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‘B’ Electrical Connector Subsea / Underwater / Marine

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Introduction:

CRE has developed a wide range of metal shell connectors over the years focussed on delivering high reliability in tough environments. They are designed for heavy duty use in the most rigorous underwater applications on the planet. The design offers a high integrity sealing arrangement, metal key-ways, multiple options, size, pin quantity, voltage and current rating along with our ability to design specific solutions for your application.

Manufactured as standard from stainless steel or custom built with any material specified, they come with high open face pressure resistance. The standard connectors are rated to 6000m WD and are designed for use in moulded, oil filled and PBOF, in power, signal, and electro-mechanical applications.

Common applications:

- ROV, Resident ROV & AUV
- Manned underwater vehicles
- Aquaculture
- Renewables
- Ocean science/research
- Dive / depressurisation systems

Key features:

- Up to 38 contacts
- Mixed contact sizing options
- Custom solutions (contact qty/size/type, glass to metal)
- Rated for 6000m WD mated and open face as standard, higher pressure available on application
- Oil filled (OF) available as standard, pressure balanced oil filled (PBOF) available for certain pin configurations (connector & bulkhead assemblies)
- Working voltage and current dependent on contact density and diameter.

‘B’ Electrical Connector Subsea / Underwater / Marine

Part numbering:

Bulkhead example:

BR	B	07	M		0900	24	01	BP	Ti	
									*	M.O.C., SS std, Ti, AL, Pk etc.
									*	Back pressure (If required), PBOF
										Interface number
										Wire gauge
										Wire length in mm.(i.e 900mm), standard cores
									*	H / H2 / H3 if the connector has a hybrid option
										Male / Female
										Number of contacts, BC (Blanking Cap)
										Connector family 'A', 'B', 'C' etc.

BR - Bulkhead receptacle (Threaded)
FR - Flanged receptacle
RC - Moulded or oil filled receptacle
FC - Flanged moulded or oil filled receptacle.

Notes:

- For standard assemblies, the part number structure indicated * above is left blank.
- Where custom wiring is required, Engineering will issue a BA**** (Bulkhead Assembly Part Number) to substitute for the wire length/gauge in the part number structure.
For example, in the part number above 090024 would be replaced by BA followed by a four digit number to create a unique identifier.

Component	Material
Bulkhead Body	Stainless steel 316L standard
Contact Insert	Epoxy or Glass to Metal
Electrical contacts	Leaded Nickel Copper C(&or K41)
Plating detail	1um Acid Gold over 2.5 um Nickel Copper Flash
Retaining nut/washer (optional, order if req.)	Stainless steel
Flange retainers (optional, order if req.)	Stainless steel
'O' Rings	Nitrile NI70 or as specified by customer

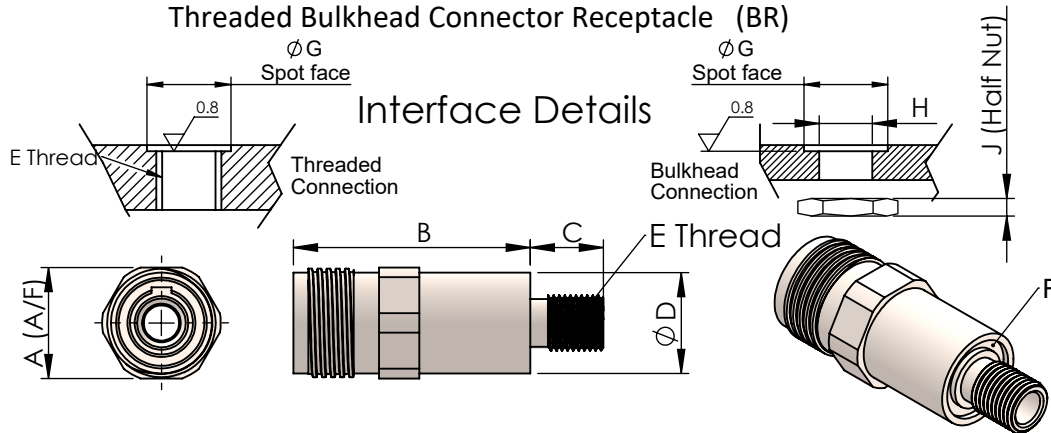
Notes:

- Contact CRE for any special-order materials required

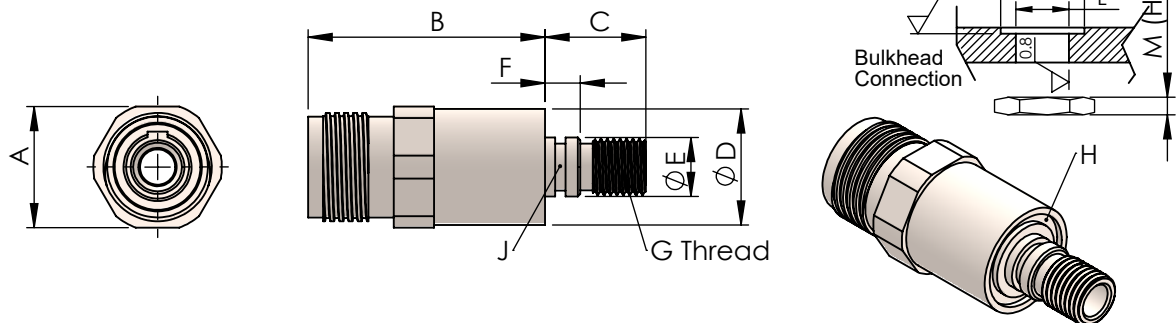
4

Reference Dimensions 'B' Connector

Threaded Bulkhead Connector Receptacle (BR)



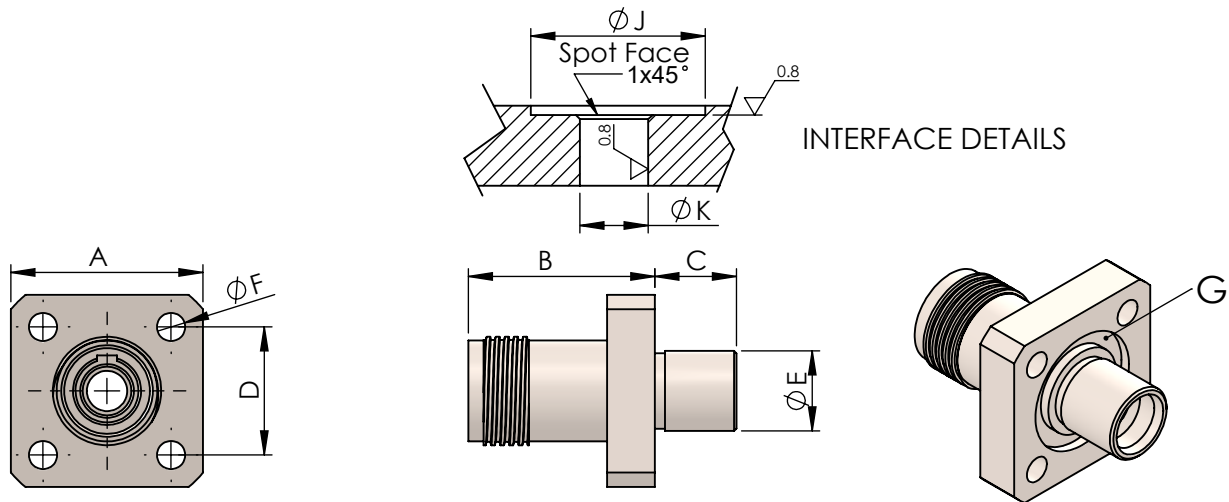
A	B	C	D	E	F-O'Ring	G	H	J	TYPE
30	49.5	14	20	7/16"-20UNF	BS014	21	1/2"	4	21
30	49.5	19	23	1/2"-20UNF	BS015	24	9/16"	4	02
30	38.5	30	22	1/2"-20 UNF	BS015	23	9/16"	4	26
30	43.5	14	26	5/8"-18 UNF	BS017	27	11/16"	4	18
30	49.5	14	26	5/8"-18 UNF	BS017	27	11/16"	4	01
30	49.5	19	26	5/8"-18 UNF	BS017	27	11/16"	4	05
30	49.5	25.4	26	5/8"-18 UNF	BS017	27	11/16"	4	10
24	42	22	28	3/4"-20UNEF	BS019	30	13/16"	5	12
30	44	12.7	29	3/4"-16UNF	BS019	30	13/16"	5	03
30	44	31	29	3/4"-16UNF	BS019	30	13/16"	5	23
30	42	45	29	3/4"-16UNF	BS019	30	13/16"	5	04
30	45.5	19	29	3/4"-16UNF	BS019	30	13/16"	5	07
30	50.3	19	29	3/4"-16UNF	BS019	30	13/16"	5	28
30	42	18	35	1.0"-14UNS	BS023	36	1.1/6"	6	06
32	21.5	25.5	35	1.0"-20UNEF	BS023	36	1.1/6"	6	19
31.75	23.5	25.4	34.8	1.0"-20UNEF	BS023	36	1.1/6"	6	22
31.75	34.4	19	34.8	1.0"-20UNEF	BS023	36	1.1/6"	6	29



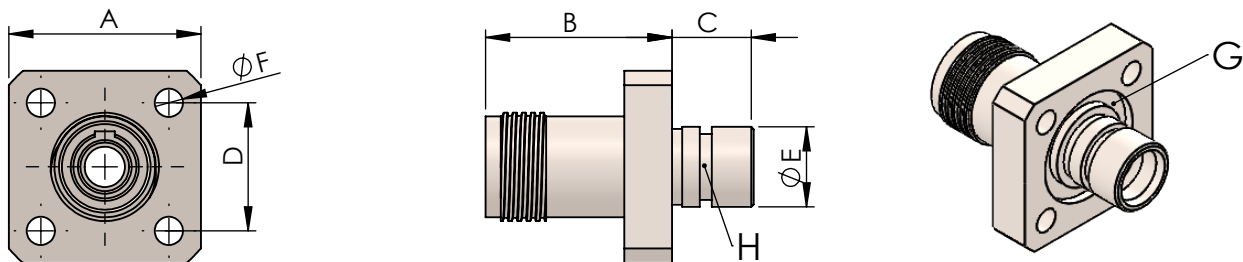
A	B	C	D	E	F	G	H-O'Ring	J-O'Ring	K	L	M	TYPE
30	49.5	21	24	13.5	7	1/2"-20UNF	BS015	11 x 1.5	25	13.55/13.6	4	09
30	49.5	20	28	16.5	7	5/8"-18UNF	BS019	14 x 1.5	29	16.55/16.6	4	08
30	49.5	73	26	16	60	5/8"-18UNF	BS017	N/A	27	16.05/16.1	4	15
27	42	28.4	30	20.5	9.4	3/4"-20UNEF	BS020	BS017	31	20.55/20.6	5	16
30	49.5	73.8	29	19.2	60	3/4"-16UNF	BS019	N/A	30	19.25/19.3	5	14
30	49.5	35	30	18.5	7	11/16"-18UNEF	BS019	16 x 1.5	31	18.55/18.6	5	24
30	23.5	26	33.25	23.75	9.4	7/8"-20UNEF	BS022	BS019	35	23.8/23.85	5	11
30	49.5	35	36	23.75	7	7/8"-20UNEF	BS023	BS019	37	23.8/23.85	5	25
32	21.5	47	35	25.4	26	1.0"-20UNEF	BS023	N/A	36	25.5/25.55	6	20
30	42	73	35	25.4	60	1.0"-14UNS	BS023	N/A	36	25.5/25.55	6	13

Reference Dimensions 'B' Connector

Flanged Bulkhead Connector Receptacle (FR)



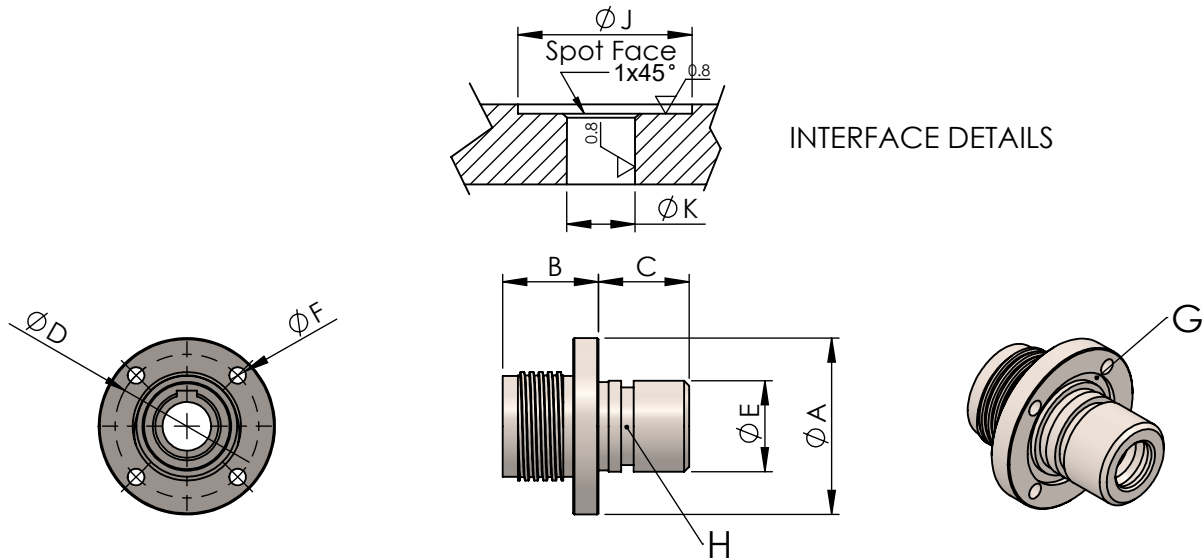
A	B	C	D	E	F	G-'O'Ring	H-'O'Ring	J	K	TYPE
38	49.5	12.5	25.4	15.8	5.6	BS116	N/A	50	15.85/15.9	01
41.25	49.5	16.2	28.6	15.88	5.6	BS116	N/A	55	15.91/15.94	07
45	42	12.5	31.75	18.8	5.6	BS118	N/A	52	18.85/18.9	03



A	B	C	D	E	F	G-'O'Ring	H-'O'Ring	J	K	TYPE
34.8	23.35	14.5	28.5	22.2	4.2	BS022	BS018	50	22.25/22.3	12
34.8	23.35	18.15	28.5	22.2	4.2	BS022	BS018	50	22.25/22.3	10
38.1	21.05	20.7	30.25	25.35	4.3	BS023	BS020	55	25.4/25.45	08
38.1	42.5	18.5	25.4	18.8	5.5	BS118	BS016	54	18.85/18.9	18
38.1	51.5	18.5	25.4	18.8	5.5	BS118	BS016	54	18.85/18.9	16
41.25	49.5	16.2	28.6	15.88	5.6	BS116	BS014	55	15.92/15.97	06
41.25	40.2	22	32.2	23.5	5.2	BS024	BS019	55	23.55/23.6	25
44.45	22.2	17.8	36.83	30	4.3	BS027	BS023	60	30.05/30.1	09
44.5	51.5	18.5	31.8	25.15	7.2	BS122	BS020	60	25.2/25.25	17
45	49.5	12.5	31.8	18	7.0	BS118	BS016	60	18.05/18.1	02
45	49.5	14.7	31.8	18	7	BS118	BS016 x 2	60	18.05/18.1	04
45	49.5	14.7	32	21	7	BS118	BS017 x 2	60	21.05/21.1	24
76.2	33	12.5	63.5	50.75	7	BS142	BS224	105	50.8/50.85	23

Reference Dimensions 'B' Connector

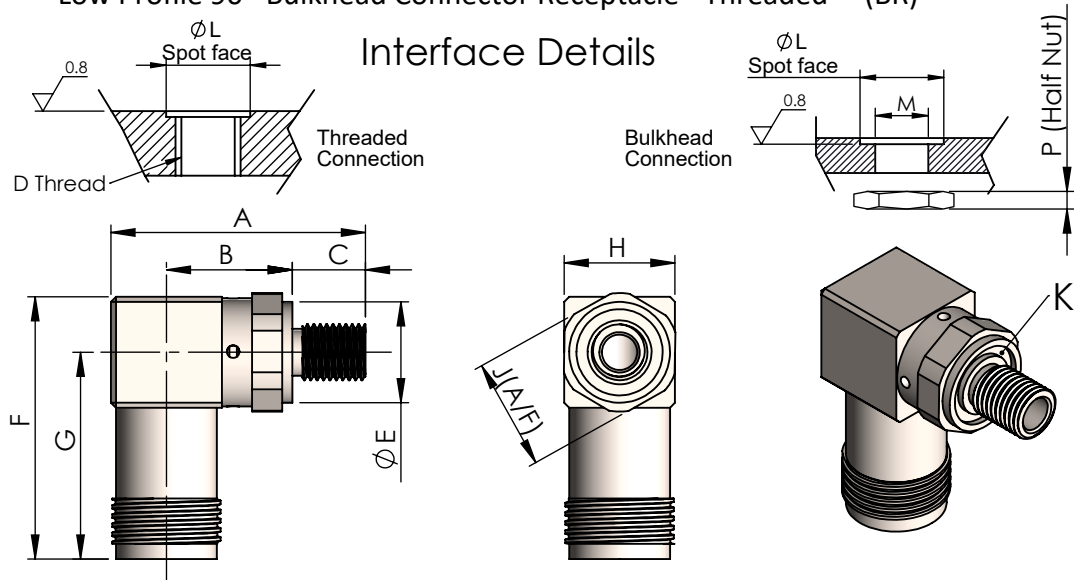
Flanged Bulkhead Connector Receptacle (FR)



A	B	C	D	E	F	G-'O'Ring	H-'O'Ring	J	K	TYPE
49	27	32	37.5	23.5	5.2	BS022	BS019	50	23.55/23.6	13
50	20	32	40	26.5	5.4	BS023	BS021	52	26.55/26.6	05
66.7	49.5	19	57.15	26.92	5.4	BS128	BS021	68	26.97/30.02	11

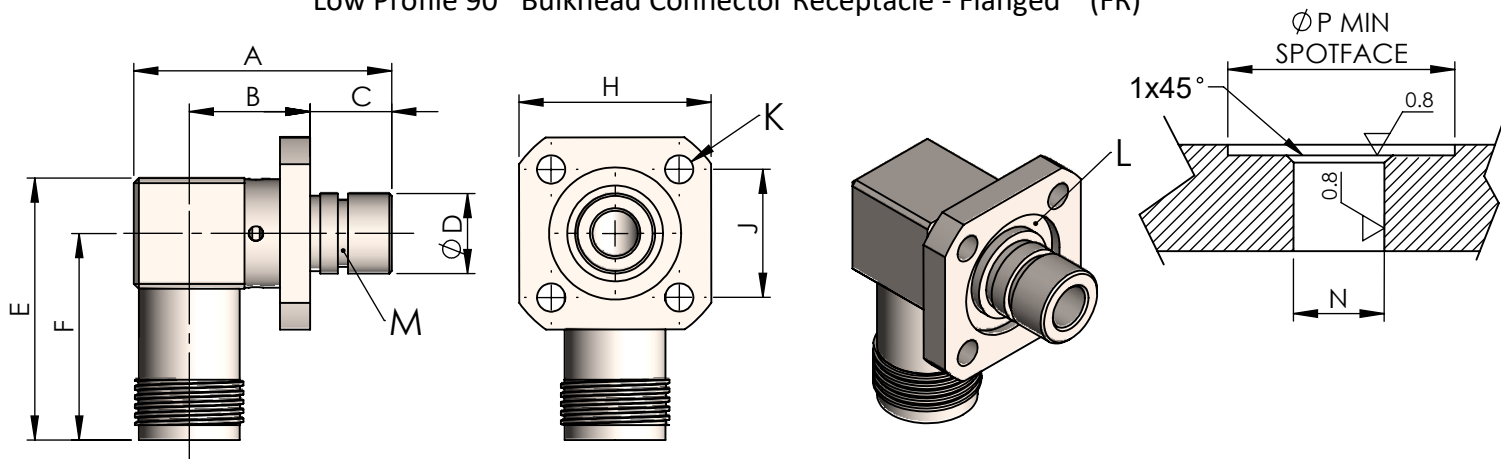
Reference Dimensions 'B' Connector

Low Profile 90° Bulkhead Connector Receptacle - Threaded (BR)



A	B	C	D	E	F	G	H	J	K-'O'Ring	L	M	P	TYPE
59	30	14	1/2"-20UNF	26	64	49	30	30	BS017	30	9/16"	4	LPT02
75	30	30	1/2"-20UNF	26	64	49	30	30	BS017	30	9/16"	4	LPT04
61	30	16	1/2" NPT	N/A	64	49	30	30	N/A	N/A	N/A	N/A	LPT05
59	30	14	5/8"-18UNF	26	64	49	30	30	BS017	30	11/16"	4	LPT01
75	30	30	5/8"-18UNF	26	64	49	30	30	BS017	30	11/16"	4	LPT06
65	30	20	1.0"-14UNS	N/A	64	49	30	34	BS023	38	1.1/16"	6	LPT03

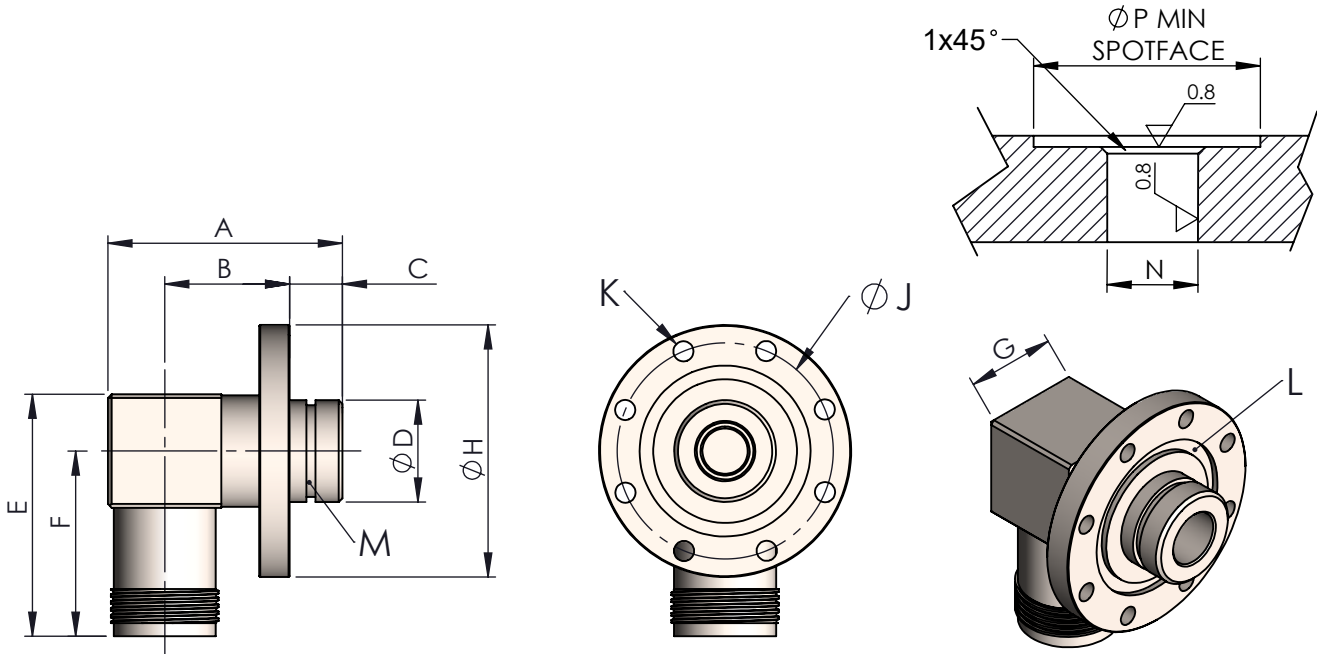
Low Profile 90° Bulkhead Connector Receptacle - Flanged (FR)



A	B	C	D	E	F	H	J	K	L-'O'Ring	M-'O'Ring	N	P	TYPE
58.5	31	12.5	15.8	64	49	38	25.4	5.6	BS116	N/A	15.85/15.9	50	LPF01
58.5	28.85	14.65	25.3	64	49	38.1	30.1	4.3	BS023	BS020	25.35/25.4	55	LPF02
62	31	16	18	64	49	45	31.8	7	BS119	BS016	18.05/18.1	60	LPF04
64.15	31	18.15	22.2	64	49	34.8	28.5	4	BS022	BS018	22.25/22.3	52	LPF03

Reference Dimensions 'B' Connector

Low Profile 90° Bulkhead Connector Receptacle - Flanged (FR)

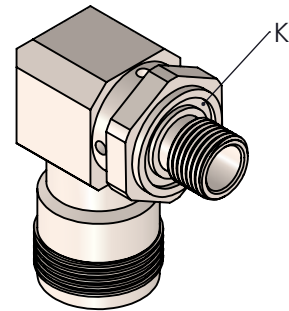
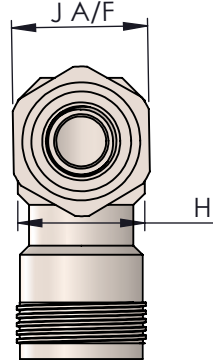
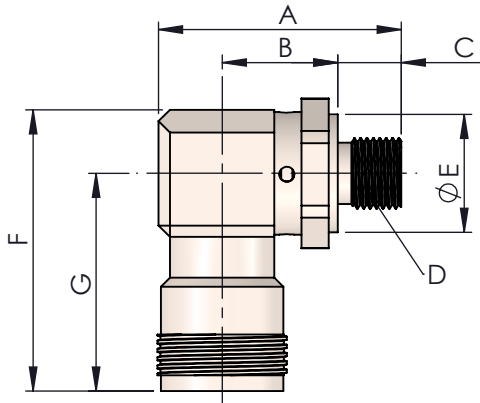
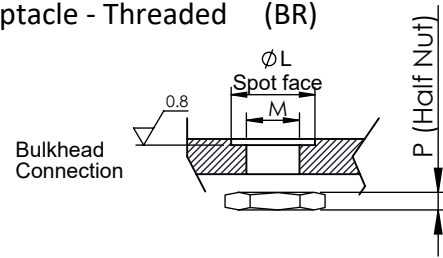
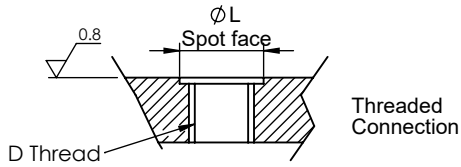


A	B	C	D	E	F	G	H	J	K	L'O'Ring	M'O'Ring	N	P	TYPE
62	33	14	26.92	64	49	30	66.7	57.15	5.33	BS128	BS021	26.97/27.02	69	LPF05

Reference Dimensions 'B' Connector

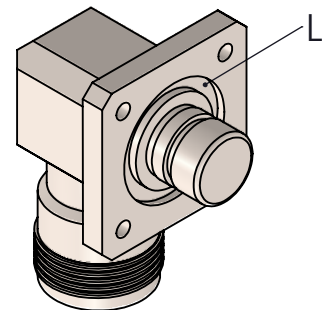
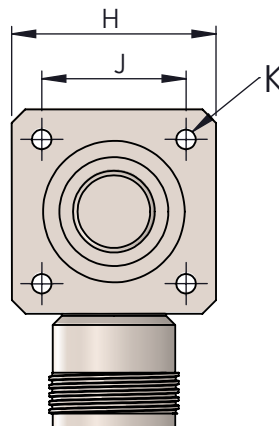
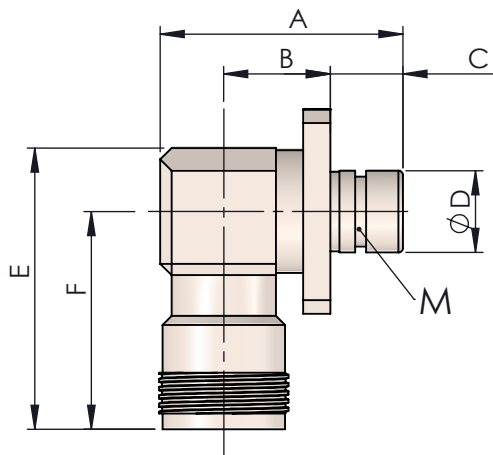
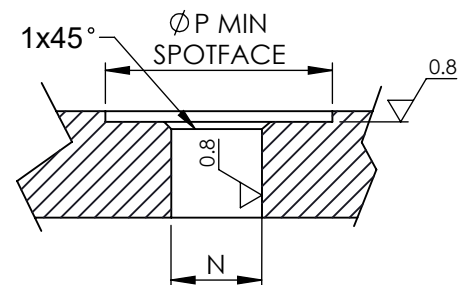
Low Low Profile 90° Bulkhead Connector Receptacle - Threaded (BR)

Interface Details



A	B	C	D	E	F	G	H	J	K-O'Ring	L	M	P	TYPE
53.5	25.5	14.5	5/8-18 UNF	26	62	48	28	30	BS017	27	11/16"	4	LLPT01

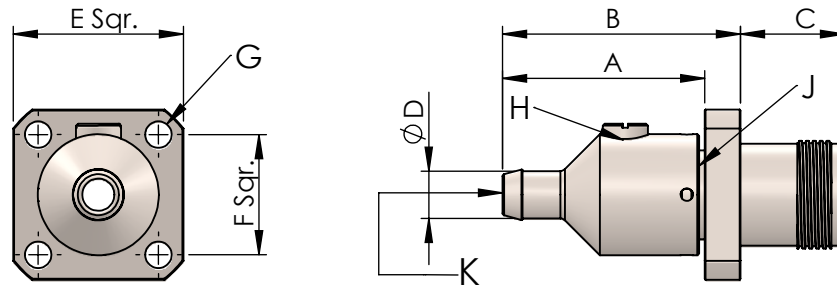
Low Low Profile 90° Bulkhead Connector Receptacle - Flanged (BR)



A	B	C	D	E	F	H	J	K	L-O'Ring	M-O'Ring	N	P	TYPE
53.5	23.5	16	18	62	48	45	31.8	5.6	BS119	BS016	18.05/18.1	65	LLPT01

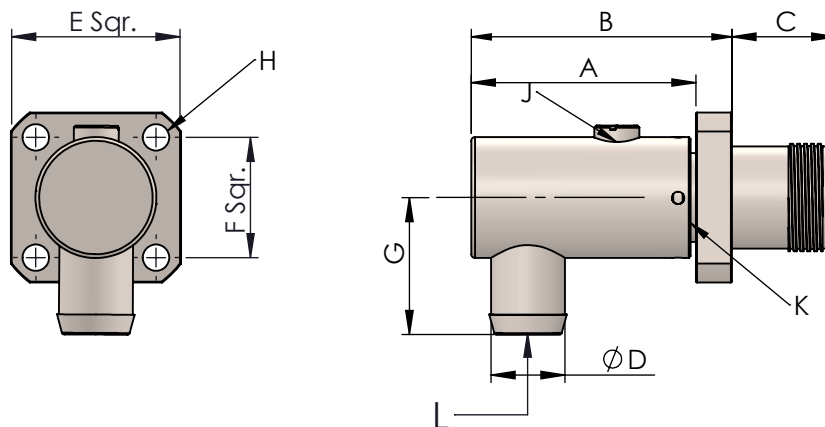
Reference Dimensions 'B' Connector

Flanged Bulkhead cable Receptacle - Straight Backshell (FPL)



A	B	C	D	E	F	G	H-'O' Ring	J-'O' Ring	BORE K	TYPE
53.5	63	27.5	12.5	45	31.8	7	6 X 1.5	22 x 2	8.5	FPL01
53.5	63	27.5	19.5	45	31.8	7	6 x 1.5	22 x 2	15.5	FPL02

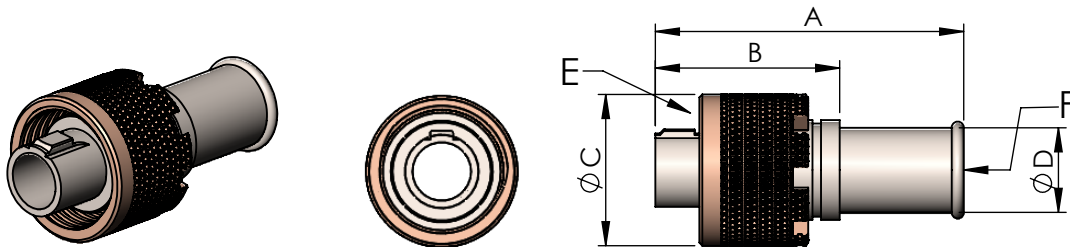
Flanged Bulkhead cable Receptacle - 90 Deg. Backshell (FPR)



A	B	C	D	E	F	G	H	J-'O' Ring	K-'O' Ring	BORE L	TYPE
59.5	63	27.5	12.5	45	31.8	36.5	7	6 X 1.5	22 x 2	8.5	FPR01
43.5	53	27.5	15	45	31.8	36.5	7	6 X 1.5	22 x 2	11	FPR03
59.5	63	27	19.5	45	31.8	36	7	6 X 1.5	22 x 2	15.5	FPR02

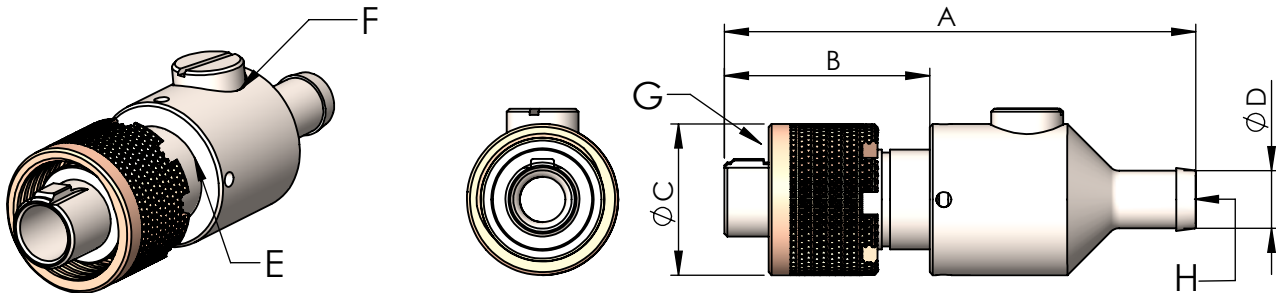
Reference Dimensions 'B' Connector

Oil Filled Cable Connector Receptacle (PL)



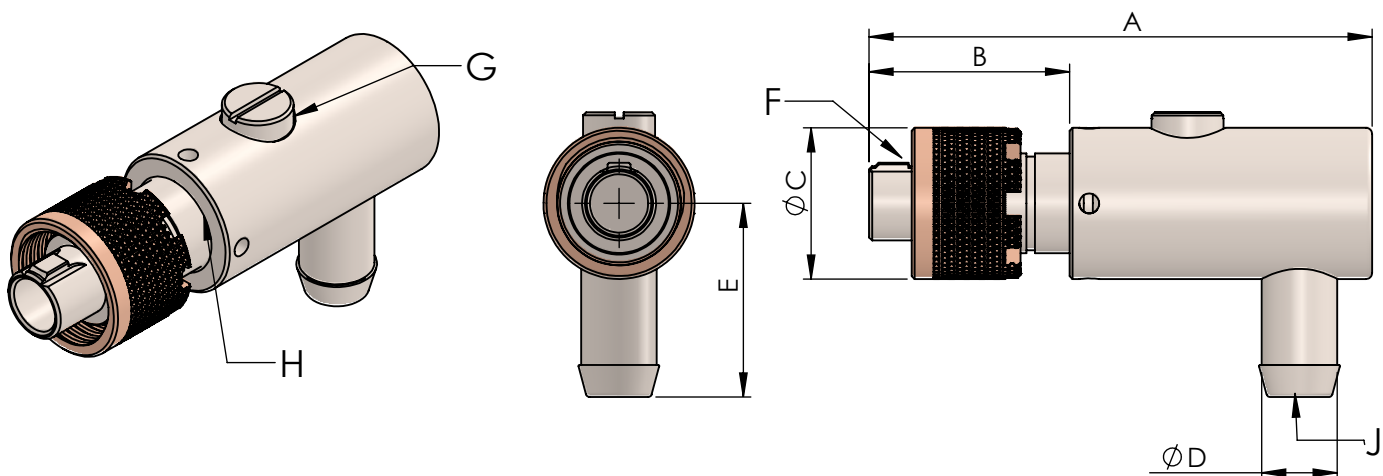
A	B	C	D	E-'O' Ring	BORE F	TYPE
51	30.4	31.7	20.5	21 x 1.65	16.5	01

Backshell Cable Connector Receptacle (PL)



A	B	C	D	E-'O' Ring	F-'O' Ring	G-'O' Ring	BORE H	TYPE
87.25	35.25	31.7	12.5	21 x 1.65	6 x 1.5	22 x 2	8.5	02
92.25	35.25	31.7	19.5	21 x 1.65	6 x 1.5	22 x 2	15.5	03

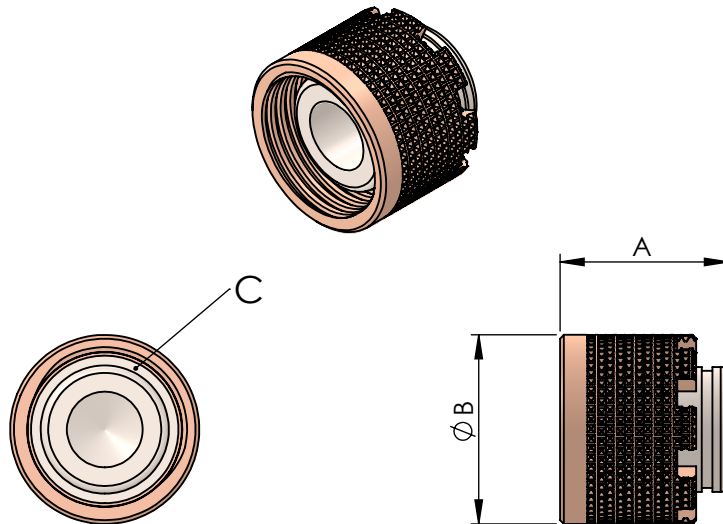
Backshell Cable Connector Receptacle-90 Deg. (PR)



A	B	C	D	E	F-'O' Ring	G-'O' Ring	H-'O' Ring	BORE J	TYPE
93.25	35.25	31.7	12.5	36.5	21 x 1.65	6 x 1.5	22 x 2	8.5	01
78	35.25	31.7	15	36.5	21 x 1.65	6 x 1.5	22 x 2	11	03
93.25	35.25	31.7	19.5	36	21 x 1.65	6 x 1.5	22 x 2	15.5	02

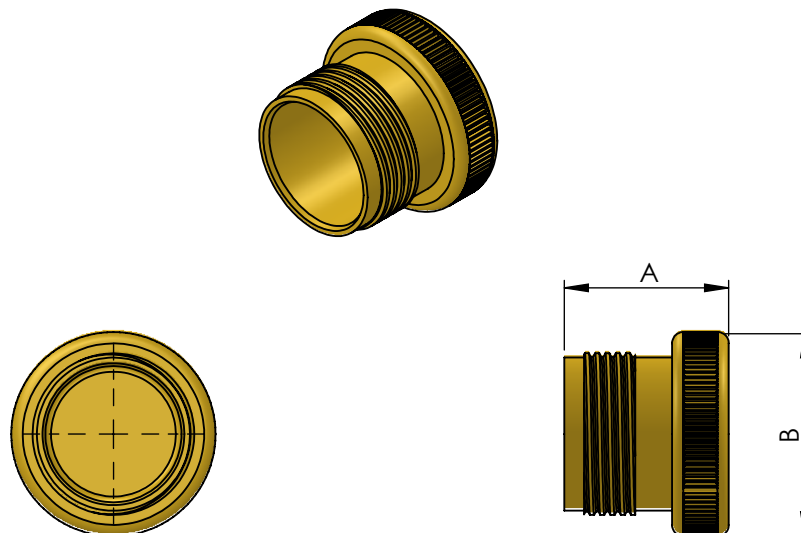
Reference Dimensions 'B' Connector

Bulkhead Blanking Plug - PLBBC



A	B	C-'O'Ring
21.8	31.7	21 x 1.65

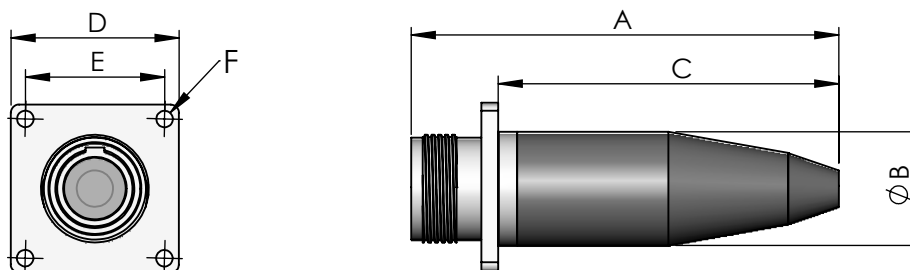
Cable Connector Blanking Plug - BRBBC



A	B
29	36

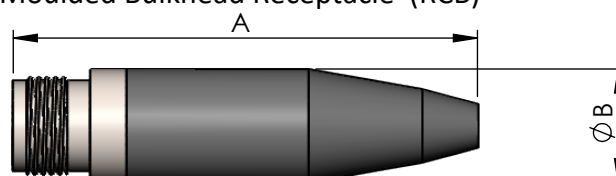
Reference Dimensions 'B' Connector

Moulded Bulkhead Receptacle (FCB)



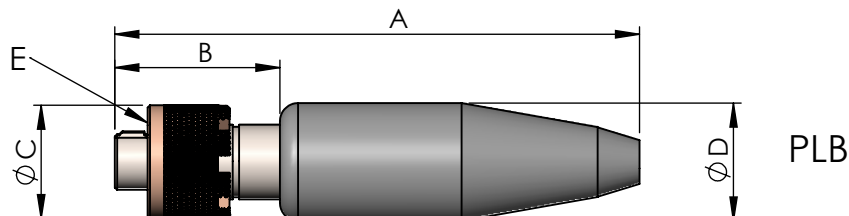
A	B	C	D	E	F
113	30	90	44.5	36.8	4.3

Moulded Bulkhead Receptacle (RCB)



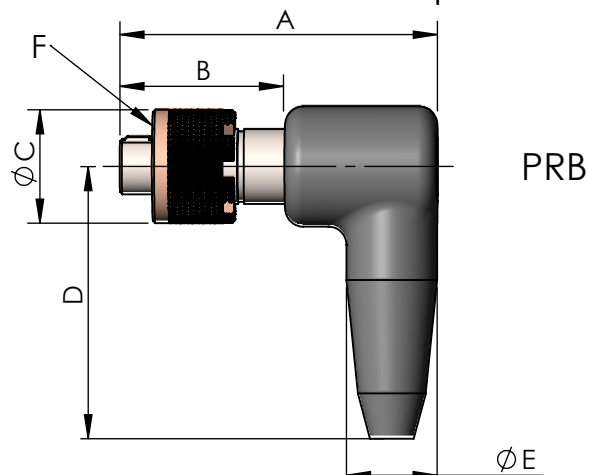
A	B
108	30

Moulded Cable Connector Receptacle-Straight



A	B	C	D	E-'O'Ring
116	36.4	31.7	32	21 x 1.65

Moulded Cable Connector Receptacle-90°



A	B	C	D	E	F-'O'Ring
80	36.7	31.7	65	25	21 x 1.65

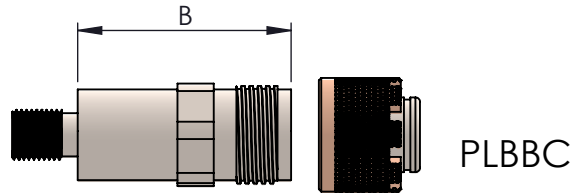
Mould Sizes Are Indicative

Note: Step files for design purposes available from engineering@CRE-marine.com

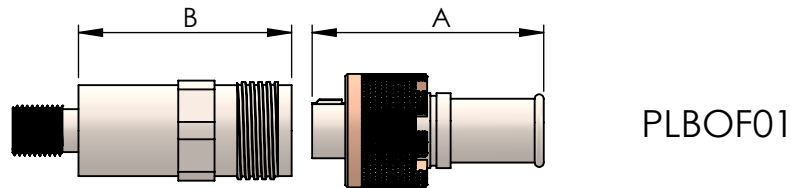
All dimension in mm

Revision 2023-05

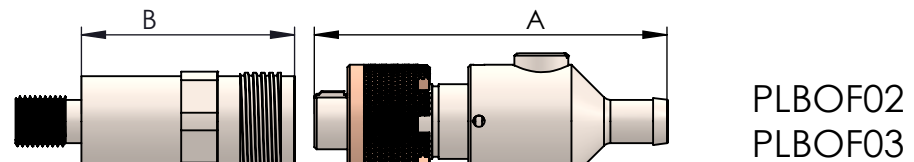
Assembled Dimensions 'B' Connector



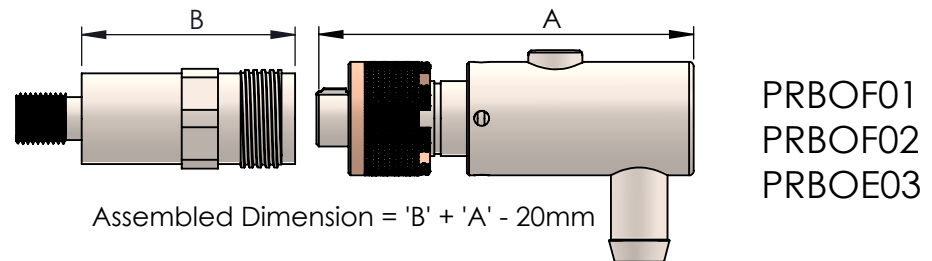
Assembled Dimension = 'B' + 9mm



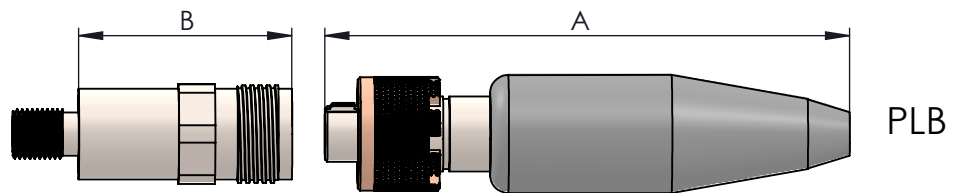
Assembled Dimension = 'B' + 'A' - 20mm



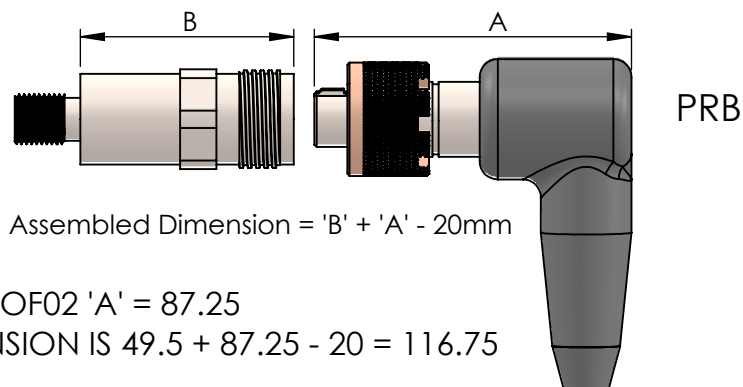
Assembled Dimension = 'B' + 'A' - 20mm



Assembled Dimension = 'B' + 'A' - 20mm



Assembled Dimension = 'B' + 'A' - 20mm



Assembled Dimension = 'B' + 'A' - 20mm

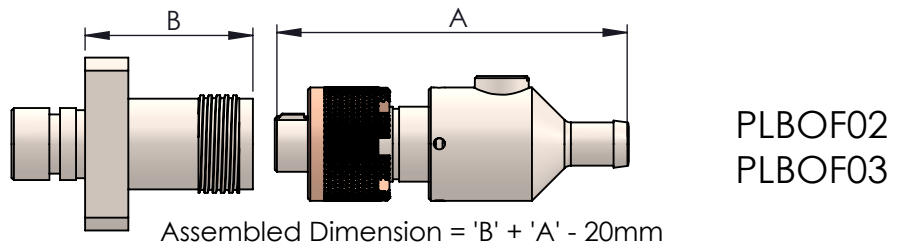
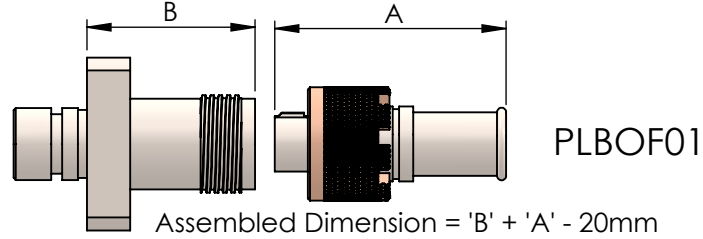
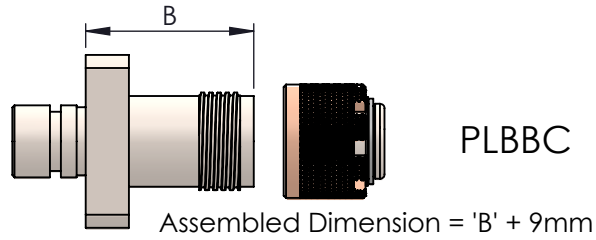
THREADED BULKHEADS
 BRB01 - BRB29

EXAMPLE: BRB01 'B' = 49.5, PLBOF02 'A' = 87.25
 THEREFORE ASSEMBLED DIMENSION IS $49.5 + 87.25 - 20 = 116.75$

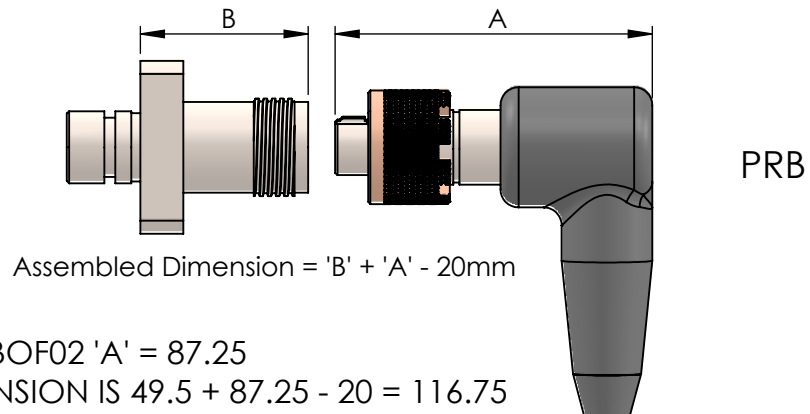
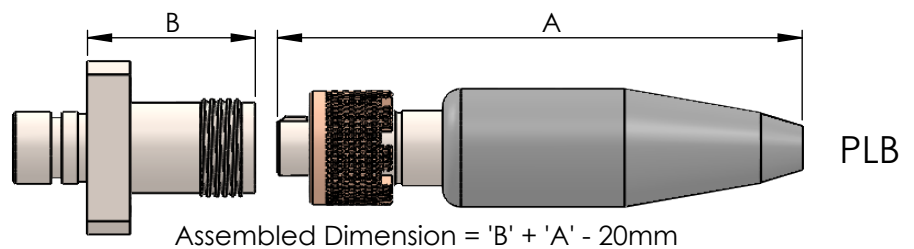
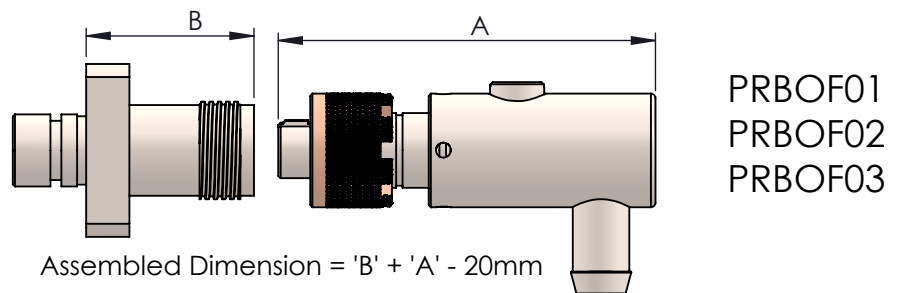
Mould Sizes Are Indicative

Note: Step files for design purposes available from engineering@CRE-marine.com

Assembled Dimensions 'B' Connector



FLANGED BULKHEADS FRB01 - FRB25



EXAMPLE: FRB01 'B' = 49.5, PLBOF02 'A' = 87.25
 THEREFORE ASSEMBLED DIMENSION IS $49.5 + 87.25 - 20 = 116.75$

Mould Sizes Are Indicative

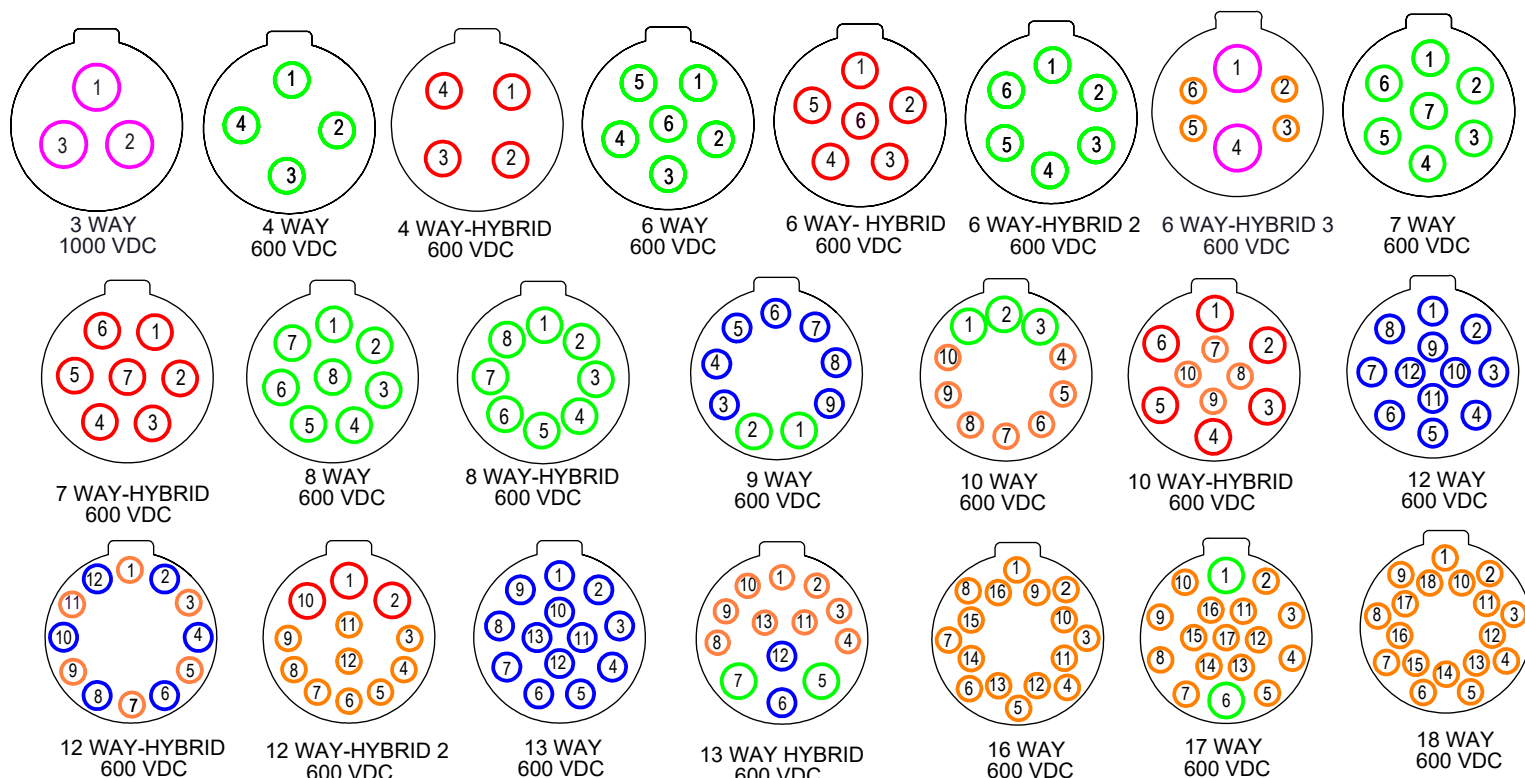
Note: Step files for design purposes available from engineering@CRE-marine.com

All dimension in mm

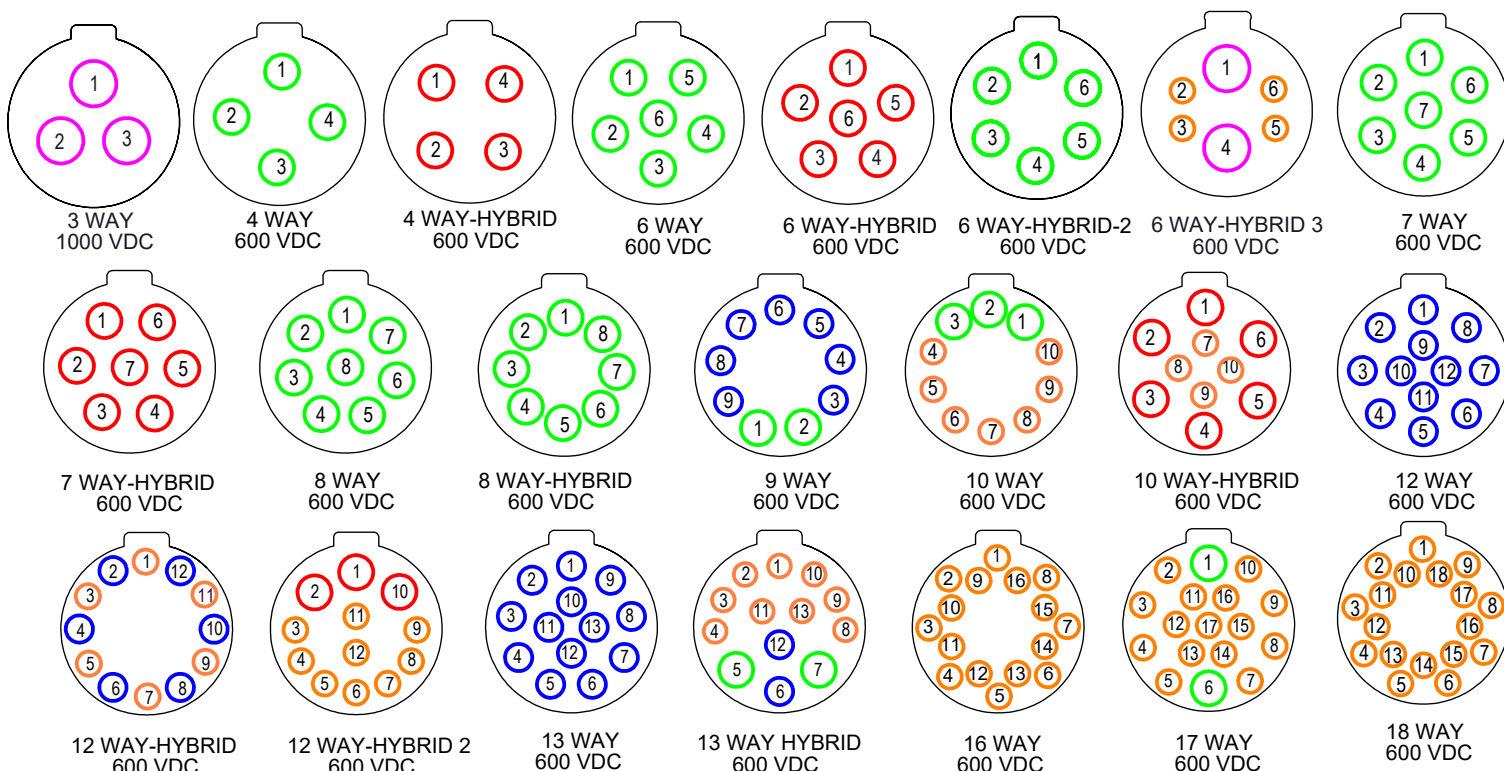
Revision 2023-05



Pin Face View

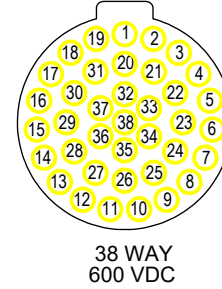
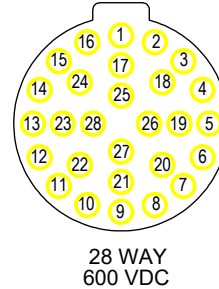
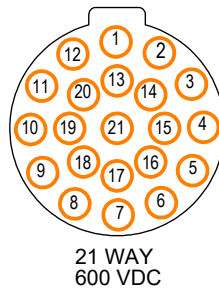
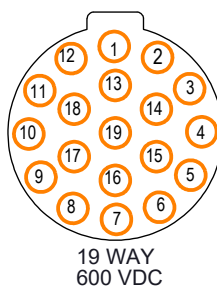


Socket Face View

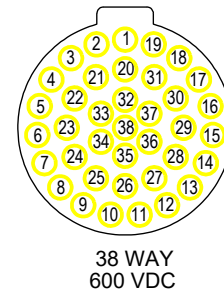
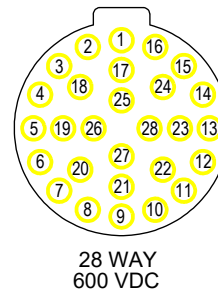
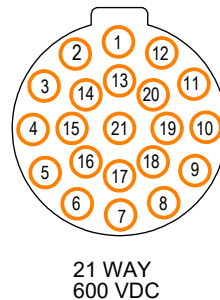
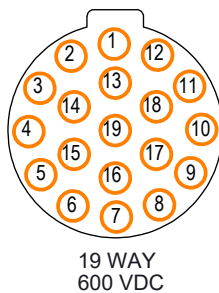


CRE recommend using a mating Bulkhead or Connector tail when carrying out continuity testing on Connectors with the 0.75mm contacts to minimise the risk of accidental damage to the contacts

Pin Face View



Socket Face View



Ø 1.0 Pin

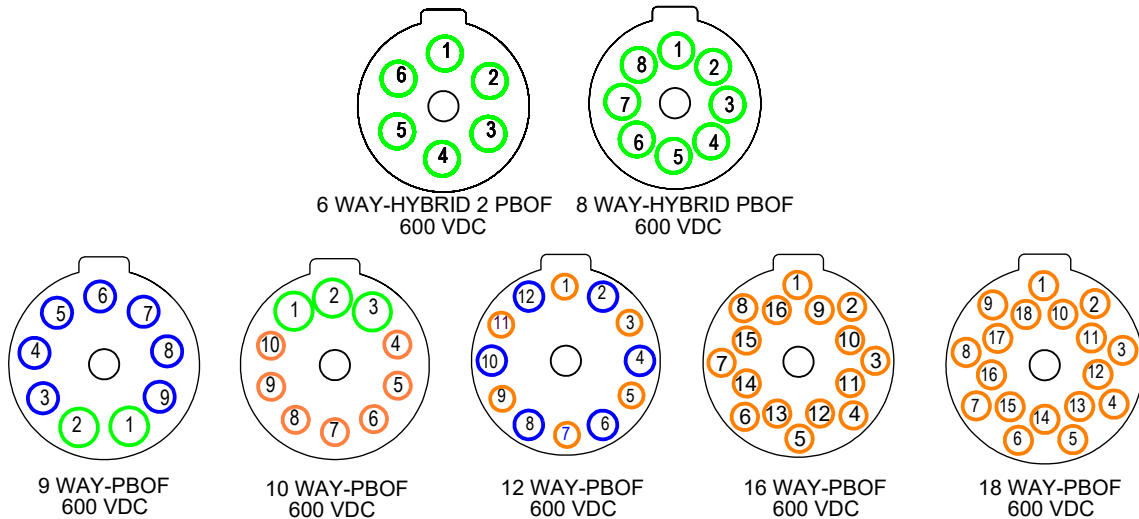


Ø 0.75 Pin

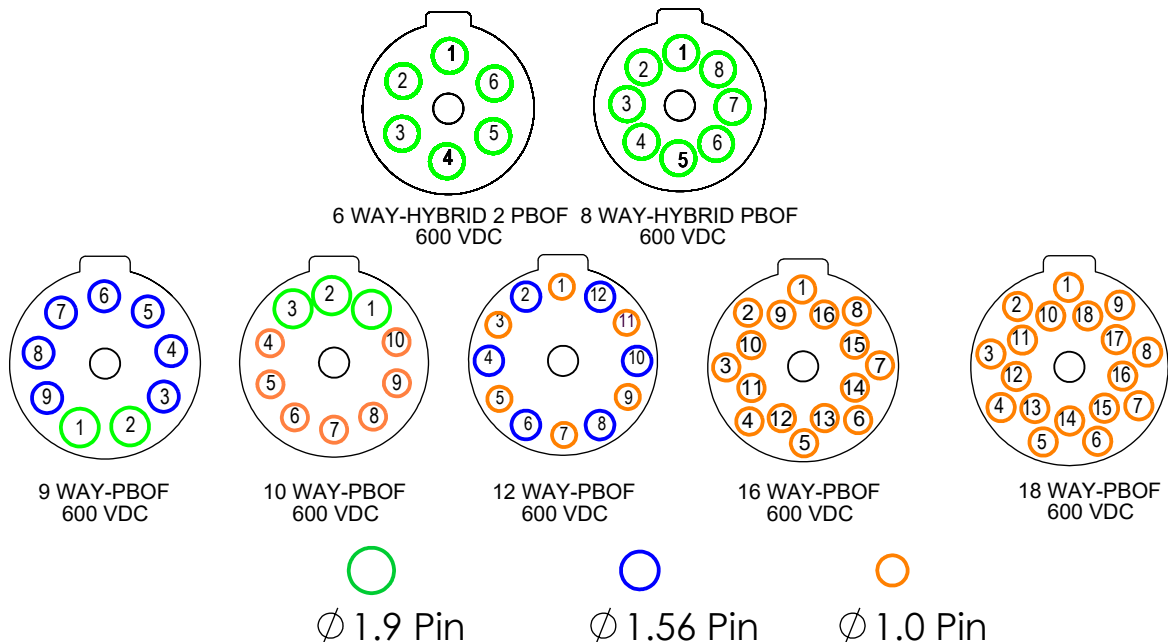
CRE recommend using a mating Bulkhead or Connector tail when carrying out continuity testing on Connectors with the 0.75mm contacts to minimise the risk of accidental damage to the contacts

For current carrying capacity and wiring recommendations see page 22

Pin Face View

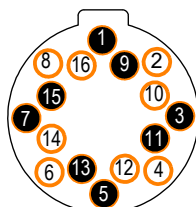


Socket Face View



For current carrying capacity and wiring recommendations see page 22

Pin Face View



16 WAY
600 VDC

Socket Face View



16 WAY
600 VDC



Ø 1.0 Pin

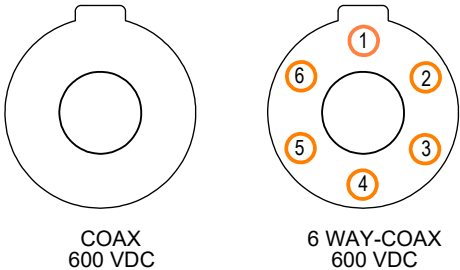
NOTES:

- Wire with Cat5E or greater to deliver 1 Gigabit Ethernet performance

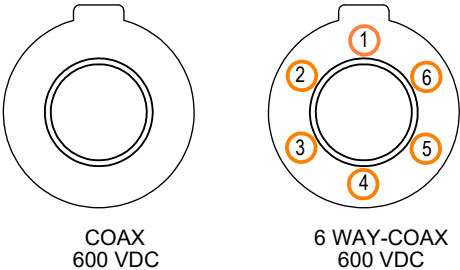
For current carrying capacity and wire recommendations see page 22



Pin Face View



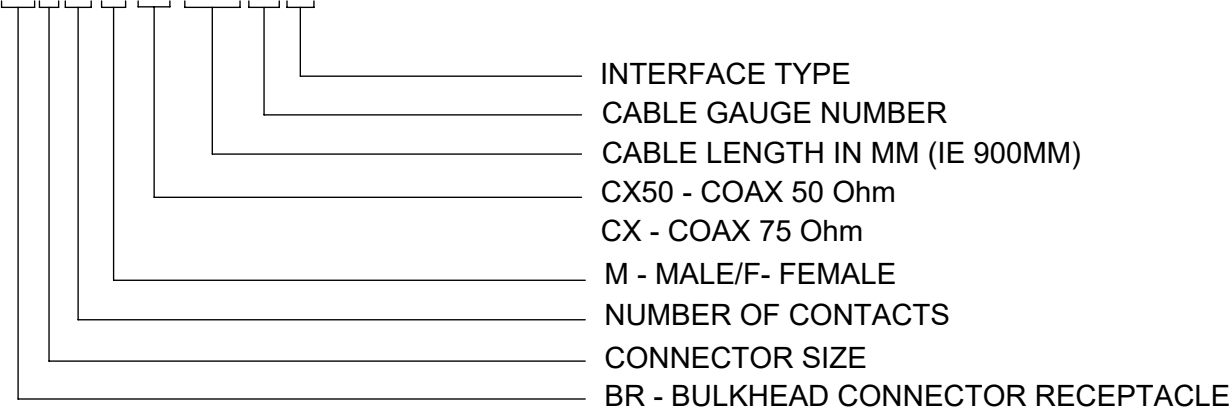
Socket Face View



Ø 0.75 Pin

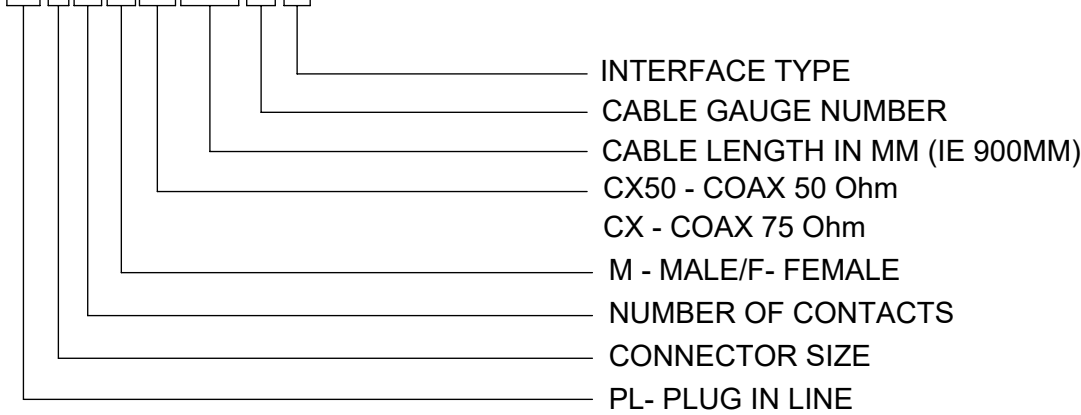
Part Numbering System-Bulkhead Example

BR B 06 M CX 0900 24 01



Part Numbering System-Connector Example

PL B 06 M CX 0900 24 01



For current carrying capacity and wire recommendations see page 22

Current Capacity and Wire Recommendations

- The wire options for bulkheads are governed by the through bore of the bulkhead body and the dimensions of the solder bucket on the contact.
- Heat, caused by an electrical current flowing through a conductor will determine the amount of current that the wire will handle.
- The current rating follows industry standards for a single wire in free air at 30 deg. C with derating for bundled wires.
- The table below shows the current required to raise the temperature of a single insulated conductor to the limits of its insulation temperature.

Contact dia.	0.75	1.0	1.56	1.9	2.25	3.3
Wire size	24 awg	22 awg	16 awg	14 awg	12 awg	8 awg
Current	8 amps	11 amps	26 amps	40 amps	50 amps	90 amps
Contact rating based on PTFE type C cable						

Derating Factors for Bundled Conductors	
Bundle #	Derating Factor (x Amps)
2 - 5	0.8
6 - 15	0.7
16 - 30	0.5

Recommended torque for threaded interfaces manufactured in 316L Stainless Steel assembled into metallic housings.

Thread	Torque N/m (Lubricated)	Torque Inch Pounds (Lubricated)
7/16-20 UNF	3-4	30-35
1/2-20 UNF	4-6	40-45
5/8-18 UNF	5-7	50-55
3/4-16 UNF	7-9	60-65
7/8-20 UNEF	8-10	75-80
1.0-14 UNS	9-11	85-95
1.0-20 UNEF	9-11	85-95

The table above shows the recommended tightening torque values for threaded bulkhead interfaces into metallic housings.

We recommend the use of a small quantity of anti-seize lubricant such as Copaslip applied to the pin thread as a lubricant to aid the make-up process.

Should you require any further information or advice please contact CRE direct on sales@cre-marine.com