

**INSTALLATION & OPERATION MANUAL  
FOR**

# **Pin-Flex Couplings**

**TYPE – RP, RPS**



**RATHI TRANSPower PVT. LTD.,**  
Gaia Apex, S.No.33/2D, Viman Nagar,  
PUNE – 411 014 (INDIA)

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**1. NOTES**

**1.1 GENERAL INSTRUCTIONS**

Please read the assembly instructions carefully before starting to operate the coupling. Pay particular attention to the safety instructions.



The **PIN-FLEX** coupling is approved for use in hazardous areas if marked with CE mark.

When using the coupling in potentially hazardous areas, pay special attention to the safety instructions.

The assembly instructions are part of your product and should be available with maintenance personal at all times until it is assembled.

Keep these instructions in a safe place, so they can be referred to by maintenance personnel.

**1.2 SAFETY AND ADVICE INSTRUCTIONS**



**Danger!**

Danger of injury to persons.



**Caution!**

Damages on the machine possible.



**Attention!**

Pointing to important items.



**Caution!**

Hints concerning explosion protection.

**1.3 GENERAL INSTRUCTIONS OF DANGER**



**Danger!**

With assembly, operation and maintenance of the coupling make sure that the entire drive train is protected against unintentional engagement. Serious injuries can occur from rotating parts. Likewise, make sure to read through and observe the following safety instructions:

- All operations on and with the coupling must be performed with “safety first” being the primary consideration.
- Make sure to disengage the power supply before you perform your work.

- Protect the power supply against unintentional engagement, for example, by providing hints at the place of engagement, or removing the power supply fuse.
- Do not touch the coupling's working area while it is operating.
- Protect the coupling against unintentional touch. Provide the necessary protective covers and devices.

### 1.4 PROPER USE

Assembly, operation and maintenance work may be performed on the coupling only if:

- The assembly instructions are read carefully and understood.
- The personnel are technically qualified & are authorized to do so by the company.

The coupling may only be used in accordance with the technical data.

Unauthorized modifications to the coupling are not admissible. We decline any warranty due to consequent damage. For future development of the product, we reserve the right to make technical modifications.

The **PIN-FLEX** coupling described here corresponds to the technical status at the time of printing these assembly instructions.

### 1.5 INTENDED USE OF THE COUPLING

The intended use of the coupling is to connect input and output of a power transmission drive with each other, in most cases these are two shafts. For Stationary Application Additional equipment like brake drums, torque limiter, etc. can be added to the couplings and will not change the intended use.

The coupling compensates within the technical limits misalignment and dampens shock loads or vibrations.

### **MANUFACTURER'S DECLARATION IN CONFORMANCE TO EC MACHINE DIRECTIVE 2006/42/EC**

Rathi **PIN-FLEX** Couplings must be treated as components in the sense of the EC machine directive 2006/42/EC.

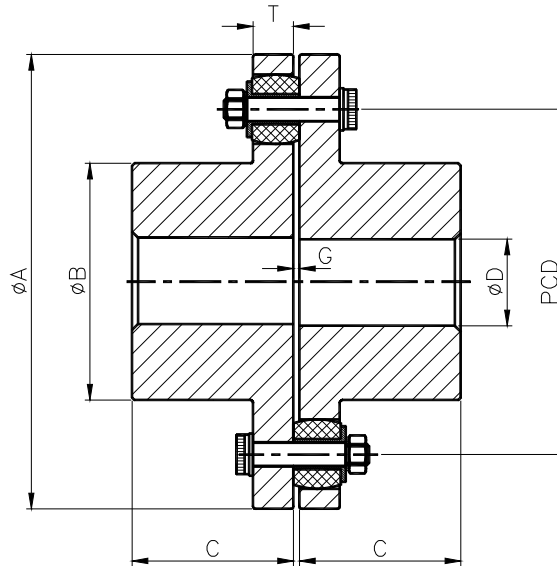
Therefore M/s Rathi need not issue a separate declaration of conformity.

Information for safe use, installation, start up and operation can be found in this manual.

**2. TECHNICAL DATA**

**2.1 DIMENSIONS, SPEED & WEIGHTS**

**TYPE-RP**



SR. NO.	Size	Polyurethane buffer			Dimensions (mm)							Solid hub		Bolt Details	
		Torque (Nm)	Kw @ 100 rpm	Max. Speed (rpm)	$\phi A$	$\phi B$	C	$\phi D$ (Min-Max)	G	T	PCD	Weight (kg)	M.I. (Kgm <sup>2</sup> )	Size	Qty.
1	RP-12.5	900	9.4	5800	125	70	50	16-50	3	20	95	6	0.009	M8	12
2	RP-14.5	1500	15.7	5500	145	80	65	16-58	5	25	112	10.1	0.02	M10	12
3	RP-16.5	2100	22	4800	165	100	70	22-75	5	25	130	14.7	0.037	M10	12
4	RP-19.5	4200	44	4400	195	120	90	32-90	5	30	155	27.13	0.09	M12	12
5	RP-24.0	9000	94.2	3600	240	150	105	42-110	5	35	190	46.6	0.246	M16	16
6	RP-29.0	17000	177.9	3000	290	180	125	60-130	6	50	230	86.2	0.7	M20	16
7	RP-32.0	22000	230.2	2600	320	210	151	70-150	6	50	260	124.3	1.17	M20	16
8	RP-35.0	30000	314	2400	350	225	161	76-160	6	60	285	161.7	1.88	M24	16
9	RP-38.0	37500	392.5	2200	380	245	181	80-180	6	60	310	206.4	2.73	M24	16

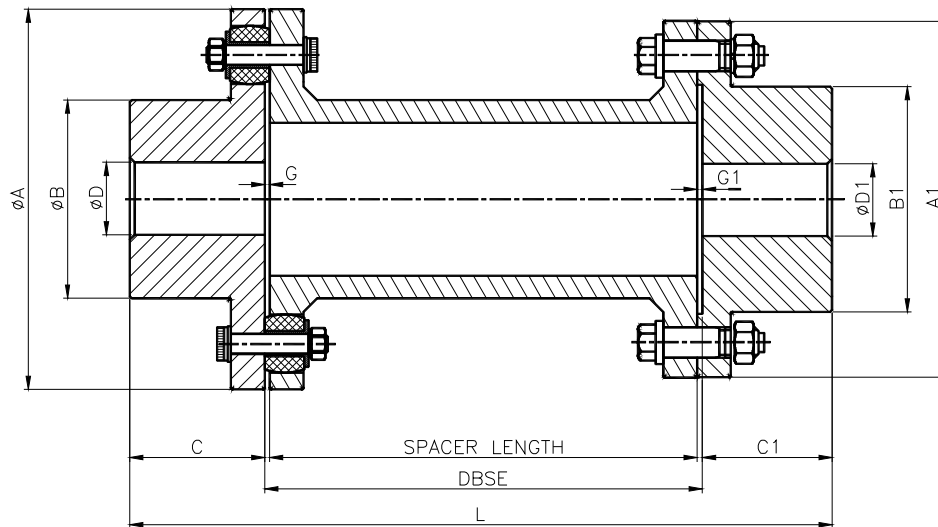
**NOTES:-**

1. All dimensions in mm.
2. Weight & Inertia shown are at solid bore condition.
3. Maintain Gap `G` at the time of assembly.

# PIN-FLEX COUPLING



## TYPE-RPS



Sr. No.	SIZE	POLYURETHANE BUFFER			D (MIN.-MAX.)	D1 (MIN.-MAX.)	DIMENSIONS (MM.)									
		TORQUE (Nm)	kW @ 100 RPM	MAX. SPEED (RPM)			DBSE	A	A1	B	B1	C	C1	G	G1	L
1	RP-16.5-R-15	2100	22	4800	22-75	26-80	180	165	152	100	107	70	47	2.5	2.5	297
2	RP-16.5-R-25								324							
3									284							
4	RP-19.5-R-25	4200	44	4400	32-90	37-110	140	195	213	120	157	90	74	2.5	2.5	304
5									344							
6	RP-24.0-R-25	9000	94.2	3600	42-110			240		150		105				359
7	RP-29.0-R-30	17000	177.9	3000	60-130			290	240	180	182	125	88			393
8	RP-32.0-R-35	22000	230.2	2600	70-150	52-150	180	320	279	210	212	151	102	3	4	447
9	RP-32.0-R-40								457							
10	RP-35.0-R-40	30000	314	2400	76-160			350	318	225	250	161	116			457
11	RP-38.0-R-40	37500	392.5	2200	80-180			380		245		181				477

### NOTES:-

All dimensions in mm.

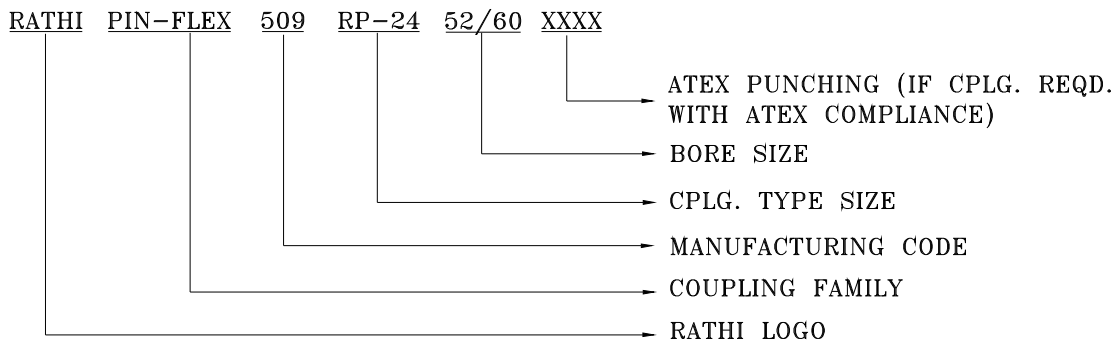
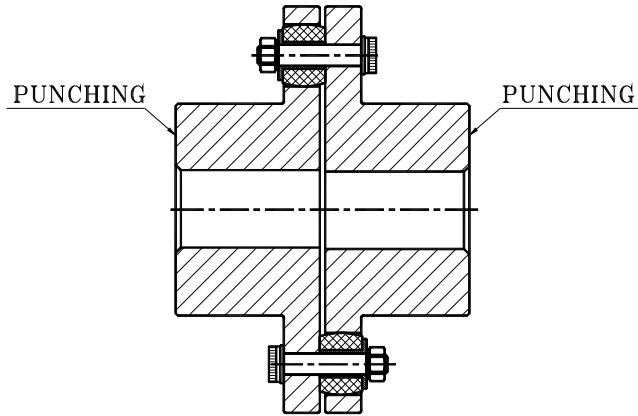
### 2.2 FLEXIBLE ELEMENTS

- Shelf life (Storage) of flexible elements up to 1 year.
- Protect Flexible elements against direct sunlight, artificial light with a high ultraviolet content, oil, grease & extreme temperature.
- Flexible element must not come in to contact with aggressive media.
- Flexible element must not be heated up to temperature given in the Table below, during installation.

SR. NO	MATERIAL	HARDNESS	TEMPERATURE RANGE
1	Polyurethane	90 ± 3 A	-30 to 110°C

**3. MARKING DETAILS**

**3.1 TYPE - RP**



**e.g. (ATEX Punching)**

RATHI PIN-FLEX 509 RP-24 52/60 II 2GD -30°C+110°C

**e.g. (Standard Punching)**

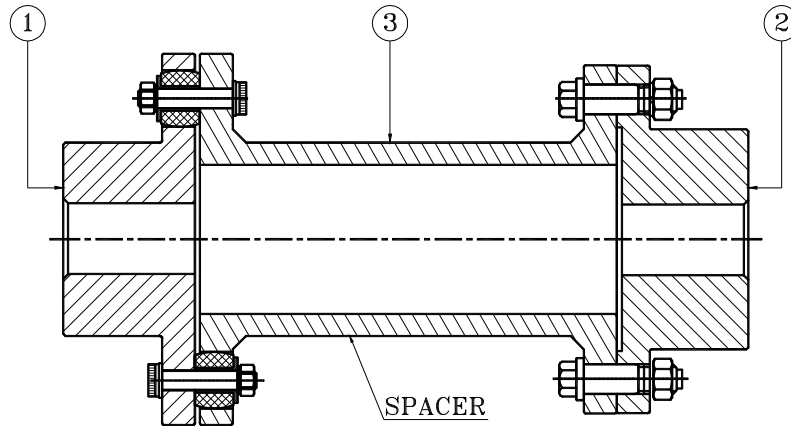
RATHI RP-24 52/60 509

# PIN-FLEX COUPLING



## 3.2 TYPE - RPS

### PUNCHING LOCATIONS



RATHI PIN-FLEX 509 RPS-24 (140) 52/60 XXXX

ATEX PUNCHING (IF CPLG. REQD. WITH ATEX COMPLIANCE)

BORE SIZE

CPLG. TYPE SIZE

MANUFACTURING CODE

COUPLING FAMILY

RATHI LOGO

**e.g. (ATEX Punching)**

1] RATHI PIN-FLEX 509 RP-24 52   II 2GD -30°C +110°C

2] RATHI R-25 60 509

3] RATHI RPS-24/140 509

**e.g. (Standard Punching)**

1] RATHI RP-24 52 509

2] RATHI R-25 60 509

3] RATHI RPS-24/140 509



## 4. INSTALLATION INSTRUCTIONS

### 4.1 BEFORE INSTALLATION



- Remove the coupling from packing & thoroughly inspect for signs of damage.
- Disassemble the coupling by removing pins & nuts. Clean all the parts carefully.
- Remove protective coatings / lubricants from bore & keyway.

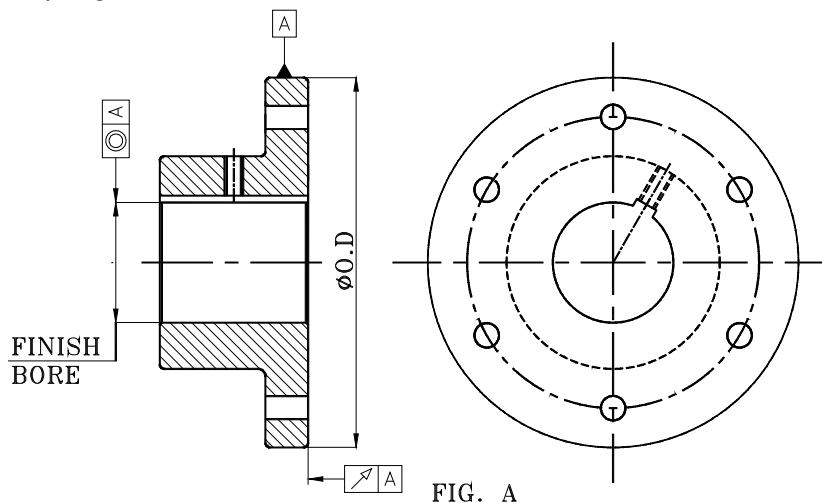
### 4.2 FINISH BORE & KEYWAY PROCEDURE



#### Danger!

The maximum finish bore value (See Page No.-5 technical data) must not be exceeded. In the event of failure to keep to these values, the hub may break and the particles dispersed by the rotation may cause serious danger.

1. Rathi couplings are supplied with pilot bore unless ordered for finish bore. They should be bored to required finish bore sizes with reference of the outside diameter (OD) of coupling.



2. Clamp on the hub dia. on lathe and true the coupling O.D. Maintain concentricity of finish bore w.r.t. coupling OD and face run-out within 0.04 mm for dia. 10-180 & 0.06 mm for dia. 180-400.

3. Unless otherwise specified, std. tolerance of H7 for Finish bore and for keyway width will be supplied as per DIN 6885/1.

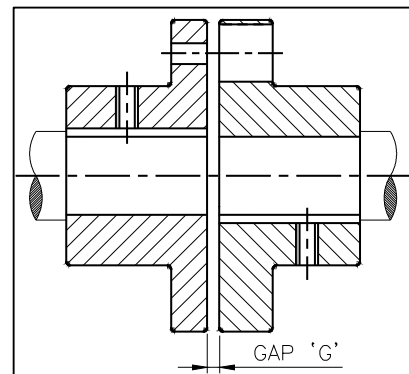
4. Use dial bore gauge or plug gauge for respective bore size. (If plug gauge is used then ensure that Go end of gauge will pass straight way through out bore length.)

5. Make chamfer of required size on both the sides of bore.

6. Mark the keyway centre line such that keyway should come between two holes in PIN-FLEX hubs (Refer FIG. A).
7. A tapped hole is provided on the hub at keyway location to hold (lock) the key in shaft-hub with a set screw of suitable size. This tapping is generally provided at midpoint of the length through bore distance. If it is not possible to use set screw at midpoint, suitable distance nearer to midpoint of the length through bore is provided.
8. Use appropriate set screw to ensure effective locking of the key. Set screw will be provided for hubs with finish bore & keyway order.

4.3 MOUNTING PROCEDURE

Mount the hubs on their respective shafts such that the shaft ends are flush with inner face of the hub & tighten the set screw over the keys. Bring both the coupling hubs (along with equipments) closer so as to maintain GAP 'G'. Values for gap, initial and maximum allowable misalignment are given in Table 'A' & 'B' on page 13.



For normal applications the shaft ends should be flush with inner face of hub; however they can protrude beyond the inner face of hub upto 0.2 mm max. per side or remain inside. if required but sufficient gap should be allowed to take care of end float of both shafts (i.e. axial misalignment)

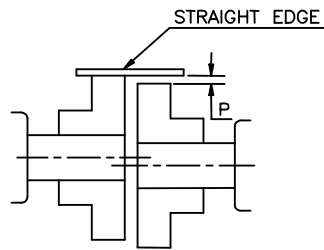
4.4 ALIGNMENT PROCEDURE

Alignment procedure is given separately for each type of alignment, for simplicity. However all 3 type of misalignments may be present at the same time.

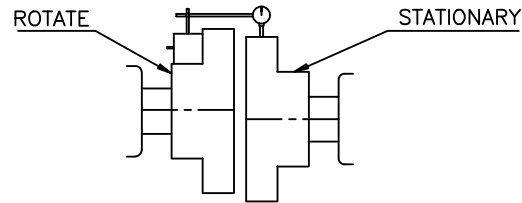
For Permissible *INITIAL (INSTALLATION)* misalignments refer table A on page 13

For Permissible *MAXIMUM (OPERATIONAL)* misalignments refer table B on page 13

I] CHECKING PARALLEL/RADIAL ALIGNMENT



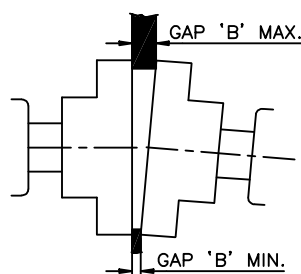
(fig 1a)



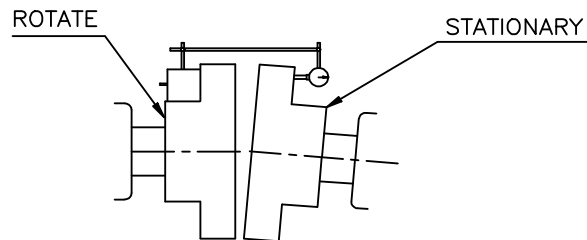
(fig 1b)

- Using straight edge (fig 1a): Align straight edge on one of hub OD , measure gap 'P' at 4 places 90° apart without rotating shafts. Gap 'P' should be less than the allowable initial parallel misalignment (P) mentioned in table 'A' on page 13.
- Using dial gauge (fig 1b): Fix dial gauge on one of hub OD & set plunger on the flange of another hub. Rotate the coupling slowly to one complete revolution by taking dial gauge reading at 4 places 90° apart. The parallel misalignment (P) is half of the Total Indicated Reading (TIR) of dial gauge which should be less than allowable parallel misalignment mentioned in table 'A' on page 13.

II] CHECKING ANGULAR ALIGNMENT



(fig 4a)



(fig 4b)

- Using filler gauge (fig 2a): Measure gap 'B' at 4 places 90° apart without rotating shafts. The difference in max. & min. gap will be the Total Indicated Reading (TIR). The angular misalignment is half the Total Indicated Reading (TIR) (Refer table 'A' on page 13 for allowable TIR values in mm).
- Using dial gauge (fig 2b): Fix the dial gauge on one of hub OD & set plunger on the face of another hub as shown. Rotate coupling slowly to one complete revolution by taking dial readings at 4 intervals 90° apart. The angular misalignment is half the Total Indicated Reading (TIR) (Refer table 'A' on page 13 for allowable TIR values in mm).

## III) CHECKING AXIAL MISALIGNMENT (End-Float)

- Deviation from standard DBSE due to axial movement of shaft is defined as axial misalignment (End float).
- The distance between two faces of coupling hubs is to be maintained as specified. The variation in this distance should not exceed the permissible initial axial misalignment given in table 'A' on page 13.
- Repeat the all above steps until the required permissible initial misalignment limits are achieved. Tighten foundation/base frame bolts & ensure the tightening of set screws over keys.

## 4.5 ASSEMBLY PROCEDURE



**IMPORTANT:-** If the spacer coupling is dynamically balanced, ensure that the match marks are in straight line & unidirectional before bolting the assembly.



**IMPORTANT:-** The necessity for shields & guards varies with individual installations. The owner or user must provide the required safety guards. Safety guards or shields are not furnished by us with the couplings.

## I) COUPLING ASSEMBLY

After ensuring that the equipments are aligned properly, follow the instructions as given below for assembly of couplings.

Insert all pins with bushes/buffers from one side of hub & fasten the nuts on the other side. Tighten the nuts evenly so as to achieve the rated tightening torque as shown in Table 'C' given below on page 14.

**Use Loctite to prevent loosening of threads, if required.**

**4.6 PERMISSIBLE INITIAL (INSTALLATION) MISALIGNMENTS**

**TABLE A**

SR NO	COUPLING SIZE	PERMISSIBLE INITIAL (INSTALLATION) MISALIGNMENT			
		Angular	Axial (±) mm	Parallel / Radial (mm) P'	GAP 'G' (mm)
		Total Indicated Reading (TIR) (mm)			
1	RP-12.5	0.14	0.13	0.15	3
2	RP-14.5	0.16	0.13	0.15	5
3	RP-16.5	0.18	0.13	0.15	5
4	RP-19.5	0.2	0.13	0.2	5
5	RP-24.0	0.25	0.2	0.2	5
6	RP-29.0	0.25	0.2	0.2	6
7	RP-32.0	0.28	0.2	0.25	6
8	RP-35.0	0.28	0.2	0.25	6
9	RP-38.0	0.3	0.25	0.25	6

**4.7 PERMISSIBLE MAXIMUM (OPERATIONAL) MISALIGNMENTS**

**TABLE B**

SR NO	COUPLING SIZE	PERMISSIBLE MAXIMUM (OPERATIONAL) MISALIGNMENT			
		Angular	Axial (±) mm	Parallel / Radial (mm) P'	GAP 'G' (mm)
		Total Indicated Reading (TIR) (mm)			
1	RP-12.5	0.56	0.5	0.6	3
2	RP-14.5	0.64	0.5	0.6	5
3	RP-16.5	0.72	0.5	0.6	5
4	RP-19.5	0.8	0.5	0.8	5
5	RP-24.0	1	0.8	0.8	5
6	RP-29.0	1	0.8	0.8	6
7	RP-32.0	1.12	0.8	1	6
8	RP-35.0	1.12	0.8	1	6
9	RP-38.0	1.2	1	1	6

**5. START-UP AND OPERATIONS**

Before starting up check the flexible elements (buffers) for correct fitment on pins and the set screws for tightness, check and if necessary, adjust the alignment and the gap dimension and check all screw connections for the specified tightening torques.



**Danger!**

Then fit the coupling guard to prevent unintentional contact  
 During operation of the coupling watch for:  
 – changes in running noise  
 – sudden shocks

**Caution!**

If any irregularities are noticed during operation, switch off the drive assembly at once. Determine the causes of the fault.  
 If the cause cannot be identified or the unit repaired with the facilities available, You are advised to contact M/s RATHI TRANSPower PVT. LTD.

**5.1 PROCEDURE BEFORE START-UP**



**Bolt tightening torques for the coupling and tightening torques for the foundation bolts of the coupled machine must be checked before startup. Enclosures (coupling protection, contact guard) must be fitted. Overload conditions during startup cannot be excluded. If the coupling breaks through overload, metal parts may fly off and cause personal injury and/or material damage.**

**5.1.1 BOLT TIGHTENING TORQUE**

**TABLE C**

SR. NO	COUPLING SIZE	BOLT SIZE	TIGHTENING TORQUE (Nm)
1	RP-12.5	M8	17
2	RP-14.5	M10	25
3	RP-16.5	M10	25
4	RP-19.5	M12	58
5	RP-24.0	M16	98
6	RP-29.0	M20	175
7	RP-32.0	M20	175
8	RP-35.0	M24	330
9	RP-38.0	M24	330



**If coupling is to be used below ground in potentially explosive areas, the coupling, which is made of steel, must be provided with a robust casing to avoid the risk of ignition from e.g. friction, impact or friction sparks.  
 The depositing of heavy metal oxides (rust) on the coupling must be avoided by the casing or other suitable precautions.**

**6. FAILURES - CAUSES AND REMEDIES****6.1 INSTRUCTIONS TO USE IN Ex HAZARDOUS AREAS****General**

The following irregularities can serve as a guide for fault tracing. Where the system is a complex one, all the other component units must be included when tracing faults.

The coupling must run with little noise and without vibration in all operating phases. Irregular behaviour must be treated as a fault requiring immediate remedy. In case of fault the drive must be stopped at once. The necessary measures for repair must be taken in accordance with the safety regulations.

**Caution!**

RATHI will not be bound by the terms of the guarantee or otherwise be responsible in cases of improper use of the coupling, modifications carried out Without RATHI's agreement or use of spare parts not supplied by RATHI.

**Danger!**

When correcting the faults and malfunctions, the coupling must always be taken out of service. Secure the drive unit to prevent it from being started up unintentionally. Attach a warning notice to the start switch.

**6.2 FAILURE MODES AND FAULT DIAGNOSIS**

<b>SR. NO.</b>	<b>FAILURE MODE</b>	<b>PROBABLE CAUSES</b>	<b>CORRECTIVE ACTIONS</b>
1	Worn out Buffers/Bushes Shaft bearing failure	Excessive misalignments.	Replace Buffers & Realign the coupling.
2	Fatigue of Buffers Overheated Buffers	Torsional vibration Excessive starts and stops High peak load	Perform torsional analysis Use larger coupling
3	Swollen or cracked Buffers	Chemical attack	Use more chemically resistant Buffers (*)
4	Distorted or deteriorated Buffers	Excessive heat	Use more heat-resistant Buffers (*)
5	Shattered Buffers	Low temperature	Use special low temperature Buffers (*)
6	Loose hubs on shaft with sheared keys.	Torsional shock overload	Find & eliminate causes of overload.
7	Severe hub corrosion	Chemical attack	Coat hub with anticorrosive coating (*)

**(\*) - Consult M/s RATHI if required**



## 7. MAINTENANCE AND REPAIR

Under normal operating conditions, the PIN-Flex coupling does not require maintenance. General maintenance of coupling consists of following check points during normal machinery maintenance schedules.



- Ensure that Axial, Angular & Parallel misalignments are still within the acceptable limits and no major movements have occurred. It is recommended that a record of misalignment readings is maintained.
- For spacer couplings, ensure that all bolts are tightened correctly.
- Check the buffers by visual inspection for any signs of failure. It is recommended to replace the buffers if signs of wear are observed. Any deep impressions, cracks or swelling are also required to be checked.

Following operating conditions can affect the life of buffers, so we request the customer to check the following,



- Numbers of starts & stops
- Working environment (either open space or in plant)
- Load variation
- Misalignments

Suggested maintenance intervals are:-

- 6 months
- At planned machine down time intervals.

**Note :**

- Any requirement for spare parts should be made quoting the original purchaser, original purchase order number and the coupling drawing number (if available).

## 8 STORAGE

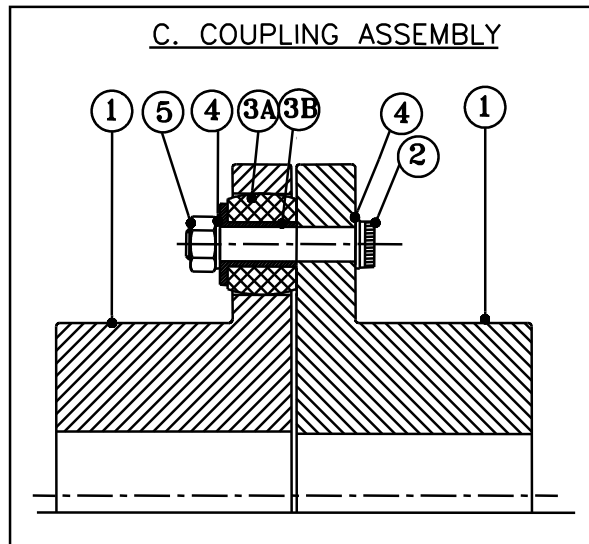
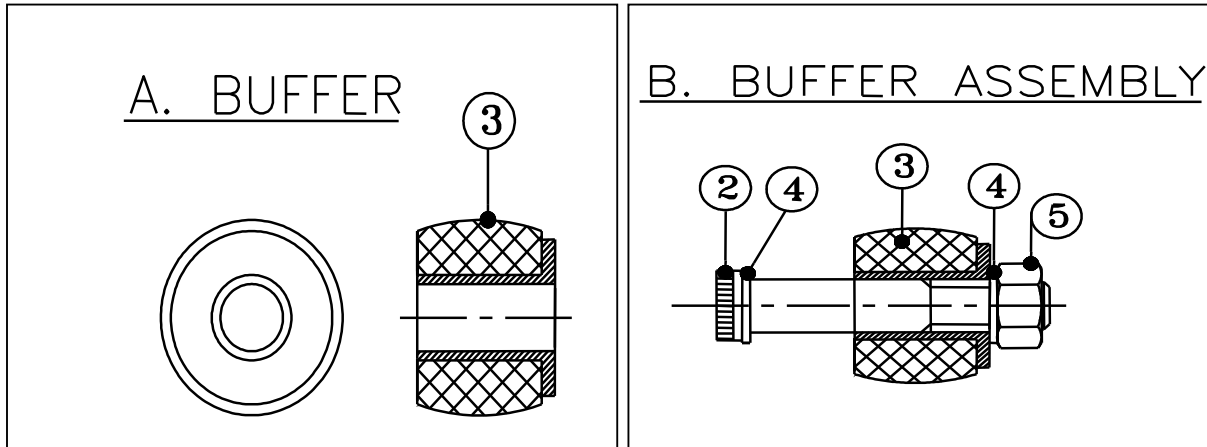
All couplings are to be stored and handled in conditions free from compression, tension or other deformation.

Attention is drawn to the need to keep the product away from heat or continual sunlight. Refer following storage conditions for spare buffers.

- Storage shall be away from direct sunlight.
- Storage temperature shall be in the range of 20°C to 30°C.
- Storage environment shall be free of extraordinary gases, vapours & chemical contacts, including oils, grease etc.

**9. COUPLING SPARE COMPONENTS**

*COUPLING COMPONENTS*



S.N.	TYPE	PART NO	COUPLING PARTS	QTY
A	BUFFER	3	BUSH WITH SLEEVE	1 No.
B	BUFFER ASSEMBLY	2	SOCKET HEAD CAP SCREW	1 No.
		4	WASHER	2 Nos.
		5	NYLOC NUT	1 No.
		A	BUFFER	1 No.
C	COUPLING ASSEMBLY	1	HUB	2 Nos.
		B	BUFFER ASSEMBLY	*1 Coupling Set

\* Quantity per coupling set is as per general assembly (GA) drawing.