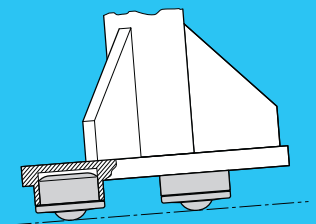
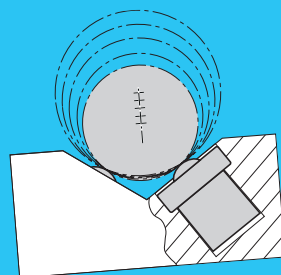
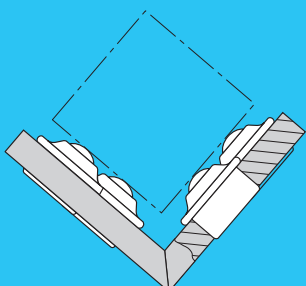
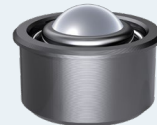
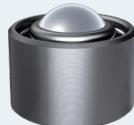
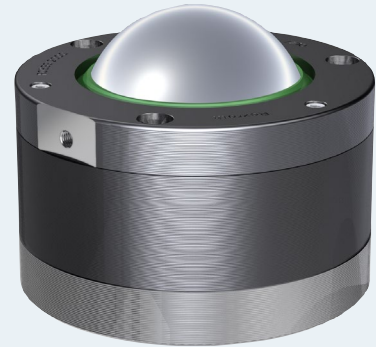
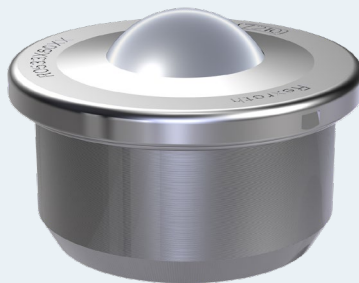


# Ball transfer units



# Changes/amendments at a glance

- Notes on: Intended use, general safety instructions, directives and standards; page 4
- Revised product description with selection guide; page 6/7
- Revision of the technical data
- Installation suggestions, notes for mounting, installation examples added;
- New Ball Transfer Unit versions with the following types:
  - R0530 131 10 and R0530 231 10 with bottom hole Ø 30
  - R0530: Size 15 to 45 with bottom hole
  - R0532 125 10: Helical spring with amended spring characteristic curve
  - R0533 .61 10: with bottom hole and lube port;
  - R0533: Size 76 and 90 galvanized; with bottom hole and lube port
  - R0533 111 10: galvanized
  - R0534 223 10: with bottom hole
  - R0535 737 00: with 7 bottom holes, felt seal up to 150 °C
- New short product names; page 34

## Product description with selection guide

**Product description / selection guide**

Ball Transfer Units make light work of shifting, raising and lowering unit loads. They have proven extremely valuable as integral parts of conveyor systems, feed devices, and machining and packaging equipment.

**Applications**

- General-purpose machines
- Feed tables for sheet metal working machines
- Devices for press brakes
- Feed devices for machining centers
- Cutting machine tables and major frame supporting tables
- Assembly aids in the manufacture of large engines and motors
- Construction of special-purpose machines
- Aerospace industry
- Storage and store-processing industries
- Not suitable for use under water

**Conveyor systems**

- Ball transfer tables, turntables and switches for sorting and distribution systems
- Conveyor sections of continuous conveyors
- Storage sorting systems at airports
- Transport of steel tubes and pipes
- Lifting platforms

**Further highlights**

- Suitable for all standard applications and for many special situations
- Easy mounting and extraction
- Conveyor speed up to 2 m/sec in all types
- Consistently high quality
- High transmission effect
- Smooth running
- Possible tilting and full load-bearing capability in any mounting orientation, even top-down

Ball Transfer Unit	R0530 / Page 12	R0531 / Page 13	R0532 / Page 14	R0533 / Page 15	R0534 / Page 16	R0535 / Page 17	R0536 / Page 18	R0537 / Page 19	R0538 / Page 20	R0539 / Page 21
Dimensions, characteristics	...	...	...	...	...	...	...	...	...	...
Frequency of use	...	...	...	...	...	...	...	...	...	...
Load capacity	...	...	...	...	...	...	...	...	...	...
Free movement	...	...	...	...	...	...	...	...	...	...
Free rotation	...	...	...	...	...	...	...	...	...	...
Free tilt	...	...	...	...	...	...	...	...	...	...
Surface finish	...	...	...	...	...	...	...	...	...	...
Material	...	...	...	...	...	...	...	...	...	...
Temperature range	...	...	...	...	...	...	...	...	...	...

## Installation suggestions

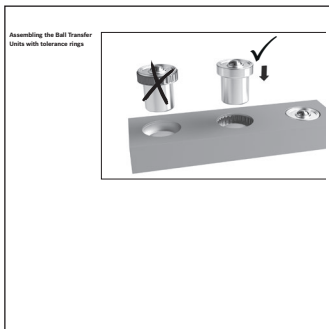
**Installation suggestions for secure fit**

**Installation dimensions D<sub>g</sub> (mm)**

Size	2 mm sheet steel	16 mm wood	5 mm aluminum
15	23.95 <sup>+0.05</sup>	23.90 <sup>+0.05</sup>	23.90 <sup>+0.05</sup>
22	35.90 <sup>+0.05</sup>	35.85 <sup>+0.07</sup>	35.85 <sup>+0.07</sup>
30	44.85 <sup>+0.05</sup>	44.80 <sup>+0.10</sup>	44.80 <sup>+0.10</sup>
45	61.83 <sup>+0.07</sup>	61.80 <sup>+0.10</sup>	61.80 <sup>+0.10</sup>

Part number	Tolerance ring	D <sub>2</sub> <sup>+0.2</sup>	D <sub>g</sub>	c <sup>+0.2</sup>	D <sub>g</sub> <sup>+0.2</sup>
R0810 024 03 <sup>1)</sup>		24.2	25.70 <sup>+0.20</sup>	7.1	24.1
R0810 036 05 <sup>1)</sup>		36.2	37.70 <sup>+0.20</sup>	12.1	36.1
R0810 045 01 <sup>1)</sup>		45.2	46.70 <sup>+0.20</sup>	12.1	45.1
R0810 045 51 <sup>2)</sup>					
R0810 062 03 <sup>1)</sup>		62.3	64.10 <sup>+0.30</sup>	15.1	62.2

## Notes for mounting



## Installation examples

**Ball Transfer Unit installation example with arrangement and determination of the Ball Transfer Unit**

**Scenario A**  
Arrangement as an equilateral triangle.

The square item to be transported (375 x 375 mm) has a central center of gravity and is supported by 5 Ball Transfer Units.

The distance of the Ball Transfer Units should not be larger than 150 mm (375 / 2.5 = 150 mm).

The mass<sup>1)</sup> (3500 N) is distributed over three Ball Transfer Units and is 1166.7 N per Ball Transfer Unit (3500 N / 3 = 1166.7 N).

Selected Ball Transfer Unit, e.g.: R0530 122 10.

## Short product names

**Identification system for short product names**

Short product name	Example:	KUF	B	15
Type	Ball Transfer Unit	=	KU	
	Ball Transfer Unit, spring-loaded	=	KUF	
	Ball Transfer Unit with solid steel housing	=	KUM	
	Ball Transfer Unit without housing	=	KUO	
	Ball Transfer Unit with reinforced steel housing	=	KUS	
	Ball Transfer Unit with clip as fastening element	=	KUK	
	Ball Transfer Unit with plastic housing (lightweight)	=	KUL	
Version	Bright metal, balls made from antifriction bearing steel	=	A	

# Contents

<b>General product information</b>	Notes		4
	Product description / selection guide		6
	Technical data		8
<b>Dimensions, Load capacities</b>	Ball Transfer Units with sheet steel housing R0530 1.., R0530 2.., R0530 6..		12
	Ball Transfer Units with plastic load balls R0531 1.., R0531 2.., R0531 6..		14
	Ball Transfer Units with reinforced sheet steel housing R0535 ...		16
	Ball Transfer Units with clip as fastening element R0536 ...		18
	Ball Transfer Unit with solid steel housing – with low collar R0533 ...		20
	Ball Transfer Unit with solid steel housing – with high collar R0533 ...		21
	Ball Transfer Unit with solid steel housing – without collar R0533 ...		22
	Ball Transfer Unit without housing R0534 ...		23
	Ball Transfer Units with solid steel housing R0533 .6.		24
	Ball Transfer Units with solid steel housing R0533 ..5, with polymer wiper seal		25
	Ball Transfer Unit with solid steel housing R0533 ...		26
	Ball Transfer Unit with solid steel housing R0533 ...,with polymer wiper seal		27
	Ball Transfer Units, spring-loaded R0532 1.., R0532 2..		28
	Ball Transfer Unit with plastic housing R0530		30
	<b>Installation examples</b>	Ball Transfer Unit installation examples	
<b>Short product names</b>	Identification system for short product names		34

## Notes

### Intended use

The product may be used in accordance with the technical documentation (product catalog) for the following purposes:

- ▶ For moving loads, in bottom installation (load ball to the top) or top installation (load ball to the bottom) or side installation.
- ▶ The type-specific load data from the relevant catalogs and the supplementary technical calculations provided by our company must be considered in all cases.
- ▶ The product is intended exclusively for professional use and not for private use.
- ▶ Use for the intended purpose also includes the requirement that you must have read and understood the product documentation completely, in particular these “Safety instructions”.

### Misuse

Use of the product in any other way than as described under “Intended Use” is considered to be misuse and is therefore not permitted. If unsuitable products are installed or used in safety-relevant applications, this may lead to uncontrolled operating statuses in the application which can cause personal injury and/or damage to property.

The product may only be used in safety-relevant applications if this use has been expressly specified and permitted in the product documentation.

Bosch Rexroth AG will not accept any liability for injury or damage caused by misuse of the product. The risks associated with any misuse of the product shall be borne by the user alone.

Misuse of the product includes:

- the transport of persons

### General safety instructions

- ▶ The safety rules and regulations of the country in which the product is used must be complied with.
- ▶ All current and applicable accident prevention and environmental regulations must be adhered to.
- ▶ The product may only be used when it is in technically perfect condition.
- ▶ The technical data and environmental conditions stated in the product documentation must be complied with.
- ▶ The product must not be put into service until it has been verified that the final product (for example a machine or system) into which the product has been installed complies with the country-specific requirements, safety regulations and standards for the application.
- ▶ Rexroth Ball Transfer Units may not be used in zones with potentially explosive atmospheres as defined in the ATEX directive 94/9/EC.
- ▶ Rexroth Ball Transfer Units must never be altered or modified.
- ▶ The product must never be disassembled.
- ▶ Special safety requirements for specific sectors (e.g. cranes, theaters, foodstuffs) as provided for in laws, directives and standards must be complied with.

**Directives and standards:**

Rexroth Ball Transfer Units are suitable for dynamic and static applications. All users must comply with a series of standards and guidelines. The standards can vary significantly worldwide. It is therefore essential to understand the legislation and standards that apply in each particular region.

**EN ISO 12100**

This standard is entitled Safety of machinery – General principles for design – Risk assessment and risk reduction. It gives a general overview and contains a guide to the major developments governing machines and their intended use.

**Directive 2006/42/EC**

The European Machinery Directive describes the basic safety and health requirements for the design and manufacture of machinery. The manufacturer of a machine or his authorized representative has a duty to ensure that a risk assessment has been performed in order to determine the health and safety requirements which have to be fulfilled for that machine. The machine must be designed and built with the results of the risk assessment in mind.

**Directive 2001/95/EC**

This directive covers general safety requirements for any product placed on the market and intended for consumers, or likely to be used by consumers under reasonably foreseeable conditions, including products that are made available to consumers in the context of service provision for use by them.

**Directive 1999/34/EC**

This directive concerns liability for defective products and applies to industrially manufactured movables, irrespective of whether they have been incorporated into another movable or into an immovable or not.

**ORDINANCE (EC)  
no. 1907/2006 (REACH)**

This regulation relates to restrictions on the marketing and use of certain dangerous substances and preparations. "Substances" means chemical elements and their compounds as they occur in the natural state or as produced by industry. "Preparations" are mixtures, compounds or solutions consisting of two or more substances.

## Product description / selection guide





Ball Transfer Units make light work of shifting, rotating and directing unit loads. They have proven extremely valuable as integral parts of conveyor systems, feed devices, and machining and packaging equipment.

### Applications

- ▶ General-purpose machines
- ▶ Feed tables for sheet-metal working machines
- ▶ Fixtures for press brakes
- ▶ Feed devices for machining centers
- ▶ Drilling machine tables and motor-driven supporting tables
- ▶ Assembly aids in the manufacture of large engines and motors
- ▶ Construction of special-purpose machines
- ▶ Aerospace industry
- ▶ Beverage and stone-processing industries
- ▶ Not suited for use under water

### Conveyor systems

- ▶ Ball transfer tables, turntables and switches for sorting and distribution systems
- ▶ Crossover sections of continuous conveyors
- ▶ Baggage sorting systems at airports
- ▶ Transport of steel tubes and pipes
- ▶ Lifting platforms

	R0530 / Page 12	R0531 / Page 14	R0535 / Page 16	R0536 / Page 18	
<b>Ball Transfer Unit</b>					
<b>Description, characteristics</b>	<b>With sheet steel housing.</b> Smallest Ball Transfer Unit. For general applications.	<b>With plastic load ball.</b> Suitable particularly for transporting sensitive materials such as glass, polished aluminum, brass and steel sheets.	<b>With sheet steel housing Reinforced housing and cover.</b> For heavy impact loads.	<b>With fastening element.</b> Easily mountable and extractable from the load side. Fixing is by means of spring clips, which permit generous tolerances in the mounting hole. Reinforced cover to withstand heavy impact loads.	

<b>Frequency of use</b>	+++	++	+++	+++	
<b>Low costs</b>	+++	+++	++	++	
<b>Easy installation</b>	++	++	++	+++	
<b>Very compact design</b>	+++	+++	+	+	
<b>Very high load-bearing capability</b>	++	-	+++	+++	
<b>Bright metal version</b>	--	--	--	--	
<b>Corrosion-resistant version</b>	+ R0530 1.. ++ R0530 2..	+ R0531 1.. ++ R0531 2..	+ R0535 1.. ++ R0535 2..	+ R0536 1.. ++ R0536 2..	
<b>Stainless version</b>	+++ R0530 6..	+++ R0531 6..	--	--	
<b>Suitable for coarse dirt</b>	+	-	+	+	
<b>Designed for vacuum<sup>1)2)</sup></b>	+	+	+	+	

<sup>1)</sup> In "dry version" only (all part oil- and grease-free), without felt seal (R053x xxx 60)

<sup>2)</sup> In "dry version" only (all part oil- and grease-free), with felt seal (R053x xxx 90)

+++ Very good

++ Good




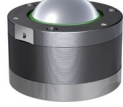


+ Fair

- Adequate, not recommended

-- Version not available

**Further highlights**

- ▶ Types for all standard applications and for many special solutions
- ▶ Easy mounting and extraction
- ▶ Conveying speed up to 2 m/sec in all types
- ▶ Consistently high quality
- ▶ High rationalization effect
- ▶ Smooth running
- ▶ Precise rolling and full load-bearing capability in any mounting orientation, even top-down

	R0533 / Page 20-22	R0534 / Page 23	R0533 / Page 24	R0533 / Page 25-27	R0532 / Page 28	R0530 / Page 30
						
	<b>With solid steel housing.</b> Without, with low or with high collar. Without felt seal. Very smooth movement.	<b>Without housing.</b> Low space requirement. Simple mounting. Mounting via holes in the collar.	<b>With solid steel housing.</b> For high loads. Alternatively with polymer wiper seal.	<b>With solid steel housing and cover.</b> For very high loads.	<b>Spring-loaded.</b> Ball Transfer Units are supported on springs and mounted under pre-load in a housing. Ball Transfer Unit recedes into its housing under high loads.	<b>With plastic housing.</b> For special applications (e.g. for lightweight ball transfer tables).
	+++	++	++	+	++	+
	+++	+++	++	+	++	++
	++	+++	++	+++	++	++
	+++	--	--	--	--	+
	++	+	+++	+++	+	+
	++	--	++	++	--	+
	--	+ R0534 1.. ++ R0534 2..	+ R0533 1.. ++ R0533 2..	+ R0533 1.. --	+ R0532 1.. ++ R0532 2..	--
	--	--	--	--	--	--
	+	+	+ R0533 .6. +++ R0533 .05	+++	+	+
	+++	+	-	-	-	-

## Technical data

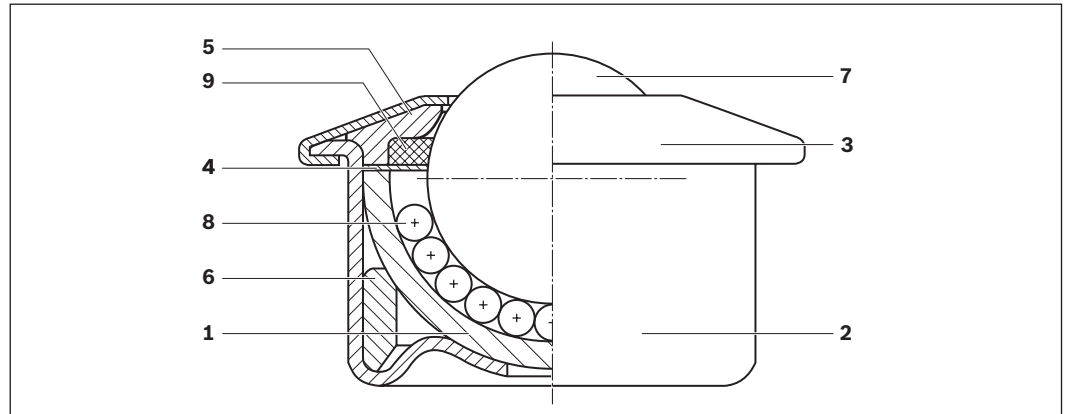
### Structural design of the Ball Transfer Units

A hardened ball cup serves as a raceway for a multitude of small supporting balls.

The supporting balls roll against the ball cup when the load ball turns.

Rexroth Ball Transfer Units are designed so that precise rolling and full load-bearing capability are ensured in any mounting orientation. Ball Transfer Units require little maintenance, and almost every type is protected against dirt by an oil-soaked felt seal.

- 1 Ball cup
- 2 Housing
- 3 Cover
- 4 Ball retaining ring
- 5 Supporting ring
- 6 Reinforcing ring
- 7 Load ball
- 8 Supporting balls
- 9 Felt seal



### Corrosion protection

Corrosion, caused by moisture or chemical attack, can lead to impaired functioning or even failure of the Ball Transfer Units. Coated (galvanized + chromated) surfaces similar to DIN 50979 specifications and/or higher-grade materials offer enhanced corrosion protection.

#### Cover and housing galvanized, R053. 1..

Offer simple protection against corrosion. In this type, the supporting balls and load balls are made from standard antifriction bearing steel and are protected from corrosive attack by the lubricant.

#### All parts galvanized, balls made from corrosion-resistant steel, R053. 2..

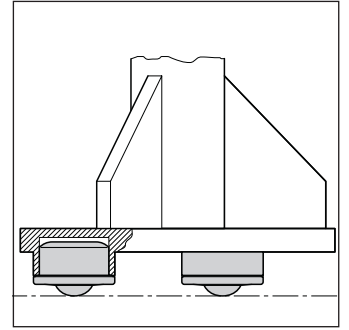
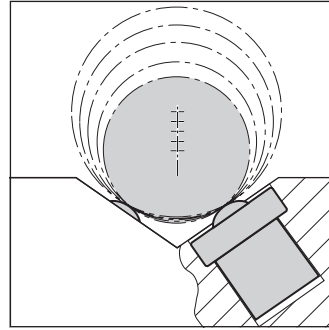
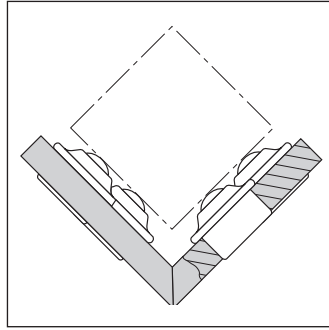
Consistent coating of all internals and the use of corrosion-resistant steels for the antifriction bearing elements, similar to ISO 683-17 specifications, ensures comprehensive corrosion protection such as specified in ASTM B117-03.

#### Complete version made from corrosion-resistant steel (in accordance with EN 10 088), R053. 6..

This version should be used for abrasive conveyed articles and/or where there is exposure to aggressive ambient conditions, especially to chemicals.

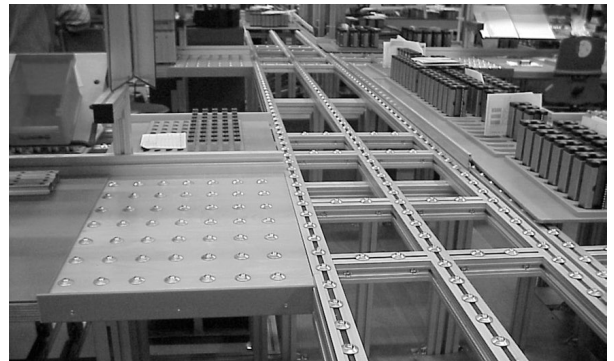


**Mounting possibilities**



**Application examples**

► E.g. Ball Transfer Units used for assembling ball runner blocks, assembly lines, packaging workstations.



## Technical data

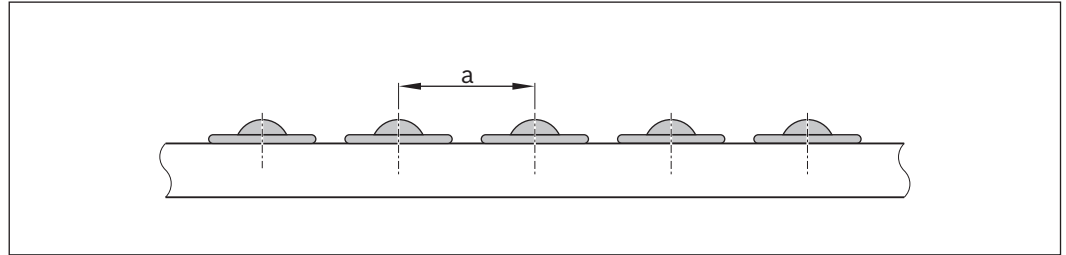
### Arrangement of the Ball Transfer Units

How the Ball Transfer Units should be arranged depends on the undersurface of the conveyed article. For articles with a uniform, smooth undersurface, such as boxes and cases, the distance between the Ball Transfer Units is calculated simply by dividing the smallest edge length by 2.5.

#### Example:

Undersurface of the conveyed article = 500 x 1000 mm

$$\text{Distance between Ball Transfer Units } a = \frac{500 \text{ mm}}{2.5} = 200 \text{ mm}$$



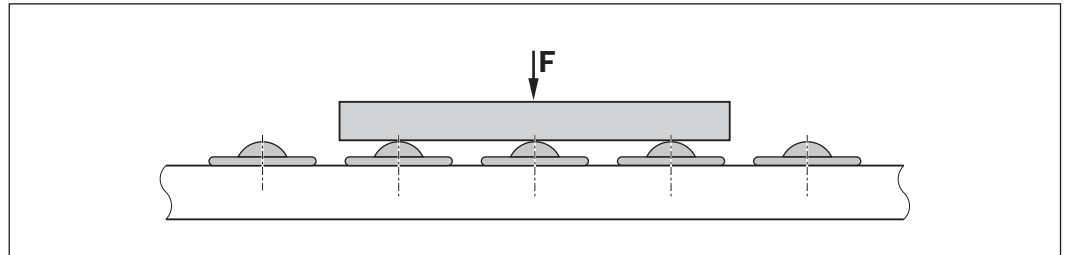
### Determining the load for Ball Transfer Units

To determine the load for a Ball Transfer Unit, the weight of the conveyed article is divided by 3. If the load ball height tolerances are well-correlated, it is possible, depending on the nature of the conveyed article, to also perform the calculation based on the number of load-bearing Ball Transfer Units.

#### Example:

Mass = 3000 N

$$\text{Ball Transfer Unit load } F = \frac{3000 \text{ N}}{3} = 1000 \text{ N}$$



**Please refer to page 32 for installation examples**

### Spring-loaded Ball Transfer Units

The figures in the column headed "Pre-tensioning force" are most important when choosing the size for these types. The weight of the conveyed article is divided in this case by the number of load-bearing Ball Transfer Units.

### Conveying speed

$$V_{\max} = 2 \text{ m/s}$$

### Load capacity

The stated load capacities apply to all mounting orientations and relate to  $10^6$  rotations of the load ball.

In case of prolonged periods of use at speeds above 1 m/sec, an increase in temperature and reduction in service life must be expected as a function of the load, especially for sizes 60 to 120.

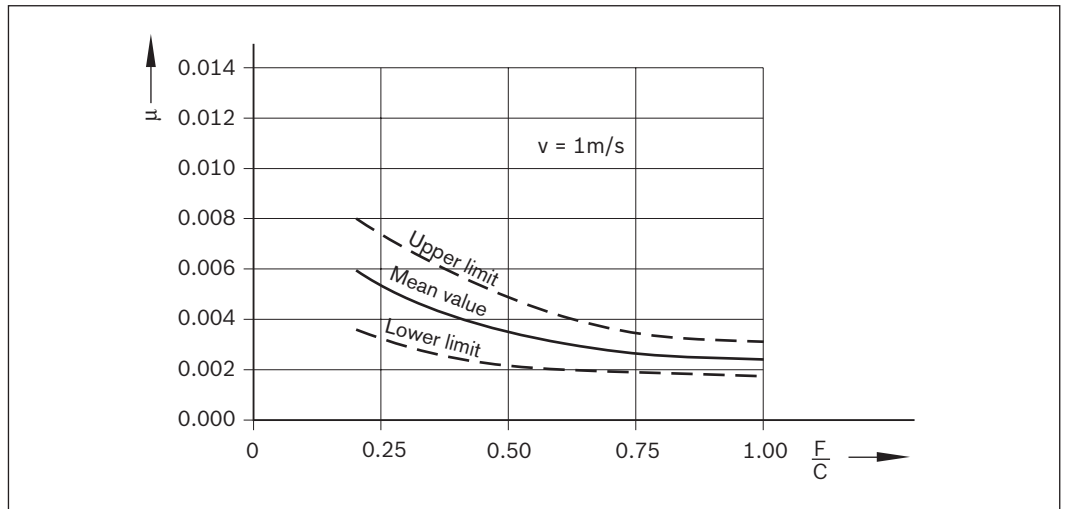
**Calculation of the service life**

$$L = \left( \frac{C}{F} \cdot f_t \right)^3 \cdot 10^6$$

- L = service life (rotations)
- C = dynamic load capacity (N)
- C<sub>0</sub> = static load capacity (N)
- F = load (N)
- f<sub>t</sub> = temperature factor (-)

**Friction coefficients**

The diagram shows the friction coefficients of Ball Transfer Units as a function of load and speed. These guideline values apply to any mounting orientation for rolling contact on a hardened steel plate.



**Operating temperature**

**Ball Transfer Unit with steel load ball**

-30 °C to 100 °C.

At temperatures above 100 °C, only bright metal load balls without a felt seal should be used. Make allowance for reduction in load capacity. Use high-temperature lubricant! Follow the manufacturer's instructions! The existing lubricant oil may have to be washed out.

**Ball Transfer Unit with plastic load ball**

Up to 30 °C.

At temperatures above 30 °C, make allowance for reduction in load capacity.

**Temperature factor**

Steel load ball		Plastic load ball	
Temperature (°C)	Temperature factor f <sub>t</sub>	Temperature (°C)	Temperature factor f <sub>t</sub>
125	0.9	40	0.9
150	0.8	50	0.8
175	0.7	60	0.7
200	0.5	80	0.5

The load capacity must be multiplied by the temperature factor.

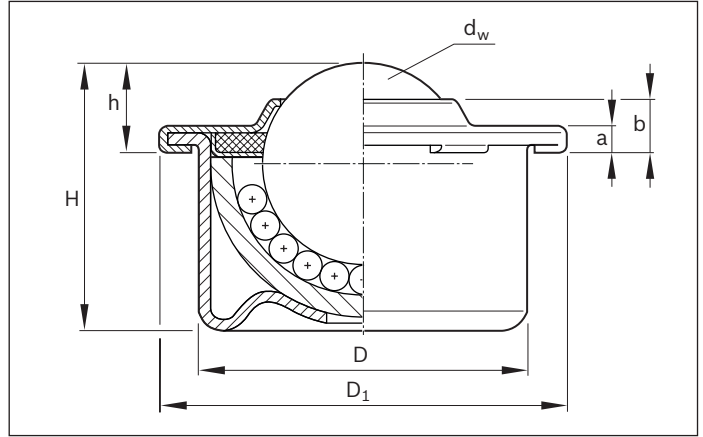
**Lubrication**

The lubrication must be adapted to the conveyed articles and to the ambient conditions. The lubricant (oil) can be introduced via the load ball.

For example:

- Morlina S2 B 100 from Shell
- Renolin DTA 100 from Fuchs
- Acer 100 from Agip

# Ball Transfer Units with sheet steel housing R0530 1.., R0530 2.., R0530 6..



Version With sheet steel housing. Smallest Ball Transfer Unit. For general applications.	Size	Part number	Load capacities (N)		Dimensions (mm)							Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D	D <sub>1</sub>	h	H	a	b	
<b>R0530 1..</b> KU-B.. - MFG Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505. With felt seal	8	R0530 108 10 <sup>1)</sup>	130	250	7.938	12.6 ±0.055	17.0	4.8 ±0.15	11.2	1.9	3.2	0.007
	12	R0530 112 10 <sup>1)</sup>	250	500	12.000	18.0 ±0.055	23.3	7.4 ±0.15	15.4	2.1	4.4	0.018
	15	R0530 115 10 <sup>1)</sup>	500	1 000	15.875	24.0 ±0.065	31.0	9.5 ±0.20	21.5	2.5	6.1	0.038
		R0530 116 10 <sup>1) 2)</sup>										
	22	R0530 122 10	1 300	2 500	22.225	36.0 ±0.080	45.0	9.8 ±0.20	29.5	2.9	5.7	0.132
		R0530 123 10 <sup>2)</sup>										
	30	R0530 130 10	2 500	5 000	30.162	45.0 ±0.080	55.0	13.8 ±0.30	37.5	3.7	7.9	0.265
		R0530 131 10 <sup>2)</sup>										
45	R0530 145 10	6 000	12 000	44.450	62.0 ±0.095	75.0	19.0 ±0.40	53.7	4.2	10.5	0.720	
	R0530 146 10 <sup>2)</sup>											
<b>R0530 2..</b> KU-C.. - MFG All parts galvanized. Balls made from corrosion-resistant steel 1.3541 / 1.4034 With felt seal	8	R0530 208 10 <sup>1)</sup>	100	200	7.938	12.6 ±0.055	17.0	4.8 ±0.15	11.2	1.9	3.2	0.007
	12	R0530 212 10 <sup>1)</sup>	180	350	12.000	18.0 ±0.055	23.3	7.4 ±0.15	15.4	2.1	4.4	0.018
	15	R0530 215 10 <sup>1)</sup>	370	700	15.875	24.0 ±0.065	31.0	9.5 ±0.20	21.5	2.5	6.1	0.038
		R0530 216 10 <sup>1) 2)</sup>										
	22	R0530 222 10	970	1 800	22.225	36.0 ±0.080	45.0	9.8 ±0.20	29.5	2.9	5.7	0.132
		R0530 223 10 <sup>2)</sup>										
	30	R0530 230 10	1 900	3 000	30.162	45.0 ±0.080	55.0	13.8 ±0.30	37.5	3.7	7.9	0.265
		R0530 231 10 <sup>2)</sup>										
45	R0530 245 10	4 500	7 000	44.450	62.0 ±0.095	75.0	19.0 ±0.40	53.7	4.2	10.5	0.720	
	R0530 246 10 <sup>2)</sup>											
<b>R0530 6..</b> KU-N.. - MFG All parts made from corrosion-resistant steel. Balls made from 1.3541 / 1.4034. With felt seal	8	R0530 608 00 <sup>1)</sup>	100	200	7.938	12.6 ±0.055	17.0	4.8 ±0.15	11.2	1.9	3.2	0.007
	12	R0530 612 00 <sup>1)</sup>	180	350	12.000	18.0 ±0.055	23.3	7.4 ±0.15	15.4	2.1	4.4	0.018
	15	R0530 615 00 <sup>1) 3)</sup>	370	700	15.875	24.0 ±0.065	31.0	9.5 ±0.20	21.5	2.5	6.1	0.038
	22	R0530 622 00 <sup>3)</sup>	970	1 800	22.225	36.0 ±0.080	45.0	9.8 ±0.20	29.5	2.9	5.7	0.132
	30	R0530 630 00 <sup>3)</sup>	1 900	3 000	30.162	45.0 ±0.80	55.0	13.8 ±0.30	37.5	3.7	7.9	0.265

<sup>1)</sup> Without felt seal

<sup>2)</sup> Ball Transfer Units with bottom hole

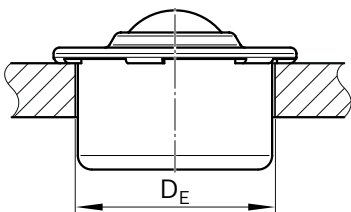
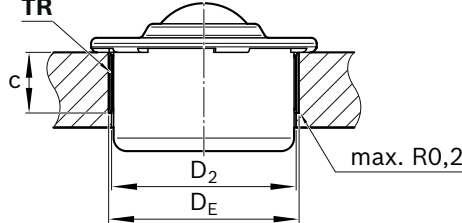
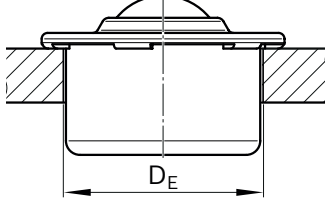
<sup>3)</sup> Ball Transfer Unit with bottom hole on request

### Explanation of short product name

(Example: **R0530 130 10 KU-B30-MFG**)

KU	B	30	MFG
Ball Transfer Unit	Cover and housing galvanized, balls made from antifriction bearing steel	Size	With felt seal, lubricated

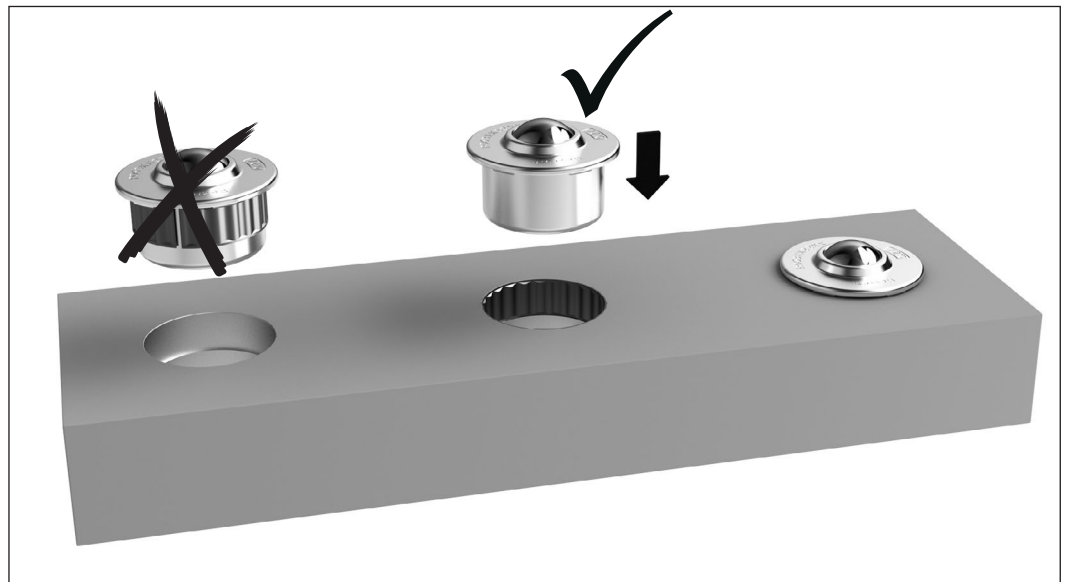
**Installation suggestions for secure fit**

Size	Installation dimensions $D_E$ (mm)		with tolerance ring (TR)	Sticking in <sup>3)</sup>			
	Press fit						
							
	$D_E$ 2 mm sheet steel 5 mm aluminum	16 mm wood	Part numbers				
			Tolerance ring	$D_2^{+0.2}$	$D_E$	$c^{+0.2}$	$D_E^{+0.2}$
<b>8</b>	12.57 <sup>+0.03</sup>	12.50 <sup>+0.05</sup>	R0810 012 52 <sup>2)</sup>	12.8	13.87 <sup>+0.15</sup>	6.1	12.7
<b>12</b>	17.97 <sup>+0.03</sup>	17.90 <sup>+0.05</sup>	R0810 018 01 <sup>1)</sup>	18.2	19.70 <sup>+0.20</sup>	6.1	18.1
<b>15</b>	23.95 <sup>+0.05</sup>	23.90 <sup>+0.05</sup>	R0810 024 03 <sup>1)</sup>	24.2	25.70 <sup>+0.20</sup>	7.1	24.1
<b>22</b>	35.90 <sup>+0.05</sup>	35.85 <sup>+0.07</sup>	R0810 036 05 <sup>1)</sup>	36.2	37.70 <sup>+0.20</sup>	12.1	36.1
<b>30</b>	44.85 <sup>+0.05</sup>	44.80 <sup>+0.10</sup>	R0810 045 01 <sup>1)</sup>	45.2	46.70 <sup>+0.20</sup>	12.1	45.1
			R0810 045 51 <sup>2)</sup>				
<b>45</b>	61.83 <sup>+0.07</sup>	61.80 <sup>+0.10</sup>	R0810 062 03 <sup>1)</sup>	62.3	64.10 <sup>+0.30</sup>	15.1	62.2

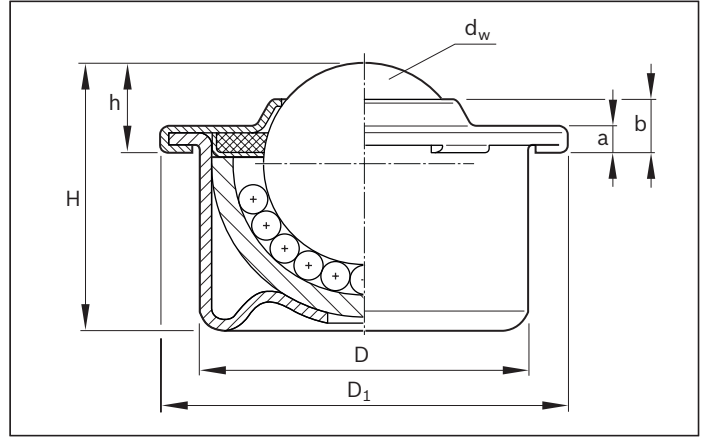
<sup>1)</sup> Made from spring hinge 1.1248 alternative 1.8159

<sup>2)</sup> Made from corrosion-resistant steel 1.4310

<sup>3)</sup> For small gap dimensions in metal, we recommend single-component acrylate adhesive. Two-component acrylate adhesives are also possible. The technical data sheets of the manufacturer must be observed.

**Assembling the Ball Transfer Units with tolerance ring**


# Ball Transfer Units with plastic load balls R0531 1.., R0531 2.., R0531 6..



Version	Size	Part number	Load capacities <sup>3)</sup> (N)		Dimensions (mm)							Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D	D <sub>1</sub>	h	H	a	b	
<b>R531 1..</b> KU-B.. - P- MFK Load balls made from PA66. Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505. With dry felt seal.	8	R0531 108 10 <sup>1)</sup>	10	10	7.938	12.6 ±0.055	17.0	4.8 ±0.15	11.2	1.9	3.2	0.005
	12	R0531 112 10 <sup>1)</sup>	35	35	12.000	18.0 ±0.055	23.3	7.4 ±0.15	15.4	2.1	4.4	0.012
	15	R0531 115 10 <sup>1) 2)</sup>	70	70	15.875	24.0 ±0.065	31.0	9.5 ±0.20	21.5	2.5	6.1	0.024
	22	R0531 122 10 <sup>2)</sup>	100	100	22.000	36.0 ±0.080	45.0	9.6 ±0.20	29.3	2.9	5.7	0.093
	30	R0531 130 10 <sup>2)</sup>	150	150	29.900	45.0 ±0.080	55.0	13.6 ±0.30	37.3	3.7	7.9	0.168
<b>R531 2..</b> KU-C.. - P- MFK Load balls made from PA66. All parts galvanized. Balls made from corrosion-resistant steel 1.3541 / 1.4034. With dry felt seal.	8	R0531 208 10 <sup>1)</sup>	10	10	7.938	12.6 ±0.055	17.0	4.8 ±0.15	11.2	1.9	3.2	0.005
	12	R0531 212 10 <sup>1)</sup>	35	35	12.000	18.0 ±0.055	23.3	7.4 ±0.15	15.4	2.1	4.4	0.012
	15	R0531 215 10 <sup>1) 2)</sup>	70	70	15.875	24.0 ±0.065	31.0	9.5 ±0.20	21.5	2.5	6.1	0.024
	22	R0531 222 10 <sup>2)</sup>	100	100	22.000	36.0 ±0.080	45.0	9.6 ±0.20	29.3	2.9	5.7	0.093
	30	R0531 230 10 <sup>2)</sup>	150	150	29.900	45.0 ±0.080	55.0	13.6 ±0.30	37.3	3.7	7.9	0.168
<b>R531 6..</b> KU-C.. - P- MFK Load balls made from PA66. All parts made from corrosion-resistant steel. Balls made from corrosion-resistant steel 1.3541 / 1.4034. With dry felt seal.	8	R0531 608 00 <sup>1)</sup>	10	10	7.938	12.6 ±0.055	17.0	4.8 ±0.15	11.2	1.9	3.2	0.005
	12	R0531 612 00 <sup>1)</sup>	35	35	12.000	18.0 ±0.055	23.3	7.4 ±0.15	15.4	2.1	4.4	0.012
	15	R0531 615 00 <sup>1) 2)</sup>	70	70	15.875	24.0 ±0.065	31.0	9.5 ±0.20	21.5	2.5	6.1	0.024
	22	R0531 622 00 <sup>2)</sup>	100	100	22.000	36.0 ±0.080	45.0	9.6 ±0.20	29.3	2.9	5.7	0.093
	30	R0531 630 00 <sup>2)</sup>	150	150	29.900	45.0 ±0.080	55.0	13.6 ±0.30	37.3	3.7	7.9	0.168

<sup>1)</sup> Without felt seal

<sup>2)</sup> Ball Transfer Unit with bottom hole on request

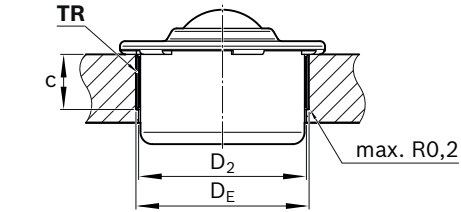
<sup>3)</sup> At 20 °C

**Explanation of short product name**

(Example: R0531 215 10 KU-C15-P-OFK)

KU	C	15	P	OFK
Ball Transfer Unit	All parts galvanized, balls made from corrosion-resistant steel	Size	Load balls made from plastic	Without felt seal, preserved

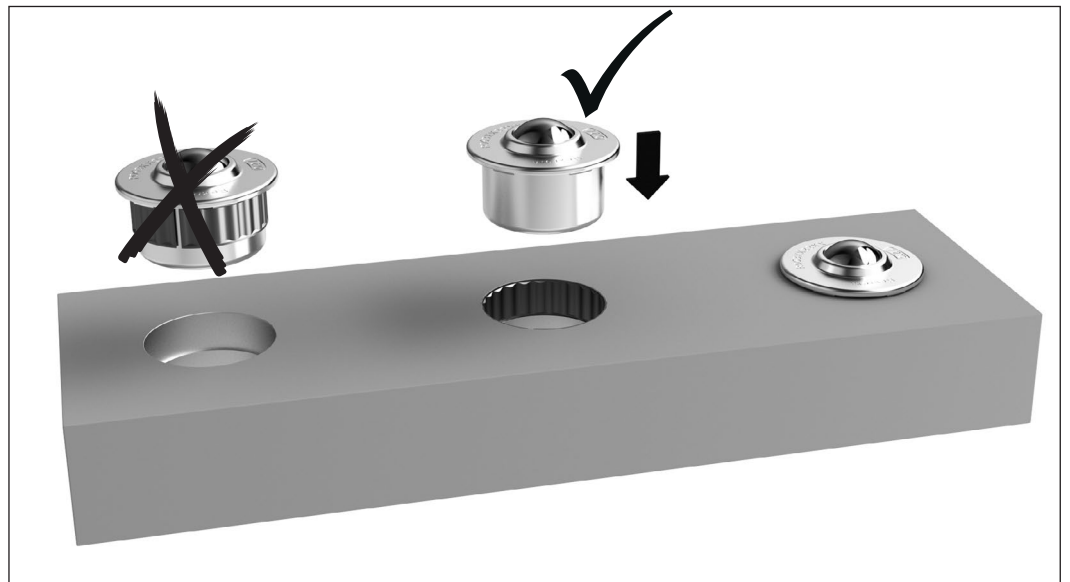
**Installation suggestions for secure fit**

Size	Installation dimensions $D_E$ (mm)		With tolerance ring (TR)				Sticking in <sup>3)</sup>
	Press fit						
	$D_E$ for $\cong$		Part number	$D_2^{+0.2}$	$D_E$	$c^{+0.2}$	$D_2^{+0.2}$
	2 mm sheet steel	16 mm wood	Tolerance ring				
	5 mm aluminum						
<b>8</b>	12.57 <sup>+0.03</sup>	12.50 <sup>+0.05</sup>	R0810 012 52 <sup>2)</sup>	12.8	13.87 <sup>+0.15</sup>	6.1	12.7
<b>12</b>	17.97 <sup>+0.03</sup>	17.90 <sup>+0.05</sup>	R0810 018 01 <sup>1)</sup>	18.2	19.70 <sup>+0.20</sup>	6.1	18.1
<b>15</b>	23.95 <sup>+0.05</sup>	23.90 <sup>+0.05</sup>	R0810 024 03 <sup>1)</sup>	24.2	25.70 <sup>+0.20</sup>	7.1	24.1
<b>22</b>	35.90 <sup>+0.05</sup>	35.85 <sup>+0.07</sup>	R0810 036 05 <sup>1)</sup>	36.2	37.70 <sup>+0.20</sup>	12.1	36.1
<b>30</b>	44.85 <sup>+0.05</sup>	44.80 <sup>+0.10</sup>	R0810 045 01 <sup>1)</sup>	45.2	46.70 <sup>+0.20</sup>	12.1	45.1
			R0810 045 51 <sup>2)</sup>				

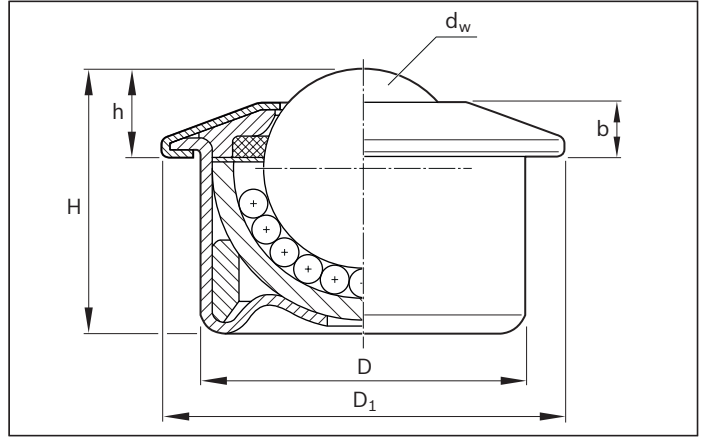
<sup>1)</sup> Made from spring hinge 1.1248 alternative 1.8159

<sup>2)</sup> Made from corrosion-resistant steel 1.4310

<sup>3)</sup> For small gap dimensions in metal, we recommend single-component acrylate adhesive. Two-component acrylate adhesives are also possible. The technical data sheets of the manufacturer must be observed.

**Assembling the Ball Transfer Units with tolerance ring**


# Ball Transfer Units with reinforced sheet steel housing R0535 ...



Version With sheet steel housing Reinforced housing and cover. For heavy impact loads.	Size	Part number	Load capacities (N)		Dimensions (mm)						Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D	D <sub>1</sub>	h	H	b	m
<b>R0535 1..</b> <b>KUS - B.. - MFG</b> Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505 With felt seal	15	R0535 115 10 <sup>1)</sup>	500	1 300	15.875	24.0 <sup>±0.065</sup>	31.0	9.5 <sup>±0.20</sup>	21.5	5.5	0.045
	22	R0535 122 10 <sup>1)</sup>	1 300	3 000	22.225	36.0 <sup>±0.080</sup>	45.0	9.8 <sup>±0.20</sup>	29.5	6.2	0.150
	30	R0535 130 10 <sup>1)</sup>	2 500	6 000	30.162	45.0 <sup>±0.080</sup>	55.0	13.8 <sup>±0.30</sup>	37.5	8.2	0.300
	45	R0535 145 10 <sup>1)</sup>	6 000	15 000	44.450	62.0 <sup>±0.095</sup>	75.0	19.0 <sup>±0.40</sup>	53.7	10.5	0.820
		R0535 147 10	8 000	15 000							
<b>R0535 2..</b> <b>KUS - C.. - MFG</b> All parts galvanized. Balls made from corrosion-resistant steel 1.3541 / 1.4034 With felt seal	15	R0535 215 10 <sup>1)</sup>	370	700	15.875	24.0 <sup>±0.065</sup>	31.0	9.5 <sup>±0.20</sup>	21.5	5.5	0.045
	22	R0535 222 10 <sup>1)</sup>	970	1 800	22.225	36.0 <sup>±0.080</sup>	45.0	9.8 <sup>±0.20</sup>	29.5	6.2	0.150
	30	R0535 230 10 <sup>1)</sup>	1 900	4 000	30.162	45.0 <sup>±0.080</sup>	55.0	13.8 <sup>±0.30</sup>	37.5	8.2	0.300
	45	R0535 245 10 <sup>1)</sup>	4 500	9 000	44.450	62.0 <sup>±0.095</sup>	75.0	19.0 <sup>±0.40</sup>	53.7	10.5	0.820
		R0535 247 10	6 000	12 000							
<b>R0535 3..</b> <b>KUS - 330 - BL - MFG</b> Ball cup and ball retaining ring made from corrosion-resistant steel, other parts galvanized. Balls made from 1.3541 / 1.4034. With bottom hole and felt seal	30	R0535 331 10	1 900	4 000	30.162	45.0 <sup>±0.080</sup>	55.0	13.8 <sup>±0.30</sup>	37.5	8.2	0.300
<b>R0535 7..</b> <b>KUS - 737 - BL - MFG</b> Reinforcing ring and supporting ring galvanized, other parts made from corrosion-resistant steel. Balls made from 1.3541 / 1.4034 With 7 bottom holes. With felt seal to 150 °C	30	R0535 737 00	1 900	4 000	30.162	45.0 <sup>±0.080</sup>	55.0	13.8 <sup>±0.30</sup>	37.5	8.2	0.300

<sup>1)</sup> Ball Transfer Unit with bottom hole on request

**Explanation of short product name**

(Example: **R0535 222 10 KUS-C22-MFG**)

KUS	C	22	MFG
Ball Transfer Unit with reinforced steel housing	All parts galvanized, balls made from corrosion-resistant steel	Size	With felt seal, lubricated



**Installation suggestions for secure fit**

Size	Installation dimensions $D_E$ (mm)		With tolerance ring (TR)				Sticking in <sup>3)</sup>	$D_E^{+0.2}$
	Press fit		TR	$D_2$	$D_E$	$c^{+0.2}$		
	$D_E$ for $\cong$		Part number					
	2 mm sheet steel	16 mm wood	Tolerance ring	$D_2^{+0.2}$	$D_E$			
	5 mm aluminum							
<b>15</b>	23.95 <sup>+0.05</sup>	23.90 <sup>+0.05</sup>	R0810 024 03 <sup>1)</sup>	24.2	25.70 <sup>+0.20</sup>	7.1		24.1
<b>22</b>	35.90 <sup>+0.05</sup>	35.85 <sup>+0.07</sup>	R0810 036 05 <sup>1)</sup>	36.2	37.70 <sup>+0.20</sup>	12.1		36.1
<b>30</b>	44.85 <sup>+0.05</sup>	44.80 <sup>+0.10</sup>	R0810 045 01 <sup>1)</sup>	45.2	46.70 <sup>+0.20</sup>	12.1		45.1
			R0810 045 51 <sup>2)</sup>					
<b>45</b>	61.83 <sup>+0.07</sup>	61.80 <sup>+0.10</sup>	R0810 062 03 <sup>1)</sup>	62.3	64.10 <sup>+0.30</sup>	15.1		62.2

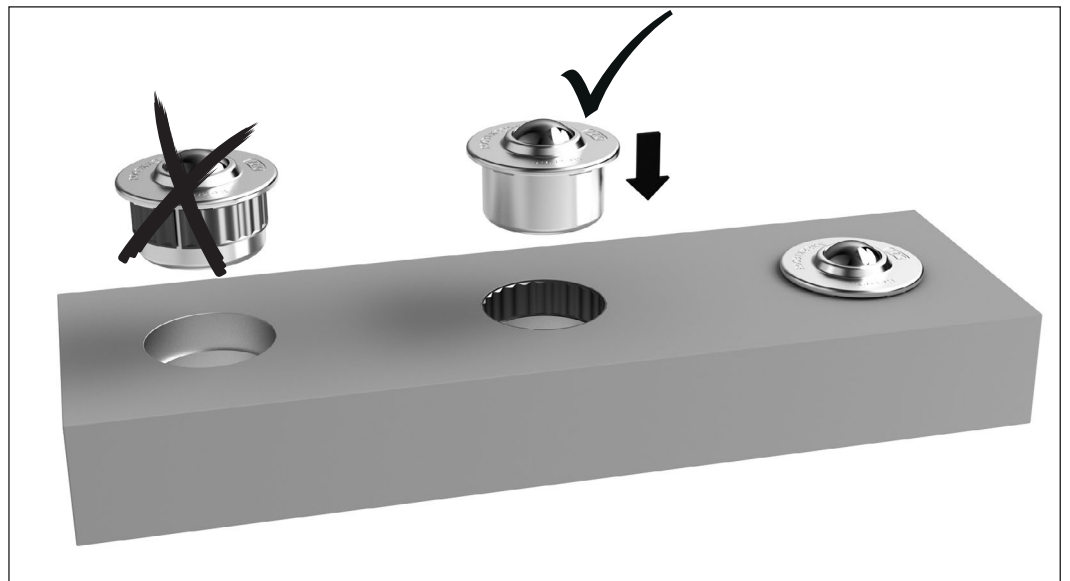
<sup>1)</sup> Made from spring hinge 1.1248 alternative 1.8159

<sup>2)</sup> Made from corrosion-resistant steel 1.4310

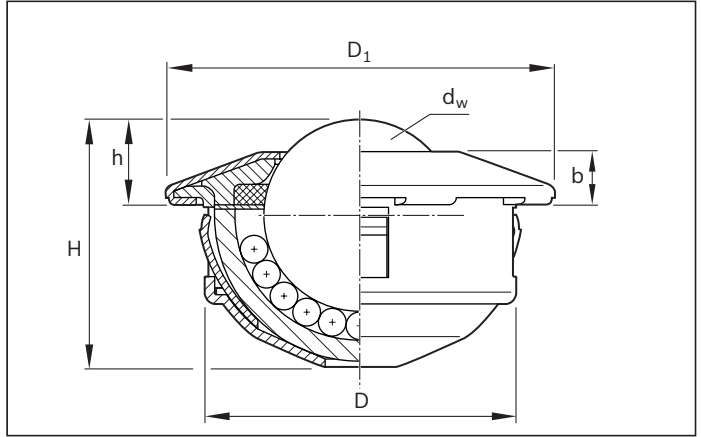
<sup>3)</sup> For small gap dimensions in metal, we recommend single-component acrylate adhesive. Two-component acrylate adhesives are also possible. The technical data sheets of the manufacturer must be observed.

**Assembling the Ball Transfer Units with tolerance ring**

Use a mounting tool  
(see page 19)



# Ball Transfer Units with clip as fastening element R0536 ...



Version	Size	Part number	Load capacities (N)		Dimensions (mm)							Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D	D <sub>1</sub>	h	H	b	m	
<b>R0536 1..</b> KUK - B.. - MFG Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505. With felt seal	15	R0536 115 10 <sup>1)</sup>	500	1 000	15.875	24.0 <sup>-0.13</sup>	31	9.5 <sup>±0.20</sup>	20.0	5.5	0.044	
	22	R0536 122 10 <sup>1)</sup>	1 300	2 600	22.225	36.0 <sup>-0.16</sup>	45	9.8 <sup>±0.20</sup>	28.6	6.2	0.146	
	30	R0536 130 10 <sup>1)</sup>	2 500	5 000	30.162	45.0 <sup>-0.25</sup>	55	13.8 <sup>±0.30</sup>	37.2	8.2	0.290	
<b>R0536 2..</b> KUK - C.. - MFG All parts galvanized. Balls made from corrosion-resistant steel 1.3541 / 1.4034. With felt seal	15	R0536 215 10 <sup>1)</sup>	370	700	15.875	24.0 <sup>-0.13</sup>	31	9.5 <sup>±0.20</sup>	20.0	5.5	0.044	
	22	R0536 222 10 <sup>1)</sup>	970	1 800	22.225	36.0 <sup>-0.16</sup>	45	9.8 <sup>±0.20</sup>	28.6	6.2	0.146	
	30	R0536 230 10 <sup>1)</sup>	1 900	3 500	30.162	45.0 <sup>-0.25</sup>	55	13.8 <sup>±0.30</sup>	37.2	8.2	0.290	
<b>R0536 3..</b> KUK - 330 - BL - MFG Ball cup and ball retaining ring made from corrosion-resistant steel, other parts galvanized. Balls made from 1.3541 / 1.4034. With bottom hole and felt seal	30	R0536 331 10	1 900	3 500	30.162	45.0 <sup>-0.25</sup>	55	13.8 <sup>±0.30</sup>	37.2	8.2	0.290	
<b>R0536 4..</b> KUK - B.. - P - MFK Load balls made from PA66. Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505. With dry felt seal.	15	R0536 415 10 <sup>1)</sup>	70 <sup>2)</sup>	70 <sup>2)</sup>	15.875	24.0 <sup>-0.13</sup>	31	9.5 <sup>±0.20</sup>	20.0	5.5	0.030	
	22	R0536 422 10 <sup>1)</sup>	100 <sup>2)</sup>	100 <sup>2)</sup>	22.000	36.0 <sup>-0.16</sup>	45	9.6 <sup>±0.20</sup>	28.4	6.2	0.105	
	30	R0536 430 10 <sup>1)</sup>	150 <sup>2)</sup>	150 <sup>2)</sup>	29.900	45.0 <sup>-0.25</sup>	55	13.6 <sup>±0.30</sup>	37.0	8.2	0.196	

<sup>1)</sup> Ball Transfer Unit with bottom hole on request

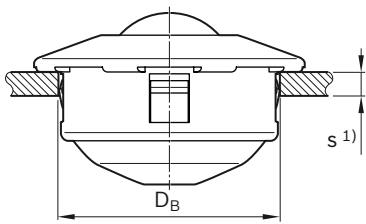
<sup>2)</sup> At 20 °C

### Explanation of short product name

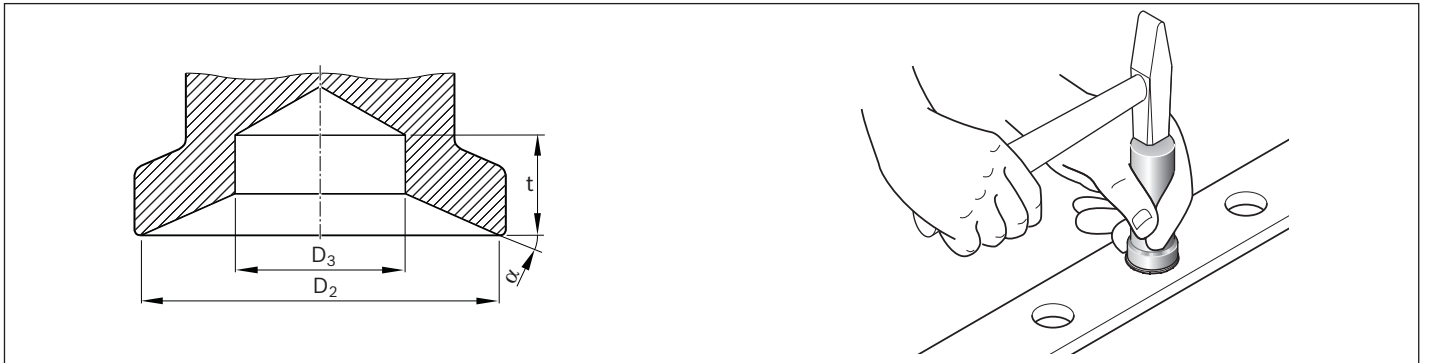
(Example: R0536 230 10 KUK-C30-MFG)

KUK	C	30	P	MFG
Ball Transfer Unit with clip as fastening element	Cover and housing galvanized, balls made from antifriction bearing steel	Size	Load balls made from plastic	With felt seal, lubricated

**Installation suggestion**

Size	Installation dimensions (mm)	
		
	<b>D<sub>B</sub></b>	<b>s</b>
<b>15</b>	24 <sup>+0.5</sup>	1.5
<b>22</b>	36 <sup>+0.8</sup>	2.0
<b>30</b>	45 <sup>+1.0</sup>	2.5

<sup>1)</sup> Minimum thickness of the mounting plate

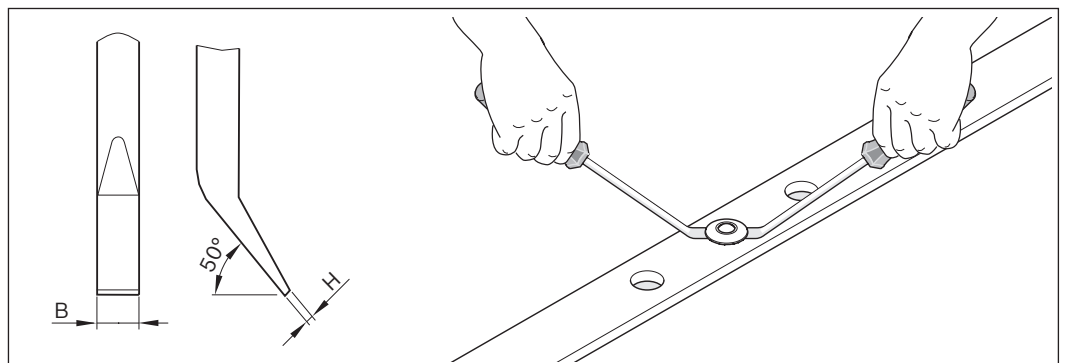
**Mounting tool for Ball Transfer Units R0535 and R0536**


Size	Part number	Dimensions (mm)			$\alpha$ (°)
		D <sub>2</sub>	D <sub>3</sub>	t <sub>min</sub>	
<b>15</b>	R0536 015 30	29	17	10	30
<b>22</b>	R0536 022 30	43	24	10	20
<b>30</b>	R0536 030 30	53	30	10	24
<b>45</b>	R0536 045 30	73	45	15	26

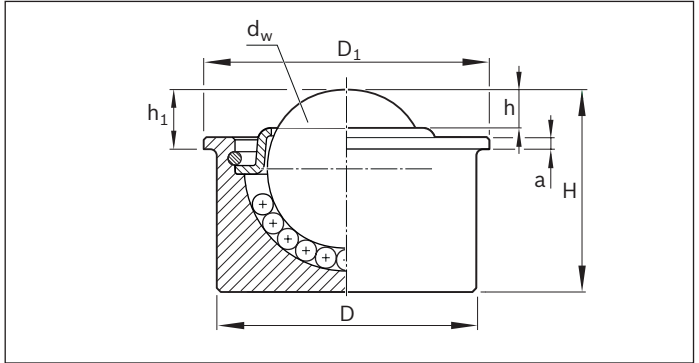
**Extraction tool**
**Recommendation for Ball Transfer Units R0536**

for	Dimensions (mm)	
	H <sup>1)</sup> max	B <sup>1)</sup> max
<b>15</b>	0.6	6
<b>22</b>	0.6	8
<b>30</b>	0.8	10

<sup>1)</sup> Suitable for the gaps in the supporting edge of the Ball Transfer Unit 0536-



# Ball Transfer Unit with solid steel housing – with low collar R0533 ...



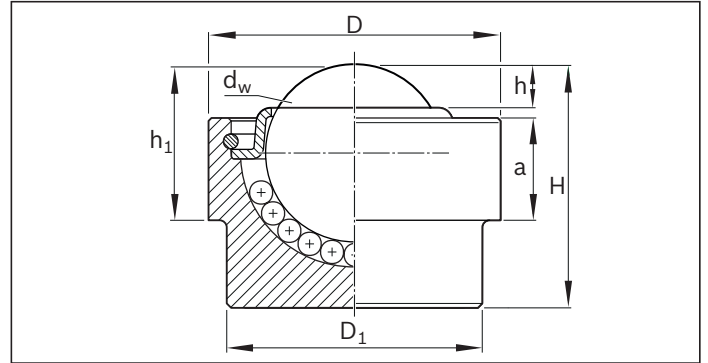
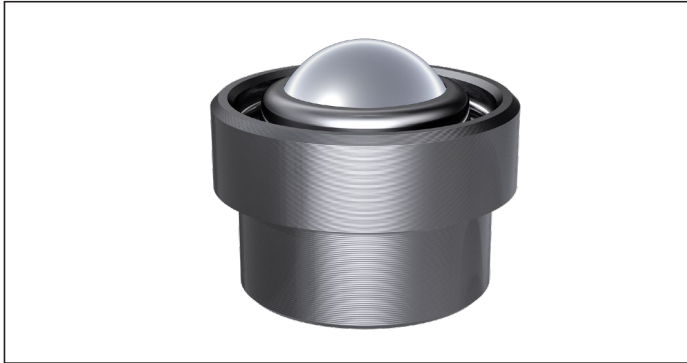
Version With solid steel housing. With low collar. Very smooth movement.	Size	Part number	Load capacity (N)		Dimensions (mm)							Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D ±0.065	D <sub>1</sub> ±0.25	h	h <sub>1</sub> ±0.01	H	a	
<b>R0533</b> KUM - A12 - NB - OFK Housing bright metal. Cover galvanized. Balls made from antifriction bearing steel 1.3505. Without felt seal.	<b>12</b>	R0533 012 00	250	700	12	20	21.75	approx. 3	4.5	15	1	0.024

## Installation suggestion for secure fit

Size	Installation dimensions D <sub>E</sub> (mm) Sticking in <sup>1)</sup>
<b>12</b>	<p style="text-align: right;"><b>D<sub>E</sub><sup>+0.2</sup></b></p>

<sup>1)</sup> For small gap dimensions in metal, we recommend single-component acrylate adhesive. Two-component acrylate adhesives are also possible. The technical data sheets of the manufacturer must be observed.

# Ball Transfer Unit with solid steel housing – with high collar R0533 ...



Version With solid steel housing. With high collar. Very smooth movement.	Size	Part number	Load capacity (N)		Dimensions (mm)							Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D <sup>±0.1</sup>	D <sub>1</sub> <sup>±0.1</sup>	h	h <sub>1</sub> <sup>±0.1</sup>	H <sup>±0.2</sup>	a <sup>±0.1</sup>	
R0533 KUM - A12 - HB - OFK Housing bright metal. Cover galvanized. Balls made from antifriction bearing steel 1.3505. Without felt seal.	12	R0533 702 00	250	700	12	20	17.5	approx. 3	10.5	16.5	7	0.027

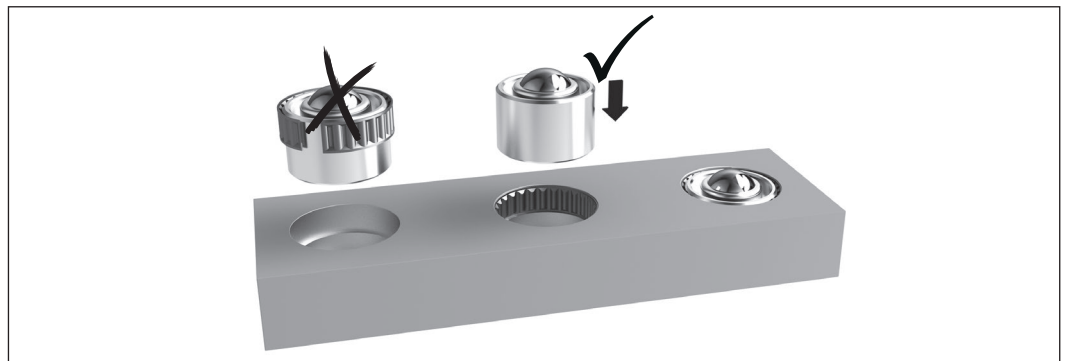
## Installation suggestions for secure fit

Size	Installation dimensions D <sub>E</sub> (mm) With tolerance ring (TR)				Sticking in <sup>2)</sup>		
	Part number Tolerance ring	D <sub>2</sub> <sup>+0.5</sup>	D <sub>E</sub> <sup>+0.2</sup>	b <sup>±0.1</sup>	D <sub>2</sub> <sup>+0.5</sup>	D <sub>E</sub> <sup>+0.2</sup>	b <sup>±0.1</sup>
12	R0810 019 51 <sup>1)</sup>	17.8	21.7	7	17.8	20.15	7

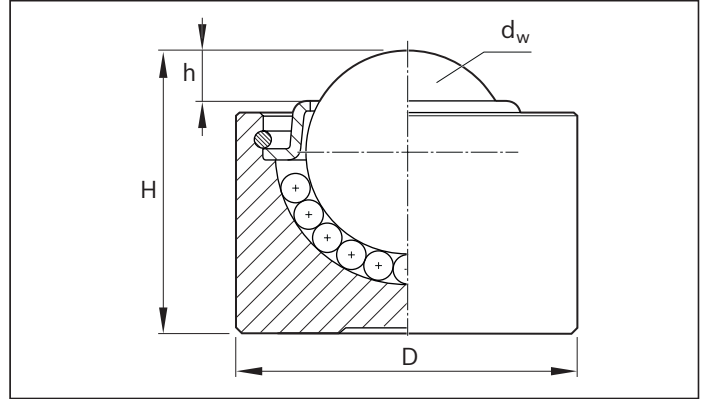
<sup>1)</sup> made from corrosion-resistant steel 1.4310

<sup>2)</sup> for small gap dimensions in metal, we recommend single-component acrylate adhesive. Two-component acrylate adhesives are also possible. The technical data sheets of the manufacturer must be observed.

## Assembling the Ball Transfer Units with tolerance ring



# Ball Transfer Unit with solid steel housing – without collar R0533 ...



Version With solid steel housing. Without collar. Very smooth movement.	Size	Part number	Load capacities (N)		Dimensions (mm)				Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D ±0.065	h	H ±0.2	
R0533 7.. KUM - A12 - OFK Housing bright metal. Cover galvanized. Balls made from antifriction bearing steel 1.3505. Without felt seal	12	R0533 712 00	250	700	12.000	20	approx. 3	16.5	0.028

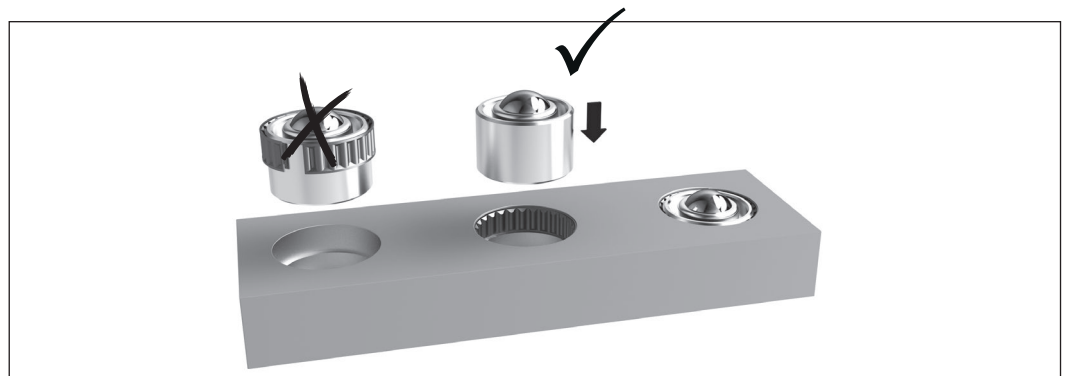
### Installation suggestions for secure fit

Size	Installation dimensions D <sub>E</sub> (mm) With tolerance ring (TR)				Sticking in <sup>2)</sup>				
	Part number Tolerance ring	D <sub>1</sub> <sup>+0.3</sup>	D <sub>E</sub> <sup>+0.2</sup>	b ±0.2	c <sup>+0.2</sup>	D <sub>1</sub> <sup>+0.3</sup>	D <sub>E</sub> <sup>+0.2</sup>	b ±0.2	c <sup>+1</sup>
12	R0810 019 51 <sup>1)</sup>	20.1	21.7	13.2	6.1	20.5	20.1	13	8

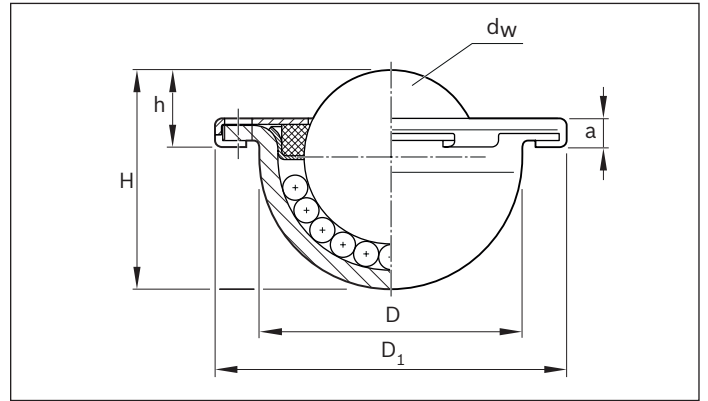
<sup>1)</sup> Made from corrosion-resistant steel 1.4310

<sup>2)</sup> For small gap dimensions in metal, we recommend single-component acrylate adhesive. Two-component acrylate adhesives are also possible. The technical data sheets of the manufacturer must be observed.

### Assembling the Ball Transfer Units with tolerance ring



# Ball Transfer Unit without housing R0534 ...



Version Without housing. Low space requirement. Simple mounting. Mounting via holes in the collar.	Size	Part number	Load capacities (N)		Dimensions (mm)						Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D <sup>-0.2</sup>	D <sub>1</sub>	h <sup>±0.2</sup>	H	a	m
<b>R0534 1..</b> KUO - B22 - MFG Surface galvanized. Balls made from antifriction bearing steel 1.3505. With felt seal.	22	R0534 122 10	1 200	1 200	22.225	33	45	9.8	27.7	3.8	0.1
<b>R0534 2..</b> KUO - C22 - MFG All parts galvanized. Balls made from corrosion-resistant Steel 1.3541 / 1.4034. With felt seal.	22	R0534 222 10 R0534 223 10 <sup>1)</sup>	900	900	22.225	33	45	9.8	27.7	3.8	0.1

<sup>1)</sup> Ball Transfer Unit with bottom hole

### Explanation of short product name

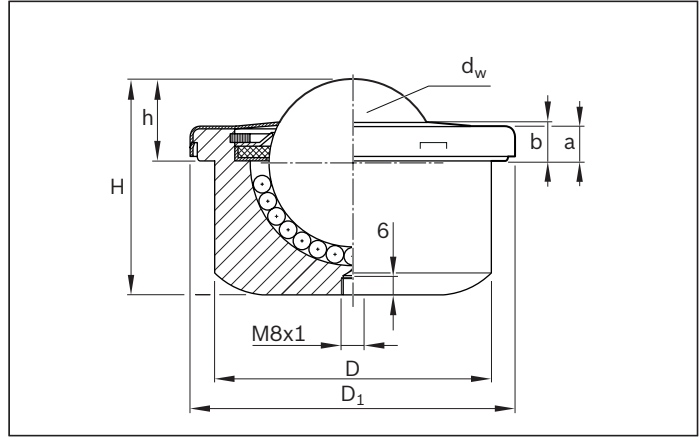
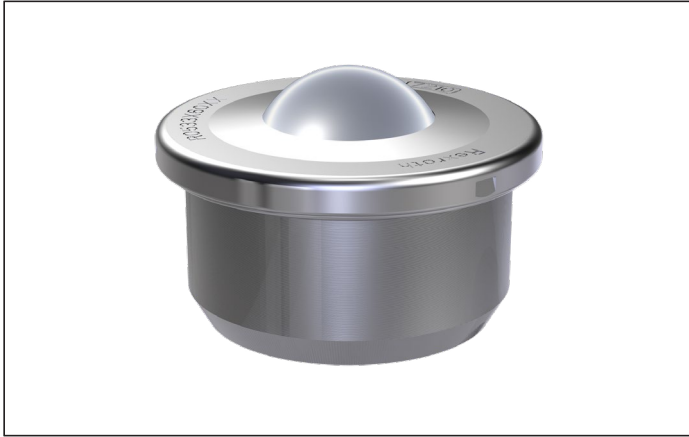
(Example: R0534 223 10 KUO-C22-BL-MFG)

KUO	C	22	BL	MFG
Ball Transfer Unit without housing	All parts galvanized, balls made from corrosion-resistant steel	Size	Bottom hole	With felt seal, lubricated

### Installation suggestion

Size	Installation dimensions (mm)		
	<b>S</b>	<b>T<sub>k</sub></b>	<b>W</b>
22	3.5	39	3 x 120°

# Ball Transfer Units with solid steel housing R0533 .6.



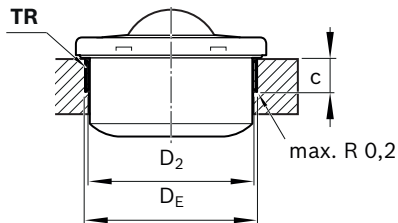
Version With solid steel housing. For high loads. Alternatively with polymer wiper seal.	Size	Part number	Load capacity (N)		Dimensions (mm)								Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D ±0.11	D <sub>1</sub>	h ±0.2	H	a	b	m	
<b>R0533 0</b> Surface bright metal. Balls made from antifriction bearing steel 1.3505. With felt seal.	60	R0533 060 00 KUM-A60-MFG	13 000	30 000	60.325	100	117	29.5	77.5	13	14.5	3.5	
		R0533 061 00 <sup>1)</sup> KUM-A60-BL-MFG-SA											
<b>R0533 1</b> Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505 With felt seal.	60	R0533 160 10 KUM-B60-MFG-SA	13 000	30 000	60.325	100	117	29.5	77.5	13	14.5	3.5	
		R0533 161 10 <sup>1)</sup> KUM-B60-BL-MFG-SA											
<b>R0533 2</b> All parts galvanized. Balls made from corrosion- resistant steel 1.3541 / 1.4034 With felt seal.	60	R0533 260 10 KUM-C60-MFG	9 700	20 000	60.325	100	117	29.5	77.5	13	14.5	3.5	
		R0533 261 10 <sup>1)</sup> KUM-C60-BL-MFG-SA											

<sup>1)</sup> Ball Transfer Unit with bottom hole and lube port

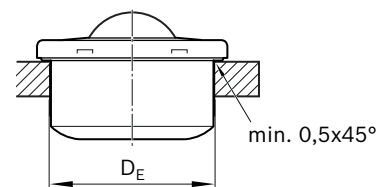
## Installation suggestions for secure fit (installation dimensions for R0533 .6. .. and R0533 .05 10)

Installation dimensions D<sub>E</sub> (mm)

With tolerance ring (TR)



Sticking in <sup>3)</sup>

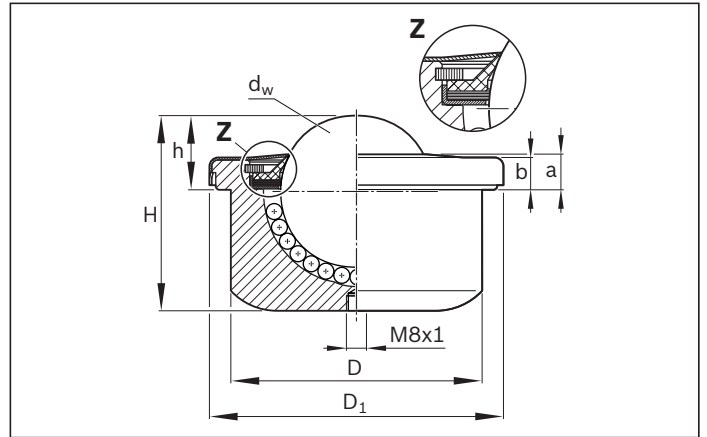
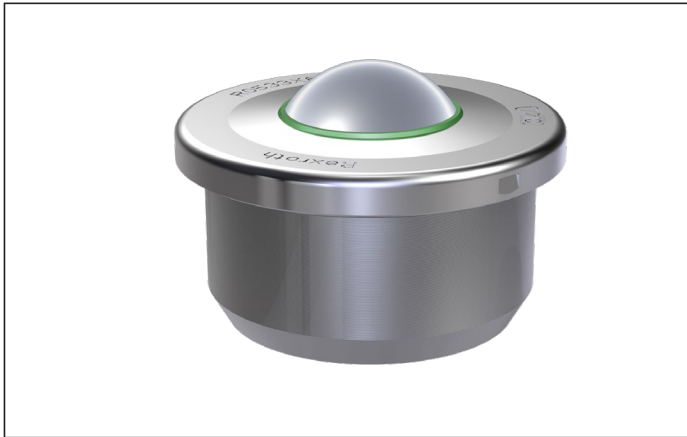


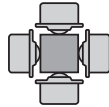
Part number Tolerance ring	D <sub>2</sub> <sup>+0.5</sup>	D <sub>E</sub> <sup>+0.35</sup>	c <sup>+0.3</sup>	D <sub>E</sub> <sup>+0.25</sup>
R0810 100 02 <sup>2)</sup>	100.3	102.5	19.1	100.15

<sup>2)</sup> Made from spring hinge 1.1248 alternative 1.8159



## Ball Transfer Units with solid steel housing R0533 ..5, with polymer wiper seal



Version With solid steel housing. For heavy loads and coarse dirt	Size	Part number	Load capacity (N)		Dimensions (mm)							Weight (kg)
			 dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D ±0.11	D	h ±0.2	H	a	b	m
<b>R0533 1..</b> <b>KUM-B60-MFG-AB</b> Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505. With felt seal and wiper.	60	R0533 105 10	13 000	30 000	60.325	100	117	29.5	77.5	13	14.5	3.5
<b>R0533 2..</b> <b>KUM-C60-MFG-AB</b> All parts galvanized. Balls made from corrosion-resistant steel 1.3541 / 1.4034. With felt seal and wiper.	60	R0533 205 10	9 700	20 000	60.325	100	117	29.5	77.5	13	14.5	3.5

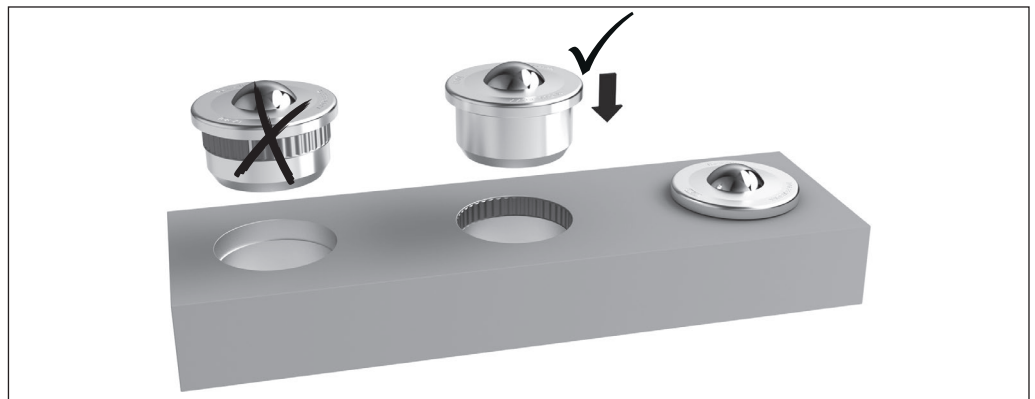
Ball Transfer Unit without lube port

### Explanation of short product name

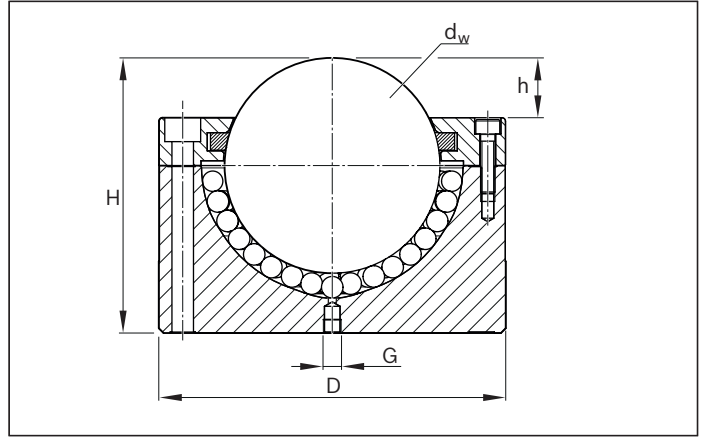
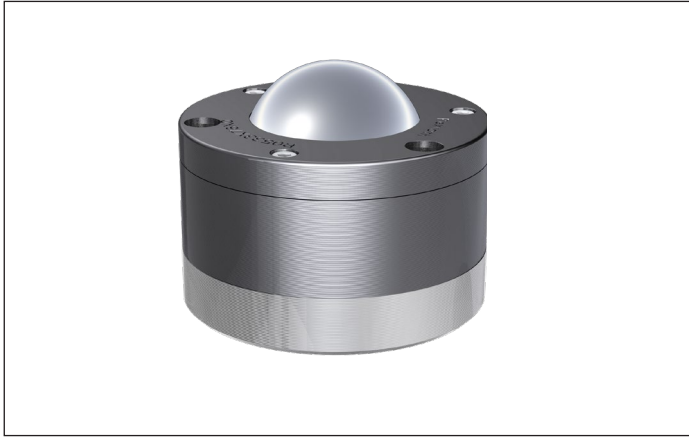
(Example: R0533 205 10 KUM-C60-MFG-AB)

KUM	C	60	MFG	AB
Ball Transfer Unit with solid steel housing	All parts galvanized, balls made from corrosion-resistant steel	Size	With felt seal, lubricated	With wiper

### Assembling the Ball Transfer Units with tolerance rings



# Ball Transfer Unit with solid steel housing R0533 ...



Version With solid steel housing and cover. For very high loads.	Size	Part number	Load capacities (N)		Dimensions (mm)					Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D ±0.08	h	H	G	m
R0533 0.. KUM-A..-MFG Surface bright metal. Balls made from antifriction bearing steel 1.3505. With felt seal.	76	R0533 076 00 <sup>1)</sup>	20 000	50 000	76.2	130	23	103 ±0.2	M8x1	8.6
	90	R0533 090 00 <sup>2)</sup>	25 000	70 000	90.0	145	25	115 ±0.2	Rp 1/8	11.2
R0533 1.. KUM-B..-BL-MFG-SA Cover and housing galvanized. Balls made from antifriction bearing steel 1.3505. With felt seal.	76	R0533 177 10 <sup>3)</sup>	20 000	50 000	76.2	130	23	103 ±0.2	M8x1	8.6
	90	R0533 191 10 <sup>3)</sup>	25 000	70 000	90.0	145	25	115 ±0.2	Rp 1/8	11.2

- <sup>1)</sup> Upon request, available with lube hole
- <sup>2)</sup> Lube hole Rp1/8" (at center of base) closed by screw plug
- <sup>3)</sup> Ball Transfer Unit with bottom hole and lube port

**Explanation of short product name**

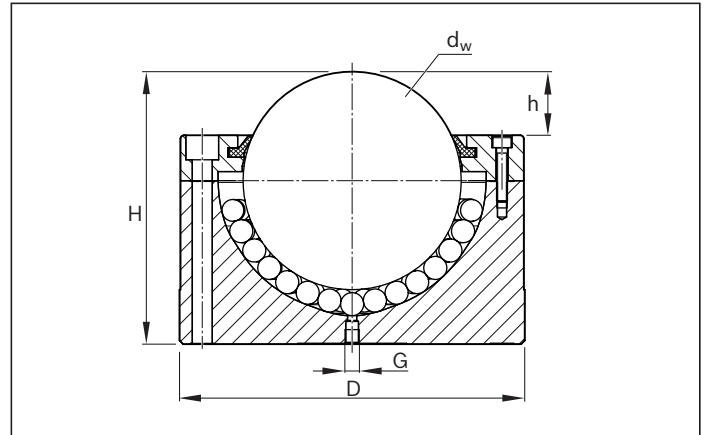
(Example: R0533 177 10 KUM-B76-BL-MFG-SA)

KUM	B	76	BL	MFG	SA
Ball Transfer Unit with solid steel housing	Cover and housing galvanized, balls made from antifriction bearing steel	Size	Bottom hole	With felt seal, lubricated	With lube port

**Installation suggestion**

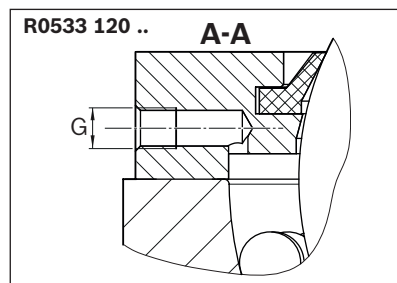
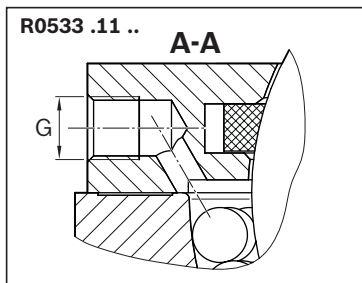
Size	Installation dimensions (mm)					
	H <sub>1</sub>	h <sub>1</sub>	S	S <sub>1</sub>	T <sub>k</sub>	W
76	69	25	9	15	110	3 x 120°
90	79	30	9	15	125	3 x 120°

# Ball Transfer Unit with solid steel housing R0533 ...,with polymer wiper seal



Version With solid steel housing and cover. For very heavy loads and coarse dirt. With wiper.	Size	Part number	Load capacities (N)		Dimensions (mm)					Weight (kg)
			dyn. C	stat. C <sub>0</sub>	d <sub>w</sub>	D	h	H <sup>+0.2</sup>	G	m
R0533 ... Surface bright metal. Balls made from antifriction bearing steel 1.3505.	90	R0533 011 00 KUM-A90-BL-AB-SA	25 000	70 000	90	145 <sup>+0.08</sup>	25	115	Rp 1/8	11.2
	120	R0533 120 00 KUM-A120-BL-AB-SA	40 000	100 000	120	190 <sup>+0.10</sup>	35	150	M8x1	24.6
R0533 1.. Cover and housing galvanized Balls made from antifriction bearing steel 1.3505.	90	R0533 111 10 KUM-B90-BL-AB-SA	25 000	70 000	90	145 <sup>+0.08</sup>	25	115	Rp 1/8	11.2

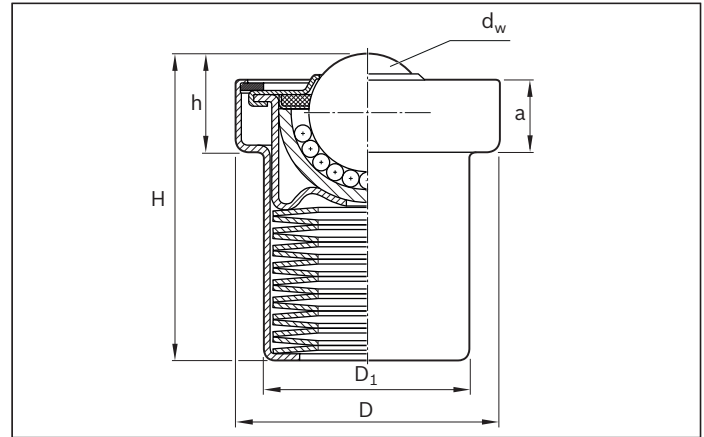
Lube port in the cover and housing

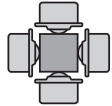


## Installation suggestion

Size	Installation dimensions (mm)					
	H <sub>1</sub>	h <sub>1</sub>	S	S <sub>1</sub>	T <sub>k</sub>	W
90	80.0	30	9	15	125	6 x 60°
120	101.5	30	11	18	165	3 x 120°

## Ball Transfer Units, spring-loaded R0532 1.., R0532 2..



Version Spring-loaded. Ball Transfer Units are supported on springs and mounted under preload in a housing. Ball Transfer Unit recedes into its housing under high loads.	Size	Part number	 Pre-tensioning force (N)   Ultimate load <sup>1)</sup> (N)		Tolerance for preload and ultimate load (%)	Dimensions (mm)						Weight (kg)
			d <sub>w</sub>	D		D <sub>1</sub>	h	H	a			
R0532 1.. KUF-B..TF-MFG Cover and housing galvanized. With cup springs. Balls made from antifriction bearing steel 1.3505. With felt seal.	22	R0532 122 10	730	860	+25 / -7.5	22.225	50 ± 0.100	38.8	18.6	58.1	13.6	0.30
	30	R0532 130 10	1 350	1 600	+15 / -7.5	30.162	62 ± 0.125	48.2	24.4	70.0	17.0	0.57
	45	R0532 145 10	2 280	2 770	+15 / -7.5	44.450	85 ± 0.150	66.2	35.6	100.5	24.2	1.60
R0532 1.. KUF-B..SF-MFG Cover and housing galvanized. With helical spring. Balls made from antifriction bearing steel 1.3505. With felt seal.	22	R0532 123 10	170	250	+15 / -7.5	22.225	50 ± 0.100	38.8	18.6	58.1	13.6	0.24
	22	R0532 125 10	116.6	195	+27.1 / -27.1	22.225	50 ± 0.100	38.8	18.6	58.1	13.6	0.24
R0532 2 KUF-C..TF-MFG All parts galvanized. With cup springs. Balls made from corrosion-resistant steel 1.3541 / 1.4034. With felt seal.	22	R0532 222 10	730	860	+25 / -7.5	22.225	50 ± 0.100	38.8	18.6	58.1	13.6	0.30
	30	R0532 230 10	1 350	1 600	+15 / -7.5	30.162	62 ± 0.125	48.2	24.4	70.0	17.0	0.57
	45	R0532 245 10	2 280	2 770	+15 / -7.5	44.450	85 ± 0.150	66.2	35.6	100.5	24.2	1.60

<sup>1)</sup> Under ultimate load the Ball Transfer Unit recedes completely.

**Explanation of short product name**

(Example: R0532 145 10 KUF-B45-TF-MFG)

KUF	B	45	TF	MFG
Ball Transfer Unit, spring-loaded	Cover and housing galvanized, balls made from antifriction bearing steel	Size	Cup spring	With felt seal, lubricated

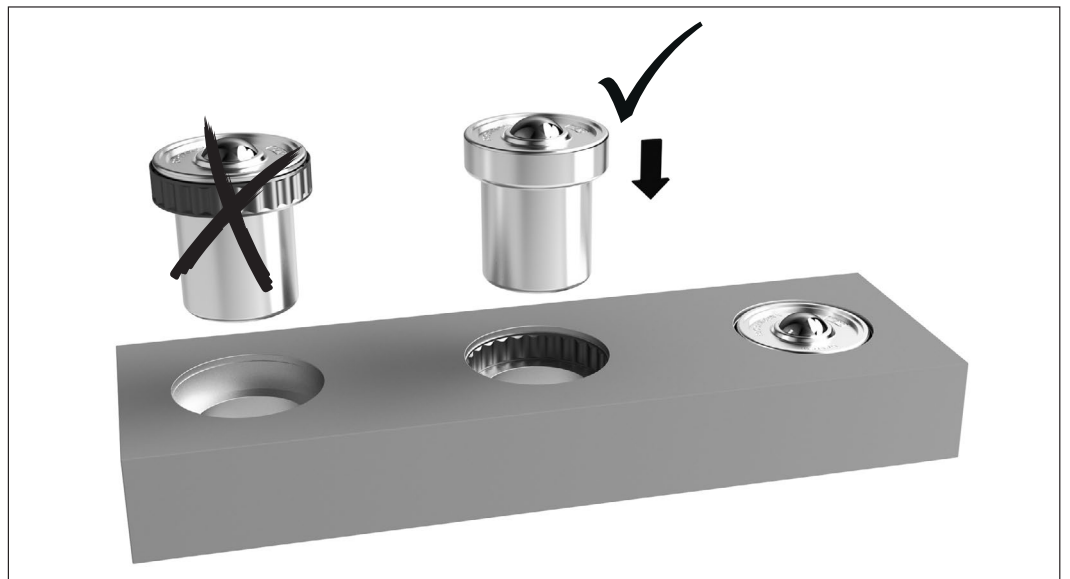
**Installation suggestions for secure fit**

Size	Installation dimensions $D_E$ (mm)					Part number Tolerance ring	With tolerance ring (TR)					Sticking in <sup>3)</sup>				
	$D_2^{+0.5}$	$D_E$	$D_3^{+0.5}$	$b \pm 0.2$	$c + 1$		$D_2^{+0.5}$	$D_E$	$D_3^{+0.5}$	$b \pm 0.2$	$c + 0.2$	$D_2^{+0.5}$	$D_E^{+0.2}$	$D_3^{+0.5}$	$b \pm 0.2$	$c + 1$
<b>22</b>	50.1	49.90 <sup>+0.05</sup>	39.2	13.6	7	R0810 050 08 <sup>2)</sup>	52.5	52.10 <sup>+0.2</sup>	39.2	13.6	11.1	50.4	50.2	39.2	13.6	7
<b>30</b>	62.2	61.85 <sup>+0.05</sup>	48.7	17.0	10	R0810 062 03 <sup>2)</sup>	64.5	64.10 <sup>+0.3</sup>	48.7	17.0	15.1	62.4	62.2	48.7	17.0	10
<b>45</b>	85.2	84.83 <sup>+0.07</sup>	66.8	24.2	13	R0810 085 01 <sup>2)</sup>	88.0	87.55 <sup>+0.3</sup>	66.8	24.2	19.1	85.4	85.2	66.8	24.2	13

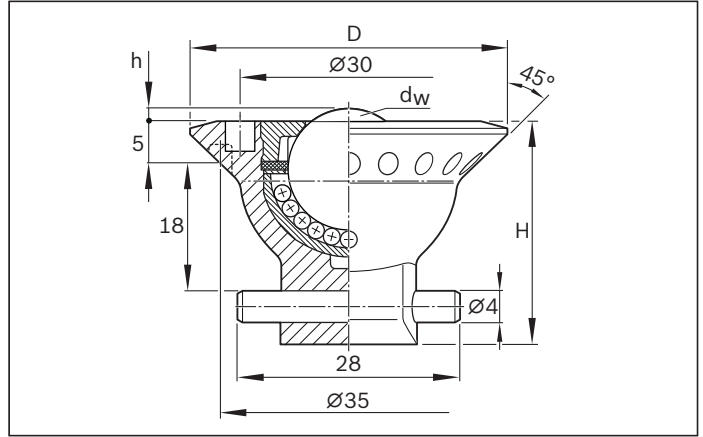
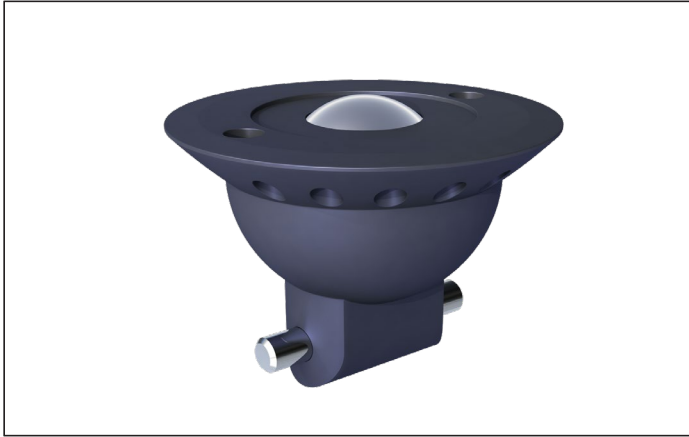
<sup>2)</sup> Made from spring hinge 1.1248 alternative 1.8159

<sup>3)</sup> For small gap dimensions in metal, we recommend single-component acrylate adhesive. Two-component acrylate adhesives are also possible. The technical data sheets of the manufacturer must be observed.

**Assembling the Ball Transfer Units with tolerance rings**



# Ball Transfer Unit with plastic housing R0530



Version With plastic housing. For special applications (e.g. for lightweight ball transfer tables).	Size	Part number	Load capacities (N)	Dimensions (mm)					Weight (kg)
				dyn. C	d <sub>w</sub>	D	h	H	
R0530 .0 KUL-15-MFG Mounting with quarter-turn fastener With felt seal.	15	R0530 005 20	500	15	42	2	32	0.045	



# Ball Transfer Unit installation examples

with arrangement and determination of the Ball Transfer Unit load

## Scenario A

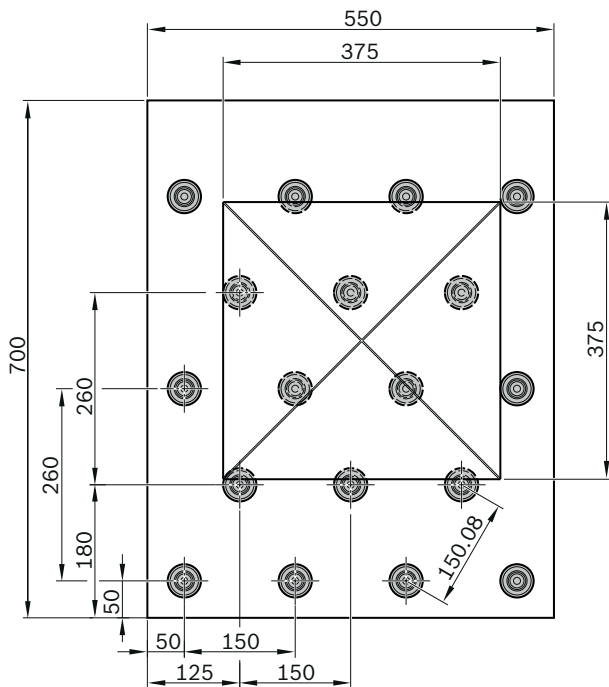
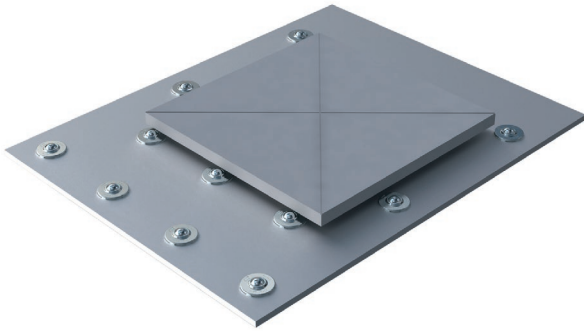
### Arrangement as an equilateral triangle.

The square item to be transported (375 x 375 mm) has a central center of gravity and is supported by 5 Ball Transfer Units.

The distance of the Ball Transfer Units should not be larger than 150 mm ( $375 / 2.5 = 150$  mm).

The mass<sup>1)</sup> (3500 N) is distributed over three Ball Transfer Units and is 1166.7 N per Ball Transfer Unit ( $3500 \text{ N} / 3 = 1166.7 \text{ N}$ ).

Selected Ball Transfer Unit, e.g.: R0530 122 10.



## Scenario B

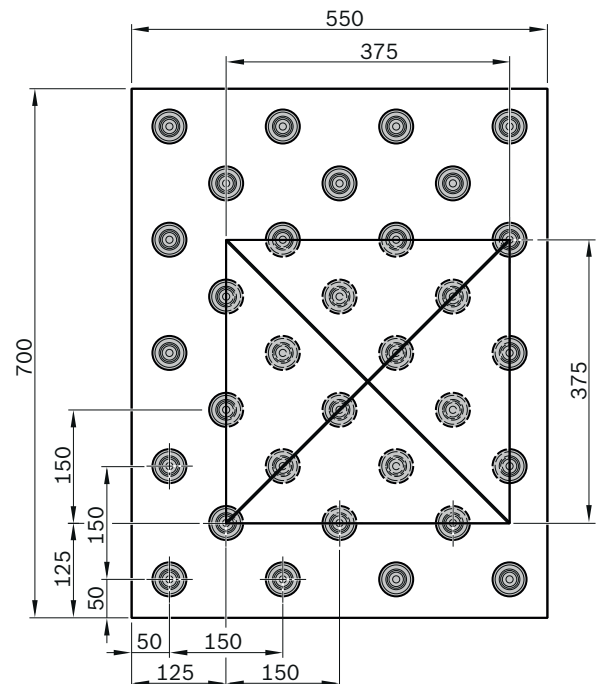
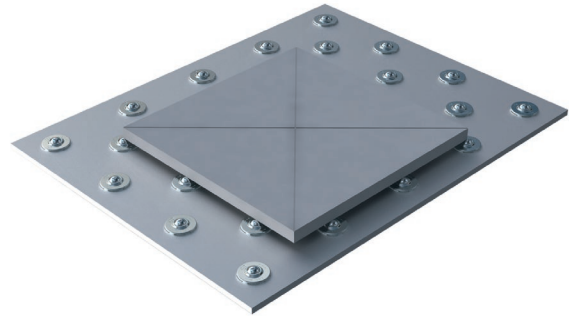
### Arrangement as a right-angled triangle.

The square item to be transported (375 x 375 mm) does not have a central center of gravity and is supported by 8 Ball Transfer Units.

The distance of the Ball Transfer Units should not be larger than 150 mm ( $375 / 2.5 = 150$  mm).

The mass<sup>1)</sup> (3500 N) is distributed over three Ball Transfer Units and is 1166.7 N per Ball Transfer Unit ( $3500 \text{ N} / 3 = 1166.7 \text{ N}$ ).

Selected Ball Transfer Unit, e.g.: R0530 122 10.



<sup>1)</sup> If the load ball height tolerances are well-correlated, it is possible, depending on the nature of the conveyed article, to also perform the calculation based on the total number of load-bearing Ball Transfer Units.



**Scenario C**

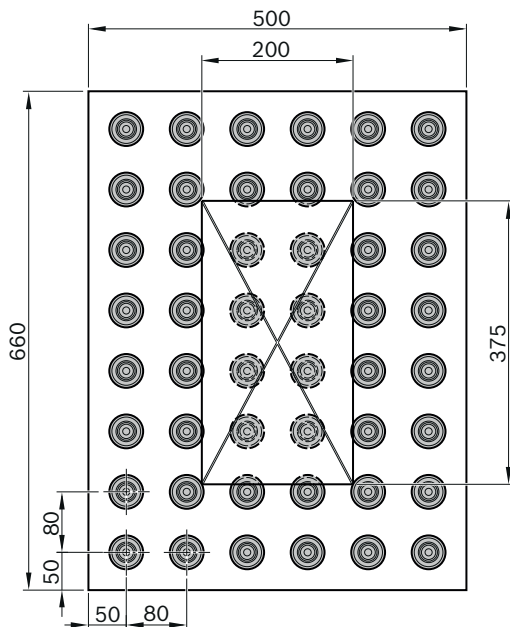
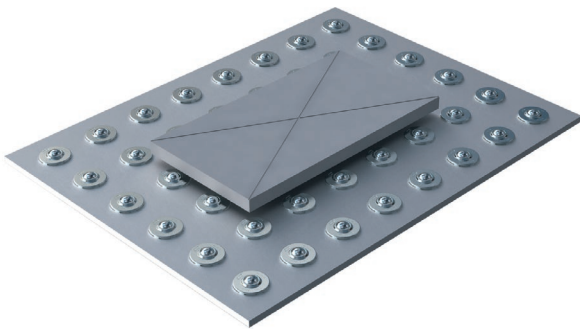
**Arrangement as a square for different items to be transported.**

The rectangular item to be transported (375 x 200 mm) has a central center of gravity and is supported by 8 Ball Transfer Units.

The distance of the Ball Transfer Units should not be larger than 80 mm ( $200 / 2.5 = 80\text{mm}$ ).

The mass<sup>1)</sup> (3500 N) is distributed over three Ball Transfer Units and is 1166.7 N per Ball Transfer Unit ( $3500 \text{ N} / 3 = 1166.7\text{N}$ ).

Selected Ball Transfer Unit, e.g.: R0530 122 10.



**Scenario D**

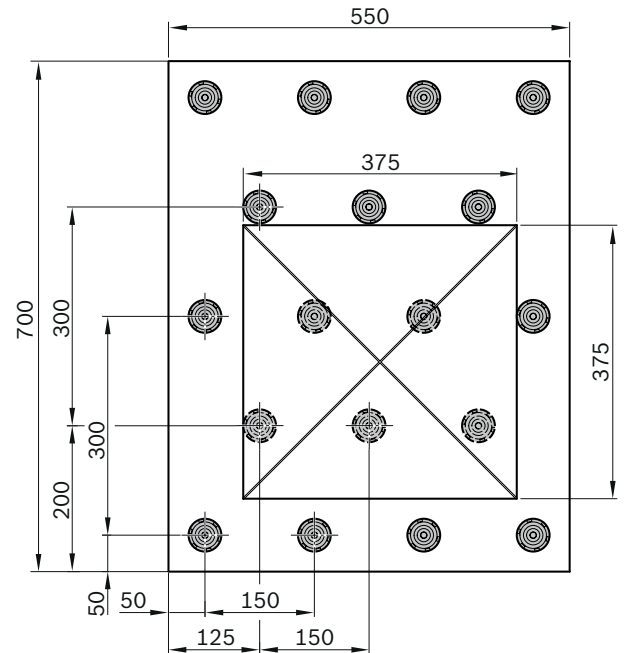
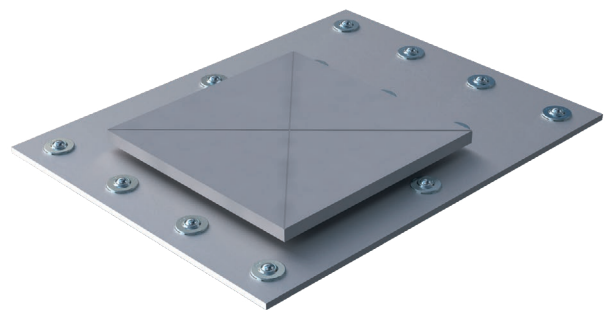
**Arrangement as a isosceles triangle.**

The square item to be transported (375 x 375 mm) has a central center of gravity and is supported by 5 Ball Transfer Units.

The distance of the Ball Transfer Units should not be larger than 150 mm ( $375 / 2.5 = 150 \text{ mm}$ ).

The mass<sup>1)</sup> (3500 N) is distributed over three Ball Transfer Units and is 1166.7 N per Ball Transfer Unit ( $3500 \text{ N} / 3 = 1166.7 \text{ N}$ ).

Selected Ball Transfer Unit, e.g.: R0530 122 10



## Identification system for short product names

<b>Short product name</b>		Example:	<b>KUF</b>	<b>B</b>	<b>15</b>	<b>P</b>	<b>TF</b>	<b>MFG</b>	<b>AB</b>	<b>SA</b>
<b>Type</b>	Ball Transfer Unit	= <b>KU</b>								
	Ball Transfer Unit, spring-loaded	= <b>KUF</b>								
	Ball Transfer Unit with solid steel housing	= <b>KUM</b>								
	Ball Transfer Unit without housing	= <b>KUO</b>								
	Ball Transfer Unit with reinforced steel housing	= <b>KUS</b>								
	Ball Transfer Unit with clip as fastening element	= <b>KUK</b>								
	Ball Transfer Unit with plastic housing (lightweight)	= <b>KUL</b>								
<b>Version</b>	Bright metal, balls made from antifriction bearing steel	= <b>A</b>								
	Cover and housing galvanized, balls made from antifriction bearing steel	= <b>B</b>								
	All parts galvanized, balls made from corrosion-resistant steel	= <b>C</b>								
	All parts made from corrosion-resistant steel	= <b>N</b>								
	Ball cup, balls and ball retaining ring made from corrosion-resistant steel, other parts galvanized.	= <b>3</b>								
	Supporting ring and reinforcing ring galvanized, other parts made from corrosion-resistant steel	= <b>7</b>								
<b>Load ball Ø</b>	Size	= <b>15</b>								
<b>Material</b>	Load balls made from plastic	= <b>P</b>								
<b>Variants</b>	Cup spring	= <b>TF</b>								
	Helical spring	= <b>SF</b>								
	Bottom hole	= <b>BL</b>								
	High collar	= <b>HB</b>								
	Low collar	= <b>NB</b>								
	High load	= <b>HL</b>								
	Special version	= <b>SO</b>								
<b>Option 1</b>	With felt seal, lubricated	= <b>MFG</b>								
	Without felt seal, preserved	= <b>OFK</b>								
	With felt seal, preserved	= <b>MFK</b>								
	Without felt seal, all parts dry	= <b>OFT</b>								
	Without felt seal, lubricated	= <b>OFG</b>								
	With felt seal, all parts dry	= <b>MFT</b>								
	With felt seal, pre-lubricated	= <b>MFB</b>								
<b>Option 2</b>	With wiper	= <b>AB</b>								
	With high-temperature wiper	= <b>HT</b>								
<b>Option 3</b>	With lube port	= <b>SA</b>								

Table shows complete overview. For available versions/options, see Ball Transfer Unit types.



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