**F - Series**

**Description**

F Series is a range of structural bearings for locating structures. They are designed to react only horizontal loads. Fixed and guided bearings are available as standards for loads up to 2352 kN. The bearings fully meet the requirements of BS5400 Section 9. They are manufactured to meet quality standards applicable throughout the world.

**Bearing Types**

The F range of bearings are available in three forms: -

- **10F**  Fixed
- **11F & 21F** Free to move in one horizontal direction

In addition all bearings can accept compressive movements of up to ±3mm which facilitates their use with bearings (such as elastomeric types) which deflect noticeably under load.

**Bearing Details - Exploded View**

**Support and Installation**

Important - See pages 8 - 10 for Installation and Maintenance. The bearings are fitted with transport brackets which maintain a clearance for vertical movement. These must be removed after installation.

**Concrete Stress**

Where suitable reinforcement has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

With these bearings it is important to ensure that the sockets are embedded in structural concrete not less than the depth indicated on page 6 and in the case of 11F types that the tang is embedded to dimension H on page 5.

A material of adequate strength must be used in conjunction with suitable reinforcement to resist bursting and tensile forces.

**Design Loads**

The designation of loading varies from country to country. These bearings are designed to BS5400 limit state loads. It may be assumed that the Serviceability Limit State load may be substituted for the maximum load in a working stress design.

**Rotation**

All the bearings can rotate at least 0.01 radians about the transverse horizontal axis. The **10F** can rotate at least 0.01 radians about all other axes.

**Translations**

The dimensions for the **11F & 21F** bearings allow for a longitudinal movement of ± 50mm. Additional movements in increments of 50mm total can be supplied.

We will be pleased to advise, but this will change the top plate dimensions.

Note: **11F & 21F** bearings should not be used where movement at right angles to the guided direction is required.
### F - Series

#### 10F - Fixed Bearing

<table>
<thead>
<tr>
<th>Bearing Part No.</th>
<th>Installation Dimensions (mm)</th>
<th>SLS Load (kN)</th>
<th>ULS Load (kN)</th>
<th>Approx Weight (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10F15</td>
<td>A 140</td>
<td>A1 260</td>
<td>B 140</td>
<td>C 240</td>
</tr>
<tr>
<td>10F25</td>
<td>A 170</td>
<td>A1 330</td>
<td>B 190</td>
<td>C 290</td>
</tr>
<tr>
<td>10F50</td>
<td>A 280</td>
<td>A1 440</td>
<td>B 280</td>
<td>C 440</td>
</tr>
<tr>
<td>10F80</td>
<td>A 280</td>
<td>A1 490</td>
<td>B 330</td>
<td>C 440</td>
</tr>
<tr>
<td>10F120</td>
<td>A 360</td>
<td>A1 640</td>
<td>B 440</td>
<td>C 520</td>
</tr>
<tr>
<td>10F170</td>
<td>A 410</td>
<td>A1 750</td>
<td>B 530</td>
<td>C 610</td>
</tr>
</tbody>
</table>

* Weight excludes fixings

### F - Series

#### 11F - Guide Bearing

<table>
<thead>
<tr>
<th>Bearing Part No.</th>
<th>Installation Dimensions (mm)</th>
<th>SLS Load (kN)</th>
<th>ULS Load (kN)</th>
<th>Approx Weight (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11F15</td>
<td>A 210</td>
<td>A1 210</td>
<td>B 22</td>
<td>C 350</td>
</tr>
<tr>
<td>11F35</td>
<td>A 340</td>
<td>A1 340</td>
<td>B 32</td>
<td>C 480</td>
</tr>
<tr>
<td>11F50</td>
<td>A 400</td>
<td>A1 350</td>
<td>B 37</td>
<td>C 540</td>
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<tr>
<td>11F80</td>
<td>A 470</td>
<td>A1 370</td>
<td>B 42</td>
<td>C 610</td>
</tr>
<tr>
<td>11F120</td>
<td>A 580</td>
<td>A1 430</td>
<td>B 52</td>
<td>C 720</td>
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<tr>
<td>11F170</td>
<td>A 660</td>
<td>A1 490</td>
<td>B 57</td>
<td>C 800</td>
</tr>
</tbody>
</table>

* Weight excludes fixings
**F - Series**

21F - Guide Bearing

The fixings detailed below are designed to suit the requirements of F Series bearings.

By adding a two letter suffix to the bearing part number the type of fixing may be designated -

First letter - Top plate fixing
Second letter - Base plate fixing

N - No fixings
B - Bolts and washers only
S - Bolts, washers & sockets

e.g. /BS signifies -
B (top plate fixing) Bolts & washers
S (base plate fixing) Bolts, washers & sockets

N.B. If standard F bearing fixings are not used, care should be taken to ensure that bolts can be fitted without dismantling the bearing.

Bolts are hexagon head to BS 3692 grade 10.9. Sockets are steel to EN 10025 grade S275.

**Bolts and Sockets - 10F**

<table>
<thead>
<tr>
<th>Bearing Size</th>
<th>Socket (mm)</th>
<th>Bolt (mm)</th>
<th>Socket (mm)</th>
<th>Bolt (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
<td>Top</td>
<td>Base</td>
<td>Top</td>
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<tr>
<td>15</td>
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<tr>
<td>170</td>
<td>105</td>
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<td>42</td>
<td>160</td>
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</tbody>
</table>

**Bolts and Sockets - 11F and 21F**

<table>
<thead>
<tr>
<th>Bearing Size</th>
<th>Socket (mm)</th>
<th>Bolt (mm)</th>
<th>Socket (mm)</th>
<th>Bolt (mm)</th>
</tr>
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<tbody>
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<td>15</td>
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<td>140</td>
</tr>
</tbody>
</table>

*Weight excludes fixings*

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*Increase to suit additional translation. See page 2*
Installation

CONSIDER THE EFFECTS IF BEARINGS ARE NOT CORRECTLY INSTALLED.

Our structural bearings are manufactured to close tolerances by skilled technicians working in clean conditions. To obtain the requisite performance from bearings it is imperative that they are properly handled at the work site and installed with the same care as when they were assembled in the factory. The following notes will assist those responsible for specifying and supervising the installation of structural bearings.

Please note that Ekspan are able to provide installation and supervision.

**Bearing must be installed with precision to meet the bridge and bearing design criteria.**

Storage

Our structural bearings are protected from contamination under normal working conditions by an efficient sealing system. Care should be taken in storage to prevent contamination and damage to the working surfaces.

**Robust transportation devices are fitted to all bearings to ensure that the components are maintained in their correct relative positions before and during installation. The devices are normally finished in red paint. Unless special devices have been specified, they should not be used for slinging or suspending the bearings beneath beams.**

Due to unpredictable conditions, which may occur during transportation or handling on site, the alignment and presetting (if applicable) of the assembled bearing should be checked against the drawing. Do not endeavour to rectify any discrepancies on site. The bearing should either be returned to Ekspan or, where practical, an Ekspan engineer should be called in to inspect and reassemble. Bearings too heavy to be lifted by hand should be properly slung using lifting equipment.

**Bearing must be supported on a flat rigid bed.**

Handling

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Presetting

**If bearings are required to be preset eg where once only large movements may occur during stressing operations, this should be specified as a requirement and should only be carried out in our works prior to despatch. Do not attempt this operation on site.**

Bedding

**Bearings must be supported on a flat rigid bed.**

Steel spreader plates must be machined flat and smooth to mate exactly with the bearings’ upper and lower faces. Bearings may also be bedded on epoxy or cement mortar or by dry packing. Whichever system is preferred for the particular structure it is of extreme importance that the final bedding is free from high or hard spots, shrinkage, voids, etc.

Unless there is a specific design requirement, the planar surfaces must be installed in a horizontal plane. The correct installation of bearings is vital for the bearing performance. Costly repairs become necessary all too often due to inadequate specification or poor site supervision. The bearings should not be loaded until the bedding mortar has cured.

Cast-In-Situ Structures

Care must be taken to ensure that the bearings are not damaged by the formwork or contaminated by concrete seepage. The interface between the top plate and the formwork should be protected and sealed.

Owing to the loading effects of a wet concrete mass, the top plates should be propped to prevent rotation and plate distortion.

Removal of Transport Brackets

These brackets, normally painted red should only be removed once the bearing is properly installed and ready for operation.

**Bearing Removability**

Where possible, bearings should be fixed in such a manner as to facilitate removal. Our bearings have generally been designed with this in mind. However, when selecting the bearing type preferred, the removability feature should be highlighted in your enquiry.

**Bearing Installation Check List**

**DO -**

1. Handle carefully and where necessary with adequate craneage.
2. Store in a clean dry place.
3. Ensure that the bearings are installed in the correct location and orientation.
4. Ensure that the bearings are installed on a flat rigid bed before the design loads are applied.
5. Ensure that the fixings are uniformly tightened.
6. Complete any site coatings and make good paint damaged during handling and installation.
7. Protect working surfaces during the placing of in-situ concrete.
8. Keep the bearings and surrounding areas clean.
9. Remove any temporary transit clamps etc. before the bearings are required to operate.
10. Take special care to support top plates when casting in-situ concrete.
HANDLING, STORAGE, INSTALLATION & MAINTENANCE

DO NOT:
1. Dismantle the bearing on site.
2. Leave bearings uncovered.
3. Attempt to modify without our approval.
4. Install without qualified supervision.

Site Coating

Care should be taken to ensure that working surfaces are not damaged in any site coating operation. After installation damaged coatings must be repaired irrespective of any call for site coatings. Exposed fixing bolts should be protected after final tightening. Any tapped holes exposed after removal of transportation brackets etc. (coloured red) should be sealed with self-vulcanizing silicone sealant.

Routine Maintenance of Bearings

1. Immediately following installation bearings shall be inspected to ensure that all aspects of ‘Installation of bearings’ have been adhered to and bearings shall subsequently be re-inspected not less frequently than every two years after their installation.

2. Paint and/or other specified protective coatings must be maintained in good and efficient condition and free from scratches or chips. Any areas of the protective coating showing damage or distress must be rectified.

3. Areas surrounding the bearings must be kept clean and dry and free from the adverse effects of external influences such as airborne debris or water/salt (for example emanating from leaking joints).

4. The wearing surfaces of the bearing must be checked to ensure that they are continuing to operate efficiently.

5. Fixing bolts must be checked for tightness.

6. Any bedding material showing signs of distress or ineffectiveness must be replaced and the reason for its failure investigated and corrected.

7. Routine inspections shall include a check that translational and rotational capacities of the bearing have not been exceeded and show no sign of being likely to exceed the requirements specified at the design stage.

Structural Waterproofing - CD 358

Pitchmastic PmB
Polyurethane (Pu) Waterproofing System

Britdex MDP
Methyl Methacrylate (MMA) Waterproofing System

Britflex UCP
Footbridge Joint

Britflex BEJ
Modular Joint

Britflex MEJS
Modular Joint

LJ
Longitudinal Joint

ES
Joint Seal

Aquaduct / Immersed Joint

DriDeck

Envirodeck

Surface Bridge Drainage

Eksam 325 Channel
Eksam 302 System
ES Seal System
DriDeck

SUB-SURFACE BRIDGE DRAINAGE

GROUP BRANDS

A world wide service offering effective solutions in-

Inspection • Design • Manufacture • Supply • Installation • Commissioning • Planned Maintenance

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