

# **ERVAC and Modul-R**





# Products described within this catalog are protected by following patents :

01	08116
02	07868
06	04757

Other patents pending

Plug In manufactures the finest quality product available to the marketplace, however these products are intended to be used in accordance with the specifications described in this catalog. Any use or application that deviates from the stated operating specifications is not recommended and may be unsafe.

Specifications are subject to change without notice. Consult Plug In for latest design specifications. All statements, information and data provided herein are believed to be accurate and reliable but are presented without guarantee, warranty or responsibility of any kind, expressed or implied. The user should not assume that all safety measures are indicated or that other measures may not be required.

Drawing dimensions are in millimeters

## ERVAC and Modul-R Catalog 2008 - 2009





Table of Contents		
Company introduction	Page 4	
Vacuum specification Outgassing Hermeticity Temperature Radiation	5 - 6 7 7 8 - 9	
Mounting example	10	
Module dimensions	11	
Flange cut-out for standard ERVAC module	12 - 13	
ERVAC D-SUB Normal Density Technical data Module type	14 15	
ERVAC D-SUB High Density Technical data Module type	16 17	
ERVAC D-SUB Mixed Layout Technical data Layout type Module type Manufacturing example	18 19 20 21	
ERVAC SMA Technical data Manufacturing example	22 23	
ERVAC BNC Technical data Module type	24 25	
ERVAC Micro-D Technical data Module type	26 27	
ERVAC Wire / Wire Technical data	28	
ERVAC Ordering Code	29	
Modul -R MII-C-38999 Technical data Layout type Manufacturing example Ordering Code	30 31 - 35 36 37	
Hermetic product lines	38 - 39	



Created in 1999, Plug In is considered today as a reference in matter of development and manufacturing of original solutions for hermetic feedthroughs. Since its foundation, the company is using the most performant 3D CAD software. With some patents, a prooved production quality and a high service oriented support, Plug In is widely recognized for its capability to solve nearly all our customers problems.

During 2004, by adding the metal to glass technology to its large product range, Plug In became the first company in the world totaly specialized in hermetic feedthroughs, able to offer custom designed, reliable and innovative products which covers the whole vacuum spectrum from high to ultra high vacuum.

Beside vacuum components (flanges, fittings and accessories) and small HV and UHV vacuum chambers, Plug In can offer all kind of feedthroughs such as Thermocouple, coaxial, power and optic fibers.

Today we are proud to present you our latest technical catalog about our ERVAC modular hermetic feedthrough. It took us nearly 5 years to finalyze that product range, by adding year after year more new versions. Until today, this family is still growing based on our customers inputs.

Experienced by the major actors of the international space oraganisations and industries, we are confident that you also will find a lot of benefits by using this innovative concept.





#### Out gassing

1/ introduction : Vacuum compatibility of our epoxy resin

2/ Description :

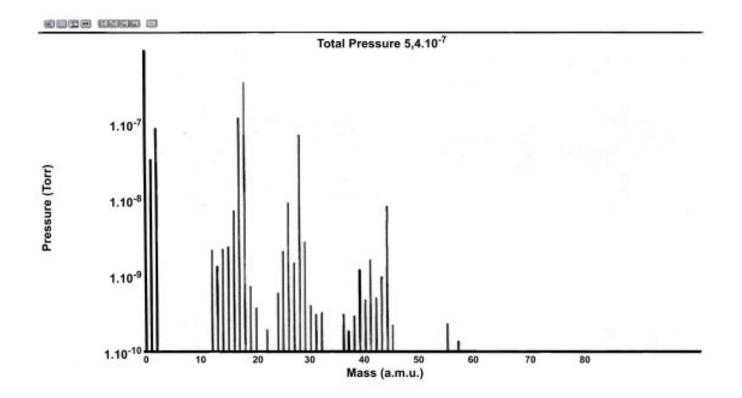
Sample inserted in a double dome vessel with instrumentation (penning gauges, gas analyser, thermocouples), and a previously calibrated conductance. The desorption rate Q is extrapolated from the pressure using the Dayton method.

3/ Results :

Q=C $\Delta$ P (assuming that Qbench is negligible compared to Qsample ) C=9 I/s (regarding the partial pressure contributions).

without bakeout:

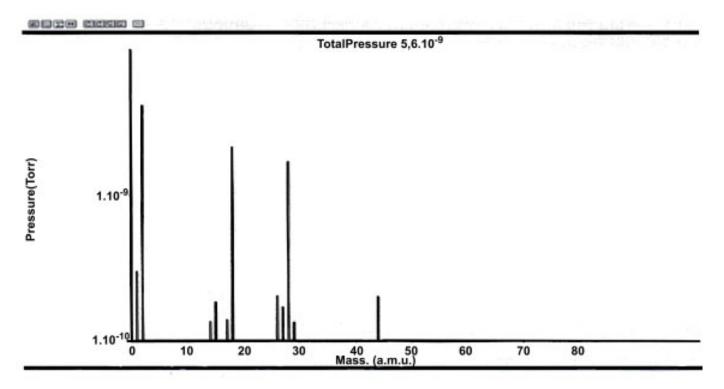
TML (Total Mass Loss) : < 1% / CVCM (Collected Volatile Condensable Materials) : < 0.1%  $\Delta$ P= 1.10<sup>-6</sup> mbar Q = 1.10<sup>-5</sup> mbar.l/s / Samples surface is around 70 cm<sup>2</sup> /  $\alpha$ =1.4 10<sup>-7</sup> mbar.l/s/cm<sup>2</sup>





The gas analysis shows a large contribution of the water vapour and typical hydrocarbon contamination group of peaks (CnHn) as expected for a non baked material.

With bakeout : Sample baked at 150°C for 48 Hours  $\Delta P = 1.10^{-8}$  mbar Q= 1.10<sup>-7</sup> mbar.I/s



The spectrum clearly shows the cleaning effect of the bakeout. The remaining hydrocarbons are now in the low -10 range. The source can be some solvents like alcohol, acetone, or trichloroethylene (= trace of chlorine peaks at 36, 39, 41 amu)

#### **Conclusions :**

As shown in the upper spectrum, no outgassing effect remains in the  $10^{-8}$  field. In most high vacuum applications, a desorption rate in the order of  $10^{-5}$  mbar.I/s is acceptable. When better parameters are required, the outgassing could be reduced by a small bakeout.



#### Hermeticity

Designation-----: Plug In tape Controled part---: connectors Controled field---: Global test

Standard or specification for control--: Afnor NFA 09-492 Control process-----: Following standards Controler level -----: Cofrend level 2 Hermeticity

Pumping device: "pompe à palette" 4m <sup>3</sup> .h <sup>-1</sup>
Control device : Mass Spectrometer " ALCATEL ASM 110 TCL "
Leak reference value: 2,6.10 <sup>-8</sup> atm.cm <sup>3</sup> .s <sup>-1</sup>
Leak reference signal on detector: 1,8.10 <sup>-8</sup>
Cell pressure: <10 <sup>-3</sup> Pa
Helium concentration: 100%
Ping: 1s
Residual signal value: 3,2.10 <sup>-9</sup>
Leak signal value: 3,2.10 <sup>-9</sup>
Leak flux: < 3,5.10 <sup>-10</sup> atm.cm <sup>3</sup> .s <sup>-1</sup> or <3,5.10 <sup>-11</sup> Pa.m <sup>3</sup> .s <sup>-1</sup>
Agreement values: 1.10 <sup>-9</sup> Pa.m <sup>3</sup> .s <sup>-1</sup>

#### Temperature

On the door of a Vacuum simulator are installed 11 Flanges. Each one is equipped with 13 connectors. Types are following.

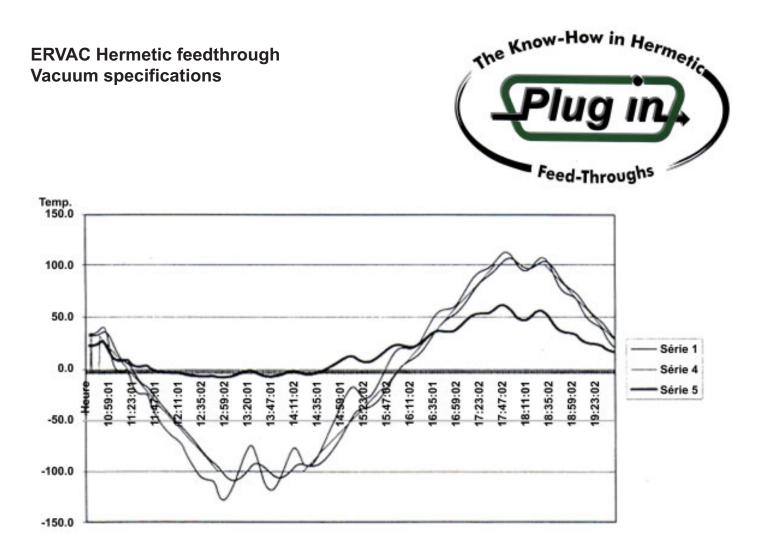
D-SUB 37 contacts SMA, TNC 8W8 D-sub Power and coaxial

Vacuum test:

4x10<sup>-7</sup> reached: **no leaks on vacuum simulator or connectors**.

Temperature test

A type K thermosensor is installed close to the flanges to analyze the temperature evolution. Flanges are protected by a Schroud , which limits the thermal conduction on connectors.



Curves show that air side connectors temperature doesn't reach maximums of vacuum simulator.

-Average M -150°C, thermosensor connectors = -3°C -Average M +150°C, thermosensor connectors = +55°C

No damage to the vacuum side connector below 80°C

#### Radiation

This part describes the influence of gamma Rays for encapsulation and hooding up to 10<sup>9</sup> rads (10<sup>7</sup> gre) is a value obtained with an exposure of 3 days into a reactor. If continued for 10 years, results shouldn't change a lot, because of influence of Gamma rays which is not significative in the time. In below table, samples are first listed before Gamma rays irradiation, hardness was measured at 25°C, 100°C and 125°C. In second part of table, hardness was measured after Gamma ray irradiation.

#### Conclusions :

- 1. Every mixes made with Catalyst CT are fine, even FR mixes.
- 2. A mix polymerised with anhydrides (Catalyst CE) is fine. Hardness increased, due, maybe, to a second polymerisation because of radiations.
- 3. A Mix with one component can have unreliable performances with an increased temperature
- 4. Catalyst CE can be used for nuclear fields
- 5. Flexible mixes lose their flexibility with a lower temperature,
- 6. Clear mixes become dark



Before irradiation						
Ref.	Hardness at 25°C	Hardness at 100°C	Hardness at 125°C	Colour	Comments	
Resin A / Cat CT Resin B / Cat CT Resin A / Cat CC Resin C / Cat CT Resin D / Cat CE Resin C / Cat CC Resin E / Cat CT Resin F Resin G Resin H (not flexible) Resin I Resin J	83 (D) 85 (D) 84 (D) 90 (D) 88 (D) 87 (D) 86 (D) 80 (D) 80 (D) 80 (D) 32 (A)	75 (D) 80 (D) 70 (D) 65 (D) 65 (D)	56 (D) 65 (D) 61 (D) 75 (D) 78 (D) 66 (D) 55 (D) 35 (D) 40 (D) 40 (D) 38 (D) 30 (A)	Red Black Black Blue Black Black Black Black Black Black Transparent Transparent		
		After irr	adiation			
Ref.	Hardness at 25°C	Hardness at 100°C	Hardness at 125°C	Colour	Comments	
Resin A / Cat CT Resin B / Cat CT Resin A / Cat CC Resin C / Cat CT Resin D / Cat CE Resin C / Cat CC Resin E / Cat CT Resin F Resin G Resin H (not flexible) Resin I Resin J	88 (D) 86 (D) 87 (D) 90 (D) 90 (D) 87 (D) 87 (D) 85 (D) 85 (D) 80 (D) 75 (D) 62 (A)	30 (D) 40 (D) 50 (D) 47 (D) 47 (D)	56 (D) 80 (D) 18 (D) 79 (D) 88 (D) 20 (D) 40 (D) 10 (D) 30 (D) 30 (D) 10 (D) 35 (A)	Red Brown/grey Grey Black Black Light brown Black Black Black Black Dark brown Dark brown	Pass Pass Pass Pass Pass Pass Don't pass Don't pass Don't pass Don't pass Don't pass	

Notes:

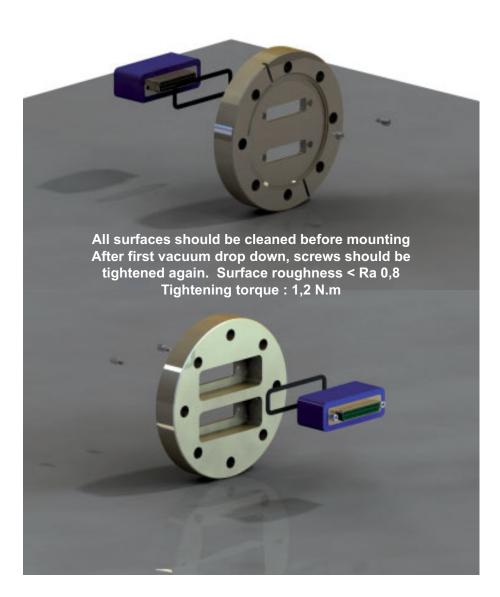
The necessary ambient temperature polymerisation could have bad influences. Nonetheless, long and hard tests on Resin H (flexible) for other projects showed a good resistance, even at 10<sup>9</sup> rads. Polyamide mixes are qualified for nuclear fields with controlled specifications. Their performances are much better than mixes with aliphatic amines.

Those tests were made in the air. Tests in water show a degradation of polyamide mixes, due to high level of acidity of water and atomic reaction when electrons are ejected under Gamma rays effect. Few epoxies are able to withstand a 10<sup>9</sup> rad irradiation under wet field.

To have an idea of electrical performances of irradiated epoxies, volume resistance get lower and dielectrically constancy seems to stay equivalent.



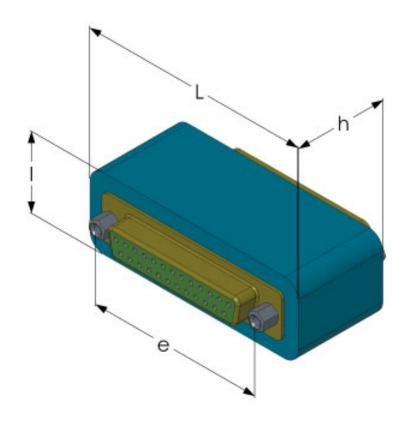
#### Mounting example



**ERVAC** 



Module dimensions



D Connector Size	ERAVC Size	L		h	е
09 / 15HD / 2W2	E	39,30	21,00	25,00	25,00
15 / 26HD / 3W3	A	47,70	21,00	25,00	33,30
25 / 44HD / 5W5	В	61,40	21,00	25,00	47,00
37 / 62HD / 8W8	C	77,80	21,00	25,00	63,50
50 / 78HD / 4 SMA	D	75,40	23,90	25,00	61,10 - 63.50

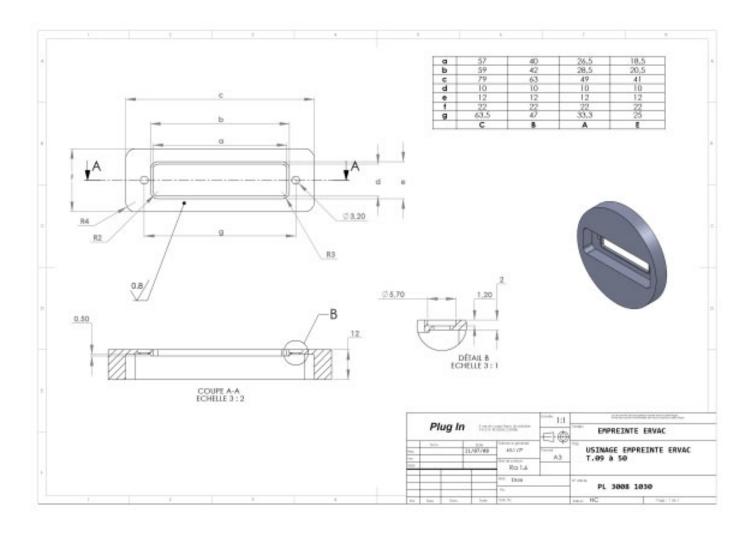
Other sizes upon request

## ERVAC Flange cut-out dimensions





# Standard dimensions for ERVAC E to C modules



Flange cut-out are valid for following part numbers :

ERVAC-E-XXM/F-X-X ERVAC-A-XXM/F-X-X ERVAC-B-XXM/F-X-X ERVAC-C-XXM/F-X-X

1

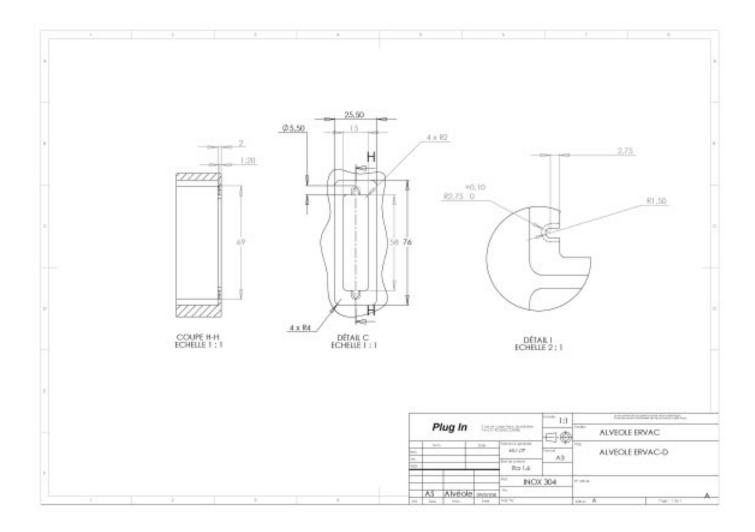
# ERVAC Flange cut-out dimensions





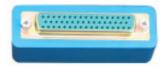
Standard dimensions for ERVAC D modules

Dimensions valid for all ERVAC-D types



# ERVAC D-SUB Normal Density Technical data



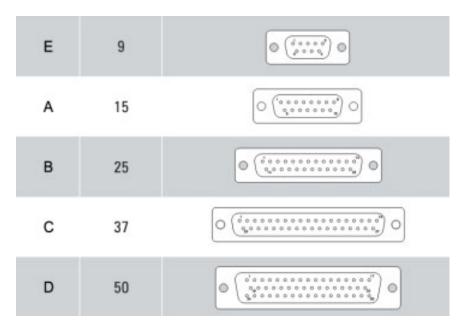


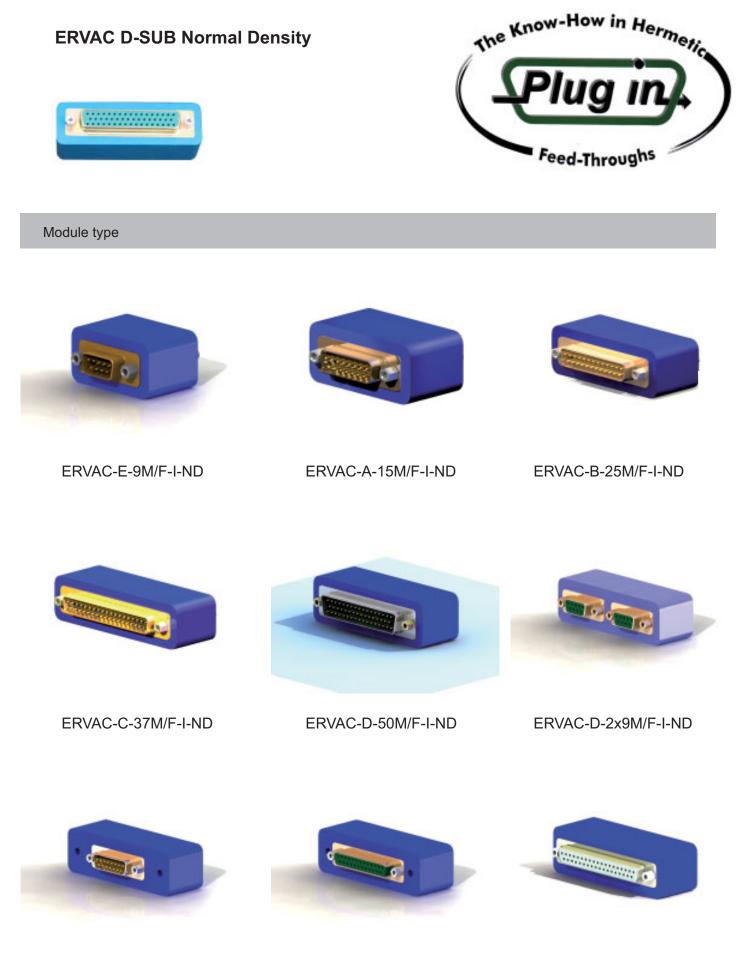
Technical Data	
Mechanical Data	
Mating force per signal contact	3,4 N
Unmating force per signal contact	0,2 N
Electrical Data	
Current rating at room temperature	5 A
Test voltage between 2 contacts / shell and contact	t 1200 V / 1 min.
Meets transition resistance requirements per conta	act pair in line with DIN 41652:
- Contacts	, 7,5 mΩ
Insulation resistance between contacts	5000 MΩ
Volume resistivity	1016 Ω cm
Dielectric strength	50 kV / mm
Materials and Platings	
Shell (standard)	Steel
Temperature limit	Room temperature +/- 40°C
Shell plating (standard)	Yellow chromate over zinc plating
Contact material	Signal : copper alloy
	Tc K type : NiCr / NiAl
	Tc T type : Cu / CuNi

All D-sub components fully meet the requirements of

MIL-PRF-24308 M24308/11-1 / M24308/10-1 M39029/64-369 / M39029/63-368

Tc E type : NiCr / CuNi Tc J type : Fe / CuNi





ERVAC-D-15M/F-I-ND

ERVAC-D-25M/F-I-ND

ERVAC-D-37M/F-I-ND

# ERVAC D-SUB High Density Technical data

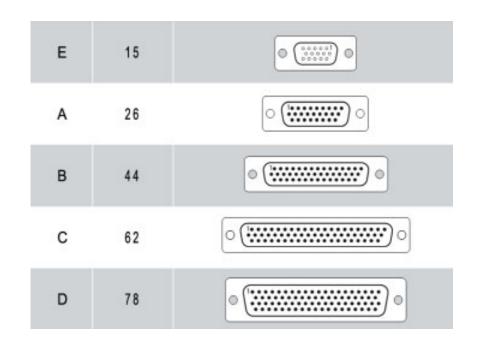




**Technical Data** 

Ma	echanical Data ating force per signal contact mating force per signal contact		3,4 N 0,2 N
Cu	ectrical Data rrent rating at room temperature st voltage between 2 contacts / shell and contac	t	3 A 1000 V / 1 min.
Cor Ins Vol	eets transition resistance requirements per conta intacts sulation resistance lume resistivity electric strength	ict pair in line with DIN	41652: 7,5 mΩ 5000 MΩ 1016 Ω cm 50 kV / mm
Materials a Shell (stan	and Platings ndard)	Steel	
Temperatu	ure limit	Room temperature +	/- 40°C
Shell platir	ng (standard)	Yellow chromate ove	r zinc plating
Contact ma	aterial	Copper alloy	
All D-sub c	components fully meet the requirements of	MIL-PRF-24308 M24308/13-1 / M243	08/12-1

M24308/13-1 / M24308/12-1 M39029/58-360 / M39029/57-354







Module type



ERVAC-E-15M/F-I-HD





ERVAC-A-26M/F-I-HD

ERVAC-B-44M/F-I-HD







ERVAC-C-62M/F-I-HD

ERVAC-D-78M/F-I-HD

ERVAC-D-2x15M/F-I-HD



ERVAC-D-26M/F-I-HD



ERVAC-D-44M/F-I-HD



ERVAC-D-62M/F-I-HD

#### ERVAC D-SUB Mixed layout Technical data

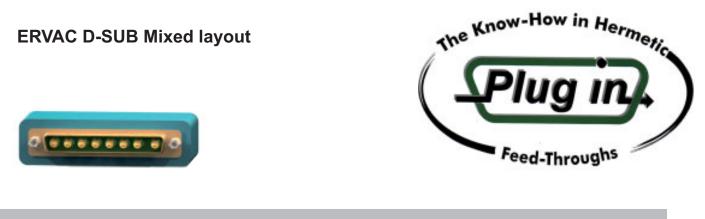




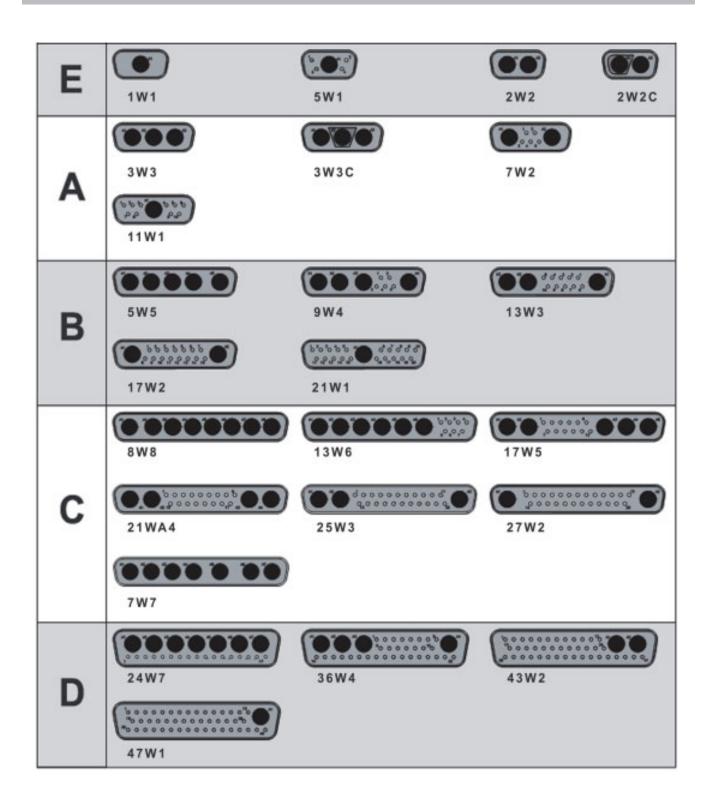
**Technical Data** 

High Power D-Sub Size 8 contact Mechanical Data Mating force per signal contact < 7 N Unmating force per signal contact ~ 5 N Mating cycles > 500 Electrical Data Current rating at room temperature 40 A Contact resistance < 1 mΩ High Voltage D-Sub Size 8 contact Mechanical Data Mating force per signal contact < 5 N Unmating force per signal contact ~ 2.5 N Mating cycles > 500 Electrical Data Current rating (DC) at room temperature 2 A < 3 mΩ Contact resistance 3 kV Maximum operating voltage Proof Voltage 4 kV / 50 Hz Coaxial D-Sub Size 8 contact Mechanical Data Mating force per signal contact < 7 N Unmating force per signal contact < 7 N Mating cycles > 500 Electrical Data 50 or 75  $\Omega$ Characteristic impedance Current rating (DC) at room temperature 2 A < 3 mΩ Inner and outer contact resistance 3 kV Maximum operating voltage 750 V / 50 Hz Proof Voltage 1000 V / 1 min. Test voltage between 2 contacts / shell and contact Meets transition resistance requirements per contact pair in line with DIN 41652 : Insulation resistance 5000 MΩ Volume resistivity  $1016 \ \Omega \ cm$ Dielectric strength 50 kV / mm Materials and Platings Shell (standard) Steel Temperature limit Room temperature +/- 40°C Shell plating (standard) Yellow chromate over zinc plating Contact material Copper alloy MIL-C-24308 All D-sub components fully meet the requirements of

M24308/13-1 / M24308/12-1 M39029/58-360 / M39029/57-354



Layout type









Module type



ERVAC-E-2W2M/F-I-P



ERVAC-A-3W3M/F-I-P



ERVAC-B-5W5M/F-I-C



ERVAC-C-8W8M/F-I-HV



ERVAC-D-27W2M/F-I-C







Manufacturing example



### ERVAC SMA Technical data





**Technical Data** 

Mechanical data Air side connector Gender Interface SMA jack (female) Vacuum side connector Gender Interface SMA jack (female)

Electrical Data	
Impedance	50 Ω
Interface Freq max	=18 GHz
Frequency Range 1	0 to 3 GHz
Return Loss Range1	> 26 dB
VSWR Range1	= 1.1
Frequency Range 2	3 to 7 GHz
Return Loss Range2	> 21 dB
VSWR Range2	= 1.2
Frequency Range 3	7 to 18 GHz
Return Loss Range3	> 17 dB
VSWR Range3	= 1.3

Number of Matings

>500 cycles

Interface Standards IEC 60169-15; MIL-STD-348A/310; CECC 22110

#### **Temperature** limit

#### room temperature +/-40°C

	Pl	g	Jack		
	min,	max.	min.	max.	
A	-	4.59/.181	4.59/.181		
В	0.00/.000	0.25/.010	0.00/.000	0.25/.010	
C	0.00/.000	0.25/.010	0.00/.000	0.25/.010	
D	-	2.54/.100	2.67/.105	-	
E	1.24/.049	1.29/.051	1.24/.049	1.29/.051	
F	0.38/.015	1.14/.045	1.88/.074	1.98/.078	
G	2	3.43/.135	0.38/.015	1.14/.045	
н	0.90/.036	0.94/.037	5.28/.208	5.49/.216	
1	-	-	4.32/.170	-	
ĸ	-		5.54/.218		

## ERVAC SMA Technical data





Manufacturing example

ISO K DN 250 Flange with 12 x ERVAC-D-4SMAF/F-I-C and 4 x ERVAC-D-78M/F-S-HD



# ISO K DN 100 Flange with 2 x ERVAC-D-4SMAF/F-I-C



## ERVAC BNC Technical data





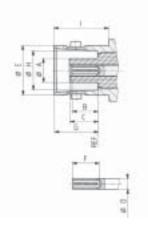
**Technical Data** 

Mechanical data Center contact retention Axial force - Mating end Axial force - Opposite end Number of matings

Electrical Data Impedance Freqency RF Leakage Voltage rating Dielectric withstanding voltage Insulation resistance 18 N mini. 18 N mini. >500 cycles

50 Ω 0-4 GHz 57 dB Maxi 500 Veff Maxi 1500 V 5000 MΩ

Interface dimesions conformable to the standards: IEC 169-8 / CECC 22120 / Mil-C-39012 / BNC interface MIL-STD-348A/301 / BS9210 N004



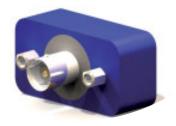
	Pla	g	Jack		
	mín.	max.	min.	max.	
Á.	4.83/.190	-	-	4.72/.186	
в	5.33/.210	5.84/.230	4.72/.186	5.23/.206	
С	5.28/ 208	5.79/ 228	4.78/.188	5.28/.208	
D	2.06/.081	2.21/ 087	2.06/.081	2.21/ 087	
E	9.78/ 385	9.91/ 390	9.60/.378	9 70/ 382	
F	1.98/.078	-	4.95/.195	-	
G	1.32/.052	1.37/.054	8.31/.327	8.51/.335	
н	0.08/.003	-	8.10/.219	8.15/.321	
1	-	-	10.52/.414	-	

# **ERVAC BNC**

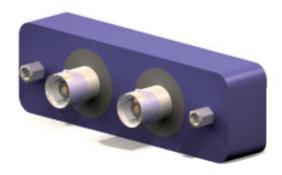




Module type



ERVAC-E-1BNCF/F-I-C



ERVAC-D-2BNCF/F-I-C

These ERVAC modules are also available in TNC, SHV, K versions.....

## **ERVAC Micro-D Technical data**



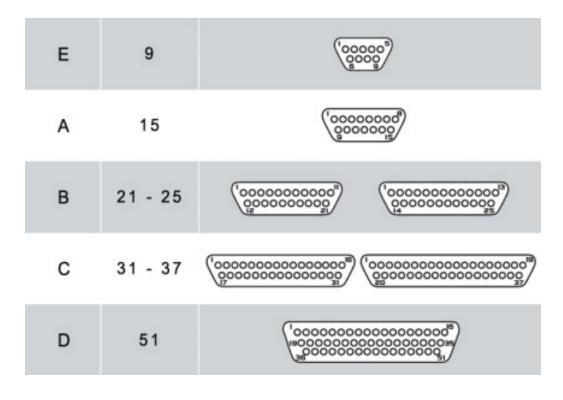


**Technical Data** 

Mechanical data	
Mating force	186 g max x number of contacts
Unmating force	15 g min x number of contacts
Mating cycles	>500 cycles
Electrical Data	-
Current rating	3 A
Contact resistance	8 mΩ max
Insulation resistance	5000 MΩ min
Dielectric withstanding voltage	
at sea level	900 V AC
	600 V AC solder cup
at altitude 21000 m	300 V AC

150 V AC solder cup

Standard: MIL-DTL-83513 E



Size 100 and 120 upon request.



Module type



ERVAC-E-9M/F-I-µD





## ERVAC-B-25M/F-I-µD

ERVAC-C-37M/F-I-µD



Size 120 special ERVAC module





ERVAC-C-37M/F-I-µD and ERVAC-A-15M/F-I-µD on CF 100 UHV Fla nge

# ERVAC Wires / Wires

**Technical Data** 

All ERVAC modules can be delivered equiped in connector / wires or wires / wires configuration. For the manufacturing of these products Plug In is using only high grade wires compatible with the use in vacuum environment.

Signal copper wires are according Mil-W-22759 or Mil-W-81044 and are PTFE insulated or equivalent.

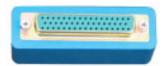
Thermocouple wires are according to IEC 584.3, single or multi stranded and PTFE insulated.

Cable braids and shieldings are according to federal specification QQB 575.

Optic fiber wires are defined by the customer.

# **ERVAC D-SUB Ordering informations**





Ordering Code

ERVAC	D	50	M/F	1	ND	- ****
Series Prefix		5				
ERVAC						
Module size						
E/A/B/C/D						
No of Contacts						
Normal density : 9, 15, 25, 37, 50 and 2x09						
High density : 15, 26, 44, 62, 78 and 2x15						
Micro-D: 9, 15, 21, 25, 31, 37 and 51						
Power, High voltage or Coaxial :						
1W1, 5W1, 2W2, 2W2C, 3W3, 3W3C, 7W2,	11W1, 5W5					
5W5, 9W4, 13W3, 17W2, 21W1, 8W8, 13W8	s, 17W5					
21WA4, 25W3, 27W2, 7W7, 24W7, 36W4, 4	3W2 and 47W1					
SMA* : 3xSMA, 4xSMA						
BNC* / TNC* : 1xBNC, 1xTNC, 2xBNC, 2x T	NC					
Wire or Fiber optic : Desired wire number (10	max for FO)					
Connector gender						
M/F - M/M ** - F/F ** - M/W - F/W - W/W						
Shell type						
I = Zinc plated Steel or wire to wire						
S= Gold plated Brass						
Contact type						
C = Coaxial size 8, SMA or BNC						
HD = High Density contact size 22						
HV = High Voltage contact size 8						
ND = Normal Density contact size 20						
P = Power Contact size 8						
TCK = Thermocouple Normal Density contact	t size 20 type K CH	ROMEL / ALUMEL				
TCT = Thermocouple Normal Density contact	t size 20 type T CO	PPER / CONSTAN	TAN			
TCE = Thermocouple Normal Density contact	t size 20 type E CH	ROMEL / CONSTA	NTAN			
TCJ = Thermocouple Normal Density contact	t size 20 type J IRO	N / CONSTANTAN				
Options						30
Length of wires (W or WW) in mm						

\* Only available in F/F version

\*\* Option not available for Double Density contact size 22 and for mixed layout D-Sub





Technical Data

With the MODUL-R range, Plug In offers an extensive array of hermetic connector feedthroughs and the ability to deliver standard or custom designed solutions to meet the highest requirements.

EMI Shielding - solid metal to metal coupling, grounding fingers, electroless nickel plating, and thicker wall sections provide superior EMI shielding capability of 65dB minimum at 10 GHz.

Contact Protection - recessed pins in this 100% scoop-proof connector minimize potential contact damage Moisture Resistance - improved interfacial seal design helps prevent electrolytic erosion of contacts Lockwiring Eliminated - unique, self-locking, quick coupling connector eliminates lockwiring Quick Coupling - completely mates and self-locks in a 360° turn of the coupling nut

#### Environmental and electrical data

Durability : Connector halves shall be mated and unmated 250 times for serie II with ground fingers and 500 times for series I and III at a rate not exceeding 300 cycles per hour.

Insulation resistance : An insulation resistance test shall be performed on unmated connectors according MIL-STD-202, method 302, test condition B. Measurement shall be made between three pairs of adjacent contacts and the shell. Failure to meet the minimum requirement of 50 000 megohms for classes E, P, F, R and T shall be cause for rejection.

	Test C	urrent	Maximum	Maximum	
Contact Size	Crimp Hermet		Millivolt Drop Crimp*	Millivolt Drop Hermetic*	
22D	5	3	73	85	
20	7.5	5	55	60	
16	13	10	49	85	
12	23	17	42	85	
10 (Power)	33	NA	33	NA	
8 (Power)	46	NA	26	NA	
4	80	NA	23	NA	
0	150	NA	21	NA	

\* When using silver plated wire.

#### SERVICE RATING

Service Rating Al		Suggested Oper. Voltage (Sea Level)		Test Voltage	Test Voltage	Test Voltage
	AC (RMS)	DC	(Sea Level)	50,000 Ft.	70,000 Ft	110,000 Ft.
м	400	550	1300 VRMS	550 VRMS	350 VRMS	200 VRMS
N	300	450	1000 VRMS	400 VRMS	260 VRMS	200 VRMS
1	600	850	1800 VRMS	600 VRMS	400 VRMS	200 VRMS
П	900	1250	2300 VRMS	800 VRMS	500 VRMS	200 VRMS

Please note that the establishment of electrical safety factors is left entirely in the designer's hands, since he is in the best position to know what peak voltage, switching surges, transients, etc. can be expected in a particular circuit.





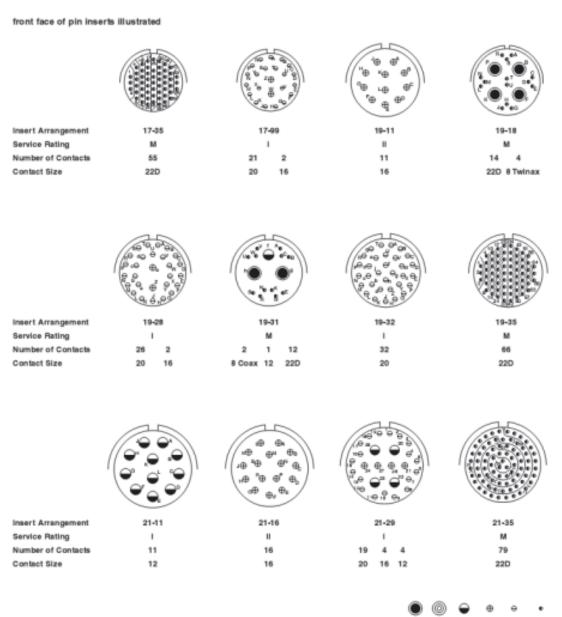
Technical Data

front face of pin ins	erts illustrated						
	،	•	(f)	6.6	(10 0 <sup>4</sup> )		(
Insert Arrangement	9-5 9-3 Grounded M		9-98	11-2	11-5	11-35 M	11-54
Service Rating Number of Contacts	Grounded M	M 2	3	1	5	M 13	4
Contact Size	8 Twinax 220		20	16	20	22D	22D
Connect Size	0 101104 220		20	10	20	220	220
Insert Arrangement	11-98 11	-99 13-4	13-8	13-13	13-35	13-98	15-4
Service Rating	1	I I	1	I, Fiber Option	c M	1	1
Number of Contacts	-	7 4	8	2 2	22	10	4
Contact Size	20 2	20 16	20	16 12	22D	20	12
				Dedicated to Fiber Optics			
				Tiber opres			
			1000 1000				
Insert Arrangement	15-6	15-15	15-18	15-1	9	15-35	15-97
Service Rating		1	1	1		м	1
Number of Contacts	6	14 1	18	19		37	8 4
Contact Size	16	20 16	20	20		22D	20 16
			) (e				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Insert Arrangement	17-2	17-6		17-8	17-22		17-26
Service Rating	м	1			Coax		1
Number of Contacts	38 1	6		8	2	2	26
Contact Size	22D 8 Twinax	12		16	12 Coax 8	Coax	20
						D 🕤 🕯	
				CONTACT LEG	END 8 1	0 12 16	3 20 22D





**Technical Data** 

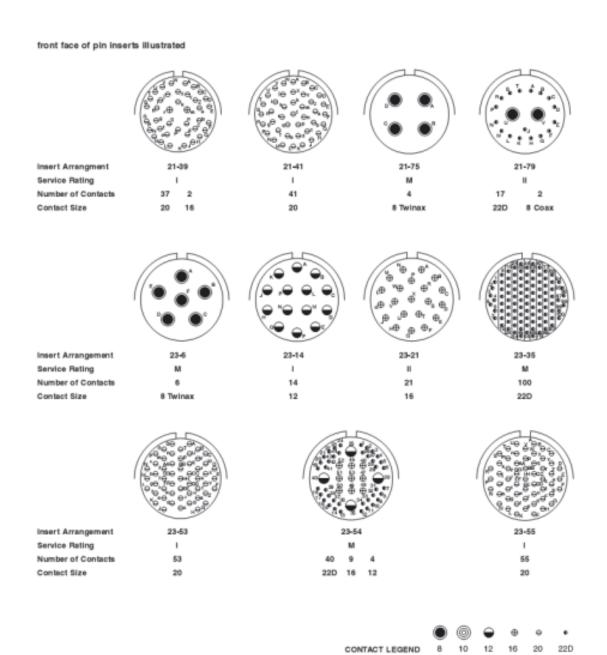


CONTACT LEGEND 8 10 12 16 20 22D





**Technical Data** 

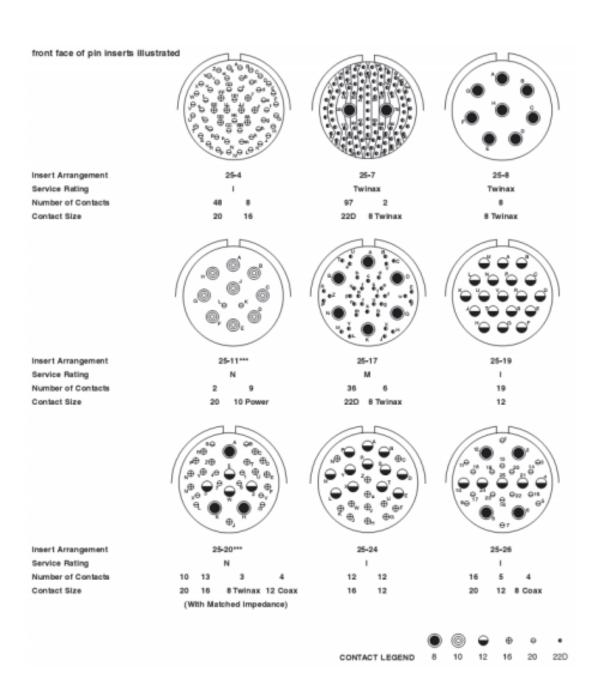


33

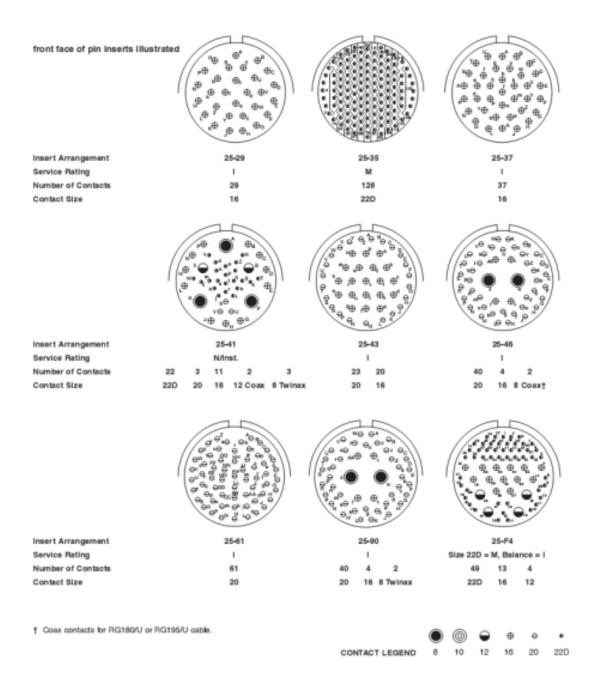




**Technical Data** 



**Technical Data** 







Manufacturing example









Ordering code

Modul-R	23	21	M/F	111	P3
Series Prefix		2			
Modul - R					
Module size					
9/11/13/15/17/19/21/23/25					
No of Contacts	2	•			
Insert 9: 1, 6, 2, and3					
Insert 11: 2, 5, 13, 4, 6 and 7					
Insert 13: 4, 8, 4M, 22 and 10					
insert 15: 4, 5, 15M, 18, 19, 37 and 12M					
Insert 17: 39M, 6, 8, 4M, 26, 55 and 23M					
Insert 19: 11, 18M, 28M, 15M, 32 and 66					
Insert 21: 11, 16, 27M, 79, 39M, 41, 4 and	19M				
Insert 23: 6, 14, 21, 100, 53, 53M and 55					
Insert 25: 56M, 99M, 8, 11M, 42M, 19, 30M	4, 24M				
25M, 29, 128, 37, 41M,43M, 4	6M, 61 and 66M				
Connector gender					
M/F - F/M - M/W - F/W					
Shell type					
Series					
1711710					
Contact type					
C = Coaxial contact size 8					
HD = High Density contact size 22					
ND = Normal Density contact size 20					
P1 = Power contact size 8					
P2 = Power contact size 12					
P3 = Power contact size 16					
TW = Twinax contact size 8					
Ontions					
Options					
Length of wires (W) in mm					

# Hermetic product lines



#### Other datasheets available



UHV and HV Vacuum chambers and systems





UHV Hermetic feedthroughs metal to glass or ceramic to glass sealed



## Hermetic product lines



Other datasheets available



More than 150 pages of Flanges, fittings and hermetic accessories

The Know-How in Hermetic Plug in Feed-Throughs

#### Headquarters

France, Belgium, Italy, Spain, Netherlands

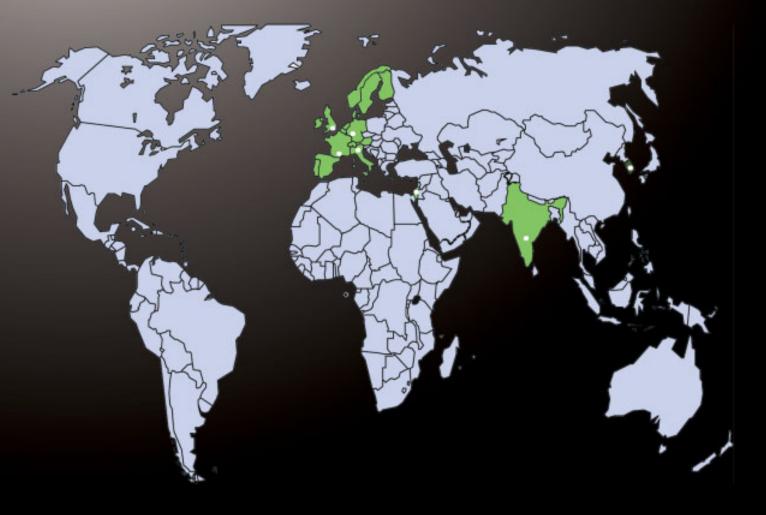
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