48SC/S48SC

DRY-RUNNING SECONDARY CONTAINMENT SEAL

Applications

Self-cooling Type 48SC Seals are full contact dry-running secondary containment seals. This breakthrough in dry tandem sealing is a face seal requiring no external lubrication system. It requires no external lubrication system, reducing hazards from buffer fluid contamination and eliminating contaminated fluid disposal problems. Available in retrofit kits, these secondary containment seals can fit into existing cartridges.

- For easy outboard seal replacement from existing liquid lubricated tandem arrangements to dry sealing.
- For MACT (Maximum Achievable Control Technology) compliant emission control use in conjunction with Type 48.
- Available in short seal designed to fit ANSI and older edition API pumps where there is restricted axial length (Type S48SC).
- The primary ring/face is a John Crane proprietary carbon grade developed specifically for dry-running systems. The mating ring is highly thermal conductive silicon carbide.
- Primary ring has lightly-loaded springs to permit dry sealing at pump speeds. Lower spring rates keep load even over a wider working height range. Controlled O-ring squeeze and spring load minimizes seal head drag.
- Self-cooling performance is enhanced by tapered back surface of mating ring, allowing greater access of air at seal faces and increasing surface area exposed to cooling air which is created by specially designed drive collar. Also contributing to low heat at faces are narrow face width, and highly controlled pressure and thermal distortion.
- For service in chemical processing, cryogenics, offshore platforms, oil production and refining, petrochemical processing, pharmaceuticals, and pipeline transmission.

Operating Conditions

- **Temperatures:** -29°C to 205°C/ -20°F to 400°F
- **Pressures:**
  - **Dry:** 0.35 bar g/5 psig continuous
  - **Wet:** 69 bar g/1000 psig*
- **Speeds:** Up to 20 m/s/ 4000 fpm

* Maximum containment pressure rating under dynamic conditions dependent upon process fluid properties. Shut down upon high pressure alarm activation is recommended.

Fluids

Condensates
Heat Transfer Fluids
Hydrocarbons (Flashing/Non-Flashing)
LNG/LPG/NGL
Mild Acids
Sour Water

48SC & S48SC

INCH RANGE

DRY-RUNNING SECONDARY CONTAINMENT SEAL

Type 48SC Typical Arrangement/Dimensional Data

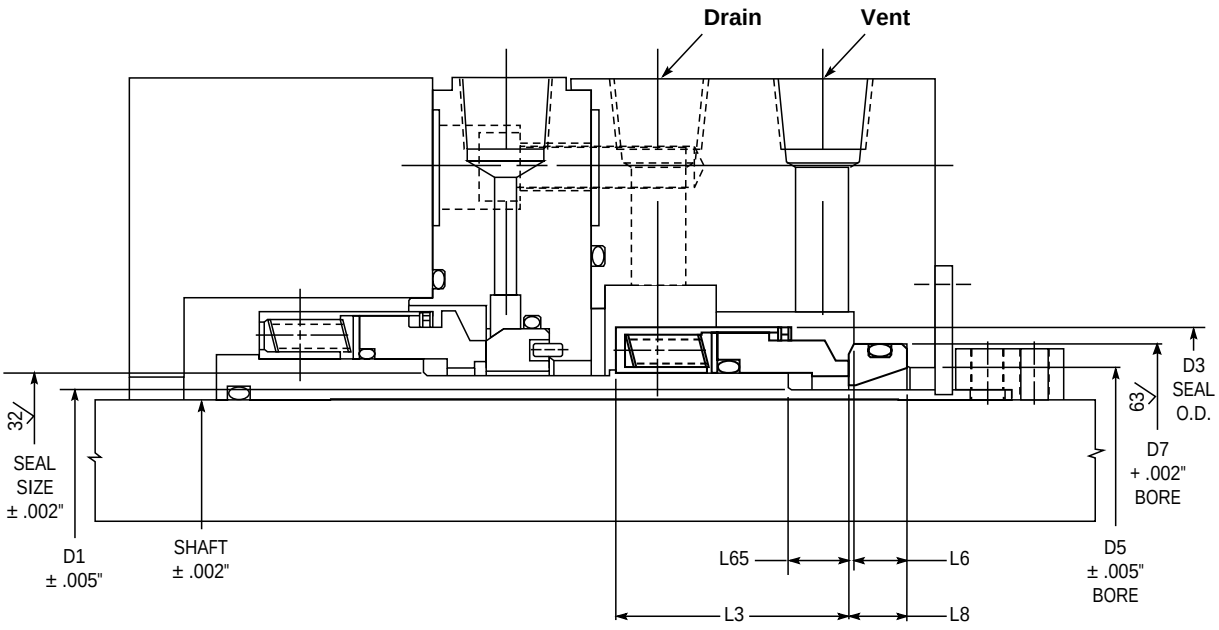


Chart 1. Type 48SC Dimensional Data

Shaft Size	Seal Size (inches)	D1	D3	D5	D7	L3	L6	L8	L65
0.500	1.000	0.750	1.562	1.062	1.375	1.312	0.343	0.406	0.343
0.625	1.125	0.875	1.687	1.187	1.500	1.375	0.343	0.406	0.343
0.750	1.250	1.000	1.875	1.312	1.625	1.375	0.375	0.437	0.343
0.875	1.375	1.125	2.000	1.468	1.750	1.437	0.375	0.437	0.343
1.000	1.500	1.250	2.125	1.593	1.875	1.437	0.375	0.437	0.343
1.125	1.625	1.375	2.375	1.703	2.000	1.750	0.375	0.437	0.437
1.250	1.750	1.500	2.500	1.812	2.125	1.750	0.375	0.437	0.437
1.375	1.875	1.625	2.625	1.968	2.375	1.750	0.437	0.500	0.437
1.500	2.000	1.750	2.750	2.093	2.500	1.750	0.437	0.500	0.437
1.625	2.125	1.875	3.000	2.218	2.625	1.750	0.437	0.500	0.500
1.750	2.250	2.000	3.125	2.343	2.750	1.750	0.437	0.500	0.500
1.875	2.375	2.125	3.250	2.500	3.000	1.750	0.500	0.562	0.500
2.000	2.500	2.250	3.375	2.625	3.125	1.750	0.500	0.562	0.500
2.125	2.625	2.375	3.500	2.750	3.250	2.062	0.500	0.562	0.500
2.250	2.750	2.500	3.625	2.890	3.375	2.062	0.500	0.562	0.500
2.375	2.875	2.625	3.750	3.046	3.625	2.062	0.562	0.625	0.500
2.500	3.000	2.750	3.812	3.171	3.500	2.062	0.562	0.625	0.500
2.625	3.125	2.875	3.937	3.296	3.750	2.062	0.562	0.625	0.562
2.750	3.250	3.000	4.125	3.437	3.875	2.062	0.562	0.625	0.562
2.875	3.375	3.125	4.250	3.546	4.000	2.062	0.656	0.781	0.562
3.000	3.500	3.250	4.375	3.671	4.125	2.062	0.656	0.781	0.562
3.125	3.625	3.375	4.500	3.796	4.250	2.062	0.656	0.781	0.562
3.250	3.750	3.500	4.625	3.921	4.375	2.062	0.656	0.781	0.562
3.375	3.875	3.625	4.750	4.046	4.500	2.062	0.656	0.781	0.562
3.500	4.000	3.750	4.875	4.171	4.625	2.062	0.656	0.781	0.562
3.625	4.125	3.875	5.125	4.296	4.750	2.062	0.656	0.781	0.562
3.750	4.250	4.000	5.250	4.421	4.875	2.062	0.656	0.781	0.562

Chart 2. Type S48SC Dimensional Data

Shaft Size	Seal Size (inches)	D1	D3	D5	D7	L3	L6	L8	L65
0.500	1.000	0.750	1.567	1.062	1.375	1.000	0.343	0.406	0.250
0.625	1.125	0.875	1.692	1.187	1.500	1.000	0.343	0.406	0.250
0.750	1.250	1.000	1.880	1.312	1.625	1.000	0.375	0.437	0.250
0.875	1.375	1.125	2.005	1.468	1.750	1.187	0.375	0.437	0.312
1.000	1.500	1.250	2.130	1.593	1.875	1.187	0.375	0.437	0.312
1.125	1.625	1.375	2.380	1.703	2.000	1.187	0.375	0.437	0.312
1.250	1.750	1.500	2.505	1.812	2.125	1.187	0.375	0.437	0.312
1.375	1.875	1.625	2.630	1.968	2.375	1.187	0.437	0.500	0.312
1.500	2.000	1.750	2.755	2.093	2.500	1.187	0.437	0.500	0.312
1.625	2.125	1.875	3.005	2.218	2.625	1.312	0.437	0.500	0.406
1.750	2.250	2.000	3.130	2.343	2.750	1.312	0.437	0.500	0.406
1.875	2.375	2.125	3.255	2.500	3.000	1.312	0.500	0.562	0.406
2.000	2.500	2.250	3.380	2.625	3.125	1.312	0.500	0.562	0.406
2.125	2.625	2.375	3.505	2.750	3.250	1.312	0.500	0.562	0.406
2.250	2.750	2.500	3.630	2.890	3.375	1.312	0.500	0.562	0.406
2.375	2.875	2.625	3.755	3.046	3.625	1.312	0.562	0.625	0.406
2.500	3.000	2.750	3.880	3.171	3.500	1.312	0.562	0.625	0.406
2.625	3.125	2.875	4.005	3.296	3.750	1.312	0.562	0.625	0.406
2.750	3.250	3.000	4.130	3.437	3.875	1.312	0.562	0.625	0.406
2.875	3.375	3.125	4.255	3.546	4.000	1.312	0.656	0.781	0.406
3.000	3.500	3.250	4.380	3.671	4.125	1.312	0.656	0.781	0.406
3.125	3.625	3.375	4.505	3.796	4.250	1.312	0.656	0.781	0.406
3.250	3.750	3.500	4.630	3.921	4.375	1.312	0.656	0.781	0.406
3.375	3.875	3.625	4.755	4.046	4.500	1.312	0.656	0.781	0.406
3.500	4.000	3.750	4.880	4.171	4.625	1.312	0.656	0.781	0.406

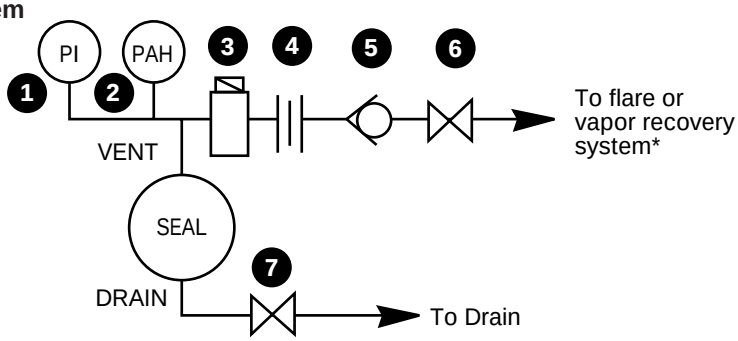
Piping Schematics

Leakage from primary seal is captured and sent to the flare or vapor recovery system in emission sensitive applications, or sent to a drain for collection in specific applications where emission control is not critical.

The following piping schematics illustrate how auxiliary piping is connected to the outboard secondary containment seal gland connections.

Typical Vent to Flare or Vapor Recovery System

1. Pressure Indicator
2. High Pressure Alarm
3. Pressure Regulator (*Optional)
4. 1/8" Orifice or Equivalent
5. Check Valve (1 psi Cracking Pressure)
6. Block Valve (Normally Open)
7. Block Valve (Normally Closed)



* A pressure regulator is recommended when the flare or vapor recovery system can operate at a negative pressure. The pressure regulator will maintain a positive pressure in the outer seal cavity.

Typical Vent to Drain or Liquid Collection Tank

1. Pressure Indicator
2. High Pressure Alarm
3. 1/8" Orifice
4. Block Valve (Normally Open)

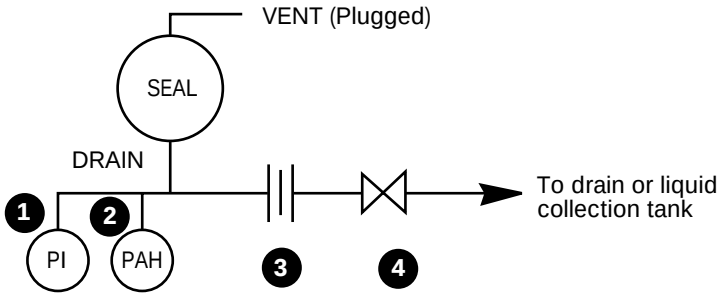


Chart 3. Criteria for Installation

Shaft/Sleeve	Limits
Surface Finish	32 Ra
Ovality/Out of Roundness (Shaft)	0.051 mm/0.002"
End Play/ Axial Float Allowance	0.78 mm/0.031" T.I.R.
Shaft Runout	0.05 mm/0.002" T.I.R.
Shaft Squareness to Housing	0.13 mm/0.005" T.I.R.

Chart 4. Materials of Construction

Seal Component Materials		Secondary Sealing Element	Primary Ring	Hardware Retainer, Disc, Snap Ring, Set Screws	Mating Ring	Mechanical Loading Device Spring
Material	Standard	Buna-N	Proprietary Dry-Running Carbon	316 Stainless Steel	Reaction Bonded Silicon Carbide	316 Stainless Steel
		Fluoroelastomer				
	Options	Kalrez*		Monel		Monel
				Alloy C-276 (UNS N10276)		Alloy C-276 (UNS N10276)

* Kalrez is a registered trademark of DuPont.

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