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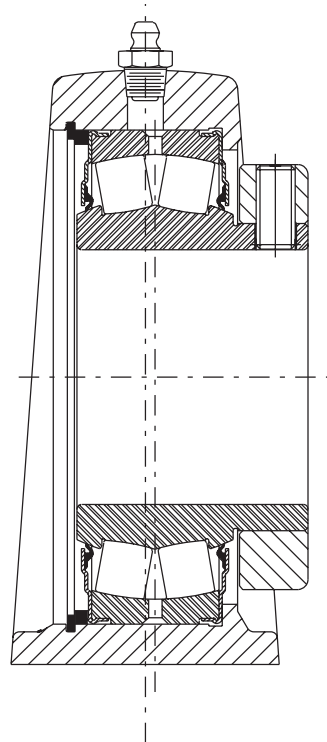
UNIFIED SAF

### UNISPHERE II



### UNISPHERE II

- High capacity double row spherical bearings
- 2-bolt pillow blocks and 4-bolt flange bearings 1-7/16" to 4", 40mm to 90mm.
- Same rolling elements and installation ready features as the S-2000 bearing.
- Ductile iron pillow block housing with 65,000 PSI tensile strength is 92% the strength of steel.
- DODGE "R" Seal provides contacting lip protection, crimped to the outer race; maintains sealing effectiveness at maximum misalignment.
- Springlok™ collar mount with 65 setscrew spacing for optimum clamping force.



Dimensionally comparable with ball bearings:

- Length through the bore
- Base-to-center height
- Footprint

**Approximately five times the rating of a ball bearing**

**NOTE:** Instruction manuals for Dodge bearings are available on [www.dodge-pt.com](http://www.dodge-pt.com)



## SPECIFICATION

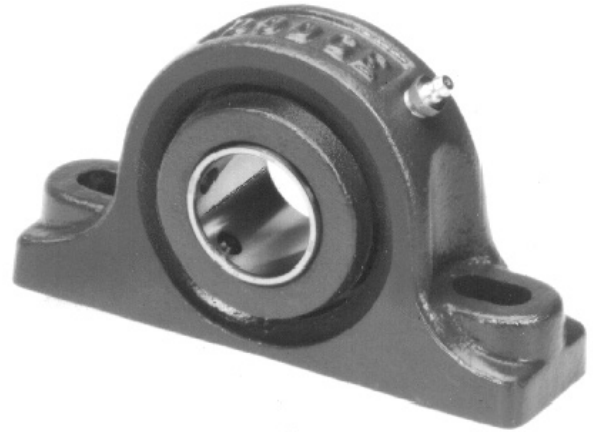
### UNISPHERE II INCH

DODGE Unitized UNISPHERE II are general purpose, high-capacity, double-row spherical roller bearings. All are mounted in single piece precision machined housings. Bearings are mounted to shafts by means of set screw collars, with 65 degree set screw spacing for maximum clamping force.

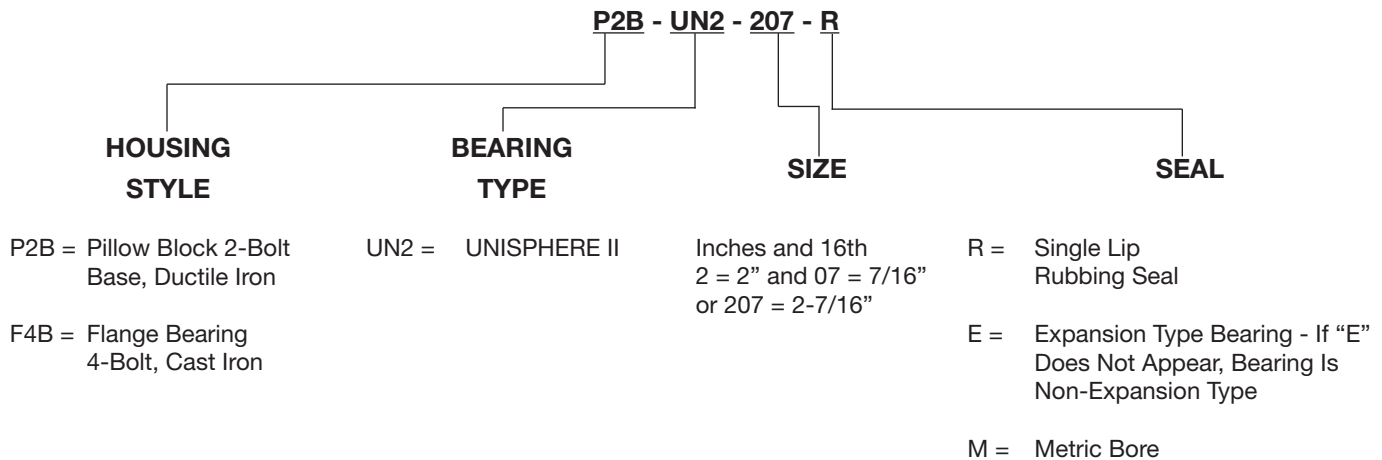
ASTM A48 Class 30 cast iron is the standard material used in S-2000 housings and UNISPHERE II flanged housings. The standard material used in UNISPHERE II pillow blocks is ductile

iron (ASTM A536 Grade 65-45-12) with 65,000 p.s.i. tensile strength. Housing designs are available for survival in extreme harsh environments, through the use of special finishes and stainless hardware.

Housings are available in a variety of standard configurations, including pillow blocks and flanges. Rubbing lip seals are standard on all units.



## NOMENCLATURE



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# SELECTION



## UNISPHERE II SPHERICAL ROLLER BEARINGS

DODGE Unitized Spherical Roller Bearings have the capacity to carry heavy radial loads and combined radial and thrust loads. The maximum recommended load which can be applied is limited by various components in the system such as bearing, housing, shaft, shaft attachment, speed and life requirements as listed in this catalog. DODGE spherical roller bearings have been applied successfully even when these limits have been exceeded under controlled operating conditions. Contact DODGE Application Engineering (864-284-5700) for applications which exceed the recommendations of this catalog.

**L<sub>10</sub> Hours Life** - The life which may be expected from at least 90% of a given group of bearings operating under identical conditions.

$$L_{10} \text{ Life, Hours} = \left( \frac{C}{P} \right)^{10/3} \times \left( \frac{16667}{\text{RPM}} \right)$$

Where: C = Dynamic Capacity (Table 1 and Table 2 on pages B13-6 and B13-7) lbs.

P = Equivalent Radial Load, lbs.

### GENERAL

**Heavy Service** - For heavy shock loads, frequent shock loads, or severe vibrations, add up to 50% (according to severity of conditions) to the Equivalent Radial Load to obtain a Modified Equivalent Radial Load. Consult DODGE Application Engineering for additional selection assistance.

Thrust load values shown in the table below are recommended as a guide for general applications that will give adequate L<sub>10</sub> life. Spherical bearings require a radial load at least equal to the thrust load for proper operation. If the thrust load exceeds this limit, consult Application Engineering. Where substantial radial load is also present, it is advisable to calculate actual L<sub>10</sub> life to assure that it meets the requirements. The effectiveness of the shaft attachment to carry thrust load depends on proper tightening of the set screws, shaft tolerance and shaft deflections. Therefore, it is advisable to use auxiliary thrust carrying devices such as shaft shoulder, snap ring or a thrust collar to locate the bearing under thrust loads heavier than shown below, or where extreme reliability is desired.

RPM	20-200	201 - 2000	Over 2000
RECOMMENDED THRUST LOAD	C/20	C/40	C/60

The shaft tolerances recommended below are adequate for normal radial and radial/thrust load applications. The radial load is limited by the attachment to the shaft (see Table 1 on page B13-6). Where the applied radial load (FR) exceeds this limit (maximum allowable slip fit radial load), a snug-to-light press fit of the shaft is required. Since the allowable load, especially at a low speed, is very large, the shaft should be checked to assure adequate shaft strength.

The magnitude and direction of both the thrust and radial load must be taken into account when selecting a housing. **When pillow blocks are utilized, heavy loads should be directed through the base. Where uplift loads are involved, see Table 7 on page B13-11 for maximum values.** Where a load pulls the housing away from the mounting base, both the hold-down bolts and housing must be of adequate strength. Auxiliary load carrying devices such as shear bars are advisable for side or end loading of pillow blocks and radial loads for flange units.

Shaft Tolerances	
Shaft Size	S-2000
UP TO 1-1/2"	+0.0000 -0.0005"
1-9/16 TO 4"	+0.000 -0.001"
4-7/16 TO 5"	+0.000 -0.0015"

### BEARING SUPPORTING RADIAL LOADS ONLY

1. Define L<sub>10</sub> Life Hours desired.
2. Establish bearing radial load, F<sub>R</sub>  
(F<sub>R</sub> = P for Pure Radial Load Conditions). The DODGE program BEST™\* can be used to find application loads.
3. Establish RPM.

Using the easy selection Table 3 on page B13-8, find, under the RPM column, the equivalent radial load that equals or is slightly higher than the application radial load for the desired life. The shaft size on the far left will be the minimum shaft size that you can use for your application.

If the desired life is different than the values shown on the chart, use alternate Method A shown below.

- Example:
1. L<sub>10</sub> Life = 30,000 Hours
  2. Radial load = 4000 lbs.
  3. RPM = 1,020

At the intersection of the 1,020 RPM column and the 30,000 hours L<sub>10</sub> life row, the equivalent radial load of 4092 lbs. exceeds the 4000 lbs. radial load for shaft size 2-7/16". A bearing with bore 2-7/16", or larger, may be used for this application.

★ The DODGE Bearing Evaluation and Selection Technique (BEST) is a menu driven computer program that calculates bearing loads, fatigue life and operating temperature for a two bearing shaft system based on user supplied input parameters. This interactive web based program is available at [www.dodge-pt.com](http://www.dodge-pt.com). Use PT Wizard on line under the tools drop down box.

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# SELECTION

## UNISPHERE II

### ALTERNATE METHOD A - SELECTING A BEARING FOR AN L<sub>10</sub> LIFE VALUE NOT SHOWN IN THE EASY SELECTION CHART.

The L<sub>10</sub> life equation can be rearranged so that the bearing dynamic capacity C is identified in terms of L<sub>10</sub>, RPM and P

$$C = \left( \frac{L_{10} \times \text{RPM}}{16667} \right)^{0.3} \times P$$

(P = F<sub>R</sub> for Pure Radial Load Conditions)

Since the L<sub>10</sub>, RPM and P are known, solve for C. Select from the dynamic capacity column on Table 1 on page B13-6 the C value equal to or greater than the C value just calculated. The bore size on the far left represents the proper bore size selection. Check that the application RPM does not exceed the MAX. RPM on Table 1 and Table 2 on pages B13-6 and B13-7. Also check that the radial load does not exceed the Maximum Allowable Slip Fit Radial Load shown on Table 1 and Table 2. If it does, a line-to-line to light press fit of shaft is required. When selecting an L<sub>10</sub> life of less than 30,000 hours, particular attention must be paid to shaft deflection and proper lubricant selection.

### SELECTING BEARINGS SUPPORTING COMBINATION RADIAL AND THRUST LOADS

When a bearing supports both a radial load and a thrust load, the loading on the two rows is shared unequally depending on the ratio of thrust to radial load. The use of the X (radial factor) and Y (thrust factor) from Table 1 and Table 2 converts the applied thrust load and radial loads to an equivalent radial load having the same effect on the life of the bearing as a radial load of this magnitude.

The equivalent radial load  $P = XF_R + YF_A$

Where:

- P = Equivalent radial load, lbs.
- F<sub>R</sub> = Radial load, lbs. (see Table 1 for allowable slip fit maximum load)
- F<sub>A</sub> = Thrust (axial) load, lbs.
- e = Thrust load to radial load factor (Table 1 and Table 2)★
- X = Radial load factor (Table 1 and Table 2)★
- Y = Thrust load factor (Table 1 and Table 2)★

To find X and Y, calculate F<sub>A</sub>/F<sub>R</sub> and compare to e for the selected bore size. Determine X and Y from Table 1 and Table 2 on pages B13-6 and B13-7 depending on whether F<sub>A</sub>/F<sub>R</sub> is equal to or less than e, or F<sub>A</sub>/F<sub>R</sub> is greater than e. Substitute all known values into the equivalent radial load equation. P (equivalent radial load) can be used in the life formula to determine L<sub>10</sub>, or it

can be compared to the allowable equivalent radial load ratings for the speed and hours life desired in the easy selection Table 3 on page B13-8 or Table 4 on page B13-9.

### SELECTING BEARINGS SUPPORTING ONLY THRUST LOADS

Spherical Roller Bearings generally are not recommended for pure thrust load applications. However, they will perform satisfactorily under very light pure thrust loads. Consult DODGE Application Engineering (864-284-5700).

### SELECTING LUBRICATION

DODGE UNISPHERE II spherical roller bearings are lubricated at the factory with Mobilgrease XHP222 grease. Mobilgrease XHP222 is a superior industrial grease using a lithium complex thickener and highly refined base oil. This grease will adequately handle low and medium speeds with low and medium loads at normal temperatures as defined on Table 6 on page B13-10. For very low and high speeds, for heavy loads and for low and high temperatures, special greases must be used. Contact DODGE Application Engineering (864-284-5700). DODGE engineers will recommend bearings and lubricants for the above unusual conditions. DODGE also has the expertise to custom design and build special bearings for your needs. The only maintenance requirement for DODGE Unitized roller bearings is periodic relubrication at regular intervals as outlined in the appropriate instruction manuals.

### MISALIGNMENT CONSIDERATIONS

In nearly all applications, good design practice requires two bearings supporting the shaft. In cases where three or more bearings are installed, unless precautions are taken to line the bearings up both vertically and horizontally, it is possible to induce heavy loads. In the case of two bearings, alignment is not as critical, especially with DODGE Unitized Spherical Roller Bearings. UNISPHERE II bearings are designed to allow a maximum of ±1° of static and dynamic misalignment. However, for optimum seal performance, misalignment should be kept under ±0.5°. To ensure good alignment, mounting surfaces must be checked for flatness and must lie in the same plane. When tightening base bolts, each bolt should be alternately tightened in incremental torque values until full torque is achieved to prevent the angular shifting of the pillow block that occurs when one bolt is tightened to its full torque. Shimming may be required to minimize misalignment.

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## UNISPHERE II

Table 1: UNISPHERE II Spherical Roller Bearings Radial And Thrust Factors

Shaft Size Inch	Basic Bearing Description	e	$F_A/F_R \leq e$		$F_A/F_R \geq e$		Max. Allow. Slip Fit Radial Load $F_R^*$ Lbs.	Dynamic Capacity (C) Lbs.	Static Capacity $C_0$	Maximum RPM
			X	Y	X	Y				
1-1/8 1-3/16 1-1/4 1-3/8 1-7/16 1-1/2	22208	0.28	1	2.4	0.67	3.6	3,750	20,800	21,000	3,000
1-5/8 1-11/16 1-3/4	22209	0.26	1	2.6	0.67	3.9	3,750	20,800	22,000	2,800
1-7/8 1-15/16 2	22210	0.24	1	2.8	0.67	4.2	4,000	22,000	24,000	2,625
2-3/16 2-1/4	22211	0.23	1	2.9	0.67	4.3	4,860	27,000	29,000	2,325
2-3/8 2-7/16 2-1/2	22213	0.24	1	2.8	0.67	4.2	6,840	39,000	47,500	1,900
2-11/16 2-3/4 2-15/16 3	22215	0.22	1	3.1	0.67	4.6	7,500	41,500	53,000	1,700
3-3/16 3-1/4 3-7/16 3-1/2	22218	0.23	1	2.9	0.67	4.3	11,500	65,500	81,500	1,400
3-11/16 3-15/16 4	22220	0.24	1	2.8	0.67	4.2	14,400	83,000	104,000	1,250

\* If load exceeds "Max. allowable slip fit load," line to line to light press fit of shaft required. Maximum slip fit radial loads apply if recommended shaft sizes are used.

# SELECTION



## UNISPHERE II

Table 2: UNISPHERE II Metric Spherical Roller Bearing

Shaft MM	Basic Bearing Description	e	$F_A/F_R \leq e$		$F_A/F_R \geq e$		Max. Allow. Slip Fit Radial Load $F_R^*$ kN	Dynamic Capacity (C) kN	Maximum RPM
			X	Y	X	Y			
30 35	22208	0.28	1	2.4	0.67	3.6	17	93	3000
40 45	22209	0.26	1	2.6	0.67	3.9	17	93	2800
50	22210	0.24	1	2.8	0.67	4.2	18	98	2625
55	22211	0.23	1	2.9	0.67	4.3	22	120	2325
60 65	22213	0.24	1	2.8	0.67	4.2	30	169	1900
70 75	22215	0.22	1	3.1	0.67	4.6	33	185	1700
80 85 90	22218	0.23	1	2.9	0.67	4.3	51	285	1400

\* If load exceeds "Max. allowable slip fit load," line to line to light press fit of shaft required. Maximum slip fit radial loads apply if recommended shaft sizes are used.

Bearing Reference  
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# SELECTION



## UNISPHERE II

**Table 3: Easy Selection Table for UNISPHERE Double Row Spherical Roller Bearings**

Shaft Size Inches	L <sub>10</sub> Life Hours	Allowable Equivalent Radial Load Rating (lbs.) at Various Revolutions per Minute														
		50	100	150	250	500	870	1,020	1,250	1,400	1,700	1,900	2,325	2,625	2,800	3000
1-3/8 to 1-1/2	10,000	7,498	6,090	5,393	4,626	3,758	3,182	3,034	2,855	2,759	2,603	2,518	2,370	2,285	2,241	2,195
	30,000	5,393	4,380	3,878	3,327	2,703	2,289	2,182	2,053	1,984	1,872	1,811	1,704	1,643	1,612	1,579
	40,000	4,947	4,018	3,558	3,052	2,479	2,100	2,002	1,883	1,820	1,717	1,661	1,563	1,508	1,479	1,448
	60,000	4,380	3,558	3,150	2,703	2,195	1,859	1,773	1,668	1,612	1,521	1,471	1,384	1,335	1,309	1,282
	100,000	3,758	3,052	2,703	2,319	1,883	1,595	1,521	1,431	1,383	1,305	1,262	1,188	1,145	1,123	1,100
1-11/16 to 1-3/4	10,000	7,498	6,090	5,393	4,626	3,758	3,182	3,034	2,855	2,759	2,603	2,518	2,370	2,285	2,241	2,195
	30,000	5,393	4,380	3,878	3,327	2,703	2,289	2,182	2,053	1,984	1,872	1,811	1,704	1,643	1,612	1,579
	40,000	4,947	4,018	3,558	3,052	2,479	2,100	2,002	1,883	1,820	1,717	1,661	1,563	1,508	1,479	1,448
	60,000	4,380	3,558	3,150	2,703	2,195	1,859	1,773	1,668	1,612	1,521	1,471	1,384	1,335	1,309	1,282
	100,000	3,758	3,052	2,703	2,319	1,883	1,595	1,521	1,431	1,383	1,305	1,262	1,188	1,145	1,123	1,100
1-15/16 to 2	10,000	7930	6441	5704	4893	3975	3366	3209	3019	2918	2753	2663	2506	2417		
	30,000	5704	4633	4102	3519	2859	2421	2308	2172	2099	1980	1915	1803	1738		
	40,000	5232	4250	3763	3228	2622	2221	2117	1992	1925	1817	1757	1654	1595		
	60,000	4633	3763	3332	2859	2322	1966	1875	1764	1705	1608	1556	1464	1412		
	100,000	3975	3228	2859	2452	1992	1687	1608	1513	1463	1380	1335	1256	1211		
2-3/16	10,000	9,733	7,905	7,000	6,005	4,878	4,131	3,939	3,706	3,582	3,379	3,268	3,076			
	30,000	7,000	5,686	5,035	4,319	3,508	2,971	2,833	2,665	2,576	2,430	2,350	2,212			
	40,000	6,421	5,216	4,618	3,962	3,218	2,726	2,599	2,445	2,363	2,229	2,156	2,029			
	60,000	5,686	4,618	4,089	3,508	2,850	2,413	2,301	2,165	2,092	1,974	1,909	1,797			
	100,000	4,878	3,962	3,508	3,010	2,445	2,070	1,974	1,857	1,795	1,694	1,638	1,542			
2-7/16 to 2-1/2	10,000	14,058	11,419	10,111	8,674	7,046	5,967	5,689	5,352	5,173	4,881	4,721				
	30,000	10,111	8,213	7,272	6,239	5,068	4,292	4,092	3,850	3,721	3,510	3,395				
	40,000	9,275	7,534	6,671	5,723	4,649	3,937	3,753	3,531	3,413	3,220	3,114				
	60,000	8,213	6,671	5,907	5,068	4,116	3,486	3,324	3,127	3,022	2,851	2,758				
	100,000	7,046	5,723	5,068	4,348	3,531	2,991	2,851	2,683	2,593	2,446	2,366				
2-11/16 to 3	10,000	14,959	12,151	10,759	9,230	7,497	6,350	6,054	5,696	5,505	5,194					
	30,000	10,759	8,739	7,738	6,639	5,392	4,567	4,354	4,096	3,959	3,735					
	40,000	9,870	8,017	7,098	6,090	4,946	4,189	3,994	3,758	3,632	3,427					
	60,000	8,739	7,098	6,285	5,392	4,380	3,709	3,537	3,327	3,216	3,034					
	100,000	7,497	6,090	5,392	4,626	3,758	3,182	3,034	2,855	2,759	2,603					
3-7/16 to 3-1/2	10,000	23,611	19,178	16,981	14,569	11,833	10,022	9,555	8,989	8,689						
	30,000	16,981	13,793	12,213	10,478	8,511	7,208	6,872	6,465	6,249						
	40,000	15,577	12,653	11,203	9,612	7,807	6,612	6,304	5,931	5,732						
	60,000	13,793	11,203	9,920	8,511	6,913	5,855	5,582	5,251	5,076						
	100,000	11,833	9,612	8,511	7,302	5,931	5,023	4,789	4,505	4,355						
3-15/16 to 4	10,000	29,919	24,302	21,518	18,461	14,995	12,699	12,108	11,391							
	30,000	21,518	17,478	15,476	13,278	10,785	9,134	8,708	8,193							
	40,000	19,739	16,033	14,197	12,180	9,893	8,378	7,988	7,515							
	60,000	17,478	14,197	12,571	10,785	8,760	7,419	7,073	6,655							
	100,000	14,995	12,180	10,785	9,252	7,515	6,365	6,068	5,709							

In the light shaded area, a line-to-line to light press fit on the shaft is required.

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## UNISPHERE II

**Table 4: Easy Selection Table for Metric UNISPHERE Double Row Spherical Roller Bearings**

Shaft Size mm	L <sub>10</sub> Life Hours	Allowable Equivalent Radial Load Rating (Newtons) at Various Revolutions per Minute														
		50	100	150	250	500	870	1,020	1,250	1,400	1,700	1,900	2,325	2,625	2,800	3000
30 35	10,000	33,365	27,101	23,997	20,587	16,722	14,162	13,502	12,703	12,278	11,584	11,204	10,545	10,168	9,973	9,769
	30,000	23,997	19,492	17,259	14,807	12,027	10,186	9,711	9,136	8,831	8,331	8,058	7,584	7,313	7,173	7,026
	40,000	22,013	17,880	15,832	13,583	11,032	9,343	8,908	8,381	8,101	7,642	7,392	6,957	6,709	6,580	6,445
	60,000	19,492	15,832	14,019	12,027	9,769	8,273	7,888	7,421	7,173	6,767	6,545	6,160	5,940	5,826	5,707
	100,000	16,722	13,583	12,027	10,318	8,381	7,098	6,767	6,367	6,154	5,806	5,615	5,285	5,096	4,998	4,896
40 45	10,000	33,350	27,089	23,986	20,578	16,715	14,156	13,496	12,697	12,273	11,578	11,198	10,540	10,164	9,969	
	30,000	23,986	19,483	17,251	14,800	12,021	10,181	9,707	9,132	8,827	8,327	8,054	7,581	7,310	7,170	
	40,000	22,003	17,872	15,825	13,576	11,027	9,339	8,904	8,377	8,097	7,639	7,388	6,954	6,705	6,577	
	60,000	19,483	15,825	14,012	12,021	9,764	8,270	7,884	7,418	7,170	6,764	6,542	6,158	5,937	5,824	
	100,000	16,715	13,576	12,021	10,313	8,377	7,095	6,764	6,364	6,151	5,803	5,613	5,283	5,094	4,996	
50	10,000	35,290	28,664	25,381	21,775	17,687	14,979	14,281	13,436	12,987	12,252	11,850	11,154	10,755		
	30,000	25,381	20,616	18,255	15,661	12,721	10,773	10,271	9,663	9,340	8,812	8,523	8,022	7,735		
	40,000	23,283	18,911	16,745	14,366	11,669	9,883	9,422	8,864	8,568	8,083	7,818	7,359	7,096		
	60,000	20,616	16,745	14,828	12,721	10,333	8,751	8,343	7,849	7,587	7,158	6,923	6,516	6,283		
	100,000	17,687	14,366	12,721	10,913	8,864	7,507	7,158	6,734	6,509	6,141	5,939	5,590	5,390		
55	10,000	43,291	35,163	31,136	26,712	21,697	18,375	17,519	16,482	15,931	15,030	14,536	13,682			
	30,000	31,136	25,290	22,394	19,212	15,605	13,216	12,600	11,854	11,458	10,810	10,455	9,841			
	40,000	28,561	23,199	20,542	17,623	14,315	12,123	11,558	10,874	10,511	9,916	9,591	9,027			
	60,000	25,290	20,542	18,189	15,605	12,675	10,735	10,234	9,629	9,307	8,780	8,492	7,993			
	100,000	21,697	17,623	15,605	13,388	10,874	9,209	8,780	8,261	7,984	7,533	7,286	6,857			
60 65	10,000	62,531	50,791	44,974	38,584	31,340	26,542	25,305	23,807	23,012	21,710	20,997				
	30,000	44,974	36,530	32,346	27,750	22,540	19,089	18,200	17,123	16,551	15,614	15,102				
	40,000	41,255	33,510	29,672	25,456	20,677	17,511	16,695	15,707	15,182	14,323	13,853				
	60,000	36,530	29,672	26,273	22,540	18,308	15,505	14,783	13,908	13,443	12,683	12,266				
	100,000	31,340	25,456	22,540	19,338	15,707	13,302	12,683	11,932	11,533	10,881	10,524				
70 75	10,000	66,539	54,047	47,857	41,057	33,349	28,243	26,927	25,334	24,487	23,101					
	30,000	47,857	38,872	34,420	29,529	23,985	20,313	19,367	18,221	17,611	16,615					
	40,000	43,900	35,658	31,574	27,088	22,002	18,634	17,765	16,714	16,155	15,241					
	60,000	38,872	31,574	27,957	23,985	19,482	16,499	15,731	14,800	14,305	13,496					
	100,000	33,349	27,088	23,985	20,577	16,714	14,155	13,496	12,697	12,272	11,578					
80 85 90	10,000	105,020	85,303	75,533	64,801	52,635	44,577	42,499	39,984	38,648						
	30,000	75,533	61,352	54,325	46,606	37,856	32,061	30,567	28,758	27,796						
	40,000	69,287	56,279	49,833	42,753	34,726	29,410	28,039	26,380	25,498						
	60,000	61,352	49,833	44,126	37,856	30,749	26,041	24,828	23,358	22,578						
	100,000	52,635	42,753	37,856	32,477	26,380	22,341	21,300	20,040	19,370						

In the light shaded area, a line-to-line to light press fit on the shaft is required.

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# SELECTION



## UNISPHERE II

**Table 5: UNISPHERE II Maximum Axial Expansion - Inch And Metric**

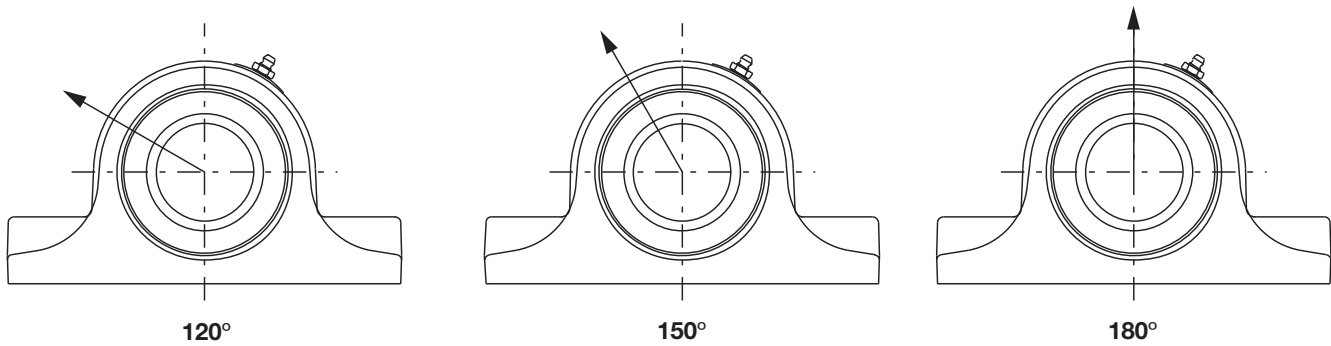
Bore Size Inches	Maximum Expansion Inches	Bore Size mm	Maximum Expansion mm
1-7/16 to 1-1/2	5/32	-	-
1-11/16 to 1-3/4	5/32	40, 45	3.9
1-15/16 to 2	5/32	50, 55	3.9
2-3/16	5/32	60, 65	4.7
2-7/16 to 2-1/2	3/16	70, 75	4.7
2-11/16 to 3	3/16	80, 85, 90	4.7
3-7/16 to 3-1/2	3/16		
3-15/16 to 4	7/32		

**Table 6: Definition Of Operating Conditions For Unitized Spherical Roller Bearings**

LOW SPEED	UP TO 20% OF MAX. RPM (TABLE 1)
MEDIUM SPEED	OVER 20% TO 80% OF MAX. RPM
HIGH SPEED	OVER 80% OF MAX. RPM
LIGHT LOAD	UP TO 8% OF <b>C</b> (TABLE 1)
NORMAL LOAD	OVER 8% TO 18% OF <b>C</b>
HEAVY LOAD	OVER 18% OF <b>C</b>
	<b>C</b> = DYNAMIC CAPACITY
LOW TEMPERATURE	20°F TO -100°F
MEDIUM TEMPERATURE	OVER 20°F TO 200°F
HIGH TEMPERATURE	OVER 200°F TO 400°F



## UNISPHERE II



**Table 7: UNISPHERE II Housing Ratings, Ductile\***

Bore Size	Pillow Block Designation	Max. Recommended Housing Cap Loads		
		P120 lb	P150 lb	P180 lb
1-1/8 to 1-1/2	UN2107	5500	6750	8000
1-5/8 to 1-3/4	UN2111	6800	8600	10000
1-7/8 to 2	UN2115	8000	9900	11700
2-3/16 to 2-1/4	UN2203	10200	12500	14800
2-3/8 to 2-1/2	UN2207	10200	12400	14900
2-11/16 to 3	UN2215	12900	15900	18900
3-3/16 to 3-1/2	UN2307	11900	14600	17400
3-11/16 to 4	UN2315	16900	20800	24600

\* When utilizing heavy cap loads on pillow block housings, the installation must adhere to the following procedures:

1. The pillow block base bolts must be on **high strength (Grade 8) bolts and properly tightened** to mounting structure.
2. Stop bars (shear strips) should be used against the plummer block where side loads are encountered.
3. In all cases where loads are heavy, the  $L_{10}$  life of the bearing should be checked for proper selection and life requirements.

**Table 8: Metric UNISPHERE II Housing Ratings, Ductile\***

Plummer Block Designation	Max. Recommended Housing Cap Loads		
	P120 kN	P150 kN	P180 kN
UN2040M	31	37	44
UN2045M	31	37	44
UN2050M	35	44	52
UN2055M	45	55	65
UN2060M	45	55	66
UN2065M	45	55	66
UN2070M	57	70	84
UN2075M	57	70	84
UN2080M	53	65	77
UN2085M	53	65	77
UN2090M	53	65	77

\* When utilizing heavy cap loads on plummer block housings, the installation must adhere to the following procedures:

1. The plummer block base bolts must be of **high strength (Grade 10.9) and properly tightened** to mounting structure.
2. Stop bars (shear strips) should be used against the plummer block where side loads are encountered.
3. In all cases where loads are heavy, the  $L_{10}$  life of the bearing should be checked for proper selection and life requirements.

**NOTE:** To convert kN to pounds-force, multiply kN by a factor of 225.

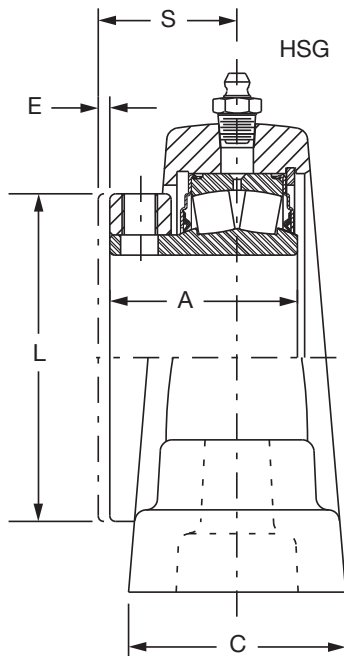
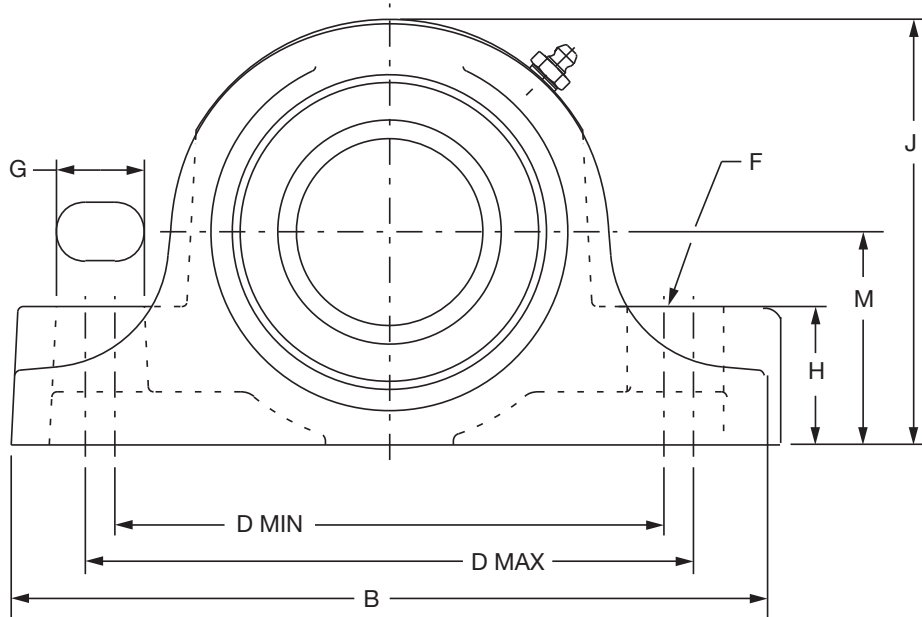
FEATURES/BENEFITS PAGE B13-2	SPECIFICATION PAGE B13-3	NOMENCLATURE PAGE B13-3	DIMENSIONS PAGE B13-12
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# DIMENSIONS

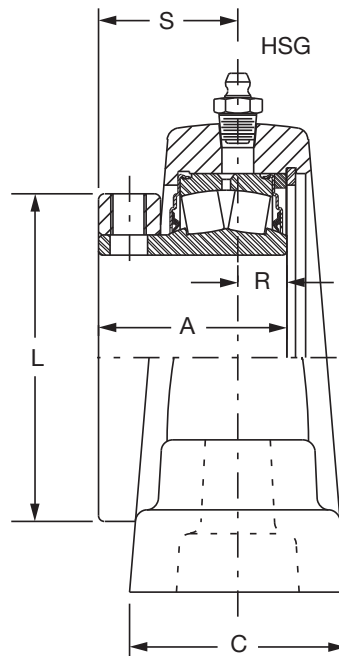


## UNISPHERE II Pillow Block - Inch

**NOTE:** All sizes use a 1/8-27 NPT hydraulic grease fitting



EXPANSION



NON-EXPANSION

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# DIMENSIONS

## UNISPHERE II Pillow Block - Inch

Bearing	Shaft Size Inch Δ	Non-Expansion*		Expansion		Approx. Wt. Lbs.
		Part No.	Part Name	Part No.	Part Name	
22208	1-7/16	<b>048000</b>	P2B-UN2-107	<b>048017</b>	P2B-UN2-107E	5.5
	1-1/2	<b>048001</b>	P2B-UN2-108	<b>048018</b>	P2B-UN2-108E	5.4
22209	1-11/16	<b>048002</b>	P2B-UN2-111	<b>048019</b>	P2B-UN2-111E	6.9
	1-3/4	<b>048003</b>	P2B-UN2-112	<b>048020</b>	P2B-UN2-112E	6.8
22210	1-15/16	<b>048004</b>	P2B-UN2-115	<b>048021</b>	P2B-UN2-115E	8.0
	2	<b>048005</b>	P2B-UN2-200	<b>048022</b>	P2B-UN2-200E	7.6
22211	2-3/16	<b>048006</b>	P2B-UN2-203	<b>048023</b>	P2B-UN2-203E	9.8
22213	2-7/16	<b>048007</b>	P2B-UN2-207	<b>048024</b>	P2B-UN2-207E	13.6
	2-1/2	<b>048008</b>	P2B-UN2-208	<b>048025</b>	P2B-UN2-208E	13.4
22215	2-11/16	<b>048009</b>	P2B-UN2-211	<b>048026</b>	P2B-UN2-211E	19.3
	2-3/4	<b>048010 †</b>	P2B-UN2-212	<b>048027 †</b>	P2B-UN2-212E	19.0
	2-15/16	<b>048011</b>	P2B-UN2-215	<b>048028</b>	P2B-UN2-215E	18.2
	3	<b>048012</b>	P2B-UN2-300	<b>048029</b>	P2B-UN2-300E	18.1
22218	3-7/16	<b>048013</b>	P2B-UN2-307	<b>048030</b>	P2B-UN2-307E	28.4
	3-1/2	<b>048014 †</b>	P2B-UN2-308	<b>048031 †</b>	P2B-UN2-308E	27.0
22220	3-15/16	<b>048015</b>	P2B-UN2-315	<b>048032</b>	P2B-UN2-315E	37.4
	4	<b>048016 †</b>	P2B-UN2-400	<b>048033 †</b>	P2B-UN2-400E	37.0

† Assembled to order. Consult DODGE for delivery.

Δ Consult DODGE for sizes not listed.

\* Furnished unless otherwise specified.

### UNISPHERE II - Pillow Block - Dimensions ●

Shaft Size Inch	A	B	C	D		E Total Exp.	F Bolt Dia.	G	H	J	L	M	R	S
				Min.	Max.									
1-7/16 1-1/2	1.69	6.88	1.95	4.69	5.50	5/32	1/2	0.97	0.97	3.88	2.75	1.88	0.50	1.19
1-11/16 1-3/4	1.91	7.38	2.06	5.19	5.88	5/32	1/2	0.91	1.31	4.25	3.00	2.13	0.47	1.44
1-15/16 2	1.91	8.38	2.06	5.94	6.69	5/32	5/8	1.06	1.38	4.56	3.25	2.25	0.47	1.44
2-3/16	2.00	8.88	2.31	6.44	7.13	5/32	5/8	1.03	1.63	5.00	3.50	2.50	0.52	1.48
2-7/16 2-1/2	2.20	9.25	2.56	6.81	7.44	3/16	5/8	1.00	1.75	5.69	4.06	2.75	0.66	1.55
2-11/16 2-3/4 2-15/16 3	2.45	10.44	2.56	7.81	8.44	3/16	3/4	1.13	2.25	6.44	4.72	3.25	0.77	1.69
3-7/16 3-1/2	2.86	13.00	2.81	9.25	10.75	3/16	7/8	1.69	2.25	7.50	5.50	3.75	0.94	1.91
3-15/16 4	3.33	14.25	3.31	10.00	11.88	7/32	1	2.00	2.50	8.44	6.47	4.13	1.13	2.19

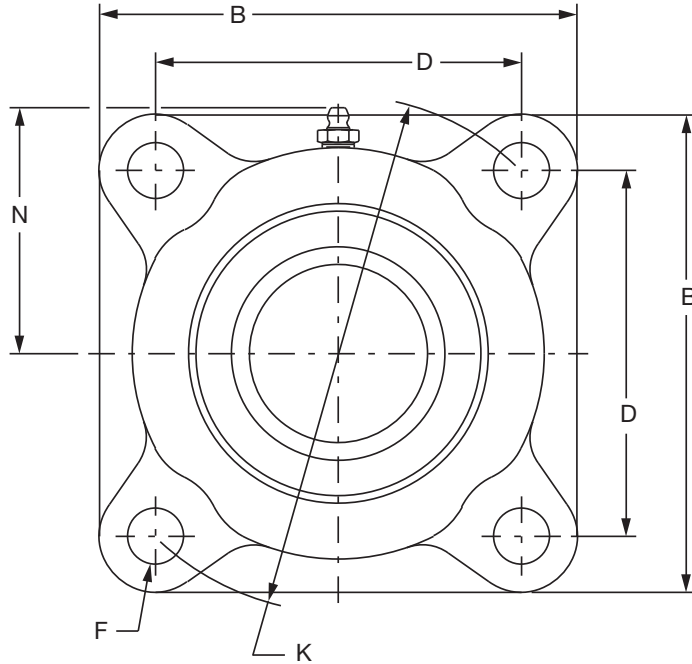
● Dimensions shown are for non-expansion units. The expansion bearing center and housing center are on the same centerline.

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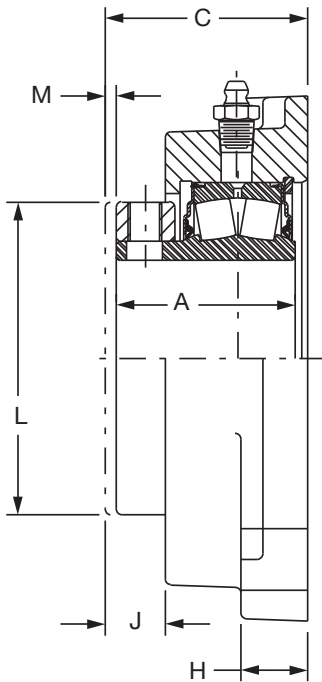
# DIMENSIONS



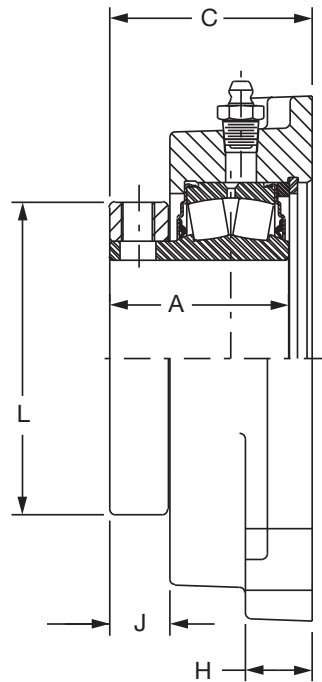
## UNISPHERE II Flange Bearing - Inch 4-BOLT



**NOTE:** All sizes use a 1/8-27 NPT hydraulic grease fitting



EXPANSION



NON-EXPANSION

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# DIMENSIONS

## UNISPHERE II Flange Bearing - Inch 4-BOLT

Bearing	Shaft Size Inch Δ	Non-Expansion*		Expansion		Approx. Wt. Lbs.
		Part No.	Part Name	Part No.	Part Name	
22208	1-7/16	<b>048034</b>	F4B-UN2-107	<b>048051</b>	F4B-UN2-107E	5.20
	1-1/2	<b>048035</b>	F4B-UN2-108	<b>048052</b>	F4B-UN2-108E	5.10
22209	1-11/16	<b>048036</b>	F4B-UN2-111	<b>048053</b>	F4B-UN2-111E	6.70
	1-3/4	<b>048037</b>	F4B-UN2-112	<b>048054</b>	F4B-UN2-112E	6.70
22210	1-15/16	<b>048038</b>	F4B-UN2-115	<b>048055</b>	F4B-UN2-115E	6.90
	2	<b>048039</b>	F4B-UN2-200	<b>048056</b>	F4B-UN2-200E	6.70
22211	2-3/16	<b>048040</b>	F4B-UN2-203	<b>048057</b>	F4B-UN2-203E	8.40
22213	2-7/16	<b>048041</b>	F4B-UN2-207	<b>048058</b>	F4B-UN2-207E	10.50
	2-1/2	<b>048042</b>	F4B-UN2-208	<b>048059</b>	F4B-UN2-208E	10.40
22215	2-11/16	<b>048043</b>	F4B-UN2-211	<b>048060 †</b>	F4B-UN2-211E	17.30
	2-3/4	<b>048044</b>	F4B-UN2-212	<b>048061 †</b>	F4B-UN2-212E	17.00
	2-15/16	<b>048045</b>	F4B-UN2-215	<b>048062</b>	F4B-UN2-215E	16.20
	3	<b>048046</b>	F4B-UN2-300	<b>048063</b>	F4B-UN2-300E	15.90
22218	3-7/16	<b>048047</b>	F4B-UN2-307	<b>048064</b>	F4B-UN2-307E	24.70
	3-1/2	<b>048048 †</b>	F4B-UN2-308	<b>048065 †</b>	F4B-UN2-308E	30.00
22220	3-15/16	<b>048049</b>	F4B-UN2-315	<b>048066</b>	F4B-UN2-315E	41.40
	4	<b>048050</b>	F4B-UN2-400	<b>048067 †</b>	F4B-UN2-400E	41.00

† Assembled to order. Consult DODGE for delivery.

Δ Consult DODGE for sizes not listed.

\* Furnished unless otherwise specified.

### UNISPHERE II 4-BOLT FLANGE DIMENSIONS ●

Shaft Size Inch	A	B	C	D	F Bolt Dia.	H	J	K	L	M Total Exp.	N
1-7/16 1-1/2	1.69	4.75	1.91	3.53	1/2	0.75	0.56	5.00	2.75	5/32	2.44
1-11/16 1-3/4	1.91	5.13	2.16	3.91	1/2	0.75	0.72	5.50	3.00	5/32	2.75
1-15/16 2	1.91	5.31	2.17	4.06	1/2	0.69	0.70	5.75	3.25	5/32	2.88
2-3/16	2.00	5.88	2.27	4.50	5/8	0.75	0.67	6.38	3.50	5/32	3.06
2-7/16 2-1/2	2.20	6.13	2.44	4.78	5/8	1.00	0.63	6.75	4.06	3/16	3.38
2-11/16 2-3/4 2-15/16 3	2.45	7.19	2.59	5.56	3/4	0.94	0.78	7.88	4.72	3/16	3.81
3-7/16 3-1/2	2.86	8.34	3.08	6.72	3/4	1.19	0.86	9.50	5.50	3/16	4.31
3-15/16 4	3.33	9.47	3.69	7.63	7/8	1.06	1.05	10.75	6.47	7/32	4.69

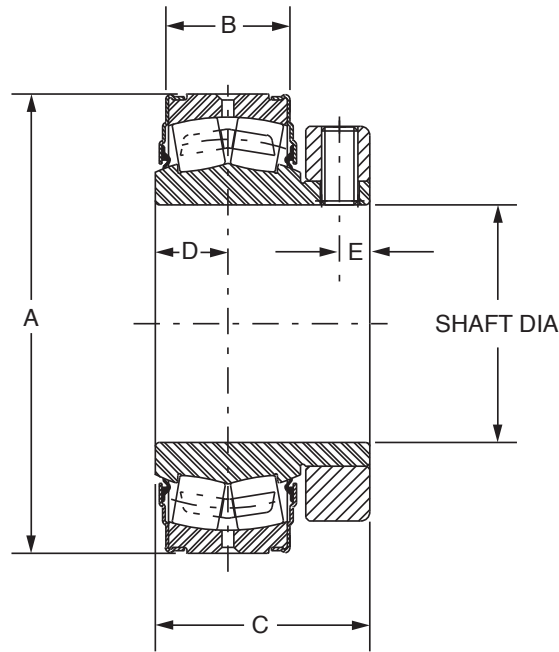
● Dimensions shown are for non-expansion units.

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# DIMENSIONS



## UNISPHERE II Bearing Insert With Seal - Inch



Bearing	Shaft Size Inch Δ	Part No. †	Part Name	Approx. Wt. Lbs.
22208	1-7/16	<b>421243</b>	BRG-UN2-107	1.5
	1-1/2	<b>421244</b>	BRG-UN2-108	1.4
22209	1-11/16	<b>421245</b>	BRG-UN2-111	1.6
	1-3/4	<b>421246</b>	BRG-UN2-112	1.5
22210	1-15/16	<b>421247</b>	BRG-UN2-115	1.8
	2	<b>421248</b>	BRG-UN2-200	1.7
22211	2-3/16	<b>421249</b>	BRG-UN2-203	2.3
	2-7/16	<b>421250</b>	BRG-UN2-207	4.1
22213	2-1/2	<b>421251</b>	BRG-UN2-208	3.9
	2-11/16	<b>421252</b>	BRG-UN2-211	5.6
22215	2-3/4	<b>421253</b>	BRG-UN2-212	5.4
	2-15/16	<b>421254</b>	BRG-UN2-215	4.8
	3	<b>421255</b>	BRG-UN2-300	4.6
22218	3-7/16	<b>421256</b>	BRG-UN2-307	9.2
	3-1/2	<b>421257</b>	BRG-UN2-308	8.6
22220	3-15/16	<b>421258</b>	BRG-UN2-315	12.4
	4	<b>421259</b>	BRG-UN2-400	12.1

† Assembled-to-order size. Consult DODGE for delivery.

Δ Consult DODGE for sizes not listed.

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# DIMENSIONS

## UNISPHERE II Bearing Insert With Seal - Inch

Bearing Reference Guide

E-Family Roller Bearings

Specialty Tapered Products

S-2000

UNISPHERE II

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### UNISPHERE II BEARING INSERT DIMENSIONS

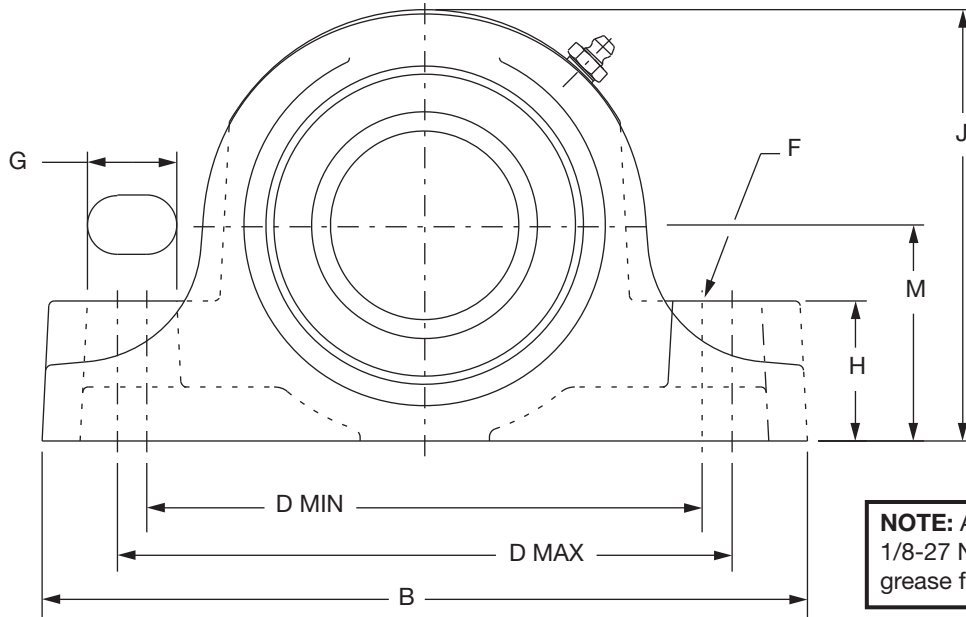
Shaft Size Inch	A	B	C	D	E
1-7/16 1-1/2	3.1496	0.95	1.69	0.56	0.29
1-11/16 1-3/4	3.3465	0.95	1.91	0.58	0.32
1-15/16 2	3.5433	0.95	1.91	0.59	0.32
2-3/16	3.9370	1.03	2.00	0.64	0.32
2-7/16 2-1/2	4.7244	1.27	2.20	0.75	0.32
2-11/16 2-3/4 2-15/16 3	5.1181	1.27	2.45	0.80	0.44
3-7/16 3-1/2	6.2992	1.62	2.86	0.95	0.44
3-15/16 4	7.0866	1.86	3.33	1.09	0.51

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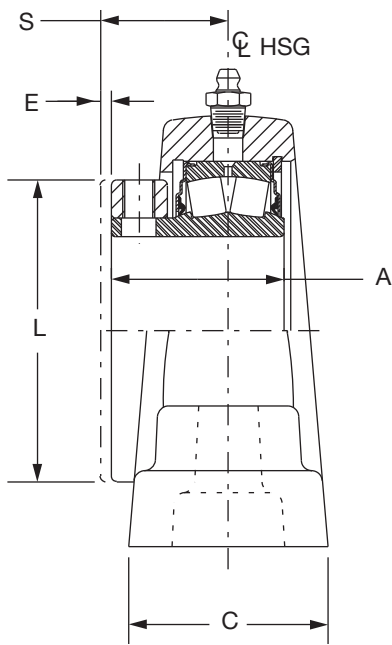
# DIMENSIONS



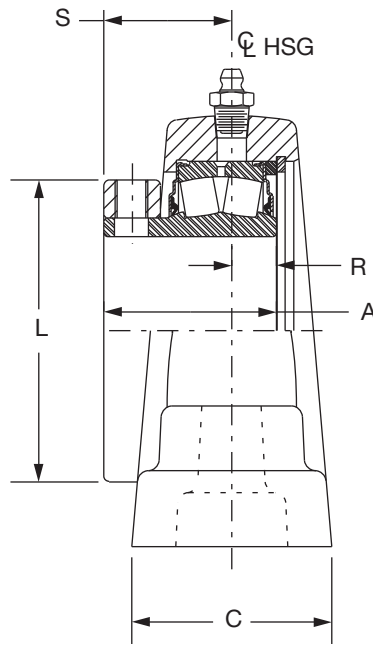
## UNISPHERE II Plummer Block Bearing - Metric



**NOTE:** All sizes use a 1/8-27 NPT hydraulic grease fitting



EXPANSION



NON-EXPANSION

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# DIMENSIONS

## UNISPHERE II Plummer Block Bearing - Metric

Bearing	Shaft Size Δ	Non-Expansion*		Expansion		Approximate Weight Kgs.
		Part No.	Part Name	Part No.	Part Name	
22210	50mm	<b>048109</b>	P2B-UN2-050M	<b>048124</b>	P2B-UN2-050ME	3.4
22211	55mm	<b>048110</b>	P2B-UN2-055M	<b>048125</b>	P2B-UN2-055ME	4.4
22213	60mm	<b>048111</b>	P2B-UN2-060M	<b>048126</b>	P2B-UN2-060ME	6.2
22215	70mm	<b>048113</b>	P2B-UN2-070M	<b>048128</b>	P2B-UN2-070ME	8.6
	75mm	<b>048114</b>	P2B-UN2-075M	<b>048129</b>	P2B-UN2-075ME	8.3
22218	80mm	<b>048115</b>	P2B-UN2-080M	<b>048130</b>	P2B-UN2-080ME	12.9
	85mm	<b>048116</b>	P2B-UN2-085M	<b>048131</b>	P2B-UN2-085ME	12.6

† Assembled to order. Consult DODGE for delivery.

Δ Consult DODGE for sizes not listed.

\* Furnished unless otherwise specified.

### METRIC UNISPHERE II - PLUMMER BLOCK - DIMENSIONS (MM) ●

Shaft Size	A mm	B mm	C mm	D		E Total Exp.	F Bolt Dia.	G mm	H mm	J mm	L mm	M mm	R mm	S mm
				Min.	Max.									
50mm	48	213	52	151	170	3.9	16	27	35	116	83	57.1	12	37
55mm	51	225	59	164	181	3.9	16	26	41	127	89	63.5	13	38
60mm	56	235	65	173	189	4.7	16	25	44	144	103	69.8	17	39
70mm	62	265	65	198	214	4.7	20	29	57	164	120	82.5	19	43
75mm														
80mm	73	330	71	235	273	4.7	22	43	57	190	140	95.2	24	48
85mm														

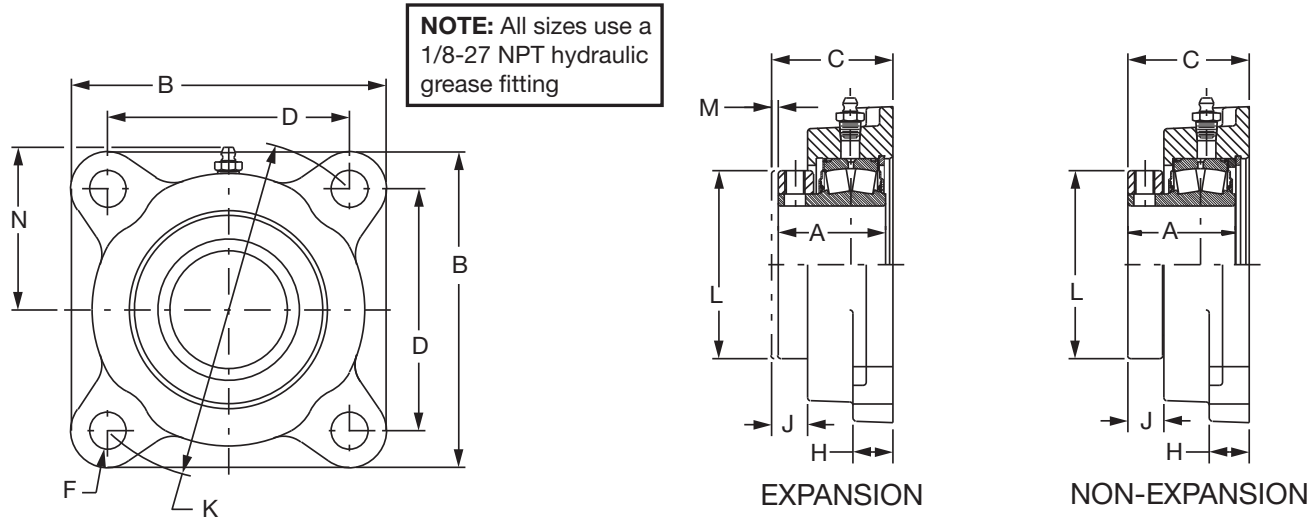
● Dimensions shown are for non-expansion units. The expansion bearing center and housing center are on the same centerline.

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# DIMENSIONS



## UNISPHERE II Flange - Metric 4-BOLT



Bearing	Shaft Size Δ	Non-Expansion*		Expansion		Approx. Wt. Kgs.
		Part No.	Part Name	Part No.	Part Name	
22209	40mm	<b>048202</b>	F4B-UN2-040M	<b>048216</b>	F4B-UN2-040ME	3.1
	45mm	<b>048203</b>	F4B-UN2-045M	<b>048217</b>	F4B-UN2-045ME	3.1
22210	50mm	<b>048204</b>	F4B-UN2-050M	<b>048218</b>	F4B-UN2-050ME	3
22211	55mm	<b>048205</b>	F4B-UN2-055M	<b>048219</b>	F4B-UN2-055ME	3.8
22213	60mm	<b>048206</b>	F4B-UN2-060M	<b>048220</b>	F4B-UN2-060ME	4.8
	65mm	<b>048207</b>	F4B-UN2-065M	<b>048221</b>	F4B-UN2-065ME	4.6
22215	70mm	<b>048208</b>	F4B-UN2-070M	<b>048222</b>	F4B-UN2-070ME	8.2
22218	80mm	<b>048210</b>	F4B-UN2-080M	<b>048224</b>	F4B-UN2-080ME	11.2

Δ Consult DODGE for sizes not listed.  
\* Furnished unless otherwise specified.

### METRIC UNISPHERE II - 4-BOLT FLANGE - DIMENSIONS (mm) ●

Shaft Size	A	B	C	D	F Bolt Dia.	H	J	K	L	M Total Exp.	N
40mm	48	130	55	99	12	19	18	140	76	3.9	70
45mm											
50mm	48	135	55	103	12	18	18	146	82	3.9	73
55mm	51	149	58	114	16	19	17	162	89	3.9	78
60mm											
65mm	56	156	62	121	16	25	16	171	103	3.9	86
70mm	62	183	66	141	20	24	20	200	120	4.7	97
80mm	73	212	78	171	20	30	22	241	140	4.7	109

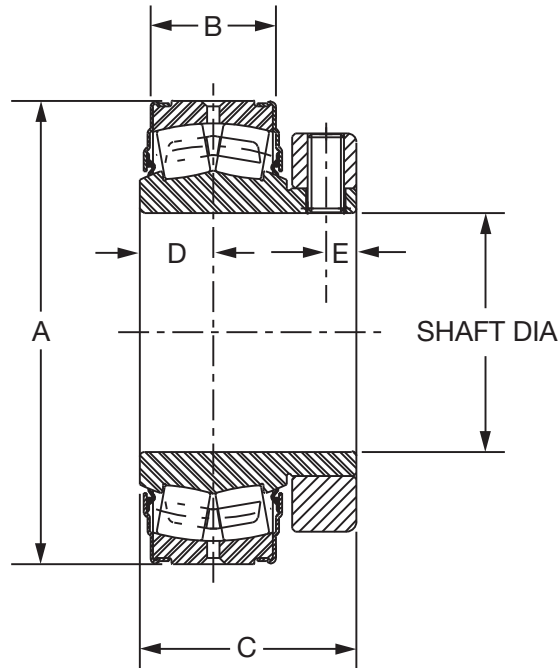
● Dimensions shown are for non-expansion units.

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# DIMENSIONS

## UNISPHERE II Bearing Insert With Seal - Metric



Bearing	UNISPHERE II Bearing Insert W/Seals Metric				UNISPHERE II Bearing Insert Dimensions-Metric					
	Shaft Size Δ	Part No.	Part Name	Approx. Wt. Kgs.	Shaft Size	A mm	B mm	C mm	D mm	E mm
22209	40mm	<b>421362</b>	BRG-UN2-040	0.80	40mm	85	24	48	14.7	7.26
	45mm	<b>421363</b>	BRG-UN2-045	0.70	45mm					
22210	50mm	<b>421364</b>	BRG-UN2-050	0.75	50mm	90	24	48	15.1	8.05
22211	55mm	<b>421365</b>	BRG-UN2-055	1.06	55mm	100	26	51	16.4	8.05
22213	60mm	<b>421366</b>	BRG-UN2-060	1.95	60mm	120	32.2	56	19.0	8.05
	65mm	<b>421367</b>	BRG-UN2-065	1.74	65mm					
22215	70mm	<b>421368</b>	BRG-UN2-070	2.37	70mm	130	32.3	62	20.2	11.2
	75mm	<b>421369</b>	BRG-UN2-075	2.09	75mm					
22218	80mm	<b>421370</b>	BRG-UN2-080	4.54	80mm	160	41.3	73	24.1	11.2
	85mm	<b>421371</b>	BRG-UN2-085	4.20	85mm					
	90mm	<b>421372</b>	BRG-UN2-090	3.90	90mm					

Δ Consult DODGE for sizes not listed.

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# NOTES



Bearing Reference  
Guide

E-Family Roller  
Bearings

Specialty Tapered  
Products

S-2000

UNISPHERE II

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