

## HOOKS FOR BRACINGS

- Hooks, disks and tensioners for the construction of bracing systems
- Bracing rods are not supplied

## HOOK FOR BRACINGS

Spheroidal gusset GJS-400-18-LT

Hot dip galvanising 85 µm

| CODE    | rod | thread <sup>(1)</sup> | S <sub>plate</sub> |      | pcs |
|---------|-----|-----------------------|--------------------|------|-----|
|         |     |                       | [mm]               | [in] |     |
| ZVBDX10 | M10 | R                     | 8                  | 0.32 | 1   |
| ZVBSX10 | M10 | L                     | 8                  | 0.32 | 1   |
| ZVBDX12 | M12 | R                     | 10                 | 0.40 | 1   |
| ZVBSX12 | M12 | L                     | 10                 | 0.40 | 1   |
| ZVBDX16 | M16 | R                     | 15                 | 0.60 | 1   |
| ZVBSX16 | M16 | L                     | 15                 | 0.60 | 1   |
| ZVBDX20 | M20 | R                     | 18                 | 0.71 | 1   |
| ZVBSX20 | M20 | L                     | 18                 | 0.71 | 1   |
| ZVBDX24 | M24 | R                     | 20                 | 0.79 | 1   |
| ZVBSX24 | M24 | L                     | 20                 | 0.79 | 1   |
| ZVBDX30 | M30 | R                     | 25                 | 0.99 | 1   |
| ZVBSX30 | M30 | L                     | 25                 | 0.99 | 1   |

<sup>(1)</sup>R = right-hand thread | L = left-hand thread

Hook for M27 rod available upon request.

Cover for thread available upon request.



|     | HOOK |      |      |      | ROD  |      |      | PIN  |      | PLATE |      |                  |      |
|-----|------|------|------|------|------|------|------|------|------|-------|------|------------------|------|
|     | A    | E    | F    | H    | M    | VL   | L6   | Ø    | G    | S     | B    | J <sub>min</sub> | hole |
|     | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm]  | [mm] | [mm]             | [mm] |
| M10 | 9,2  | 17,5 | 23,0 | 29,0 | M10  | 16   | 28   | 10   | 32,3 | 8     | 20   | 35               | 11   |
| M12 | 11,2 | 21,0 | 27,2 | 35,4 | M12  | 18   | 32   | 12   | 38,4 | 10    | 23   | 41               | 13   |
| M16 | 16,4 | 27,5 | 38,5 | 45,6 | M16  | 22   | 42   | 16   | 48,4 | 15    | 31   | 52               | 17   |
| M20 | 19,6 | 35,0 | 46,5 | 56,0 | M20  | 28   | 51   | 20   | 59,9 | 18    | 37   | 62               | 21   |
| M24 | 21,8 | 42,0 | 54,5 | 69,0 | M24  | 36   | 63   | 24   | 67,8 | 20    | 45   | 75               | 25   |
| M30 | 27,0 | 52,5 | 67,6 | 86,0 | M30  | 44   | 78   | 30   | 82,1 | 25    | 56   | 93               | 31   |

# DISK FOR BRACINGS

S355 carbon steel

Hot dip galvanising 85 µm

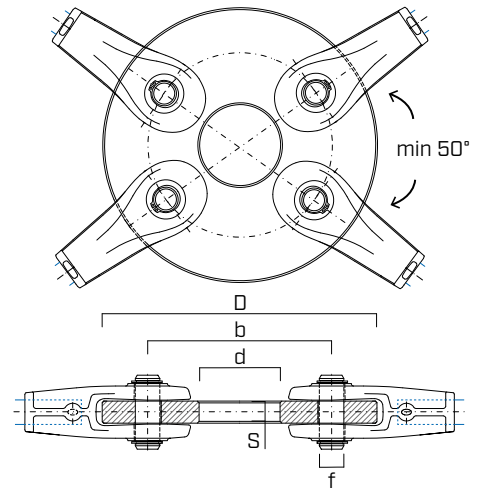
| CODE      | hook | no. holes <sup>(1)</sup><br>[pcs] | pcs |
|-----------|------|-----------------------------------|-----|
| ZVBDISC10 | M10  | 2                                 | 1   |
| ZVBDISC12 | M12  | 2                                 | 1   |
| ZVBDISC16 | M16  | 2                                 | 1   |
| ZVBDISC20 | M20  | 2                                 | 1   |
| ZVBDISC24 | M24  | 2                                 | 1   |
| ZVBDISC30 | M30  | 2                                 | 1   |

<sup>(1)</sup>Depending on the number of hooks converging on the disk, additional holes must be provided with diameter suitable to accommodate the joining pin.

Disk for M27 hook available upon request.

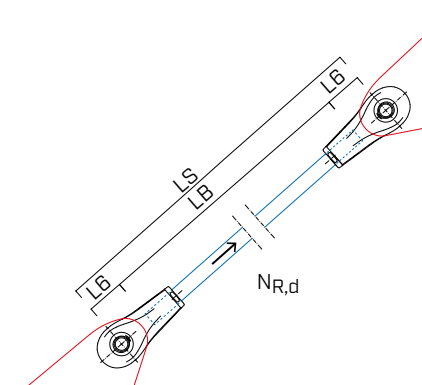
|            | D<br>[mm] | d<br>[mm] | b<br>[mm] | S<br>[mm] | f<br>[mm] |
|------------|-----------|-----------|-----------|-----------|-----------|
| <b>M10</b> | 118       | 36        | 78        | 8         | 11        |
| <b>M12</b> | 140       | 42        | 94        | 10        | 13        |
| <b>M16</b> | 184       | 54        | 122       | 15        | 17        |
| <b>M20</b> | 224       | 66        | 150       | 18        | 21        |
| <b>M24</b> | 264       | 78        | 178       | 20        | 25        |
| <b>M30</b> | 334       | 98        | 222       | 25        | 31        |

f = hole diameter to join disk and hook.



## STRUCTURAL VALUES - TENSILE STRENGTH

$N_{R,d}$  FOR DIFFERENT ROD - HOOK - DISK - JOINING PLATE COMBINATIONS



— Rod  
— Hook  
— Plate

LS = system length

LB = rod length = LS - 2 · L6

| hook for<br>Rothoblaas<br>bracings | disk for Rothoblaas<br>bracings | steel rod<br>$f_{y,k}$ [N/mm <sup>2</sup> ] | joining plate<br>steel <sup>(1)</sup> | $N_{R,d}$<br>[kN] |      |      |      |      |     |
|------------------------------------|---------------------------------|---------------------------------------------|---------------------------------------|-------------------|------|------|------|------|-----|
|                                    |                                 |                                             |                                       | M10               | M12  | M16  | M20  | M24  | M30 |
| GJS-400-18-LT                      | S355                            | 540                                         | S355                                  | 31,0              | 43,7 | 81,4 | 127  | 183  | 291 |
|                                    |                                 | 540                                         | S235                                  | 25,6              | 38,5 | 76,9 | 110  | 148  | 230 |
|                                    |                                 | 355                                         | S235                                  | 19,6              | 28,5 | 53,1 | 82,9 | 120  | 190 |
|                                    |                                 | 235                                         | S235                                  | 15,0              | 21,9 | 40,7 | 63,5 | 91,5 | 145 |

<sup>(1)</sup>The plate connecting the bracing system to the main structure needs to be dimensioned case by case, hence it cannot be provided by Rothoblaas.

### GENERAL PRINCIPLES

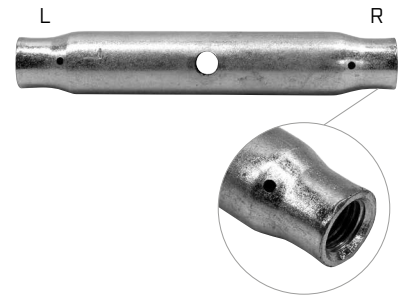
- Design values are consistent with EN 1993.
- The rod shall be dimensioned case by case.
- Dimensioning and verification of the connection between the bracing system and the main structure has to be carried out separately.

## TENSIONER WITH INSPECTION HOLE

S355 bright zinc plated carbon steel  
DIN 1478

| CODE        | rod | length |         | pcs |
|-------------|-----|--------|---------|-----|
|             |     | [mm]   | [in]    |     |
| ZVBTEN12    | M12 | 125    | 4 15/16 | 1   |
| ZVBTEN16    | M16 | 170    | 6 3/4   | 1   |
| ZVBTEN20    | M20 | 200    | 8       | 1   |
| ZVBTEN24    | M24 | 255    | 10 1/16 | 1   |
| ZVBTEN27(*) | M27 | 255    | 10 1/16 | 1   |
| ZVBTEN30    | M30 | 255    | 10 1/16 | 1   |

(\*) Value not included in DIN 1478.

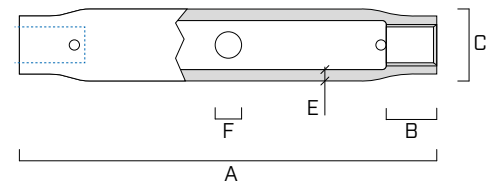


R = right-hand thread  
L = left-hand thread

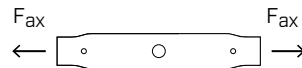
## GEOMETRY OF THE TENSIONER ACCORDING TO DIN 1478

|        | C    | A    | B    | E    | F    |
|--------|------|------|------|------|------|
|        | [mm] | [mm] | [mm] | [mm] | [mm] |
| M12    | 25   | 125  | 15   | 4,0  | 10   |
| M16    | 30   | 170  | 20   | 4,5  | 10   |
| M20    | 33,7 | 200  | 24   | 5,0  | 12   |
| M24    | 42,4 | 255  | 29   | 5,6  | 12   |
| M27(*) | 42,4 | 255  | 40   | 5,6  | 12   |
| M30    | 51   | 255  | 36   | 6,3  | 16   |

(\*) Size not included in DIN 1478.



## STRUCTURAL VALUES | TENSILE STRENGTH



|                   |      | M12  | M16  | M20   | M24   | M27   | M30   |
|-------------------|------|------|------|-------|-------|-------|-------|
| N <sub>ax,k</sub> | [kN] | 65,3 | 96,0 | 117,4 | 182,1 | 182,1 | 242,5 |

### GENERAL PRINCIPLES

- The characteristic values  $R_{ax,k}$  are according to EN 1993.
- Design values can be obtained from characteristic values as follows:

$$R_{ax,d} = \frac{R_{ax,k}}{\gamma_{M0}}$$

The coefficient  $\gamma_{M0}$  should be taken according to the current regulations used for the calculation.