Z	Solder cup
			Y	Straight PC tails
		BF	Z	Solder cup
			Y	Straight PC tails
			YC 01	Right angle PC tails
	508	AF BF	Z	Solder cup
			Y	Straight PC tails
Male plug 254 ou 508		AM BM CM	Vide	Right angle PC tails

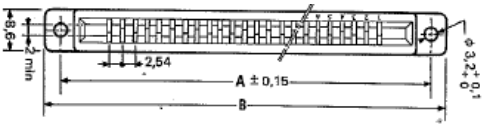
All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 / HE701 >>> GENERAL SPECIFICATIONS

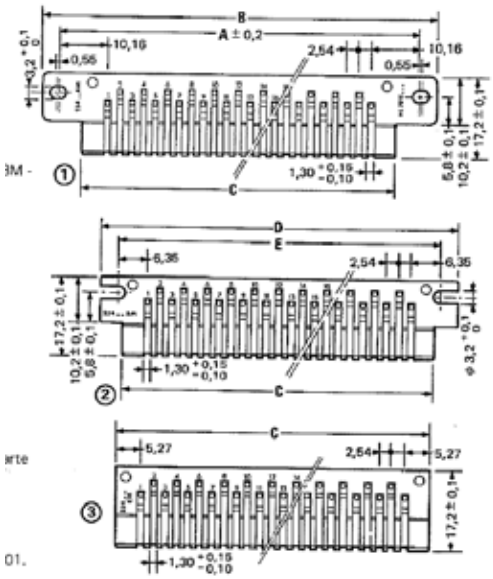


Dimensional characteristics

Receptacle



Plug



Receptacle:

- B = 53,1 [2.091] to 144,6 [5.693] (type A)
- B = 68,4 [2.693] to 144,6 [5.693] (type B)

Plug:

- B = 53,1 [2.091] to 144,6 [5.693] (Type A)
- D = 45,5 [1.791] to 136,9 [5.390] (Type B)
- C = 35,95 [1.415] to 127,40 [5.016] (Type C)

508 series:
Connectors are made from the same mouldings and contacts as 254 series. Only odd-numbered contacts are mounted

Female contact

Floating lyre **contact (Y & Z) for type A**
Patented double lyre **contact (Z, Z & YC) for type B**
Material

- Copper alloy

Plating

- Terminations: gold over nickel
- Active contact area: gold over nickel

Male contact

Material

- Copper alloy

Plating

- Terminations: gold over nickel
- Active contact area: gold over nickel

Materials

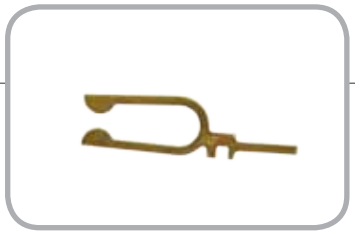
- **Polarising key:** thermoplastic
- **Plastic insert:** thermoset

MECHANICAL CHARACTERISTICS	254 / HE701
Backoff[1] (mm)	1.20 MAX
Mating force per contact pair (N) **Unmating force** per contact pair(N)	2.7 MAX
Contact retention in housing (N)	
Solder on wire	20 MIN
Stright PC tail / SMT	20 MIN
ENVIRONMENTAL CHARACTERISTICS	
Thermal shocks (°C)	-55 / +125
ELECTRICAL CHARACTERISTICS	
Current rating per contacts (A) direct connection	3
Current rating per contacts (A) indirect connection	5
Insulation resistance (GΩ)	5 MIN
Contact resistance (mΩ)	10 MAX
Capacitance between contacts (pF)	5 MAX
Service voltage at 50Hz	200
Test voltage at sea level (Vrms)	900
Test voltage at 20 mbar (Vrms)	200

1: When both connectors are fully mated, the backoff is the maximum distance the connectors can be unmated while functioning properly

All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 / HE701 >>> SIGNAL CONTACT

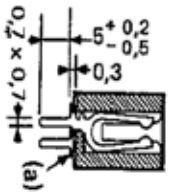


Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)

FEMALE CONTACTS TYPE A

Floating contacts, terminations in two row, 2,54 [.100] pitch

Straight PC tail

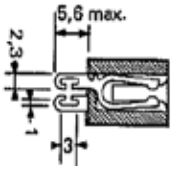


- Thru hole soldering
- Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Used for indirect connection: mate with male plug
- Mother board
- Termination section: 0,7x 0,7 [.028 x .028]
- PCB thickness: 3,2 MAX [.126]
- Weight: 0,15g

(a): insulated washer stuck on the underside of the end feet of connectors to enable board cleaning

Termination style	254 ** AF Y HE701 EN ** Y

Solder cup



- Hard-soldering on wire
- O: 1 MAX [.039] on core section
- Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Used for indirect connection: mate with male plug
- Weight 0,16g

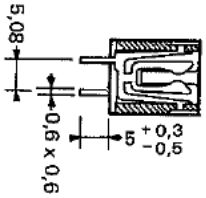
Termination style	254 ** AF Z HE701 EN ** Z

FEMALE CONTACTS TYPE B

Removable contacts, terminations in two row, 5,08 [.200] pitch

The mention → or ← means the contact removal direction

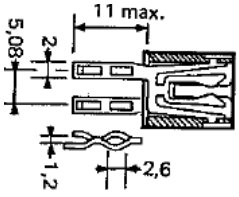
Straight PC tail



- Thru hole soldering
- Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Used for indirect connection: mate with male plug
- Mother board
- Termination section: 0,6 x 0,6 [.024 x .024]
- PCB thickness: 3,2 MAX [.126]
- Weight: 0,27g
- *To order the contact alone* *043247*

Termination style	254 ** BF Y HE701 EV ** Y

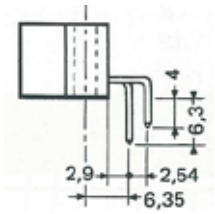
Solder cup



- Hard-soldering on wire
- For soldering two wires, one of which can be a busbar joining adjacent connectors (supply, ground)
- Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Used for indirect connection: mate with male plug
- Weight: 0,37g
- *To order the contact alone* *042635*

Termination style	254 ** BF Z HE701 EV ** Z

Right angle PC tail

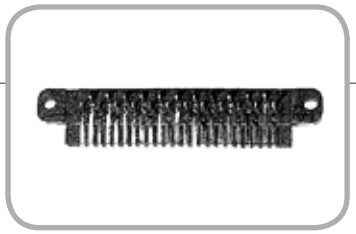


Thru hole soldering
Used for direct connection: mate with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
Used for indirect connection: mate with male plug
Extender board
Weight: 0,31g

Termination style	254 ** BF YC01

All dimensions are given for information only and are in mm [inch], except as otherwise specified

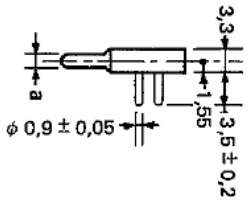
254 / HE701 >>> SIGNAL CONTACT



Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
Indirect connection is made by a female receptacle mated with a male plug (two-part connectors)

MALE CONTACTS

Right angle PC tail



- Thru hole soldering
- Used for indirect connection: mate with female receptacle
- Daughter board
- Termination diameter: 0,9 ± 0,05 [.035 ± .002]
- PCB thickness: 2,6 MAX [.102]
- **(a)**: 1,9 [.075] over the moulding, 1,6 ± 0,15 [.063 ± .006] over the contacts

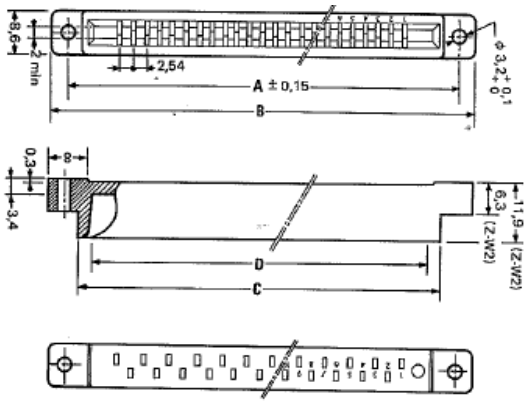
Termination style	254 ** AM HE701 F ** Y 254 ** BM 254 ** CM

254 / HE701 >>> TYPICAL ARRANGEMENTS

FEMALE RECEPTACLES TYPE A

Equipped with straight PC tails or solder cup contacts (Y or Z)

External dimensions



**: number of contacts
*: type of contacts (Z or Y)

Part number	254 ** AF * HE701 EN **

Mother board layout

- Female receptacle equipped with straight PC tails (Y)
- The positional tolerance of the holes is 0,1 [.004] from the theoretical position
- The board is shown from the connector side. Contact #1 is given for reference
- *Having mounted the connector on the board, insert a male plug or a board to correctly position the contacts*

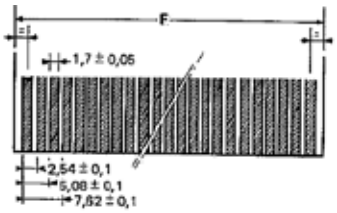
Part number	254 ** AF Y HE701 EN ** Y

Panel cut outs

- Female receptacle equipped with solder cup contacts (Z)

Part number	254 ** AF Z HE701 EN ** Z

Daughterboard layout (for direct connection only)



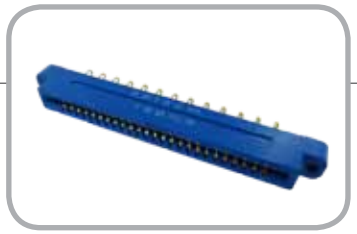
⑤

- Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Daughterboard cut outs

Number of contacts	A	B ± 0.3 [± .012]	C ± 0.3 [± .012]	$D^{+0.15}_{-0.1}$	E_{MIN}	F ± 0.1 [± .004]	Housing weight (g)
11	46,7 [1.839]	53,1 [2.091]	40,8 [1.606]	36,05 [1.419]	41,40 [1.630]	35,85[1.411]	5,8
17	62,0 [2.441]	68,4 [2.693]	56,1 [2.209]	51,30 [2.020]	56,60 [2.228]	51,10 [2.012]	7,6
23	77,2 [3.039]	83,6 [3.291]	71,3 [2.807]	66,55 [2.620]	71,90 [2.831]	66,35 [2.612]	9,3
25	82,3 [3.241]	88,7 [3.492]	76,4 [3.008]	71,62 [2.820]	77,00 [3.031]	71,42 [2.812]	9,9
29	92,5 [3.642]	98,9 [3.894]	86,6 [3.409]	81,80 [3.220]	87,10 [3.429]	81,60 [3.213]	11,1
35	107,7 [4.240]	114,1 [4.492]	101,8 [4.008]	97,00 [3.819]	102,40 [4.031]	96,80 [3.811]	12,8
41	122,9 [4.839]	129,3 [5.091]	117,0 [4.606]	112,25 [4.419]	117,60 [4.630]	112,05 [4.411]	14,6
47	138,2 [5.441]	144,6 [5.693]	132,3 [5.209]	127,50 [5.020]	132,90 [5.232]	127,30 [5.012]	16,4

All dimensions are given for information only and are in mm [inch], except as otherwise specified

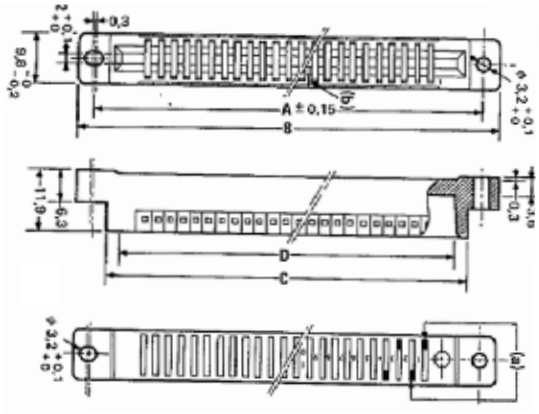
254 / HE701 >>> TYPICAL ARRANGEMENTS



FEMALE RECEPTACLES TYPE B

Equipped with straight PC tails or solder cup contacts (Y or Z)

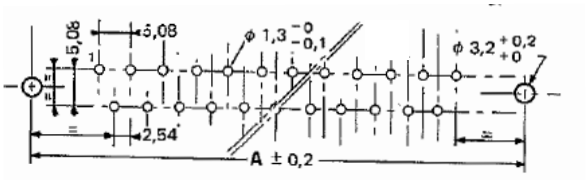
External dimensions



- **: number of contacts
- *: type of contacts (Z or Y)
- **(a)**: position of contact termination
- **(b)**: identification of every 10th contact on mating side

Part number	254 ** BF * HE701 EV **

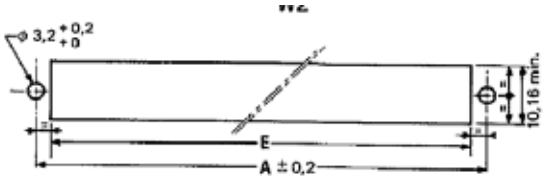
Mother board layout



- Female receptacle equipped with straight PC tails (Y)
- The positional tolerance of the holes is 0,1 [.004] from the theoretical position
- The board is shown from the connector side. Contact #1 is given for reference

Part number	254 ** BF Y HE701 EV ** Y

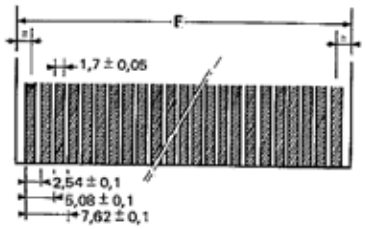
Panel cut outs



- Female receptacle equipped with solder cup contacts (Z)

Part number	254 ** BF Z HE701 EV ** Z

Daughterboard layout (for direct connection only)



- Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Daughterboard cut outs

Number of contacts	A	B ± 0.3 [± .012]	C ± 0.3 [± .012]	D +0.15 -0.1	E MIN	F ± 0.1 [± .004]	Housing weight (g)
17	62,0 [2.441]	68,4 [2.693]	56,1 [2.209]	51,30 [2.020]	56,60 [2.228]	51,10 [2.012]	8,7
23	77,2 [3.039]	83,6 [3.291]	71,3 [2.807]	66,55 [2.620]	71,90 [2.831]	66,35 [2.612]	10,5
25	82,3 [3.241]	88,7 [3.492]	76,4 [3.008]	71,62 [2.820]	77,00 [3.031]	71,42 [2.812]	11,2
29	92,5 [3.642]	98,9 [3.894]	86,6 [3.409]	81,80 [3.220]	87,10 [3.429]	81,60 [3.213]	12,3
35	107,7 [4.240]	114,1 [4.492]	101,8 [4.008]	97,00 [3.819]	102,40 [4.031]	96,80 [3.811]	14,2
41	122,9 [4.839]	129,3 [5.091]	117,0 [4.606]	112,25 [4.419]	117,60 [4.630]	112,05 [4.411]	16
47	138,2 [5.441]	144,6 [5.693]	132,3 [5.209]	127,50 [5.020]	132,90 [5.232]	127,30 [5.012]	17,8

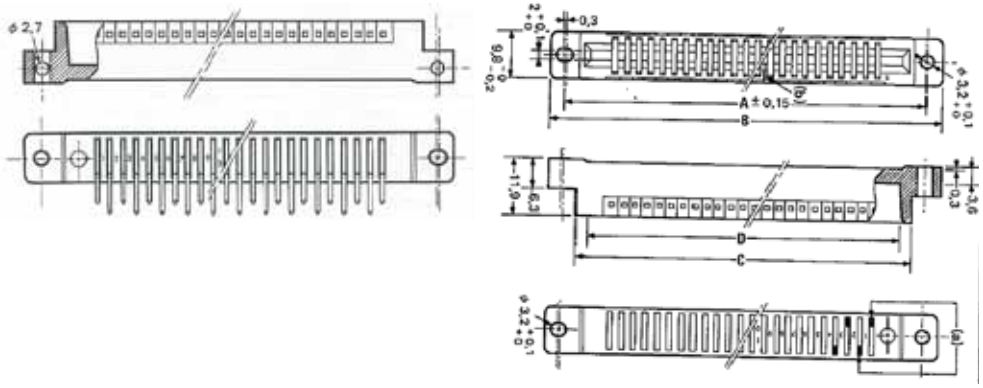
All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 / HE701 >>> TYPICAL ARRANGEMENTS

FEMALE EXTENDER RECEPTACLES TYPE B

Equipped with right angle PC tails (YC01)

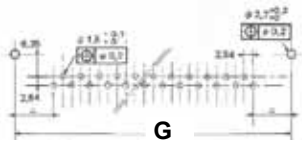
External dimensions



**: number of contacts
- **(a)**: position of contact termination
- **(b)**: identification of every 10th contact on mating side
- *Housing identical to receptacles type B, with transverse drilling of end feet for board mounting*

Part number	254 ** BF YC01

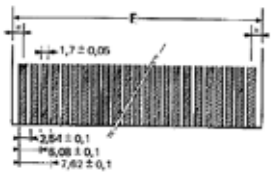
Extender board lavout



- Female receptacle equipped with right angle PC tails (YC01)
- Contact #1 is given for reference

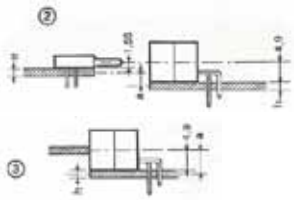
Part number	254 ** BF YC01

Daughterboard layout (for direct connection only)



- Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board
- Daughterboard cut outs

Extender board offset



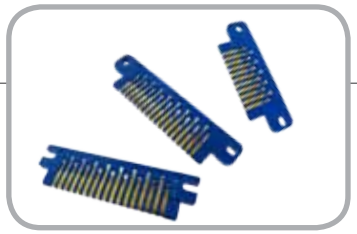
- The axis of the board soldered to the extender is offset with respect to the connecting board by a:
- Indirect insertion **(2)** a = 3,35 + h/2 –e/2
- Direct insertion **(3)** a = 4,9 + h/2

h: thickness of the board soldered to the extender
e: thickness of the board soldered to the plug

Number of contacts	A	B ± 0.3 [± .012]	C ± 0.3 [± .012]	D $^{+0.15}_{-0.1}$	E $_{MIN}$	F ± 0.1 [± .004]	G	Housing weight (g)
17	62,0 [2.441]	68,4 [2.693]	56,1 [2.209]	51,30 [2.020]	56,60 [2.228]	51,10 [2.012]	62,0 [2.441]	8,7
23	77,2 [3.039]	83,6 [3.291]	71,3 [2.807]	66,55 [2.620]	71,90 [2.831]	66,35 [2.612]	77,2 [3.039]	10,5
25	82,3 [3.241]	88,7 [3.492]	76,4 [3.008]	71,62 [2.820]	77,00 [3.031]	71,42 [2.812]	82,3 [3.241]	11,2
29	92,5 [3.642]	98,9 [3.894]	86,6 [3.409]	81,80 [3.220]	87,10 [3.429]	81,60 [3.213]	92,5 [3.642]	12,3
35	107,7 [4.240]	114,1 [4.492]	101,8 [4.008]	97,00 [3.819]	102,40 [4.031]	96,80 [3.811]	107,7 [4.240]	14,2
41	122,9 [4.839]	129,3 [5.091]	117,0 [4.606]	112,25 [4.419]	117,60 [4.630]	112,05 [4.411]	122,9 [4.839]	16
47	138,2 [5.441]	144,6 [5.693]	132,3 [5.209]	127,50 [5.020]	132,90 [5.232]	127,30 [5.012]	138,2 [5.441]	17,8

All dimensions are given for information only and are in mm [inch], except as otherwise specified

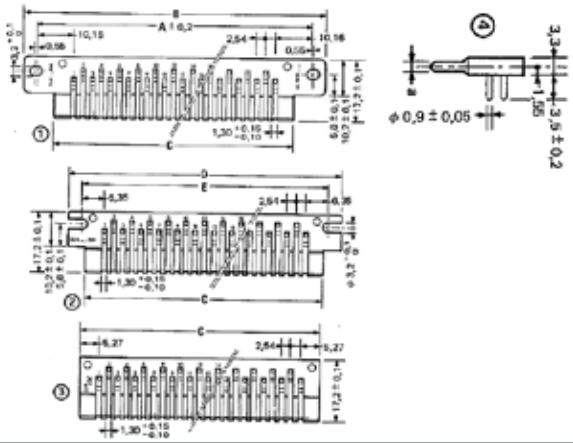
254 / HE701 >>> TYPICAL ARRANGEMENTS



MALE PLUGS TYPE A, B OR C

Equipped with right angle PC tails

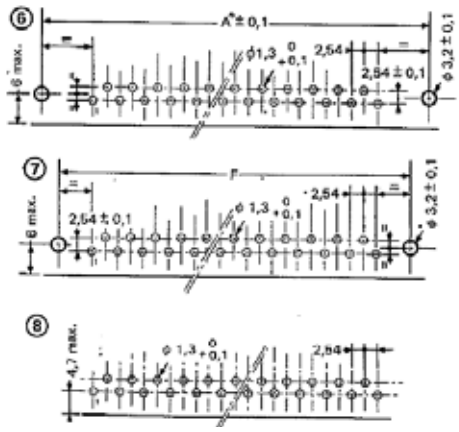
External dimensions



- **: number of contacts
- **(1)**: Plug type A
- **(2)**: Plug type B
- **(3)**: Plug type C
- **(4)**: Plug type A, B or C
  - **(a)**: 1.9 [.075] over the moulding
    1,6 ± 0,15 [.063 ± .006] over the contacts

Part number	254 ** AM HE701 F ** Y 254 ** BM 254 ** CM

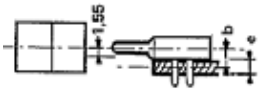
Daughter board layout



- **: number of contacts
- **(6)**: Plug type A
  - **(dimension A)**: fixing hole centres as per NF C/UTE 93-421
  - *As connector has oblong mounting holes, the fixing centres can be increased to A + 0,55 [.022] to make the centres of the mounting holes and board holes coincide*
- **(7)**: Plug type B
- **(8)**: Plug type C
- The positional tolerance of the holes is 0,1 [.004] from the theoretical position
- The board is shown from the connector side. Contact #1 is given for reference

Part number	254 ** AM HE701 F ** Y 254 ** BM 254 ** CM

Daughter board offset



- Offset between the axis of the receptacle and the daughterboard
- **b** = 1,55 +e/2

b: offset between axes
e: board thickness

Number of contacts	A	B ± 0.3 [± .012]	C $^{0}_{-0.3}$	D ± 0.3 [± .012]	E ± 0.2 [± .008]	F ± 0.1 [± .004]	Weight (g)	
							A or B	C
11	45,7 [1.799]	53,1 [2.091]	35,95 [1.415]	45,5 [1.791]	38,1 [1.500]	38,6 [1.520]	4	3
17	61 [2.402]	68,4 [2.693]	51,20 [2.016]	60,7 [2.390]	53,3 [2.098]	53,8 [2.118]	5	4
23	76,2 [3.000]	83,6 [3.291]	55,45 [2.183]	76 [2.992]	68,6 [2.701]	69,1 [2.720]	6	5
25	81,3 [3.201]	88,7 [3.492]	71,50 [2.815]	81,1 [3.193]	73,7 [2.902]	74,2 [2.921]	7	6
29	91,5 [3.602]	98,9 [3.894]	81,70 [3.216]	91,2 [3.591]	83,8 [3.299]	84,3 [3.319]	8	7
35	106,7 [4.201]	114,1 [4.492]	96,90 [3.815]	106,5 [4.193]	99,1 [3.902]	99,6 [3.921]	9	8
41	121,9 [4.799]	129,3 [5.091]	112,15 [4.415]	121,7 [4.791]	114,3 [4.500]	114,8 [4.520]	10	9
47	137,2 [5.402]	144,6 [5.693]	127,40 [5.016]	136,9 [5.390]	129,5 [5.098]	130 [5.118]	12	11

All dimensions are given for information only and are in mm [inch], except as otherwise specified

254 / HE701 >>> POLARIZATION

FOR DIRECT CONNECTION

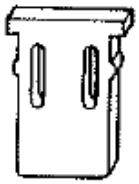
Direct connection is made by a female receptacle directly mated with a 1,6 ± 0,2 [.063 ± .008] printed circuit board

Polarizing key for female receptacle type A

- A contact is replaced by a metal key with a corresponding cut out of the printed board
- Width of key: 0,6 ± 0,03 [.024 ± .001]

Part number	038366

Polarizing key for female receptacle type B



- A contact is replaced by a metal key with a corresponding cut out of the printed board
- Width of key: $0,7\ ^{+0.15}_{-0.1}$ [$.028\ ^{+.002}_{-.008}$]

Part number	042572

FOR INDIRECT CONNECTION

Indirect connection is made by a female receptacle mated with a male plug -two-part connectors)

Polarizing key for male plug / short contact*

- The polarizing keys are fitted to the male connector
  1. Remove a contact and replace it by the polarizing key
  2. Check that the polarizing key is correctly positioned and pinch it to retain it
  3. Remove the corresponding female contact from the receptacle
- Black colour

Part number	037742

Polarizing key for male plug / short contact*

- The polarizing keys are fitted to the male connector
  1. Remove a contact and replace it by the polarizing key
  2. Check that the polarizing key is correctly positioned and pinch it to retain it
  3. Remove the corresponding female contact from the receptacle
- White colour

Part number	041235

*** Never mount a long polarizing key in place of a short contact and vice versa**

254 / HE701 >>> 508 SERIES

508 SERIES

Connectors are made from the same mouldings and contacts as 254 series.
Only odd-numbered contacts are mounted

508 SERIES – 254 SERIES CORRESPONDING CONNECTOR

Number of contacts series 508 connector		Number of contacts in the correcponding connector of series 254
Odd contact mounted	Even contacts mounted	
6*	5*	11*
9	8	17
13	12	25
15	14	29
18	17	35
21	20	41
24	23	47

**: number of contacts
*: type of contacts (Z or Y)

Part number	508 ** AF* 508 ** BF* 508 ** AM 508 ** BM 508 ** CM

* These connectors cannot be supplied in BF version

254 / HE701 >>> TOOLING

REMOVAL TOOLS

Contact removal tool for receptacle type B

Part number	641

NOTES

NOTES

NOTES

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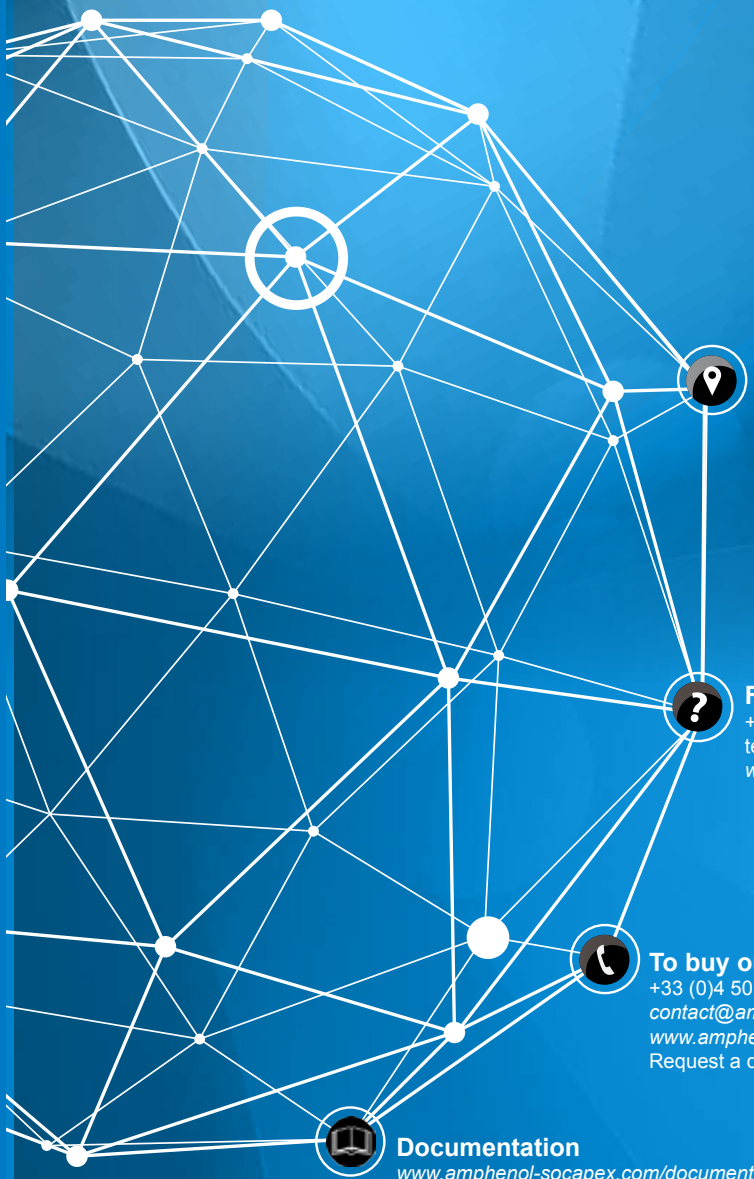

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