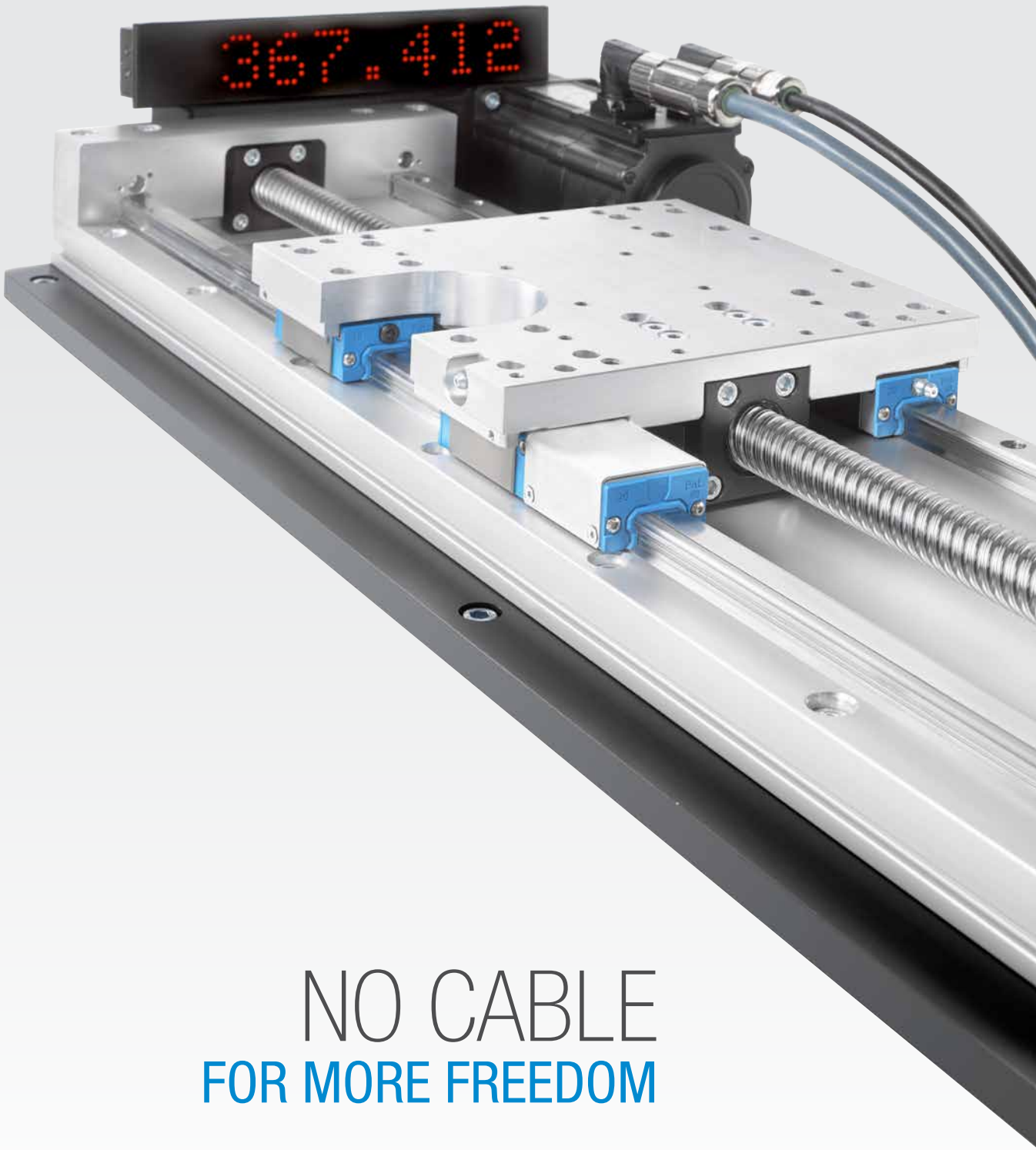
# WIRELESS LINEAR MEASURING SYSTEM

NTN SNR

www.ntn-snr.com

With You




## NO CABLE

## FOR MORE FREEDOM

# Wireless Linear Measuring System

## Highlights

### • Space saving
The linear sensor is integrated directly into the guiding system.

### • More flexibility
The wireless concept allows you to remove the energy chain.

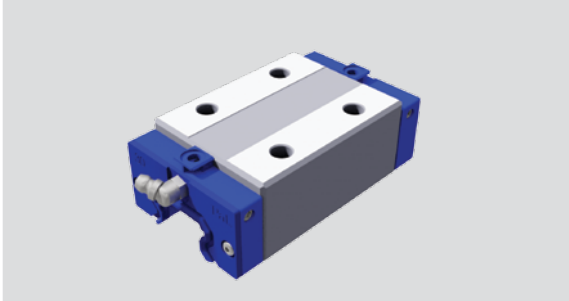
### • Easy to assemble
The sensor accuracy is ready to use and needs no calibration during installation.

### • High resolution sensing
The very latest magnetic technology enables high performance position measurement.

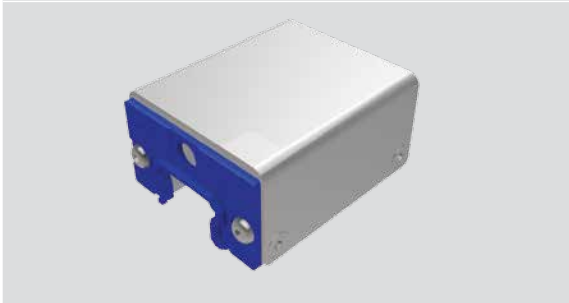
### • Robust design for harsh environment
The measuring system can be combined with a multitude of sealing options.

# 1. Description

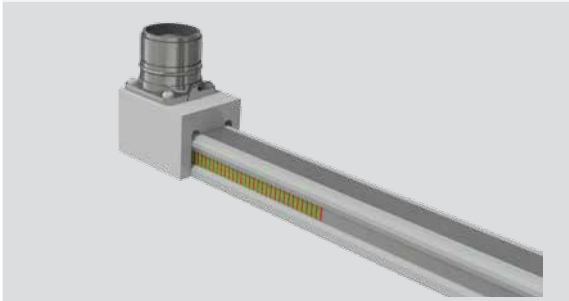
## The wireless measuring system from NTN-SNR is composed of



Carriage
Available from size 20 to 55
Normal or flat height
14 sealing options
Lubrication options

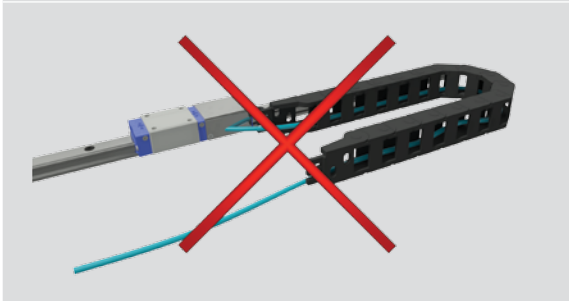


Wireless sensing unit
Including magnetic sensor, power transfer and data transmission units



Guiding rail
Available from size 20 to 55
Maximum length: 4 meters
Integrated magnetic scale
Integrated inductive power transfer system
Optical guide integrated
With cable and connector

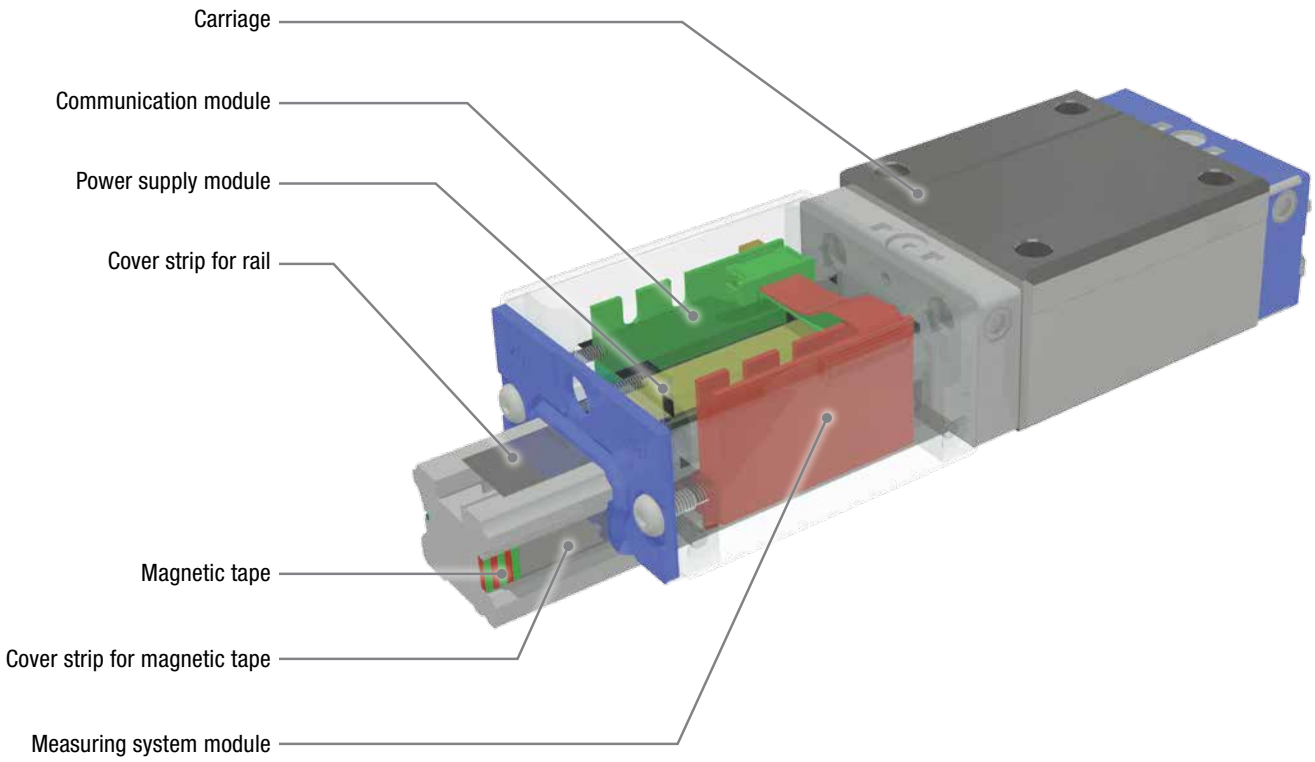
Receiver unit
Including power stage and data processing unit.
Connected to the rail and to a superior controller or display



The system brings together mechanical guiding and linear position measuring into a single product without any moving cable

## 2. Structure

### The mechatronic system fulfills the functions of guidance and measurement into one unit




### Energy system

The embedded electronics is supplied using an inductive power transfer technology. No battery is present inside the unit and the energy is available as soon as the receiver is powered on. It uses a primary unit integrated into the rail and a receiver in the mobile part.

### Measuring solution

The measuring sensor is a low power magnetoresistive chip. It scans without any contact the magnetic scale located on the rail side and protected by a steel strip. The conditioning circuit is able to output high resolution position. A zero position can be defined on the magnetic scale and enables a pseudo absolute system.

### Data transmission

The contactless data transmission is based on an optical technology. An optical guide is integrated on the rail side, protected by a hardcoated film with excellent chemical and scratch resistance. The wireless mobile unit consists of a light source with a signal processing unit.  It encodes and position data as light output at high rate. A light receiver at the end of the rail converts the light intensity changes into a binary data stream.

### Connection

The linear rail is connected with a fixed cable to the receiver using a round plug coupling. The receiver should be connected to a superior controller using the M23 flange socket (female) 12 pin.

## 3. Technical datas

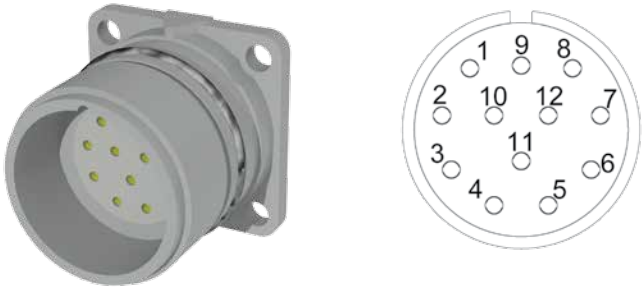
| | |
|---|---|
| Maximum travel velocity | 5 m/s |
| Protection class (EN 60529) | IP68 |
| Operation temperature | 0 to 70 °C |
| Storage temperature | -10 to 70 °C |
| Power supply | 9 V to 24V |
| Power consumption | 20 W |
| Cable | PUR Jacket high flexibility |
| Output signals | RS422 – SSI (100 Kbps – 200 Kbps) |
| Signal coding | 24 bit |
| Measuring system resolution | 1 µm |
| Measuring system accuracy | +/- 15 µm/m |

Other output protocols (BiSS / EnDAT 2.2 / CanOpen / Incremental ABZ TIA-422-A) are available on request

## 4. Electrical Interfaces

**The receiver integrates two M23 plugs, which are connected to the rail (female one) respectively to a controller or display (male one).**

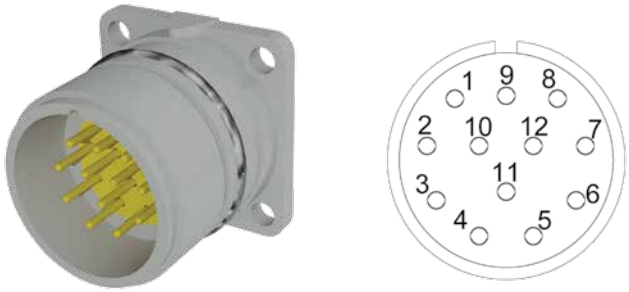
Receiver input (12 pin female flange M23)




| Contact | Signal name |
|---|---|
| 1 | Supply A |
| 2 | Supply B |
| 3 | Supply C |
| 4 | Supply D |
| 5 | NC |
| 6 | Signal |
| 7 | NC |
| 8 | NC |
| 9 | NC |
| 10 | 0V |
| 11 | Supply |
| 12 | NC |

*Cable shield connected to housing*

Receiver output (12 pin male flange M23)



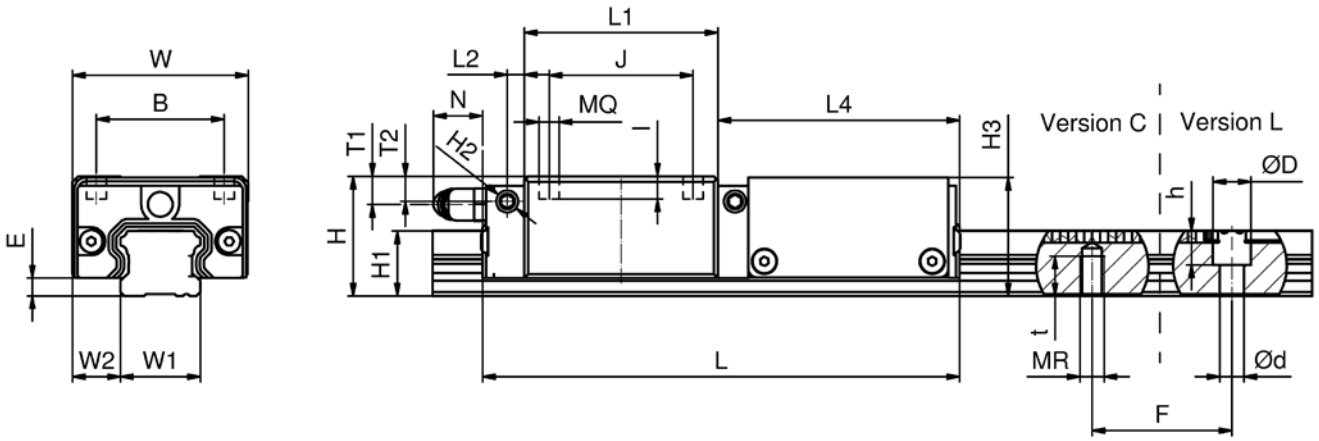

| Contact | Signal name |
|---|---|
| 1 | Supply |
| 2 | NC |
| 3 | 0V |
| 4 | NC |
| 5 | Data+ |
| 6 | Data- |
| 7 | Clock+ |
| 8 | Clock- |
| 9 | NC |
| 10 | 0V |
| 11 | Diagnosis |
| 12 | NC |

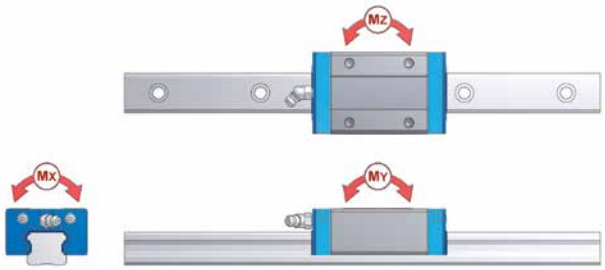
*Cable shield connected to housing*

# 5. Mechanical properties

## The carriage is available in two different design versions : block and flange

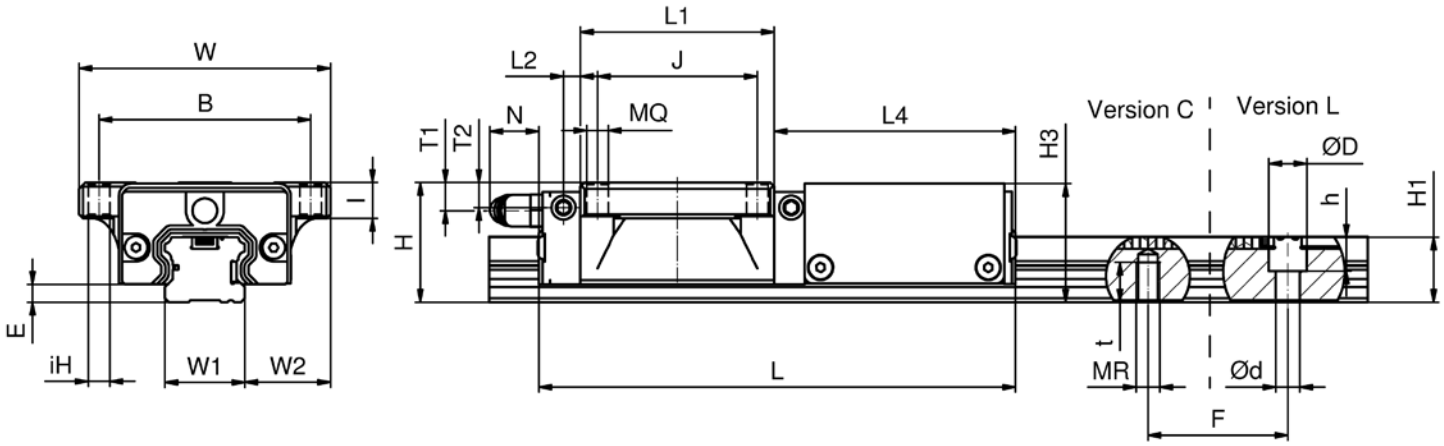
## Carriage design; normal und flat height




| Typ | | System mm | | | | | Carriage mm | | | | | | | | | | | | Load rating kN | | Load rating kNm | | | Mass kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| without ball chain | with ball chain | H | W | W2 | E | L | B | J | MQ | I | L1 | H3 | L4 | T1 | N | T2 | L2 | L3 | C | C0 | MX | MY | MZ | Carriage |
| **Normal height** | | | | | | | | | | | | | | | | | | | | | | | | |
| LGBXH20 BN | LGBCH20 BN | 30 | 44 | 12,0 | 4,5 | 119,3 | 32 | 36 | M 5 | 6,5 | 48,5 | 29,7 | 60,4 | 7,1 | 15,6 | 6,3 | 4,25 | 2,10 | 17,98 | 30,96 | 0,289 | 0,224 | 0,224 | 0,310 |
| LGBXH20 BL | LGBCH20 BL | 30 | 44 | 12,0 | 4,5 | 132,1 | 32 | 36 | M 5 | 6,5 | 61,3 | 29,7 | 60,4 | 7,1 | 15,6 | 6,3 | 4,25 | 2,10 | 23,30 | 40,11 | 0,376 | 0,366 | 0,366 | 0,360 |
| LGBXH20 BE | LGBCH20 BE | 30 | 44 | 12,0 | 4,5 | 147,3 | 32 | 50 | M 5 | 6,5 | 76,5 | 29,7 | 60,4 | 7,1 | 15,6 | 6,3 | 4,25 | 2,10 | 27,85 | 49,61 | 0,464 | 0,565 | 0,565 | 0,470 |
| **Flat** | | | | | | | | | | | | | | | | | | | | | | | | |
| LGBXS20 BS | LGBCS20 BS | 28 | 42 | 11,0 | 4,5 | 98,3 | 32 | -- | M 5 | 5,5 | 27,5 | 29,7 | 60,4 | 5,1 | 15,6 | 4,3 | 4,25 | 2,10 | 9,25 | 15,93 | 0,148 | 0,066 | 0,066 | 0,170 |
| LGBXS20 BN | LGBCS20 BN | 28 | 42 | 11,0 | 4,5 | 119,3 | 32 | 32 | M 5 | 5,5 | 48,5 | 29,7 | 60,4 | 7,1 | 15,6 | 4,3 | 4,25 | 2,10 | 17,98 | 30,96 | 0,289 | 0,224 | 0,224 | 0,220 |

## Flange design; normal and flat height



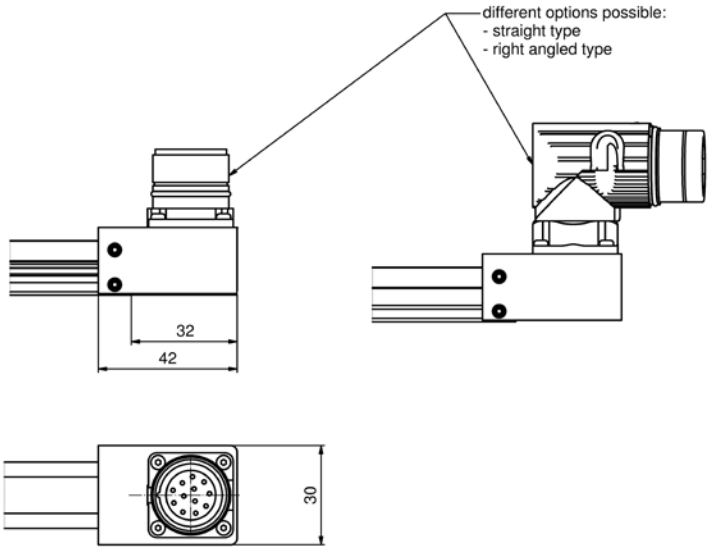

| Typ | | System mm | | | | | Carriage mm | | | | | | | | | | | | Load rating kN | | kNm | | | Mass kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| without ball chain | with ball chain | H | W | W2 | E | L | B | J | MQ | ih | I | L1 | H3 | L4 | T1 | N | T2 | L2 | L3 | C | C0 | MX | MY | MZ | Carriage |
| **Normal height** | | | | | | | | | | | | | | | | | | | | | | | | | |
| LGBXH20 FN | LGBCH20 FN | 30 | 63 | 21,5 | 4,5 | 119,3 | 53 | 40 | M 6 | 5,4 | 9,0 | 48,5 | 29,7 | 60,4 | 7,1 | 15,6 | 6,3 | 4,25 | 2,10 | 17,98 | 30,96 | 0,289 | 0,224 | 0,224 | 0,50 |
| LGBXH20 FL | LGBCH20 FL | 30 | 63 | 21,5 | 4,5 | 132,1 | 53 | 40 | M 6 | 5,4 | 9,0 | 61,3 | 29,7 | 60,4 | 7,1 | 15,6 | 6,3 | 4,25 | 2,10 | 23,30 | 40,11 | 0,376 | 0,366 | 0,366 | 0,56 |
| LGBXH20 FE | LGBCH20 FE | 30 | 63 | 21,5 | 4,5 | 147,3 | 53 | 40 | M 6 | 5,4 | 9,0 | 76,5 | 29,7 | 60,4 | 7,1 | 15,6 | 6,3 | 4,25 | 2,10 | 27,85 | 49,61 | 0,464 | 0,565 | 0,565 | 0,71 |
| **Flat** | | | | | | | | | | | | | | | | | | | | | | | | | |
| LGBXS20 FS | LGBCS20 FS | 28 | 59 | 19,5 | 4,5 | 98,3 | 49 | -- | M 6 | 5,4 | 7,0 | 27,5 | 29,7 | 60,4 | 5,1 | 15,6 | 4,3 | 4,25 | 2,10 | 9,25 | 15,93 | 0,148 | 0,066 | 0,066 | 0,28 |
| LGBXS20 FN | LGBCS20 FN | 28 | 59 | 19,5 | 4,5 | 119,3 | 49 | 32 | M 6 | 5,4 | 7,0 | 48,5 | 29,7 | 60,4 | 5,1 | 15,6 | 4,3 | 4,25 | 2,10 | 17,98 | 30,96 | 0,289 | 0,224 | 0,224 | 0,41 |

## Rail dimensions

| W1 | H1 | F | d | D | h | MR | t | Mass [kg/m] |
|---|---|---|---|---|---|---|---|---|
| 20 | 16,3 | 60 | 6 | 9,5 | 8,5 | M6 | 10 | 2,15 |

## End cap device

The end cap device should be attached to one end of the rail. It manages the energy and data link with the receiver.




*Mechanical dimensions*

## Sealing options

Linear guides are exposed to a variety of pollution types during operation. NTN-SNR linear guides can be combined with a multitude of sealing options to provide an optimal sealing system for various applications.

Here is an overview of the different options that are available.

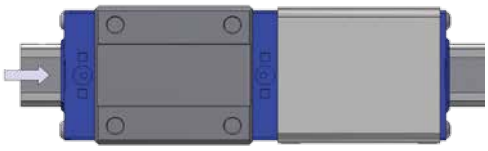
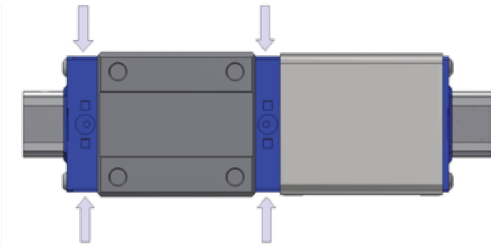
| Description | LGB | LGM | Sealing structure |
|---|---|---|---|
| SS | S | - | End seals on both sides, inner and side seals |
| AA | X | X | No sealing |
| UU | X | - | End seals on both sides |
| BB | X | S | End seals on both sides and side seals |
| EE | X | - | Double end seals on both sides, inner and side seals |
| FF | X | - | End seals on both sides, inner and side seals, scraper on both sides |
| GG | X | - | Double end seals on both sides, inner and side seals, scraper on both sides |
| ES | X | - | Double end seals on one side, inner and side seals |
| FS | X | - | End seals on both sides, inner and side seals, scraper on one side |
| GS | X | - | Double end seals on one side, inner and side seals, scraper on one side |
| VV | X | - | Double end seals on both sides, inner and side seals, MLS on both sides |
| WW | X | - | Double end seals on both sides, inner and side seals, scraper and MLS on both sides |
| LL | X | - | LFS on both sides |
| JJ | X | - | LFS on both sides and side seals |
| XX | X | - | Special sealing option (description of customer specification required) |

Depending on which sealing option is chosen the carriage length varies according to the following table.

| Size | Sealing option | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SS | UU | AA | BB | EE | FF | GG | VV | WW | LL | JJ |
| LGB_20_S | 98,3 | 98,3 | 98,3 | 98,3 | 105,3 | 99,5 | 107,7 | 118,3 | 120,7 | 98,3 | 98,3 |
| LGB_20_N | 119,3 | 119,3 | 119,3 | 119,3 | 126,3 | 120,5 | 128,7 | 139,3 | 141,7 | 119,3 | 119,3 |
| LGB_20_L | 132,1 | 132,1 | 132,1 | 132,1 | 139,1 | 133,3 | 141,5 | 152,1 | 154,5 | 132,1 | 132,1 |
| LGB_20_E | 147,3 | 147,3 | 147,3 | 147,3 | 154,3 | 148,5 | 156,7 | 167,3 | 169,7 | 147,3 | 147,3 |

# 6. Lubrication options

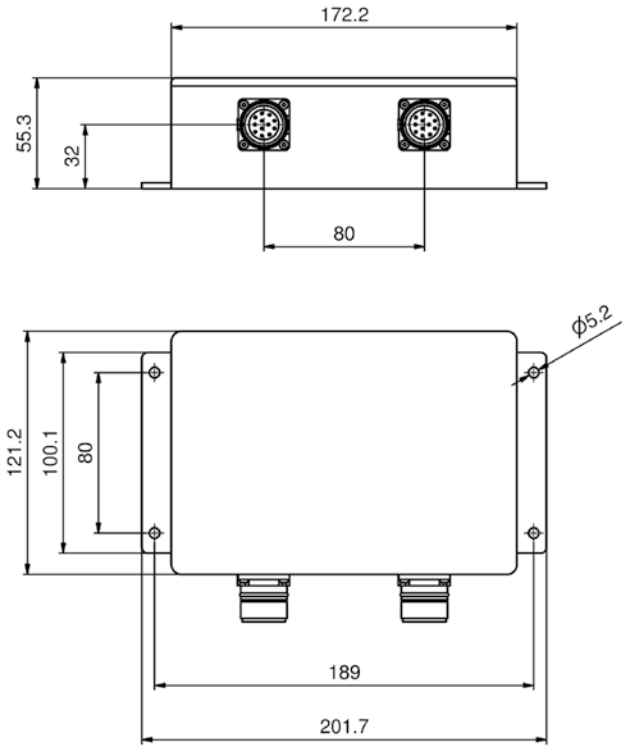
## Grease nipples, lubrication connections

| Installation postion | Grease nipple | | Lubrication connection |
|---|---|---|---|
|  | GRN-M6-8,0-z-0 | | LE-MQ-MqxL |
| | GRN-M6-12,0-z-0 | double seals,<br>double seals + Scraper | LS-MQ-Mq |
| | GRN-M6-5,5-k-45 | | LH-M6S-ØD |
| | GRN-M6-8,0-z-67 | | LH-M6A-ØD |
| | GRN-M6-12,0-z-67 | double seals + Scraper | |
| | GRN-M6-7,5-z-90 | | |
| | GRN-M6-12,0-z-90 | double seals + Scraper | |
|  | GRN-M6-5,0-z-0 | | LE-MQ-MqxL |
| | GRN-M6-5,5-k-45 | | LH-M6S-ØD |
| | GRN-M6-5,0-z-67 | | LH-M6A-ØD |
| | GRN-M6-5,5-k-90 | | |

*Lubrication adapter (Lubrication from the top side)*

## 7. Receiver dimensions

**The receiver module represents the interface between the measuring system/rail and a superior controlling unit or display. It is connected to both items by M23 connectors.**




*Dimensional Drawing*

# Conclusion

## The Wireless Measuring system from NTN-SNR offers new opportunities in your machine design.

By using the innovative wireless data transmission technology, restraining trailing cable installations and their junctions can be omitted. Therefore the overall construction can be carried out much more compact, while the measurement system can be integrated easily.

In addition, the high-precision low-power measuring system enables accurate positioning and meets modern system requirements.

Feel free to contact us at linear.motion@ntn-snr.com

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