

AQUACON HERMETIC

HIGH PRESSURE IMMERSIBLE HERMETIC 38999 CONNECTORS PDS - 382



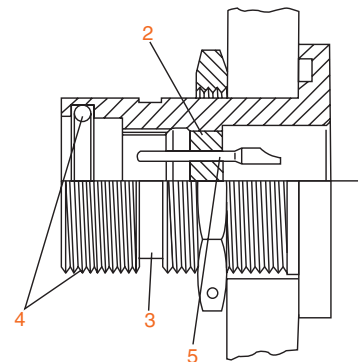
Amphenol Aquacon hermetic connectors are engineered to resist the corrosive environments encountered with oceanic or fluid immersion applications while maintaining a waterproof seal.

Specially designed type 316 stainless-steel shells resist corrosion and can withstand hydrostatic pressure. Positive threaded coupling "O" rings, and a color band visual indicator assure proper sealing and mating.

FEATURES & BENEFITS:

- 1500 PSI Capability
- "O" Ring Sealing, Thread
- Threaded Coupling
- Visual Mating Indication
- Design Flexibility
- Corrosion resistant aluminum bronze coupling nut
- 316 stainless steel shell resists corrosion and provides a pressure withstanding connector
- Hermetic sealing rated 1×10^{-8} cc/sec helium

DESIGN FEATURES:



2. Hermetic inserts in MIL-DTL-38999 patterns.
3. Visual mating indicator
4. 1500 PSI sealing capability assured by threaded coupling and "O" ring
5. Pin contacts in receptacle



**HERMETIC
JAM NUT
RECEPTACLE
AJ7H/AS7H**



**HERMETIC
SQUARE FLANGE
RECEPTACLE
AJ0H**

Aquacon Series

Specifications, Alternate Positioning

Amphenol
Aerospace

AQUACON 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	+.004 -.000	.094
22D	5	—	40	—	—	.0345 ±.001	.141	—		—
22	5	3	40	20	85	.0365 ±.001	.141	.036	+.004 -.000	.094
20	7.5	5	35	20	60	.047 ±.001	.209	.044	+.004 -.000	.125
16	13	10	25	20	85	.067 ±.001	.209	.078	+.004 -.002	.141
12	23	17	25	20	85	.100 ±.002	.209	.116 ±.004		.151

AQUACON SERVICE RATINGS

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

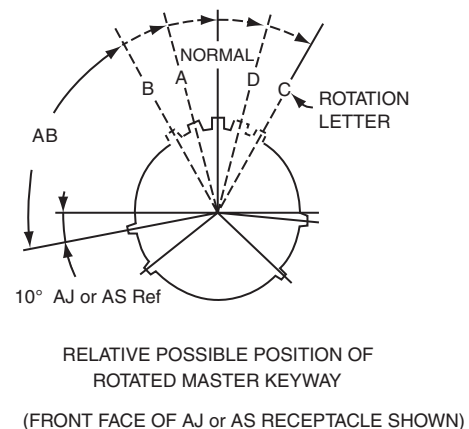
Alternate positioning of connectors allows connectors with identical insert arrangements to be mounted side by side by providing a positive means of eliminating inadvertent cross-mating or cross-plugging.

Alternate positioning of Aquacon 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.

AQUACON 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



Aquacon Series

Insert Availability

Aquacon Shell Size	Hermetic*	Service Rating**	Total Contacts	Contact Size					
				22D	22M	22	20	16	12
8-3	X	M	3				3		
8-6	X	M	6		6				
8-35	X	M	6	6					
8-98	X	I	3				3		
10-5	X	I	5				5		
10-13	X	M	13		13				
10-35	X	M	13	13					
10-98	X	I	6				6		
12-3	X	II	3					3	
12-8	X	I	8				8		
12-35	X	M	22	22					
12-98	X	I	10				10		
14-5	X	II	5					5	
14-18	X	I	18				18		
14-35	X	M	37	37					
14-37	X	M	37		37				
16-6†	X	I	6						6
16-8	X	II	8					8	
16-26	X	I	26				26		
16-35	X	M	55	55					
16-55	X	M	55		55				
18-32	X	I	32				32		
18-35	X	M	66	66					
18-66	X	M	66		66				
20-16	X	II	16					16	
20-41	X	I	41				41		
22-21	X	II	21					21	
22-55	X	I	55				55		
24-19†	X	I	19						19

* Tooled for pin inserts only (contact Amphenol for socket availability).

** See specifications

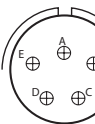
† AS Aquacon version - these arrangements use SJT (38999 type) patterns that incorporate size 12 contacts.

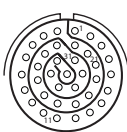
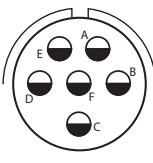
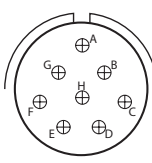
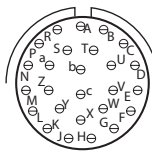
See how to order page 47.

Additional insert arrangements may be made available upon request.

Front face of pin inserts illustrated

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

							
Insert Arrangement	10-98	12-3	12-8	12-35	12-98	14-5	14-18
Service Rating	I	II	I	M	I	II	I
Number of Contacts	6	3	8	22	10	5	18
Contact Size	20	16	20	22D	20	16	20

					
Insert Arrangement	14-35	14-37	16-6†	16-8	16-26
Service Rating	M	M	I	II	I
Number of Contacts	37	37	6	8	26
Contact Size	22D	22M	12	16	20

See page 43 for service ratings and contact sizes.
† AS Aquacon version - uses an SJT (38999 type) pattern with size 12 contacts.
See how to order page 47.

CONTACT LEGEND



8



12



16



20



22



22M



22D

Front face of pin inserts illustrated

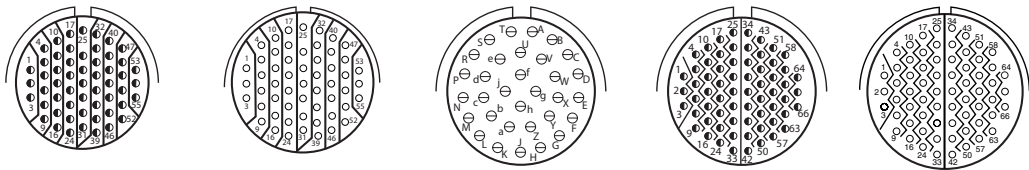


Table with 6 columns: Insert Arrangement, 16-35, 16-55, 18-32, 18-35, 18-66. Rows include Service Rating, Number of Contacts, and Contact Size.

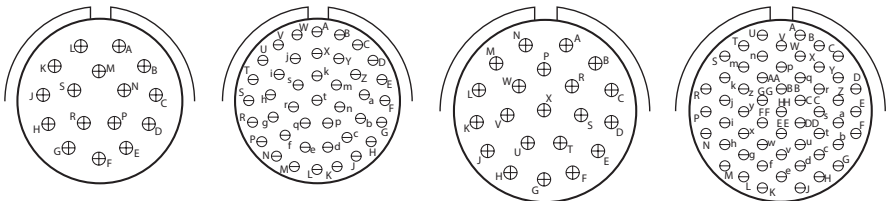


Table with 5 columns: Insert Arrangement, 20-16, 20-41, 22-21, 22-55. Rows include Service Rating, Number of Contacts, and Contact Size.

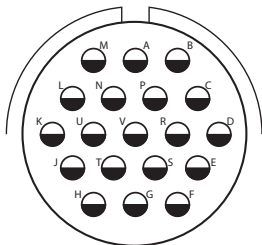


Table with 2 columns: Insert Arrangement, 24-19†. Rows include Service Rating, Number of Contacts, and Contact Size.

See page 43 for service ratings and contact sizes.
† AS Aquacon version - uses an SJT (38999 type) pattern with size 12 contacts. See how to order page 47.

CONTACT LEGEND
8 12 16 20 22 22M 22D

1. Connector & Shell Style	2. Contact Type	3. Shell Size – Insert Arrangement	4. Contact Configuration	5. Insert Rotation
AJ7	H	20-41	P	A

AQUACON IMMERSIBLE CONNECTORS

Aquacon with JT (38999 Type) Inserts

Aquacon with SJT (38999 Type) inserts- size 12 contacts only

Fused compression glass sealed inserts. Leakage rate less than 1.0x10⁻⁶ cc/sec at 15 psi differential; with interfacial seal.

Hermetic	Jam Nut Receptacle	AJ7	AS7
	Square Flange	AJ0	

2. CONTACT TYPE

Receptacle	
H	Hermetic (Glass Seal) Solder Termination (Receptacles only)

3. INSERT ARRANGEMENT

Shell Size & Insert Arrangements are on pages 44. First number represents Shell Size, second number is the Insert Arrangement.

4. CONTACTS

P	Pin Contacts - Solder
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5. ALTERNATE KEYING POSITION

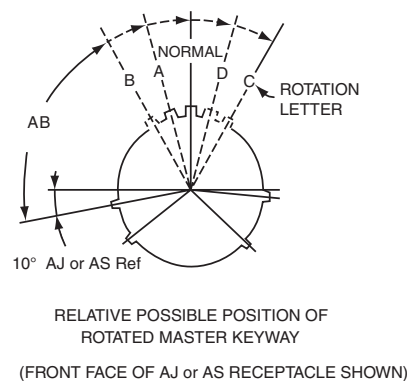
Alternate positioning of Aquacon Series is achieved by a rotation of the master key/keyway, relative to the insert, as part of the shell manufacturing operation.

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

AQUACON 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

Hermetics are available only in pin contacts.



Consult Amphenol Aerospace for other options and special variations available.

AJ7H / AS7H Aquacon

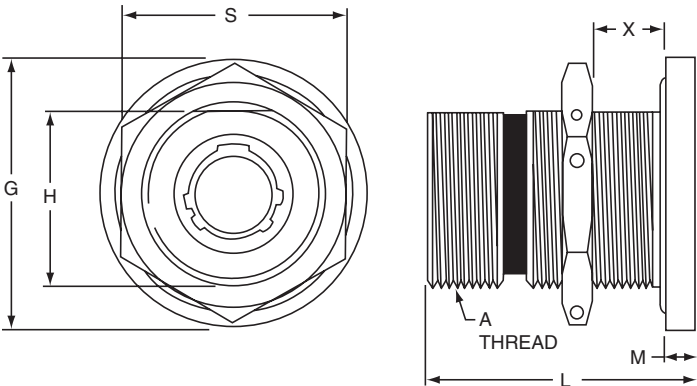
Hermetic Jam Nut Receptacle

PART NUMBER BUILDER

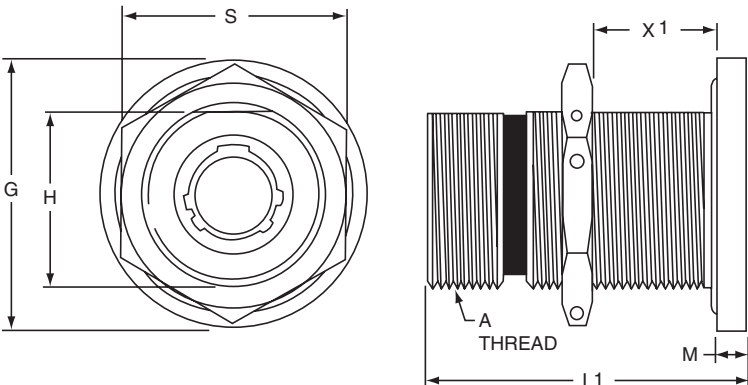
AJ7H-

AS7H-

AJ7H-XX-XXX(XXX)



AS7H-XX-XXX(XXX)



AJ Aquacon use JT (38999 type) inserts that incorporate contact sizes 22D, 22M, 22, 20 or 16. AS Aquacon use SJT (38999 type) inserts that incorporate size 12 contacts

Shell Size	A Thread Class 2A	G Dia.	H +.000 - .000	L ±.010 (Hermetic AJ)	L1 +.000 - .010 (Hermetic AS)	M	S Hex ±.016	X Bulkhead Thickness (AJ)	X1 Bulkhead Thickness (AS)
8	.750-20 UNEF	1.125	.700	1.125	1.500	.125	.938	.03 – .31	.06 – .72
10	.875-20 UNEF	1.250	.825	1.125	1.500	.125	1.062	.03 – .31	.06 – .72
12	1.000-20 UNEF	1.406	.950	1.125	1.500	.125	1.188	.03 – .31	.06 – .72
14	1.125-18 UNEF	1.531	1.075	1.125	1.500	.125	1.312	.03 – .31	.06 – .72
16	1.250-18 UNEF	1.654	1.200	1.125	1.500	.125	1.438	.03 – .31	.06 – .72
18	1.375-18 UNEF	1.844	1.325	1.125	1.500	.125	1.562	.03 – .31	.06 – .72
20	1.500-18 UNEF	2.000	1.450	1.250	1.500	.188	1.688	.03 – .38	.06 – .65
22	1.625-18 UNEF	2.125	1.575	1.250	1.500	.188	1.812	.03 – .38	.06 – .65
24	1.750-18 UNS	2.250	1.700	1.250	1.500	.188	2.000	.03 – .38	.06 – .65

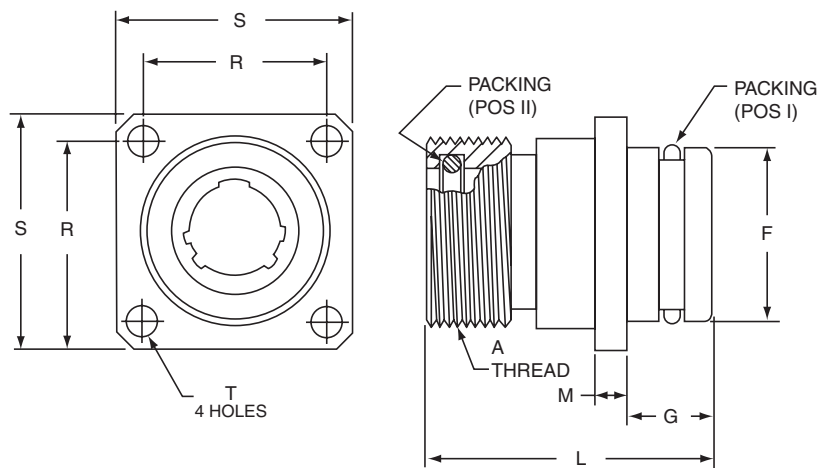
All dimensions for reference only.

AJOH Aquacon

Hermetic Square Flange Receptacle

PART NUMBER BUILDER

AJOH-



AJOH-XX-XXX(XXX)

The Aquacon Hermetic Square Flange Receptacle is available in AJ style only which incorporates contact sizes 22D, 22M, 22, 20 or 16.

Shell Size	A Thread Class 2A	F Dia. +.000 - .001	G ±.030	L	M	R	S	T ±.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

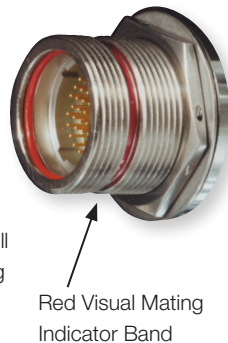
All dimensions for reference only.

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.



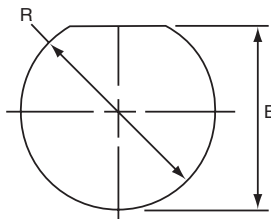
MOUNTING SURFACES

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 23 microns or less are recommended for "O" ring sealing areas when jam nut or through bulkhead receptacles are mounted.

RECEPTACLE "O" RING RACKING 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

MOUNTING CUTOUTS



Rear mount jam nut

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

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.

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		

1. How many Contacts?

Consider including a number of redundant contacts to accommodate any system developments you have planned for the future, or to comply with specified growth provisions.

2. What are the electrical requirements?

Work out a steady state and peak requirement for both the current and voltage.

3. Will your Glass-to-Metal Sealing be under any pressure?

Depending on the medium (for example, oil, water, or a vacuum) there may be a pressure differential to consider. Glass-to-Metal Sealing (GTMS) can be supplied in multi-pin preforms or, for high pressure applications in individual glass beads.

4. How will your GTMS be attached?

Will it be secured with a standard O-ring, for example, or welded in place?

5. What are your cable interface requirements?

Be sure to include any instructions for screen termination, potting requirements, and/or cable strain relief.

6. Do you require custom functionality?

If you have any specific requirements, such as electromagnetic compatibility (EMC) filters or printed circuit board (PCB) mounting, make sure they are included in your design specification.

7. What are your plating requirements?

We offer a wide range of in-house plating options, including tin, nickel, and hard and soft gold. We can also customize the plating to meet any special requirements. Note that gold-plated solder contacts should either be desoldered before installation or appropriate plating thickness specified, to avoid solder embrittlement.

8. Are there any environmental factors?

If your application will be operating in a harsh or hostile environment (exposed to shock, vibration, thermal changes or extreme temperatures, for example) these will need to be factored into the design.

9. What are the qualification requirements?

If qualification tests are required, these should be discussed and specified during the design phase. We are able to perform most qualification tests on the appropriate levels of assembly.

10. What testing will you need?

Examples include leak testing, pressure testing, and geometrical and electrical testing; including breakdown, voltage, and insulation resistance of finished parts.

11. Cabling and wiring too?

If you would like to extend your brief to include your cabling and wiring requirements, we can address those as well.