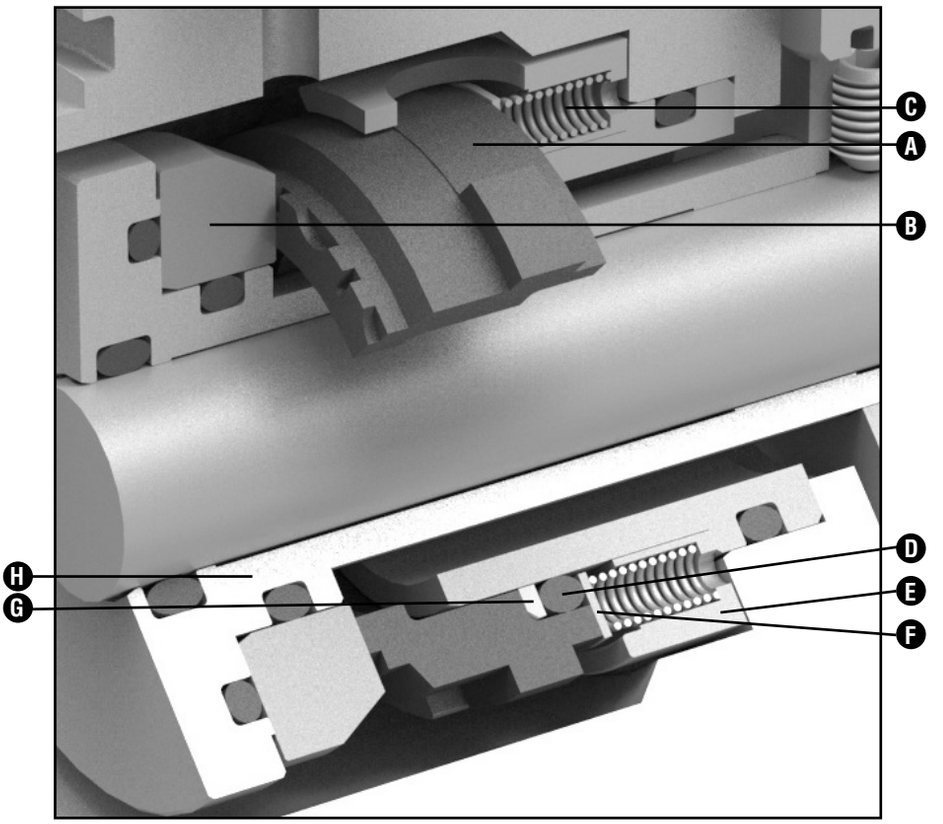
TYPE 48VBF

ELASTOMER O-RING SEAL FOR HOT WATER

Technical Specification

A – Face/Primary Ring
B – Seat/Mating Ring
C – Spring
D – Dynamic O-ring
E – Retainer
F – Disc
G – Anti-X Ring
H – Sleeve



Product Description

The 48VBF seal is a single cartridge, stationary head, O-ring pusher seal that can operate without an external heat exchanger (API Plan 23) in critical high temperature, medium pressure pumps. This is ideal for application in Boiler Feed pumps, which inject feedwater (hot, demineralized, deaerated water) into the boiler at fossil-fuel steam power plants or within the on-site generation plant of a processing or manufacturing site.

The main risk of seal failure is due to numerous problems associated with the heat exchanger seal support loop, resulting in the BFW pump shutting down and the boiler going offline. Common heat exchanger support loop problems include:

- Loss of cooling water
- Undersized heat exchanger
- Incorrectly installed/located heat exchanger and/or piping
- Poor/inadequate venting procedure after outages/shutdowns
- Scale/corrosion build-up within the piping, limiting flow and seal cooling

By allowing operation without that heat exchanger, the 48VBF reduces cost to the end-user for the heat exchanger, piping and water usage.

Performance Capabilities

- Temperature: 0°C to 200°C/32°F to 392 °F
- Pressures: Carbon Face: Up to 30 bar g/435 psi g
- Speed: Up to 30 m/s/5900 fpm

Design Features

Primary ring– high duty carbon-graphite grade for tolerance to difficult sealing conditions found in hot water services.

Unique design - proprietary patent pending hydrodynamic features to allow sealing hot water far above its atmospheric boiling point while minimizing leakage. Allows operation on hot water without cooling.

Rotating mating ring design - enhances cooling and permits use at higher shaft speeds, often required in power plants.

Compatible - Fits API seal chambers, and interchangeable with existing John Crane seals on similar applications.

Easy upgrade - Existing commonly used 48V seal may be upgraded to 48VBF by simple change of primary ring

Robust drive mechanism - The primary ring incorporates an optimized ear drive design for increased torque capability

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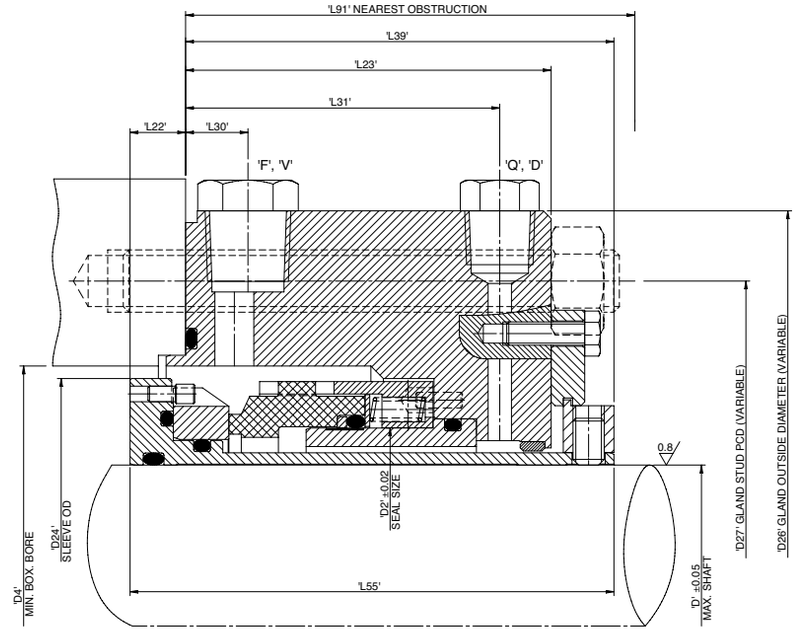
Type 48VBF Typical Arrangement



Type 48VBF Dimensional Data (mm)

Seal Size	Size Code	D Max. Shaft Size	D2	D4	D24	D26	D27	L22	L23	L30	L31	L39	L55	L91	Stud Size
2.750	**0698**	50.80	69.85	98.4	92.1	178	142	11.1	89.1	16	75.9	105.2	116.2	108.2	M16
2.875	**0730**	53.98	73.03	101.6	95.3	181	145	11.1	89.1	16	75.9	105.2	116.2	108.2	M16
3.000	**0762**	57.15	76.20	104.8	98.4	185	149	11.1	89.1	16	75.9	105.2	116.2	108.2	M16
3.125	**0793**	60.33	79.38	111.1	104.8	191	155	14.2	89.1	16	75.9	105.2	119.4	108.2	M16
3.250	**0825**	63.50	82.55	114.3	108.0	194	158	14.2	89.1	16	75.9	105.2	119.4	108.2	M16
3.375	**0857**	66.68	85.73	117.5	111.1	197	161	14.2	89.1	16	75.9	105.2	119.4	108.2	M16
3.500	**0889**	69.85	88.90	120.7	114.3	200	164	14.2	89.1	16	75.9	105.2	119.4	108.2	M16
3.625	**0920**	73.03	92.08	123.8	117.5	204	168	14.3	93.8	16	80.6	109.9	124.2	112.9	M16
3.750	**0952**	76.20	95.25	127.0	120.7	207	171	14.3	93.8	16	80.6	109.9	124.2	112.9	M16
3.875	**0984**	79.38	98.43	130.2	123.8	210	174	14.3	93.8	16	80.6	109.9	124.2	112.9	M16
4.000	**1016**	82.55	101.60	133.4	127.0	213	177	14.3	93.8	16	80.6	109.9	124.2	112.9	M16
4.125	**1047**	85.73	104.78	136.5	130.2	228	184	14.3	93.8	16	80.6	109.9	124.2	112.9	M20
4.250	**1079**	88.90	107.95	139.7	133.4	234	190	14.3	93.8	16	80.6	109.9	124.2	112.9	M20
4.375	**1111**	92.08	111.13	142.9	136.5	238	194	14.3	93.8	16	80.6	112.9	127.2	115.9	M20
4.500	**1143**	95.25	114.30	146.1	139.7	241	197	14.3	93.8	16	80.6	112.9	127.2	115.9	M20
4.625	**1174**	98.43	117.48	150.8	144.4	244	200	17.4	93.9	16	80.7	113.0	130.4	116.0	M20
4.750	**1206**	101.60	120.65	154.0	147.6	247	203	17.4	93.9	16	80.7	113.0	130.4	116.0	M20
4.875	**1238**	104.78	123.83	157.1	150.8	251	207	17.4	93.9	16	80.7	113.0	130.4	116.0	M20
5.000	**1270**	107.95	127.00	160.3	154.0	253	209	17.4	93.9	16	80.7	113.0	130.4	116.0	M20
5.125	**1301**	111.13	130.18	163.5	157.1	257	213	17.4	93.9	16	80.7	113.0	130.4	116.0	M20
5.250	**1333**	114.30	133.35	166.7	160.3	260	216	17.3	101.9	16	88.7	121.0	138.3	124.0	M20
5.375	**1365**	117.48	136.53	169.8	163.5	263	219	17.3	101.9	16	88.7	121.0	138.3	124.0	M20
5.500	**1397**	120.65	139.70	173.0	166.7	266	222	17.3	101.9	16	88.7	121.0	138.3	124.0	M20
5.625	**1428**	123.83	142.88	176.2	169.8	270	226	17.3	101.9	16	88.7	121.0	138.3	124.0	M20
5.750	**1460**	127.00	146.05	179.4	173.0	272	228	17.3	101.9	16	88.7	121.0	138.3	124.0	M20
5.875	**1492**	130.18	149.23	182.5	176.2	276	232	17.3	101.9	16	88.7	121.0	138.3	124.0	M20
6.000	**1524**	133.35	152.40	185.7	179.4	288	244	17.3	101.9	16	88.7	121.0	138.3	124.0	M20
6.250	**1587**	139.70	158.75	193.8	185.7	294	250	17.6	103.1	16	90.0	126.2	143.9	129.2	M20
6.500	**1651**	146.05	165.10	200.1	192.1	300	256	17.6	103.1	16	90.0	126.2	143.9	129.2	M20
6.750	**1714**	152.40	171.45	206.5	198.4	306	262	17.6	103.1	16	90.0	126.2	143.9	129.2	M20
7.000	**1778**	158.75	177.80	212.8	204.8	312	268	17.6	103.1	16	90.0	126.2	143.9	129.2	M20
7.250	**1841**	165.10	184.15	219.2	211.1	318	274	17.6	103.1	16	90.0	126.2	143.9	129.2	M20
7.500	**1905**	171.45	190.50	225.5	217.5	324	280	17.6	103.1	16	90.0	126.2	143.9	129.2	M20
7.750	**1968**	177.80	196.85	231.9	225.4	330	286	19.3	109.5	16	96.3	132.6	151.8	135.6	M20

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Type 48VBF Dimensional Data (inches)

Seal Size	Size Code	D Max. Shaft Size	D2	D4	D24	D26	D27	L22	L23	L30	L31	L39	L55	L91	Stud Size
2.750	**0698**	2.000	2.750	3.874	3.626	7.008	5.591	0.437	3.508	0.630	2.988	4.142	4.575	4.260	5/8"-11UNC
2.875	**0730**	2.125	2.875	4.000	3.752	7.126	5.709	0.437	3.508	0.630	2.988	4.142	4.575	4.260	5/8"-11UNC
3.000	**0762**	2.250	3.000	4.126	3.874	7.283	5.866	0.437	3.508	0.630	2.988	4.142	4.575	4.260	5/8"-11UNC
3.125	**0793**	2.375	3.125	4.374	4.126	7.520	6.102	0.559	3.508	0.630	2.988	4.142	4.701	4.260	5/8"-11UNC
3.250	**0825**	2.500	3.250	4.500	4.252	7.638	6.220	0.559	3.508	0.630	2.988	4.142	4.701	4.260	5/8"-11UNC
3.375	**0857**	2.625	3.375	4.626	4.374	7.756	6.339	0.559	3.508	0.630	2.988	4.142	4.701	4.260	5/8"-11UNC
3.500	**0889**	2.750	3.500	4.752	4.500	7.874	6.457	0.559	3.508	0.630	2.988	4.142	4.701	4.260	5/8"-11UNC
3.625	**0920**	2.875	3.625	4.874	4.626	8.031	6.614	0.563	3.693	0.630	3.173	4.327	4.890	4.445	5/8"-11UNC
3.750	**0952**	3.000	3.750	5.000	4.752	8.150	6.732	0.563	3.693	0.630	3.173	4.327	4.890	4.445	5/8"-11UNC
3.875	**0984**	3.125	3.875	5.126	4.874	8.268	6.850	0.563	3.693	0.630	3.173	4.327	4.890	4.445	5/8"-11UNC
4.000	**1016**	3.250	4.000	5.252	5.000	8.386	6.969	0.563	3.693	0.630	3.173	4.327	4.890	4.445	5/8"-11UNC
4.125	**1047**	3.375	4.125	5.374	5.126	8.976	7.244	0.563	3.693	0.630	3.173	4.327	4.890	4.445	3/4"-10UNC
4.250	**1079**	3.500	4.250	5.500	5.252	9.213	7.480	0.563	3.693	0.630	3.173	4.327	4.890	4.445	3/4"-10UNC
4.375	**1111**	3.625	4.375	5.626	5.374	9.370	7.638	0.563	3.693	0.630	3.173	4.445	5.008	4.563	3/4"-10UNC
4.500	**1143**	3.750	4.500	5.752	5.500	9.488	7.756	0.563	3.693	0.630	3.173	4.445	5.008	4.563	3/4"-10UNC
4.625	**1174**	3.875	4.625	5.937	5.685	9.606	7.874	0.685	3.697	0.630	3.177	4.449	5.134	4.567	3/4"-10UNC
4.750	**1206**	4.000	4.750	6.063	5.811	9.724	7.992	0.685	3.697	0.630	3.177	4.449	5.134	4.567	3/4"-10UNC
4.875	**1238**	4.125	4.875	6.185	5.937	9.882	8.150	0.685	3.697	0.630	3.177	4.449	5.134	4.567	3/4"-10UNC
5.000	**1270**	4.250	5.000	6.311	6.063	9.961	8.228	0.685	3.697	0.630	3.177	4.449	5.134	4.567	3/4"-10UNC
5.125	**1301**	4.375	5.125	6.437	6.185	10.118	8.386	0.685	3.697	0.630	3.177	4.449	5.134	4.567	3/4"-10UNC
5.250	**1333**	4.500	5.250	6.563	6.311	10.236	8.504	0.681	4.012	0.630	3.492	4.764	5.445	4.882	3/4"-10UNC
5.375	**1365**	4.625	5.375	6.685	6.437	10.354	8.622	0.681	4.012	0.630	3.492	4.764	5.445	4.882	3/4"-10UNC
5.500	**1397**	4.750	5.500	6.811	6.563	10.472	8.740	0.681	4.012	0.630	3.492	4.764	5.445	4.882	3/4"-10UNC
5.625	**1428**	4.875	5.625	6.937	6.685	10.630	8.898	0.681	4.012	0.630	3.492	4.764	5.445	4.882	3/4"-10UNC
5.750	**1460**	5.000	5.750	7.063	6.811	10.709	8.976	0.681	4.012	0.630	3.492	4.764	5.445	4.882	3/4"-10UNC
5.875	**1492**	5.125	5.875	7.185	6.937	10.866	9.134	0.681	4.012	0.630	3.492	4.764	5.445	4.882	3/4"-10UNC
6.000	**1524**	5.250	6.000	7.311	7.063	11.339	9.606	0.681	4.012	0.630	3.492	4.764	5.445	4.882	3/4"-10UNC
6.250	**1587**	5.500	6.250	7.628	7.312	11.575	9.843	0.693	4.059	0.630	3.543	4.969	5.665	5.087	3/4"-10UNC
6.500	**1651**	5.750	6.500	7.878	7.562	11.811	10.079	0.693	4.059	0.630	3.543	4.969	5.665	5.087	3/4"-10UNC
6.750	**1714**	6.000	6.750	8.128	7.812	12.047	10.315	0.693	4.059	0.630	3.543	4.969	5.665	5.087	3/4"-10UNC
7.000	**1778**	6.250	7.000	8.378	8.062	12.283	10.551	0.693	4.059	0.630	3.543	4.969	5.665	5.087	3/4"-10UNC
7.250	**1841**	6.500	7.250	8.628	8.312	12.520	10.787	0.693	4.059	0.630	3.543	4.969	5.665	5.087	3/4"-10UNC
7.500	**1905**	6.750	7.500	8.878	8.562	12.756	11.024	0.693	4.059	0.630	3.543	4.969	5.665	5.087	3/4"-10UNC
7.750	**1968**	7.000	7.750	9.128	8.875	12.992	11.260	0.760	4.311	0.630	3.791	5.220	5.976	5.339	3/4"-10UNC

TYPE 48VBF

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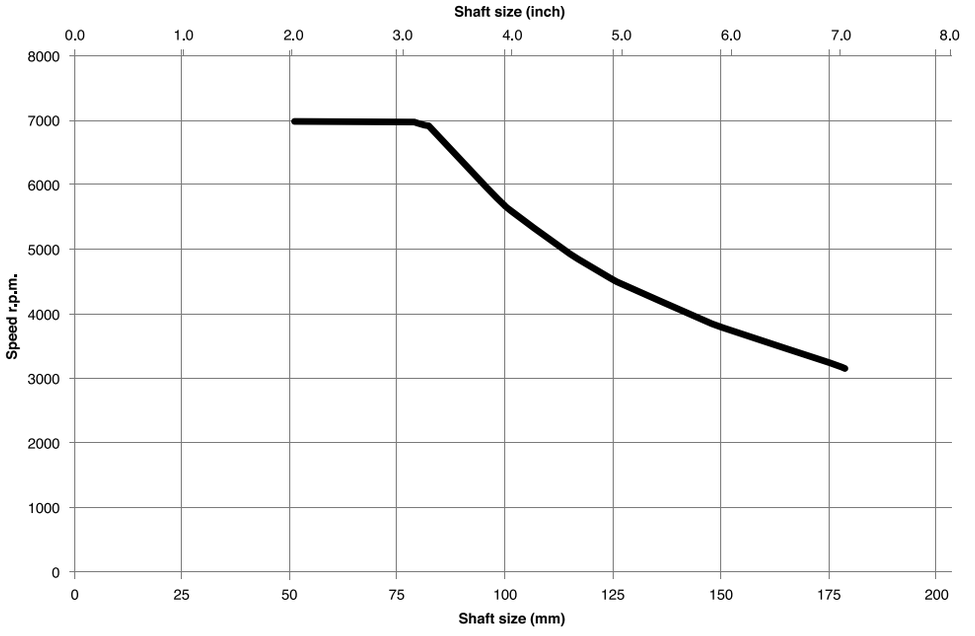
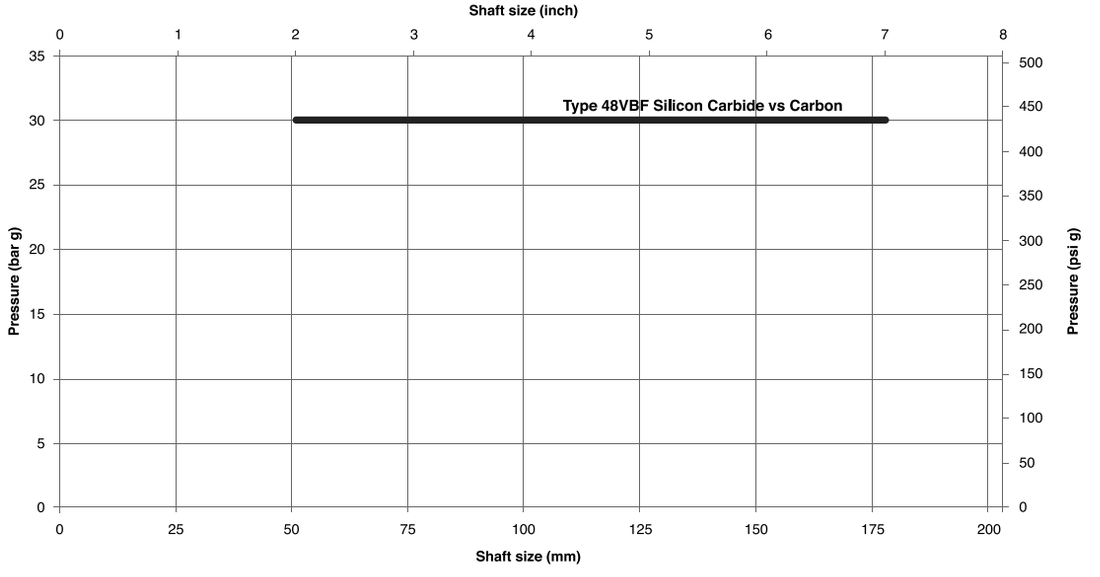
Technical Specification

Type 48VBF Speed Rating



Type 48VBF Pressure Rating



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