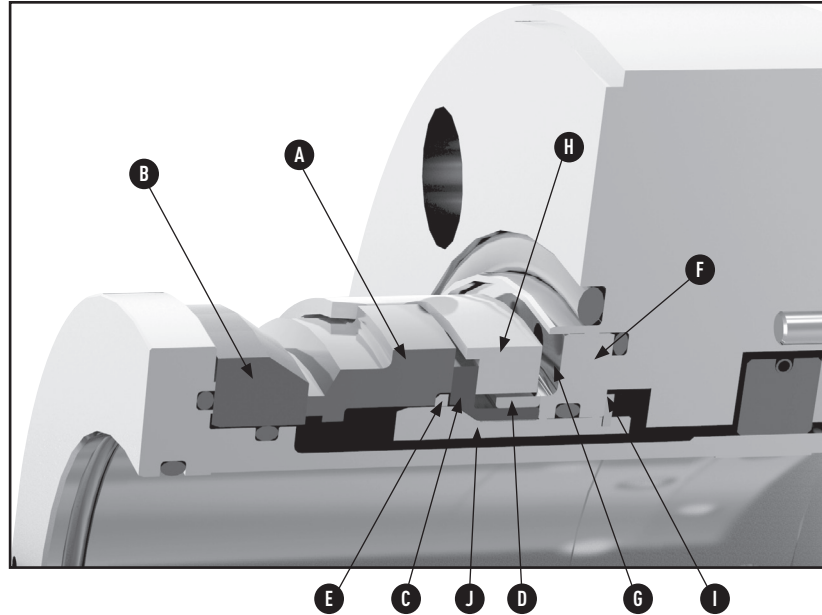


- A – Primary ring
- B – Mating ring
- C – Bellows
- D – Band
- E – Anti X-ring
- F – Spring adapter
- G – Spring
- H – Retainer
- I – Snap ring
- J – Stub sleeve



The 8648VRS is available in many configurations to suit the equipment it is being installed on.

Product Description

John Crane 8648VRS is a standardized non-pusher elastomer mechanical seal using patented technology, designed specifically for difficult liquid hydrocarbon pipeline applications, with a focus on meeting the demanding requirements of pipeline pumping station duties. Available as a single, dual pressurized or dual unpressurized arrangement, the seal can be configured to suit both the operator and pipeline needs.

The main risk of seal failure in these applications is due to the numerous problems associated with the dynamic O-ring, potentially resulting in hang-up, fretting or stub-sleeve wear. The design of the 8648VRS completely eliminates these common problems.

By allowing operation without the potential for seal problems, the 8648VRS provides longevity and reliability even in the most difficult pipeline applications.

Performance Capabilities

- Temperature: -4°F to 400°F / -20°C to 204°C
- Pressure:
 - Dynamic pressure (single seal):
 - Up to 1,500 psig/100 barg (crude)
 - 1,300 psig/90 barg (non-crude)
 - Dynamic pressure (dual seal):
 - Up to 1,750 psig/120 barg (crude)
 - Static pressure:
 - Up to 2,200 psig/152 barg (crude)
 - 2,000 psig/138 barg (non-crude)
- Speed:
 - 5,000 fpm/25.3 m/s (crude)
 - 6,000 fpm/31.5 m/s (non-crude)

Design Features

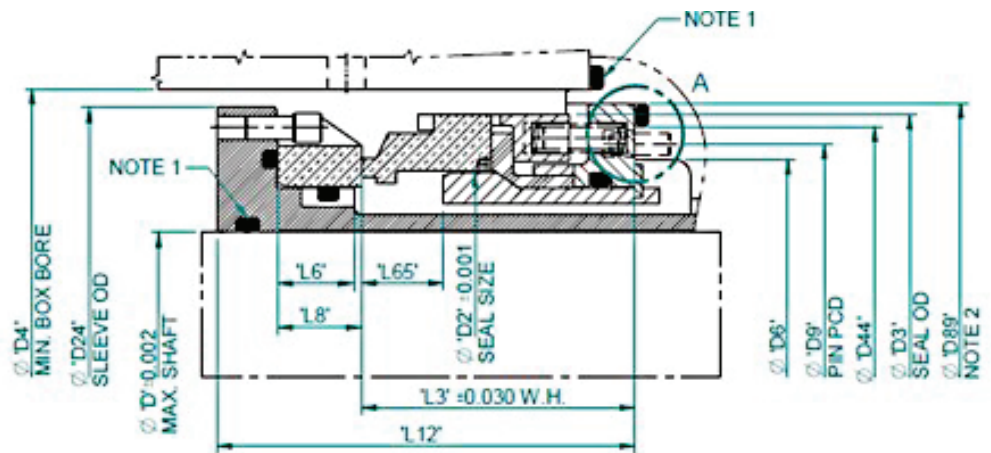
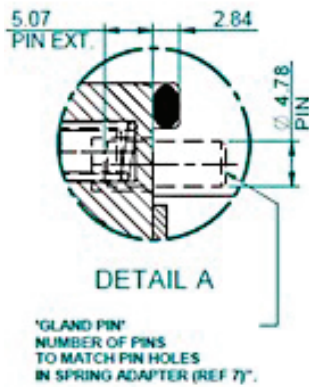
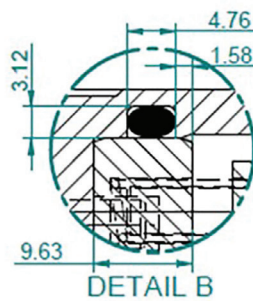
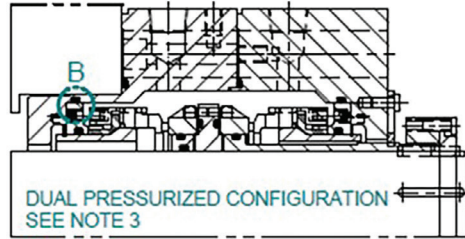
- Unique patented secondary seal technology prevents wear to the sealing diameter and prevents secondary seal hang-up
- Non-compressible flexible elastomer bellows
- Ear drive – primary ring incorporates optimized ear drive design for increased drive torque capability
- Balanced design – balanced construction, including anti-extrusion ring, permitting use in higher pressures
- Rotating mating ring design – enhances cooling and permits use at higher shaft speeds
- Premium seal face material options – permits sealing of difficult services at high operating pressures.
- Laser face grooved mating ring for use on flashing hydrocarbons
- 90 shore elastomer for robust construction
- Axially compact and easy-to-install seal head assembly
- Hard faces are standard to handle higher viscosity fluids and high torque application, as well as abrasive wear resistance. Carbon faces are standard to handle lighter viscosity fluids
- No O-rings in the pusher head assembly to fret under pump shuttling
- Robust drive for the most difficult of applications
- Static reverse pressure capability on the inboard seal of the dual pressurized configuration.

TYPE 8648VRS

NON-PUSHER ELASTOMER LIQUID HYDROCARBON PIPELINE SEAL

Technical Specification

Typical Arrangement/Dimensional Data



TYPE 8648VRS

NON-PUSHER ELASTOMER LIQUID HYDROCARBON PIPELINE SEAL

Technical Specification

Crude Oil Dimensional Data (inches)

Seal Size	Size Code	D Max.Shaft	D2	D3	D4	D24	L3	L12	L65
2.375	0603	1.500	2.375	3.312	3.678	3.252	2.058	2.932	0.487
3.125	0793	2.188	3.125	4.062	4.428	4.126	2.058	3.057	0.487
3.250	0825	2.375	3.250	4.187	4.553	4.252	2.058	3.057	0.487
3.500	0889	2.625	3.500	4.437	4.803	4.500	2.058	3.057	0.487
3.625	0920	2.750	3.625	4.562	4.928	4.625	2.246	3.308	0.675
3.750	0952	2.875	3.750	4.687	5.053	4.750	2.246	3.308	0.675
4.000	1016	3.135	4.000	4.937	5.303	5.000	2.246	3.308	0.675
4.125	1047	3.260	4.125	5.062	5.428	5.125	2.246	3.308	0.675
4.250	1079	3.375	4.250	5.187	5.553	5.250	2.246	3.308	0.675
4.500	1143	3.510	4.500	5.437	5.803	5.500	2.246	3.308	0.675
4.625	1174	3.625	4.625	5.562	5.928	5.687	2.246	3.371	0.675
4.750	1206	3.760	4.750	5.687	6.114	5.811	2.246	3.371	0.675
5.000	1270	4.000	5.000	5.892	6.375	6.062	2.246	3.371	0.675
5.250	1333	4.323	5.250	6.187	6.615	6.312	2.246	3.371	0.675
5.500	1397	4.510	5.500	6.437	6.875	6.562	2.246	3.371	0.675
5.750	1460	4.760	5.750	6.687	7.114	6.811	2.246	3.371	0.675
6.500	1524	5.510	6.500	7.437	7.865	7.562	2.246	3.433	0.675
6.750	1270	5.755	6.750	7.688	8.250	7.812	2.246	3.433	0.675
7.250	1333	6.130	7.250	8.466	8.615	8.312	2.402	3.589	0.831
7.750	1397	6.500	7.750	8.966	9.500	8.812	2.402	3.589	0.831
8.250	1460	7.010	8.250	9.466	10.000	9.312	2.402	3.589	0.831
8.500	1524	7.260	8.500	9.716	10.250	9.562	2.402	3.589	0.831

Crude Oil Dimensional Data (mm)

Seal Size	Size Code	D Max.Shaft	D2	D3	D4	D24	L3	L12	L65
2.375	603	38.1	60.33	84.12	93.42	82.6	52.27	74.47	12.37
3.125	793	55.58	79.38	103.17	112.47	104.8	52.27	77.65	12.37
3.250	825	60.33	82.55	106.35	115.65	108	52.27	77.65	12.37
3.500	889	66.68	88.9	112.7	122	114.3	52.27	77.65	12.37
3.625	920	69.85	92.08	115.87	125.174	117.48	57.05	84.02	17.15
3.750	952	73.03	95.25	119.05	128.35	120.65	57.05	84.02	17.15
4.000	1016	79.63	101.6	125.4	134.7	127	57.05	84.02	17.15
4.125	1047	82.8	104.78	128.57	137.87	130.18	57.05	84.02	17.15
4.250	1079	85.73	107.95	131.75	141.05	133.35	57.05	84.02	17.15
4.500	1143	89.15	114.3	138.1	147.4	139.7	57.05	84.02	17.15
4.625	1174	92.08	117.48	141.27	150.57	144.45	57.05	85.62	17.15
4.750	1206	120.65	144.45	155.30	125.73	139.70	139.70	14.30	15.88
5.000	1270	127.00	149.66	161.93	132.08	146.05	146.05	14.30	15.88
5.250	1333	133.35	157.15	168.02	138.43	152.40	152.40	14.30	15.88
5.500	1397	139.70	163.50	174.63	144.78	158.75	158.75	14.30	15.88
5.750	1460	146.05	169.85	180.70	151.13	165.10	165.10	14.30	15.88
6.500	1524	165.10	188.90	199.77	170.18	184.15	184.15	15.88	17.45
6.750	1270	171.45	195.28	209.55	176.53	190.50	190.50	15.88	17.45
7.250	1333	184.15	215.04	218.82	189.61	203.20	203.20	15.88	17.45
7.750	1397	196.85	227.74	241.30	204.37	Note 5	See JC	15.88	17.45
8.250	1460	209.55	240.44	254.00	217.07	Note 5	See JC	15.88	17.45
8.500	1524	215.90	246.79	260.35	225.04	Note 5	See JC	15.88	17.45

TYPE 8648VRS

NON-PUSHER ELASTOMER LIQUID HYDROCARBON PIPELINE SEAL

Flashing Hydrocarbons Dimensional Data (inches)

Seal Size	Size Code	D Max. Shaft	D2	D3	D4	D6	D24	L3	L12	L65
3.500	0889	2.625	3.500	4.437	4.625	3.700	4.500	2.058	3.057	0.487
3.625	0920	2.750	3.625	4.562	4.750	3.825	4.626	2.246	3.245	0.675
3.750	0952	2.875	3.750	4.687	4.875	3.950	4.752	2.246	3.245	0.675
4.000	1016	3.135	4.000	4.937	5.125	4.200	5.000	2.246	3.245	0.675
4.125	1047	3.260	4.125	5.062	5.250	4.325	5.126	2.246	3.245	0.675
4.250	1079	3.375	4.250	5.187	5.375	4.450	5.252	2.246	3.245	0.675
4.500	1143	3.510	4.500	5.437	5.750	4.700	5.500	2.246	3.245	0.675
4.625	1174	3.625	4.625	5.562	5.875	4.825	5.685	2.246	3.372	0.675
4.750	1206	3.760	4.750	5.687	6.000	4.950	5.811	2.246	3.372	0.675
5.000	1270	4.010	5.000	5.937	6.250	5.200	6.063	2.246	3.372	0.675
5.250	1333	4.323	5.250	6.187	6.500	5.450	6.312	2.246	3.372	0.675
5.500	1397	4.510	5.500	6.437	6.750	5.700	6.562	2.246	3.372	0.675
6.500	1651	5.510	6.500	7.437	7.750	6.700	7.562	2.246	3.434	0.675

Flashing Hydrocarbons Dimensional Data (mm)

Seal Size	Size Code	D Max. Shaft	D2	D3	D4	D6	D24	L3	L12	L65
3.500	0889	66.675	88.900	112.700	117.475	93.980	114.300	52.273	77.648	12.370
3.625	0920	69.850	92.075	115.875	120.650	97.155	117.500	57.048	82.423	17.145
3.750	0952	73.025	95.250	119.050	123.825	100.330	120.701	57.048	82.423	17.145
4.000	1016	79.629	101.600	125.400	130.175	106.680	127.000	57.048	82.423	17.145
4.125	1047	82.804	104.775	128.575	133.350	109.855	130.200	57.048	82.423	17.145
4.250	1079	85.725	107.950	131.750	136.525	113.030	133.401	57.048	82.423	17.145
4.500	1143	89.154	114.300	138.100	146.050	119.380	139.700	57.048	82.423	17.145
4.625	1174	92.075	117.475	141.275	149.225	122.555	144.399	57.048	85.649	17.145
4.750	1206	95.504	120.650	144.450	152.400	125.730	147.599	57.048	85.649	17.145
5.000	1270	101.854	127.000	150.800	158.750	132.080	154.000	57.048	85.649	17.145
5.250	1333	109.804	133.350	157.150	165.100	138.430	160.325	57.048	85.649	17.145
5.500	1397	114.554	139.700	163.500	171.450	144.780	166.675	57.048	85.649	17.145
6.500	1651	139.954	165.100	188.900	196.850	170.180	192.075	57.048	87.224	17.145

TYPE 8648VRS

NON-PUSHER ELASTOMER LIQUID HYDROCARBON PIPELINE SEAL

Non Flashing Hydrocarbons, Dimensional Data (inches)

Seal Size	Size Code	D Max.Shaft	D2	D3	D4	D6	D24	L3	L12	L65
3.500	0889	2.625	3.500	4.437	4.625	3.700	4.500	2.058	3.057	0.487
3.625	0920	2.750	3.625	4.562	4.750	3.825	4.626	2.246	3.245	0.675
3.750	0952	2.875	3.750	4.687	4.875	3.950	4.752	2.246	3.245	0.675
4.000	1016	3.135	4.000	4.937	5.125	4.200	5.000	2.246	3.245	0.675
4.125	1047	3.260	4.125	5.062	5.250	4.325	5.126	2.246	3.245	0.675
4.250	1079	3.375	4.250	5.187	5.375	4.450	5.252	2.246	3.245	0.675
4.500	1143	3.510	4.500	5.437	5.750	4.700	5.500	2.246	3.245	0.675
4.625	1174	3.625	4.625	5.562	5.875	4.825	5.685	2.246	3.372	0.675
4.750	1206	3.760	4.750	5.687	6.000	4.950	5.811	2.246	3.372	0.675
5.000	1270	4.010	5.000	5.937	6.250	5.200	6.063	2.246	3.372	0.675
5.250	1333	4.323	5.250	6.187	6.500	5.450	6.312	2.246	3.372	0.675
5.500	1397	4.510	5.500	6.437	6.750	5.700	6.562	2.246	3.372	0.675
6.500	1651	5.510	6.500	7.437	7.750	6.700	7.562	2.246	3.434	0.675

Non Flashing Hydrocarbons, Dimensional Data (mm)

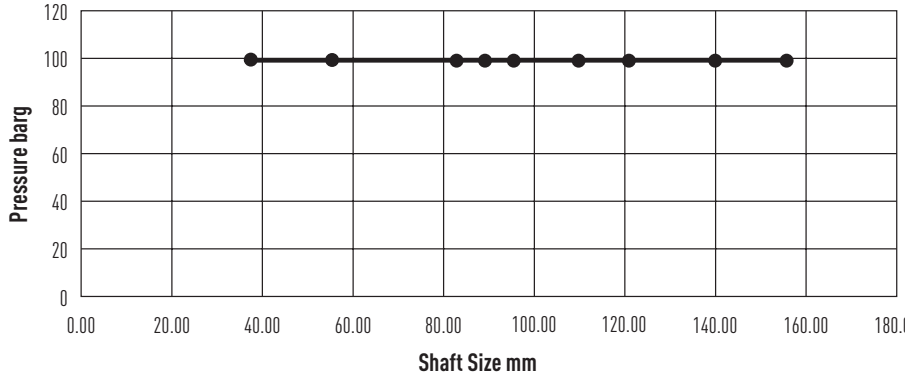
Seal Size	Size Code	D Max.Shaft	D2	D3	D4	D6	D24	L3	L12	L65
3.500	0889	66.675	88.900	112.700	117.475	93.980	114.300	52.273	77.648	12.370
3.625	0920	69.850	92.075	115.875	120.650	97.155	117.500	57.048	82.423	17.145
3.750	0952	73.025	95.250	119.050	123.825	100.330	120.701	57.048	82.423	17.145
4.000	1016	79.629	101.600	125.400	130.175	106.680	127.000	57.048	82.423	17.145
4.125	1047	82.804	104.775	128.575	133.350	109.855	130.200	57.048	82.423	17.145
4.250	1079	85.725	107.950	131.750	136.525	113.030	133.401	57.048	82.423	17.145
4.500	1143	89.154	114.300	138.100	146.050	119.380	139.700	57.048	82.423	17.145
4.625	1174	92.075	117.475	141.275	149.225	122.555	144.399	57.048	85.649	17.145
4.750	1206	95.504	120.650	144.450	152.400	125.730	147.599	57.048	85.649	17.145
5.000	1270	101.854	127.000	150.800	158.750	132.080	154.000	57.048	85.649	17.145
5.250	1333	109.804	133.350	157.150	165.100	138.430	160.325	57.048	85.649	17.145
5.500	1397	114.554	139.700	163.500	171.450	144.780	166.675	57.048	85.649	17.145
6.500	1651	139.954	165.100	188.900	196.850	170.180	192.075	57.048	87.224	17.145

TYPE 8648VRS

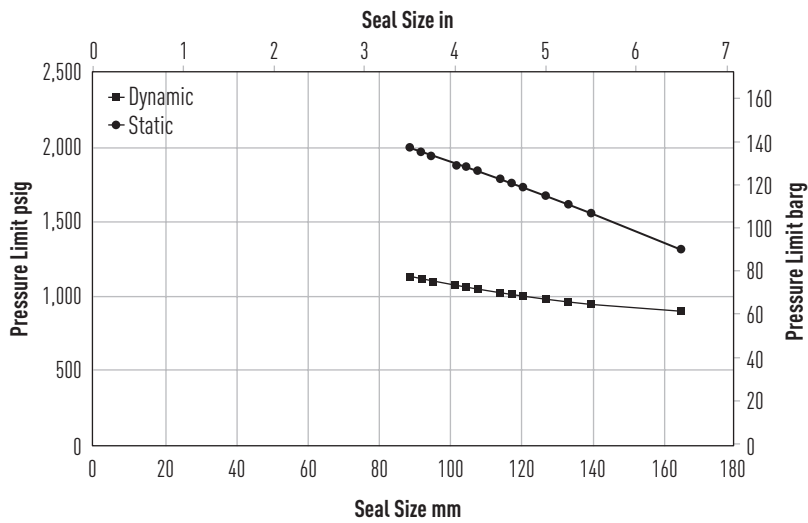
NON-PUSHER ELASTOMER LIQUID HYDROCARBON PIPELINE SEAL

Basic Pressure Rating

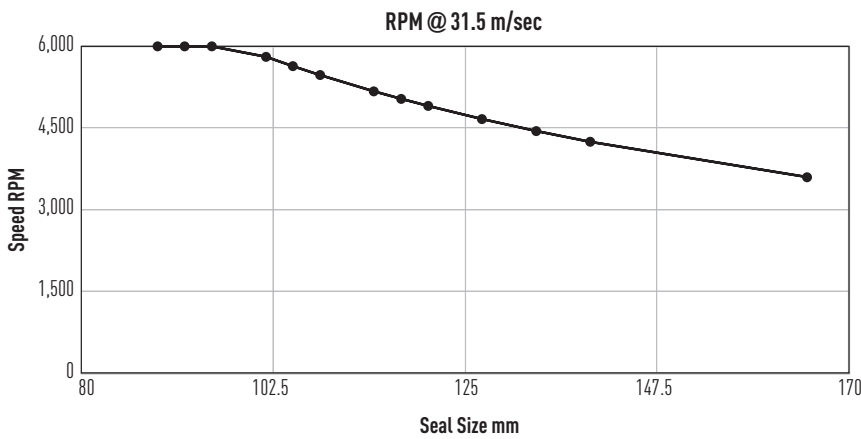
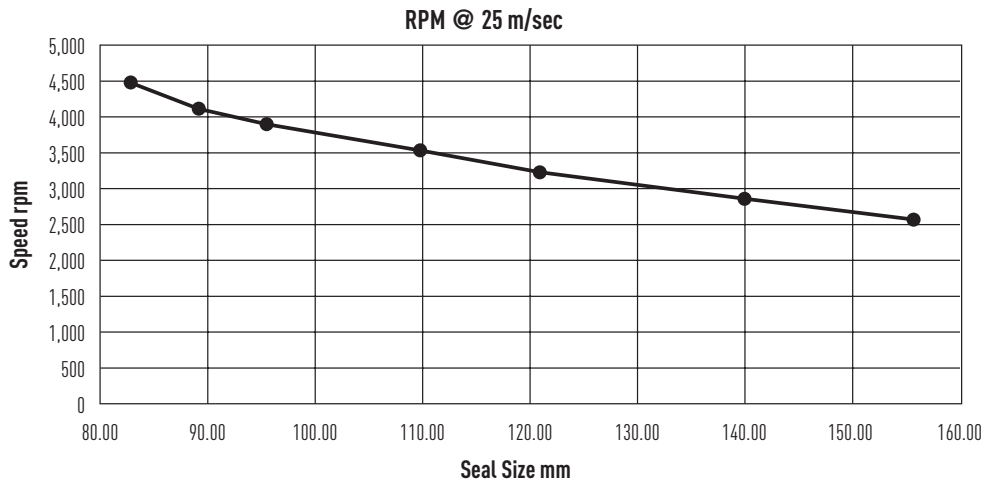
8648VRS Basic Pressure Rating, Crude Oil



8648VRS Basic Pressure Rating >0.65 specific gravity, e.g. Gasoline/Diesel



Speed Rating



Materials of Construction

Seal Component	GMI	Material	Finish
Bellows	0868	Viton 90 duro	
	1792	Aflas 90 duro	
Primary ring	9048	Carbon	polish
Mating ring*	9221	SiC	polish
Retainer	0550	316 SS	
Drive band	0594	Duplex SS	
Stub sleeve	0594	Duplex SS	
Spring adapter	0550	316 SS	
Anti X-ring	7510	GFPTFE	
	7301	Carbon Filled PTFE	
Spring	0690	Hast C	
Snap ring	0550	316 SS	

*Laserface technology is used for flashing hydrocarbon version.



TYPE 8648VRS

NON-PUSHER ELASTOMER LIQUID HYDROCARBON PIPELINE SEAL

Technical Specification



North America
United States of America
Tel: 1-847-967-2400

Europe
United Kingdom
Tel: 44-1753-224000

Latin America
Brazil
Tel: 55-11-3371-2500

Middle East & Africa
United Arab Emirates
Tel: 971-481-27800

Asia Pacific
Singapore
Tel: 65-6518-1800

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