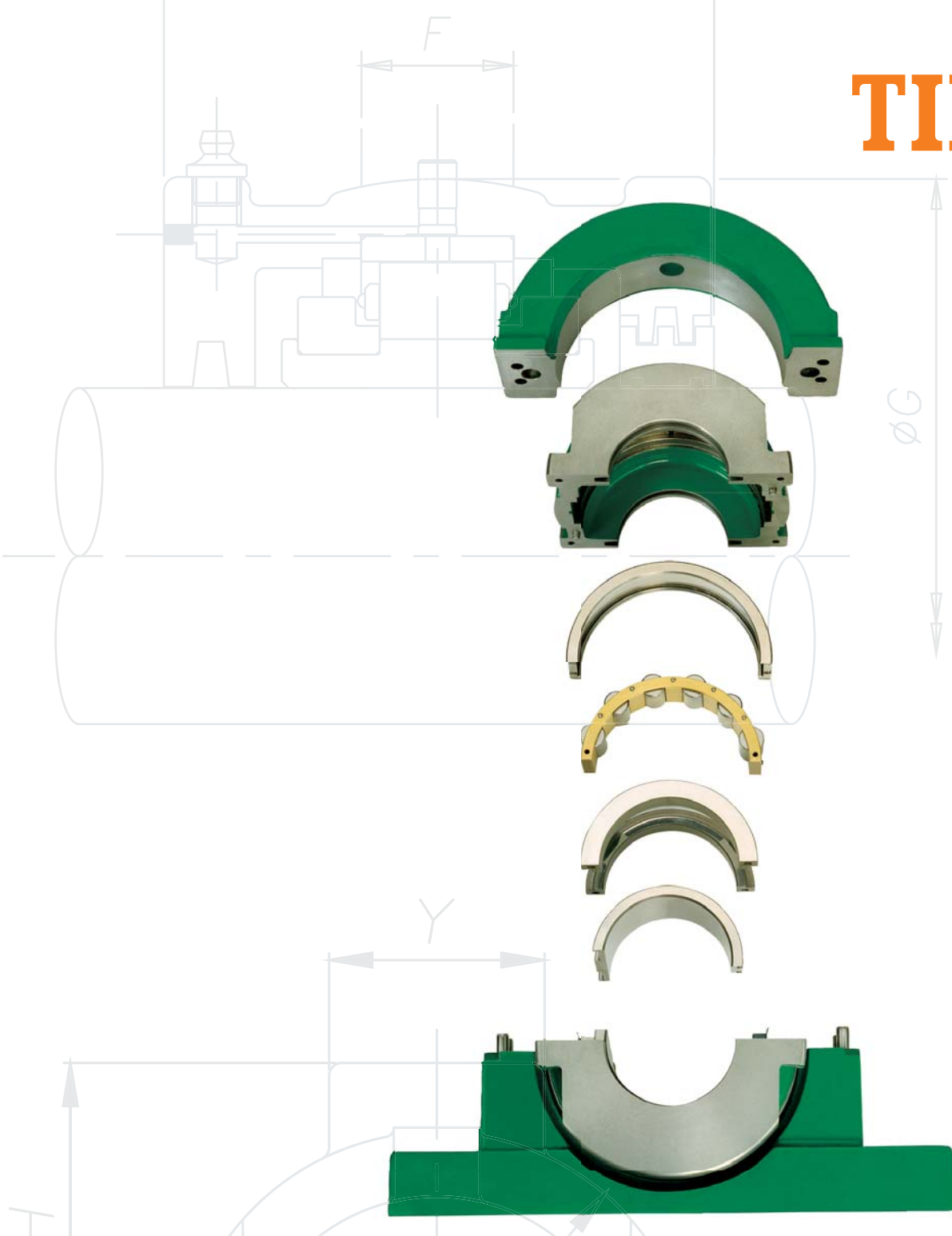
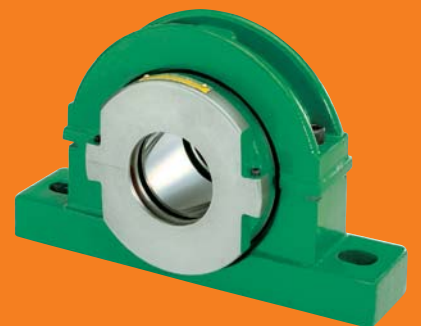


TIMKEN



TIMKEN® SPLIT CYLINDRICAL ROLLER BEARING HOUSED UNIT CATALOG



ABOUT THE TIMKEN COMPANY

As a global leader in bearings and power transmission systems, Timken focuses on precise solution design, materials and craftsmanship to deliver reliable and efficient performance that improves productivity and uptime. Timken offers a full range of bearings, belts, chains, couplings, gears and lubricants, along with rebuild and repair services. Timken (NYSE; TKR; www.timken.com) applies its proven expertise in metallurgy, tribology and mechanical power transmission to create innovative approaches to customers' complex needs. Global availability of products and engineering talent, combined with exceptional service delivery across markets, makes Timken a preferred choice worldwide.

To view more Timken catalogs, go to www.timken.com/catalogs for interactive versions, or to download our catalog app to your smartphone or mobile device.



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TAKING THE INITIATIVE

In today's demanding industrial environment, specialist technology is, more than ever, key to improved efficiency, productivity and ultimately profitability. Timken is increasingly seen as a product brand, that routinely challenges technological boundaries.

Rapid response and flexibility result from a production facility manufacturing not only split cylindrical roller bearing assemblies but also cutting edge products for aerospace and railway. The unique relationship between manufacturer and distributors combined with innovative cellular manufacturing and modular stocking offer unparalleled availability.

From concept to design, design to production, and then throughout the life cycle of the unit, no other split bearing manufacturer works so hard to exceed your expectations.

PERFORMANCE

Timken products are designed and developed to maximize service life and minimize maintenance effort.

Timken bearings have machined brass cages with unique single-piece clips as standard; rolling elements are profiled to minimize damaging edge stresses and provide optimum rolling contact.

All supports and housings incorporate pry slots and doweled machined joints for easy separation. Supports are manufactured from high-strength cast iron and feature double webs and thick sections. Product life is thus enhanced due to high rigidity and inherent strength.

INNOVATION IN SERVICE

Producing products that push the boundaries of performance is only the beginning. Timken recognizes that users and specifiers of split cylindrical roller bearings demand logistical, technical and after-sales support.

Experienced application engineering support assists customers with concepts through consultation, commissioning, training, supply and post installation support.

Regional inventory provides excellent availability of product in the right place at the right time.



INNOVATION IN APPLICATION

The benefits of totally split-to-the-shaft bearing assemblies are long-established; subsequent savings in production and maintenance are well documented.

However, split cylindrical roller bearings are today being selected for an even wider range of applications. Additional sealing options allow our bearings to run at higher speeds and temperatures in increasingly more hostile environments.

Optimization of plant efficiency is the goal of today's maintenance engineer. The application of reliable products offering real savings is derived from increased mean time between failures. This widens periods between planned shutdowns and also eliminates unplanned downtime when utilizing advanced components accommodating split options.

ADVANTAGES OF SPLIT CYLINDRICAL ROLLER BEARING HOUSED UNITS

Split cylindrical roller bearings are essential in applications involving limited access and are highly cost effective by reducing down time and production losses during change-outs.

Split cylindrical roller bearings are completely split to the shaft. Installation and inspection times are therefore dramatically less than for solid bearings. Additionally, the time saved and costs eliminated by not having to remove ancillary equipment results in even higher potential savings.

INSPECTION SIMPLIFIED

No matter what the size or type of split cylindrical roller bearing, inspection is straightforward. Simply remove the support cap and the top half of the housing and all bearing parts become visible and accessible.

SHORT TERM PAYBACK, LONG TERM BENEFITS

Though it would be easy to cite examples where the use of split bearings results in spectacular savings, significant savings can be seen in almost any trapped application. Even modest savings can be enough to justify the use of split bearings. Depending on the application, down times for replacement of split bearings can be a small fraction of those required for solid bearings. This yields savings in both maintenance work-hours and lost production.

When such cost savings are taken into account at the bearing selection stage, it's easy to make the case for choosing Timken split cylindrical roller bearings.

FURTHER SAVINGS

Anywhere Timken bearings are used to replace other split bearing brands, the potential for savings exists. Through the use of machined brass cages as standard, inclusion of profiled rolling elements and the incorporation of high-grade materials for housings and supports, Timken bearings have the capability to extend service life leading to a reduction in bearing consumption.



FEATURES AND BENEFITS

TABLE 1. SPLIT CYLINDRICAL ROLLER BEARING HOUSED UNIT FEATURES AND BENEFITS

Features	Benefits
All components are totally split to the shaft	Quick and easy installation. Substantial reduction in downtime compared to replacement of solid bearings
Support caps and housing halves are quickly removed	Easy visual inspection to assess the condition of the bearing (during planned maintenance)
Replacement bearing interchangeability with existing housing	Simple and economic bearing replacement
Unit accommodates initial misalignment	Simplifies installation of associated equipment
Machined brass cage as standard	Enhanced ability to accommodate higher speeds and temperatures
Innovative cage clip design	Clips retained on one cage half during assembly and disassembly
ASTM 48A – Grade 35 Cast Iron	Strength and durability
Profiled rolling elements	Minimizes damaging edge stresses



HOW TO USE THIS CATALOG

We designed this catalog to help you find the Timken bearings best suited to your equipment needs and specifications.

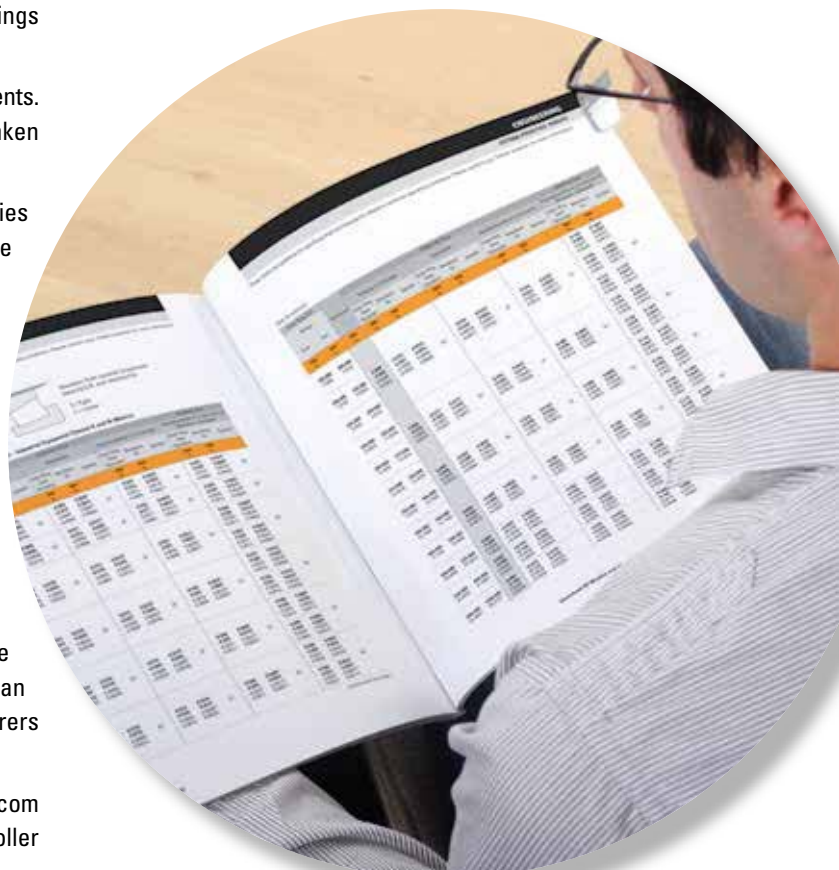
The product tables list split bearing housed units and components. For other bearing types, please refer to the respective Timken product catalog reference.

Timken offers an extensive range of bearings and accessories in both imperial and metric sizes. For your convenience, size ranges are indicated in millimeters and inches. Contact your Timken engineer to learn more about our complete line for the special needs of your application.

This publication contains dimensions, tolerances and load ratings, as well as engineering sections describing mounting and fitting practices for shafts and housings, internal clearances, materials and other bearing features. It provides valuable assistance in the initial consideration of the type and characteristics of the bearings that may best suit your particular needs.

ISO and ANSI/ABMA, as used in this publication, refer to the International Organization for Standardization and the American National Standards Institute/American Bearing Manufacturers Association.

Updates are made periodically to this catalog. Visit www.timken.com for the most recent version of the Timken Split Cylindrical Roller Bearing Housed Unit Catalog.



SHELF LIFE AND STORAGE OF GREASE-LUBRICATED BEARINGS AND COMPONENTS

To help you get the most value from our products, Timken provides guidelines for the shelf life of grease-lubricated ball and roller bearings, components and assemblies. Shelf life information is based on Timken and industry test data and experience.

SHELF LIFE

Shelf life should be distinguished from lubricated bearing/component design life as follows:

- Shelf life of the grease-lubricated bearing/component represents the period of time prior to use or installation.
- The shelf life is a portion of the anticipated aggregate design life. It is impossible to accurately predict design life due to variations in lubricant bleed rates, oil migration, operating conditions, installation conditions, temperature, humidity and extended storage.
- Shelf life values, available from Timken, represent a maximum limit and assume adherence to the storage and handling guidelines suggested in this catalog or by a Timken associate. Deviation from the Timken storage and handling guidelines may reduce shelf life. Any specification or operating practice that defines a shorter shelf life should be used.

Timken cannot anticipate the performance of the grease lubricant after the bearing or component is installed or placed in service.

TIMKEN IS NOT RESPONSIBLE FOR THE SHELF LIFE OF ANY BEARING/COMPONENT LUBRICATED BY ANOTHER PARTY.

SPLIT CYLINDRICAL ROLLER BEARING HOUSED UNITS ARE NOT SHIPPED PRE-GREASED.

EUROPEAN REACH COMPLIANCE

Timken lubricants, greases and similar products sold in stand alone containers or delivery systems are subject to the European REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) directive. For import into the European Union, Timken can sell and provide only those lubricants and greases that are registered with ECHA (European Chemicals Agency). For further information, please contact your Timken engineer.



STORAGE

Timken suggests the following storage guidelines for our finished products (bearings, components and assemblies, referred to as “products”):

- Unless directed otherwise by Timken, products should be kept in their original packaging until they are ready to be placed into service.
- Do not remove or alter any labels or stencil markings on the packaging.
- Products should be stored in such a way that the packaging is not pierced, crushed or otherwise damaged.
- After a product is removed from its packaging, it should be placed into service as soon as possible.
- When removing a product that is not individually packaged from a bulk pack container, the container should be resealed immediately after the product is removed.
- Do not use product that has exceeded its shelf life as defined in the Timken shelf life guidelines statement.
- The storage area temperature should be maintained between 0° C (32° F) and 40° C (104° F); temperature fluctuations should be minimized.
- The relative humidity should be maintained below 60 percent and the surfaces should be dry.
- The storage area should be kept free from airborne contaminants such as, but not limited to, dust, dirt, harmful vapors, etc.
- The storage area should be isolated from undue vibration.
- Extreme conditions of any kind should be avoided.

Due to the fact that Timken is not familiar with your particular storage conditions, we strongly suggest following these guidelines. However, you may be required by circumstances or applicable government requirements to adhere to stricter storage requirements.

Most bearing components typically ship protected with a corrosion-preventive compound that is not a lubricant. These components may be used in oil-lubricated applications without removal of the corrosion-preventive compound. When using some specialized grease lubrications, we advise you to remove the corrosion-preventive compound before packing the bearing components with suitable grease.

When you receive a bearing or housed unit shipment, do not remove products from their packaging until they are ready for mounting so they do not become corroded or contaminated.

Store bearings and housed units in an appropriate atmosphere so they remain protected for the intended period.

WARNINGS



WARNING

Failure to observe the following warnings could create a risk of death or serious injury.

Proper maintenance and handling practices are critical. Always follow installation instructions and maintain proper lubrication.

Overheated bearings can ignite explosive atmospheres. Special care must be taken to properly select, install, maintain, and lubricate housed unit bearings that are used in or near atmospheres that may contain explosive levels of combustible gases or accumulations of dust such as grain, coal, or other combustible materials.

Never spin a bearing with compressed air. The components may be forcefully expelled.



CAUTION

Failure to follow these cautions may result in property damage.

Do not use damaged housed units.

When fitting the inner ring there should be an equal gap at each joint. If there are no gaps do not proceed.

Warnings for this product line are in this catalog and posted on <http://www.timken.com/legal-notice/>

NOTE

Do not use excessive force when mounting or dismantling the unit.

Follow all tolerance, fit, and torque recommendations.

Ensure proper alignment.

Never weld housed units.

Do not heat components with an open flame.

Do not operate at bearing temperatures above 121° C (250° F).

Never interchange components between completed bearing assemblies.

Never use a hammer and steel bar on a bearing for installation or removal. Use only a brass bar or a soft-headed mallet.

Consult your equipment designer or supplier for installation and maintenance instructions.

Never use steam or hot water when cleaning the bearings because these methods can create rust or corrosion.

Never expose any surface of a bearing to the flame of a torch.

Do not heat bearing beyond 149° C (300° F).

DISCLAIMER

This catalog is provided solely to give you analysis tools and data to assist you in your product selection. Product performance is affected by many factors beyond the control of Timken. Therefore, you must validate the suitability and feasibility of all product selections.

Timken products are sold subject to the Timken terms and Conditions of Sale, which include our limited warranty and remedy. You can find these at <https://www.timken.com/legal-notice/termsandconditionsofsale/>.

Please consult with your Timken engineer for more information and assistance. Every reasonable effort has been made to ensure the accuracy of the information in this writing, but no liability is accepted for errors, omissions or for any other reason.



ENGINEERING

The following topics are covered within this section:

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STANDARD UNIT ANATOMY

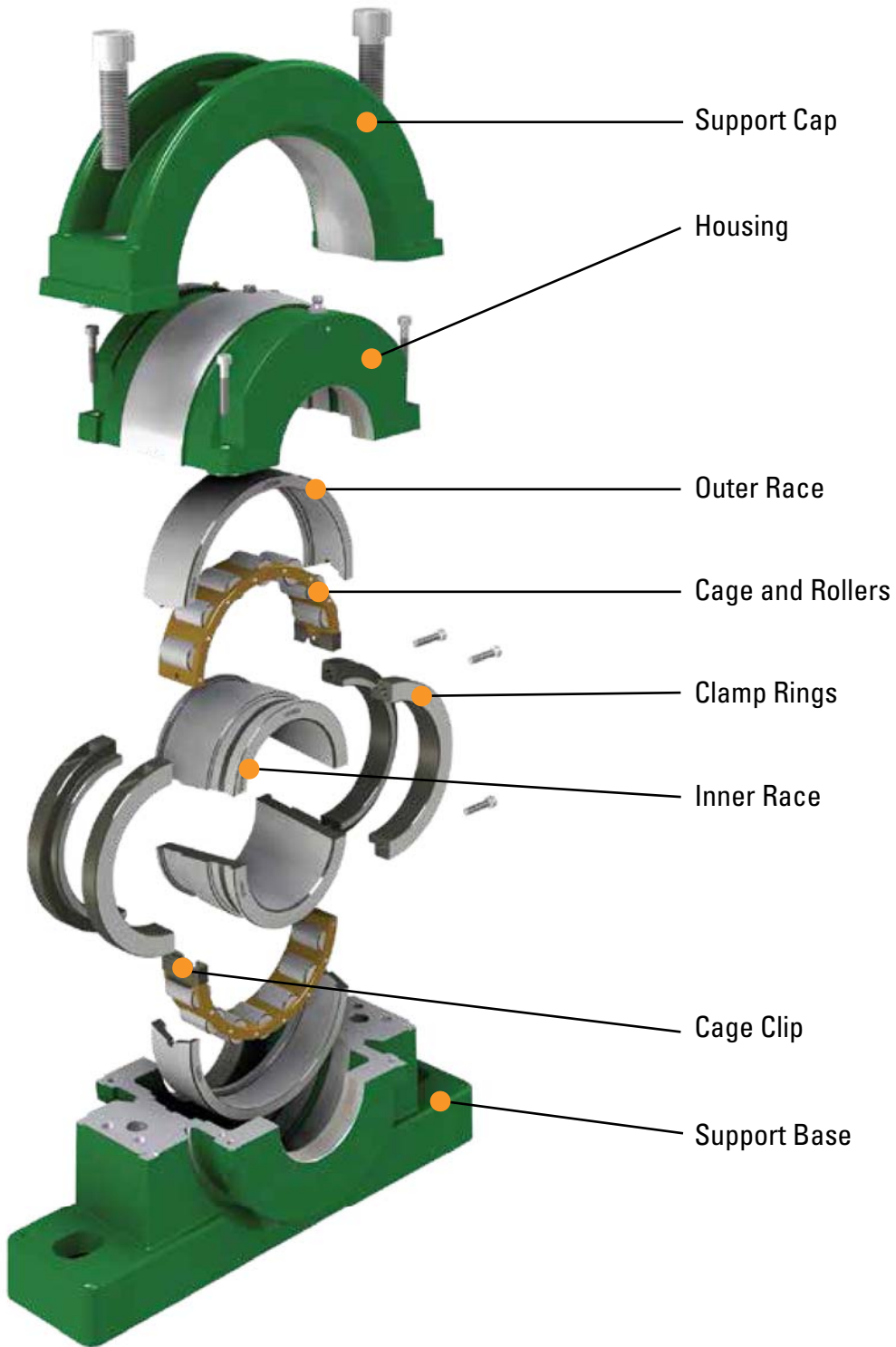


Fig. 1. Standard unit anatomy.

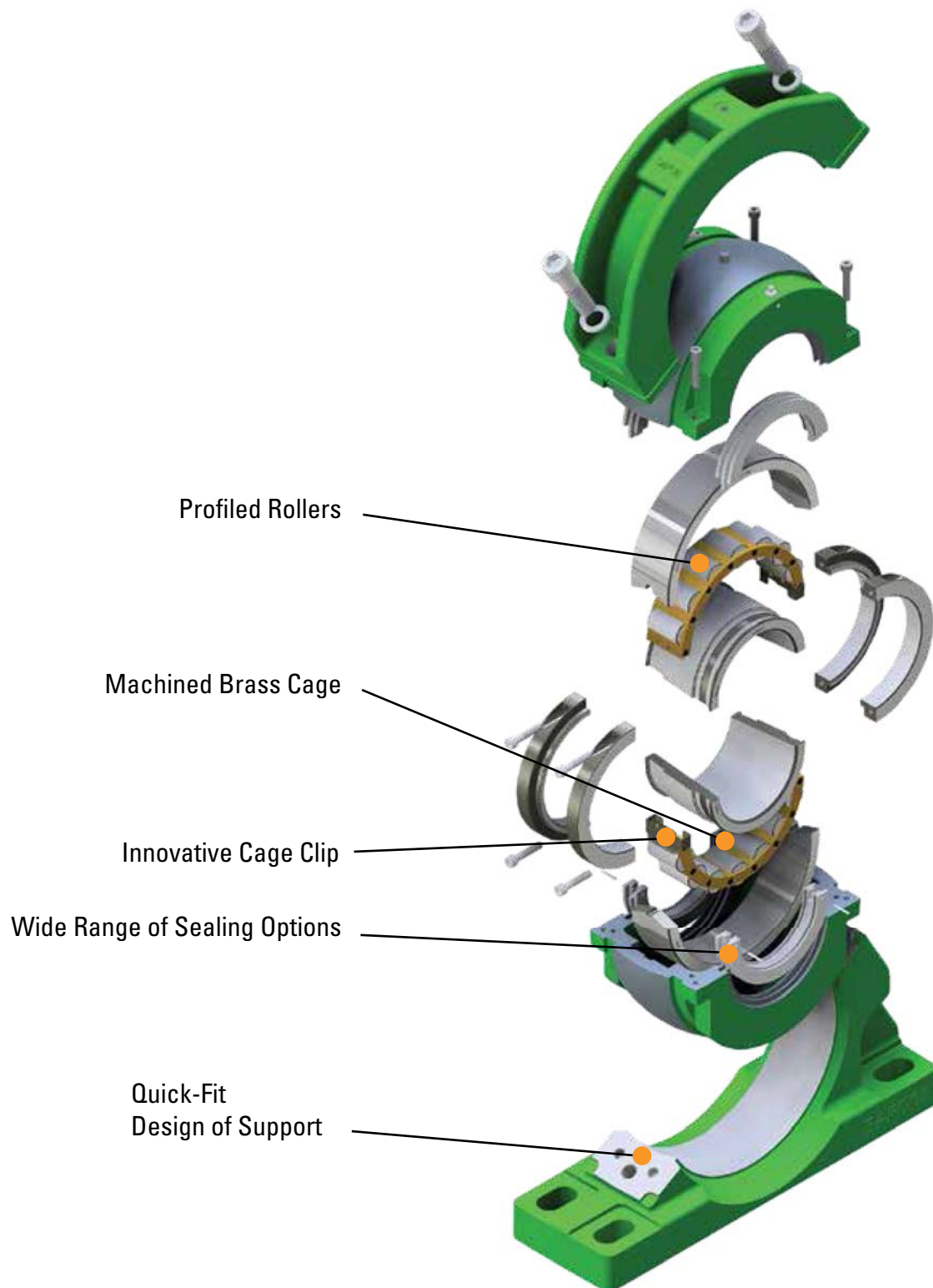
TECHNICAL FEATURES

Fig. 2. Technical features.

INDUSTRY APPLICATIONS

TABLE 2. APPLICATIONS

Application	Target Markets													
	Bulk Terminals	Cement & Aggregate	Construction Materials	Food & Beverage	Forest Products & Timber	Grains & Malts	Metals	Marine	Mining & Quarrying	Power Generation	Pulp & Paper	Refining & Petrochem	Sugar	Water Treatment
Ancillary Equipment														
Crankshafts		X					X		X					
Fans & Blowers		X	X	X	X	X	X		X	X	X		X	
Gearboxes & Transmissions	X	X		X	X	X	X		X	X	X		X	
Heat Exchangers										X				
Motors		X					X		X	X	X			
Pumps & Pump Drives		X						X	X	X				X
Mechanical Handling														
Continuous Casters							X							
Conveyors	X	X	X	X	X	X	X		X	X	X		X	
Cooling Beds							X							
Elevators	X	X	X				X						X	
Line Shafting			X				X				X			
Lumber Tables & Stackers					X						X			
Overhead Cranes			X				X				X			
Screw Conveyors		X	X			X				X	X	X		X
Bucket Wheels	X						X		X	X				
Stacker Reclaimers	X						X		X	X				
Process Equipment														
Ball Mill Drives		X	X				X		X	X				
Ball Mill Trunnions		X	X				X		X	X				
Cane Knives & Slicers													X	
Crushers		X	X				X		X	X				
Drum Drier Trunnions		X										X	X	
Dryer Rolls											X			
Kiln & Mill Carrier Rollers		X							X				X	
Kiln & Mill Drives		X										X	X	
Mixer Drives		X	X	X		X					X	X		
Press Rolls			X								X			
Rotary Screens											X			X
Shredders									X	X			X	
Sugar Diffuser Drives													X	
Sugar Diffuser Under Rolls													X	
Washers		X		X				X			X		X	
Other Applications														
Hydro Electric Turbines										X				
Rotary Biological Contactors														X
Mine Winders										X				
Marine Propulsion Shafts								X						
Water Treatment Screens											X			X
Water Treatment Aerators														X

NOMENCLATURE

In order to provide our customers with clear and concise labeling, Timken has endeavored to keep things simple when creating references. The following should cover the majority of ordering

situations however, as always, your local Timken engineer will be pleased to provide further assistance if required.

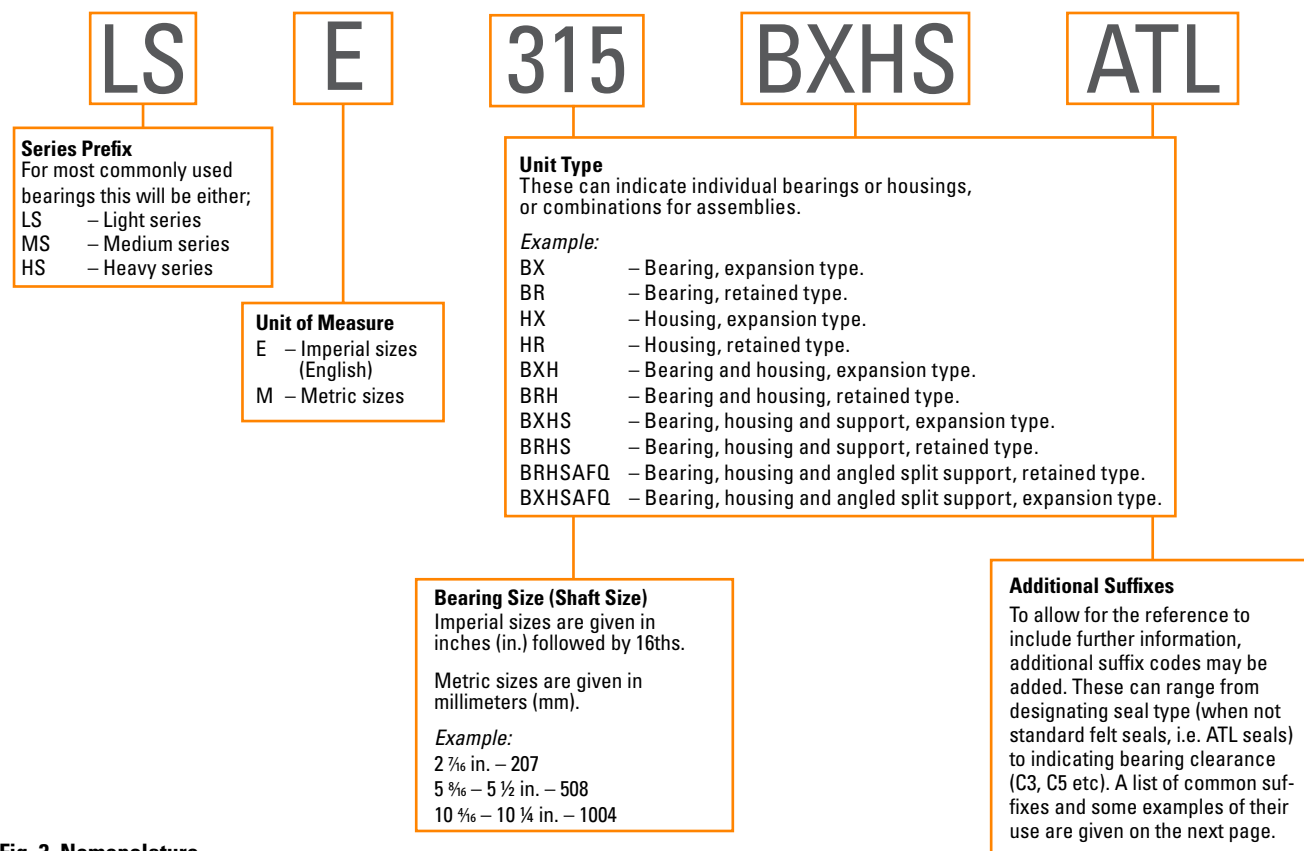


Fig. 3. Nomenclature.

For Triple Labyrinth (ATL) style housings and seals see pages 32-34.

Typical Examples

LSE108BXHATL

Light series 1 ¹/₂ in. bearing with housing and ATL seals.

LSE407BR

Light series 4 ⁷/₁₆ in. bearing retained.

MSE200BXHSATL

Medium series 2 in. expansion bearing with housing and with ATL seals.

LSE700BXHSAFQATL

Light series 7 in. bearing, housing and angled split support retained type with ATL seals.

MSE815BRHKS

Medium series 8 ¹⁵/₁₆ in. bearing, housing and support, retained type with Kevlar® seals.

LSE315BXHSATL

Light series 3 ¹⁵/₁₆ in. bearing, housing and support, expansion type with ATL seals.

QUICK REFERENCE TABLES

TABLE 3. SERIES PREFIXES

Series Prefixes	
LSE	Light series imperial
LSM	Light series metric
MSE	Medium series imperial
MSM	Medium series metric
HSE	Heavy series imperial
HSM	Heavy series metric
XSE	Tubular strander series imperial
XSM	Tubular strander series metric
CCE	Water cooled series imperial
CCM	Water cooled series metric

TABLE 4. UNIT TYPE REFERENCES

Unit Type References	
BX	Expansion bearing
BR	Retained bearing
HX	Expansion housing
HR	Retained housing
HG	Hanger support
BXH	Expansion bearing with housing
BRH	Retained bearing with housing
BXHG	Expansion bearing with hanger
BXHS	Expansion bearing with housing and support
BRHS	Retained bearing with housing and support
BXHF	Expansion bearing with housing and flange
BRHF	Retained bearing with housing and flange
BXHTT	Expansion bearing with housing and tension type take up
BRHTT	Retained bearing with housing and tension type take up
BXHTP	Expansion bearing with housing and pull type take up
BRHTP	Retained bearing with housing and pull type take up

TABLE 5. ADDITIONAL SUFFIXES

Examples of Additional Suffixes	
F	Axial float
AP	Air purge
ATL	Aluminium triple labyrinth
BEM	Base ends machined
BL	Brass label
BOEC	Bolt-on end cover
C2, C3, C5	Bearing clearance (ISO)
CH	Inner race bore chamfer with size e.g. CH6mm, CH11mm
E0302	Specifications for marine applications
EC	End cover
ECTL	End cover for triple labyrinth bore
ES	Electrical specification
FC	Full compliment of rollers
GE	Grease escape
HTPS	High temperature packing seal
LSR	Laminar seal rings
OB	Overbored with size e.g. OB160mm
OTL	Overbored triple labyrinth seal
RSS	Nitrile single lip seal
S1, S2, S3	Designation for tempered bearings (ISO)
SF0	Swivel fit, zero clearance
SLO	Single lipped outer
SLUB	Spherical lubrication
SNQ	SN angled split
TE	Temperature probe hole
WSRP	Single lip seal with garter spring and retaining plate
XAR	Extended antirotation pin

TABLE 6.

Light Series					
in.	mm	Support	Flange	Take Ups	
1 3/16 to 1 1/2	35 to 40	S01	F01	TT01	TP01
1 1/16 to 2	45 to 50	S02	F02	TT02	TP02
2 3/16 to 2 1/2	60 to 65	S03	F03	TT03	TP03
2 1/16 to 3	70 to 75	S04	F04	TT04	TP04
3 3/16 to 3 1/2	80 to 90	S05	F05	TT05	TP05
3 1/16 to 4	100 to 105	S06	F06	TT06	TP06
4 3/16 to 4 1/2	110 to 115	S07	F07	TT07	TP07
4 1/16 to 5	120 to 130	S08	F08	TT08	TP08
5 3/16 to 5 1/2	135 to 140	S09	F09	TT09	TP09
5 1/16 to 6	150 to 155	S10	F10	TT10	TP10
6 7/16 to 6 1/2	160	S11	F11	–	–
6 1/16 to 7	170 to 180	S12	F12	–	–
7 1/4 to 8	190 to 200	S13	F13	–	–
8 1/2 to 9	220 to 230	S14	F14	–	–
9 1/2 to 10	240 to 250	S15	F15	–	–
10 1/2 to 11	260 to 280	S16	F16	–	–
11 1/2 to 12	300	S17	–	–	–
12 1/2 to 13	320 to 330	S18	–	–	–
14	340 to 350	S19	–	–	–
15	360 to 380	S20	–	–	–
16	400	S21	–	–	–
17	420	S22	–	–	–
18	440 to 460	S23	–	–	–
19	480	S24	–	–	–
20	500	S25	–	–	–
21	530	S26	–	–	–
22	560	S27	–	–	–
23	580	S28	–	–	–
24	600	S29	–	–	–

TABLE 7.

Medium Series					
in.	mm	Support	Flange	Take Ups	
–	–	–	–	–	–
1 1/16 to 2	45 to 50	S03	F03	TT03	TP03
2 3/16 to 2 1/2	60 to 65	S04	F04	TT04	TP04
2 1/16 to 3	70 to 75	S05	F05	TT05	TP05
3 3/16 to 3 1/2	80 to 90	S06	F06	TT06	TP06
3 1/16 to 4	100 to 105	S07	F07	TT07	TP07
4 3/16 to 4 1/2	110 to 115	S08	F08	TT08	TP08
4 1/16 to 5	120 to 130	S10	F10	TT09	TP09
5 3/16 to 5 1/2	135 to 140	S30	F30	TT30	TP30
5 1/16 to 6	150 to 155	S31	F31	TT31	TP31
6 7/16 to 6 1/2	160 to 170	S32	F32	–	–
6 1/16 to 7	180	S33	F33	–	–
7 1/4 to 8	190 to 200	S34	F34	–	–
8 1/2 to 9	220 to 230	S35	F35	–	–
9 1/2 to 10	240 to 260	S36	F36	–	–
10 1/2 to 11	280	S37	F37	–	–
11 1/2 to 12	300	S38	F38	–	–
12 1/2 to 13	320 to 330	S39	–	–	–
14	340 to 360	S40	–	–	–
15	380	S41	–	–	–
16	400	S42	–	–	–
17	420	S43	–	–	–
18	440 to 460	S44	–	–	–
19	480	S45	–	–	–
20	500	S46	–	–	–
21	530	S47	–	–	–
22	560	S48	–	–	–
23	580	S49	–	–	–
24	600	S50	–	–	–

TABLE 8.

Heavy Series			
in.	mm	Support	Flange
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
3 1/16 to 4	100 to 105	S54	F54
4 3/16 to 4 1/2	110 to 120	S55	F55
4 1/16 to 5	125 to 130	S56	F56
5 3/16 to 5 1/2	135 to 140	S57	F57
5 1/16 to 6	150 to 155	S58	F58
6 7/16 to 6 1/2	160 to 170	S59	F59
6 1/16 to 7	180	S60	F60
7 1/4 to 8	190 to 200	S61	F61
8 1/2 to 9	220 to 230	S62	F62
9 1/2 to 10	240 to 260	S63	F63
11	280	S83	F64
12	300	S65	F65
13	320 to 330	S66	–
14	340 to 360	S86	–
15 to 16	380 to 400	S68	–
–	–	–	–
17	420 to 440	S89	–
18	460	S90	–
19	480	S94	–
20	500	S94	–
21	530	S94	–
22	560	S94	–
23	580	S95	–
24	600	S95	–

BEARING TYPES

RETAINED-TYPE BEARINGS (BR)

This bearing has integral flanges on the outer race to provide a surface for axial load. This axial load is accommodated on the inner race via the hardened clamp rings, which both align the inner race halves and provide roller guidance. In larger bearings the inner race is manufactured with integral ribs for roller guidance and axial load.



Fig. 4. Retained-type bearings (BR).

This type of bearing will locate the shaft axially as well as provide a means for taking axial load. The retained outer race must be fixed sideways against one of the housing groove shoulders using the pins and screws provided. Only one retained unit should be mounted on any particular shaft. Additional care should be taken when mounting split cylindrical roller bearing unit on shafts using other, non-split types of bearings (ball, cylindrical and spherical roller, etc.) to ensure there are no other locating bearings used.

EXPANSION-TYPE BEARINGS (BX)

This bearing is designed for radial loads only. As in the retained type bearing, the rollers are guided on the inner race by the hardened shoulders of the clamping rings.



Fig. 5. Expansion-type bearings (BX).

During expansion or contraction of the shaft, rollers are free to move across the outer race offering virtually no resistance to axial movement. Limits for the amount of axial movement are given in the assembly and maintenance section (pages 36-39).

SUPPORT TYPES

Timken bearings and housings may be mounted in a variety of support units according to the application and loading constraints. A number of variants are available as standard types with other unit types available on request. Timken offers a design and manufacturing facility to produce custom units to cover more specialized applications.

PILLOW BLOCK (SUPPORT) TYPE

This is by far the most popular method for mounting Timken units. These supports are manufactured from high strength, ASTM 48A grade 35 cast iron. This, combined with the robust design, provides a stable, rigid base, allowing the split bearing fitted to give optimum performance.



Fig. 6. Pillow block support type.

FLANGE UNITS

In applications where bearings need to be mounted against horizontal or vertical faces, Timken flange units provide a simple means of achieving this goal. Again, the use of ASTM 48A Grade 35 cast iron ensures a durable unit.



Fig. 7. Flange units.

HANGER UNITS

A compact unit commonly used for supporting screw conveyors or similar equipment.



Fig. 8. Hanger units.

TAKE-UP UNITS

These sliding units can be used to effectively tension conveyor and elevator systems. Both pull and push types are available.



Fig. 9. Take-up units.

SERIES COMPARISON

Timken offers a range of bearing series, providing solutions for a wide range of operating conditions. Light Series, Medium Series and Heavy Series offer an increasing ability to accommodate higher loads. As the series increases the speed capability reduces.

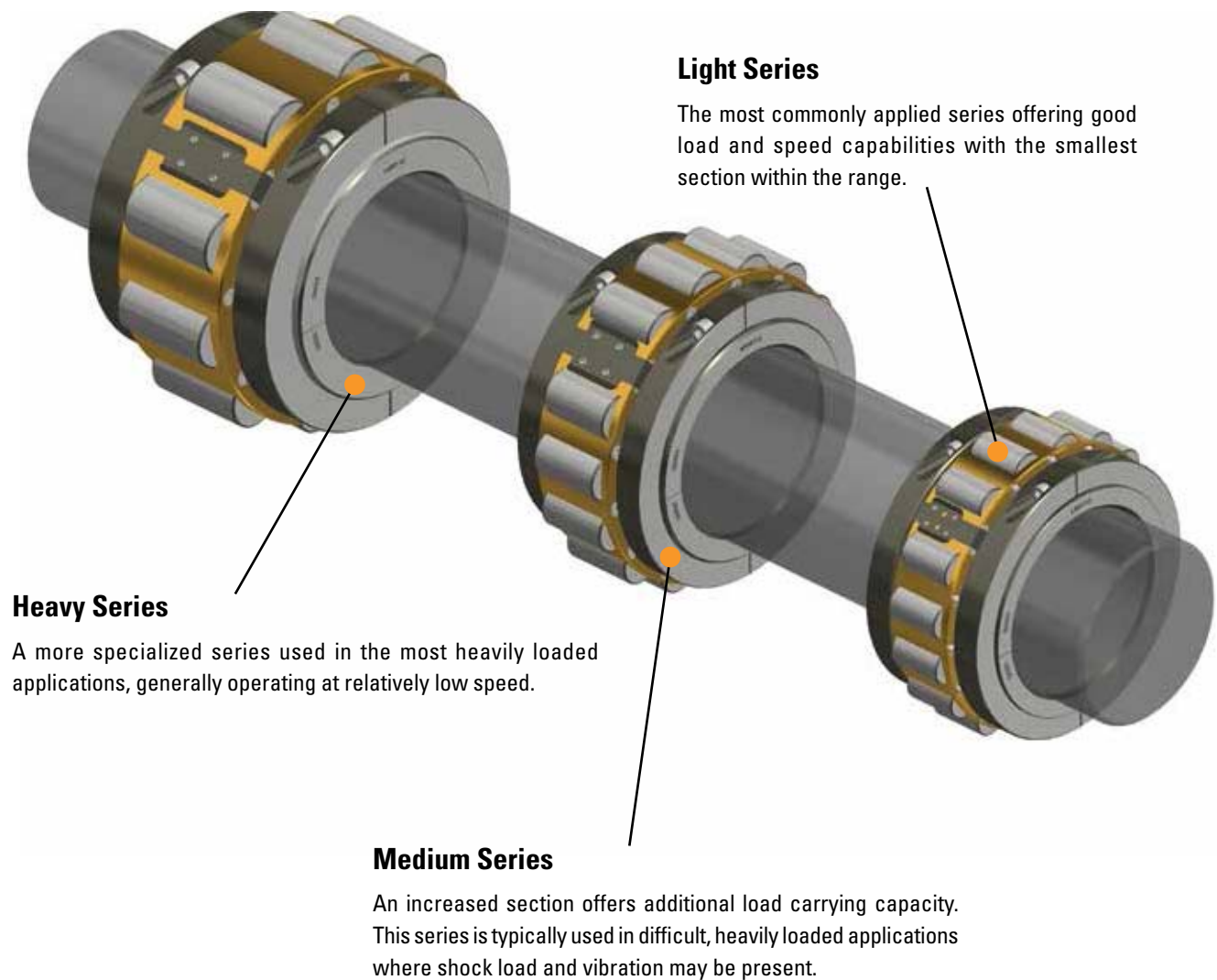


Fig. 10. Series comparison.

BEARING SELECTION

DYNAMIC LOADING

Selection of Timken split cylindrical roller bearings must take into account the effects of both radial and axial loads. These loads must be considered independently of each other.

RADIAL LOAD CONSIDERATIONS

The basic rating life of a bearing can be derived from the formula laid down in ISO 281:2007.

$$L_{10} = (C/P)^{10/3} \text{ (Millions of Revolutions)} \quad - (i)$$

In the majority of cases where the speed remains constant then the life can be expressed in hours from the formula.

$$L_{10}h = \frac{(10^6) \times L_{10}}{60 \times n} \quad - (ii)$$

Substituting – (i)

$$L_{10}h = \frac{(10^6) \times \left(\frac{C}{P}\right)^{10/3}}{60 \times n} \quad - (iii)$$

L_{10} = Basic rating life (90 percent reliability),
10⁶ revolutions

$L_{10}h$ = Basic rating life (90 percent reliability),
hours

C = Bearing dynamic capacity, kN

N = Speed, min⁻¹

P = Equivalent bearing load

This calculation assumes for the load components considered for an individual bearing, that the shaft system is a beam resting on rigid, movement free supports. Elastic deformations in the bearing, housing or machine structure are not taken into account.

EQUIVALENT LOAD “P”

As previously stated radial and axial loads must be considered separately for split cylindrical roller bearings. For the calculation of theoretical life only radial loads are considered.

$F_r =$ RADIAL LOADS

The value of F_r is that calculated from standard mechanical formula, the impact of additional forces resulting from external influences must also be considered.

TABLE 9.

Load Condition	Factor F_z
Steady	1.0 to 1.3
Light shock or out of balance	1.3 to 2.0
Heavy shock or vibration	2.0 to 3.0

$F_z =$ FACTOR

Under the influence of the above conditions.

$P = F_r \times F_z$

The required theoretical bearing life is based upon a number of factors, including reliability, accessibility and service considerations. Generally life values should be as follows:

TABLE 10.

Guide to Life Values	
Machine used intermittently	500 to 2,000 hours
Occasional use	5,000 to 10,000 hours
Normal operation	20,000 to 50,000 hours
Continuous operation	75,000 to 100,000 hours
High reliability	> 100,000

ADJUSTED LIFE CALCULATION

The L_{10} fatigue life calculation is based upon the rating life of a large number of identical bearings expressed as a number of revolutions operating at a constant speed. This rating life is reached or exceeded by 90 percent of these before the first evidence of fatigue appears.

The above definition applies to bearings operating under optimum conditions. Variations in operating conditions will lead to changes in the life of these bearings.

ISO 281 allows for an adjusted life calculation:

$$L_{hna} = a_1 \times a_2 \times a_3 \times L_{10}h$$

Where

L_{hna} = Adjusted life

$L_{10}h$ = Rating life in hours

a_1 = Life adjustment factor, failure probability other than 10 percent

a_2 = Life adjustment factor, material properties

a_3 = Life adjustment factor, operating conditions

a_1 FACTOR

In cases where a failure rate other than 10 percent is required, then an a_1 factor as in the table below should be applied.

TABLE 11.

Adjustment Factor						
Failure Probability %	10	5	4	3	2	1
Factor a_1	1.00	0.62	0.53	0.44	0.33	0.21

a_2 FACTOR

This factor takes into account the material properties.

a_3 FACTOR

The a_3 factor considers all operational parameters that influence fatigue life. The most obvious of these is lubrication. The highest life values are achieved where a state of hydrodynamic lubrication exists, in this state no metal-to-metal contact occurs.

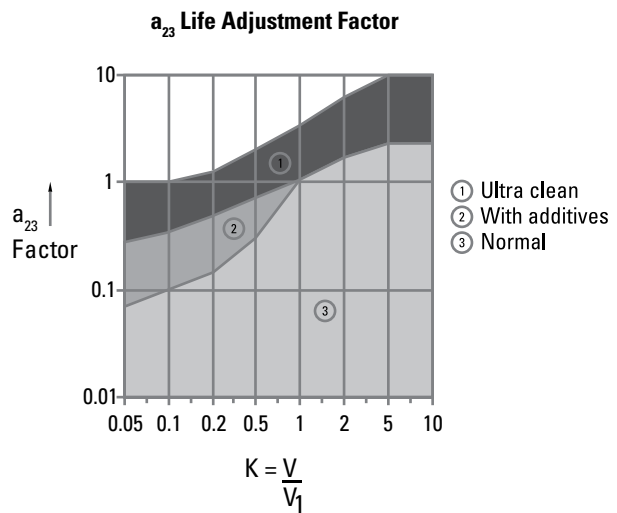
Decreasing effectiveness of lubricant due to decreasing film thickness or effects of contamination will reduce the a_3 factor.

Due to the interrelationships between materials adjustment factor a_2 and operating adjustment factor a_3 , a common factor a_{23} is frequently used.

a_{23} FACTOR

$$a_{23} = a_2 \times a_3$$

The a_{23} factor can be taken from Fig. 11.



V_1 = Rated viscosity (depends on bearing size and operating speed)

V = Operating viscosity (depends on original viscosity and operating temperature)

Fig. 11. Life adjustment factor.

Values for V and V_1 are obtained from the following graphs:

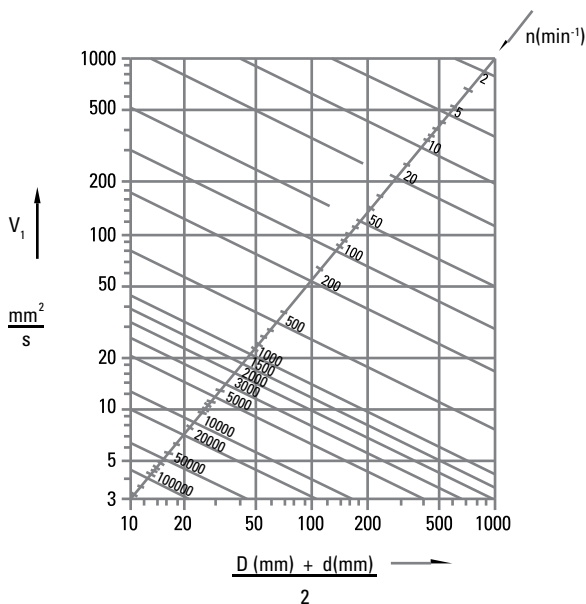


Fig. 12. V and V_1 values.

Where

- D = Bearing outside diameter
- d = Bearing bore
- n = Shaft speed (RPM)

V_1 is then read off the vertical axis.

Using the operating temperature and nominal lubricant viscosity, the value for operating viscosity, V , is read from the horizontal axis.

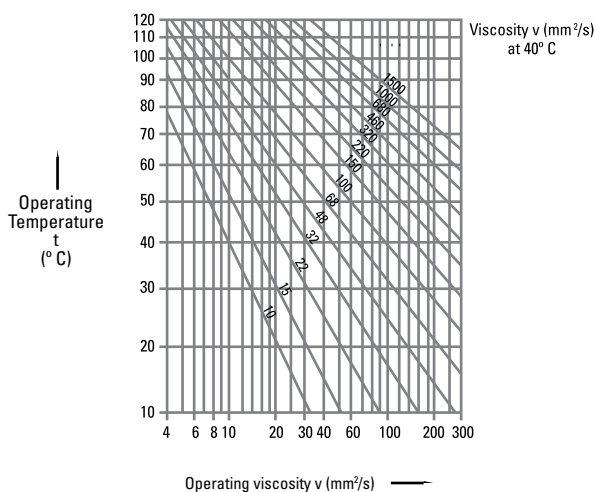


Fig. 13. Operating viscosity.

STATIC LOADING

In situations where bearings rotate slowly (<10 RPM), oscillate slowly, are stationary for prolonged periods or subject to high shock loads, it is important to check that no permanent deformations occur between rolling elements and raceways at peak load.

The basic static load rating is defined in ISO 76:1987 and refers to the contact stress at the centre of the most heavily loaded rolling element/raceway contact area. For roller bearings this value is 4000 Mpa. This will result in a permanent deformation of 0.0001 of the roller diameter.

The required static load rating can be determined from:

$$C_o = F_s \times P_o$$

C_o = Basic static load rating

P_o = Equivalent static load

F_s = Static safety factor

Guidelines for the static safety factor F_s can be found in the table below:

TABLE 12.

Nature of Duty	Requirements for Duty		
	Low	Medium	High
Smooth, no vibration	1.0	1.5	3.0
Normal	1.0	1.5	3.5
Heavy	>2.5	>3.0	>4.0

BEARING RATINGS

TABLE 13. LIGHT SERIES

Shaft (d)		Bearing Ratings			
		Dynamic C _r	Static C _{or}	Axial C _a	Max
mm	in.	kN lb.	kN lb.	kN lb.	RPM
35	1 3/16	65	68	3.20	5400
40	1 1/2	14613	15287	719.38	
45	1 1/16	83	87	3.60	4630
50	2	18659	19558	809.30	
55	2 3/16	103	115	5.40	3940
65	2 1/2	23155	25853	1213.95	
70	2 1/16	138	161	7.60	3310
75	3	31024	36194	1708.53	
80	3 3/16	187	231	12.40	2790
90	3 1/2	42039	51931	2787.59	
100	3 1/16	288	366	16.00	2340
105	4	64745	82280	3596.90	
110	4 3/16	316	427	18.60	1970
115	4 1/2	71040	95993	4181.39	
120	4 1/16	363	496	22.20	1740
130	5	81606	111505	4990.69	
135	5 3/16	422	585	25.80	1570
140	5 1/2	94869	131513	5799.99	
150	5 1/16	459	664	29.40	1450
155	6	103187	149273	6609.30	
160	6 3/16	538	792	33.00	1320
170	6 1/2	120947	178049	7419	
170	6 1/16	524	828	36.40	1220
180	7	117800	186142	8183	
190	7 1/4	614	990	41.00	1070
200	8	138033	222561	9217	
220	8 1/2	708	1168	49.00	930
230	9	159165	262577	11016	
240	9 1/2	744	1289	57.80	820
250	10	167258	289779	12994	
260	10 1/2	848	1502	66.80	730
280	11	190638	337663	15017	
300	11 1/2	929	1665	78.20	650
305	12	208848	374307	17580	
320	12 1/2	920	1674	89.00	590
330	13	206824	376330	20008	
340	14	1022	1965	99.60	540
350		229755	441745	22391	
360	15	1224	2431	110.40	500
380		275166	546511	24819	
400	16	1107	2266	115.60	460
		248864	509417	25988	
420	17	1146	2418	121.00	430
		257631	543588	27202	
440	18	1185	2469	127.20	410
460		266399	555053	28596	
480	19	1348	2965	132.60	380
		303042	666559	29810	
500	20	1392	3139	137.80	360
		312934	705675	30979	
530	21	1431	3316	140.60	340
		321702	745466	31608	
560	22	1472	3490	142.40	330
		330919	784583	32013	
580	23	1616	3841	144.00	310
		363291	863491	32372	
600	24	1660	4033	146.80	300
		373183	906654	33002	

TABLE 14. MEDIUM SERIES

Shaft (d)		Bearing Ratings			
		Dynamic C _r	Static C _{or}	Axial C _a	Max
mm	in.	kN lb.	kN lb.	kN lb.	RPM
-	-	-	-	-	-
45	1 1/16	121	127	6.20	4350
50	2	27202	28551	1394	
55	2 3/16	168	190	8.80	3680
65	2 1/2	37768	42714	1978	
70	2 1/16	258	300	10.60	3080
75	3	58001	67443	2383	
80	3 3/16	297	353	17.80	2520
90	3 1/2	66768	79358	4002	
100	3 1/16	388	491	25.00	2130
105	4	87226	110381	5620	
110	4 3/16	454	592	31.20	1820
115	4 1/2	102063	133087	7014	
120	4 1/16	525	700	38.20	1600
130	5	102063	133087	7014	
135	5 3/16	600	817	45.40	1450
140	5 1/2	134885	183669	10206	
150	5 1/16	730	1034	52.40	1320
155	6	164111	232453	11780	
160	6 3/16	842	1175	61.40	1200
170	6 1/2	189289	264151	13803	
180	6 1/16	927	1357	71.20	1120
	7	208398	305066	16006	
190	7 1/4	1013	1516	80.00	960
200	8	227732	340810	17985	
220	8 1/2	1138	1668	89.80	850
230	9	255833	374981	20188	
240	9 1/2	1354	2117	98.80	750
260	10	304391	475921	22211	
270	10 1/2	1476	2357	113.80	670
280	11	331818	529875	25583	
300	11 1/2	1587	2644	129.00	610
305	12	356772	594395	29000	
320	12 1/2	1723	2922	144.20	550
330	13	387346	656892	32417	
340	14	2029	3403	159.20	500
360		456137	765025	35790	
380	15	1931	3522	174.40	460
		434106	791777	39207	
400	16	2105	3793	188.40	430
		473223	852701	42354	
420	17	2324	4164	202.00	400
		522456	936105	45411	
440	18	2215	4183	216.00	380
460		497952	940376	48559	
480	19	2445	4594	230.00	360
		549658	1032773	51706	
500	20	2453	4923	244.00	340
		551456	1106734	54853	
530	21	2702	5415	258.00	330
		607434	1217340	58001	
560	22	2851	5740	272.00	310
		640930	1290403	61148	
580	23	2982	6173	286.00	300
		670380	1387746	64295	
600	24	2972	6185	300.00	290
		668132	1390443	67443	

Axial load ratings (C_a) assume the use of EP additives or oil lubrication, otherwise use 50 percent of values. Higher loads and speeds may be permissible. Please contact a Timken engineer for more information.

TABLE 15. HEAVY SERIES

Shaft (d)		Bearing Ratings			
		Dynamic C _r	Static C _{0r}	Axial C _a	Max
mm	in.	kN lb.	kN lb.	kN lb.	RPM
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
100	3 11/16	653	783	31.20	1820
105	4	146800	176025	7014	
110	4 3/16	656	801	39.10	1640
120	4 1/2	147475	180072	8790	
125	4 11/16	753	974	49.00	1500
130	5	169281	218964	11016	
135	5 3/16	928	1265	58.80	1340
140	5 1/2	208623	284383	13219	
150	5 11/16	1037	1325	69.40	1220
155	6	233127	297872	15602	
160	6 7/16	1196	1576	79.20	1110
170	6 1/2	268871	354299	17805	
175	6 11/16	1330	1867	89.00	1030
180	7	298996	419718	20008	
190	7 1/4	1597	2285	99.60	880
200	8	359020	513688	22391	
220	8 1/2	1665	2455	109.40	760
230	9	374307	551906	24594	
240	9 1/2	1896	2789	130.80	700
260	10	426238	626992	29405	
280	11	2202	3507	153.00	620
		495029	788405	34396	
300	12	2337	3650	174.40	560
		525379	820553	39207	
320	13	2718	4093	198.80	500
		611031	920143	44692	
340	14	2935	4973	213.60	460
360		659814	1117975	48019	
380	15	3195	5238	250.80	420
400	16	718265	1177550	56382	
–	–	–	–	–	–
420	17	3582	6377	275.80	360
440		805266	1433607	62002	
460	18	3807	6611	302.40	340
		855848	1486212	67982	
–	–	–	–	–	–
500	20	4660	8183	347.00	310
530	21	1047610	1839612	78009	
–	–	–	–	–	–
560	22	4795	9412	382.60	280
		1077959	2115902	86012	
580	23	4951	9451	400	270
600	24	1113029	2124669	89924	

Axial load ratings (C_a) assume the use of EP additives or oil lubrication, otherwise use 50 percent of values. Higher loads and speeds may be permissible. Please contact a Timken engineer for more information.

AXIAL CONSIDERATIONS

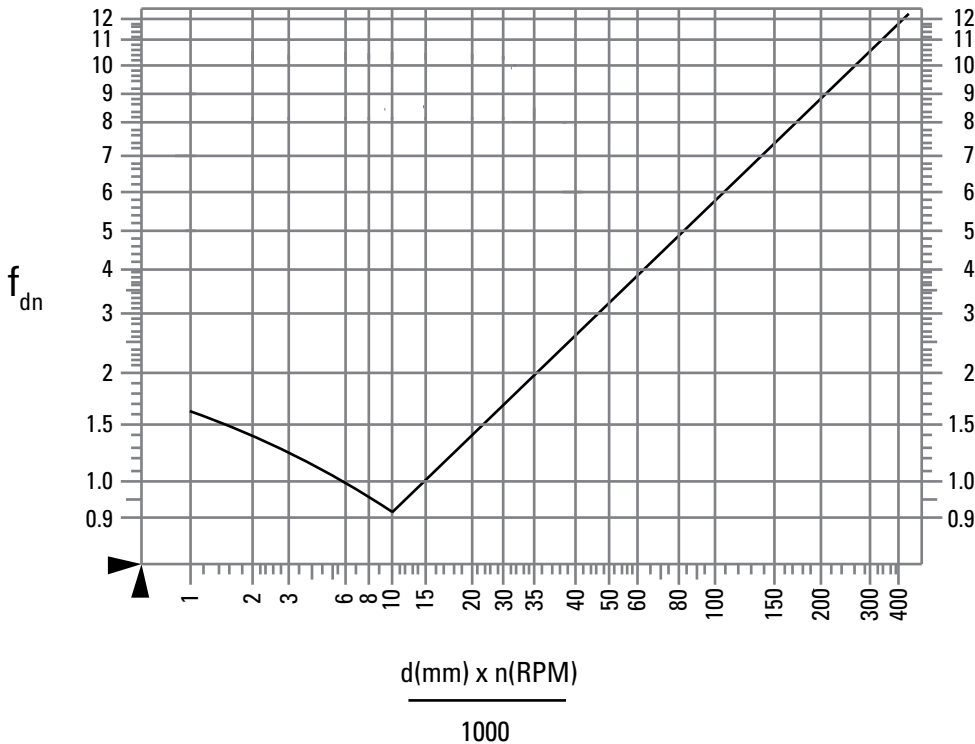
AXIAL LOAD

Bearing selection, on an axial load basis, must be considered independently from the radial load.

1. Calculate the axial loads acting on the bearing.
2. Multiply each load by the appropriate dynamic factor f_z .
3. Combine these loads to determine the effective axial load P_a .
4. Select a bearing having a C_a value greater than the product of $P_a \times f_{dn}$, $d \cdot n$ is the product of the shaft size in millimeter and the speed in RPM. To determine f_{dn} use the velocity graph below.

AXIAL RATINGS C_a

These ratings are for constant loads with oil or extra pressure greases. If greases without extra pressure additives are applied then the catalog rating must be decreased by 50 percent. In instances where bearings operate at over 50 percent of their catalog speed rating and over 50 percent of their axial load ratings (C_a) then recessed shafts should be considered. Please contact a Timken engineer for assistance.



VELOCITY

Applies only to axial loads on br retained bearings.

Bearing bore = d

Bearing RPM = n

Fig. 14. Velocity graph.

BEARING CLEARANCE AND TEMPERATURE CONSIDERATIONS

Timken bearings are manufactured to give an ISO CN clearance as standard. At specific customer request, bearings may be produced with any clearance to suit a particular application. When assessing the requirement for special clearances, it is particularly important to consider the differential temperature between shaft and housing. It also should be noted that an increase in bearing clearance will lead to a small reduction in bearing capacity. For example, typically a C₃ clearance will reduce capacity by 5 percent and C₅ clearance by 10 percent.

Timken bearings also can be produced as C₂. This clearance is smaller than CN and is typically used in applications involving shock or reciprocating loads.

Cleanliness of component parts when fitting will have a direct impact on the running clearance of the bearing. This is of particular importance when fitting new bearings into existing cast iron or refitting bearings after maintenance. Special care must be taken to remove build-ups of aged grease and other contaminants in order to avoid reducing the bearing clearance when fitted.

When selecting bearings for use at elevated temperatures, consideration also should be given to the bearings' dimensional stability. Timken bearings are tempered to give stability up to 140° C (284° F). In order to operate at higher temperatures, bearings must be specially heat-treated. This process will lead to a reduction in capacity as a result of the reduced hardness.

The designations for specially heat-treated bearings are in line with those quoted in ISO standards. The effects of temperature stabilization are detailed in the table shown.

TABLE 16.

Operating Temperature	200° C	250° C	300° C
	392° F	482° F	572° F
Designation	S1	S2	S3
Reduction in Capacity	10%	25%	40%

SUPPORT LOADS AND BEARING FREQUENCIES

Throughout the Timken range, the split cylindrical roller bearing supports have been designed to provide a rigid and stable base to enable the associated bearing to operate to its full potential. With this in mind, all types of Timken split cylindrical roller bearing housings and supports are manufactured from ASTM 48A – Grade 35 cast iron as a minimum and include strengthening webs and ribs to provide a highly robust unit. In order to complement the inherent strength, we recommend that careful consideration be given to the siting and mounting of the support unit.

To determine a support's suitability, one should consider the resultant effective load derived in the bearing selection process and the direction of that load. The diagram shown indicates the area in which the full C_{0r} rating of the bearing may be applied. Should the direction of the applied load be outside this area it may be necessary to consider alternative designs or materials. Timken has a proven track record of innovative solutions and would be happy to provide assistance.

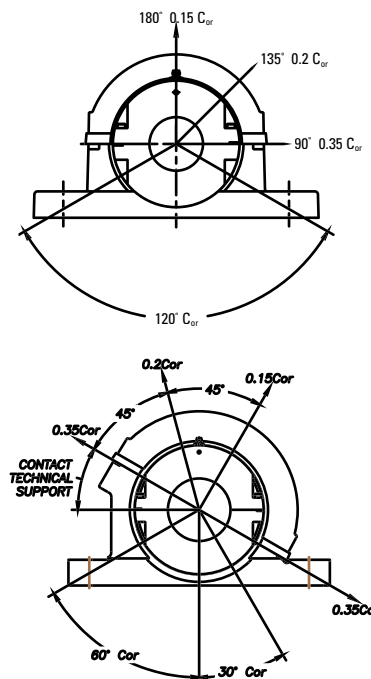


Fig. 15. C_{0r} rating application.

Condition monitoring is the collection, storage, comparison and evaluation of data taken to establish the running condition of a machine. The data can be made up of several parameters, for example, electric current, pressure, brush wear, vibration and temperature, to name a few. Vibration analysis is the area of condition monitoring concerned with evaluating and identifying the source of vibration within a system and assessing its severity and hence proposing the required maintenance action.

The individual components of any bearing will exhibit frequency characteristics which will identify it within a system subject to vibration analysis. For Timken bearings these characteristic frequencies are detailed in the tables opposite. The values given are for a nominal speed of 1 RPM. To obtain the correct frequency required for vibration analysis software, multiply by the speed of rotation in RPM.

For further information on condition monitoring services Please contact a Timken engineer.

BEARING FREQUENCY TABLES (HZ)

TABLE 17. LIGHT SERIES

		Inner Race	Outer Race	Roller	Cage
mm	in.	hz	hz	hz	hz
35	1 3/16	5.878	4.122	2.760	0.412
40	1 1/2				
45	1 11/16	5.852	4.148	2.847	0.415
50	2				
60	2 3/16	6.932	5.068	3.140	0.422
65	2 1/2				
70	2 11/16	6.902	5.098	3.252	0.425
75	3				
80	3 3/16	8.017	5.983	3.370	0.427
90	3 1/2				
100	3 11/16	8.089	5.911	3.137	0.422
105	4				
110	4 3/16	9.109	6.891	3.538	0.431
115	4 1/2				
120	4 11/16	9.100	6.900	3.569	0.431
130	5				
135	5 3/16	9.087	6.913	3.612	0.432
140	5 1/2				
150	5 11/16	10.159	7.841	3.819	0.436
155	6				
160	6 7/16	10.162	7.838	3.809	0.435
170	6 1/2				
170	6 11/16	12.223	9.777	4.442	0.444
180	7				
190	7 1/4	12.204	9.796	4.515	0.445
200	8				
220	8 1/2	12.171	9.829	4.645	0.447
230	9				
240	9 1/2	13.154	10.846	5.152	0.452
250	10				
260	10 1/2	13.118	10.882	5.319	0.453
280	11				
300	11 1/2	13.087	10.913	5.472	0.455
305	12				
320	12 1/2	13.028	10.972	5.795	0.457
330	13				
340	14	15.125	12.875	6.182	0.460
350					
360	15	16.133	13.867	6.580	0.462
380					
400	16	17.150	14.850	6.92	0.464
420	17	18.156	15.844	7.319	0.466
440	18	19.165	16.835	7.694	0.468
460					
480	19	19.166	16.834	7.684	0.468
500	20	20.177	17.823	8.038	0.469
530	21	21.175	18.825	8.479	0.471
560	22	22.184	19.816	8.841	0.472
580	23	23.254	20.746	8.744	0.472
600	24	23.208	20.792	9.078	0.473

TABLE 18. MEDIUM SERIES

		Inner Race	Outer Race	Roller	Cage
mm	in.	hz	hz	hz	hz
-	-	-	-	-	-
45	1 11/16	5.988	4.012	2.432	0.401
50	2				
60	2 3/16	7.091	4.909	2.659	0.409
65	2 1/2				
70	2 11/16	7.153	4.847	2.506	0.404
75	3				
80	3 3/16	7.091	4.909	2.659	0.409
90	3 1/2				
100	3 11/16	8.205	5.795	2.818	0.414
105	4				
110	4 3/16	8.143	5.857	2.981	0.418
115	4 1/2				
120	4 11/16	8.105	5.895	3.088	0.421
130	5				
135	5 3/16	8.082	5.918	3.157	0.423
140	5 1/2				
150	5 11/16	9.225	6.775	3.188	0.423
155	6				
160	6 7/16	8.107	5.893	3.083	0.421
170	6 1/2				
180	6 11/16	9.192	6.808	3.281	0.425
190	7 1/4	9.119	6.881	3.505	0.430
200	8				
220	8 1/2	9.161	6.839	3.372	0.427
230	9				
240	9 1/2	10.218	7.782	3.628	0.432
260	10				
270	10 1/2	10.162	7.838	3.808	0.435
280	11				
300	11 1/2	11.207	8.793	4.082	0.440
305	12				
320	12 1/2	12.287	9.713	4.217	0.442
330	13				
340	14	11.202	8.798	4.100	0.440
360					
380	15	12.141	9.859	4.769	0.448
400	16	12.169	9.831	4.651	0.447
420	17	12.195	9.805	4.548	0.446
440	18	14.257	11.743	5.122	0.452
460					
480	19	14.273	11.727	5.057	0.451
500	20	15.265	12.735	5.489	0.455
530	21	15.249	12.751	5.559	0.455
560	22	15.241	12.759	5.597	0.456
580	23	16.277	13.723	5.831	0.457
600	24	16.252	13.748	5.951	0.458

The above figures are unitary values. For the appropriate frequency, multiply by application RPM.

TABLE 19. HEAVY SERIES

		Inner Race	Outer Race	Roller	Cage
mm	in.	hz	hz	hz	hz
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
100 105	3 ¹¹ / ₁₆ 4	6.073	3.927	2.222	0.393
110 120	4 ³ / ₁₆ 4 ½	5.983	4.017	2.446	0.402
125 130	4 ¹¹ / ₁₆ 5	7.114	4.886	2.601	0.407
135 140	5 ³ / ₁₆ 5 ½	8.259	5.741	2.690	0.410
150 155	5 ¹¹ / ₁₆ 6	7.190	4.810	2.422	0.401
160 170	6 ⁷ / ₁₆ 6 ½	7.159	4.841	2.491	0.403
175 180	6 ¹¹ / ₁₆ 7	8.243	5.757	2.727	0.411
190 200	7 ¹ / ₄ 8	8.221	5.779	2.779	0.413
220 230	8 ½ 9	8.102	5.898	3.097	0.421
240 260	9 ½ 10	8.131	5.869	3.013	0.419
280	11	9.197	6.803	3.267	0.425
300	12	9.192	6.808	3.280	0.425
320	13	9.246	6.754	3.132	0.422
340 360	14	10.224	7.776	3.609	0.432
380 400	15 16	10.250	7.750	3.530	0.431
420 440	17	11.263	8.737	3.895	0.437
460	18	10.170	7.830	3.781	0.435
-	-	-	-	-	-
500 530	20 21	10.172	7.828	3.773	0.435
560	22	12.174	9.826	4.630	0.447
580 600	23 24	12.240	9.760	4.378	0.444

The above figures are unitary values. For the appropriate frequency, multiply by application RPM.

SHAFT CONSIDERATIONS

It is essential that the shaft on to which the bearing is to be mounted has been produced to the correct size and tolerance for the operating conditions. If replacing a bearing in an existing system, the shaft must be checked to establish if any wear or

damage has taken place. The table below may be followed for both the manufacture of new shafts and the inspection of existing shafts.

TABLE 20. SHAFT CONSIDERATIONS

Shaft Dia.	dn<50000 & C/P>10	50000<dn<150000 & C/P>10	50000<dn<150000 & C/P<10	dn>150000	Cylindricity of Shaft
Over - Incl.	h9	h8	h7	h6	IT6
mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
0 - 50 0 - 2	-62 -2.5	-39 -1.5	-25 -1	-16 -0.6	-16 -0.6
50 - 80 2 - 3	-74 -3	-46 -1.8	-30 -1.2	-19 -0.7	-19 -0.7
80 - 120 3 - 5	-87 -3.5	-54 -2.1	-35 -1.4	-22 -0.9	-22 -0.9
120 - 180 5 - 7	-100 -3.9	-63 -2.5	-40 -1.6	-25 -1	-25 -1
180 - 250 7 - 10	-115 -4.5	-72 -2.8	-46 -1.8	-29 -1.2	-29 -1.2
250 - 315 10 - 12 ½	-130 -5.1	-81 -3.2	-52 -2	-32 -1.3	-32 -1.3
315 - 400 12 ½ - 15 ½	-140 -5.5	-89 -3.5	-57 -2.2	-36 -1.4	-36 -1.4
400 - 500 15 ½ - 19 ½	-155 -6.1	-97 -3.8	-63 -2.5	-40 -1.6	-40 -1.6
19 ½ - 24" 500 - 600 mm	-175 -6.9	-110 -4.3	-70 -2.8	-44 -1.7	-44 -1.7

dn value = shaft size (mm) x RPM
 C = Bearing dynamic capacity (kN)
 P = Equivalent bearing load

RECESS MOUNTING

In applications where the resultant axial load exceeds 50 percent of the C_a rating for the bearing, the shaft design should include either a recess for bearing seating or grooves to accommodate retaining rings. Such an arrangement should also be considered if the unit is subjected to shock loads, fluctuations in temperature over 100° C (212° F) or the shaft is vertical.

The dimensions for producing an appropriate recess or for governing the position and size of the retaining rings if used are derived from table 21.

TABLE 21. RECESS MOUNTING

Journal Diameter d	Shoulder Diameter D	Fillet Radii	Shoulder Height B	Recess Width R	Squareness of Abutment Faces
mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
40 - 90 1 ½ - 3 ½	d + 5 d + ¼	1.2 ¾	2.5 ⅝	C + 0.1 C + 0.3 C + 0.004 C + 0.012	0.1 0.004
Over 90 - 150 Over 3 ½ - 6	d + 10 d + ⅜	2.0 ¾	5.0 ⅝	C + 0.15 C + 0.40 C + 0.006 C + 0.016	0.1 0.004
Over 155 Over 6	d + 10 d + ⅜	2.3 ¾	5.0 ⅝	C + 0.2 C + 0.5 C + 0.008 C + 0.02	0.1 0.004

N.B. Width of recesses for standard bearings may be different from that used for existing products. Please consult a Timken engineer for bearings suitable for other recess sizes.

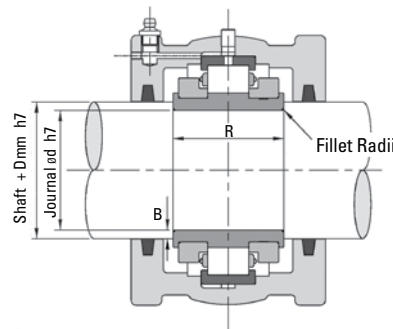


Fig. 16. Recess Mounting.

SEALING ARRANGEMENTS

Any bearing, housing and support unit that is not suitably sealed against its surrounding environment is unlikely to achieve its full potential, either in terms of performance or life span. The prevention of ingress of foreign materials and contaminants is paramount and should be considered as early in the selection process as possible.

A wide variety of sealing solutions are available to users of Timken products as off-the-shelf arrangements. This range will cover the vast majority of operating environments found throughout all industries. To cover those situations where a proprietary arrangement is not suitable, Timken is able to work closely with designers and end users to develop and manufacture custom solutions tailored to specific applications.

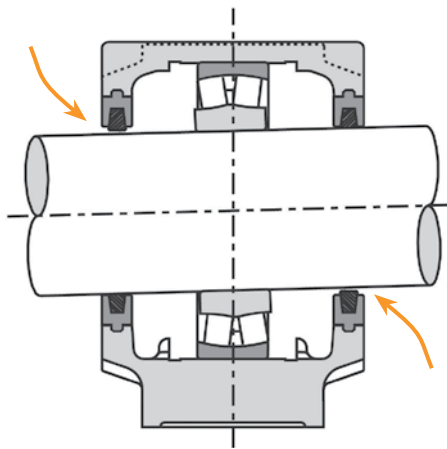


Fig. 17. Seal ineffective.



Fig. 18. Steel industry applications are ideal for Timken Split Cylindrical Roller Bearing Housed Unit.

Timken units have inherent advantages over traditional solid bearing arrangements when considering sealing. The spherical location between housing and support ensures that whichever type of seal is used, it will always remain concentric to the shaft.

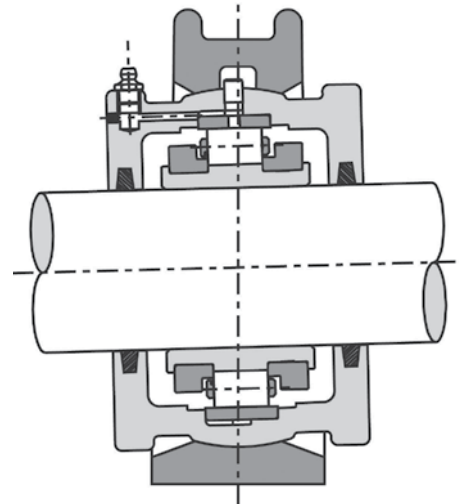


Fig. 19. Seal remains concentric.



Fig. 20. Timken Split Cylindrical Roller Bearing Housed Unit is shown here in a steel industry application.

ALUMINIUM TRIPLE LABYRINTH

A precision machined, non-contacting seal suitable for both high speed and general applications. Once fitted the seal revolves with the shaft. The seal grips the shaft via two split O-rings fitted to the bore of the seal. Timken triple labyrinth seals are fitted with high-temperature Viton cord as standard.

Max. Speed	As Bearing
Temp. Range	-20° C to +175° C (-4° F to + 347° F)
Shaft Finish	3.2µm Ra
Suffix Letters	ATL

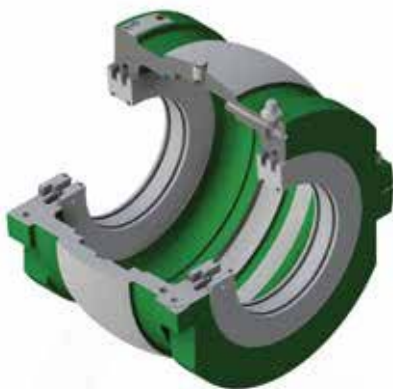


Fig. 21. Aluminium Triple Labyrinth.

KEVLAR® PACKING SEAL

This recent addition to the sealing range has proved highly effective in areas having the potential for fine particle contaminants such as cement or ash. Please consult a Timken engineer for more information.

Max. Speed	As bearing
Temp. Range	-100° C to +280° C (-148° F to + 536° F)
Shaft Finish	1.6µm Ra
Suffix Letters	KPS

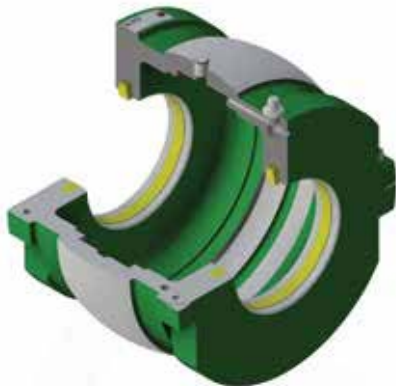


Fig. 22. Kevlar Packing Seal.

VITON SINGLE LIP

For environments involving moderate liquid splashing but not submersion. Should be avoided where abrasive particles are also present as this can lead to shaft wear in the seal area.

Max. Speed	dN(mm)<150000
Temp. Range	-34° C to +204° C (-30° F to + 400° F)
Shaft Finish	3.2µm Ra
Suffix Letters	RSS

Note: d = shaft diameter, N = RPM

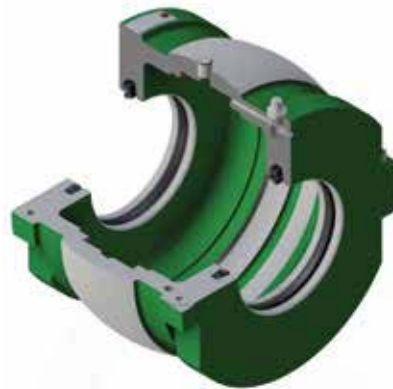


Fig. 23. Viton Single Lip.

HIGH-TEMPERATURE PACKING

A self-lubricating high temperature packing seal based around PTFE and graphite.

Max. Speed	dN(mm)<150000
Temp. Range	-60° C to + 300° C (-76° F to + 572° F)
Shaft Finish	1.2µm Ra
Suffix Letters	HTPS

Note: d = shaft diameter, N = RPM

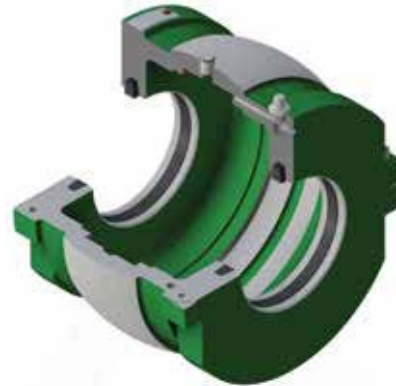


Fig. 24. High-Temperature Packing.

FELT SEAL

This type of seal is supplied as standard with all Timken housings up to a bore size of 12 inch. Consisting of felt strips made from blended fibers. Seals are supplied dry and need to be soaked in oil prior to fitting.

Max. Speed	dN(mm)<150000
Temp. Range	-60° C to +100° C (-76° F to +212° F)
Shaft Finish	1.6µm Ra

Note: d = shaft diameter, N = RPM

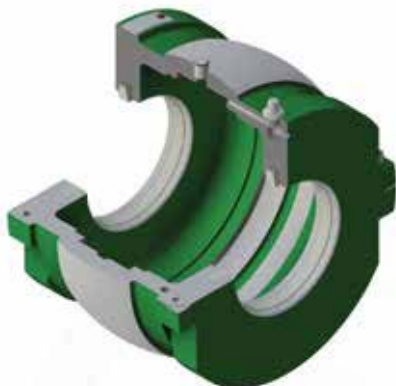


Fig. 25. Felt Seal.

SINGLE-LIP WITH GARTER SPRING AND RETAINING PLATE

A more specialized seal for very wet environments with heavy splash. This type of seal is not suitable for continuous submersion without due consideration being given to sealing of the housing joint and any other possible points of liquid entry. Please consult a Timken engineer for more information.

Max. Speed	dN(mm)<150000
Temp. Range	-20° C to +100° C (-4° F to + 212° F)
Shaft Finish	0.8µm Ra
Suffix Letters	WSRP

Note: d = shaft diameter, N = RPM



Fig. 26. Single-Lip with Garter Spring and Retaining Plate.

LABYRINTH GREASE GROOVE

For shaft sizes over 12 in., housings are supplied with a close-fitting labyrinth groove machined into the housing. No additional seal is added. For harsh environments, alternative sealing arrangements are available.

Max. Speed	As Bearing
Temp. Range	As Bearing
Shaft Finish	3.2µm Ra
Suffix Letters	LAB

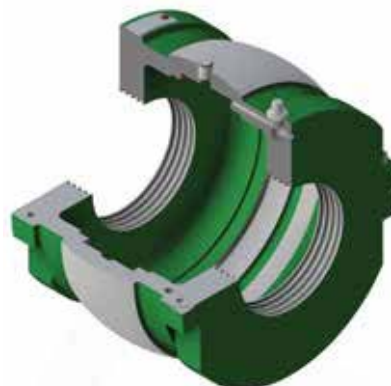


Fig. 27. Labyrinth Grease Groove.

COMBINATION SEAL

This seal combines a labyrinth grease seal with grease purge and the strip seal of your choice (felt, RSS, HTPS or KPS). This combination is ideal for harsh environments with high levels of contamination. Only available for shaft sizes above 12 inches.

Max. Speed	As per the chosen strip seal type.
Temp. Range	As per the chosen strip seal type.
Shaft Finish	1.6µm Ra
Suffix Letters	LABLUB

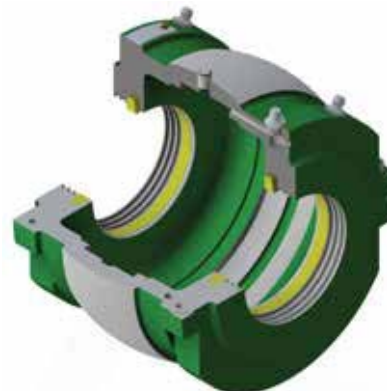


Fig. 28. Combination Seal.

TRIPLE LABYRINTH HOUSING AND SEAL REFERENCES

TABLE 22. LIGHT SERIES

Shaft (d)		Triple Labyrinth Seal Reference		Housing Reference	Retained Expansion	Shaft (d)		Triple Labyrinth Seal Reference		Housing Reference	Retained Expansion
mm	in.	mm	in.			mm	in.	mm	in.		
35	1 3/16	35MMATL	103ATL	LS1HRTL	LS1HRTL	240	9 1/2	240MMATL	908ATL	LS15HRTL	LS15HRTL
	1 1/4		104ATL				912ATL				
40	1 7/16	40MMATL	107ATL	LS1HXTL	LS1HXTL	250	9 3/4	250MMATL	1000ATL	LS15HXTL	LS15HXTL
	1 1/2		108ATL				1000ATL				
45	1 11/16	45MMATL	111ATL	LS2HRTL	LS2HRTL	260	10 1/2	260MMATL	1008ATL	LS16HRTL	LS16HRTL
	1 3/4		112ATL						1012ATL		
50	1 15/16	50MMATL	115ATL	LS2HXTL	LS2HXTL	270	10 3/4	270MMATL	1100ATL	LS16HXTL	LS16HXTL
	2		200ATL						1100ATL		
55	2 3/16	55MMATL	203ATL	LS3HRTL	LS3HRTL	300	11 1/2	300MMATL	1108ATL	LS17HRTL	LS17HRTL
	2 1/4		204ATL						1200ATL		
60	2 7/16	60MMATL	207ATL	LS3HXTL	LS3HXTL	305	12	305MMATL	1200ATL	LS17HXTL	LS17HXTL
	2 1/2		208ATL						1200ATL		
70	2 11/16	70MMATL	211ATL	LS4HRTL	LS4HRTL	320	12 1/2	320MMATL	1208ATL	LS18HRTL	LS18HRTL
	2 3/4		212ATL						1300ATL		
75	2 15/16	75MMATL	215ATL	LS4HXTL	LS4HXTL	330	13	330MMATL	1300ATL	LS18HXTL	LS18HXTL
	3		300ATL						1300ATL		
80	3 3/16	80MMATL	303ATL	LS5HRTL	LS5HRTL	340	14	340MMATL	1400ATL	LS19HRTL	LS19HRTL
	3 1/4		304ATL						1400ATL		
85	3 7/16	85MMATL	307ATL	LS5HXTL	LS5HXTL	350	14	350MMATL	1400ATL	LS19HXTL	LS19HXTL
	3 1/2		308ATL						1400ATL		
90	3 11/16	90MMATL	311ATL	LS5HXTL	LS5HXTL	360	15	360MMATL	1500ATL	LS20HRTL	LS20HRTL
	3 3/4		312ATL						1500ATL		
100	3 15/16	100MMATL	315ATL	LS6HRTL	LS6HRTL	380	15	380MMATL	1500ATL	LS20HXTL	LS20HXTL
	4		400ATL						1500ATL		
110	4 3/16	110MMATL	403ATL	LS7HRTL	LS7HRTL	400	16	400MMATL	1600ATL	LS21HRTL	LS21HRTL
	4 1/4		404ATL						1600ATL		
115	4 7/16	115MMATL	407ATL	LS7HXTL	LS7HXTL	420	17	420MMATL	1700ATL	LS22HRTL	LS22HRTL
	4 1/2		408ATL						1700ATL		
120	4 11/16	120MMATL	411ATL	LS8HRTL	LS8HRTL	440	18	440MMATL	1800ATL	LS23HRTL	LS23HRTL
	4 3/4		412ATL						1800ATL		
125	4 15/16	125MMATL	415ATL	LS8HXTL	LS8HXTL	460	18	460MMATL	1800ATL	LS23HXTL	LS23HXTL
	5		500ATL						1800ATL		
130	5 1/16	130MMATL	503ATL	LS9HRTL	LS9HRTL	480	19	480MMATL	1900ATL	LS24HRTL	LS24HRTL
	5 3/8		504ATL						1900ATL		
135	5 1/4	135MMATL	507ATL	LS9HXTL	LS9HXTL	500	20	500MMATL	2000ATL	LS25HRTL	LS25HRTL
	5 1/2		508ATL						2000ATL		
140	5 7/16	140MMATL	511ATL	LS10HRTL	LS10HRTL	530	21	530MMATL	2100ATL	LS26HRTL	LS26HRTL
	5 1/2		512ATL						2100ATL		
150	5 11/16	150MMATL	515ATL	LS10HXTL	LS10HXTL	560	22	560MMATL	2200ATL	LS27HRTL	LS27HRTL
	5 3/4		600ATL						2200ATL		
155	5 15/16	155MMATL	607ATL	LS11HRTL	LS11HRTL	580	23	580MMATL	2300ATL	LS28HRTL	LS28HRTL
	6		608ATL						2300ATL		
160A	6	160MMATL	611ATL	LS11HXTL	LS11HXTL	600	24	600MMATL	2400ATL	LS29HRTL	LS29HRTL
	6		612ATL						2400ATL		
160	6 7/16	160MMATL	615ATL	LS12HRTL	LS12HRTL	600	24	600MMATL	2400ATL	LS29HXTL	LS29HXTL
	6 1/2		615ATL						2400ATL		
170	6 11/16	170MMATL	704ATL	LS12HXTL	LS12HXTL	530	21	530MMATL	2100ATL	LS26HXTL	LS26HXTL
	6 3/4		704ATL						2100ATL		
175	6 15/16	175MMATL	708ATL	LS13HRTL	LS13HRTL	560	22	560MMATL	2200ATL	LS27HXTL	LS27HXTL
	7		708ATL						2200ATL		
180	7	180MMATL	715ATL	LS13HXTL	LS13HXTL	580	23	580MMATL	2300ATL	LS28HXTL	LS28HXTL
	7 1/4		800ATL						2300ATL		
190	7 1/2	190MMATL	808ATL	LS14HRTL	LS14HRTL	600	24	600MMATL	2400ATL	LS29HXTL	LS29HXTL
	7 1/2		808ATL						2400ATL		
200	7 15/16	200MMATL	814ATL	LS14HXTL	LS14HXTL	600	24	600MMATL	2400ATL	LS29HXTL	LS29HXTL
	8		900ATL						2400ATL		
220	8 1/2	220MMATL	900ATL	LS14HXTL	LS14HXTL	600	24	600MMATL	2400ATL	LS29HXTL	LS29HXTL
	8 3/8		900ATL						2400ATL		
230	9	230MMATL	900ATL	LS14HXTL	LS14HXTL	600	24	600MMATL	2400ATL	LS29HXTL	LS29HXTL
	9		900ATL						2400ATL		

TABLE 23. MEDIUM SERIES

Shaft (d)		Triple Labyrinth Seal Reference		Housing Reference	Retained Expansion
mm	in.	mm	in.		
-	-	-	-	-	
45	1 1/16	45MMATL	111ATL	MS3HRTL MS3HXTL	
50	1 3/4		112ATL		
	1 5/16		115ATL		
	2		200ATL		
55	2 3/16	55MMATL	203ATL	MS4HRTL MS4HXTL	
60	2 1/4		204ATL		
65	2 7/16		207ATL		
	2 1/2		208ATL		
70	2 1/16	70MMATL	211ATL	MS5HRTL MS5HXTL	
75	2 3/4		212ATL		
	2 5/16		215ATL		
	3		300ATL		
80	3 3/16	80MMATL	303ATL	MS6HRTL MS6HXTL	
85	3 1/4		304ATL		
90	3 7/16		307ATL		
	3 1/2		308ATL		
100	3 1/16	100MMATL	311ATL	MS7HRTL MS7HXTL	
105	3 3/4		312ATL		
	3 5/16		315ATL		
	4		400ATL		
110	4 3/16	110MMATL	403ATL	MS8HRTL MS8HXTL	
115	4 1/4		404ATL		
	4 7/16		407ATL		
	4 1/2		408ATL		
120	4 1/16	120MMATL	411ATL	MS10HRTL MS10HXTL	
125	4 3/4		412ATL		
130	4 5/16		415ATL		
	5		500ATL		
135	5 3/16	135MMATL	503ATL	MS30HRTL MS30HXTL	
140	5 1/4		504ATL		
	5 7/16		507ATL		
	5 1/2		508ATL		
150	5 1/16	150MMATL	511ATL	MS31HRTL MS31HXTL	
155	5 3/4		512ATL		
	5 5/16		515ATL		
			600ATL		
160A	6	160MMATL	-	MS31HRTLE0548 MS31HXTLE0548	
160	6 7/16	160MMATL	607ATL	MS32HRTL MS32HXTL	
170	6 1/2		170MMATLE0547		608ATL
	6 11/16				611ATLE0547
	6 3/4		612ATLE0547		
175	6 1/16	175MMATL	615ATL	MS33HRTL MS33HXTL	
180	7		180MMATL		700ATL
190	7 1/4	190MMATL	704ATL	MS34HRTL MS34HXTL	
200	7 1/2		200MMATL		708ATL
	7 5/16				715ATL
	8		800ATL		
220	8 1/2	220MMATL	808ATL	MS35HRTL MS35HXTL	
230	8 7/8		230MMATL		814ATL
	9		900ATL		

Shaft (d)		Triple Labyrinth Seal Reference		Housing Reference	Retained Expansion
mm	in.	mm	in.		
240	9 1/2	240MMATL	908ATL	MS36HRTL MS36HXTL	
	9 3/4		912ATL		
	10		1000ATL		
260	10 1/2	260MMATL	1008ATL	MS36HRTLE0548 MS36HXTLE0548	
270	10 3/4		270MMATL		1012ATL
280	11		280MMATL		1100ATL
300	11 1/2	300MMATL	1108ATL	MS38HRTL MS38HXTL	
305	12		305MMATL		1200ATL
320	12 1/2	320MMATL	1208ATL	MS39HRTL MS39HXTL	
330	13		330MMATL		1300ATL
340	14	340MMATL	1400ATL	MS40HRTL MS40HXTL	
360					360MMATLE0547
380	15	380MMATL	1500ATL	MS41HRTL MS41HXTL	
400	16	400MMATL	1600ATL	MS42HRTL MS42HXTL	
420	17	420MMATL	1700ATL	MS43HRTL MS43HXTL	
440	18	440MMATL	1800ATL	MS44HRTL MS44HXTL	
460					460MMATL
480	19	480MMATL	1900ATL	MS45HRTL MS45HXTL	
500	20	500MMATL	2000ATL	MS46HRTL MS46HXTL	
530	21	530MMATL	2100ATL	MS47HRTL MS47HXTL	
560	22	560MMATL	2200ATL	MS48HRTL MS48HXTL	
580	23	580MMATL	2300ATL	MS49HRTL MS49HXTL	
600	24	600MMATL	2400ATL	MS50HRTL MS50HXTL	

TRIPLE LABYRINTH HOUSING AND SEAL REFERENCES

TABLE 24. HEAVY SERIES

Shaft (d)		Triple Labyrinth Seal Reference		Housing Reference	
mm	in.	mm	in.	Retained Expansion	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
100	3 11/16	100MMATL	311ATL	HS54HRTL	
105	3 3/4		312ATL		
	3 15/16	105MMATL	315ATL	HS54HXTL	
	4		400ATL		
110	4 3/16	110MMATL	403ATL	HS55HRTL	
115	4 1/4		404ATL		
120	4 7/16		120MMATLE0547		407ATL
	4 1/2				408ATL
125	4 11/16	125MMATL	411ATL	HS56HRTL	
	4 3/4		412ATL		
	4 15/16		415ATL		
	5		500ATL		
135	5 3/16	135MMATL	503ATL	HS57HRTL	
	5 1/4		504ATL		
	5 7/16		507ATL		
	5 1/2		508ATL		
150	5 11/16	150MMATL	511ATL	HS58HRTL	
	5 3/4		512ATL		
	5 15/16		515ATL		
160A	6	160MMATL	-	HS58HRTLE0548 HS58HXTLE0548	
160	6 7/16	160MMATL	607ATL	HS59HRTL	
	6 1/2		608ATL		
	6 11/16		611ATLE0547		
	6 3/4		612ATLE0547		
175	6 15/16	175MMATL	615ATL	HS60HRTL	
	7		700ATL		
190	7 1/4	190MMATL	704ATL	HS61HRTL	
	7 1/2		708ATL		
	7 15/16		715ATL		
			8		800ATL
220	8 1/2	220MMATL	808ATL	HS62HRTL	
	8 7/8		814ATL		
	9		900ATL		

Shaft (d)		Triple Labyrinth Seal Reference		Housing Reference		
mm	in.	mm	in.	Retained Expansion		
240	9 1/2	240MMATL	908ATL	HS63HRTL		
	9 3/4		912ATL			
	10		1000ATL			
260	-	260MMATL	-	HS63HRTLE0548 HS63HXTLE0548		
270	10 1/2	270MMATL	1008ATL	HS83HRTL		
	10 3/4		1012ATL			
	11		1100ATL			
300	11 1/2	300MMATL	1108ATL	HS65HRTL		
	12		1200ATL			
320	13	320MMATL	1300ATL	HS66HRTL HS66HXTL		
340	14	340MMATL	1400ATL	HS86HRTL		
					360	360MMATLE0547
380	15	380MMATL	1500ATL	HS68HRTL HS68HXTL		
					400	-
420	17	420MMATL	1700ATL	HS89HRTL		
					440	440MMATLE0547
460	18	460MMATL	1800ATL	HS90HRTL HS90HXTL		
500	20	500MMATL	2000ATL	HS94HRTL HS94HXTL		
530	-	530MMATL	-	HS94HRTLE0548 HS94HXTLE0548		
560	22	560MMATL	2200ATL	HS94HRTLE0548 HS94HXTLE0548		
580	23	580MMATL	2300ATL	HS95HRTL		
					600	600MMATLE0547
HS95HXTL						
-	-	-	-	-		

BEARING LUBRICATION

The function of a lubricant in a rolling element bearing is to prevent metal-to-metal contact between components, prevent wear and protect against corrosion. Two methods of lubrication are normal grease and oil. In the case of Timken split bearings, grease lubrication is most often employed.

GREASE LUBRICATION

Greases can be used to lubricate Timken split cylindrical roller bearings under most normal conditions. Grease is the preferred method of lubrication because it can be more easily retained within the bearing enclosure and housing, the latter simplifying sealing arrangements. Greases are a semi-solid lubricant generally consisting of a soap emulsified with mineral or synthetic oils. Other ingredients include rust inhibitors or extra pressure additives. The oils employed may be mineral or synthetic depending upon the application.

Timken bearings are heat treated to retain dimensional stability up to 140° C (284° F). At temperatures up to 100° C (212° F), standard high-quality greases may be used. We suggest good quality lithium soap or complex-based greases having extra pressure additives and a penetration number of 3. It is important to note that all values given in this catalog for axial capacity assume the use of grease with extra pressure (EP) additives. If EP additives are not present then axial capacity is reduced by 50 percent.

At temperatures exceeding 100° C (212° F) care must be taken to ensure that the correct thickener and viscosity of base oil are selected. The performance of grease at such temperatures is dependent on a stable thickener and the temperature/viscosity ratio of the base oil. A stable base oil and soap thickener are important, as is the ability of the oil to offer adequate viscosity at an elevated temperature.

In cases of water splash, calcium soap based greases may be used. These are particularly resistant to water wash out.

Care should be taken when mixing greases with different soap thickeners and base oil types. Please contact a Timken engineer for further advice.

For initial lubrication the bearing should always be well filled with grease. The remaining housing space should be filled as follows:

- At low speeds, not exceeding 25 percent of catalog speed rating, we suggest that the remaining housing space be fully filled with grease.
- At medium speeds, between 25 and 50 percent of catalog speed rating, the remaining housing space may be $\frac{1}{3}$ to $\frac{1}{2}$ filled with grease.
- At high speeds, exceeding 50 percent of catalog speed rating, the remaining housing space should be left empty.

RE-LUBRICATION

The re-lubrication intervals will be dependent on the prevailing operating conditions.

Greases age and oxidize due to a number of considerations. These include load, speed, temperature, cleanliness, presence of water and even airflow through the bearing.

For retained-type bearings, initial re-lubrication intervals for guidance purposes would be 2-4 weeks with 0.1-0.2 ounces (3-6 mls) added. For expansion type bearings, initial re-lubrication intervals would be 3-4 months with 0.1-0.2 ounces (3-6 mls) added. More accurate intervals and quantities should be established from observations taken during bearing operation. If re-lubrication can be carried out while the bearing is in operation, this will allow for even distribution of the grease. This means of re-lubrication should only be undertaken if it is safe to do so.

OIL LUBRICATION

Timken split cylindrical roller bearings are rarely lubricated with oil. In cases where oil is selected as a means of lubrication, then special consideration must be given to the bearing housing design and sealing.

There are three principal methods of oil lubrication:

OIL SUMP

The oil sits in the bearing housing at a level approximately halfway up the bottom dead center rolling element. Oil circulation around the bearing is then provided via the bearing rotation agitating the oil sump. It is very important to provide a sufficiently dimensioned oil sump as too small a volume will result in increased frequency of oil change and elevated operating temperatures.

OIL MIST

An oil/air mist is injected into the bearing via nozzles, normally a total oil loss system; this provides extremely high speed capability at high cost.

For further advice on oil selection and oil lubrication systems please consult a Timken engineer.

OIL CIRCULATION

Oil is circulated into the bearing housing assembly from an external oil sump. This allows the oil to be cooled and filtered, additionally an external oil sump normally allows for a higher volume of oil. While being a more optimum solution, specialist housing designs must be provided. There are also cost and space considerations with such systems.

ASSEMBLY AND MAINTENANCE

SHAFT CHECK

When fitting bearings on both new and existing installations, the shaft need only be raised $\frac{1}{6}$ to $\frac{1}{4}$ inch. This should provide sufficient clearance to allow for easy fitting. Prior to the assembly of any bearing components the shaft must be checked for size, roundness and parallelism.



- Check a minimum of three positions along the journal length.
- Check a minimum of three positions around the shaft to establish roundness
- Shaft tolerances and shaft surface finish are given in the table on page 28.

FITTING THE INNER RING

- Carefully unpack and clean the bearing removing all preservatives.
- Inner race locating clamping rings cannot be removed before the cage has been dismantled.
- Care must be taken that no damage occurs when cage halves are separated.



NOTE

Spring clips should always be retained on one cage half.

- Clean the shaft and lightly oil the bore of the inner race.
- Place the two inner race halves in approximately the correct position with the joints at the top and bottom. With the joints in that position it will allow easy access to the clamp ring screws later when they are tightened
- Ensure that the match marks (black band) in the clamp ring groove on one side of the race coincide.



There should be an equal gap at each joint. If there are no gaps do not proceed and contact a Timken engineer.

- Fit the inner race locating clamping rings. Ensure that the correct clamp ring is fitted in the corresponding groove. To assist in this the clamping rings are intentionally manufactured to different widths on the more popular sizes. In addition, the match-marking groove found on the inner race is repeated on the corresponding clamping ring.
- Make sure that the thrust faces are not damaged when the rings enter the grooves.
- The joints should be at 90 degrees to the inner race joints and the screws should be tightened in such a way that there are four equal gaps.
- Screws should only be finger tight so that the race can be adjusted axially into its final position.



ASSEMBLY OF THE OUTER RACE INTO THE SEATING GROOVE IN THE HOUSING

- The housing must be cleaned thoroughly removing all preservatives. If reusing an existing housing it is essential that the outer race seating groove is clean and free of any hardened grease deposits or corrosion.
- Lightly oil the seating groove and the outside diameter of the outer race halves.
- Place the race halves of the expansion or retained type into the seating groove and ensure that:
 - The match marking numbers on the edge of each race half coincide.
 - The lubrication hole in the outer race is in the upper housing half.
 - The outer race joints should protrude equally above the housing joint faces.



If a retained bearing is being fitted:

- Pre-assemble the housing halves and fully tighten the joint socket head cap screws.
- Ensure that the joints are closed.
- Fit the pins and screws provided and tighten up evenly to ensure that the outer race is fixed square against the opposite shoulder of the seating groove.

Larger bearings (both retained and expansion) may require outer race retaining screws. If these are required, please ensure that the flat washers are not omitted. Once fitted, ensure that the end of the screw does not protrude above the race track surface.



- Separate the housing halves. These are now ready for final assembly.
- Fit the appropriate seals. The seal grooves in the standard housing are suitable for felt and synthetic rubber. If the bearing is inspected or replaced on an existing installation and the housing is re-used, we advise fitting new seals.

PRE-FITTING THE LOWER HOUSING HALF

On existing installations it is often unnecessary to change the support if a bearing, or bearing and housing, has to be replaced. In such cases the support base bolts should not be touched to ensure that the replacement bearing and the old or new housing will be in the same position as previously. In new installations the support base should be positioned with the bolts finger tight. This will allow additional freedom of movement when aligning the inner and outer races.



RETAINED BEARING

- Slide the pre-assembled bottom half into the support base.
- Line up the inner and outer race roller track by adjusting the inner ring sideways into the final position. The final position should be confirmed by passing one half of the cage and roller assembly between the inner and outer races. The cage half should pass freely round the lower half of the bearing without becoming jammed or trapped.
- Remove the bottom housing half and tighten the clamp ring socket head cap screws and fit the cage as explained below.

EXPANSION BEARING

- As in the case of the retained bearing, slide in the pre-assembled bottom housing half.
- Line up the inner ring by adjusting it sideways until it is central with the outer race.
- The clearance between the inner race end faces and inside housing walls should be equal. If cage and rollers are assembled in this position the shaft can expand either side of the centre line by the amount shown in column 2 in table 25.
- When the position of the inner ring is satisfactory, remove the bottom half housing and tighten the clamp ring socket head cap screws and fit the cage as explained below.

A greater degree of expansion allowance can be obtained, but only in one direction. This is achieved by offsetting the inner race with respect to the housing. In this case the total amount of linear movement in service is given in column 3 of table 25.

TABLE 25. EXPANSION BEARING – ALLOWABLE LIMITS

Group	Maximum Expansion if Cage and Rollers are Assembled Central	Maximum Expansion
mm in.	mm in.	mm in.
40 1 ½	3.0 ⅛	6 ¼
50 2	3.0 ⅛	6 ¼
60 2 ½	3.5 9/64	7 9/32
70 3	4.0 5/32	8 5/16
80 3 ½	6.0 ¼	12 ½
100 4	5.5 7/32	11 7/16
110 4 ½	5.5 7/32	11 7/16
120 5	5.5 7/32	11 7/16
140 5 ½	8.0 5/16	16 5/8
150 6	8.0 5/16	16 5/8

TIGHTENING OF THE LOCATING CLAMPING RING SCREWS

- When the inner race is in its final position, tighten all four clamping ring screws equally.
- Use the correct hexagon key and a torque wrench.
- Tap down the locating thrust rings with a nylon mallet to ensure that they are seating down correctly within the grooves.
- Re-tighten and repeat the tapping down until the screws are fully tight.
- Torque values for the various screw sizes are given in the tables at the end of this section. If a screw is lost it must be replaced using a high tensile socket head cap screw grade, 12.9.



FITTING THE CAGE

- Grease the inner race roller track and cage.
- Place the cage halves around the inner race ensuring that the match mark numbers on the edge of each cage half are the same and coincide at one joint.
- Press the cage halves into the clip ensuring that the roll pins are fully located.
- Check that the cage assembly runs freely on the inner race.
- Fully pack the cage and roller assembly with the correct type of grease.



FINAL FITTING OF THE HOUSING

- Charge the bottom and upper housing halves with the correct amount of grease. Refer to page 35 for correct types and quantities of grease depending on the application and the speed.
- Lightly oil the spherical diameter of both housing and support and slide the bottom housing half into the support base.
- Lower the shaft with the assembled inner races and cages, until the rollers touch the tracks in the bottom half housing. Make sure that when the rollers in the retained bearing enter the outer race groove they do not damage the lips.
- Turning the shaft by hand, the rollers should move freely between the thrust shoulders of the inner race and the lips of the retained outer race.



- Fit the upper housing half then tighten the housing joint screws. Torque values for housing screws are given in the tables on pages 40-42. Check that there is no gap at the joints.

FITTING THE SUPPORT CAP

- Place the support cap over the upper housing half and engage the locating dowels at the joint.
- Using a nylon mallet, gently tap the support cap down to close the gap at the joints.
- Fit the bolts and tighten just enough to hold the support joints closed.



- At this point, and only if it is safe to do so, the shaft should be run at low speed and if possible, with low loading. This will allow the spherical locating surfaces to correctly align. If running the shaft under power is not an option, the shaft should be rotated by hand to achieve this goal.
- Tighten the cap bolts fully using a torque wrench. At this point the support base bolts should also be checked and tightened as required. Torque values for support screws are given in the tables on pages 40-42.

SCREW SIZES, KEY SIZES AND TORQUE VALUES LIGHT SERIES

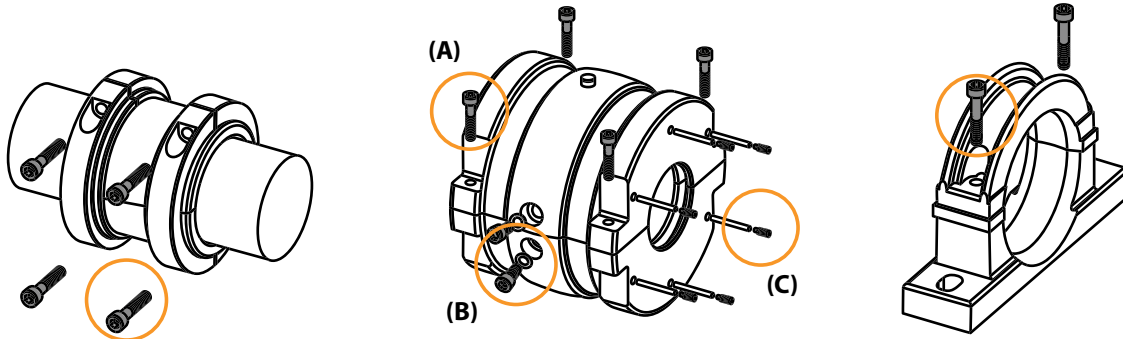


TABLE 26. LIGHT SERIES

Shaft (d)		Clamping Ring ⁽¹⁾			Housing									Support		
					Joint (A)			Radial Retainer (B)			(HR only) (C)					
mm	in.	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)
35 - 40	1 3/16 - 1 1/2	M4	3	4 (2.6)	M4	3	4 (2.6)	-	-	-	M4	3	4 (2.6)	M8	6	27 (20)
45 - 50	1 11/16 - 2	M4	3	4 (2.6)	M4	3	4 (2.6)	-	-	-	M4	3	4 (2.6)	M8	6	27 (20)
60 - 65	2 3/16 - 2 1/2	M4	3	4 (2.6)	M4	3	4 (2.6)	-	-	-	M4	3	4 (2.6)	M10	8	54 (40)
70 - 75	2 11/16 - 3	M4	3	4 (2.6)	M4	3	4 (2.6)	-	-	-	M4	3	4 (2.6)	M12	10	94 (69)
80 - 90	3 3/16 - 3 1/2	M5	4	7 (5)	M5	4	7 (5)	-	-	-	M4	3	4 (2.6)	M16	14	231 (170)
100 - 105	3 11/16 - 4	M6	3	11 (8)	M6	3	11 (8)	-	-	-	M4	3	4 (2.6)	M16	14	231 (170)
110 - 115	4 3/16 - 4 1/2	M6	3	11 (8)	M6	3	11 (8)	-	-	-	M6	3	11 (8)	M20	17	434 (320)
120 - 130	4 11/16 - 5	M6	3	11 (8)	M6	3	11 (8)	-	-	-	M6	3	11 (8)	M20	17	434 (320)
135 - 140	5 3/16 - 5 1/2	M8	6	27 (20)	M8	6	27 (20)	-	-	-	M6	3	11 (8)	M20	17	434 (320)
150 - 155	5 11/16 - 6	M8	6	27 (20)	M8	6	27 (20)	-	-	-	M6	3	11 (8)	M20	17	434 (320)
160	6 7/16 - 6 1/2	M8	6	27 (20)	M8	6	27 (20)	-	-	-	M6	3	11 (8)	M16	14	231 (170)
170 - 180	6 11/16 - 7	M8	6	27 (20)	M8	6	27 (20)	-	-	-	M6	3	11 (8)	M16	14	231 (170)
190 - 200	7 1/4 - 8	M8	6	27 (20)	M8	6	27 (20)	M10	8	54 (40)	M6	3	11 (8)	M16	14	231 (170)
220 - 230	8 1/2 - 9	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M6	3	11 (8)	M16	14	231 (170)
240 - 250	9 1/2 - 10	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M6	3	11 (8)	M20	17	434 (320)
260 - 280	10 1/2 - 11	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
300	11 1/2 - 12	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
320 - 330	12 1/2 - 13	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
340 - 350	14	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
360 - 380	15	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
400	16	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
420	17	M12	10	94 (69)	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
440 - 460	18	M12	10	94 (69)	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
480	19	M12	10	94 (69)	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
500	20	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
530	21	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
560	22	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
580	23	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
600	24	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)

⁽¹⁾ May be increased by up to 20 percent for high axial load applications.

MEDIUM SERIES

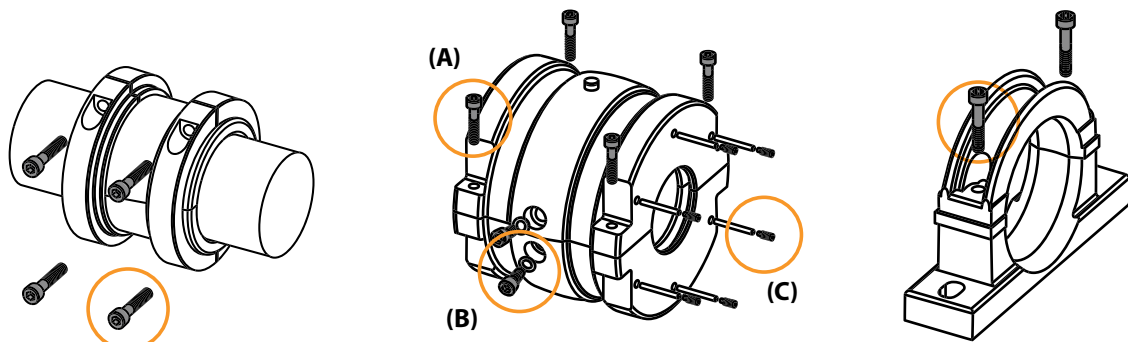


TABLE 27. MEDIUM SERIES

Shaft (d)		Clamping Ring ⁽¹⁾			Housing									Support		
					Joint (A)			Radial Retainer (B)			(HR only) (C)					
mm	in.	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)	Screw	Key	Torque Nm (lb.ft)
45 - 50	1 11/16 - 2	M5	4	7 (5)	M5	4	7 (5)	–	–	–	M4	3	4 (2.6)	M110	8	54 (40)
60 - 65	2 3/16 - 2 1/2	M5	4	7 (5)	M5	4	7 (5)	–	–	–	M4	3	4 (2.6)	M12	10	94 (69)
70 - 75	2 11/16 - 3	M6	3	11 (8)	M6	3	11 (8)	–	–	–	M4	3	4 (2.6)	M16	14	231 (170)
80 - 90	3 3/16 - 3 1/2	M6	3	11 (8)	M6	3	11 (8)	–	–	–	M4	3	4 (2.6)	M16	14	231 (170)
100 - 105	3 11/16 - 4	M6	3	11 (8)	M6	3	11 (8)	–	–	–	M4	3	4 (2.6)	M20	17	434 (320)
110 - 115	4 3/16 - 4 1/2	M8	6	27 (20)	M8	6	27 (20)	–	–	–	M6	3	11 (8)	M20	17	434 (320)
120 - 130	4 11/16 - 5	M8	6	27 (20)	M8	6	27 (20)	–	–	–	M6	3	11 (8)	M20	17	434 (320)
135 - 140	5 3/16 - 5 1/2	M8	6	27 (20)	M8	6	27 (20)	–	–	–	M6	3	11 (8)	M20	17	434 (320)
150 - 155	5 11/16 - 6	M8	6	27 (20)	M8	6	27 (20)	–	–	–	M6	3	11 (8)	M20	17	434 (320)
160 - 170	6 7/16 - 6 1/2	M10	8	54 (40)	M10	8	54 (40)	–	–	–	M6	3	11 (8)	M20	17	434 (320)
180	6 11/16 - 7	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M6	3	11 (8)	M20	17	434 (320)
190 - 200	7 1/4 - 8	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M6	3	11 (8)	M20	17	434 (320)
220 - 230	8 1/2 - 9	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M6	3	11 (8)	M20	17	434 (320)
240 - 260	9 1/2 - 10	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
280	10 1/2 - 11	M16	14	231 (170)	M16	14	231 (170)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
300	11 1/2 - 12	M16	14	231 (170)	M16	14	231 (170)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
320 - 330	12 1/2 - 13	M16	14	231 (170)	M16	14	231 (170)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
340 - 360	14	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
380	15	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
400	16	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
420	17	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
440 - 460	18	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
480	19	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
500	20	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
530	21	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
560	22	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
580	23	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
600	24	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)

⁽¹⁾ May be increased by up to 20 percent for high axial load applications.

SCREW SIZES, KEY SIZES AND TORQUE VALUES - CONT'D
HEAVY SERIES

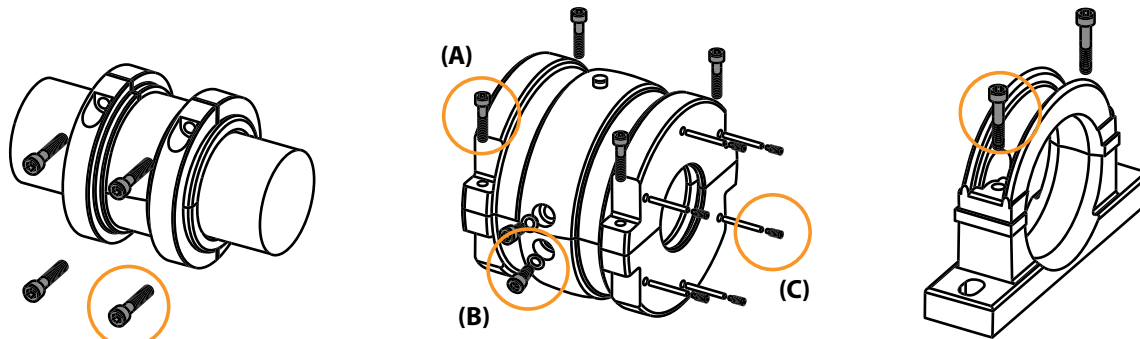


TABLE 28. HEAVY SERIES

Shaft (d)		Clamping Ring ⁽¹⁾			Housing									Support		
		Screw	Key	Torque	Joint (A)			Radial Retainer (B)			(HR only) (C)			Screw	Key	Torque
mm	in.			Nm (lb.ft)			Nm (lb.ft)			Nm (lb.ft)			Nm (lb.ft)			Nm (lb.ft)
100 - 105	3 11/16 - 4	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M6	3	11 (8)	M16	14	231 (170)
110 - 120	4 3/16 - 4 1/2	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M6	3	11 (8)	M16	14	231 (170)
125 - 130	4 15/16 - 5	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M16	14	231 (170)
135 - 140	5 3/16 - 5 1/2	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
150 - 155	5 11/16 - 6	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M10	8	54 (40)	M20	17	434 (320)
160 - 170	6 7/16 - 6 11/16	M12	10	94 (69)	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
180	6 3/4 - 7	M12	10	94 (69)	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
190 - 200	7 1/4 - 8	M12	10	94 (69)	M12	10	94 (69)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
220 - 230	8 1/2 - 9	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
240 - 260	9 1/2 - 10	M16	14	231 (170)	M16	14	231 (170)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
280	11	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
300	12	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M20	17	434 (320)
320 - 330	13	M20	17	434 (320)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
340 - 360	14	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
380 - 400	15 - 16	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
420 - 440	17	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M16	14	231 (170)	M24	19	760 (560)
460	18	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M16	14	231 (170)	M24	19	760 (560)
480	19	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M16	14	231 (170)	M24	19	760 (560)
500	20	M24	19	760 (560)	M20	17	434 (320)	M16	14	231 (170)	M10	8	54 (40)	M24	19	760 (560)
530	21	M24	19	760 (560)	M20	17	434 (320)	M16	14	231 (170)	M10	8	54 (40)	M24	19	760 (560)
560	22	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
580	23	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)
600	24	M24	19	760 (560)	M20	17	434 (320)	M12	10	94 (69)	M10	8	54 (40)	M24	19	760 (560)

⁽¹⁾ May be increased by up to 20 percent for high axial load applications.

SHIPPING WEIGHTS

TABLE 29. LIGHT SERIES

TABLE 30. MEDIUM SERIES

TABLE 31. HEAVY SERIES

		Bearing	Housing	Support	Comp. Unit			Bearing	Housing	Support	Comp. Unit			Bearing	Housing	Support	Comp. Unit
mm	in.	Kg lb.	Kg lb.	Kg lb.	Kg lb.	mm	in.	Kg lb.	Kg lb.	Kg lb.	Kg lb.	mm	in.	Kg lb.	Kg lb.	Kg lb.	Kg lb.
35	1 3/16	1.3	2.5	3	6.8	-	-	-	-	-	-	-	-	-	-	-	-
40	1 1/2	3	6	7	16	-	-	-	-	-	-	-	-	-	-	-	-
45	1 11/16	1.8	3.5	5	10.3	45	1 11/16	2.5	5	5.9	13.4	-	-	-	-	-	-
50	2	4	8	11	23	50	2	6	11	13	30	-	-	-	-	-	-
60	2 3/16	2.3	4.4	5.9	12.6	60	2 3/16	3.7	8	9.5	21.2	-	-	-	-	-	-
65	2 1/2	5	10	13	28	65	2 1/2	8	18	21	47	-	-	-	-	-	-
70	2 11/16	3.3	6.5	9.5	19.3	70	2 11/16	5.6	10	15	30.6	-	-	-	-	-	-
75	3	7	14	21	42	75	3	12	22	33	67	-	-	-	-	-	-
80	3 3/16	5	9	15	29	80	3 3/16	7	12	16	35	-	-	-	-	-	-
90	3 1/2	11	20	33	64	90	3 1/2	15	26	35	76	-	-	-	-	-	-
100	3 11/16	7	11	16	34	100	3 11/16	11	13	24	48	100	3 11/16	35	40	121	196
105	4	15	24	35	74	105	4	24	29	53	106	105	4	77	88	266	431
110	4 3/16	10.5	16	24	50.5	110	4 3/16	15.5	20	41	76.5	110	4 3/16	41	45	141	227
115	4 1/2	23	35	53	111	115	4 1/2	34	44	90	168	115	4 1/2	90	90	310	499
120	4 11/16	14	24	41	79	120	4 11/16	21	28	49	98	125	4 11/16	42	46	156	244
130	5	31	53	90	174	130	5	46	62	108	216	130	5	92	101	343	536
135	5 3/16	17	27	49	93	135	5 3/16	25	36	72	133	135	5 3/16	50	51	197	298
140	5 1/2	37	59	108	204	140	5 1/2	55	79	158	292	140	5 1/2	110	112	433	655
150	5 11/16	18	31	49	98	150	5 11/16	31	42	80	153	150	5 11/16	59	75	261	395
155	6	40	68	108	216	155	6	68	92	176	336	155	6	130	165	574	869
160	6 7/16	19	35	65	119	160	6 7/16	40	58	118	216	160	6 7/16	74	87	291	452
170	6 1/2	42	77	143	262	170	6 1/2	88	128	260	476	170	6 1/2	163	191	640	994
175	6 11/16	23	36	73	132	180	6 11/16	47	68	138	253	175	6 11/16	83	91	338	512
180	7	51	79	161	291	180	7	103	150	304	557	180	7	183	200	744	1127
190	7 1/4	26	45	92	163	190	7 1/4	59	86	192	337	190	7 1/4	105	120	454	679
200	8	57	99	202	358	200	8	130	189	422	741	200	8	231	264	999	1494
220	8 1/2	33	48	117	198	220	8 1/2	69	101	229	399	220	8 1/2	151	164	408	949
230	9	73	106	257	436	230	9	152	222	504	878	230	9	332	361	1395	2088
240	9 1/2	42	60	147	249	240	9 1/2	79	108	277	464	240	9 1/2	153	174	540	1064
250	10	92	132	323	547	260	10	174	238	609	1021	260	10	337	383	1621	2341
260	10 1/2	53	73	171	297	270	10 1/2	87	134	320	541	280	11	203	201	459	863
280	11	117	161	376	654	280	11	191	295	704	1190	280	11	447	442	1010	1899
300	11 1/2	60	89	199	348	300	11 1/2	125	132	372	629	300	12	242	249	1019	1510
305	12	132	196	438	766	305	12	275	290	818	1383	300	12	532	548	2242	3322
320	12 1/2	72	109	214	395	320	12 1/2	150	176	385	711	320	13	327	300	1116	1743
330	13	158	240	471	869	330	13	330	387	847	1564	320	13	719	660	2455	3834
340	14	79	121	241	441	340	14	184	190	477	851	340	14	375	361	1620	2356
350	14	174	266	530	970	360	14	405	418	1049	1872	360	14	825	794	3564	5183
360	15	90	130	294	514	380	15	187	213	490	890	380	15	436	433	1538	2407
380	15	198	286	647	1131	380	15	411	469	1078	1958	400	16	959	953	3384	5296
400	16	96	145	315	556	400	16	210	258	540	1008	-	-	-	-	-	-
400	16	211	319	693	1223	400	16	462	568	1188	2218	-	-	-	-	-	-
420	17	105	155	323	583	420	17	245	269	586	1100	420	17	400	443	1014	1857
440	18	119	156	377	652	440	18	255	270	623	1148	440	18	636	274	1513	2423
460	18	262	343	829	1434	460	18	561	594	1371	2526	460	18	1399	603	3329	5331
480	19	123	167	467	757	480	19	268	277	690	1235	-	-	-	-	-	-
480	19	271	367	1027	1665	480	19	590	609	1518	2717	-	-	-	-	-	-
500	20	139	198	449	786	500	20	276	328	745	1349	500	20	700	880	1863	3443
500	20	306	436	988	1730	500	20	607	722	1639	2968	530	21	1540	1936	4099	7575
530	21	180	220	502	902	530	21	314	357	899	1570	-	-	-	-	-	-
530	21	396	484	1104	1984	530	21	691	785	1978	3454	-	-	-	-	-	-
560	22	185	258	578	1021	560	22	341	385	960	1686	560	22	675	694	1847	3216
560	22	407	568	1272	2247	560	22	750	847	2112	3709	560	22	1485	1527	4063	7075
580	23	190	280	690	1160	580	23	375	405	1001	1781	580	23	700	770	1794	3264
580	23	418	616	1518	2552	580	23	825	891	2202	3918	600	24	1540	1694	3947	7181
600	24	240	296	730	1266	600	24	390	460	1056	1906	-	-	-	-	-	-
600	24	528	651	1606	2785	600	24	858	1012	2323	4193	-	-	-	-	-	-

HOUSED UNIT CONVERSION WORKSHEET

Option #1: To help us understand your application needs, please fill out the information below. This data will enable us to select the appropriate split cylindrical bearing housed unit that will perform best for your application.

Option #2: Please fill out the following information to help us select the appropriate split cylindrical bearing housed unit for your application.

Option #3: When converting to a different style of housed unit, use this worksheet to provide the application data specific to your project needs. This information is critical to ensuring the appropriate split cylindrical bearing unit is selected.

Date: _____

Customer Contact: _____ Timken Contact: _____

Application Details: _____

Drive Details

Motor Power: _____ No. Belts: _____

Direct Drive: YES NO Drive Pulley Dia. (mm): _____

Belt Drive: YES NO Driven Pulley Dia. (mm): _____

Gear Drive: YES NO Current DE Bearing: _____

Gear Ratio: YES NO Current NDE Bearing: _____

Environment

Wet: YES NO Bearing Temp. (° C or ° F): _____

Dry: YES NO Shaft Diameter (mm): _____

Dust: YES NO

Severe: YES NO Shaft Speed (RPM): _____

Submerged: YES NO

<i>Load</i>	<i>Lubrication</i>	<i>Specification</i>	<i>Amount</i>
Radial (kN or lbs): _____	Oil: <input type="checkbox"/> YES <input type="checkbox"/> NO	_____	_____
Axial (kN or lbs): _____	Grease: <input type="checkbox"/> YES <input type="checkbox"/> NO	_____	_____

Duty

Intermittent: YES NO

Continuous: YES NO

Current Sealing Arrangement: _____



LIGHT SERIES

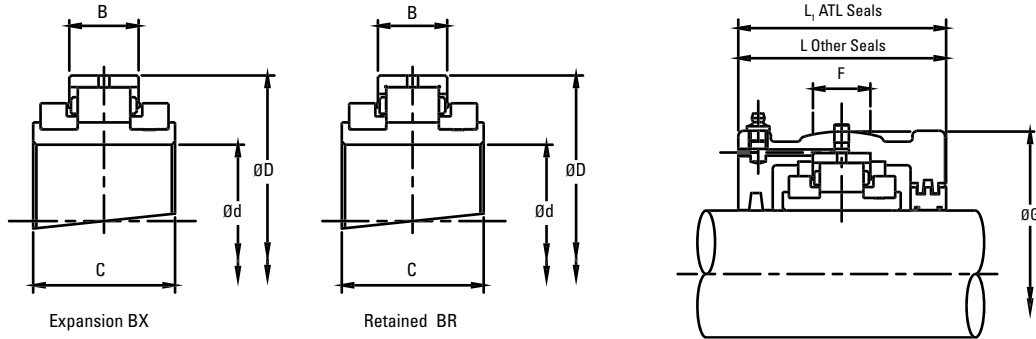
Light series bearing products are by far the most commonly utilized range within the split bearing family. With a wide variety of mounting and sealing solutions available, light series bearing units can readily be matched to an ever-increasing range of applications. If a standard catalog product does not meet your requirements, a Timken engineer will be happy to provide help and advice on your application.

The following topics are covered within this section:

Light Series Bearing and Housing 35 mm to 155 mm (1 3/16 in. to 6 in.)	46
Light Series Support S01 - S10	47
Light Series Bearing and Housing 160 mm to 350 mm (6 1/8 in. to 14 in.)	48
Light Series Support S11 - S19	49
Light Series Bearing and Housing 360 mm to 600 mm (15 in. to 24 in.)	50
Light Series Support S20 - S29	51
Light Series Flange Units 35 mm - 305 mm (1 3/16 in. to 12 in.)	52
Light Series Take-Up Units TT/TP 35 mm to 155 mm (1 3/16 in. to 6 in.)	54
Light Series Support Hanger Units	56

LIGHT SERIES BEARING AND HOUSING

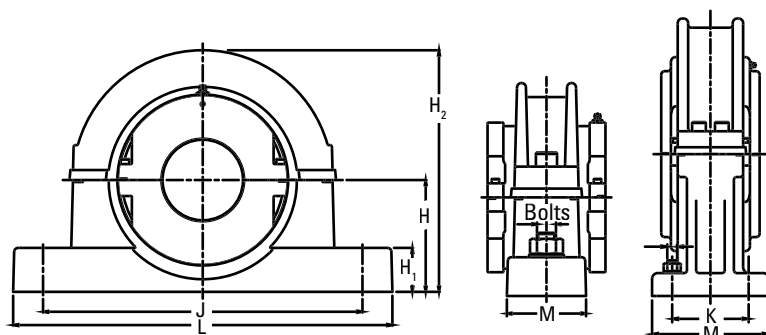
35 MM TO 155 MM (1 3/16 IN. TO 6 IN.)



Shaft (d)		Reference		Bearings Ratings						Housing Reference							
		Add BR for Retained Add BX for Expansion e.g. LSE215BR		Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. LS4HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. LSE215HR	G	F	L	L ₁	
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
35 40	1 3/16 1 1/4 1 1/8 1 1/2	LSM35 LSM40	LSE103 LSE104 LSE107 LSE108	65 14613	68 15287	3.20 719.38	5400	3.313 84.14	0.937 23.80	2.165 55.00	LS1	LSM35 LSM40	LSE103 LSE104 LSE107 LSE108	100.00 3.937	25 1.0	84 3.3	91 3.6
45 50	1 11/16 1 3/4 1 15/16 2	LSM45 LSM50	LSE111 LSE112 LSE115 LSE200	83 18659	87 19558	3.60 809.30	4630	3.875 98.42	1.000 25.40	2.362 60.00	LS2	LSM45 LSM50	LSE111 LSE112 LSE115 LSE200	117.48 4.625	25 1.0	96 3.8	98 3.9
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	LSM55 LSM60 LSM65	LSE203 LSE204 LSE207 LSE208	103 23155	115 25853	5.40 1213.95	3940	4.500 114.30	1.063 27.00	2.362 60.00	LS3	LSM55 LSM60 LSM65	LSE203 LSE204 LSE207 LSE208	134.94 5.313	32 1.3	102 4.0	104 4.1
70 75	2 11/16 2 3/4 2 15/16 3	LSM70 LSM75	LSE211 LSE212 LSE215 LSE300	138 31024	161 36194	7.60 1708.53	3310	5.250 133.35	1.252 31.80	2.559 65.00	LS4	LSM70 LSM75	LSE211 LSE212 LSE215 LSE300	157.16 6.187	38 1.5	112 4.4	114 4.5
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	LSM80 LSM85 LSM90	LSE303 LSE304 LSE307 LSE308	187 42039	231 51931	12.40 2787.59	2790	6.000 152.4	1.531 38.90	2.953 75.00	LS5	LSM80 LSM85 LSM90	LSE303 LSE304 LSE307 LSE308	177.80 7.000	50 2.0	134 5.3	136 5.4
100 105	3 11/16 3 3/4 3 15/16 4	LSM100 LSM105	LSE311 LSE312 LSE315 LSE400	288 64745	366 82280	16.00 3596.90	2340	6.875 174.62	1.783 45.30	3.346 85.00	LS6	LSM100 LSM105	LSE311 LSE312 LSE315 LSE400	203.20 8.000	50 2.0	132 5.2	134 5.3
110 115	4 3/16 4 1/4 4 7/16 4 1/2	LSM110 LSM115	LSE403 LSE404 LSE407 LSE408	316 71040	427 95993	18.60 4181.39	1970	8.000 203.20	1.846 46.90	3.543 90.00	LS7	LSM110 LSM115	LSE403 LSE404 LSE407 LSE408	231.78 9.125	64 2.5	140 5.5	142 5.6
120 125 130	4 11/16 4 3/4 4 15/16 5	LSM120 LSM125 LSM130	LSE411 LSE412 LSE415 LSE500	363 81606	496 111505	22.20 4990.69	1740	8.750 222.25	2.126 54.00	3.740 95.00	LS8	LSM120 LSM125 LSM130	LSE411 LSE412 LSE415 LSE500	266.70 10.500	76 3.0	154 6.1	156 6.1
135 140	5 3/16 5 1/4 5 7/16 5 1/2	LSM135 LSM140	LSE503 LSE504 LSE507 LSE508	422 94869	585 131513	25.80 5799.99	1570	9.500 241.30	2.189 55.60	3.874 98.40	LS9	LSM135 LSM140	LSE503 LSE504 LSE507 LSE508	279.40 11.000	76 3.0	166 6.5	168 6.6
150 155 160	5 11/16 5 3/4 5 15/16 6	LSM150 LSM155 LSM160A	LSE511 LSE512 LSE515 LSE600	459 103187	664 149273	29.40 6609.30	1450	10.000 254.00	2.189 55.60	3.874 98.40	LS10 LS10E0548	LSM150 LSM155 LSM160A	LSE511 LSE512 LSE515 LSE600	295.28 11.625	82 3.2	172 6.8	174 6.9

LIGHT SERIES SUPPORT

S01 - S10

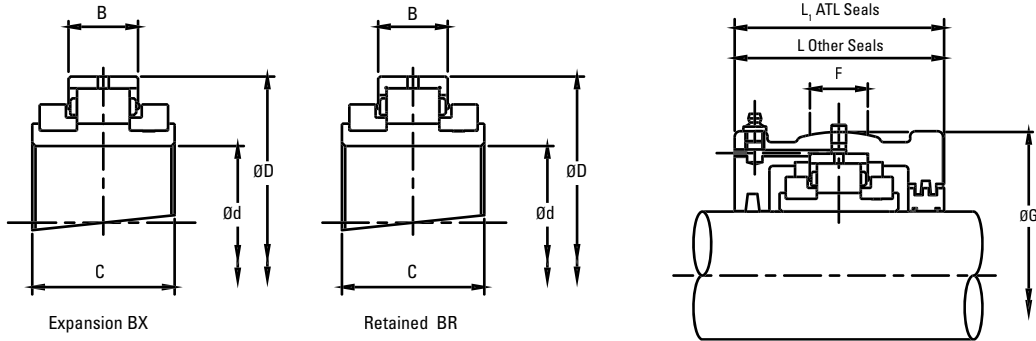


Shaft (d)		Support Reference	H	H ₁	H ₂	J x K	L x M	Bolts
mm	in.		mm in.	mm in.	mm in.	mm in.	mm in.	
35 40	1 3/16 1 1/4 1 7/16 1 1/2	S01	60 2.362	22 0.9	138 5.4	180 7.1	228 x 60 9 x 2.4	2 x M12
45 50	1 11/16 1 3/4 1 15/16 2	S02	70 2.756	25 1.0	158 6.2	214 8.4	270 x 60 10.6 x 2.4	2 x M16
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	S03	80 3.150	32 1.3	180 7.1	234 9.2	280 x 70 11 x 2.8	2 x M16
70 75	2 11/16 2 3/4 2 15/16 3	S04	95 3.740	38 1.5	208 8.2	270 10.6	330 x 76 13 x 3	2 x M20
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	S05 S05-4B	112 4.409 112 4.409	44 1.7 44 1.7	242 9.53 242 9.53	320 12.6 328 x 88.9 12.9 x 3.5	380 x 90 15 x 3.5 380 x 140 15 x 5.51	2 x M24 4 x M20
100 105	3 11/16 3 3/4 3 15/16 4	S06 S06-4B	125 4.921 125 4.921	55 2.17 55 2.17	265 10.43 265 10.43	354 13.9 368 x 102 14.5 x 4	420 x 102 16.5 x 4 426 x 152 16.8 x 6	2 x M24 4 x M20
110 115	4 3/16 4 1/4 4 7/16 4 1/2	S07 S07-4B	143 5.630 143 5.630	60 2.4 60 2.4	303 11.93 303 11.93	392 15.4 412 x 114.3 16.2 x 4.5	466 x 120 18.3 x 4.7 476 x 172 17.74 x 6.77	2 x M24 4 x M20
120 125 130	4 11/16 4 3/4 4 15/16 5	S08	162 6.378	38 1.5	372 14.6	450 x 120 17.7 x 4.7	508 x 178 20 x 7	4 x M24
135 140	5 3/16 5 1/4 5 7/16 5 1/2	S09	181 7.126	40 1.6	405 15.9	482 x 120 19 x 4.7	558 x 178 22 x 7	4 x M24
150 155 160	5 11/16 5 3/4 5 15/16 6	S10	181 7.126	40 1.6	415 16.3	496 x 120 19.5 x 4.7	558 x 178 22 x 7	4 x M24

PRODUCT DATA TABLES

LIGHT SERIES • LIGHT SERIES BEARING AND HOUSING • 160 MM TO 350 MM (6 7/16 IN. TO 14 IN.)

LIGHT SERIES BEARING AND HOUSING 160 MM TO 350 MM (6 7/16 IN. TO 14 IN.)

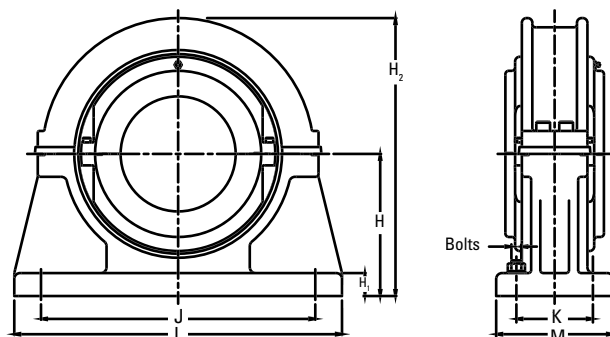


Shaft (d)		Reference Add BR for Retained Add BX for Expansion e.g. LSE715BR		Bearings Ratings						Housing Reference							
				Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. LS13HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. LS715HR	G	F	L	L ₁	
mm	in.		kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.		
160 170A	6 7/16 6 1/2	LSM160 LSM170A	LSE607 LSE608	583 131064	792 178049	33.00 7419	1320	273.05 10.750	60.30 2.374	109.00 4.291	LS11	LSM160 LSM170A	LSE607 LSE608	311.15 12.250	76 3.0	172 6.8	192 7.6
170 175 180	6 11/16 6 3/4 6 15/16 7	LSM170 LSM175 LSM180	LSE611 LSE612 LSE615 LSE700	524 117800	828 186142	36.40 8183	1220	285.75 11.250	55.50 2.185	109.00 4.291	LS12	LSM170 LSM175 LSM180	LSE611 LSE612 LSE615 LSE700	323.85 12.750	70 2.8	172 6.8	200 7.9
190 200	7 1/4 7 1/2 7 15/16 8	LSM190 LSM200	LSE704 LSE708 LSE715 LSE800	614 138033	990 222561	41.00 9217	1070	311.15 12.250	60.30 2.374	109.00 4.291	LS13	LSM190 LSM200	LSE704 LSE708 LSE715 LSE800	358.78 14.125	86 3.4	172 6.8	200 7.9
220 230	8 1/2 8 7/8 9	LSM220 LSM230	LSE808 LSE814 LSE900	708 159165	1168 262577	49.00 11016	930	342.90 13.500	63.50 2.500	115.00 4.528	LS14	LSM220 LSM230	LSE808 LSE814 LSE900	387.35 15.250	82 3.2	178 7.0	216 8.5
240 250	9 1/2 9 3/4 10	LSM240 LSM250	LSE908 LSE912 LSE1000	744 167258	1289 289779	57.80 12994	820	374.65 14.750	66.70 2.626	122.00 4.803	LS15	LSM240 LSM250	LSE908 LSE912 LSE1000	419.10 16.500	90 3.5	188 7.4	222 8.7
260 270 280	10 1/2 10 3/4 11	LSM260 LSM270 LSM280	LSE1008 LSE1012 LSE1100	848 190638	1502 337663	66.80 15017	730	406.40 16.000	69.00 2.717	128.00 5.039	LS16	LSM260 LSM270 LSM280	LSE1008 LSE1012 LSE1100	454.00 17.874	95 3.7	204 8.0	232 9.1
300 305	11 1/2 12	LSM300 LSM305	LSE1108 LSE1200	929 208848	1665 374307	78.20 17580	650	438.15 17.250	74.60 2.937	143.00 5.630	LS17	LSM300 LSM305	LSE1108 LSE1200	489.00 19.252	98 3.9	216 8.5	248 9.8
320 330	12 1/2 13	LSM320 LSM330	LSE1208 LSE1300	920 206824	1674 376330	89.00 20008	590	463.55 18.250	74.60 2.937	136.00 5.354	LS18	LSM320 LSM330	LSE1208 LSE1300	520.70 20.500	95 3.7	260 10.2	—
340 350	14	LSM340 LSM350	LSE1400	1022 229755	1965 441745	99.60 22391	540	488.95 19.250	74.60 2.937	136.00 5.354	LS19	LSM340 LSM350	LSE1400	546.10 21.500	98 3.9	260 10.2	—

For triple labyrinth seal designations, please refer to page 32-34.

LIGHT SERIES SUPPORT

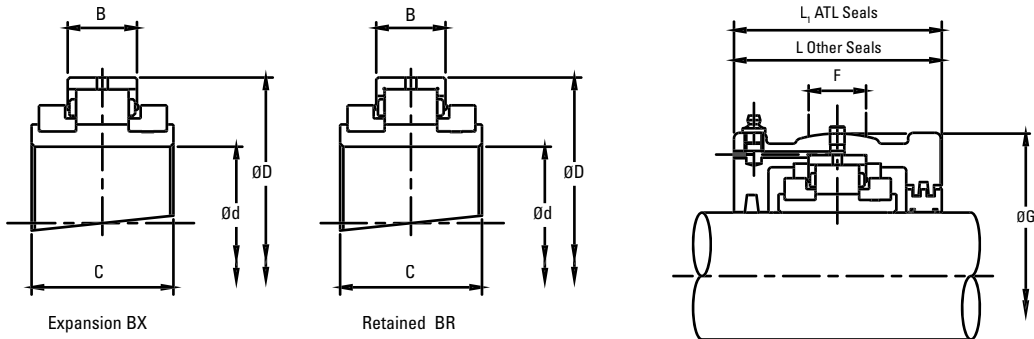
S11 - S19



Shaft (d)		Support Reference	H	H ₁	H ₂	J x K	L x M	Bolts
mm	in.		mm in.	mm in.	mm in.	mm in.	mm in.	
160 170A	6 7/16 6 1/2	S11	213 8.386	32 1.3	430 16.9	368 x 114 14.5 x 4.5	508 x 178 20 x 7	4 x M24
170 175 180	6 11/16 6 3/4 6 15/16 7	S12	235 9.252	35 1.4	470 18.5	388 x 128 15.3 x 5	534 x 190 21 x 7.5	4 x M24
190 200	7 1/4 7 1/2 7 15/16 8	S13	248 9.764	38 1.5	495 19.5	422 x 140 16.6 x 5.5	572 x 204 22.5 x 8	4 x M24
220 230	8 1/2 8 7/8 9	S14	270 10.630	40 1.6	540 21.3	460 x 140 18.1 x 5.5	636 x 216 25 x 8.5	4 x M30
240 250	9 1/2 9 3/4 10	S15	292 11.496	44 1.7	585 23.0	502 x 140 19.8 x 5.5	686 x 228 27 x 9	4 x M30
260 270 280	10 1/2 10 3/4 11	S16	311 12.244	48 1.9	620 24.4	534 x 140 21 x 5.5	724 x 228 28.5 x 9	4 x M30
300 305	11 1/2 12	S17	343 13.504	50 2.0	685 27.0	584 x 178 23 x 7	762 x 254 32 x 10	4 x M30
320 330	12 1/2 13	S18	368 14.488	54 2.1	735 28.9	622 x 178 24.5 x 7	812 x 254 32 x 10	4 x M36
340 350	14	S19	387 15.236	57 2.2	775 30.5	654 x 166 25.7 x 6.5	850 x 254 33.5 x 10	4 x M36

LIGHT SERIES BEARING AND HOUSING

360 MM TO 600 MM (15 IN. TO 24 IN.)

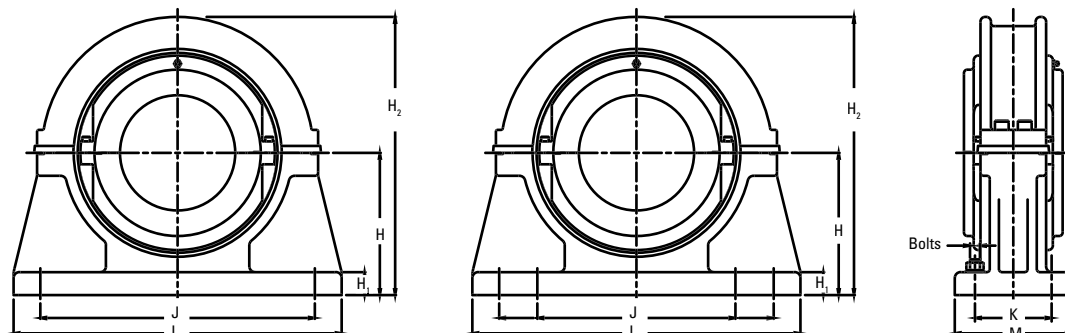


Shaft (d)		Reference		Bearings Ratings						Housing Reference							
		Add BR for Retained Add BX for Expansion e.g. LSM35BR		Dynamic C_r	Static C_{or}	Axial C_a	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. LS11HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. LSM35HR	G	F	L	L_1	
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
360 380	15	LSM360 LSM380	LSE1500	1224 275166	2431 546511	110.40 24819	500	520.70 20.500	76.20 3.000	140.00 5.512	LS20	LSM360 LSM380	LSE1500	571.50 22.500	98 3.9	260 10.2	–
400	16	LSM400	LSE1600	1107 248864	2266 509417	115.60 25988	460	546.10 21.500	76.20 3.000	140.00 5.512	LS21	LSM400	LSE1600	603.30 23.752	102 4.0	280 11.0	–
420	17	LSM420	LSE1700	1146 257631	2418 543588	121.00 27202	430	571.50 22.500	76.20 3.000	140.00 5.512	LS22	LSM420	LSE1700	628.70 24.752	102 4.0	292 11.5	–
440 460	18	LSM440 LSM460	LSE1800	1185 266399	2469 555053	127.20 28596	410	596.90 23.500	76.20 3.000	140.00 5.512	LS23	LSM440 LSM460	LSE1800	650.90 25.626	4.3 108	304 12.0	–
480	19	LSM480	LSE1900	1348 303042	2965 666559	132.60 29810	380	628.65 24.750	81.00 3.189	144.00 5.669	LS24	LSM480	LSE1900	682.60 26.874	4.3 108	304 12.0	–
500	20	LSM500	LSE2000	1392 312934	3139 705675	137.80 30979	360	654.05 25.750	80.20 3.157	168.00 6.614	LS25	LSM500	LSE2000	717.60 28.252	114 4.5	304 12.0	–
530	21	LSM530	LSE2100	1431 321702	3316 745466	140.60 31608	340	692.15 27.250	81.00 3.189	168.00 6.614	LS26	LSM530	LSE2100	755.70 29.752	114 4.5	330 13.0	–
560	22	LSM560	LSE2200	1472 330919	3490 784583	142.40 32013	330	717.55 28.250	81.00 3.189	168.00 6.614	LS27	LSM560	LSE2200	781.10 30.752	114 4.5	336 13.2	–
580	23	LSM580	LSE2300	1616 363291	3841 863491	144.00 32372	310	749.00 29.488	84.10 3.311	172.00 6.772	LS28	LSM580	LSE2300	816.00 32.126	120 4.7	342 13.5	–
600	24	LSM600	LSE2400	1660 373183	4033 906654	146.80 33002	300	774.70 30.500	84.10 3.311	172.00 6.772	LS29	LSM600	LSE2400	841.40 33.126	120 4.7	342 13.5	–

For triple labyrinth seal designations, please refer to page 32-34.

LIGHT SERIES SUPPORT

S20 - S29



Shaft (d)		Support Reference	H		H ₁		H ₂		J x K		L x M		Bolts
mm	in.		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
360 380	15	S20	397 15.630	60 2.4	795 31.3	676 x 166 26.6 x 6.5		902 x 254 35.5 x 10				4 x M36	
400	16	S21	432 17.008	67 2.6	865 34.1	724 x 166 28.5 x 6.5		940 x 254 37 x 10				4 x M36	
420	17	S22	445 17.520	67 2.6	890 35.0	756 x 166 29.8 x 6.5		966 x 254 38 x 10				4 x M36	
440 460	18	S23	464 18.268	70 2.8	925 36.4	788 x 190 31 x 7.5		1042 x 280 41 x 11				4 x M42	
480	19	S24	483 19.016	73 2.9	965 38.0	816 x 188 32.1 x 7.4		1092 x 304 43 x 12				4 x M42	
500	20	S25	489 19.252	76 3.0	980 38.6	844 x 216 33.2 x 8.5		1092 x 304 43 x 12				4 x M42	
530	21	S26	533 20.984	80 3.1	1065 41.9	904 x 206 35.6 x 8.1		1194 x 304 47 x 12				4 x M42	
560	22	S27	552 21.732	83 3.3	1110 43.7	936 x 206 36.9 x 8.1		1220 x 304 48 x 12				4 x M42	
580	23	S28	578 22.756	83 3.3	1156 45.5	1080 & 877 x 220 42.5 & 34.5 x 8.7		1372 x 304 54 x 12				8 x M36	
600	24	S29	597 23.504	90 3.5	1200 47.2	1118 & 908 x 200 44 & 35.7 x 7.9		1372 x 304 54 x 12				8 x M36	

LIGHT SERIES SUPPORT
FLANGE UNITS 35 MM - 305 MM (1 3/16 IN. TO 12 IN.)

When faced with flat horizontal or vertical faces, flange units offer a simple mounting solution. As with pillow block supports, flange units are produced with spherical location to accommodate standard bearing housings and provide easy initial alignment of shaft and equipment.

To facilitate positive location of the flange to the surface, the rear face is recessed (dimensions N and V). This allows for a spigot (tolerance f8) to be located into the flange.

Bearing inspection is simply a matter of removing the top half of the flange and housing. Bearing replacement may also be achieved in the same manner if required.

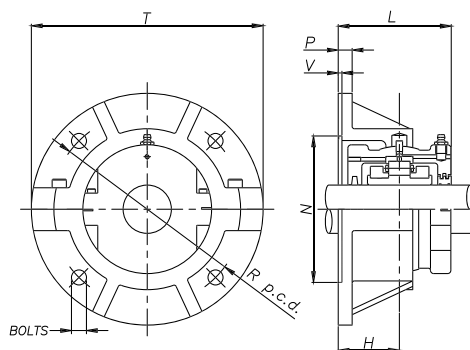
When integrating flange units into new applications, it should be noted that a maximum radial load equivalent to 0.26 C_r is permissible. A maximum axial load of 0.25 C_a must also be taken into account for applications with thrust loading. Units for vertically oriented shafts may also need special consideration given to sealing arrangements.

As always, Timken will be happy to advise on any application issues.

Shaft (d)		Flange Reference	T	Bolts	R	P	H	N	V	L
mm	in.									
35 40	1 3/16 1 1/4 1 7/16 1 1/2	F01	204 8.0	4 x M12	164 6.5	13 0.5	51 2.0	119.06 4.687	3 0.1	94 3.7
45 50	1 11/16 1 3/4 1 15/16 2	F02	216 8.5	4 x M12	180 7.1	13 0.5	57 2.2	136.52 5.375	3 0.1	106 4.2
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	F03	260 10.2	4 x M12	218 8.6	16 0.6	67 2.6	166.96 571	3 0.1	120 4.7
70 75	2 11/16 2 3/4 2 15/16 3	F04	286 11.3	4 x M12	242 9.5	16 0.6	73 2.9	192.09 7.563	3 0.1	130 5.1
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	F05	330 13.0	4 x M16	274 10.8	19 0.7	79 3.1	215.98 500	3 0.1	148 5.8
100 105	3 11/16 3 3/4 3 15/16 4	F06	356 14.0	4 x M16	302 11.9	19 0.7	86 3.4	244.47 9.625	3 0.1	154 6.1
110 115	4 3/16 4 1/4 4 7/16 4 1/2	F07	382 15.0	4 x M16	334 13.1	22 0.9	92 3.6	276.22 10.875	3 0.1	164 6.5
120 125 130	4 11/16 4 3/4 4 15/16 5	F08	432 17.0	4 x M24	374 14.7	22 0.9	98 3.9	314.32 12.375	3 0.1	176 6.9

For bearings and housings see pages 46-49.

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continued from previous page

Shaft (d)		Flange Reference	T	Bolts	R	P	H	N	V	L
mm	in.									
135 140	5 3/16 5 1/4 5 7/16 5 1/2	F09	444 17.5	4 x M24	384 15.1	25 1.0	98 3.9	317.51 2.500	3 0.1	182 7.2
150 155 160A	5 11/16 5 3/4 5 15/16 6	F10	470 18.5	4 x M24	412 16.2	25 1.0	114 4.5	346.07 13.625	3 0.1	202 8.0
160 170A	6 7/16 6 1/2	F11	496 19.5	4 x M24	426 16.8	25 1.0	105 4.1	352.42 13.875	3 0.1	202 8.0
170 175 180	6 11/16 6 3/4 6 15/16 7	F12	508 20.0	4 x M24	438 17.2	29 1.1	108 4.3	365.12 14.375	3 0.1	208 8.2
190 200	7 1/4 7 1/2 7 15/16 8	F13	534 21.0	4 x M24	474 18.7	32 1.3	108 4.3	400.05 15.750	3 0.1	208 8.2
220 230	8 1/2 8 7/8 9	F14	584 23.0	4 x M30	512 20.2	35 1.4	117 4.6	431.81 7.000	3 0.1	226 8.9
240 250	9 1/2 9 3/4 10	F15	610 24.0	4 x M30	542 21.3	35 1.4	117 4.6	463.55 18.250	3 0.1	228 9.0
260 270 280	10 1/2 10 3/4 11	F16	660 26.0	4 x M30	584 23.0	38 1.5	124 4.9	504.82 19.875	3 0.1	240 9.4
300 305	11 1/2 12	F17	712 28.0	4 x M30	626 24.6	38 1.5	133 5.2	539.75 21.250	3 0.1	258 10.2

For bearings and housings see pages 46-49.

LIGHT SERIES SUPPORT TAKE-UP UNITS TT/TP 35 MM TO 155 MM (1 3/16 IN. TO 6 IN.)

This type of split unit can be found in use on materials handling equipment in many industries. Take-up units provide an efficient and readily accessible means of tensioning conveyor systems and large scale drives.

The units consist of either push-type or pull-type sliding supports into which standard housings and bearings may be

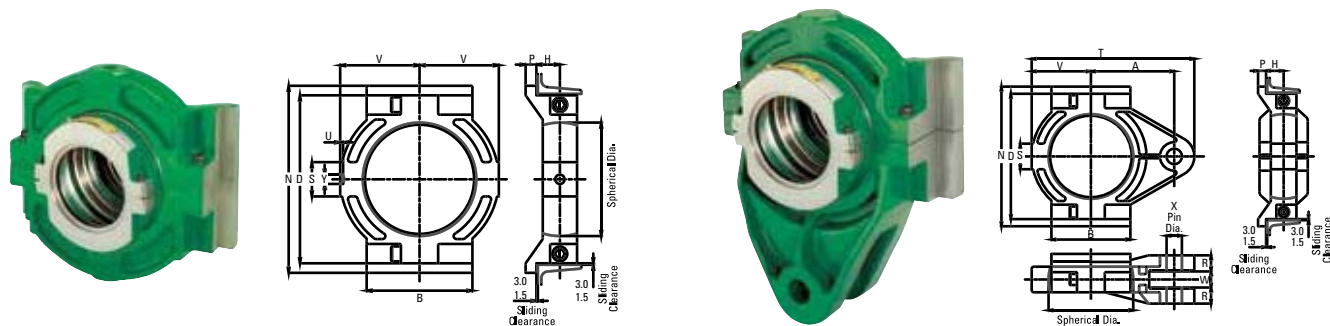
mounted. When integrating take-up units into new applications, it should be noted that a maximum radial load equivalent to 0.3 C_{or} is permissible. As with all Timken units, a wide variety of sealing solutions may be applied dependant on the environment and application. Please contact a Timken engineer for assistance.

Shaft (d)		Support Reference		B	N	D	V	P	H	S	A	T	X	W	R	U	Y
		Tension-Type	Push-Type														
mm	in.			mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
35 40	1 3/16 1 1/4 1 1/8 1 1/2	TT01	TP01	102 4.0	172 6.8	153 6.0	76 3.0	14 0.6	29 1.1	25 1.0	32 1.3	216 8.5	20 0.8	25 1.0	24 0.9	5 0.2	13 0.5
45 50	1 11/16 1 3/4 1 13/16 2	TT02	TP02	114 4.5	204 8.0	178 7.0	88 3.5	16 0.6	29 1.1	29 1.1	128 5.0	242 9.5	24 0.9	25 1.0	25 1.0	5 0.2	13 0.5
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	TT03	TP03	128 5.0	235 9.3	203 8.0	102 4.0	20 0.8	32 1.3	38 1.5	146 5.7	280 11.0	24 0.9	30 1.2	29 1.1	6 0.2	16 0.6
70 75	2 11/16 2 3/4 2 15/16 3	TT04	TP04	152 6.0	266 10.5	229 9.0	114 4.5	22 0.9	40 1.6	41 1.6	158 6.2	305 12.0	24 0.9	30 1.2	32 1.3	6 0.2	16 0.5
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	TT05	TP05	190 7.5	318 12.5	280 11.0	140 5.5	22 0.9	40 1.6	51 2.0	190 7.5	368 14.5	30 1.2	38 1.5	35 1.4	6 0.2	16 0.5

For bearings and housings see pages 46-49.

continued on next page

LIGHT SERIES • LIGHT SERIES SUPPORT • TAKE-UP UNITS TT/TP 35 MM TO 155 MM (1 3/16 IN. TO 6 IN.)



continued from previous page

Shaft (d)		Support Reference		B	N	D	V	P	H	S	A	T	X	W	R	U	Y
		Tension-Type	Push-Type														
mm	in.			mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
100	3 1/16	TT06	TP06	204	342	305	152	22	43	51	210	414	36	44	35	6	19
	3 3/4																
105	3 15/16	TT07	TP07	216	382	343	162	22	48	70	228	445	42	44	41	6	19
	4																
110	4 3/16	TT08	TP08	254	420	381	190	25	51	76	260	508	42	44	44	6	19
	4 1/4																
115	4 7/16	TT09	TP09	266	438	400	196	25	54	76	266	514	42	44	48	8	23
	4 1/2																
120	4 11/16	TT10	TP10	266	464	426	204	25	57	86	280	546	48	50	51	8	23
	4 3/4																
125	4 15/16	TT09	TP09	266	438	400	196	25	54	76	266	514	42	44	48	8	23
	5																
130	5 1/16	TT10	TP10	266	464	426	204	25	57	86	280	546	48	50	51	8	23
	5 1/4																
135	5 3/16	TT09	TP09	266	438	400	196	25	54	76	266	514	42	44	48	8	23
	5 1/4																
140	5 7/16	TT10	TP10	266	464	426	204	25	57	86	280	546	48	50	51	8	23
	5 1/2																
150	5 11/16	TT10	TP10	266	464	426	204	25	57	86	280	546	48	50	51	8	23
	5 3/4																
155	5 15/16	TT10	TP10	266	464	426	204	25	57	86	280	546	48	50	51	8	23
	6																

For bearings and housings see pages 46-49.

LIGHT SERIES SUPPORT HANGER UNITS

Timken hanger units are the optimum solution for the support of screw conveyor shafts. The unit is comprised of a cast iron split housing into which expansion-type split cylindrical roller bearings are fitted. Provision of a drilled and tapped boss in one half of the housing allows for the unit to be mounted from the conveyor cross bracing or any other suitable surface. It is recommended that some form of swivel fixing be incorporated into the mounting arrangement to allow for static alignment.

Due to the arduous conditions often found in screw conveyor applications, correct seal selection is critical. Timken hanger units are available with many sealing variants, all of which can

also be tailored to suit specific applications. When integrating hanging units into new applications, it should be noted that a maximum radial load equivalent to 0.3 C_{or} is permissible. Only suitable for an expansion (BX) type bearings. Please contact a Timken engineer for further information.

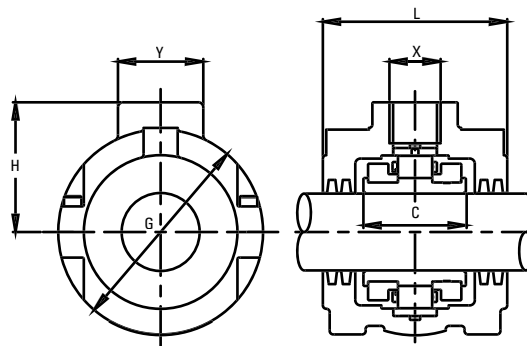
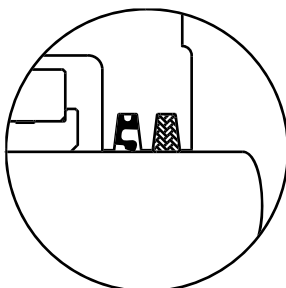
Hanger units have two seal grooves per side. They are supplied with double felt seals as standard. However, the standard seal groove will accept any combination of strip seal.

A further option is to have a tapped hole between the seal grooves at each end of the housing to incorporate a grease or air supply to purge the seals.

Shaft (d)		Support Reference		C	G	L	H	X ⁽¹⁾	Y
mm	in.	mm	in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
35 40	1 3/16	LSM35HG LSM40HG	LSE103HG	55.0 2.165	106 4.2	108 4.3	66 2.6	M30 1 - 8 UNC	50 2.0
	1 1/4		LSE104HG						
	1 7/16		LSE107HG						
	1 1/2		LSE108HG						
45 50	1 11/16	LSM45HG LSM50HG	LSE111HG	60.0 2.362	121 4.8	108 4.3	76 3.0	M30 1 - 8 UNC	50 2.0
	1 3/4		LSE112HG						
	1 15/16		LSE115HG						
	2		LSE200HG						
55 60 65	2 3/16	LSM55HG LSM60HG LSM65HG	LSE203HG	60.0 2.362	140 5.5	108 4.3	82 3.2	M30 1 - 8 UNC	50 2.0
	2 1/4		LSE204HG						
	2 7/16		LSE207HG						
	2 1/2		LSE208HG						
70 75	2 11/16	LSM70HG LSM75HG	LSE211HG	65.0 2.559	162 6.4	130 5.1	92 3.6	M30 1 - 8 UNC	50 2.0
	2 3/4		LSE212HG						
	2 15/16		LSE215HG						
	3		LSE300HG						
80 85 90	3 3/16	LSM80HG LSM85HG LSM90HG	LSE303HG	75.0 2.953	187 7.4	146 5.7	114 4.5	M36 1 1/2 - 6 UNC	76 3.0
	3 1/4		LSE304HG						
	3 7/16		LSE307HG						
	3 1/2		LSE308HG						

⁽¹⁾ Hanger units with inch bore sizes have UNC mounting threads as standard. Hanger units with metric bore sizes have metric mounting threads as standard

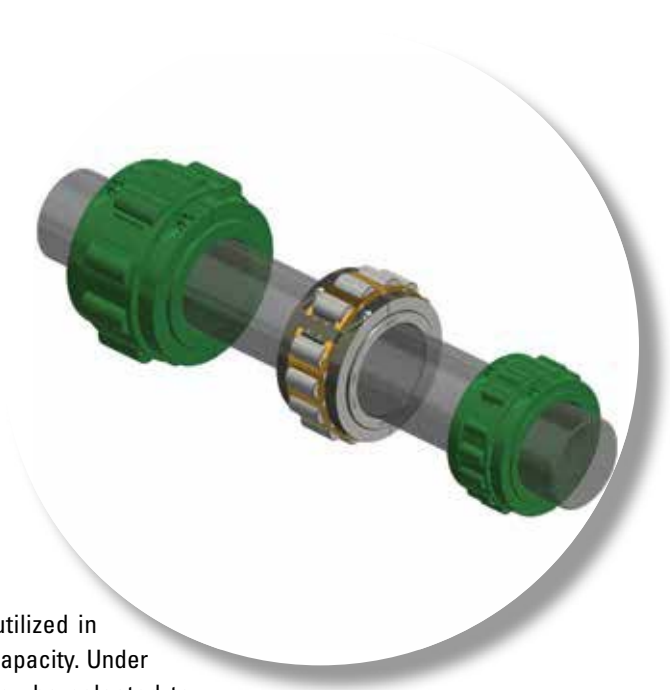
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Shaft (d)		Support Reference		C	G	L	H	X ⁽¹⁾	Y
mm	in.			mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
100	3 1/16	LSM100HG	LSE311HG	85.0	210	152	128	M36	76
	3 3/4		LSE312HG						
105	3 15/16	LSM105HG	LSE315HG	3.346	8.3	6.0	5.0	1 1/2 - 6 UNC	3.0
	4		LSE400HG						
110	4 3/16	LSM110HG	LSE403HG	90.0	232	156	140	M36	76
	4 1/4		LSE404HG						
115	4 7/16	LSM115HG	LSE407HG	3.543	9.1	6.1	5.5	1 1/2 - 6 UNC	3.0
	4 1/2		LSE408HG						
120	4 11/16	LSM120	LSE411	95	276	162	156	M36	76
	4 3/4		LSE412						
125	4 15/16	LSM125	LSE415	3.740	10.866	6.378	6.142	1 1/2 - 6 UNC	2.992
	5		LSE500						
135	5 3/16	LSM135	LSE503	98.4	280	158	160	M36	75
	5 1/4		LSE504						
140	5 7/16	LSM140	LSE507	3.874	11.024	6.220	6.299	1 1/2 - 6 UNC	2.953
	5 1/2		LSE508						

⁽¹⁾ Hanger units with inch bore sizes have UNC mounting threads as standard. Hanger units with metric bore sizes have metric mounting threads as standard



MEDIUM SERIES

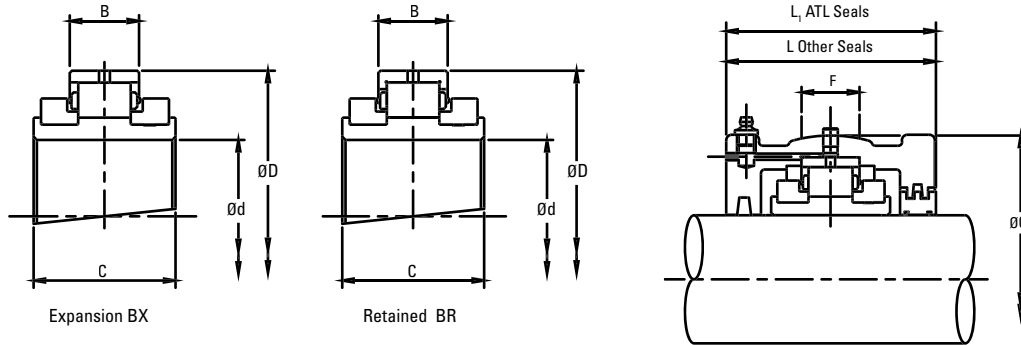
Medium series bearing products can be utilized in applications requiring higher load-carrying capacity. Under normal conditions, medium series also may be selected to provide an extended bearing life when compared to light series. Medium series offers the same range of mounting and sealing solutions as light series, with the exception of hanger units. If a standard catalog product does not meet your requirements, a Timken engineer will be happy to provide help and advice on your application.

The following topics are covered within this section:

Medium Series Bearing and Housing 45 mm to 155 mm (1 1/8 in. to 6 in.)	60
Medium Series Support S03 - S31	61
Medium Series Bearing and Housing 160 mm to 360 mm (6 3/8 in. to 14 in.)	62
Medium Series Support S32 - S40	63
Medium Series Bearing and Housing 380 mm to 600 mm (15 in. to 24 in.)	64
Medium Series Support S41 - S50	65
Medium Series Support Flange Units 45 mm to 305 mm (1 1/8 in. to 12 in.)	66
Medium Series Support Take-Up Units TT/TP 45 mm to 155 mm (1 1/8 in. to 6 in.)	68

MEDIUM SERIES BEARING AND HOUSING

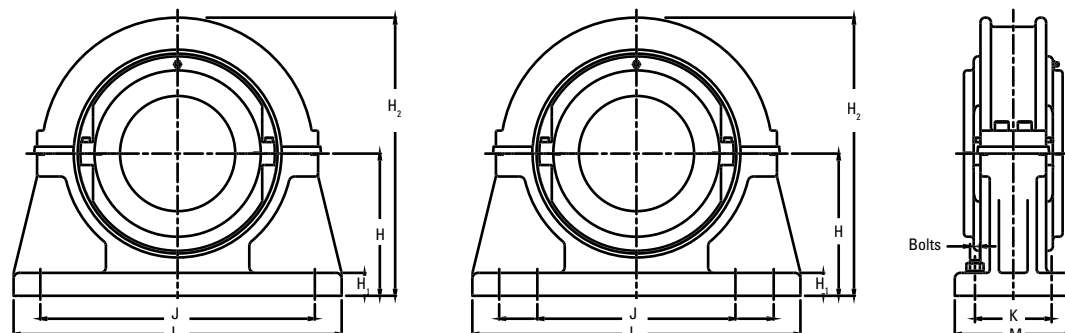
45 MM TO 155 MM (1 1/16 IN. TO 6 IN.)



Shaft (d)		Reference		Bearings Ratings						Housing Reference							
		Add BR for Retained Add BX for Expansion e.g. MSM55BR		Dynamic Cr	Static Cor	Axial Ca	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. MS3HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. MSM55HR	G	F	L	L1	
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
45 50	1 1/16 1 3/4	MSM45 MSM50	MSE111 MSE112	121 27202	127 28551	6.20 1394	4350	107.95 4.250	35.00 1.378	67.50 2.657	MS3	MSM45 MSM50	MSE111 MSE112 MSE115 MSE200	134.94 5.313	32 1.3	112 4.4	114 4.5
	1 1/16 2		MSE203 MSE204 MSE207 MSE208														
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	MSM55 MSM60 MSM65	MSE211 MSE212 MSE215 MSE300	168 37768	190 42714	8.80 1978	3680	127.00 5.000	38.90 1.531	72.30 2.846	MS4	MSM55 MSM60 MSM65	MSE203 MSE204 MSE207 MSE208	157.16 6.187	38 1.5	124 4.9	126 5.0
	2 1/16 2 3/4 2 15/16 3		MSE303 MSE304 MSE307 MSE308														
70 75	2 11/16 2 3/4 2 15/16 3	MSM70 MSM75	MSE311 MSE312 MSE315 MSE400	258 58001	300 67443	10.60 2383	3080	149.22 5.875	46.10 1.815	82.60 3.252	MS5	MSM70 MSM75	MSE211 MSE212 MSE215 MSE300	177.80 7.000	50 2.0	138 5.4	140 5.5
	3 3/16 3 1/4 3 7/16 3 1/2		MSE303 MSE304 MSE307 MSE308														
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	MSM80 MSM85 MSM90	MSE311 MSE312 MSE315 MSE400	297 66768	353 79358	17.80 4002	2520	169.86 6.687	48.40 1.906	89.70 3.531	MS6	MSM80 MSM85 MSM90	MSE303 MSE304 MSE307 MSE308	203.20 8.000	50 2.0	152 6.0	154 6.1
	3 11/16 3 3/4 3 15/16 4		MSE311 MSE312 MSE315 MSE400														
100 105	3 11/16 3 3/4 3 15/16 4	MSM100 MSM105	MSE403 MSE404 MSE407 MSE408	388 87226	491 110381	25.00 5620	2130	193.68 7.625	51.60 2.031	92.10 3.626	MS7	MSM100 MSM105	MSE311 MSE312 MSE315 MSE400	231.78 9.125	64 2.5	144 5.7	146 5.7
	4 3/16 4 1/4 4 7/16 4 1/2		MSE403 MSE404 MSE407 MSE408														
110 115	4 3/16 4 1/4 4 7/16 4 1/2	MSM110 MSM115	MSE411 MSE412 MSE415 MSE500	454 102063	592 133087	31.20 7014	1820	228.60 9.000	57.20 2.252	100.00 3.937	MS8	MSM110 MSM115	MSE403 MSE404 MSE407 MSE408	266.70 10.500	76 3.0	160 6.3	162 6.4
	4 11/16 4 3/4 4 15/16 5		MSE411 MSE412 MSE415 MSE500														
120 125 130	4 11/16 4 3/4 4 15/16 5	MSM120 MSM125 MSM130	MSE503 MSE504 MSE507 MSE508	525 118025	700 157366	38.20 8588	1600	254.00 10.000	63.50 2.500	114.30 4.500	MS10	MSM120 MSM125 MSM130	MSE411 MSE412 MSE415 MSE500	295.28 11.625	82 3.2	182 7.2	184 7.2
	5 3/16 5 1/4 5 7/16 5 1/2		MSE503 MSE504 MSE507 MSE508														
135 140	5 3/16 5 1/4 5 7/16 5 1/2	MSM135 MSM140	MSE511 MSE512 MSE515 MSE600	600 134885	817 183669	45.40 10206	1450	273.05 10.750	66.70 2.626	117.50 4.626	MS30	MSM135 MSM140	MSE503 MSE504 MSE507 MSE508	323.85 12.750	90 3.5	186 7.3	188 7.4
	5 11/16 5 3/4 5 15/16 6		MSE511 MSE512 MSE515 MSE600														
150 155 160	5 11/16 5 3/4 5 15/16 6	MSM150 MSM155 MSM160A	MSE511 MSE512 MSE515 MSE600	730 164111	1034 232453	52.40 11780	1320	292.10 11.500	68.30 2.689	123.80 4.874	MS31 MS32E0548	MSM150 MSM155 MSM160A	MSE511 MSE512 MSE515 MSE600	336.55 13.250	95 3.7	202 8.0	204 8.0
	5 11/16 5 3/4 5 15/16 6		MSE511 MSE512 MSE515 MSE600														

For triple labyrinth seal designations, please refer to page 32-34.

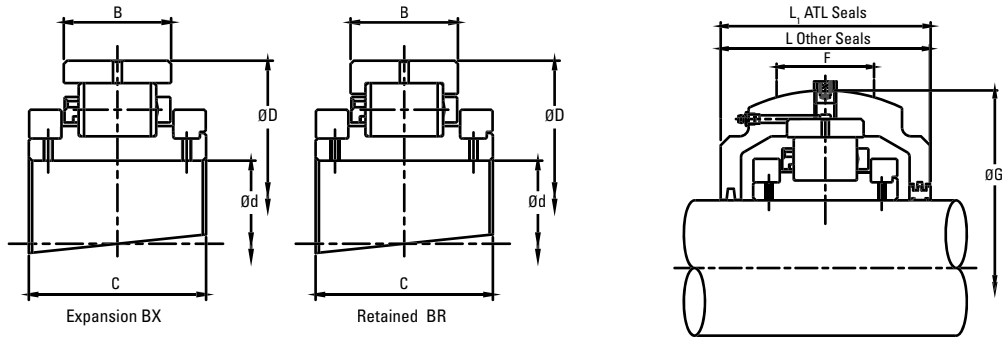
MEDIUM SERIES SUPPORT S03 - S31



Shaft (d)		Support Reference	H	H ₁	H ₂	J x K	L x M	Bolts
mm	in.							
45 50	1 11/16 1 3/4 1 15/16 2	S03	80 3.150	32 1.3	180 7.1	234 9.2	280 x 70 11 x 2.8	2 x M16
	55 60 65		S04	95 3.740	38 1.5	208 8.2	270 10.6	
70 75	2 11/16 2 3/4 2 15/16 3	S05 S05-4B		112 4.409 112 4.409	44 1.7 44 1.7	242 9.53 242 9.53	320 12.6 328 x 88.9 12.9 x 3.5	380 x 90 15 x 3.5 380 x 140 15 x 5.51
	80 85 90	3 3/16 3 3/4 3 7/16 3 1/2	S06 S06-4B	125 4.921 125 4.921	55 2.17 55 2.17	265 10.43 265 10.43	354 13.9 368 x 102 14.5 x 4	420 x 102 16.5 x 4 426 x 152 16.8 x 6
100 105		3 11/16 3 3/4 3 15/16 4	S07 S07-4B	143 5.630 143 5.630	60 2.4 60 2.4	303 11.93 303 11.93	392 15.4 412 x 114.3 16.2 x 4.5	466 x 120 18.3 x 4.7 476 x 172 17.74 x 6.77
	110 115	4 3/16 4 1/4 4 7/16 4 1/2	S08	162 6.378	38 1.5	372 14.6	450 x 120 17.7 x 4.7	508 x 178 20 x 7
120 125 130		4 11/16 4 3/4 4 15/16 5		S10	181 7.126	40 1.6	415 16.3	496 x 120 19.5 x 4.7
	135 140	5 3/16 5 1/4 5 7/16 5 1/2	S30		203 7.992	50 2.0	460 18.1	546 x 120 21.5 x 4.7
150 155 160		5 11/16 5 3/4 5 15/16 6		S31	210 8.268	50 2.0	470 18.5	558 x 128 22 x 5

MEDIUM SERIES BEARING AND HOUSING

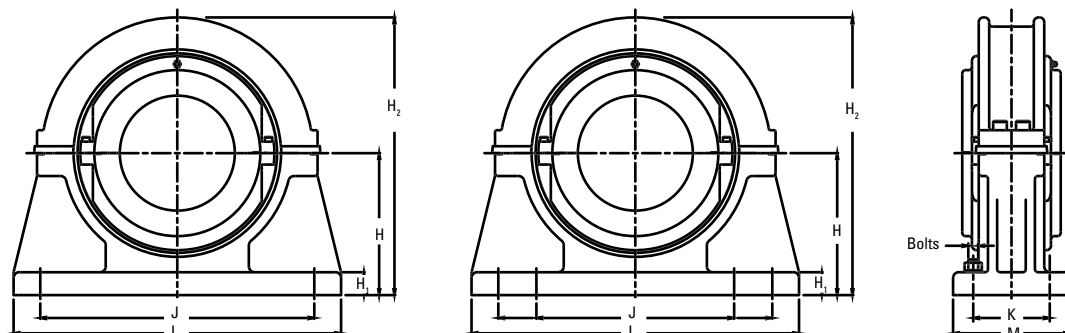
160 MM TO 360 MM (6 7/16 IN. TO 14 IN.)



Shaft (d)		Reference		Bearings Ratings						Housing Reference							
				Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. MS3HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. MSM160HR	G	F	L	L ₁	
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
160 170	6 7/16	MSM160 MSM170	MSE607	842 189289	1175 264151	61.40 13803	1200	317.50 12.500	83.30 3.280	140.00 5.512	MS32	MSM160 MSM170	MSE607	368.30 14.500	95 3.7	206 8.1	232 9.1
	6 1/2		MSE608										MSE608				
	6 11/16		MSE611										MSE611				
	6 3/4		MSE612										MSE612				
175 180	6 15/16	MSM175 MSM180	MSE615	927 208398	1357 305066	71.20 16006	1120	330.20 13.000	83.30 3.280	140.00 5.512	MS33	MSM175 MSM180	MSE615	381.00 15.000	95 3.7	222 8.7	242 9.5
	7		MSE700										MSE700				
190 200	7 1/4	MSM190 MSM200	MSE704	1013 227732	1516 340810	80.00 17985	960	368.30 14.500	90.50 3.563	156.00 6.142	MS34	MSM190 MSM200	MSE704	425.50 16.752	105 4.1	235 9.3	258 10.2
	7 1/2		MSE708										MSE708				
220 230	7 15/16	MSM220 MSM230	MSE715	1138 255833	1668 374981	89.80 20188	850	393.70 15.500	90.50 3.563	163.00 6.417	MS35	MSM220 MSM230	MSE715	457.20 18.000	110 4.3	242 9.5	274 10.8
	8		MSE800										MSE800				
240 250 260	8 1/2	MSM240 MSM250 MSM260	MSE808	1354 304391	2117 475921	98.80 22211	750	431.80 17.000	96.80 3.811	170.00 6.693	MS36	MSM240 MSM250	MSE808	495.30 19.500	118 4.6	248 9.8	280 11.0
	8 7/8		MSE814										MSE814				
	9		MSE900										MSE900				
270 280	9 1/2	MSM270 MSM280	MSE908	1476 331818	2357 529875	113.80 25583	670	463.55 18.250	101.60 4.000	186.00 7.323	MS37	MSM270 MSM280	MSE908	527.10 20.752	130 5.1	264 10.4	300 11.8
	10 3/4		MSE1012										MSE1012				
300 305	10 1/2	MSM300 MSM305	MSE1012	1587 356772	2644 594395	129.00 29000	610	495.30 19.500	103.20 4.063	193.00 7.598	MS38	MSM300 MSM305	MSE1012	552.50 21.752	128 5.0	268 10.6	306 12.0
	11 1/2		MSE1108										MSE1108				
320 330	11	MSM320 MSM330	MSE1108	1723 387346	2922 656892	144.20 32417	550	527.05 20.750	106.40 4.189	192.00 7.559	MS39	MSM320 MSM330	MSE1108	587.40 23.126	128 5.0	298 11.7	-
	12 1/2		MSE1208										MSE1208				
340 350 360	13	MSM340 MSM350 MSM360	MSE1300	1989 447145	3403 765025	159.20 35790	500	565.15 22.250	115.90 4.563	200.00 7.874	MS40	MSM340 MSM350 MSM360	MSE1300	628.70 24.752	146 5.7	305 12.0	-
	14		MSE1400										MSE1400				

For triple labyrinth seal designations, please refer to page 32-34.

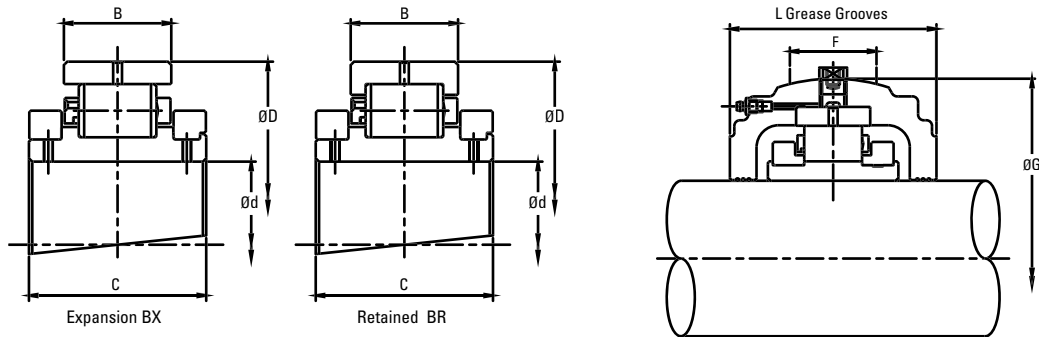
MEDIUM SERIES SUPPORT S32 - S40



Shaft (d)		Support Reference	H	H ₁	H ₂	J x K	L x M	Bolts
mm	in.							
160 170	6 7/16 6 1/2	S32	267 10.512	44 1.7	535 21.1	448 x 172 17.6 x 6.8	596 x 242 23.5 x 9.5	4 x M30
175 180	6 11/16 6 3/4 6 15/16 7	S33	273 10.748	44 1.7	545 21.5	458 x 166 18 x 6.5	636 x 242 25 x 9.5	4 x M30
190 200	7 1/4 7 1/2 7 15/16 8	S34	305 12.008	50 2.0	610 24.0	508 x 190 20 x 7.5	686 x 266 27 x 10.5	4 x M30
220 230	8 1/2 8 7/8 9	S35	324 12.756	50 2.0	650 25.6	550 x 190 21.7 x 7.5	750 x 280 29.5 x 11	4 x M30
240 250 260	9 1/2 9 3/4 10	S36	356 14.016	54 2.1	710 28.0	596 x 204 23.5 x 8	812 x 292 32 x 11.5	4 x M36
270 280	10 1/2 10 3/4 11	S37	378 14.882	60 2.4	760 29.9	736 & 534 x 254 29 & 21 x 10	914 x 330 36 x 13	8 x M30
300 305	11 1/2 12	S38	394 15.512	60 2.4	790 31.1	768 & 566 x 254 30.2 & 22.3 x 10	958 x 330 37.7 x 13	8 x M30
320 330	12 1/2 13	S39	419 16.496	64 2.5	840 33.1	812 & 610 x 210 32 & 24 x 8.3	1016 x 292 40 x 11.5	8 x M30
340 350 360	14	S40	451 17.756	67 2.6	900 35.4	864 & 660 x 280 34 & 26 x 11	1092 x 368 43 x 14.5	8 x M36

MEDIUM SERIES BEARING AND HOUSING

380 MM TO 600 MM (15 IN. TO 24 IN.)

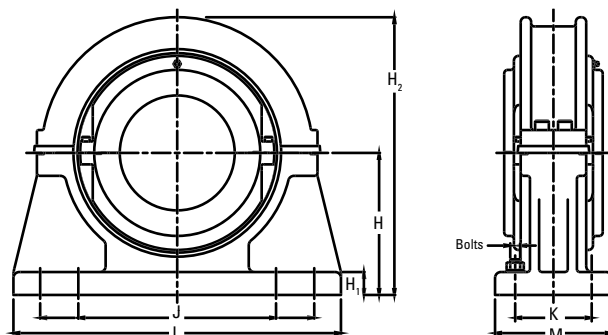


Shaft (d)		Reference Add BR for Retained Add BX for Expansion e.g. MS1700BR		Bearings Ratings						Housing Reference							
				Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. MS34HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. MSE1700HR		G	F	L	L ₁
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
380	15	MSM380	MSE1500	1931 434106	3522 791778	174.40 39207	460	584.20 23.000	111.10 4.374	200.00 7.874	MS41	MSM360 MSM380	MSE1500	647.70 25.500	146 5.7	305 12.0	–
400	16	MSM400	MSE1600	2105 473223	3793 852701	188.40 42354	430	615.95 24.250	115.90 4.563	200.00 7.874	MS42	MSM400	MSE1600	685.80 27.000	146 5.7	324 12.8	–
420	17	MSM420	MSE1700	2324 522456	4164 936105	202.00 45411	400	647.70 25.500	119.10 4.689	200.00 7.874	MS43	MSM420	MSE1700	717.60 28.252	146 5.7	350 13.8	–
440 460	18	MSM440 MSM460	MSE1800	2215 497952	4183 940376	216.00 48559	380	666.75 26.250	115.90 4.563	200.00 7.874	MS44	MSM440 MSM460	MSE1800	733.40 28.874	146 5.7	350 13.8	–
480	19	MSM480	MSE1900	2445 549658	4594 1032773	230.00 51706	360	698.50 27.500	119.10 4.689	223.00 8.780	MS45	MSM480	MSE1900	762.00 30.000	146 5.7	368 14.5	–
500	20	MSM500	MSE2000	2453 551456	5054 1137229	244.00 54853	340	717.55 28.250	115.90 4.563	226.00 8.898	MS46	MSM500	MSE2000	787.40 31.000	146 5.7	368 14.5	–
530	21	MSM530	MSE2100	2702 607434	5467 1230020	258.00 58001	330	762.00 30.000	119.10 4.689	229.00 9.016	MS47	MSM530	MSE2100	831.90 32.752	150 5.9	368 14.5	–
560	22	MSM560	MSE2200	2851 640930	5794 1303567	272.00 61148	310	793.75 31.250	122.20 4.811	233.00 9.173	MS48	MSM560	MSE2200	866.80 34.126	152 6.0	374 14.7	–
580	23	MSM580	MSE2300	2982 670380	6231 1402056	286.00 64295	300	812.80 32.000	119.10 4.689	232.00 9.134	MS49	MSM580	MSE2300	883.00 34.764	152 6.0	374 14.7	–
600	24	MSM600	MSE2400	2972 668132	6243 1404650	300.00 67443	290	838.20 33.000	119.10 4.689	214.00 8.425	MS50	MSM600	MSE2400	914.40 36.000	152 6.0	388 15.3	–

For triple labyrinth seal designations, please refer to page 32-34.

MEDIUM SERIES SUPPORT

S41 - S50



Shaft (d)		Support Reference	H	H ₁	H ₂	J x K	L x M	Bolts
mm	in.		mm in.	mm in.	mm in.	mm in.	mm in.	
380	15	S41	464 18.268	67 2.6	925 36.4	886 & 682 x 280 34.9 & 26.9 x 11	1092 x 368 43 x 14.5	8 x M36
400	16	S42	495 19.488	70 2.8	990 39.0	934 & 730 x 280 36.8 & 28.7 x 11	1168 x 368 46 x 14.5	8 x M36
420	17	S43	514 20.236	70 2.8	1030 40.6	972 & 768 x 280 38.3 & 30.2 x 11	1194 x 368 47 x 14.5	8 x M36
440 460	18	S44	533 20.984	73 2.9	1070 42.1	996 & 788 x 280 39.2 & 31 x 11	1244 x 368 49 x 14.5	8 x M36
480	19	S45	552 21.732	76 3.0	1110 43.7	1042 & 812 x 280 41 & 32 x 11	1270 x 368 50 x 14.5	8 x M36
500	20	S46	572 22.520	80 3.1	1145 45.1	1074 & 844 x 280 42.3 & 33.2 x 11	1296 x 368 51 x 14.5	8 x M36
530	21	S47	594 23.386	83 3.3	1180 46.5	1118 & 890 x 280 44 & 35 x 11	1398 x 368 55 x 14.5	8 x M36
560	22	S48	616 24.252	86 3.4	1230 48.4	1158 & 930 x 280 45.6 & 36.6 x 11	1422 x 382 56 x 15	8 x M42
580	23	S49	635 25.000	89 3.5	1270 50.0	1187 & 959 x 280 46.7 & 37.8 x 11	1448 x 382 57 x 15	8 x M42
600	24	S50	673 26.496	92 3.6	1345 53.0	1238 & 1010 x 280 48.7 & 39.8 x 11	1524 x 382 60 x 15	8 x M42

MEDIUM SERIES SUPPORT FLANGE UNITS 45 MM TO 305 MM (1 1/16 IN. TO 12 IN.)

When faced with flat horizontal or vertical faces, flange units offer a simple mounting solution. As with pillow block supports, flange units are produced with spherical location to accommodate standard bearing housings and provide easy initial alignment of shaft and equipment.

To facilitate positive location of the flange to the surface, the rear face is recessed (dimensions N and V). This allows for a spigot (tolerance f8) to be located into the flange.

Bearing inspection is simply a matter of removing the top half of the flange and housing. Bearing replacement also may be achieved in the same manner if required.

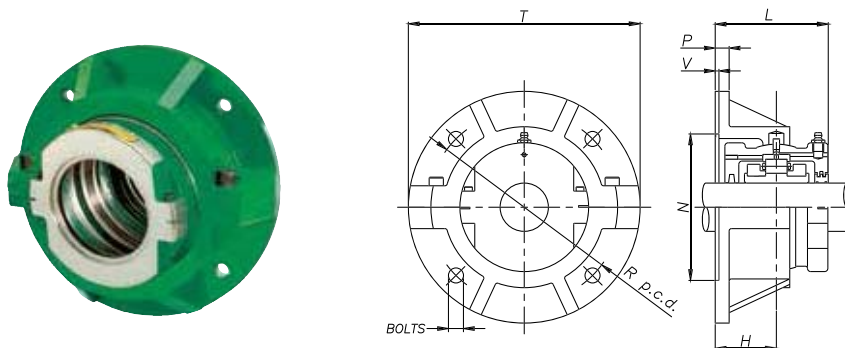
When integrating flange units into new applications, it should be noted that a maximum radial load equivalent to 0.26 C_{or} is permissible. A maximum axial load of 0.25 C_a also must be taken into account for applications with thrust loading. Units for vertically oriented shafts may also need special consideration given to sealing arrangements.

Contact a Timken engineer for any application issues.

Shaft (d)		Flange Reference	T	Bolts	R	P	H	N	V	L
mm	in.									
45 50	1 11/16 1 3/4 1 15/16 2	F03	260 10.2	4 x M12	218 8.6	16 0.6	67 2.6	166.9 6.571	3 0.1	124 4.9
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	F04	286 11.3	4 x M12	242 9.5	16 0.6	73 2.9	192.09 7.563	3 0.1	136 5.4
70 75	2 11/16 2 3/4 2 15/16 3	F05	330 13.0	4 x M16	274 10.8	19 0.7	79 3.1	215.9 8.500	3 0.1	150 5.9
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	F06	356 14.0	4 x M16	302 11.9	19 0.7	86 3.4	244.47 9.625	3 0.1	164 6.5
100 105	3 11/16 3 3/4 3 15/16 4	F07	382 15.0	4 x M16	334 13.1	22 0.9	92 3.6	276.22 10.875	3 0.1	166 6.5
110 115	4 3/16 4 1/4 4 7/16 4 1/2	F08	432 17.0	4 x M24	374 14.7	22 0.9	98 3.9	314.32 12.375	3 0.1	180 7.1
120 125 130	4 11/16 4 3/4 4 15/16 5	F10	470 18.5	4 x M24	412 16.2	25 1.0	114 4.5	346.07 13.625	3 0.1	206 8.1
135 140	5 3/16 5 1/4 5 7/16 5 1/2	F30	508 20.0	4 x M24	444 17.5	25 1.0	114 4.5	377.82 14.875	3 0.1	208 8.2

For bearings and housings see pages 60, 62 and 64.

continued on next page



continued from previous page

Shaft (d)		Flange Reference	T	Bolts	R	P	H	N	V	L
mm	in.									
150 155 160A	5 11/16 5 3/4 5 15/16 6	F31	534 21.0	4 x M24	466 18.3	25 1.0	124 4.9	393.70 15.500	3 0.1	226 8.9
160 170	6 7/16 6 1/2	F32	584 23.0	4 x M30	508 20.0	29 1.1	124 4.9	428.62 16.875	5 0.2	240 9.4
175 180	6 11/16 6 3/4 6 15/16 7	F33	596 23.5	4 x M30	524 20.6	32 1.3	130 5.1	444.50 17.500	5 0.2	252 9.9
190 200	7 1/4 7 1/2 7 15/16 8	F34	648 25.5	4 x M30	572 22.5	32 1.3	137 5.4	492.12 19.375	5 0.2	266 10.5
220 230	8 1/2 8 7/8 9	F35	712 28.0	4 x M36	620 24.4	35 1.4	146 5.7	527.05 20.750	5 0.2	284 11.2
240 250 260	9 1/2 9 3/4 10	F36	736 29.0	4 x M36	660 26.0	38 1.5	149 5.9	568.32 22.375	5 0.2	290 11.4
270 280	10 1/2 10 3/4 11	F37	762 30.0	8 x M30	682 26.9	38 1.5	159 6.3	603.25 23.750	5 0.2	310 12.2
300 305	11 1/2 12	F38	788 31.0	8 x M30	708 27.9	41 1.6	162 6.4	628.65 24.750	5 0.2	316 12.4

MEDIUM SERIES SUPPORT

TAKE-UP UNITS TT/TP 45 MM TO 155 MM (1 1/16 IN. TO 6 IN.)

This type of split unit can be found in use on materials handling equipment in many industries. Take-up units provide an efficient and readily accessible means of tensioning conveyor systems and large scale drives.

The units consist of either push-type or pull-type sliding supports into which standard housings and bearings may

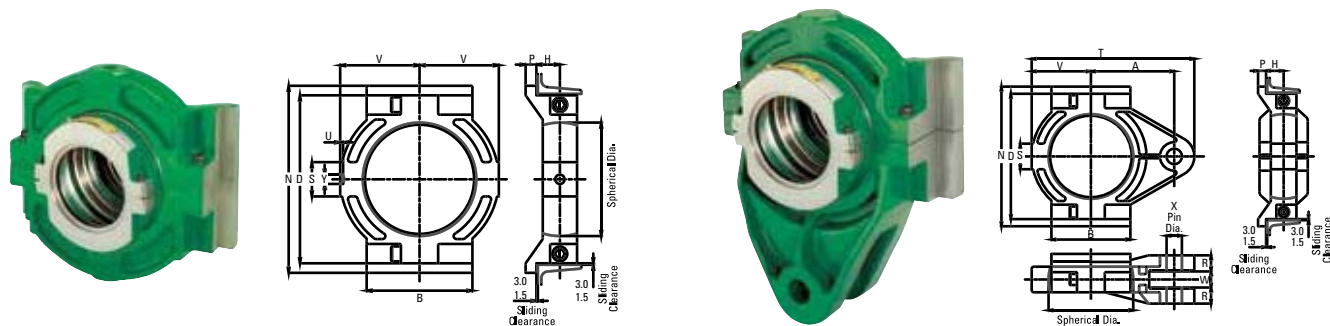
be mounted. When integrating take-up units into new applications, it should be noted that a maximum radial load equivalent to 0.3 C_{0r} is permissible. As with all Timken units, a wide variety of sealing solutions may be applied dependant on the environment and application. Please contact a Timken engineer for assistance.

Shaft (d)		Support Reference		B	N	D	V	P	H	S	A	T	X	W	R	U	Y
		Tension-Type	Push-Type														
mm	in.			mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
45 50	1 11/16 1 3/4 1 15/16 2	TT03	TP03	128 5.0	235 9.3	203 8.0	102 4.0	20 0.8	32 1.3	38 1.5	146 5.7	280 11.0	24 0.9	30 1.2	29 1.1	6 0.2	16 0.6
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	TT04	TP04	152 6.0	266 10.5	229 9.0	114 4.5	22 0.9	40 1.6	41 1.6	158 6.2	305 12.0	24 0.9	30 1.2	32 1.3	6 0.2	16 0.6
70 75	2 11/16 2 3/4 2 15/16 3	TT05	TP05	190 7.5	318 12.5	280 11.0	140 5.5	22 0.9	40 1.6	51 2.0	190 7.5	368 14.5	30 1.2	38 1.5	35 1.4	6 0.2	16 0.6
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	TT06	TP06	204 8.0	342 13.5	305 12.0	152 6.0	22 0.9	43 1.7	51 2.0	210 8.3	414 16.3	36 1.4	44 1.7	35 1.4	6 0.2	19 0.7
100 105	3 11/16 3 3/4 3 15/16 4	TT07	TP07	216 8.5	382 15.0	343 13.5	162 6.4	22 0.9	48 1.9	70 2.8	228 9.0	445 17.5	42 1.7	44 1.7	41 1.6	6 0.2	19 0.7

For bearings and housings see pages 60, 62 and 64.

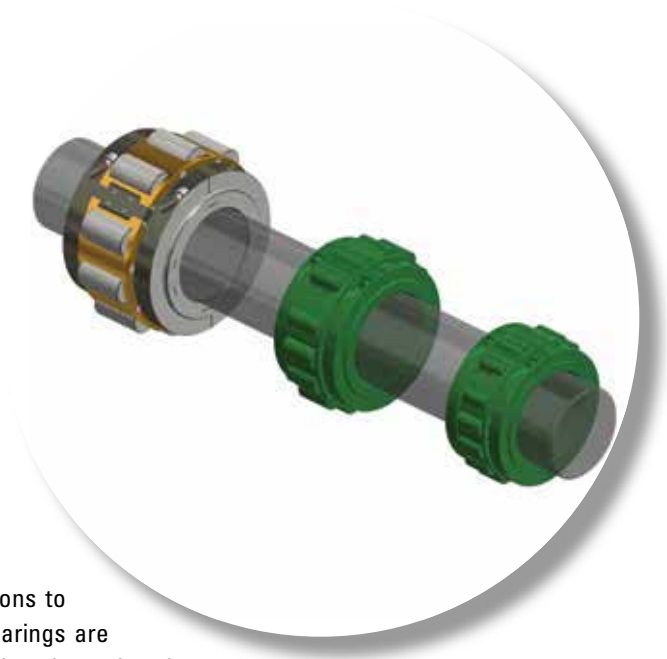
continued on next page

MEDIUM SERIES • MEDIUM SERIES SUPPORT • TAKE-UP UNITS TT/TP 45 MM TO 155 MM (1 1/16 IN. TO 6 IN.)



continued from previous page

Shaft (d)		Support Reference		B	N	D	V	P	H	S	A	T	X	W	R	U	Y
		Tension-Type	Push-Type														
mm	in.			mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
110 115	4 3/16	TT08	TP08	254	420	381	190	25	51	76	260	508	42	44	44	6	19
	4 1/4			10.0	16.5	15.0	7.5	1.0	2.0	3.0	10.2	20.0	1.7	1.7	1.7	0.2	0.7
	4 7/16 4 1/2																
120 125 130	4 11/16	TT10	TP10	266	464	426	204	25	57	86	280	546	48	50	51	8	23
	4 3/4			10.5	18.3	16.8	8.0	1.0	2.2	3.4	11.0	21.5	1.9	2.0	2.0	0.3	0.9
	4 15/16 5																
135 140	5 3/16	TT30	TP30	280	502	464	222	25	60	92	298	584	48	50	54	8	23
	5 1/4			11.0	19.8	18.3	8.7	1.0	2.4	3.6	11.7	23.0	1.9	2.0	2.1	0.3	0.9
	5 7/16 5 1/2																
150 155 160	5 11/16	TT31	TP31	305	528	489	235	25	64	92	312	616	48	50	57	10	26
	5 3/4			12.0	20.8	19.3	9.3	1.0	2.5	3.6	12.3	24.3	1.9	2.0	2.2	0.4	1.0
	5 15/16 6																



HEAVY SERIES

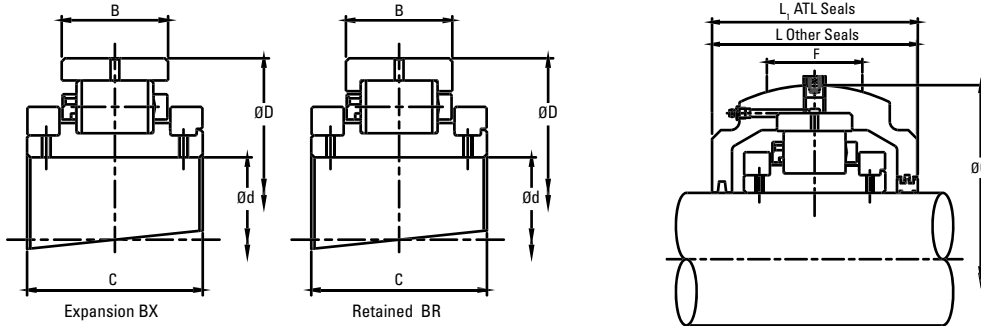
Heavy series bearing products offer solutions to the most demanding of load conditions. Bearings are supported by robust and durable mountings and can be equipped with a variety of sealing solutions. If a standard catalog product does not meet your requirements, a Timken engineer will be happy to provide help and advice on your application.

The following topics are covered within this section:

Heavy Series Bearing and Housing 100 mm to 260 mm (3 1/8 in. to 10 in.)	72
Heavy Series Support S54 - S63	73
Heavy Series Bearing and Housing 280 mm to 600 mm (11 in. to 24 in.)	74
Heavy Series Support S83 - S95	75
Heavy Series Support Flange Units 125 mm to 260 mm (4 1/8 in. to 10 in.)	76

HEAVY SERIES BEARING AND HOUSING

100 MM TO 260 MM (3 1/16 IN. TO 10 IN.)

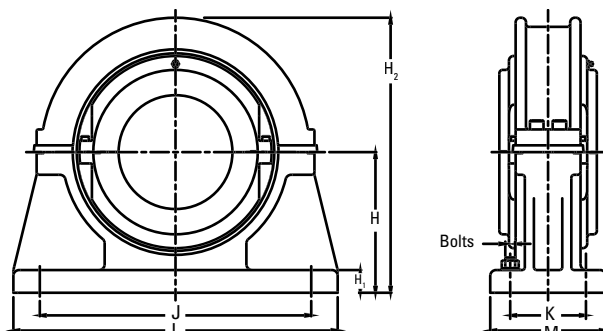


Shaft (d)		Reference		Bearings Ratings							Housing Reference						
				Dynamic C _r	Static C _{0r}	Axial C _a	Max	D	B, B ₁	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. HS58HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. HSE515HR	G	F	L	L ₁	
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
100 105	3 1/16 3 3/4	HSM100 HSM105	HSE311 HSE312	653 146800	783 176025	31.20 7014	1820	254.00 10.000	84.20 3.315	136.00 5.354	HS54	HSM100 HSM105	HSE311 HSE312 HSE315 HSE400	308.00 12.126	95 3.7	200 7.9	206 8.1
	3 15/16 4		HSE403 HSE404 HSE407 HSE408														
110 115 120	4 3/16 4 1/4	HSM110 HSM115 HSM120	HSE403 HSE404 HSE407 HSE408	656 147475	801 180072	39.10 8790	1640	266.70 10.500	87.30 3.437	147.00 5.787	HS55	HSM110 HSM115 HSM120	HSE403 HSE404 HSE407 HSE408	323.85 12.750	102 4.0	210 8.3	222 8.7
	4 7/16 4 1/2		HSE411 HSE412 HSE415 HSE500														
125 130	4 1/16 4 3/4	HSM125 HSM130	HSE411 HSE412 HSE415 HSE500	753 169281	974 218964	49.00 11016	1500	279.40 11.000	73.10 2.878	140.00 5.512	HS56	HSM125 HSM130	HSE415 HSE500	323.85 12.750	102 4.0	214 8.4	222 8.7
	4 15/16 5		HSE503 HSE504 HSE507 HSE508														
135 140	5 3/16 5 1/4	HSM135 HSM140	HSE503 HSE504 HSE507 HSE508	928 208623	1265 284383	58.80 13219	1340	304.80 12.000	79.40 3.126	147.00 5.787	HS57	HSM135 HSM140	HSE503 HSE504 HSE507 HSE508	355.60 14.000	108 4.3	216 8.5	230 9.1
	5 7/16 5 1/2		HSE511 HSE512 HSE515 HSE600														
150 155	5 11/16 5 3/4	HSM150 HSM155	HSE511 HSE512 HSE515 HSE600	1037 233127	1325 297872	69.40 15602	1220	330.20 13.000	81.00 3.189	160.00 6.299	HS58	HSM150 HSM155	HSE511 HSE512 HSE515 HSE600	393.70 15.500	114 4.5	232 9.1	254 10.0
	5 15/16 6		HSE607 HSE608 HSE611														
160 170	6 7/16 6 1/2	HSM160 HSM170	HSE607 HSE608 HSE611	1196 268871	1576 354299	79.20 17805	1110	355.60 14.000	103.20 4.063	171.00 6.732	HS59	HSM160 HSM170	HSE607 HSE608 HSE611	422.30 16.626	120 4.7	244 9.6	268 10.6
	6 11/16		HSE612 HSE615 HSE700														
175 180	6 3/4 6 15/16	HSM175 HSM180	HSE612 HSE615 HSE700	1330 298996	1867 419718	89.00 20008	1030	374.65 14.750	92.10 3.626	178.00 7.008	HS60	HSM175 HSM180	HSE612 HSE615 HSE700	431.80 17.000	132 5.2	254 10.0	284 11.2
	7		HSE704 HSE708 HSE715 HSE800														
190 200	7 1/4 7 1/2	HSM190 HSM200	HSE704 HSE708 HSE715 HSE800	1597 359020	2285 513688	99.60 22391	880	419.10 16.500	97.70 3.846	191.00 7.520	HS61	HSM190 HSM200	HSE704 HSE708 HSE715 HSE800	489.00 19.252	146 5.7	270 10.6	300 11.8
	7 15/16 8		HSE808 HSE814 HSE900														
220 230	8 1/2 8 7/8	HSM220 HSM230	HSE808 HSE814 HSE900	1665 374307	2455 551906	109.40 24594	760	469.90 18.500	109.60 4.315	212.00 8.346	HS62	HSM220 HSM230	HSE808 HSE814 HSE900	546.10 21.500	165 6.5	298 11.7	334 13.1
	9		HSE908 HSE912 HSE1000														
240 260	9 1/2 9 3/4	HSM240 HSM260	HSE908 HSE912 HSE1000	1896 426238	2789 626992	130.80 29405	700	482.60 19.000	105.60 4.157	211.00 8.307	HS63 HS63E0548	HSM240 HSM260	HSE908 HSE912 HSE1000	558.80 22.000	165 6.5	298 11.7	334 13.1
	10																

For triple labyrinth seal designations, please refer to page 32-34.

HEAVY SERIES SUPPORT

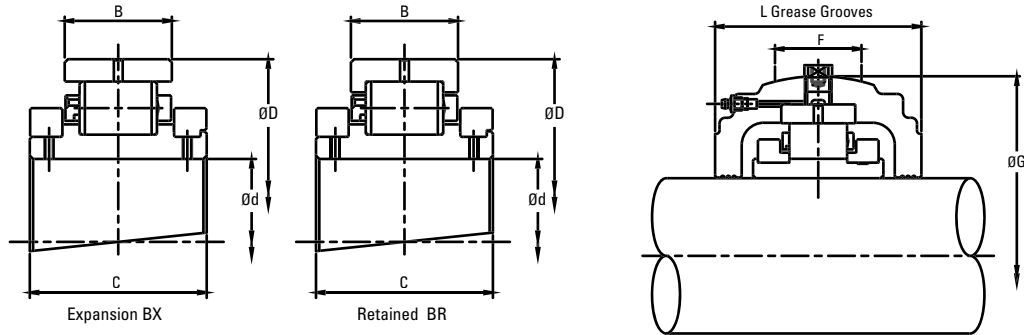
S54 - S63



Shaft (d)		Support Reference	H	H ₁	H ₂	J x K	L x M	Bolts
mm	in.		mm in.	mm in.	mm in.	mm in.	mm in.	
100 105	3 11/16 3 3/4 3 15/16 4	S54	191 7.520	38 1.5	405 15.9	438 x 82 17.2 x 3.2	514 x 152 20.2 x 6	4 x M24
110 115 120	4 3/16 4 1/4 4 7/16 4 1/2	S55	197 7.756	38 1.5	425 16.7	458 x 88 18 x 3.5	534 x 166 21 x 6.5	4 x M24
125 130	4 15/16 5	S56	203 7.992	48 1.9	435 17.1	470 x 96 18.5 x 3.8	546 x 166 21.5 x 6.5	4 x M24
135 140	5 3/16 5 1/4 5 7/16 5 1/2	S57	229 9.016	54 2.1	485 19.1	514 x 102 20.2 x 4	622 x 178 24.5 x 7	4 x M30
150 155	5 11/16 5 3/4 5 15/16 6	S58	254 10.000	57 2.2	535 21.1	558 x 120 22 x 4.7	666 x 204 26.2 x 8	4 x M30
160 170	6 7/16 6 1/2 6 11/16	S59	267 10.512	60 2.4	570 22.4	628 x 140 24.7 x 5.5	736 x 228 29 x 9	4 x M30
175 180	6 1/4 6 15/16 7	S60	279 10.984	64 2.5	580 22.8	636 x 152 25 x 6	762 x 254 30 x 10	4 x M30
190 200	7 1/4 7 1/2 7 15/16 8	S61	311 12.244	67 2.6	655 25.8	636 x 172 25 x 6.8	838 x 266 33 x 10.5	4 x M36
220 230	8 1/2 8 5/8 9	S62	349 13.740	76 3.0	730 28.7	736 x 178 29 x 7	952 x 280 37.5 x 11	4 x M42
240 260	9 1/2 9 3/4 10	S63	394 15.512	76 3.0	790 31.1	670 x 304 26.4 x 12	914 x 406 36 x 16	4 x M42

HEAVY SERIES BEARING AND HOUSING

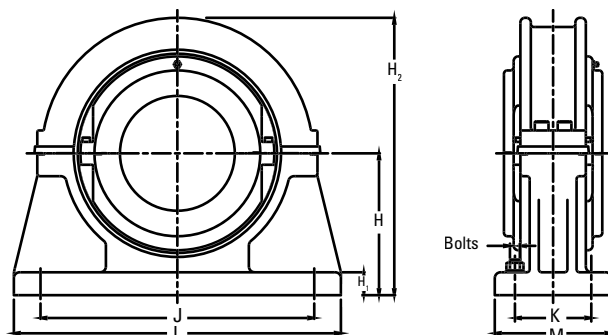
280 MM TO 600 MM (11 IN. TO 24 IN.)



Shaft (d)		Reference		Bearings Ratings						Housing Reference							
				Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B, B ₁	C	ATL Seals		Other Seal Types		G	F	L
Add BR for Retained Add BX for Expansion e.g. HSE1700BR		Add HRTL for retained Add HXTL for expansion e.g. HS89HRTL									Add HR for Retained Add HX for Expansion e.g. HSE1700HR						
mm	in.																
		kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.				mm in.	mm in.	mm in.	mm in.		
280	11	HSM280 HSE1100	2202 495029	3507 788405	153.00 34396	620	495.30 19.500	139.70 5.500	244.00 9.606	HS83	HSM280 HSE1100	571.50 22.500	165 6.5	356 14.0	356 14.0		
300	12	HSM300 HSE1200	2337 525379	3650 820553	174.40 39207	560	558.80 22.000	139.70 5.500	244.00 9.606	HS65	HSM300 HSE1200	641.40 25.252	165 6.5	346 13.6	370 14.6		
320	13	HSM320 HSE1300	2718 611031	4093 920143	198.80 44692	500	622.30 24.500	160.40 6.315	272.00 10.709	HS66	HSM320 HSE1300	717.60 28.252	170 6.7	368 14.5	—		
340 360	14	HSM340 HSM360 HSE1400	2935 659814	4973 1117975	213.60 48019	460	615.95 24.250	158.00 6.220	279.00 10.984	HS86	HSM340 HSM360 HSE1400	704.90 27.752	196 7.7	432 17.0	—		
380 400	15 16	HSM380 HSM400 HSE1500 HSE1600	3195 718265	5238 1177550	250.80 56382	420	685.80 27.000	166.70 6.563	292.00 11.496	HS68 HS68E0548	HSM380 HSM400 HSE1500 HSE1600	774.70 30.500	202 8.0	400 15.7	—		
420 440	17	HSM420 HSM440 HSE1700	3582 805266	6377 1433607	275.80 62002	360	700.00 27.559	160.00 6.299	284.00 11.181	HS89	HSM420 HSM440 HSE1700	788.00 31.024	200 7.9	440 17.3	—		
460	18	HSM460 HSE1800	3807 855848	6611 1486212	302.40 67982	340	740.00 29.134	170.00 6.693	294.00 11.575	HS90	HSM460 HSE1800	840.00 33.071	200 7.9	450 17.7	—		
500 530	20 21	HSM500 HSM530 HSE2000 HSE2100	4660 1047610	8183 1839612	347.00 78009	310	850.90 33.500	187.40 7.378	300.00 11.811	HS94 HS94E0548	HSM500 HSM530 HSE2000 HSE2100	958.90 37.752	204 8.0	495 19.5	—		
560	22	HSM560 HSE2200	4795 1077959	9412 2115902	382.60 86012	280	863.60 34.000	196.90 7.752	310.00 12.205	HS94	HSM560 HSE2200	958.90 37.752	204 8.0	490 19.3	—		
580 600	23 24	HSM580 HSM600 HSE2300 HSE2400	4951 1113029	9451 2124669	400 89924	270	890.00 35.039	184.00 7.244	310.00 12.205	HS95	HSM580 HSM600 HSE2300 HSE2400	990.00 38.976	204 8.0	490 19.3	—		

HEAVY SERIES SUPPORT

S83 - S95



Shaft (d)		Support Reference	H	H ₁	H ₂	J x K	L x M	Bolts
mm	in.		mm in.	mm in.	mm in.	mm in.	mm in.	
280	11	S83	368 14.488	70 2.8	785 30.9	742 & 502 x 178 29.2 & 19.8 x 7	940 x 280 37 x 11	8 x M36
300	12	S65	457 17.992	76 3.0	915 36.0	876 & 674 x 330 34.5 & 26.5 x 13	1092 x 420 43 x 16.5	8 x M36
320	13	S66	518 20.394	80 3.1	1035 40.7	978 & 762 x 266 38.5 & 30 x 10.5	1194 x 356 47 x 14	8 x M36
340 360	14	S86	470 18.504	82 3.2	1000 39.4	928 & 660 x 190 36.5 & 26 x 7.5	1220 x 318 48 x 12.5	8 x M42
380 400	15 16	S68	559 22.008	92 3.6	1120 44.1	1036 & 806 x 292 40.8 & 31.7 x 11.5	1270 x 394 50 x 15.5	8 x M42
420 440	17	S89	508 20.000	90 3.5	1075 42.3	990 & 690 x 210 39 & 27.2 x 8.3	1270 x 360 50 x 14.2	8 x M48
460	18	S90	550 21.654	95 3.7	1165 45.9	1080 & 780 x 220 42.5 & 30.7 x 8.7	1370 x 380 53.9 x 15	8 x M48
500 530	20 21	S94	622 24.488	102 4.0	1340 52.8	1270 & 940 x 242 50 & 37 x 9.5	1600 x 406 63 x 16	8 x M56
560	22	S94	622 24.488	102 4.0	1340 52.8	1270 & 940 x 242 50 & 37 x 9.5	1600 x 406 63 x 16	8 x M56
580 600	23 24	S95	622 24.488	102 4.0	1340 52.8	1270 & 940 x 242 50 & 37 x 9.5	1600 x 406 63 x 16	8 x M56

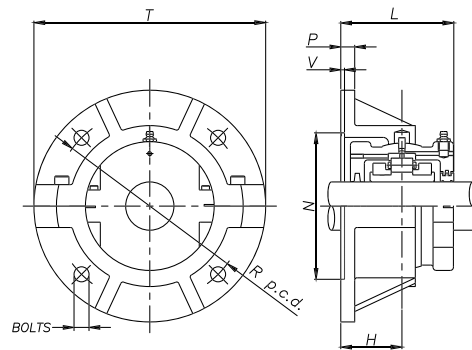
HEAVY SERIES FLANGE UNITS 125 MM TO 260 MM (4 15/16 IN. TO 10 IN.)

When faced with flat horizontal or vertical faces, flange units offer a simple mounting solution. As with pillow block supports, flange units are produced with spherical location to accommodate standard bearing housings and provide easy initial alignment of shaft and equipment.

To facilitate positive location of the flange to the surface, the rear face is recessed (dimensions N and V). This allows for a spigot (tolerance f8) to be located into the flange.

Bearing inspection is simply a matter of removing the top half of the flange and housing. Bearing replacement also may be achieved in the same manner if required.

When integrating flange units into new applications, it should be noted that a maximum radial load equivalent to 0.26 C_{or} is permissible. A maximum axial load of 0.25 C_a also must be taken into account for applications with thrust loading. Units for vertically oriented shafts may also need special consideration given to sealing arrangements.



Shaft (d)		Flange Reference	T	R	P	H	N	V	L
mm	in.								
125 130	4 15/16 5	F56	530 20.9	460 18.1	34 1.3	122 4.8	390.45 15.372	7 0.3	233 9.2
150 155	5 11/16 5 3/4 5 15/16 6	F58	648 25.5	574 22.6	44 1.7	137 5.4	495.35 19.502	7 0.3	264 10.4
175 180	6 3/4 6 15/16 7	F60	724 28.5	638 25.1	44 1.7	156 6.1	546.15 21.502	8 0.3	298 11.7
240 250 260	9 1/2 9 3/4 10	F63	890 35.0	796 31.3	48 1.9	181 7.1	692.20 27.252	8 0.3	348 13.7

For bearings and housings see page 72.



SAF/SN/SD BEARINGS

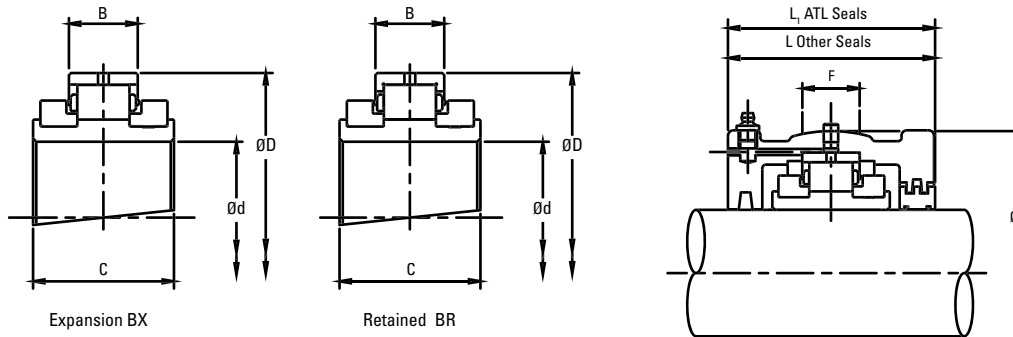
The new compact split plummer block bearing from Timken is the first split cylindrical roller bearing assembly to be interchangeable with standard SAF, SN and SD series plummer blocks, bringing the benefits of a split design to a much wider customer base.

The following topics are covered within this section:

SAFQ Two-Bolt/SAFQ Four-Bolt Bearing and Housing 1 7/16 in. to 3 7/16 in.	78
SAFQ Two-Bolt/SAFQ Four-Bolt Support SAFQ1-2B - SAFQ05-2B. . .	79
SAFQ Two-Bolt/SAFQ Four-Bolt Bearing and Housing 3 7/16 in. to 7 1/16 in.	80
SAFQ Two-Bolt/SAFQ Four-Bolt Support SAFQ06A - SAFQ34A. . .	81
Light SNQ/SDQ Range Bearing and Housing 35 mm to 160 mm (1 3/8 in. to 6 in.)	82
Light SNQ/SDQ Range Support SNQ01 - SNQ10	83
Light SNQ/SDQ Range Bearing and Housing 160 mm to 305 mm (6 3/8 in. to 12 in.)	84
Light SNQ/SDQ Range Support SDQ11 - SDQ17.	85
Light SN/SD Range Bearings and Housings 35 mm to 160 mm (1 3/8 in. to 6 in.)	86
Light SN/SD Range Support SN01 - SD10	87
Light SN/SD Range Bearings and Housings 160 mm to 305 mm (6 3/8 in. to 12 in.)	88
Light SN/SD Range Support SD11 - SD17	89
Medium SN/SD Range Bearing and Housing 135 mm to 260 mm (5 3/8 in. to 10 in.)	90
Medium SN/SD Range Support SN30 - SD36A.	91
Medium SN/SD Range Bearing and Housing 270 mm to 400 mm (10 1/2 in. to 16 in.)	92
Medium SN/SD Range Support SD37 - SD42	93

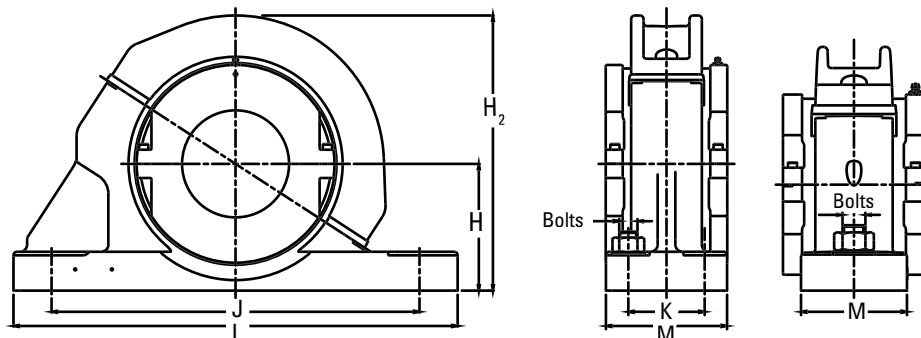
SAFQ TWO-BOLT / SAFQ FOUR-BOLT BEARING AND HOUSING

1 7/16 IN. TO 3 7/16 IN.



Shaft (d)	Reference		Bearings Ratings							Housing Reference					
	Add BR for Retained Add BX for Expansion	Additional Bearing(s)	Dynamic Cr	Static Cor	Max	D	B	C	Retained	Expansion	G	F	L	L ₁	
in.		mm in.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
1 7/16	LSE107	LSM30 LSM35 LSM40	LSE103 LSE104	63.5 14296	65.4 14724	5400	84.14 3.313	23.8 0.937	55 2.165	LS1HRTL	LS1HXTL	100 3.937	25 0.984	84 3.307	91 3.582
1 11/16	LSE111	LSM45	LSE112	83.1 18694	87.3 19643	4630	98.42 3.875	25.4 1.000	60 2.362	LS2HRTL	LS2HXTL	117.48 4.625	25 0.984	96 3.780	98 3.858
1 15/16	LSE115	LSM45 LSM50	LSE111 LSE112 LSE200	83.1 18695	87.3 19644	4630	98.42 3.875	25.4 1.000	60 2.362	LS2HRTL	LS2HXTL	117.48 4.625	25 0.984	96 3.780	98 3.858
2 3/16	LSE203	LSM55 LSM60 LSM65	LSE204 LSE207 LSE208	102.7 23118	115 25848	3940	114.3 4.500	27 1.063	60 2.362	LS3HRTL	LS3HXTL	134.94 5.313	32 1.260	102 4.016	104 4.094
2 7/16	LSE207	LSM55 LSM60 LSM65	LSE203 LSE204 LSE208	102.7 23118	114.9 25848	3940	114.3 4.500	27 1.063	60 2.362	LS3HRTL	LS3HXTL	134.94 5.313	32 1.260	102 4.016	104 4.094
2 7/16	LSE207	LSM55 LSM60 LSM65	LSE203 LSE204 LSE208	102.7 23118	114.9 25848	3940	114.3 4.500	27 1.063	60 2.362	LS3HRTL	LS3HXTL	134.94 5.313	32 1.260	102 4.016	104 4.094
2 11/16	LSE211	LSM70 LSM75	LSE212 LSE215 LSE300	138 31041	160.8 36179	3310	133.35 5.250	31.8 1.252	65 2.559	LS4HRTL	LS4HXTL	157.16 6.187	38 1.496	112 4.409	114 4.488
2 11/16	LSE211	LSM70 LSM75	LSE212 LSE215 LSE300	138 31041	160.8 36179	3310	133.35 5.250	31.8 1.252	65 2.559	LS4HRTL	LS4HXTL	157.16 6.187	38 1.496	112 4.409	114 4.488
2 15/16	LSE215	LSM70 LSM75	LSE211 LSE212 LSE300	138 31041	160.8 36179	3310	133.35 5.250	31.8 1.252	65 2.559	LS4HRTL	LS4HXTL	157.16 6.187	38 1.496	112 4.409	114 4.488
2 15/16	MSE215	MSM70	MSE211 MSE212 MSE300	258 58051	300.3 67566	3080	149.22 5.875	46.1 1.815	82.6 3.252	MSSHRTL	MSSHXTL	177.8 7.000	50 1.969	138 5.433	140 5.512
3 3/16	LSE303	LSM80 LSM85	LSE304	187.3 42145	231.3 52033	2790	152.4 6.000	38.9 1.532	70.7 2.784	LSSHRTL	LSSHXTL	177.8 7.000	50 1.969	134 5.276	136 5.354
3 7/16	LSE307	LSM80 LSM85	LSE303 LSE304 LSE308	187.3 42145	231.3 52033	2790	152.4 6.000	38.9 1.532	70.7 2.784	LSSHRTL	LSSHXTL	177.8 7.000	50 1.969	134 5.276	136 5.354

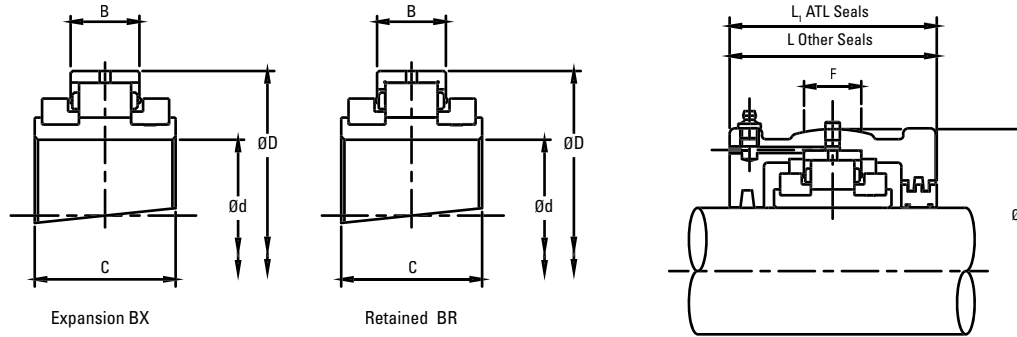
SAFQ TWO-BOLT / SAFQ FOUR-BOLT SUPPORT SAFQ1-2B - SAFQ05-2B



Shaft (d)	Support Reference	SAF Reference	Additional Shafts		H	J		K	Bolts	L	M	H ₂
			mm	in.		Min.	Max.					
in.			mm	in.	in.	in.	in.	in.		in.	in.	in.
1 1/16	SAFQ01-2B	SAF 509 2-BOLT	30 35 40	1 3/16 1 1/4	2 1/4	6 1/4	7	–	2 x 1/2	8 3/4	2 3/16	5.2
1 11/16	SAFQ02-2B	SAF 510 2-BOLT	45	1 3/4	2 1/2	6 1/2	7	–	2 x 1/2	8 3/4	2 3/8	5.9
1 15/16	SAFQ02A-2B	SAF 511 2-BOLT	45 50	1 11/16 1 3/4 2	2 3/4	7 3/8	8 1/4	–	2 x 5/8	9 5/8	2 3/4	6.15
2 3/16	SAFQ03-2B	SAF 513 2-BOLT	55 60 65	2 1/4 2 7/16 2 1/2	3	8 1/4	9 1/2	–	2 x 5/8	11	3 1/4	6.95
2 7/16	SAFQ03A-2B	SAF 515 2-BOLT	55 60 65	2 3/16 2 1/4 2 1/2	3 1/4	8 5/8	9 5/8	–	2 x 5/8	11 1/8	3 1/8	7.2
2 7/16	SAFQ03A-4B	SAF 515 4-BOLT	55 60 65	2 3/16 2 1/4 2 1/2	3 1/4	8 5/8	9 5/8	1 7/8	4 x 1/2	11 1/8	3 1/8	7.2
2 11/16	SAFQ04A-2B	SAF 516 2-BOLT	70 75	2 3/4 2 15/16 3	3 1/2	9 3/4	11	–	2 x 3/4	12 19/32	3 1/2	7.95
2 11/16	SAFQ04A-4B	SAF 516 4-BOLT	70 75	2 3/4 2 15/16 3	3 1/2	9 5/8	11	2 1/8	4 x 5/8	12 19/32	3 1/2	7.95
2 15/16	SAFQ04-2B	SAF 517 2-BOLT	70 75	2 11/16 2 3/4 3	3 3/4	9 7/8	11	–	2 x 3/4	12 19/32	3 1/2	8.2
2 15/16	SAFQ05A-4B	SAF 517 4-BOLT	80 85	2 11/16 2 3/4	3 3/4	9 7/8	11	2 1/8	4 x 5/8	12 19/32	3 1/2	8.5
3 3/16	SAFQ05B-2B	SAF 518 2-BOLT	80 85	3 1/4	4	10 1/4	11 3/4	–	2 x 3/4	13 3/8	3 7/8	8.95
3 3/16	SAFQ05-2B	SAF 520 2-BOLT	80 85 90	3 3/16 3 1/4 3 1/2	4 1/2	11 5/8	13 1/8	–	2 x 7/8	15 23/64	4 11/32	9.6

SAFQ TWO-BOLT / SAFQ FOUR-BOLT BEARING AND HOUSING

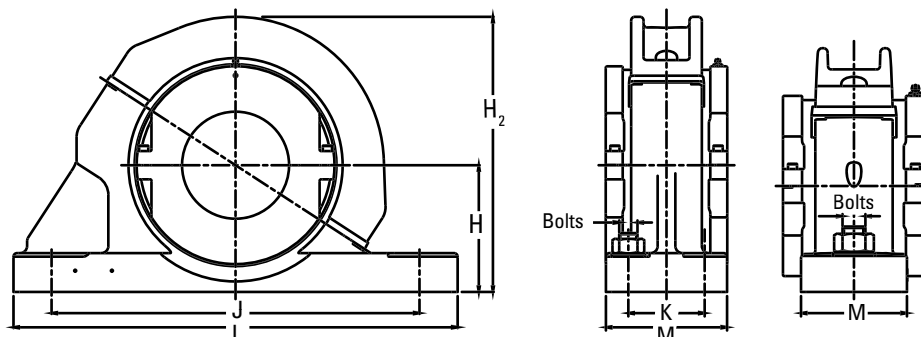
3 7/16 IN. TO 7 15/16 IN.



Shaft (d)	Reference			Bearings Ratings						Housing Reference					
	Add BR for Retained Add BX for Expansion	Additional Bearing(s)		Dynamic Cr	Static Cor	Max	D	B	C	Retained	Expansion	G	F	L	L ₁
in.		mm	in.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.
3 7/16	MSE307	MSM80 MSM85	MSE303 MSE304 MSE308	297 66830	352.5 79315	2520	169.86 6.687	48.4 1.906	89.7 3.532	MS6HRTL	MS6HXTL	203.2 8.000	50 1.969	152 5.984	154 6.063
3 15/16	MSE315	MSM95 MSM100	MSE311 MSE312 MSE400	387.7 87235	490.6 110375	2130	193.68 7.625	51.6 2.032	92.1 3.626	MS7HRTL	MS7HXTL	231.78 9.125	64 2.517	144 5.669	146 5.748
4 3/16	LSE403	LSM110 LSM115	LSE404 LSE406 LSE407 LSE408	316 71105	426.9 96059	1970	203.2 8.000	46.9 1.847	84.9 3.343	LS7HRTL	LS7HXTL	231.78 9.125	64 2.517	140 5.512	142 5.591
4 7/16	MSE407	MSM110 MSM115	MSE403 MSE404 MSE406 MSE408	453.9 102130	591.7 133135	1820	228.6 9.000	57.2 2.252	100 3.937	MS8HRTL	MS8HXTL	266.7 10.500	76 2.992	160 6.299	162 6.378
4 15/16	MSE415	MSM120 MSM125	MSE411 MSE412	524.8 118084	700.3 157566	1600	254 10.000	63.5 2.189	114.3 3.874	MS10HR- TLE0509	MS10HX- TLE0509	287.98 11.625	82 3.228	182 6.772	184 6.850
5 3/16	LSE503	LSM135 LSM140	LSE504 LSE507 LSE508	422.5 95055	585.2 131675	1570	241.3 9.500	55.6 2.189	98.4 3.874	LS9HRTL	LS9HXTL	279.4 11.000	76 2.992	166 6.535	168 6.614
5 7/16	MSE507	MSM135 MSM140	MSE503 MSE504 MSE508	600.4 135088	816.6 183729	1450	273.05 10.750	66.7 2.626	117.5 4.626	MS30HRTL	MS30HXTL	323.85 12.750	90 3.543	186 7.323	188 7.402
5 15/16	MSE515	MSM150	MSE511 MSE512 MSE514	730.2 164289	1033.8 232600	1320	292.1 11.500	68.3 2.689	123.8 4.874	MS31HRTL	MS31HXTL	336.55 13.250	95 3.740	202 7.953	204 8.031
6 7/16	MSE607	MSM160	MSE608	824.1 185430	1143 257168	1200	317.5 12.500	83.3 3.280	140 5.512	MS32HRTL	MS32HXTL	368.3 14.500	95 3.740	206 8.110	232 9.134
6 15/16	LSE615	LSM170 LSM175 LSM180	LSE611 LSE612 LSE700	524.4 117993	827.7 186233	1220	285.75 11.250	55.5 2.185	109 4.291	LS12HRTL	LS12HXTL	323.85 12.750	70 2.756	172 6.772	200 7.874
7 3/16	LSE703	LSM190 LSM200	LSE704 LSE708 LSE715 LSE800	607 136576	989.7 222676	1070	311.15 12.250	60.3 2.374	109 4.291	LS13HRTL	LS13HXTL	258.78 10.188	86 3.386	172 6.772	200 7.874
7 15/16	MSE715	MSM190 MSM200	MSE703 MSE704 MSE708 MSE800	1012.9 227893	1516.3 341160	960	368.3 14.500	90.5 3.563	156 6.142	MS34HRTL	MS34HXTL	425.5 16.752	105 4.134	235 9.252	258 10.157

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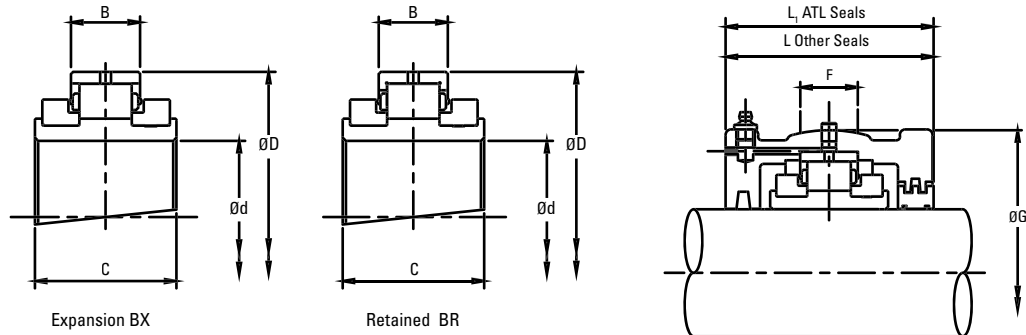
SAFQ TWO-BOLT / SAFQ FOUR-BOLT SUPPORT SAFQ06A - SAFQ34A



Shaft (d)	Support Reference	SAF Reference	Additional Shafts		H	J		K	Bolts	L	M	H ₂
			mm	in.		Min.	Max.					
in.			mm	in.	in.	in.	in.	in.		in.	in.	in.
3 7/16	SAFQ06A	SAF 520 4-BOLT	80 85	3 3/16 3 1/4 3 1/2	4 1/2	11 5/8	13 1/8	2 3/8	4 x 3/4	15 23/64	4 11/32	9.95
3 15/16	SAFQ07A	SAF 522	95 100	3 11/16 3 3/4 4	4 15/16	12 5/16	14 1/2	2 3/4	4 x 3/4	16 1/2	4 3/4	11
4 3/16	SAFQ07B	SAF 524	110 115	4 1/4 4 3/8 4 7/16 4 1/2	5 1/4	13 3/4	14 1/2	2 3/4	4 x 3/4	16 1/2	4 3/4	11.3
4 7/16	SAFQ08A	SAF526	110 115	4 3/16 4 1/4 4 3/8 4 1/2	6	14 1/2	16	3 1/4	4 x 7/8	18 3/8	5 1/8	13.1
4 15/16	SAFQ10A	SAF528	120 125	4 11/16 4 3/4 5	6	15 5/8	17 3/8	3 3/8	4 x 1	19 45/64	5 7/8	13.3
5 3/16	SAFQ09A	SAF530	135 140	5 7/16 5 1/4 5 1/2	6 5/16	16 3/4	18 1/2	3 3/4	4 x 1	21 1/4	6 1/4	14.2
5 7/16	SAFQ30	SAF532	135 140	5 3/16 5 1/4 5 1/2	6 11/16	17 3/8	19 1/4	3 3/4	4 x 1	21 21/32	6 1/4	15.15
5 15/16	SAFQ31	SAF534	150	5 11/16 5 3/4 5 7/8 6	7 1/16	19 3/8	21 5/8	4 1/4	4 x 1	24 3/4	6 3/4	15.75
6 7/16	SAFQ32	SAF536	160	6 1/2	7 1/2	20 7/8	23 5/8	4 5/8	4 x 1	26 3/4	7 1/8	17.6
6 15/16	SAFQ12	SAF538	170 175 180	6 11/16 6 3/4 7	7 7/8	21 5/8	24 3/8	4 1/2	4 x 1 1/4	28	7 1/2	16.75
7 3/16	SAFQ13	SAF540	190 200	7 1/4 7 1/2 7 11/16 8	8 1/4	22 1/2	25	5	4 x 1 1/4	29 3/8	8	17.7
7 15/16	SAFQ34A	SAF544	190 200	7 3/16 7 1/4 7 1/2 8	9 1/2	24 3/4	27 7/8	5 1/4	4 x 1 1/2	32 3/4	8 3/4	21.35

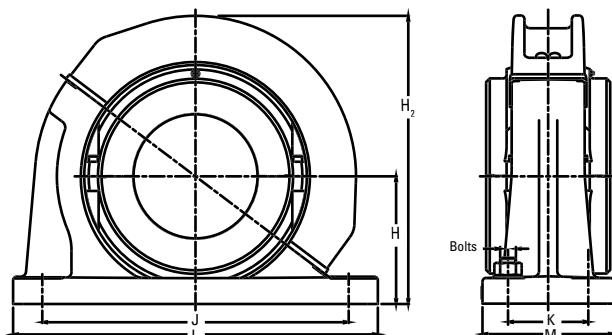
LIGHT SNQ/SDQ RANGE BEARING AND HOUSING

35 MM TO 160 MM (1 3/16 IN. TO 6 IN.)



Shaft (d)		Reference		Bearings Ratings							Housing Reference							
				Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B, B ₁	C	ATL Seals		Other Seal Types		G	F	L	L ₁
											Add BR for Retained Add BX for Expansion e.g. LSE103BR	Add HRTL for retained Add HXTL for Expansion e.g. LS1HRTL	Add HR for Retained Add HX for Expansion e.g. LSE103HR					
mm	in.	kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.				
35 40	1 3/16	LSM35 LSM40	LSE103	65 14613	68 15287	3.20 719.38	5400	84.14 3.313	23.80 0.937	55.00 2.165	LS1	LSM35 LSM40	LSE103	100.00 3.937	25 1.0	84 3.3	91 3.6	
	1 1/4		LSE104										LSE104					
	1 7/16		LSE107										LSE107					
	1 1/2		LSE108										LSE108					
45 50	1 11/16	LSM45 LSM50	LSE111	83 18659	87 19558	3.60 809.30	4630	98.42 3.875	25.40 1.000	60.00 2.362	LS2	LSM50	LSE111	117.48 4.625	25 1.0	96 3.8	98 3.9	
	1 3/4		LSE112										LSE112					
	1 15/16		LSE115										LSE115					
	2		LSE200										LSE200					
55 60 65	2 3/16	LSM55 LSM60 LSM65	LSE203	103 23155	115 25853	5.40 1213.95	3940	114.30 4.500	27.00 1.063	60.00 2.362	LS3	LSM55 LSM60 LSM65	LSE203	134.94 5.313	32 1.3	102 4.0	104 4.1	
	2 1/4		LSE204										LSE204					
	2 7/16		LSE207										LSE207					
	2 1/2		LSE208										LSE208					
70 75	2 11/16	LSM70 LSM75	LSE211	138 31024	161 36194	7.60 1708.53	3310	133.35 5.250	31.80 1.252	65.00 2.559	LS4	LSM70 LSM75	LSE211	157.16 6.187	38 1.5	112 4.4	114 4.5	
	2 3/4		LSE212										LSE212					
	2 15/16		LSE215										LSE215					
	3		LSE300										LSE300					
80 85 90	3 3/16	LSM80 LSM85 LSM90	LSE303	187 42039	231 51931	12.40 2787.59	2790	152.40 6.000	38.90 1.531	75.00 2.953	LS5	LSM80 LSM85 LSM90	LSE303	177.80 7.000	50 2.0	134 5.3	136 5.4	
	3 1/4		LSE304										LSE304					
	3 7/16		LSE307										LSE307					
	3 1/2		LSE308										LSE308					
95 100 105	3 11/16	LSM95 LSM100 LSM105	LSE311	288 64745	366 82280	16.00 3596.90	2340	174.62 6.875	45.30 1.783	85.00 3.346	LS6	LSM95 LSM100 LSM105	LSE311	203.20 8.000	50 2.0	132 5.2	134 5.3	
	3 3/4		LSE312										LSE312					
	3 15/16		LSE315										LSE315					
	4		LSE400										LSE400					
110 115	4 3/16	LSM110 LSM115	LSE403	316 71040	427 95993	18.60 4181.39	1970	203.20 8.000	46.90 1.846	90.00 3.543	LS7	LSM110 LSM115	LSE403	231.78 9.125	64 2.5	140 5.5	142 5.6	
	4 1/4		LSE404										LSE404					
	4 7/16		LSE407										LSE407					
	4 1/2		LSE408										LSE408					
120 125 130	4 11/16	LSM120 LSM125 LSM130	LSE411	363 81606	496 111505	22.20 4990.69	1740	222.25 8.750	54.00 2.126	95.00 3.740	LS8	LSM120 LSM125 LSM130	LSE411	266.70 10.500	76 3.0	154 6.1	156 6.1	
	4 3/4		LSE412										LSE412					
	4 15/16		LSE415										LSE415					
	5		LSE500										LSE500					
135 140	5 3/16	LSM135 LSM140	LSE503	422 94869	585 131513	25.80 5799.99	1570	241.30 9.500	55.60 2.189	98.40 3.874	LS9	LSM135 LSM140	LSE503	279.40 11.000	76 3.0	166 6.5	168 6.6	
	5 1/4		LSE504										LSE504					
	5 7/16		LSE507										LSE507					
	5 1/2		LSE508										LSE508					
150 155 160	5 11/16	LSM150 LSM155 LSM160A	LSE511	459 103187	664 149273	29.40 6609.30	1450	254.00 10.000	55.60 2.189	98.40 3.874	LS10	LSM150 LSM155 LSM160A	LSE511	295.28 11.625	82 3.2	172 6.8	174 6.9	
	5 3/4		LSE512										LSE512					
	5 15/16		LSE515										LSE515					
	6		LSE600										LSE600					

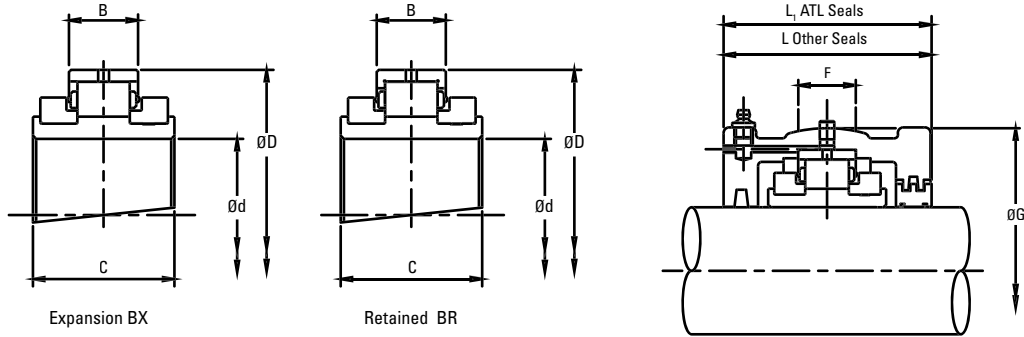
LIGHT SNQ/SDQ RANGE SUPPORT SNQ01 - SNQ10



Shaft (d)		Spherical Roller Bearing Reference	SN/SD Reference	H	H ₂	J x K	L x M	Bolts
mm	in.							
35 40	1 3/16	SNQ01	SN 508 SN 509	60	135	170	205 x 60	2 x M12
	1 1/4							
	1 7/16							
	1 1/2							
45 50	1 11/16	SNQ02	SN 511	70	155	210	255 x 70	2 x M16
	1 3/4							
	1 5/8							
	2							
55 60 65	2 3/16	SNQ03	SN 513 SN 515	80	180	234	275 x 70	2 x M16
	2 1/4							
	2 7/16							
	2 1/2							
70 75	2 11/16	SNQ04	SN 516 SN 517	95	208	260	315 x 90	2 x M20
	2 3/4							
	2 5/8							
	3							
80 85 90	3 3/16	SNQ05 SNQ05A SNQ05B	SN 518 SN 519 SN 520	100 112 112	230 242 242	290 290 320	345 x 100 345 x 100 380 x 110	2 x M20 2 x M20 2 x M24
	3 1/4							
	3 7/16							
	3 1/2							
95 100 105	3 11/16	SNQ06	SN 522	125	265	350	410 x 120	2 x M24
	3 3/4							
	3 5/8							
	4							
110 115	4 3/16	SNQ07 SNQ07A	SN 524 SN 526	140 150	300 310	350 380	410 x 120 445 x 130	2 x M24 2 x M24
	4 1/4							
	4 7/16							
	4 1/2							
120 125 130	4 11/16	SNQ08	SN 528	150	354	420	500 x 150	2 x M30
	4 3/4							
	4 5/8							
	5							
135 140	5 3/16	SNQ09 SNQ09A	SN 530 SN 532	160 170	369 379	450 470	530 x 160 550 x 160	2 x M30 2 x M30
	5 1/4							
	5 7/16							
	5 1/2							
150 155 160	5 11/16	SDQ10	SD 3134	170	379	430 x 100	510 x 180	4 x M24
	5 3/4							
	5 5/8							
	6							

LIGHT SNQ/SDQ RANGE BEARING AND HOUSING

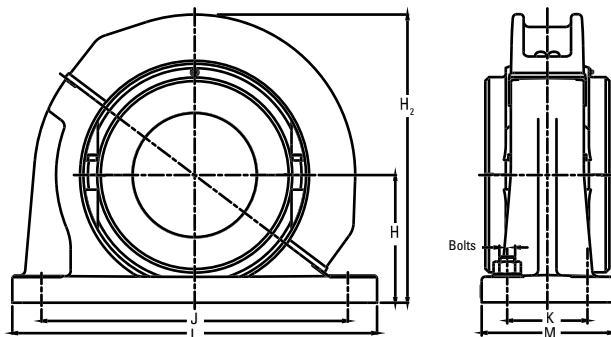
160 MM TO 305 MM (6 7/16 IN. TO 12 IN.)



Shaft (d)		Reference		Bearings Ratings							Housing Reference						
				Dynamic Cr	Static Cor	Axial Ca	Max	D	B, B1	C	ATL Seals		Other Seal Types		G	F	L
mm	in.	kN lb.	kN lb.								kN lb.	RPM	mm in.	mm in.			
160 170	6 7/16 6 1/2	LSM160 LSM170A	LSE607 LSE608	583	792	33.00	1320	273.05	60.30	109.00	LS11	LSM160 LSM170A	LSE607 LSE608	311.15	76	172	192
				131064	178049	7419		10.750	2.374	4.291				12.250	3.0	6.8	7.6
170 175 180	6 11/16 6 3/4 6 15/16 7	LSM170 LSM175 LSM180	LSE611 LSE612 LSE615 LSE700	524	828	36.40	1220	285.75	55.50	109.00	LS12	LSM170 LSM175 LSM180	LSE611 LSE612 LSE615 LSE700	323.85	70	172	200
				117800	186142	8183		11.250	2.185	4.291				12.750	2.8	6.8	7.9
190 200	7 3/16 7 1/4 7 1/2 7 15/16 8	LSM190 LSM200	LSE703 LSE704 LSE708 LSE715 LSE800	614	990	41.00	1070	311.15	60.30	106.00	LS13	LSM190 LSM200	LSE703 LSE704 LSE708 LSE715 LSE800	358.78	86	172	200
				138033	222561	9217		12.250	2.374	4.173				14.125	3.4	6.8	7.9
220 230	8 7/16 8 1/2 8 7/8 9	LSM220 LSM230	LSE807 LSE808 LSE814 LSE900	708	1168	49.00	930	342.90	63.50	115.00	LS14	LSM220 LSM230	LSE807 LSE808 LSE814 LSE900	387.35	82	178	216
				159165	262577	11016		13.500	2.500	4.528				15.250	3.2	7.0	8.5
240 250 260	9 1/2 9 3/4 10	LSM240 LSM250 LSM260A	LSE908 LSE912 LSE1000	744	1289	57.80	820	374.65	66.70	122.00	LS15	LSM240 LSM250 LSM260A	LSE908 LSE912 LSE1000	419.10	90	188	222
				167258	289779	12994		14.750	2.626	4.803				16.500	3.5	7.4	8.7
260 270 280	10 7/16 10 1/2 10 3/4 11	LSM260 LSM270 LSM280	LSE1007 LSE1008 LSE1012 LSE1100	848	1502	66.80	730	406.40	69.00	128.00	LS16	LSM260 LSM270 LSM280	LSE1007 LSE1008 LSE1012 LSE1100	454.00	95	204	232
				190638	337663	15017		16.000	2.717	5.039				17.874	3.7	8.0	9.1
300 305	11 1/2 12	LSM300 LSM305	LSE1108 LSE1200	929	1665	78.20	650	438.15	74.60	143.00	LS17	LSM300 LSM305	LSE1108 LSE1200	489.00	98	216	248
				208848	374307	17580		17.250	2.937	5.630				19.252	3.9	8.5	9.8

LIGHT SNQ/SDQ RANGE SUPPORT

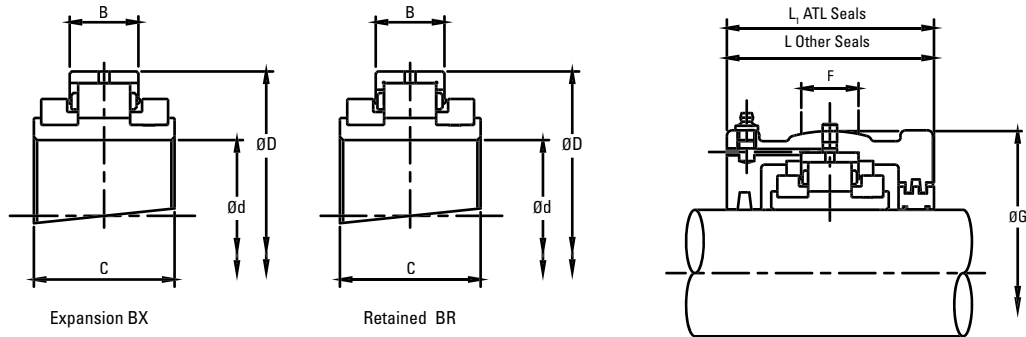
SDQ11 - SDQ17



Shaft (d)		Spherical Roller Bearing Reference	SN/SD Reference	H	H ₂	J x K	L x M	Bolts
mm	in.							
160 170	6 7/16 6 1/2	SDQ11	SD 3136	180	396	450 x 110	530 x 190	4 x M24
170 175 180	6 11/16 6 3/4 6 15/16 7	SDQ12 SDQ12A	SD 3138 SD 3140	190 210	417 437	480 x 120 510 x 130	560 x 210 610 x 230	4 x M24 4 x M30
190 200	7 3/16 7 1/4 7 1/2 7 15/16 8	SDQ13	SD 3144	220	457	540 x 140	640 x 240	4 x M30
220 230	8 7/16 8 1/2 8 7/8 9	SDQ14	SD 3148	240	510	600 x 150	700 x 260	4 x M30
240 250 260	9 1/2 9 3/4 10	SDQ15	SD 3152	260	545	650 x 160	770 x 280	4 x M36
260 270 280	10 7/16 10 1/2 10 3/4 11	SDQ16 SDQ16A	SD 3156 SD 3160	280 300	589 609	670 x 160 710 x 190	790 x 280 830 x 310	4 x M36 4 x M36
300 305	11 1/2 12	SDQ17	SD3164	320	662	750 x 200	880 x 330	4 x M36

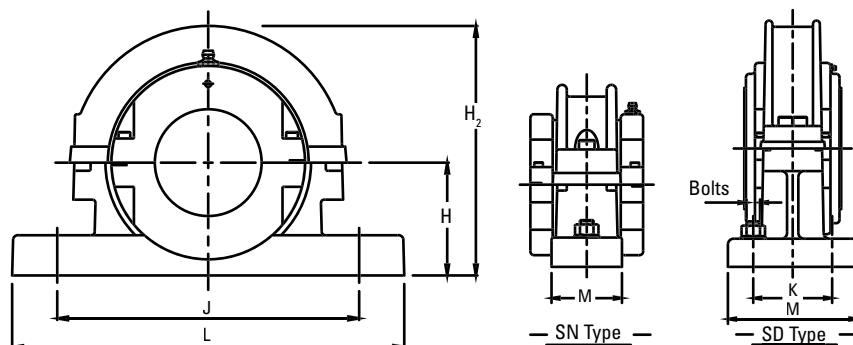
LIGHT SN/SD RANGE BEARINGS AND HOUSINGS

35 MM TO 160 MM (1 3/16 IN. TO 6 IN.)



Shaft (d)		Reference		Bearings Ratings							Housing Reference						
				Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B	C	ATL Seals		Other Seal Types		G	F	L
mm	in.	kN lb.	kN lb.								kN lb.	RPM	mm in.	mm in.			
35 40	1 3/16	LSM35 LSM40	LSE103	65	68	3.20	5400	84.14	23.80	55.00	LS1	LSM35 LSM40	LSE103	100.00	25	84	91
	1 1/4		LSE104										14613				
45 50	1 1/16	LSM45 LSM50	LSE111	83	87	3.60	4630	98.42	25.40	60.00	LS2	LSM50	LSE111	117.48	25	96	98
	1 3/8		LSE112										18659				
55 60 65	2 3/16	LSM55 LSM60 LSM65	LSE203	103	115	5.40	3940	114.30	27.00	60.00	LS3	LSM55 LSM60 LSM65	LSE203	134.94	32	102	104
	2 1/4		LSE204										23155				
70 75	2 1/16	LSM70 LSM75	LSE211	138	161	7.60	3310	133.35	31.80	65.00	LS4	LSM70 LSM75	LSE211	157.16	38	112	114
	2 3/4		LSE212										31024				
80 85 90	3 3/16	LSM80 LSM85 LSM90	LSE303	187	231	12.40	2790	152.40	38.90	75.00	LS5	LSM80 LSM85 LSM90	LSE303	177.80	50	134	136
	3 1/4		LSE304										42039				
95 100 105	3 1/16	LSM95 LSM100 LSM105	LSE311	288	366	16.00	2340	174.62	45.30	85.00	LS6	LSM95 LSM100 LSM105	LSE311	203.20	50	132	134
	3 3/4		LSE312										64745				
110 115	4 3/16	LSM110 LSM115	LSE403	316	427	18.60	1970	203.20	46.90	90.00	LS7	LSM110 LSM115	LSE403	231.78	64	140	142
	4 1/4		LSE404										71040				
120 125 130	4 1/16	LSM120 LSM125 LSM130	LSE411	363	496	22.20	1740	222.25	54.00	95.00	LS8	LSM120 LSM125 LSM130	LSE411	266.70	76	154	156
	4 3/8		LSE412										81606				
135 140	5 3/16	LSM135 LSM140	LSE503	422	585	25.80	1570	241.30	55.60	98.40	LS9	LSM135 LSM140	LSE503	279.40	76	166	168
	5 1/4		LSE504										94869				
150 155 160	5 1/16	LSM150 LSM155 LSM160A	LSE511	459	664	29.40	1450	254.00	55.60	98.40	LS10	LSM150 LSM155 LSM160A	LSE511	295.28	82	172	174
	5 3/8		LSE512										103187				

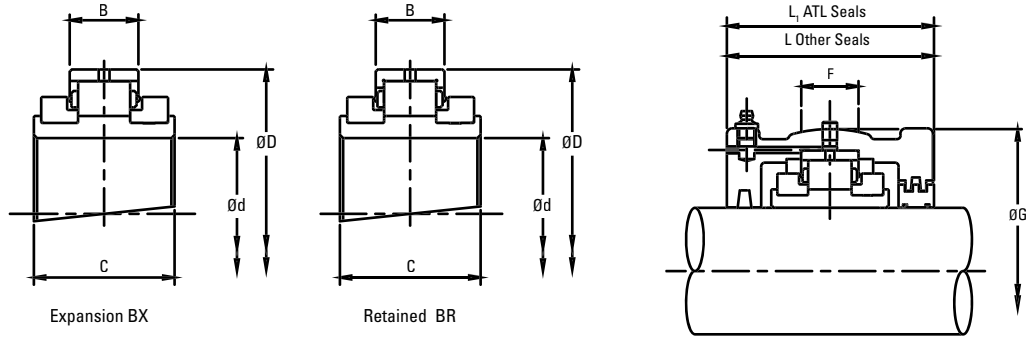
LIGHT SN/SD RANGE SUPPORT SN01 - SD10



Shaft (d)		Spherical Roller Bearing Reference	SN/SD Reference	H	H ₂	J x K	L x M	Bolts
mm	in.							
35 40	1 3/16 1 1/4 1 7/16 1 1/2	SN01	SN 508 SN 509	60	135	170	205 x 60	2 x M12
45 50	1 11/16 1 3/4 1 15/16 2	SN02	SN 511	70	155	210	255 x 70	2 x M16
55 60 65	2 3/16 2 1/4 2 7/16 2 1/2	SN03	SN 513 SN 515	80	180	234	275 x 70	2 x M16
70 75	2 11/16 2 3/4 2 15/16 3	SN04	SN 516 SN 517	95	208	260	315 x 90	2 x M20
80 85 90	3 3/16 3 1/4 3 7/16 3 1/2	SN05 SN05A SN05B	SN 518 SN 519 SN 520	100 112 112	230 242 242	290 290 320	345 x 100 345 x 100 380 x 110	2 x M20 2 x M20 2 x M24
95 100 105	3 11/16 3 3/4 3 15/16 4	SN06	SN 522	125	265	350	410 x 120	2 x M24
110 115	4 3/16 4 1/4 4 7/16 4 1/2	SN07 SN07A	SN 524 SN 526	140 150	300 310	350 380	410 x 120 445 x 130	2 x M24 2 x M24
120 125 130	4 11/16 4 3/4 4 15/16 5	SN08	SN 528	150	354	420	500 x 150	2 x M30
135 140	5 3/16 5 1/4 5 7/16 5 1/2	SN09 SN09A	SN 530 SN 532	160 170	369 379	450 470	530 x 160 550 x 160	2 x M30 2 x M30
150 155 160	5 11/16 5 3/4 5 15/16 6	SD10	SD 3134	170	379	430 x 100	510 x 180	4 x M24

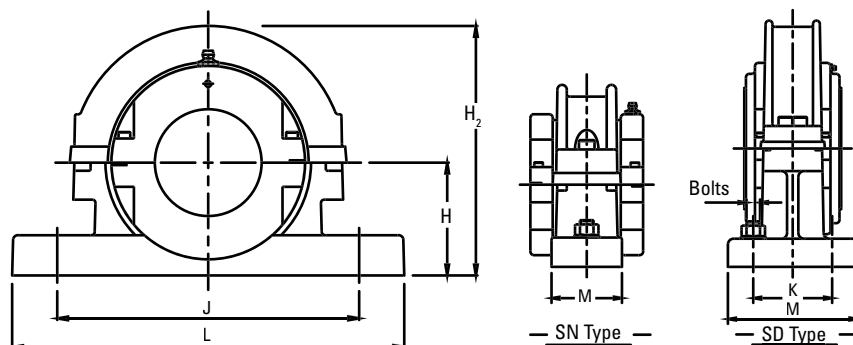
LIGHT SN/SD RANGE BEARINGS AND HOUSINGS

160 MM TO 305 MM (6 7/16 IN. TO 12 IN.)



Shaft (d)		Reference		Bearings Ratings							Housing Reference						
		Add BR for Retained Add BX for Expansion e.g. LSE215BR		Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B, B ₁	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. LS4HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. LSE215HR		G	F	L	L ₁
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
160 170	6 7/16 6 1/2	LSM160 LSM170A	LSE607 LSE608	583 131064	792 178049	33.00 7419	1320	273.05 10.750	60.30 2.374	109.00 4.291	LS11	LSM160 LSM170A	LSE607 LSE608	311.15 12.250	76 3.0	172 6.8	192 7.6
170 175 180	6 11/16 6 3/4 6 15/16 7	LSM170 LSM175 LSM180	LSE611 LSE612 LSE615 LSE700	524 117800	828 186142	36.40 8183	1220	285.75 11.250	55.50 2.185	109.00 4.291	LS12	LSM170 LSM175 LSM180	LSE611 LSE612 LSE615 LSE700	323.85 12.750	70 2.8	172 6.8	200 7.9
190 200	7 3/16 7 1/4 7 1/2 7 15/16 8	LSM190 LSM200	LSE703 LSE704 LSE708 LSE715 LSE800	614 138033	990 222561	41.00 9217	1070	311.15 12.250	60.30 2.374	106.00 4.173	LS13	LSM190 LSM200	LSE703 LSE704 LSE708 LSE715 LSE800	358.78 14.125	86 3.4	172 6.8	200 7.9
220 230	8 7/16 8 1/2 8 7/8 9	LSM220 LSM230	LSE807 LSE808 LSE814 LSE900	708 159165	1168 262577	49.00 11016	930	342.90 13.500	63.50 2.500	115.00 4.528	LS14	LSM220 LSM230	LSE807 LSE808 LSE814 LSE900	387.35 15.250	82 3.2	178 7.0	216 8.5
240 250 260	9 1/2 9 3/4 10	LSM240 LSM250 LSM260A	LSE908 LSE912 LSE1000	744 167258	1289 289779	57.80 12994	820	374.65 14.750	66.70 2.626	122.00 4.803	LS15	LSM240 LSM250 LSM260A	LSE908 LSE912 LSE1000	419.10 16.500	90 3.5	188 7.4	222 8.7
260 270 280	10 7/16 10 1/2 10 3/4 11	LSM260 LSM270 LSM280	LSE1007 LSE1008 LSE1012 LSE1100	848 190638	1502 337663	66.80 15017	730	406.40 16.000	69.00 2.717	128.00 5.039	LS16	LSM260 LSM270 LSM280	LSE1007 LSE1008 LSE1012 LSE1100	454.00 17.874	95 3.7	204 8.0	232 9.1
300 305	11 1/2 12	LSM300 LSM305	LSE1108 LSE1200	929 208848	1665 374307	78.20 17580	650	438.15 17.250	74.60 2.937	143.00 5.630	LS17	LSM300 LSM305	LSE1108 LSE1200	489.00 19.252	98 3.9	216 8.5	248 9.8

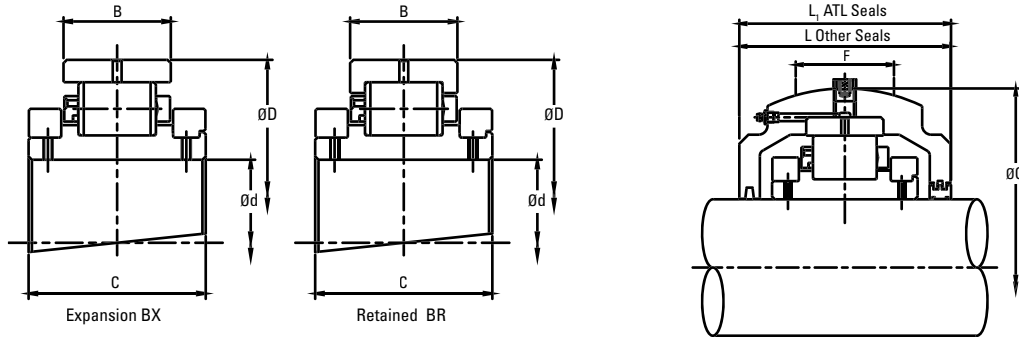
**LIGHT SN/SD RANGE SUPPORT
SD11 - SD17**



Shaft (d)		Spherical Roller Bearing Reference	SN/SD Reference	H	H ₂	J x K	L x M	Bolts
mm	in.							
160 170	6 7/16 6 1/2	SD11	SD 3136	180	396	450 x 110	530 x 190	4 x M24
170 175 180	6 11/16 6 3/4 6 15/16 7	SD12 SD12A	SD 3138 SD 3140	190 210	417 437	480 x 120 510 x 130	560 x 210 610 x 230	4 x M24 4 x M30
190 200	7 3/16 7 1/4 7 1/2 7 15/16 8	SD13	SD 3144	220	457	540 x 140	640 x 240	4 x M30
220 230	8 7/16 8 1/2 8 7/8 9	SD14	SD 3148	240	510	600 x 150	700 x 260	4 x M30
240 250 260	9 1/2 9 3/4 10	SD15	SD 3152	260	545	650 x 160	770 x 280	4 x M36
260 270 280	10 7/16 10 1/2 10 3/4 11	SD16 SD16A	SD 3156 SD 3160	280 300	589 609	670 x 160 710 x 190	790 x 280 830 x 310	4 x M36 4 x M36
300 305	11 1/2 12	SD17	SD 3164	320	662	750 x 200	880 x 330	4 x M36

MEDIUM SN/SD RANGE BEARING AND HOUSING

135 MM TO 260 MM (5 3/16 IN. TO 10 IN.)

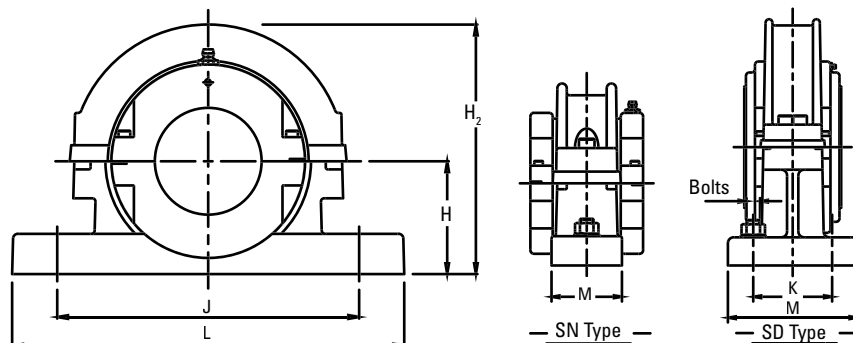


Shaft (d)		Reference Add BR for Retained Add BX for Expansion e.g. MSE503BR		Bearings Ratings							Housing Reference									
				Dynamic C _r	Static C _{0r}	Axial C _a	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. MS30HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. MSE503HR		G	F	L	L ₁			
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.				
135	5 3/16	MSM135	MSE503	600	817	45.40	1450	273.05	66.70	117.50	MS30 MS30E0548	MSM135 MSM140 MSM150A	MSE503	323.85	90	186	188			
140	5 1/4	MSM140	MSE504										MSE507					MSE508	MSE600A ⁽¹⁾	MSE504
150	5 7/16	MSM150A ⁽¹⁾	MSE507										MSE508					MSE600A ⁽¹⁾	MSE507	MSE600A
150	5 11/16	MSM150	MSE511	730	1034	52.40	1320	292.10	68.30	123.80	MS31 MS31E0548	MSM150 MSM155 MSM160A	MSE511	336.55	95	202	204			
155	5 3/4	MSM155	MSE512										MSE515					MSE600	MSE512	
160	5 15/16	MSM160A ⁽¹⁾	MSE515										MSE600					MSE515	MSE600	
160	6 7/16	MSM160	MSE607	842	1175	61.40	1200	317.50	83.30	140.00	MS32	MSM160 MSM170	MSE607	368.30	95	206	232			
170	6 1/2	MSM170	MSE608										MSE608					MSE608	MSE608	
175	6 11/16	MSM175	MSE611	927	1357	71.20	1120	330.20	83.30	140.00	MS33	MSM175 MSM180	MSE611	381.00	95	222	242			
180	6 3/4	MSM180	MSE612										MSE615					MSE700	MSE612	
	6 15/16		MSE615										MSE700					MSE615	MSE700	
190	7 1/4	MSM190	MSE704	1013	1516	80.00	960	368.30	90.50	156.00	MS34	MSM190 MSM200	MSE704	425.5	105	235	258			
200	7 1/2	MSM200	MSE708										MSE715					MSE800	MSE708	
	7 15/16		MSE715										MSE800					MSE715	MSE800	
220	8 1/2	MSM220	MSE807	1138	1668	89.80	850	393.70	90.50	163.00	MS35	MSM220 MSM230	MSE807	457.20	110	242	274			
230	8 7/8	MSM230	MSE814										MSE900					MSE814	MSE900	
	9		MSE900										MSE900					MSE900	MSE900	
240	9 1/2	MSM240	MSE908	1360	2130	98.80	750	431.80	96.80	170.00	MS36	MSM240 MSM250 MSM260	MSE908	495.30	118	248	280			
250	9 3/4	MSM250	MSE912										MSE1000					MSE912	MSE1000	
260	10	MSM260	MSE1000										MSE1000					MSE1000	MSE1000	

⁽¹⁾When ordering these bearings with ATL seals the housing must contain the E0548 suffix.

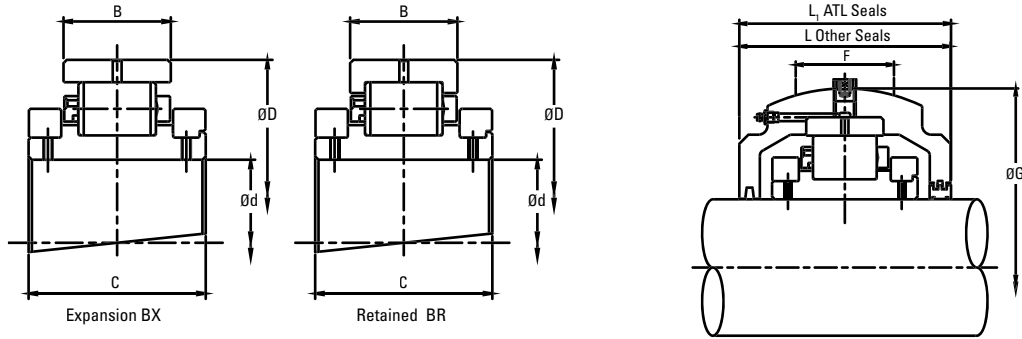
MEDIUM SN/SD RANGE SUPPORT

SN30 - SD36A



Shaft (d)		Spherical Roller Bearing Reference	SN/SD Reference	H	H ₂	J x K	L x M	Bolts
mm	in.							
135	5 3/16	SN30 SD30	SNL532 SD/SNL3134	170	397	470	550 x 160	2 x M30
140	5 1/4							
150	5 7/16							
	5 1/2	SD31	SD3136 SNL3136	170	397	430 x 100	510 x 180	4 x M24
	6							
	6							
150	5 11/16	SD32	SD3138 SNL3138	180	410	450 x 110	530 x 190	4 x M24
155	5 3/4							
160	5 15/16							
	6	SD33	SD3140 SNL3140	190	456	480 x 120	560 x 210	4 x M24
160	6 7/16							
170	6 1/2							
175	6 11/16	SD34	SD3144 SNL3144	210	482	510 x 130	610 x 230	4 x M30
180	6 3/4							
	6 15/16							
	7	SD35	SD/SNL3148	220	510	540 x 140	640 x 240	4 x M30
190	7 1/4							
200	7 1/2							
	7 15/16	SD36 SD36A	SD/SNL3152 SD/SNL3156	240	566	600 x 150	700 x 260	4 x M30
	8							
	8							
220	8 1/2	SD36 SD36A	SD/SNL3152 SD/SNL3156	240	614	650 x 160	770 x 280	4 x M36
230	8 7/8							
	9							
240	9 1/2	SD36 SD36A	SD/SNL3152 SD/SNL3156	260	634	670 x 160	790 x 280	4 x M36
250	9 3/4							
260	10							

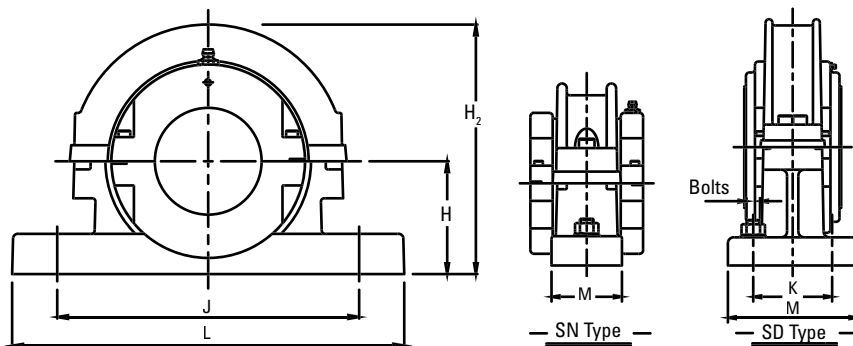
MEDIUM SN/SD RANGE BEARING AND HOUSING 270 MM TO 400 MM (10 1/2 IN. TO 16 IN.)



Shaft (d)		Reference Add BR for Retained Add BX for Expansion e.g. MSE503BR		Bearings Ratings						Housing Reference							
				Dynamic C _r	Static C _{or}	Axial C _a	Max	D	B	C	ATL Seals Add HRTL for Retained Add HXTL for Expansion e.g. MS30HRTL	Other Seal Types Add HR for Retained Add HX for Expansion e.g. MSE503HR	G	F	L	L ₁	
mm	in.			kN lb.	kN lb.	kN lb.	RPM	mm in.	mm in.	mm in.			mm in.	mm in.	mm in.	mm in.	
270 280	10 1/2	MSM270 MSM280	MSE1008	1476 331818	2357 529875	113.80 25583	670	463.55	101.60	186.00	MS37	MSM270 MSM280	MSE1008	527.10	130	264	300
	10 3/4		MSE1012					MSE1012	20.752	5.118			10.394	11.811			
300 305	11 1/2	MSM300 MSM305	MSE1108	1587 356771	2644 594395	129.00 29000	610	495.30	103.20	193.00	MS38	MSM300 MSM305	MSE1108	552.50	128	268	306
	12		MSE1200					MSE1200	21.752	5.039			10.6	12.0			
320 330	12 1/2	MSM320 MSM330	MSE1208	1851 416121	3214 722536	144.20 32417	550	527.05	106.40	192.00	MS39	MSM320 MSM330	MSE1208	587.40	128	298	-
	13		MSE1300					MSE1300	23.126	5.039			11.732	-			
340 350 360	13 1/2	MSM340 MSM350 MSM360 ⁽¹⁾	MSE1308	2029 456137	3449 775366	159.20 35790	500	565.15	115.90	200.00	MS40 MS40E0548	MSM340 MSM350 MSM360	MSE1308	628.70	146	305	-
	14		MSE1400					MSE1400	24.752	5.748			12.008	-			
380	15	MSM380	MSE1500	1931 434106	3522 791777	174.40 39207	460	584.20	111.10	200.00	MS41	MSM380	MSE1500	647.70	146	305	-
								23.000	4.374	7.874				25.500	5.748	12.008	-
400	16	MSM400	MSE1600	2105 473223	3793 852700	188.40 42354	430	615.95	115.90	200.00	MS42	MSM400	MSE1600	685.80	146	324	-
								24.250	4.563	7.874				27.000	5.748	12.756	-

⁽¹⁾When ordering these bearings with ATL seals the housing must contain the E0548 suffix.

**MEDIUM SN/SD RANGE SUPPORT
SD37 - SD42**



Shaft (d)		Spherical Roller Bearing Reference	SN/SD Reference	H	H ₂	J x K	L x M	Bolts
mm	in.							
270 280	10 ½ 10 ¾ 11	SD37	SD3160 SNL3160	300	682	710 x 190	830 x 310	4 x M36
300 305	11 ½ 12	SD38	SD3164 SNL3164	320	716	750 x 200	880 x 330	4 x M36
320 330	12 ½ 13	SD39	SNL3168L	340	761	810 x 220	950 x 360	4 x M36
340 350 360	13 ½ 14	SD40 SD40A	SNL3172L SNL3176L	350 360	799 809	840 x 220 870 x 220	1000 x 360 1040 x 360	4 x M36 4 x M36
380	15	SD41	SNL3180L	380	841	950 x 240	1120 x 390	4 x M42
400	16	SD42	SNL3184L	410	902	1000 x 260	1170 x 420	4 x M42



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