

Amphenol® AJ Aquacon Immersible Connectors

12-140-4



Amphenol

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Metric equivalents of dimensional data in this catalog have not been included.
All dimensions given may be converted to the metric system by the standard
formula: dimension (inches X 25.40 = dimension (millimeters).

NOTE:
The connector products in this brochure were formerly known as Bendix® products.
These products are now manufactured and sold under the Amphenol® brand name.
The name “Amphenol” will replace the name “Bendix” on products and literature
in the future.

AJ Aquacon

design features

The Amphenol® AJ Aquacon Series of connectors has been designed to provide maximum service in oceanic or fluid immersion applications.

The AJ Aquacon offers the following features:

- 1500 PSI capability
- "O" ring sealing, thread
- threaded coupling
- visual mating indication
- design flexibility

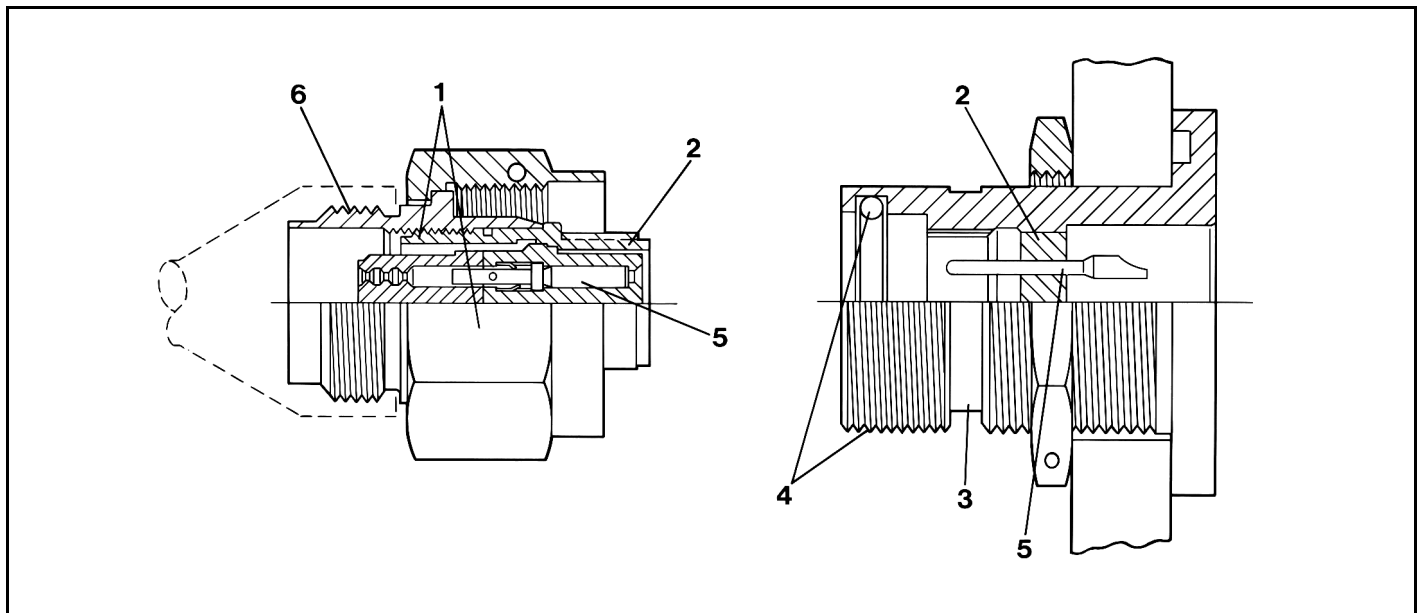
A specially designed aluminum bronze coupling nut and type 316 stainless steel shells resist corrosion and provide a pressure withstanding connector. Positive threaded coupling, "O" rings, and a color band visual indicator assure sealing and proper mating.

A rear accessory thread provides for the use of EMI hardware or molding adapters.

The AJ Series is available in several different shell styles, with numerous MIL-C-38999 insert patterns. Hermetically sealed (1×10^{-6} cc/sec leakage rate) arrangements are also available.

For application assistance or further information, please contact:

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Amphenol Aerospace
40-60 Delaware Avenue
Sidney, New York 13838-1395
Phone: 607-563-5011
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www.amphenol-aerospace.com



1. Corrosion resistant aluminum bronze coupling nut and stainless steel sleeve
2. Hermetic and non-hermetic inserts in MIL-C-38999 patterns. Glass or hard dielectric material
3. Visual mating indicator
4. 1500 PSI sealing capability assured by threaded coupling and "O" ring
5. Pin or socket contacts in either plug or receptacle
6. Environmental resistant molded cable terminations with or without EMI accessory

AJ Aquacon

specifications, alternate positions

AJ Contact Ratings

Contact Size	Test Current		Maximum Millivolt Drop			Crimp Well Data		Solder Well Data	
	Standard	Hermetic	Crimp	Solder	Solder Hermetic	Diameter	Depth	Diameter	Depth
22M	3	2	30	20	60	.029 ±.001	.141	.029 $\begin{smallmatrix} +.004 \\ -.000 \end{smallmatrix}$	.094
22D	5	—	40	—	—	.0345 ±.001	.141	—	—
22	5	3	40	20	85	.0365 ±.001	.141	.036 $\begin{smallmatrix} +.004 \\ -.000 \end{smallmatrix}$	.094
20	7.5	5	35	20	60	.047 ±.001	.209	.044 $\begin{smallmatrix} +.004 \\ -.000 \end{smallmatrix}$	.125
16	13	10	25	20	85	.067 ±.001	.209	.078 $\begin{smallmatrix} +.004 \\ -.002 \end{smallmatrix}$	.141
12	23	17	25	20	85	.100 ±.002	.209	.116 ±.004	.151

Service Rating

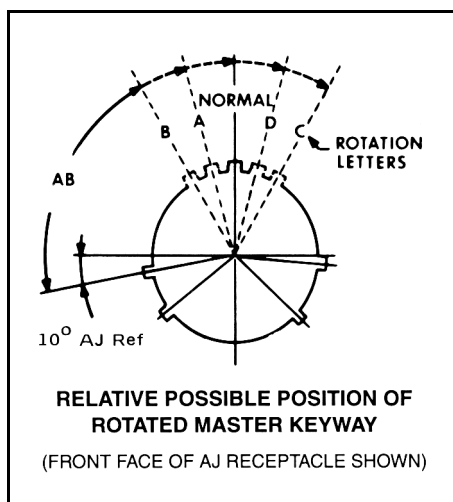
Service Rating	Suggested Operating Voltage (Sea Level)	
	AC (RMS)	DC
M	400	550
I	600	850
II	900	1250

The establishment of electrical safety factors is left entirely in the designer's hands, as he can best determine what peak voltage, switching surges, transients, etc. can be expected in a particular circuit.

Alternate positioning of connectors allows connectors with identical insert arrangements to be mounted side by side by providing a positive means of eliminating inadvertent cross-mating or cross-plugging.

Alternate positioning of Aquacon AJ Series is achieved by a rotation of the master key/keyway, relative to the insert, as part of the shell manufacturing operation.

Recommended practice is to use alternate position inserts only when necessary.



AJ Master Key/Keyway Rotation

Shell Size	AB Angle of Rotation (Degrees)				
	Normal	A	B	C	D
8	100	82			118
10	100	86	72	128	114
12	100	80	68	132	120
14	100	79	66	134	121
16	100	82	70	130	118
18	100	82	70	130	118
20	100	82	70	130	118
22	100	85	74	126	115
24	100	85	74	126	115

AJ Aquacon

insert availability

AJ	Solder	Crimp	Hermetic*	Service Rating**	Total Contacts	Contact Size					
						22D	22M	22	20	16	12
8-3	X		X	M	3				3		
8-6	X	X	X	M	6		6				
8-35		X	X	M	6	6					
8-44		X	X	M	4			4			
8-98		X	X	I	3				3		
10-5	X	X	X	I	5				5		
10-13	X	X	X	M	13		13				
10-35		X	X	M	13	13					
10-98	X	X	X	I	6				6		
12-3	X	X	X	II	3					3	
12-8	X	X	X	I	8				8		
12-35		X	X	M	22	22					
12-98	X	X	X	I	10				10		
14-5	X	X		II	5					5	
14-15	X	X	X	I	15				14	1	
14-18	X	X	X	I	18				18		
14-35		X	X	M	37	37					
14-37	X	X	X	M	37		37				
16-6†		X	X	I	6						6
16-8	X	X	X	II	8					8	
16-26	X	X	X	I	26				26		
16-35		X	X	M	55	55					
16-55	X	X	X	M	55		55				
18-11	X	X	X	II	11					11	
18-32	X	X	X	I	32				32		
18-35		X	X	M	66	66					
18-66	X	X	X	M	66		66				
20-1		X		M	79		79				
20-2		X		M	65			65			
20-16	X	X	X	II	16					16	
20-35		X		M	79	79					
20-39	X	X	X	I	39				37	2	
20-41	X	X	X	I	41				41		
22-2	X	X	X	M	85			85			
22-21	X	X	X	II	21					21	
22-32	X		X	I	32				32		
22-35		X		M	100	100					
22-55	X	X	X	I	55				55		
24-19†		X		I	19						19
24-24†		X	X	I	24					12	12
24-35		X		M	128	128					
24-61	X	X	X	I	61				61		

* Pin insert only (Consult Amphenol, Sidney, NY for socket availability)

** See specifications

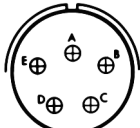
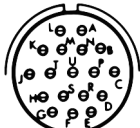
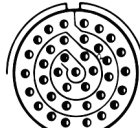
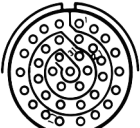
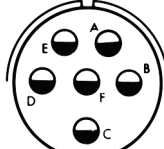
† Available in AS version. Consult Amphenol, Sidney, NY for information.
Additional insert arrangements may be made available upon request.

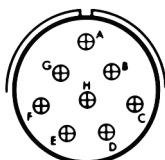
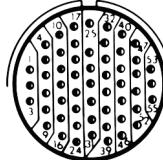
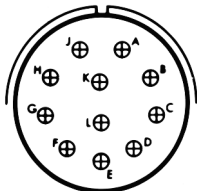
AJ Aquacon

insert arrangements

							
Insert Arrangement	8-3	8-6	8-35	8-44	8-98	10-5	10-13
Service Rating	M	M	M	M	I	I	M
Number of Contacts	3	6	6	4	3	5	13
Contact Size	20	22M	22D	22	20	20	22M

						
Insert Arrangement	10-35	10-98	12-3	12-8	12-35	12-98
Service Rating	M	I	II	I	M	I
Number of Contacts	13	6	3	8	22	10
Contact Size	22D	20	16	20	22D	20

						
Insert Arrangement	14-5	14-15	14-18	14-35	14-37	16-6
Service Rating	II	I	I	M	M	I
Number of Contacts	5	14 1	18	37	37	6
Contact Size	16	20 16	20	22D	22M	12

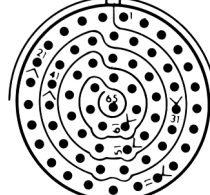
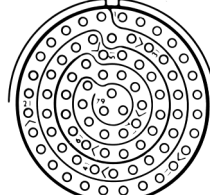
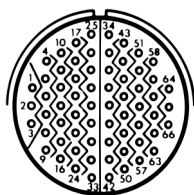
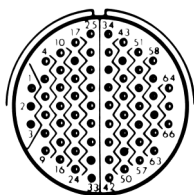
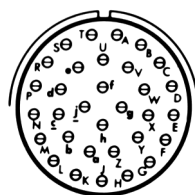
					
Insert Arrangement	16-8	16-26	16-35	16-55	18-11
Service Rating	II	I	M	M	II
Number of Contacts	8	26	55	55	11
Contact Size	16	20	22D	22M	16

Front face of pin inserts illustrated
See page 3 for service ratings and contact sizes

Contact Legend							
	8	12	16	20	22	22M	22D

AJ Aquacon

insert arrangements



Insert Arrangement
Service Rating
Number of Contacts
Contact Size

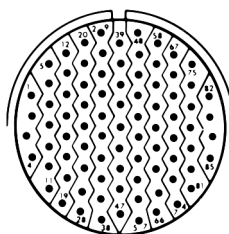
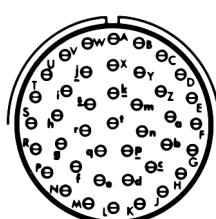
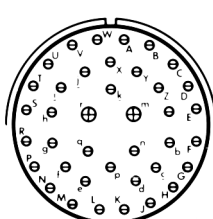
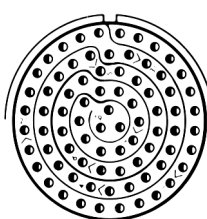
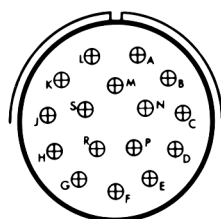
18-32
I
32
20

18-35
M
66
22D

18-66
M
66
22M

20-1
M
79
22M

20-2
M
65
22



Insert Arrangement
Service Rating
Number of Contacts
Contact Size

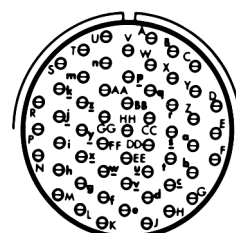
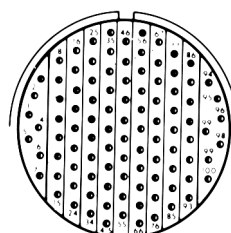
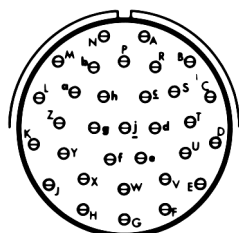
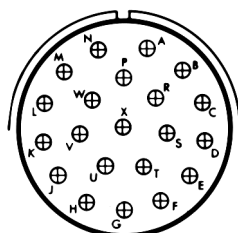
20-16
II
16
16

20-35
M
79
22D

20-39
I
37 2
20 16

20-41
I
41
20

22-2
M
85
22



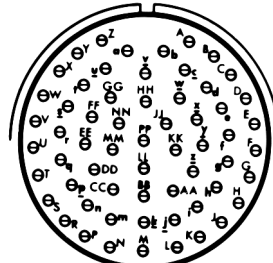
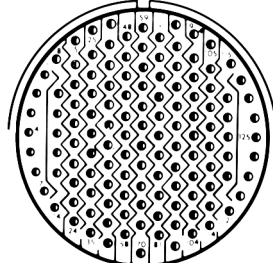
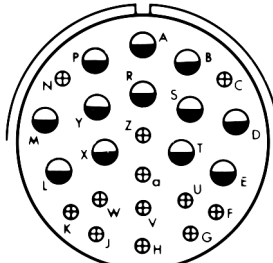
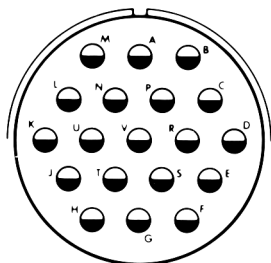
Insert Arrangement
Service Rating
Number of Contacts
Contact Size

22-21
II
21
16

22-32
I
32
20

22-35
M
100
22D

22-55
I
55
20



Insert Arrangement
Service Rating
Number of Contacts
Contact Size

24-19
I
19
12

24-24
I
12 12
16 12

24-35
M
128
22D

24-61
I
61
20

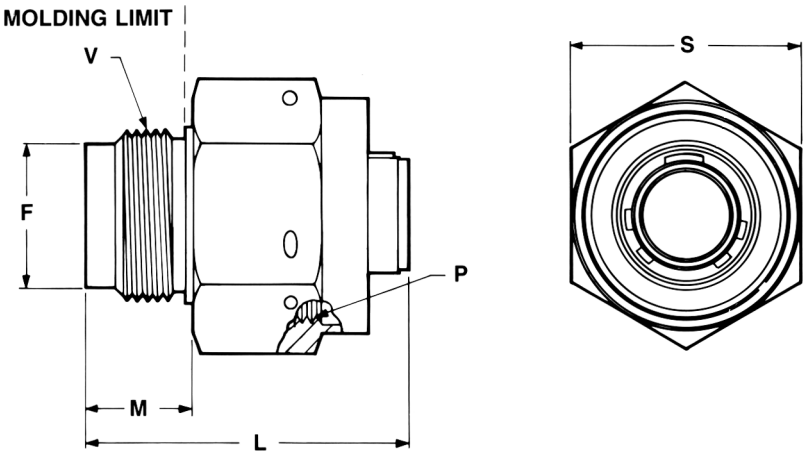
Front face of pin inserts illustrated
See page 3 for service ratings and contact sizes

Contact Legend

8 12 16 20 22 22M 22D

AJ6R Aquacon

straight plug



*AJ6C-XX-XXX (445)
 *AJ6R-XX-XXX (445)

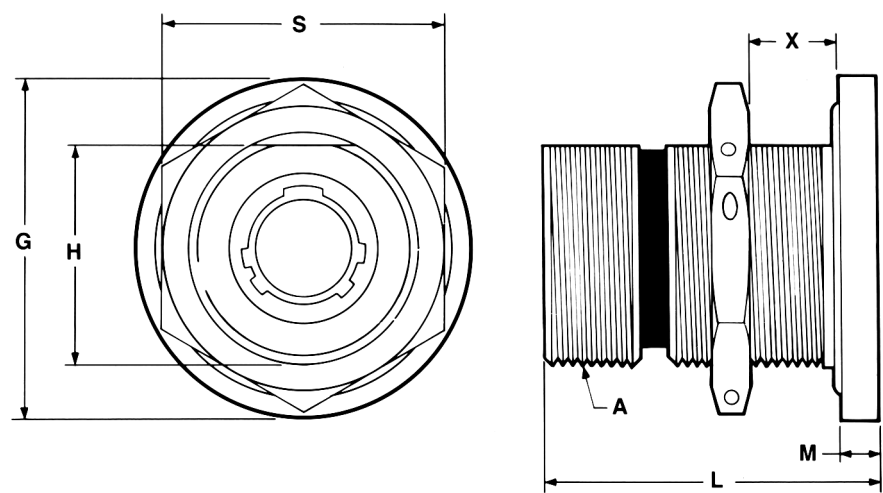
* To complete order number, see page 12.
 For installation data, see pages 11-12.

Shell Size	F Dia. +.000 -.005	L Max.	M ±.010	P Thread Class 2B	S Hex ±.016	V Thread Class 2A UNEF
8	.477	1.067	.360	.750-20 UNEF	.875	.5625-24
10	.602	1.067	.360	.875-20 UNEF	1.000	.6875-24
12	.727	1.062	.360	1.000-20 UNEF	1.125	.8125-20
14	.852	1.062	.360	1.125-18 UNEF	1.250	.9375-20
16	.977	1.062	.360	1.250-18 UNEF	1.375	1.0625-18
18	1.102	1.062	.360	1.375-18 UNEF	1.500	1.1875-18
20	1.227	1.312	.610	1.500-18 UNEF	1.625	1.3125-18
22	1.352	1.312	.610	1.625-18 UNEF	1.750	1.4375-18
24	1.477	1.312	.610	1.750-18 UNS	1.875	1.5625-18

All dimensions for reference only.

AJ7H Aquacon

hermetic jam nut receptacle



***AJ7H-XX-XXX**

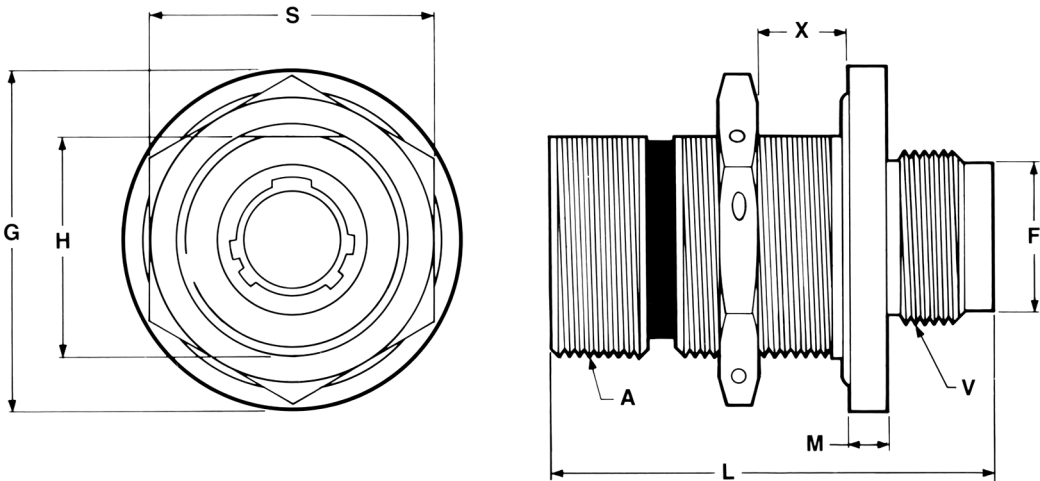
* To complete order number, see page 12.
For installation data, see pages 11-12.

Shell Size	A Thread Class 2A	G Dia.	H +.000 -.005	L (Hermetic)	M	S Hex. ±.016	X Bulkhead Thickness
8	.750-20 UNEF	1.125	.700	1.125	.125	.938	.03-.31
10	.875-20 UNEF	1.250	.825	1.125	.125	1.062	.03-.31
12	1.000-20 UNEF	1.406	.950	1.125	.125	1.188	.03-.31
14	1.125-18 UNEF	1.531	1.075	1.125	.125	1.312	.03-.31
16	1.250-18 UNEF	1.654	1.200	1.125	.125	1.438	.03-.31
18	1.375-18 UNEF	1.844	1.325	1.125	.125	1.562	.03-.31
20	1.500-18 UNEF	2.000	1.450	1.250	.188	1.688	.03-.38
22	1.625-18 UNEF	2.125	1.575	1.250	.188	1.812	.03-.38
24	1.750-18 UNS	2.250	1.700	1.250	.188	2.000	.03-.38

All dimensions for reference only.

AJ7R Aquacon

jam nut receptacle



***AJ7R-XX-XXX (168)**

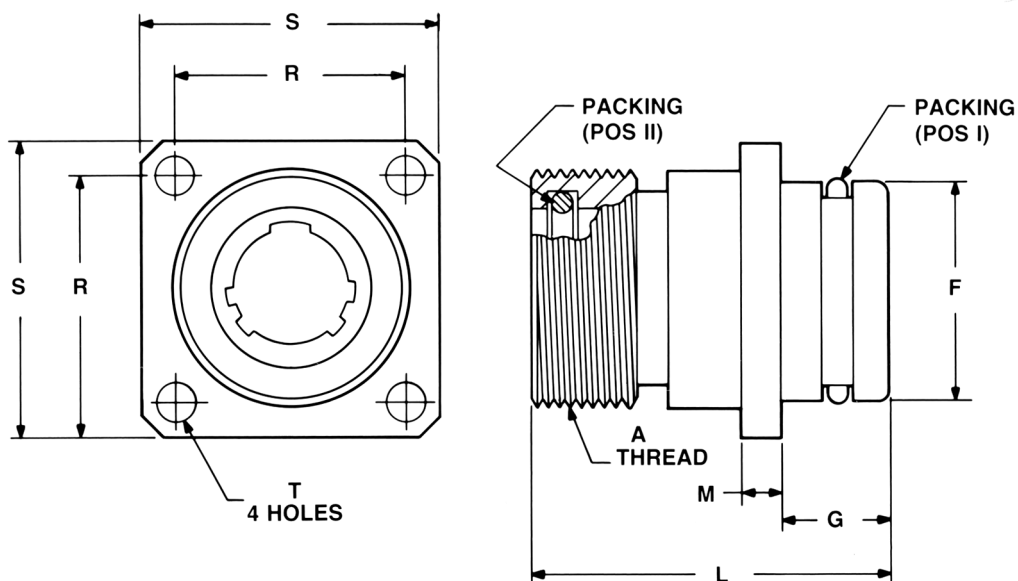
* To complete order number, see page 12.
 For installation data, see pages 11-12.

Shell Size	A Thread Class 2A	F +.000 -.005	G Dia.	H +.000 -.005	L	M	S Hex. ±.016	V Thread Class 2A UNEF	X Bulkhead Thickness
8	.750-20 UNEF	.477	1.125	.700	1.484	.125	.938	.5625-24	.03-.31
10	.875-20 UNEF	.602	1.250	.825	1.484	.125	1.062	.6875-24	.03-.31
12	1.000-20 UNEF	.727	1.406	.950	1.484	.125	1.188	.8125-20	.03-.31
14	1.125-18 UNEF	.852	1.531	1.075	1.484	.125	1.312	.9375-20	.03-.31
16	1.250-18 UNEF	.977	1.654	1.200	1.484	.125	1.438	1.0625-18	.03-.31
18	1.375-18 UNEF	1.102	1.844	1.325	1.484	.125	1.562	1.1875-18	.03-.31
20	1.500-18 UNEF	1.227	2.000	1.450	1.609	.188	1.688	1.3125-18	.03-.38
22	1.625-18 UNEF	1.352	2.125	1.575	1.609	.188	1.812	1.4375-18	.03-.38
24	1.750-18 UNS	1.477	2.250	1.700	1.609	.188	2.000	1.5625-18	.03-.38

All dimensions for reference only.

AJ0H Aquacon

hermetic square flange receptacle



*AJ0H-XX-XXX

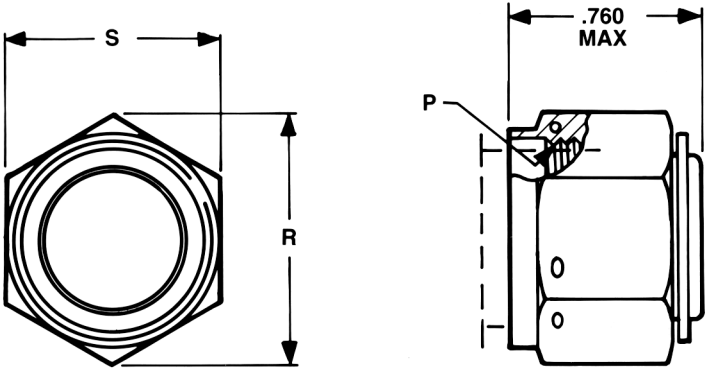
* To complete order number, see page 12.
For installation data, see pages 11-12.

Shell Size	A Thread Class 2A	F Dia. $\begin{smallmatrix} +.000 \\ -.001 \end{smallmatrix}$	G $\pm .030$	L	M	R	S	T $\pm .005$	Packing Pos I Part Number	Packing Pos II Part Number
8	.750-20 UNEF	.685	.344	1.125	.125	.719	.938	.128	10-90351-15	10-90351-14
10	.875-20 UNEF	.810	.344	1.125	.125	.812	1.031	.128	10-90351-17	10-90351-16
12	1.000-20 UNEF	.935	.344	1.125	.125	.906	1.125	.128	10-90351-19	10-90351-18
14	1.125-18 UNEF	1.060	.344	1.125	.125	.969	1.219	.128	10-90351-21	10-90351-20
16	1.250-18 UNEF	1.185	.344	1.125	.125	1.062	1.312	.128	10-90351-23	10-90351-22
18	1.375-18 UNEF	1.248	.344	1.125	.125	1.156	1.438	.128	10-90351-24	10-90351-24
20	1.500-18 UNEF	1.373	.375	1.219	.188	1.250	1.562	.128	10-90351-26	10-90351-26
22	1.625-18 UNEF	1.498	.375	1.219	.188	1.375	1.688	.147	10-90351-28	10-90351-28
24	1.750-18 UNS	1.623	.375	1.219	.188	1.500	1.812	.147	10-90351-29	10-90351-29

All dimensions for reference only.

AJ Aquacon

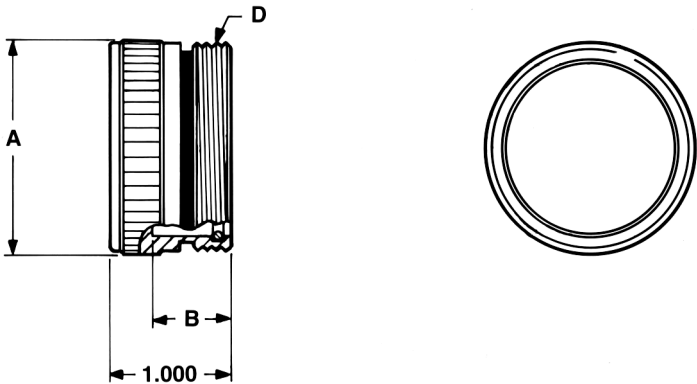
protection caps



Receptacle Protection Cap
10-377664-XX*

Shell Size	P Thread Class 2B	R Ref.	S Hex +.005 −.010
8	.750-20 UNEF	1.010	.875
10	.875-20 UNEF	1.155	1.000
12	1.000-20 UNEF	1.299	1.125
14	1.125-18 UNEF	1.443	1.250
16	1.250-18 UNEF	1.588	1.375
18	1.375-18 UNEF	1.732	1.500
20	1.500-18 UNEF	1.876	1.625
22	1.625-18 UNEF	2.021	1.750
24	1.750-18 UNS	2.165	1.875

All dimensions for reference only.



Plug Protection Cap
10-399623-XX*

Shell Size	A Dia. Max.	B +.031 −.000	D Thread Class 2A
8	.771	.625	.750-20 UNEF
10	.898	.625	.875-20 UNEF
12	1.010	.625	1.000-20 UNEF
14	1.137	.625	1.125-18 UNEF
16	1.264	.625	1.250-18 UNEF
18	1.392	.625	1.375-18 UNEF
20	1.519	.688	1.500-18 UNEF
22	1.646	.688	1.625-18 UNEF
24	1.744	.688	1.750-18 UNS

All dimensions for reference only.

* To complete order number, see page 12.

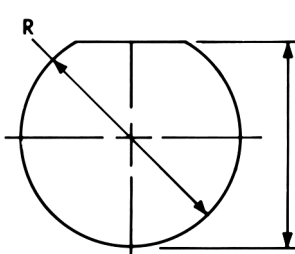
AJ Aquacon

installation instructions, application tools

Molding - Suggested method of assembly to cable for Aquacon plugs and cable connecting receptacles is molding. The mold sealing diameter has been designed to use a common mold for both plug and receptacle in a given shell size.

Sealing - In a mated condition, the red visual mating indicator band must be fully concealed by the plug coupling nut to assure a reliable, pressure rated sealed joint. Failure to fully tighten the coupling nut may allow leakage through the main joint seal. The red visual mating indicator is so located that only a full and proper mating of the plug and receptacle will cause the indicator to be fully hidden by the plug coupling nut.

Mounting Surfaces - The integrity of an "O" ring hydrostatic shell is dependent upon the flatness of the surface on which the receptacle is mounted. Surface finishes of 32 microns or less are recommended for "O" ring sealing areas when jam nut or through bulkhead receptacles are mounted.

MOUNTING CUTOUTS		Shell Size	B +.010 -.000	R +.010 -.000
		8	.705	.759
		10	.830	.884
		12	.955	1.007
		14	1.080	1.134
		16	1.205	1.259
		18	1.330	1.384
		20	1.455	1.507
		22	1.580	1.634
		24	1.705	1.759

Receptacle "O" Ring Packing Requirements

ARP 568 Uniform Dash Number

Shell Size	Main Joint Seal	Shell to Mounting Surface Seal
		Jam Nut
8	ARP-014	ARP-019
10	ARP-016	ARP-021
12	ARP-018	ARP-023
14	ARP-020	ARP-025
16	ARP-022	ARP-027
18	ARP-024	ARP-029
20	ARP-026	ARP-030
22	ARP-028	ARP-031
24	ARP-029	ARP-032

Conversion Table

Salt Water Depth to Hydrostatic Pressure

Salt-Water Depth in Feet	Pounds per sq. inch	Salt-Water Depth in Feet	Pounds per sq. inch
10	4	2,000	890
25	11	2,500	1,113
50	22	3,000	1,335
75	33	4,000	1,780
100	45	5,000	2,225
200	89	6,000	2,670
250	111	7,000	3,115
300	134	7,500	3,338
400	178	8,000	3,560
500	223	9,000	4,005
600	267	10,000	4,450
750	334	15,000	6,675
800	356	20,000	8,900
1,000	445	25,000	11,125

Application Tooling

Contact Size	Crimping Tool	Positioner	Insertion Tool*	Removal Tool*	Sealing Plug*	Color Code	Reference Publication
22M	M22520/2-01	M22520/2-09†	11-8674-24	11-8675-24	10-405996-22	Black	L-624
22D	M22520/2-01	M22520/2-09†	11-8674-24	11-8675-24	10-405996-22	Black	
22	M22520/2-01	M22520/2-09†	11-8674-22	11-8675-22	10-405996-22	Black	
20	M22520/1-01	M22520/1-04	11-8674-20	11-8675-20	10-405996-20	Red	
16	M22520/1-01	M22520/1-04	11-8674-16	11-8675-16	10-405996-16	Blue	
12	M22520/1-01	M22520/1-04	11-8674-12	11-8675-12	10-405996-12	Yellow	

* Amphenol Part Numbers

† Pin only, use M22520/2-06 for socket contacts

AJ Aquacon

contact installation/how to order

CONTACT INSTALLATION

Wire and Cable Preparation

1. Cut wire or cable to desired length. Strip insulation from end of wire in accordance with the following table. Hot wire stripping methods are recommended. Avoid nicking or cutting wire strands.

Wire Strip Length in Inches

Contact Type	Contact Size					
	22M	22D	22	20	16	12
Solder	1/8	—	1/8	5/32	5/32	
Crimp	1/8 – 5/32			7/32 – 1/4		

Solder Contact Termination

1. Clean conductors and pre-tin with a good grade 60/40 tin-lead solder to 1/16 inch.
2. Pre-tin contact solder well.
3. With connector in a suitable holding device, solder wells facing operator, and the cutaway portion of the wells up, insert pre-tinned conductor into contact well. Apply heat to closed side of wire well to make joint. Remove heat and allow joint to cool.
4. A resistance soldering unit of approximately 125 watts is recommended. If a soldering iron is used, do not exceed 20 watts for size 22M, 22D and 22 contacts; 80 watts for size 20; and 150 watts for size 16 and 12 contacts.
5. Wipe or brush excess flux from terminations.

Crimp Contact Termination

1. Select proper crimping tool and positioner from Application Tooling table on page 11.
2. Position wire in wire well. Wire must be visible in the inspection hole provided.
3. With the wire in place, insert the contact fully into the crimping tool. Squeeze the crimping tool handles to the full extent of their travel. The recommended crimping tools are the “full cycling” type and will not release until a complete crimp is made. Release pressure on handles and remove the completed crimped contact/wire assembly.

Contact Insertion

1. Select proper insertion tool from Application Tooling table on page 11.
2. With contact/wire assembly properly positioned in the insertion tool, push forward, directly in line with the grommet hole, until the contact is felt to snap into place.
3. Remove insertion tool.
All unused contact positions must be filled with uncrimped contacts. In addition, sealing plugs (see Application Tooling table) should be inserted in all unused grommet holes.

Contact Removal

1. Select proper removal tool from Application Tooling table.
2. Carefully insert removal tool until contact to be removed is released. AJ contacts are rear release, rear removable.
3. Remove contact.

HOW TO ORDER

AQUACON CONNECTORS

To more easily illustrate ordering procedure, part number AJ6R-20-41SA () is shown as follows:

A	J	6	R	-20	-41	S	A	(445)
1	2	3	4	5	6	7	8	9

See code below:

1. Type Designator

A designates Aquacon

2. Family Designator

J designates hard dielectric inserts

3. Shell Style

- 0 – square flange receptacle
- 6 – straight plug
- 7 – jam nut receptacle

4. Contact Type

- C – non-removable solder terminations (plug only)
- R – removable crimp termination
- H – hermetic (glass seal) solder termination

5. Shell Size

Aquacon shell sizes available from 8 through 24. See insert availability, page 3.

6. Insert Arrangement

Refer to insert availability on page 3.

7. Contact Configuration

- P designates pin contacts
- S designates socket contacts

8. Insert Rotation

Refer to alternate positions, page 2.
No letter required for normal (no rotation) position.

9. Special Variations

Consult Amphenol, Sidney, NY for options and special variations available.
(168) designates rear accessory threads
(445) designates hex coupling and rear accessory threads

How to Order Protection Caps

Part number 10-377664-20 is shown as follows:

10-377664	–	20
1		2

1. Protection cap style

- 10-377664-XX (Receptacle)
- 10-399623-XX (Plug)

2. Cap Size

Cap size is determined by shell size of connectors to be protected.

Amphenol® Cage Code No.77820