

# **AQUACON**

## HIGH PRESSURE IMMERSIBLE 38999 CONNECTORS

PDS - 382



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

Specially designed 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.

Aquacon Connectors are available in two receptacle styles, with numerous MIL-DTL-38999 insert patterns.

### **FEATURES & BENEFITS:**

- 1500 PSI Capability
- "O" Ring Sealing, Thread
- Threaded Coupling
- Visiual Mating Indication
- Deign Flexibility

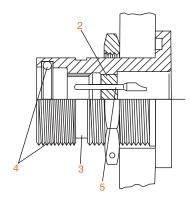


HERMETIC
JAM NUT
RECEPTACLE
AJ7H/AS7H



HERMETIC SQUARE FLANGE RECEPTACLE AJOH

### **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

Specifications, Alternate Positioning

## **AQUACON CONTACT RATINGS**



Contact	Test C	urrent	Max	Maximum Millivolt Drop		Crimp Wel	Crimp Well Data		Solder Well Data		
Size	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	
1	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**

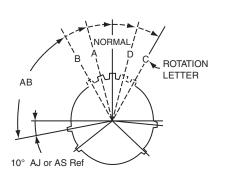
Alternate positioning of connectors allows connectors with identical insert arrangements to be mounted side by side by providing a positive means of eliminating inadvertent cross-mating or cross-plugging.

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	AB Angle of Rotation (Degrees)							
Size	Normal	Α	В	С	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			



RELATIVE POSSIBLE POSITION OF ROTATED MASTER KEYWAY

(FRONT FACE OF AJ or AS RECEPTACLE SHOWN)

Insert Availability



Aquacon		Service	Total			Conta	ct Size		
Shell Size	Hermetic*	Rating**	Contacts	22D	22M	22	20	16	12
8-3	Х	М	3				3		
8-6	X	М	6		6				
8-35	X	М	6	6					
8-98	X	I	3				3		
10-5	X	I	5				5		
10-13	X	М	13		13				
10-35	X	М	13	13					
10-98	X	I	6				6		
12-3	X	II	3					3	
12-8	X	I,	8				8		
12-35	X	М	22	22					
12-98	X	I	10				10		
14-5	X	II	5					5	
14-18	X	I	18				18		
14-35	X	М	37	37					
14-37	X	М	37		37				
16-6†	X	I	6						6
16-8	X	II	8					8	
16-26	X	I	26				26		
16-35	X	М	55	55					
16-55	X	М	55		55				
18-32	X	I	32				32		
18-35	X	М	66	66					
18-66	X	М	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

<sup>\*</sup> Tooled for pin inserts only (contact Amphenol for socket availability).

Additional insert arrangements may be made available upon request.

<sup>\*\*</sup> See specifications

<sup>†</sup> AS Aquacon version - these arrangements use SJT (38999 type) patterns that incorporate size 12 contacts. See how to order page 47.

## Insert Arrangements



## Front face of pin inserts illustrated















	_	_	_	_			
Insert Arrangement	8-3	8-6	8-35	8-98	10-5	10-13	10-35
Service Rating	М	М	М	I	I	М	М
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	М	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	М	М	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.









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CONTACT LEGEND

16

22 22M 22D

# **AJ Aquacon**

## Insert Arrangements

## Front face of pin inserts illustrated





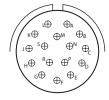


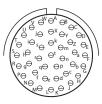


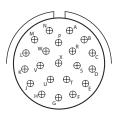


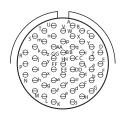


Insert Arrangement	16-35	16-55	18-32	18-35	18-66
Service Rating	M	М	I	M	М
Number of Contacts	55	55	32	66	66
Contact Size	22D	22M	20	22D	22M

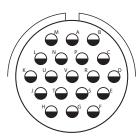








Insert Arrangement	20-16	20-41	22-21	22-55
Service Rating	II	I	II	I
Number of Contacts	16	41	21	55
Contact Size	16	20	16	20



Insert Arrangement	24-19†
Service Rating	I
Number of Contacts	19
Contact Size	12

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.















## **AJ Aquacon**

## How to Order



1.	2.	3.	4.	5.
Connector & Shell Style	Contact Type	Shell Size – Insert Arrangement	Contact Configuration	Insert Rotation
AJ7	Н	20-41	Р	Α

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.

netic	Jam Nut Receptacle	AJ7	AS7
Hern	Square Flange	AJ0	

# 2. CONTACT TYPE Receptacle 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					

### 5. ALTERNATE KEYING POSITION

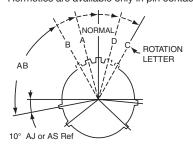
Alternate positioning of Aquacon Series is achieved by a rotation of the master key/keyway, relative to the insert, as part of the shell manufacturing operation.

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

## **AQUACON MASTER KEY/KEYWAY ROTATION**

Shell Size	AB A	Angle of Rotation (Degrees)					
Size	Normal	A	В	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.



RELATIVE POSSIBLE POSITION OF ROTATED MASTER KEYWAY

(FRONT FACE OF AJ or AS RECEPTACLE SHOWN)

Consult Amphenol Aerospace for other options and special variations available.

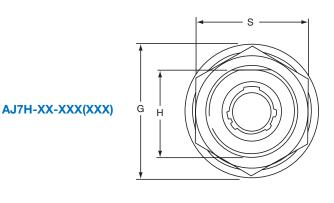
# AJ7H / AS7H Aquacon

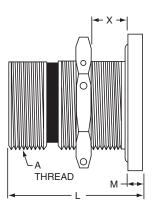
Hermetic Jam Nut Receptacle

**PART NUMBER BUILDER Page 47** 

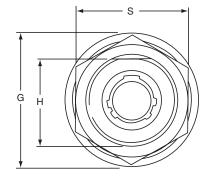
AJ7H-

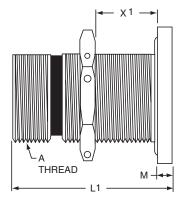
AS7H-





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	A Thread	G	H +.000	L ±.010	L1 +.000 010		S Hex	X Bulkhead Thickness	X1 Bulkhead Thickness
Size	Class 2A	Dia.	000	(Hermetic AJ) (Hermetic AS)		M ±.016		(AJ)	(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.

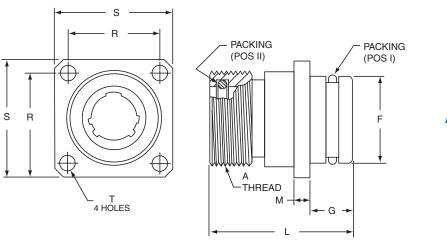
# **AJOH Aquacon**

Hermetic Square Flange Receptacle

**PART NUMBER BUILDER Page 47** 

AJOH-





AJ0H-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	М	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.

## Installation Instructions, Application Tools

## Aer

### **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 to 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.

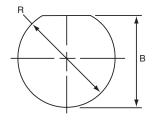


Red Visual Mating Indicator Band

### **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.

## 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

## **WIRE AND CABLE PREPARATION**

 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					
туре	22M	22D	22	20	16	12		
Solder	1/8	-	1/8	5/32	5/32			
Crimp	1/8 – 5/32				7/32 – 1/4	-		

### 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			

## **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.
- 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.
- 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.