



# Bearings and Related Products for Continuous Casting Machines



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## Introduction

In continuous casting machines, roll support bearings are used under heavy loads and at extremely low speed. In addition, the operating conditions are severe, resulting in exposure to splashing water and scales.

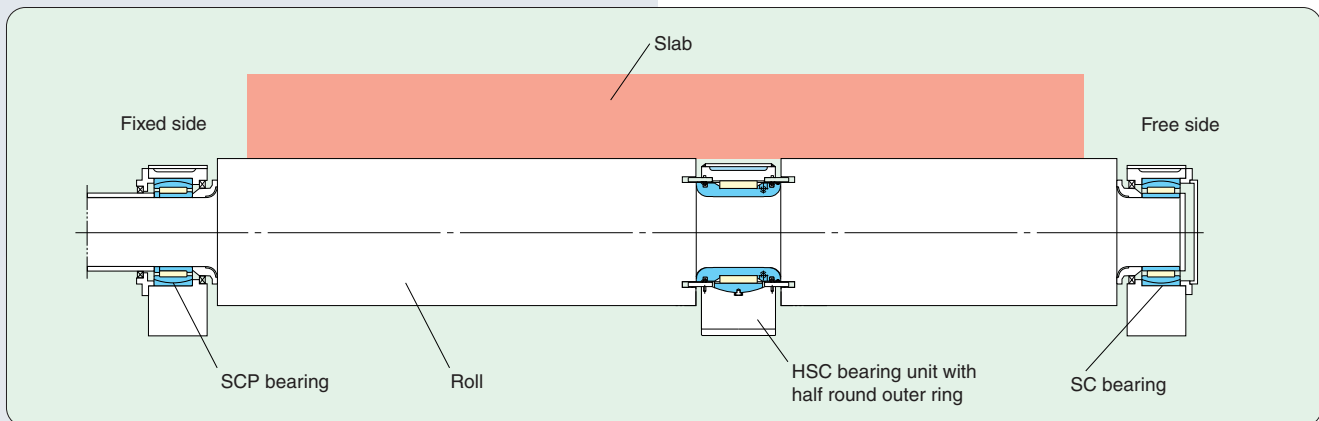
Accordingly, roll support bearings may be failed in an extremely short period of time, typically due to wear and cracking.

To solve these problems, **JTEKT** has developed a series of products optimized to support the rolls of continuous casting machines, including bearings, oil seals, HSC (Half Split Cylindrical Roller) bearing units and Oil/Air lubrication systems, providing a systematic solution for extending the service life of bearings in this application.

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### ■ Typical Arrangement of Roll Support Bearings in Continuous Casting Machines



## 1. Failure mechanism of Bearing

In continuous casting machines, rolls are loaded under excessively heavy loads and may be bent considerably. Accordingly, to support the rolls, spherical roller bearings, which have a self-aligning, are commonly used.

JTEKT has performed a variety of verification tests and analyses concerning this application, and concluded that differential slip occurs in the spherical roller bearings on the rolls of the continuous casting machines when excessively heavy loads at extremely low speed are imposed on the bearings under severe lubrication conditions (Refer to Fig. 1). JTEKT therefore recommends full complement cylindrical roller bearings for this application.

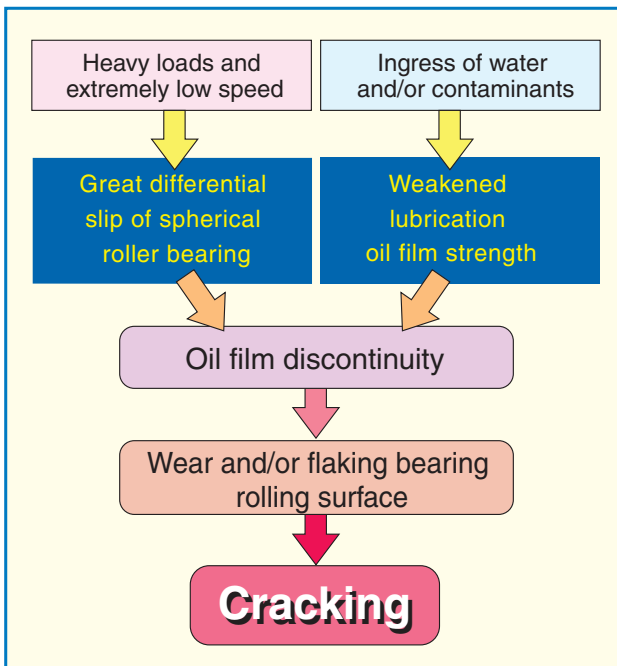
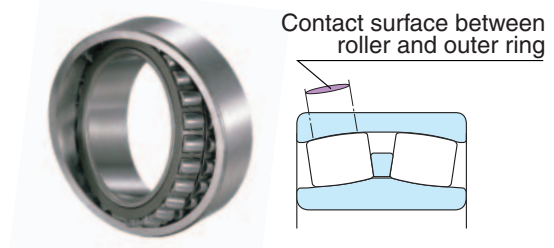


Fig. 1 Typical Failure Mechanism of Roll Support Bearing in Continuous Casting Machines

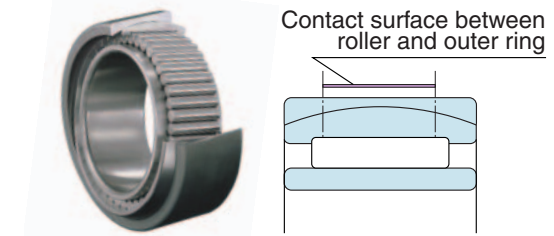
### ● Spherical roller bearing



When a spherical roller bearing is loaded, elastic deformation occurs on the contact surface between each roller and bearing raceway, producing an elliptical contact surface. This oval surface causes differential slip, which is attributed to the rolling mechanism of the spherical roller bearing.

Under normal load conditions, this differential sliding is negligible. However, under the excessively heavy loads, the major axis of the contact ellipse may become excessively enlarged, resulting in an increase in slip rate.

### ● Cylindrical roller bearing (with self-aligning ring)



When a cylindrical roller bearing is used to carry the loads, differential slip does not occur on the contact surface.

Fig. 2 Differential Slip of Spherical Roller Bearing



Fig. 3 Typical failure to Spherical Roller Bearings Supporting the Rolls of Continuous Casting Machines

# Bearings and Related Products for Continuous Casting Machines

## 2. High performance Products and Their Features

### (1) Roll support bearings

Compared with spherical roller bearings, cylindrical roller bearings do not produce differential slip on the contact surface between each roller and bearing raceway under the excessively heavy loads, delaying the development of wear and thus extending bearing service life.

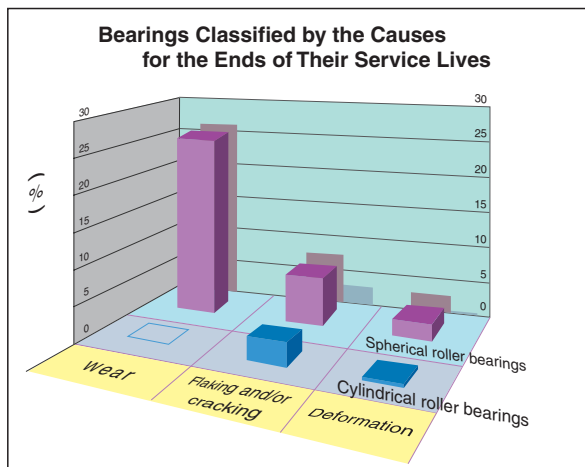


Fig. 4 Advantages of Cylindrical Roller Bearings

### ● SCP bearing at fixed side

This bearing is designed based on a full complement cylindrical roller bearing, with reference to maximized static load ratings. Crowning are set up on rolling surface of its rollers, according to the size of loads, which contributes to solve stress concentration at specific location. The ribs provided for the inner and outer rings and loose rib, adjacent to the inner ring, accommodate axial loads.

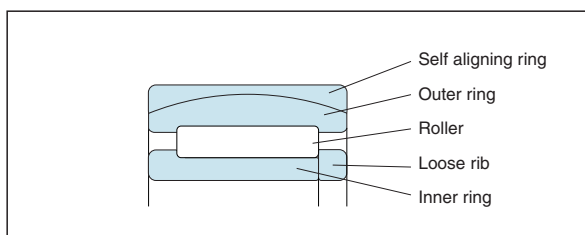


Fig. 5 SCP Bearing Structure

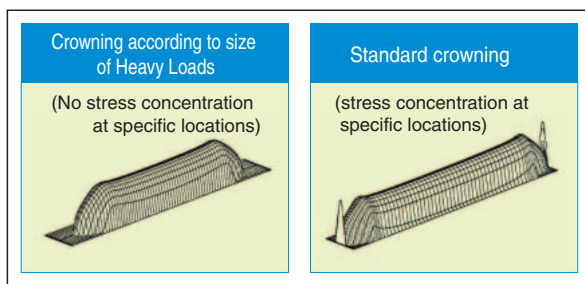


Fig. 6 Advantages of Roller Crowning According to the Size of Heavy Loads

### ● SC bearing at free side

To accommodate thermal roll contraction and expansion, the inner ring of this bearing are designed to move smoothly in the axial direction.

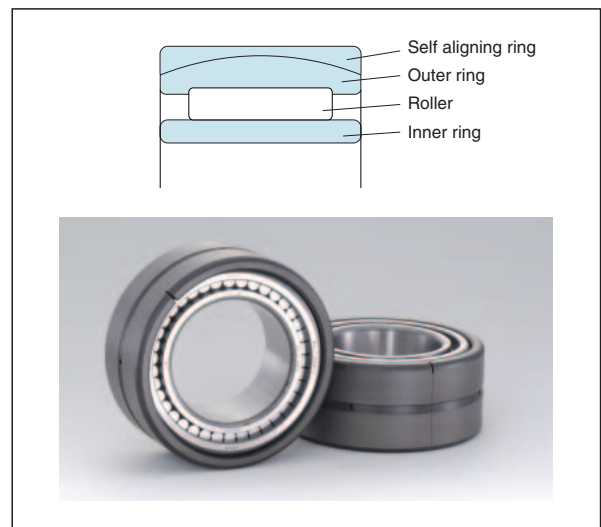


Fig. 7 SC Bearing Structure

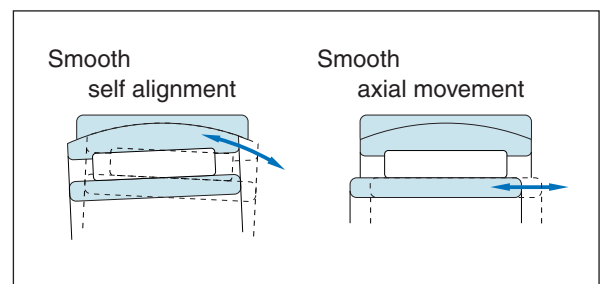


Fig. 8 SC Bearing Functions



## (2) HSC bearing units with half-round outer ring

This unit is designed to support the rolls of continuous casting machines at their middle position under heavy loads, and has high cooling efficiency.

This unit has unique structure, with a half-round outer ring placed on the loaded side only.

This special half-round outer ring and compact seal design realizes a 15% increase in static load rating over that of conventional products.

The outside diameter surface of the outer ring is finished spherically, providing a self-aligning to the housing.

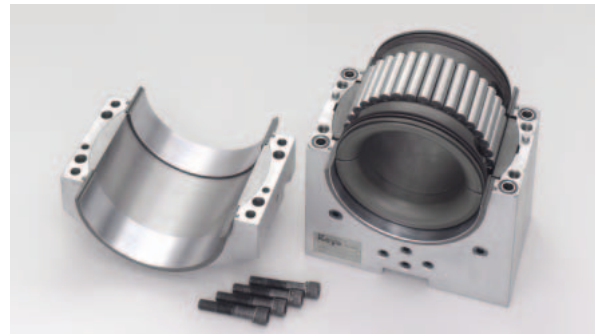


Fig. 9 HSC bearing Units with Half-round Outer Ring

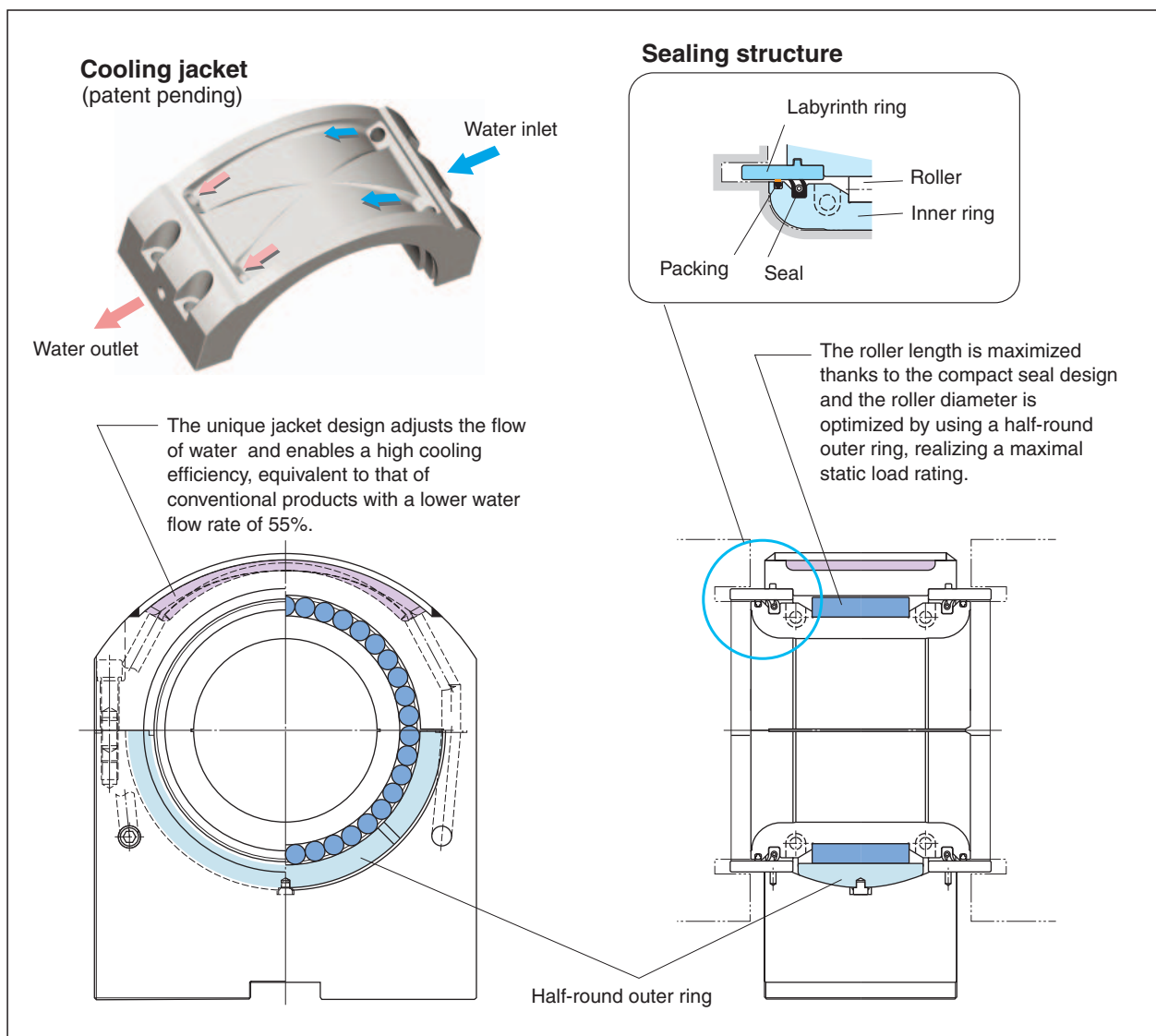


Fig. 10 Structure and Features of the HSC bearing Unit with Half-round Outer Ring

## 2. High performance Products and Their Features

### (3) Oil seals for roll support housings

This oil seal is applied for non grease evacuated type (Called Seal Out Type) housing. The standard material of seal rubber is H-NBR, which well resists to high temperature and stable under steam.

For the roll barrel side, the GE type seal having a dust lip that securely prevents the ingress of water and scales is recommended.

For the roll end side, the ME type seal with a dust lip is recommended.

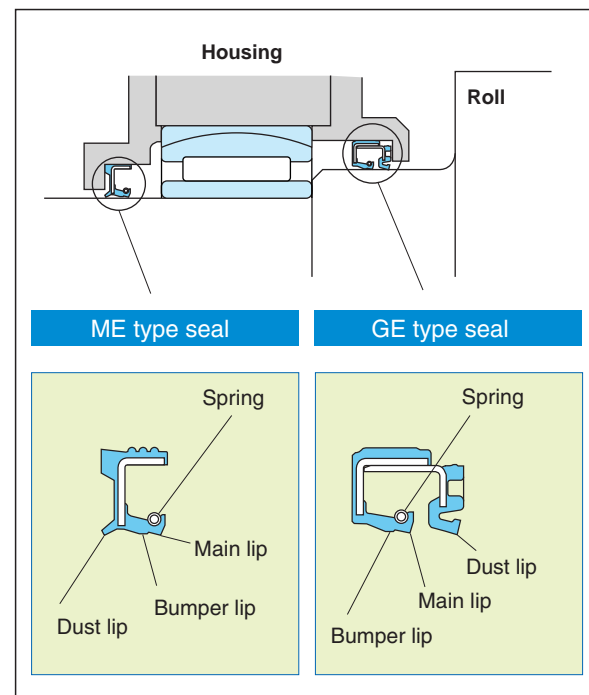


Fig. 11 Type and shape of oil seals

All these oil seals have a main lip equipped with a spring, delaying deterioration in sealing performance due to thermal rubber deformation. The bumper lip adjacent to the main lip distributes contact stress on the roll, delaying roll wear and thus extending sealing durability.

Oil seals applied for grease evacuated type (Called Seal In Type) housing are also available from JTEKT. Please contact JTEKT for further details.



Fig. 12 GE Type Oil Seal

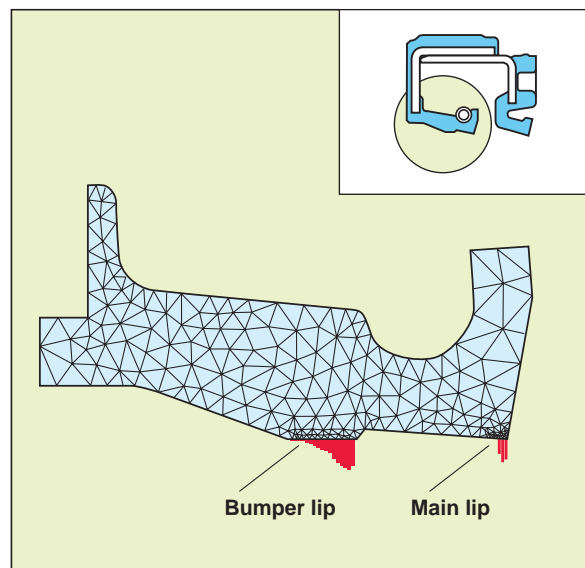


Fig. 13 FEM Analysis for Effects of Bumper Lip

### (4) Oil/Air lubrication system

This system supplies lubrication oil into the housing by means of compressed air. Therefore, the internal pressure of the housing is essentially high, preventing the ingress of contaminants.

This lubrication method is the most suitable for bearings used under severe environments where they may be exposed to scattering water and scales.

JTEKT supplies Oil/Air lubrication systems. Please contact JTEKT for further details.



Fig. 14 Example of Koyo Oil/Air Lubrication System

#### Features of Oil/Air lubrication system

- **Low environmental pollution**  
Oil emissions to the atmosphere are low, realizing a clean work environment.
- **Prevention of contaminants ingress into the housing**  
Compared with oil mist lubrication and grease lubrication, this system provides the housing interior with a higher pressure, essentially preventing the ingress of contaminants.
- **Less restrictions for piping**  
Restrictions on pipe branching are lessened compared with oil mist lubrication.
- **Lubrication oil saving**  
Consumption of lubrication oil is reduced.

#### Rust on the raceway of outer and inner rings



Fig. 15 Rust on Spherical Roller Bearing Caused by Water Ingress

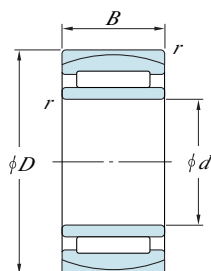


Fig. 16 Rust on Bearing Supporting Roll at Middle Position

# Bearings and Related Products for Continuous Casting Machines

## 3. Dimensions Tables

### SC Bearings and SCP Bearings

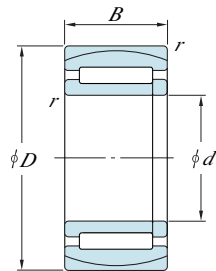


SC Bearing (Free side)

#### SC Bearings (Free side)

| Boundary Dimensions (mm) |     |        |            | Acceptable roll heat expansion (mm) | Basic Load Ratings (kN) |          | Bearing No.     | Mass (kg) | Corresponding Spherical Roller Bearing |       |          |
|--------------------------|-----|--------|------------|-------------------------------------|-------------------------|----------|-----------------|-----------|--|-------|----------|
| $d$                      | $D$ | $B$    | $r$ (Min.) |                                     | $C_r$                   | $C_{or}$ |                 |           | Bearing No.                            | $C_r$ | $C_{or}$ |
| 50                       | 110 | 40     | 2          | ±4.5                                | 164                     | 254      | SC101140VA      | 2.1       | 22310RHR                               | 204   | 237      |
| 55                       | 90  | 32     | 1.1        | ±3.5                                | 89.9                    | 202      | SC119032VA      | 0.9       | —                                      | —     | —        |
|                          | 100 | 25     | 1.5        | ±4                                  | 95.9                    | 143      | SC111025VA      | 0.9       | 22211RHR                               | 124   | 144      |
| 65                       | 120 | 31     | 1.5        | ±4                                  | 118                     | 206      | SC131231V-1A    | 1.7       | 22213RHR                               | 178   | 211      |
|                          | 140 | 48     | 2.1        | ±5.5                                | 238                     | 393      | SC131448VA      | 4.0       | 22313RHR                               | 305   | 360      |
| 70                       | 125 | 31     | 1.5        | ±6                                  | 126                     | 213      | SC141331VA      | 1.8       | 22214RHR                               | 187   | 222      |
|                          | 150 | 51     | 2.1        | ±7.5                                | 273                     | 406      | SC141551VA      | 4.7       | 22314RHR                               | 348   | 413      |
| 75                       | 130 | 31     | 1.5        | ±5                                  | 129                     | 220      | SC151331V-1A    | 1.9       | 22215RHR                               | 193   | 236      |
| 85                       | 150 | 65     | 3          | ±8                                  | 280                     | 621      | SC171565VA      | 5.4       | 24217RHB                               | 370   | 558      |
| 90                       | 160 | 40     | 2          | ±4.5                                | 240                     | 427      | SC181640-1VA    | 3.8       | 22218RHR                               | 298   | 381      |
|                          | 160 | 45/48* | 2          | ±5.5                                | 249                     | 507      | SC181645/48V-1A | 4.4       | —                                      | —     | —        |
|                          | 160 | 52.4   | 2          | ±5.5                                | 309                     | 555      | SC181652VA      | 4.9       | 23218RH                                | 336   | 482      |
| 100                      | 150 | 50     | 1.5        | ±6                                  | 232                     | 543      | SC201550VA      | 3.4       | —                                      | —     | —        |
|                          | 165 | 52     | 2          | ±5.5                                | 279                     | 600      | SC201752V-1A    | 4.8       | 23120RH                                | 328   | 510      |
| 105                      | 160 | 56     | 2          | ±9                                  | 242                     | 594      | SC211656VA      | 4.4       | 24021RHA                               | 317   | 550      |
| 110                      | 170 | 45     | 2          | ±5.5                                | 220                     | 533      | SC221745V-2A    | 4.1       | 23022RH                                | 300   | 486      |
|                          | 170 | 60     | 2          | ±8                                  | 279                     | 722      | SC221760V-1A    | 5.5       | 24022RH                                | 375   | 647      |
|                          | 170 | 64     | 2          | ±10                                 | 279                     | 722      | SC221764VA      | 5.8       | —                                      | —     | —        |
|                          | 180 | 56     | 2          | ±7.5                                | 296                     | 667      | SC221856V-8A    | 6.1       | 23122RH                                | 385   | 605      |
|                          | 180 | 69     | 2          | ±9                                  | 355                     | 842      | SC221869V-3A    | 7.6       | 24122RH                                | 469   | 778      |
| 120                      | 180 | 46     | 2          | ±6                                  | 231                     | 588      | SC241846V-2A    | 4.5       | 23024RH                                | 314   | 524      |
|                          | 180 | 54     | 2          | ±12                                 | 246                     | 516      | SC241854VA      | 5.0       | —                                      | —     | —        |
|                          | 180 | 56/46* | 2          | ±10                                 | 279                     | 626      | SC241856/46VA   | 5.2       | —                                      | —     | —        |
|                          | 180 | 58     | 2          | ±12                                 | 273                     | 589      | SC241858VA      | 5.4       | —                                      | —     | —        |
|                          | 180 | 60     | 2          | ±9                                  | 274                     | 726      | SC241860V-1A    | 5.8       | 24124RH                                | 397   | 709      |
|                          | 200 | 80     | 2          | ±9.5                                | 521                     | 1120     | SC242080VA      | 11.1      | 24124RH                                | 605   | 1020     |
| 130                      | 200 | 69     | 2          | ±9                                  | 381                     | 969      | SC262069V-1A    | 8.7       | 24026RH                                | 512   | 914      |
|                          | 200 | 79/69* | 2          | ±11                                 | 443                     | 1090     | SC262079/69VA   | 9.6       | —                                      | —     | —        |
|                          | 210 | 64     | 2          | ±10                                 | 408                     | 882      | SC262164VA      | 9.2       | 23126RH                                | 494   | 799      |
|                          | 210 | 80     | 2          | ±11.5                               | 448                     | 1120     | SC262180V-2A    | 11.9      | 24126RH                                | 620   | 1080     |
|                          | 230 | 64     | 3          | ±9                                  | 442                     | 950      | SC262364V-2A    | 12.5      | 22226RHR                               | 658   | 914      |
| 140                      | 210 | 53     | 2          | ±6                                  | 331                     | 834      | SC282153V-1A    | 7.1       | 23028RH                                | 422   | 723      |
|                          | 210 | 69     | 2          | ±9.5                                | 431                     | 1010     | SC282169RVA     | 8.8       | 24028RH                                | 524   | 957      |
|                          | 225 | 68     | 2.1        | ±7                                  | 512                     | 1150     | SC282368RVA     | 11.1      | 23128RH                                | 565   | 940      |
|                          | 225 | 85     | 2.1        | ±11.5                               | 521                     | 1300     | SC282385V-1A    | 14.4      | 24128RH                                | 702   | 1220     |
| 150                      | 225 | 75     | 2.1        | ±9.5                                | 468                     | 1220     | SC302375V-4A    | 11.7      | 24030RH                                | 593   | 1100     |
|                          | 250 | 100    | 2.1        | ±14                                 | 666                     | 1650     | SC3025100V-1A   | 21.9      | 24130RH                                | 915   | 1590     |
|                          | 270 | 96     | 3          | ±12                                 | 806                     | 1670     | SC302796VA      | 26.2      | 23230RH                                | 959   | 1540     |

Note \* indicates width of outer ring and inner ring, respectively.



Boundary Dimensions

SCP Bearing (Fixed side)

SC Bearings (Free side)

| Boundary Dimensions (mm) |          |          |                 | Acceptable roll heat expansion (mm) | Basic Load Ratings (kN) |                       | Bearing No.   | Mass (kg) | Corresponding Spherical Roller Bearing |                      |                       |
|--------------------------|----------|----------|-----------------|-------------------------------------|-------------------------|-----------------------|---------------|-----------|--|----------------------|-----------------------|
| <i>d</i>                 | <i>D</i> | <i>B</i> | <i>r</i> (Min.) |                                     | <i>C<sub>r</sub></i>    | <i>C<sub>0r</sub></i> |               |           | Bearing No.                            | <i>C<sub>r</sub></i> | <i>C<sub>0r</sub></i> |
| 160                      | 240      | 80       | 2.1             | ± 13                                | 542                     | 1280                  | SC322480-2VA  | 13.6      | 24032RH                                | 679                  | 1270                  |
|                          | 270      | 109      | 2.1             | ± 13.5                              | 869                     | 1980                  | SC3227109VA   | 28.0      | 24132RH                                | 1070                 | 1890                  |
|                          | 340      | 114      | 4               | ± 15                                | 1230                    | 2300                  | SC3234114VA   | 55.3      | 22332RHA                               | 1420                 | 1940                  |
| 170                      | 260      | 90       | 2.1             | ± 14                                | 622                     | 1560                  | SC342690V-1A  | 18.7      | 24034RH                                | 828                  | 1540                  |
|                          | 310      | 110      | 4               | ± 14                                | 1010                    | 2180                  | SC3431110VA   | 40.1      | 23234RHA                               | 1210                 | 1940                  |
| 180                      | 280      | 100      | 2.1             | ± 14                                | 743                     | 1890                  | SC3628100V-1A | 25.0      | 24036RH                                | 984                  | 1830                  |
|                          | 320      | 112      | 4               | ± 15                                | 950                     | 2350                  | SC3632112V-1A | 43.5      | 23236RHA                               | 1320                 | 2170                  |
| 190                      | 290      | 100      | 2.1             | ± 14                                | 768                     | 2030                  | SC3829100V-1A | 26.1      | 24038RHA                               | 1010                 | 1920                  |
|                          | 320      | 104      | 3               | ± 12                                | 1030                    | 2270                  | SC3832104VA   | 37.2      | 23138RHA                               | 1210                 | 2080                  |
|                          | 320      | 128      | 4               | ± 15.5                              | 1120                    | 2790                  | SC3832128VA   | 46.7      | 24138RHA                               | 1460                 | 2630                  |
|                          | 340      | 120      | 4               | ± 16                                | 1110                    | 2720                  | SC3834120V-1A | 53.0      | 23238RHA                               | 1490                 | 2470                  |
| 200                      | 310      | 109      | 2.1             | ± 11                                | 978                     | 2550                  | SC403111RVA   | 33.5      | 24040RHA                               | 1180                 | 2230                  |
|                          | 340      | 112      | 3               | ± 16                                | 1080                    | 2490                  | SC4034112V-1A | 46.0      | 23140RHA                               | 1380                 | 2340                  |
|                          | 340      | 140      | 3               | ± 19                                | 1350                    | 3090                  | SC4034140VA   | 56.1      | 24140RHA                               | 1660                 | 2970                  |
| 220                      | 370      | 150      | 4               | ± 19                                | 1540                    | 3750                  | SC4437150VA   | 72.3      | 24144RHA                               | 1920                 | 3550                  |

SCP Bearings (Fixed side)

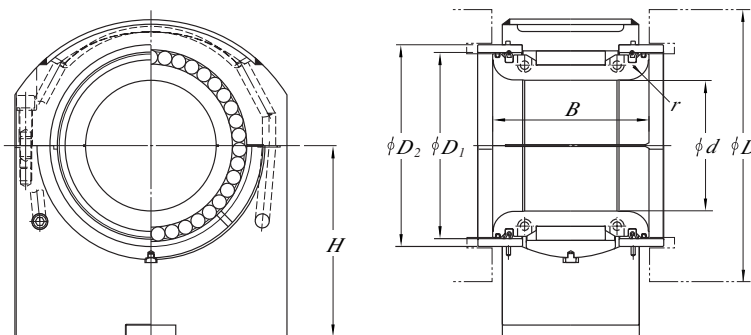
| Boundary Dimensions (mm) |          |          |                 | Acceptable roll heat expansion (mm) | Basic Load Ratings (kN) |                       | Bearing No.    | Mass (kg) | Corresponding Spherical Roller Bearing |                      |                       |
|--------------------------|----------|----------|-----------------|-------------------------------------|-------------------------|-----------------------|----------------|-----------|--|----------------------|-----------------------|
| <i>d</i>                 | <i>D</i> | <i>B</i> | <i>r</i> (Min.) |                                     | <i>C<sub>r</sub></i>    | <i>C<sub>0r</sub></i> |                |           | Bearing No.                            | <i>C<sub>r</sub></i> | <i>C<sub>0r</sub></i> |
| 85                       | 150      | 65       | 3               | —                                   | 280                     | 621                   | SCP171565VA    | 5.5       | 24217RHB                               | 370                  | 558                   |
| 90                       | 160      | 40       | 2               | —                                   | 194                     | 400                   | SCP181640V-1A  | 3.9       | 22218RHR                               | 298                  | 381                   |
|                          | 160      | 52.4     | 1.1             | —                                   | 271                     | 566                   | SCP181652V-2A  | 5.1       | 23218RH                                | 336                  | 482                   |
| 100                      | 150      | 50       | 1.5             | —                                   | 232                     | 543                   | SCP201550VA    | 3.4       | —                                      | —                    | —                     |
| 110                      | 170      | 45       | 2               | —                                   | 220                     | 533                   | SCP221745V-2A  | 4.2       | 23022RH                                | 300                  | 486                   |
|                          | 180      | 69       | 2               | —                                   | 355                     | 842                   | SCP221869V-3A  | 7.8       | 24122RH                                | 469                  | 778                   |
|                          | 200      | 53       | 2.1             | —                                   | 333                     | 626                   | SCP222053VA    | 8.2       | 22222RHR                               | 491                  | 642                   |
| 120                      | 180      | 46       | 2               | —                                   | 231                     | 588                   | SCP241846V-2A  | 4.6       | 23024RH                                | 314                  | 524                   |
|                          | 200      | 80       | 2               | —                                   | 431                     | 1040                  | SCP242080V-3A  | 12.0      | 24124RH                                | 605                  | 1020                  |
| 130                      | 200      | 52       | 2               | —                                   | 295                     | 701                   | SCP262052V-1A  | 6.7       | 23026RH                                | 404                  | 674                   |
|                          | 200      | 69       | 2               | —                                   | 381                     | 969                   | SCP262069V-1A  | 8.9       | 24026RH                                | 512                  | 914                   |
|                          | 210      | 80       | 2               | —                                   | 448                     | 1120                  | SCP262180V-2A  | 12.2      | 24126RH                                | 620                  | 1080                  |
| 140                      | 210      | 53       | 2               | —                                   | 331                     | 834                   | SCP282153V-1A  | 7.2       | 23028RH                                | 422                  | 723                   |
|                          | 225      | 85       | 2.1             | —                                   | 521                     | 1300                  | SCP282385V-1A  | 14.8      | 24128RH                                | 702                  | 1220                  |
| 150                      | 225      | 75       | 2               | —                                   | 468                     | 1220                  | SCP302375V-4A  | 11.7      | 24030RH                                | 593                  | 1100                  |
| 180                      | 320      | 112      | 4               | —                                   | 950                     | 2350                  | SCP3632112V-1A | 44.1      | 23236RHA                               | 1320                 | 2170                  |
| 190                      | 290      | 100      | 2.1             | —                                   | 768                     | 2030                  | SCP3829100V-1A | 26.8      | 24038RHA                               | 1010                 | 1920                  |
|                          | 320      | 128      | 4               | —                                   | 1120                    | 2790                  | SCP3832128VA   | 47.8      | 24138RHA                               | 1460                 | 2630                  |



## Bearings and Related Products for Continuous Casting Machines

### 3. Dimensions Tables

HSC bearing Units with  
Half-round Outer Ring



| Boundary Dimensions (mm) |          |           |            |       |       |                   | Housing No. <sup>1)</sup> | Bearing No. | Acceptable roll heat expansion (mm) | Basic Load Ratings (kN) |          |
|--------------------------|----------|-----------|------------|-------|-------|-------------------|---------------------------|-------------|-------------------------------------|-------------------------|----------|
| Roll Dia. $D$            | Bore $d$ | Width $B$ | Height $H$ | $D_1$ | $D_2$ | $r$ <sup>2)</sup> |                           |             |                                     | $C_r$                   | $C_{0r}$ |
| 195                      | 100      | 145       | 175        | 133   | 143   | C8*               | PBA391H                   | HSC2017-1C3 | ±7                                  | 373                     | 876      |
| 220                      | 110      | 139       | 225        | 155   | 168   | 18                | PBA399H                   | HSC2219-7C3 | ±9                                  | 402                     | 876      |
|                          | 110      | 139       | 225        | 155   | 168   | 18                | PBA360H                   | HSC2219-6C3 | ±9                                  | 433                     | 966      |
| 225                      | 100      | 169       | 132        | 140   | 150   | 15                | PBA328H                   | HSC2019C3   | ±8                                  | 603                     | 1250     |
| 230                      | 110      | 113       | 185        | 160   | 173   | 13                | PBA171H                   | HSC2219-3C3 | ±8                                  | 337                     | 619      |
|                          | 110      | 141       | 246        | 160   | 173   | 18                | PBA171AXH                 | HSC2219-1C3 | ±8                                  | 528                     | 1120     |
|                          | 110      | 150       | 190        | 160   | 173   | 15                | PBA208H                   | HSC2219-2C3 | ±8                                  | 554                     | 1190     |
|                          | 110      | 154       | 180        | 160   | 173   | 20                | PBA368H                   | HSC2219-4C3 | ±8                                  | 554                     | 1190     |
|                          | 110      | 154       | 180        | 160   | 173   | 20                | PBA404H                   | HSC2220C3   | ±9                                  | 575                     | 1270     |
| 235                      | 140      | 145       | 175        | 175   | 186.5 | C8*               | PBA339H                   | HSC2821C3   | ±5                                  | 431                     | 1160     |
| 240                      | 115      | 202       | 251        | 160   | 175   | 15                | PBA316H                   | HSC2321C3   | ±10                                 | 745                     | 1550     |
|                          | 120      | 173       | 230        | 165   | 180   | 15                | PBA396H                   | HSC2421-2C3 | ±9                                  | 673                     | 1510     |
| 250                      | 120      | 151       | 190        | 172   | 185   | 20                | PBA411H                   | HSC2421-6C3 | ±9                                  | 576                     | 1310     |
|                          | 120      | 153       | 185        | 175   | 190   | 20                | PBA336H                   | HSC2421C3   | ±8                                  | 651                     | 1380     |
|                          | 120      | 153       | 145        | 175   | 190   | 20                | PBA336AH                  | HSC2421C3   | ±8                                  | 651                     | 1380     |
|                          | 120      | 154       | 175        | 170   | 188   | 20                | PBA378H                   | HSC2421-1C3 | ±10                                 | 578                     | 1190     |
|                          | 120      | 154       | 190        | 175   | 190   | 20                | PBA251H-2                 | HSC2421-4C3 | ±9                                  | 605                     | 1400     |
|                          | 120      | 154       | 180        | 175   | 190   | 20                | PBA251H                   | HSC2421-3C3 | ±9                                  | 605                     | 1400     |
|                          | 120      | 154       | 180        | 170   | 185   | 20                | PBA407H                   | HSC2421-5C3 | ±9                                  | 605                     | 1400     |
| 255                      | 125      | 174       | 180        | 180   | 195   | 20                | PBA410H                   | HSC2522C3   | ±9                                  | 793                     | 1740     |
| 260                      | 120      | 154       | 180        | 170   | 188   | 20                | PBA379H                   | HSC2421-1C3 | ±10                                 | 578                     | 1190     |
|                          | 130      | 157       | 180        | 185   | 200   | 20                | PBA412H                   | HSC2622-2C3 | ±9                                  | 623                     | 1480     |
| 265                      | 140      | 175       | 242.5      | 190   | 205   | 20                | PBA397H                   | HSC2823-2C3 | ±9                                  | 699                     | 1640     |
|                          | 140      | 191       | 250        | 190   | 205   | 20                | PBA355H                   | HSC2823-1C3 | ±7                                  | 721                     | 1710     |
| 270                      | 130      | 154       | 190        | 185   | 200   | 20                | PBA252H                   | HSC2622C3   | ±9                                  | 623                     | 1480     |
|                          | 140      | 126       | 205        | 199   | 212   | 16                | PBA176H                   | HSC2823C3   | ±8                                  | 505                     | 992      |
|                          | 140      | 174       | 205        | 199   | 212   | 20                | PBA207H                   | HSC2824-1C3 | ±8                                  | 863                     | 1980     |
| 275                      | 150      | 163       | 175        | 190   | 203.5 | C10*              | PBA389H                   | HSC3024C3   | ±7                                  | 711                     | 1800     |
|                          | 130      | 174       | 205        | 185   | 200   | 20                | PBA337H                   | HSC2624C3   | ±8                                  | 846                     | 1910     |
| 280                      | 130      | 174       | 160        | 185   | 200   | 20                | PBA337AH                  | HSC2624C3   | ±8                                  | 846                     | 1910     |
|                          | 145      | 196       | 260        | 200   | 215   | 20                | PBA356H                   | HSC2925-1C3 | ±6                                  | 840                     | 1930     |
|                          | 140      | 139       | 215        | 208   | 223   | 16                | PBA177H                   | HSC2825C3   | ±8                                  | 863                     | 1980     |
| 290                      | 145      | 178       | 215        | 208   | 223   | 20                | PBA206H                   | HSC2925C3   | ±8                                  | 967                     | 2260     |
|                          | 145      | 208       | 270        | 200   | 215   | 20                | PBA357H                   | HSC2926C3   | ±6                                  | 880                     | 2260     |
| 295                      | 150      | 169       | 205        | 205   | 220   | 20                | PBA408H                   | HSC3025C3   | ±8.5                                | 855                     | 1990     |
| 310                      | 140      | 184       | 215        | 205   | 220   | 20                | PBA338H                   | HSC2827C3   | ±8                                  | 1000                    | 2210     |
|                          | 140      | 184       | 175        | 205   | 220   | 20                | PBA338AH                  | HSC2827C3   | ±8                                  | 1000                    | 2210     |
| 320                      | 150      | 187       | 220        | 220   | 235   | 20                | PBA380H                   | HSC3028C3   | ±9                                  | 1040                    | 2370     |
|                          | 160      | 150       | 291        | 240   | 255   | 18                | PBA178H                   | HSC3228C3   | ±8                                  | 816                     | 1680     |
|                          | 160      | 199       | 270        | 215   | 230   | 20                | PBA398H                   | HSC3227C3   | ±9                                  | 1000                    | 2410     |
|                          | 165      | 228       | 280        | 230   | 245   | 25                | PBA358H                   | HSC3328C3   | ±6                                  | 1030                    | 2550     |
| 340                      | 180      | 235       | 280        | 245   | 260   | 25                | PBA359H                   | HSC3630C3   | ±6                                  | 1140                    | 2720     |
| 370                      | 190      | 233       | 280        | 326   | 336   | 20                | PBA324H                   | HSC3834C3   | ±7                                  | 1540                    | 3540     |

Notes 1) The housing numbers do not includes a bearing.

2) \* indicates a special design.

# GLOBAL NETWORK

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