

# Festoon Systems for C-Rails

Program 0240



**CONDUCTIX**  
wampfler

DELACHAUX GROUP

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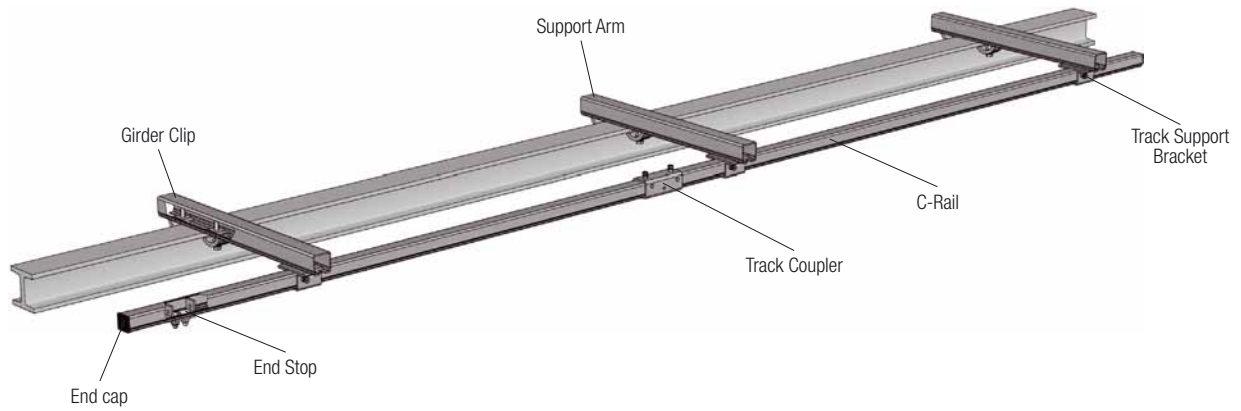
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## Helpful Hints

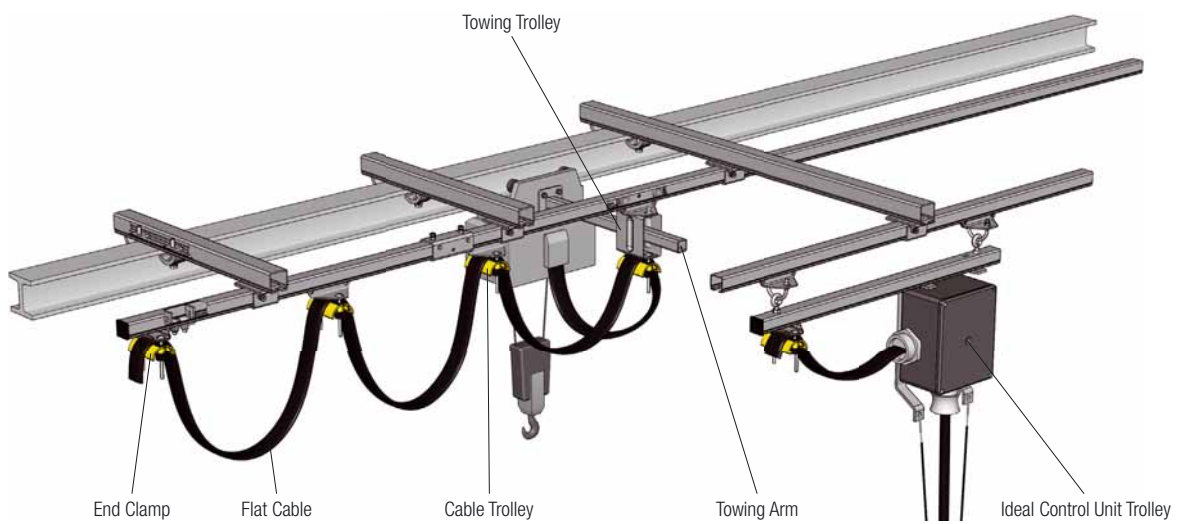
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# System Arrangement Program 0240

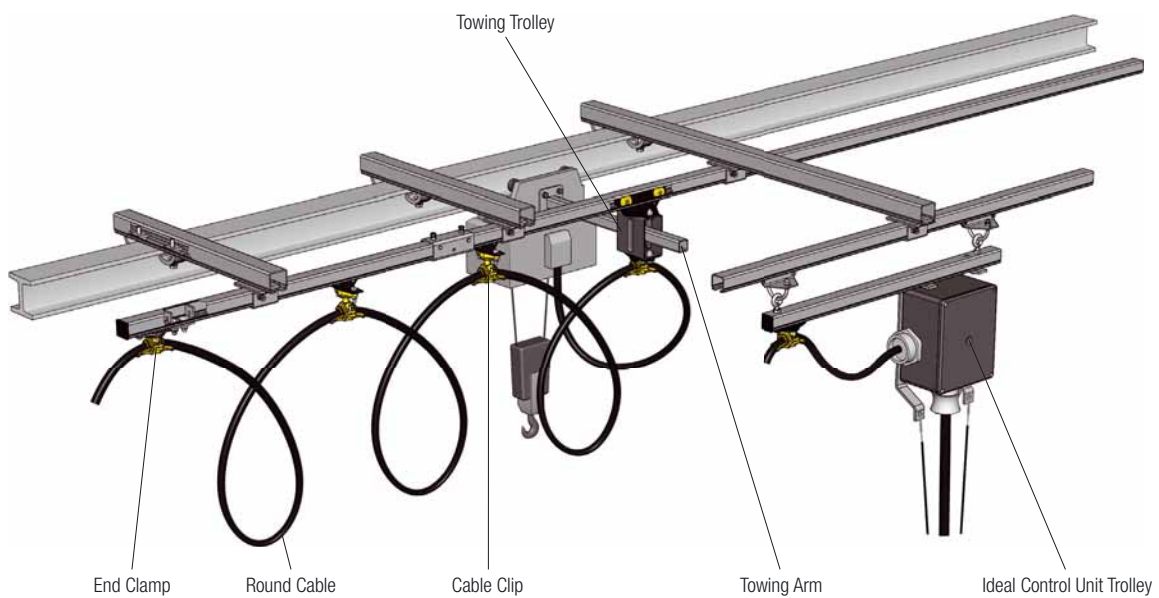
## Rails and Mounting Parts



## Festoon Systems for Flat Cables

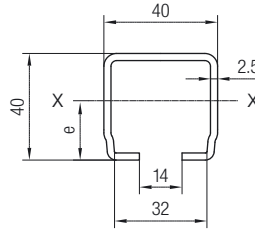


## Festoon Systems for Round Cable



# C-Rails and Accessories Program 0240

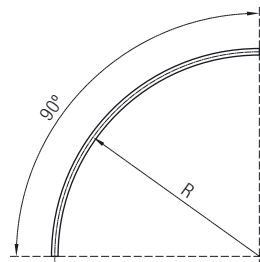
## C-Rails



| Order No. | Material                   | Length<br>[mm] | Thickness<br>s<br>[mm] | $I_x$<br>[cm <sup>4</sup> ] | Static Values<br>$W_x$<br>[cm <sup>3</sup> ] | e<br>[mm] | Weight<br>[kg/m] |
|-----------|----------------------------|----------------|------------------------|-----------------------------|--|-----------|------------------|
| 024100-6  | sendzimir galvanized steel | 6000           | 2.5                    | 6.74                        | 3.08   | 21.6      | 2.5              |
| 024100-4  |                            | 4000           |                        |                             |  |           |                  |
| 024104-6  | stainless steel V2A 1.4301 | 6000           | 2.5                    | 6.74                        | 3.08   | 21.6      | 2.5              |
| 024104-4  |                            | 4000           |                        |                             |  |           |                  |
| 024109-6  | stainless steel V4A 1.4571 | 6000           | 2.5                    | 6.74                        | 3.08   | 21.6      | 2.5              |
| 024109-4  |                            | 4000           |                        |                             |  |           |                  |

Other lengths on request

## 90°- Curves

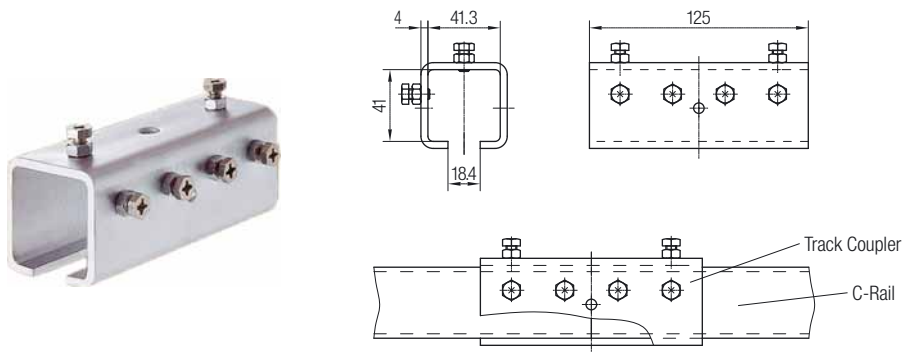


| Order No.    | Material                         | R<br>[mm] | Developed<br>Length<br>[mm] | Loop<br>Depth<br>max. 0.35 x R<br>[mm] | for max.<br>Trolley<br>Length<br>[mm] | Weight<br>[kg] |
|--------------|----------------------------------|-----------|-----------------------------|--|---------------------------------------|----------------|
| 024102-01000 | sendzimir<br>galvanized<br>steel | 1000      | 1570                        | 350                                    | 160                                   | 3.9            |
| 024102-01200 |                                  | 1200      | 1885                        | 420                                    | 160                                   | 4.7            |
| 024102-01400 |                                  | 1400      | 2200                        | 490                                    | 200                                   | 5.5            |
| 024102-01600 |                                  | 1600      | 2510                        | 560                                    | 200                                   | 6.3            |
| 024102-01800 |                                  | 1800      | 2830                        | 630                                    | 280                                   | 7.1            |
| 024102-02000 |                                  | 2000      | 3140                        | 700                                    | 280                                   | 7.9            |
| 024108-01000 | stainless steel V2A<br>1.4301    | 1000      | 1570                        | 350                                    | 160                                   | 3.9            |
| 024108-01200 |                                  | 1200      | 1885                        | 420                                    | 160                                   | 4.7            |
| 024108-01400 |                                  | 1400      | 2200                        | 490                                    | 200                                   | 5.5            |
| 024108-01600 |                                  | 1600      | 2510                        | 560                                    | 200                                   | 6.3            |
| 024108-01800 |                                  | 1800      | 2830                        | 630                                    | 280                                   | 7.1            |
| 024108-02000 |                                  | 2000      | 3140                        | 700                                    | 280                                   | 7.9            |
| 024115-01000 | stainless steel V4A<br>1.4571    | 1000      | 1570                        | 350                                    | 160                                   | 3.9            |
| 024115-01200 |                                  | 1200      | 1885                        | 420                                    | 160                                   | 4.7            |
| 024115-01400 |                                  | 1400      | 2200                        | 490                                    | 200                                   | 5.5            |
| 024115-01600 |                                  | 1600      | 2510                        | 560                                    | 200                                   | 6.3            |
| 024115-01800 |                                  | 1800      | 2830                        | 630                                    | 280                                   | 7.1            |
| 024115-02000 |                                  | 2000      | 3140                        | 700                                    | 280                                   | 7.9            |

Other lengths on request

# C-Rails and Accessories Program 0240

## Track Couplers

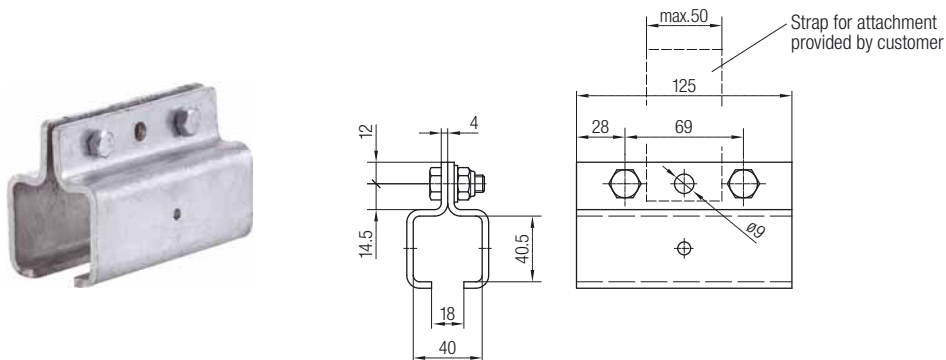


| Order No. | Material            | Weight [kg] |
|-----------|---------------------|-------------|
| 024105    | galvanized steel    | 0.610       |
| 024186    | stainless steel V4A | 0.610       |

### Note

A track coupler must be provided at each track joint.

## Track Couplers, Two-Piece

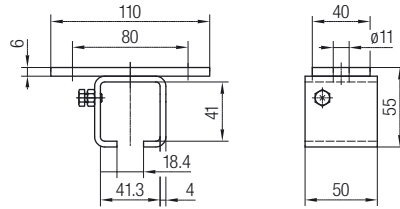


| Order No. | Material            | Weight [kg] |
|-----------|---------------------|-------------|
| 024106    | galvanized steel    | 0.790       |
| 024188    | stainless steel V4A | 0.790       |

# C-Rails and Accessories

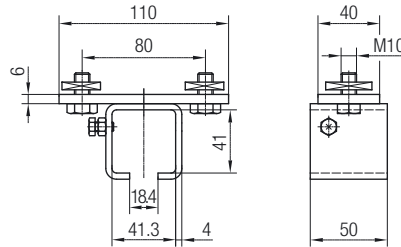
## Program 0240

### Track Support Bracket, One-Piece, for Ceiling Attachment



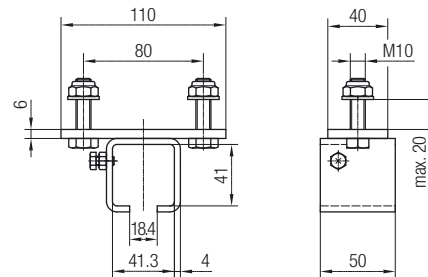
| Order No. | Material            | Perm. Load [kg] | Weight [kg] |
|-----------|---------------------|-----------------|-------------|
| 024121    | galvanized steel    | 250             | 0.360       |
| 024191    | stainless steel V4A | 250             | 0.360       |

### Track Support Bracket, One-Piece, with Square Nut for Attachment to Support Arms



| Order No. | Material            | Suitable for support arm type | Perm. Load [kg] | Weight [kg] |
|-----------|---------------------|-------------------------------|-----------------|-------------|
| 024122    | galvanized steel    | 020186, 020276                | 250             | 0.450       |
| 024192    | stainless steel V4A | 020485, 020488                | 250             | 0.450       |

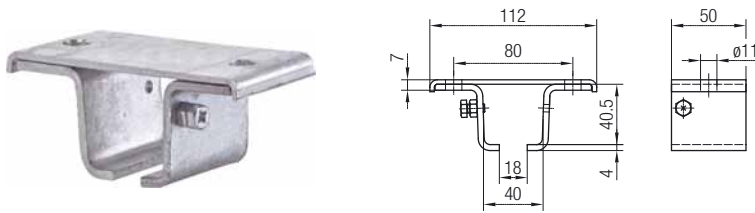
### Track Support Bracket, One-Piece, for Attachment to Existing Steel Structure



| Order No. | Material            | Perm. Load [kg] | Weight [kg] |
|-----------|---------------------|-----------------|-------------|
| 024123    | galvanized steel    | 250             | 0.470       |
| 024193    | stainless steel V4A | 250             | 0.470       |

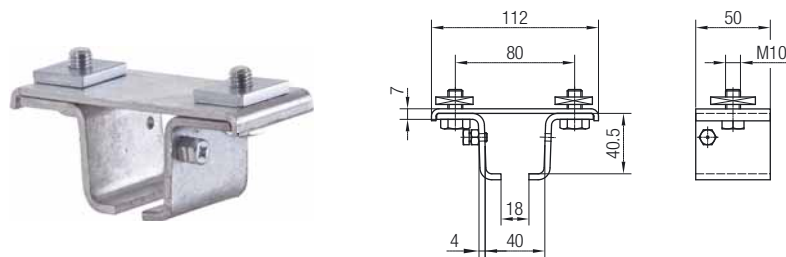
# C-Rails and Accessories Program 0240

## Track Support Brackets, Three-Piece, for Ceiling Attachment



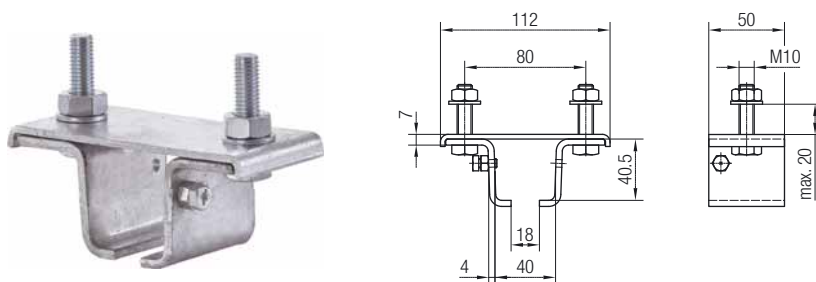
| Order No. | Type                  | Material            | Perm. Load [kg] | Weight [kg] |
|-----------|-----------------------|---------------------|-----------------|-------------|
| 024152    | without locking screw | galvanized steel    | 100             | 0.350       |
| 024153    | with locking screw    |                     |                 | 0.360       |
| 024172    | without locking screw | stainless steel V4A | 100             | 0.350       |
| 024173    | with locking screw    |                     |                 | 0.360       |

## Track Support Brackets, Three-Piece, with Square Nut for Attachment to Support Arms



| Order No. | Type                  | Material            | Suitable for Support Arm Type | Perm. Load [kg] | Weight [kg] |
|-----------|-----------------------|---------------------|-------------------------------|-----------------|-------------|
| 024154    | without locking screw | galvanized steel    | 020186, 020276                | 100             | 0.440       |
| 024155    | with locking screw    |                     |                               |                 | 0.450       |
| 024174    | without locking screw | stainless steel V4A | 020485, 020488                | 100             | 0.440       |
| 024175    | with locking screw    |                     |                               |                 | 0.450       |

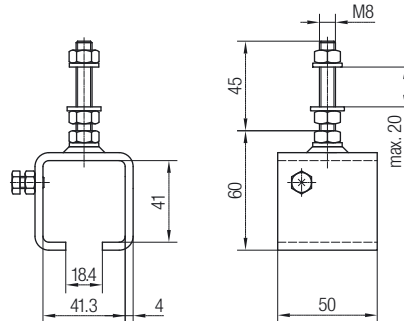
## Track Support Brackets, Three-Piece, for Attachment to the Existing Steel Structure



| Order No. | Type                  | Material            | Perm. Load [kg] | Weight [kg] |
|-----------|-----------------------|---------------------|-----------------|-------------|
| 024156    | without locking screw | galvanized steel    | 100             | 0.460       |
| 024157    | with locking screw    |                     |                 | 0.470       |
| 024176    | without locking screw | stainless steel V4A | 100             | 0.460       |
| 024177    | with locking screw    |                     |                 | 0.470       |

# C-Rails and Accessories Program 0240

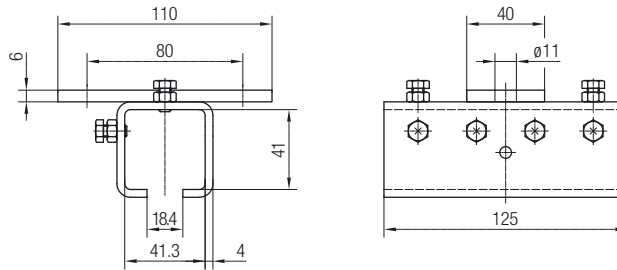
## Track Support Bracket for Attachment to the Existing Steel Structure



### Order No. 024125

- Material: galvanized steel
- Perm. Load: 100 kg
- Weight: 0.320 kg

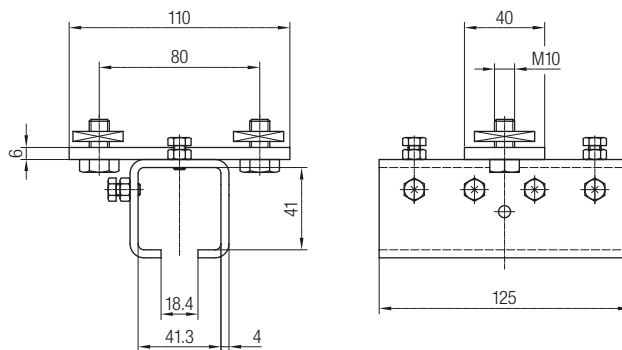
## Track Support Bracket and Coupler, One-Piece, for Ceiling Attachment



### Order No. 024141

- Material: galvanized steel
- Perm. Load: 250 kg
- Weight: 0.660 kg

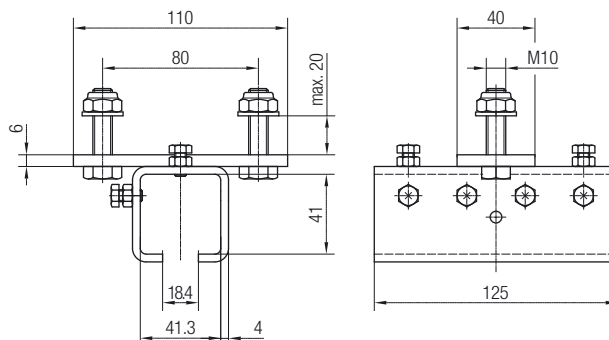
## Track Support Bracket and Coupler, One-Piece with Square Nut for Attachment to Support Arms



### Order No. 024142

- Material: galvanized steel
- Perm. Load: 250 kg
- Suitable for support arm type: 020186 and 020276
- Weight: 0.750 kg

## Track Support Bracket and Coupler, One-Piece for Attachment to the Existing Steel Structure

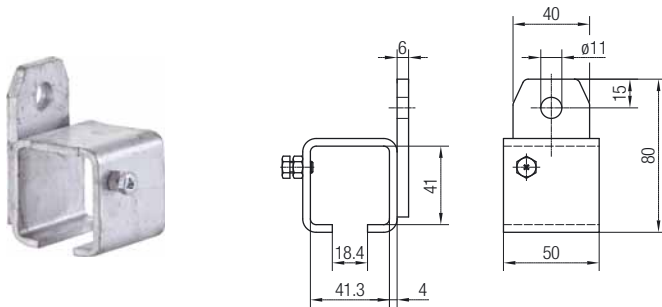


### Order No. 024143

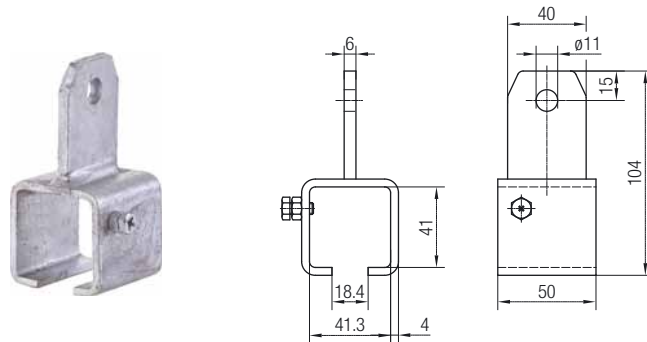
- Material: galvanized steel
- Perm. Load: 250 kg
- Weight: 0.770 kg

# C-Rails and Accessories Program 0240

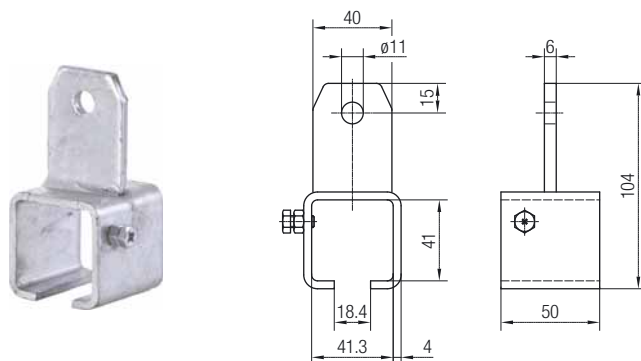
## Track Support Brackets for Attachment to the Existing Steel Structure



| Order No. | Material            | Perm. Load [kg] | Weight [kg] |
|-----------|---------------------|-----------------|-------------|
| 024130    | galvanized steel    | 100             | 0.320       |
| 024182    | stainless steel V4A | 100             | 0.320       |



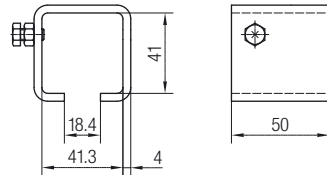
| Order No. | Material            | Perm. Load [kg] | Weight [kg] |
|-----------|---------------------|-----------------|-------------|
| 024131    | galvanized steel    | 250             | 0.300       |
| 024197    | stainless steel V4A | 250             | 0.300       |



| Order No. | Material            | Perm. Load [kg] | Weight [kg] |
|-----------|---------------------|-----------------|-------------|
| 024132    | galvanized steel    | 250             | 0.300       |
| 024198    | stainless steel V4A | 250             | 0.300       |

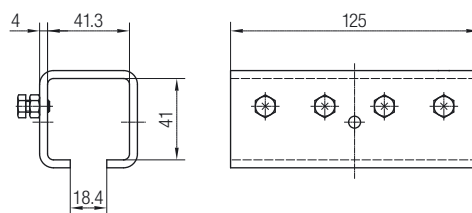
# C-Rails and Accessories Program 0240

## Track Support Bracket, bare to weld on



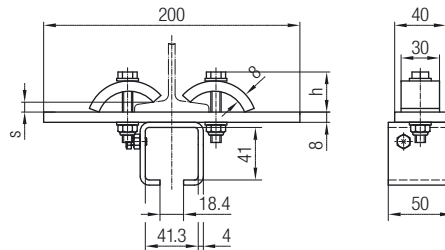
- Order No. 024120**
- Material: bare steel
  - Weight: 0.220 kg

## Track Support Bracket and Coupler, bare to weld on

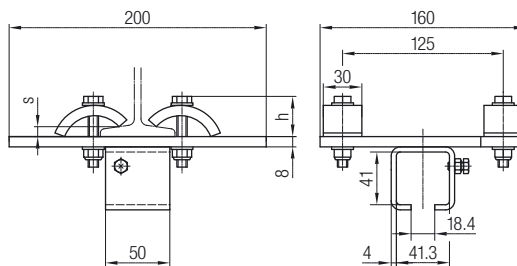


- Order No. 024140**
- Material: bare steel
  - Weight: 0.600 kg

## Track Support Bracket for Direct Attachment below I-Beams



- Order No. 024124**
- Material: galvanized steel
  - Perm. Load: 160 kg
  - for flange widths 40 - 103 mm
  - Weight: 0.800 kg

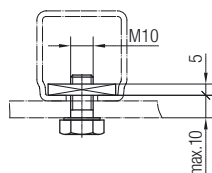


- Order No. 024128**
- Material: galvanized steel
  - Perm. Load: 250 kg
  - for flange widths 40 - 103 mm
  - Weight: 2.820 kg

|                         |   |   |   |    |    |    |    |
|-------------------------|---|---|---|----|----|----|----|
| Flange Thickness s [mm] | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
|-------------------------|---|---|---|----|----|----|----|

|                        |    |    |    |    |    |    |    |
|------------------------|----|----|----|----|----|----|----|
| Mounting Height h [mm] | 31 | 32 | 33 | 34 | 35 | 37 | 40 |
|------------------------|----|----|----|----|----|----|----|

## Bolt Complete



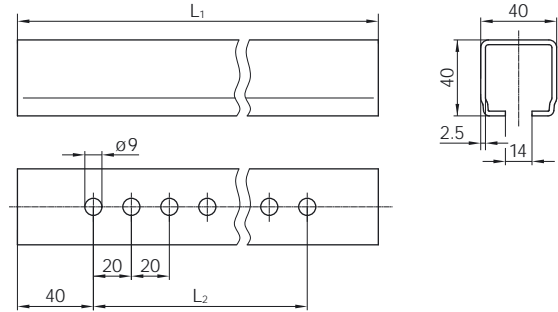
| Order No.     | Packing Unit [St.] | Material            | Weight [kg] |
|---------------|--------------------|---------------------|-------------|
| 020176-10x20P | 20                 | galvanized steel    | 0.900       |
| 020476-10x20P | 20                 | stainless steel V4A | 0.900       |

Design in stainless steel V4A

# C-Rails and Accessories

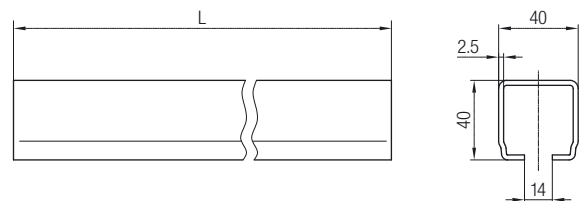
## Program 0240

### Support Arms 40 x 40 x 2.5 - punched



| Order No.   | L <sub>1</sub><br>[mm] | L <sub>2</sub><br>[mm] | Material                      | Weight<br>[kg] |
|-------------|------------------------|------------------------|-------------------------------|----------------|
| 020186-0250 | 250                    | 200                    | sendzimir<br>galvanized steel | 0.625          |
| 020186-0315 | 315                    | 260                    |                               | 0.785          |
| 020186-0400 | 400                    | 340                    |                               | 1.000          |
| 020186-0500 | 500                    | 340                    |                               | 1.250          |
| 020186-0630 | 630                    | 340                    |                               | 1.575          |
| 020186-0800 | 800                    | 340                    |                               | 2.000          |
| 020186-1000 | 1000                   | 340                    |                               | 2.500          |
| 020186-1250 | 1250                   | 340                    |                               | 3.125          |
| 020488-0400 | 400                    | 340                    | stainless steel<br>V4A 1.4571 | 1.000          |
| 020488-0500 | 500                    | 340                    |                               | 1.250          |
| 020488-0630 | 630                    | 340                    |                               | 1.575          |
| 020488-0800 | 800                    | 340                    |                               | 2.000          |
| 020488-1000 | 1000                   | 340                    |                               | 2.500          |
| 020488-1250 | 1250                   | 340                    |                               | 3.125          |

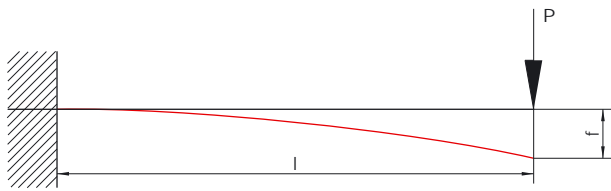
### Support Arms 40 x 40 x 2.5 - unpunched



| Order No.   | L<br>[mm] | Material                      | Weight<br>[kg] |
|-------------|-----------|-------------------------------|----------------|
| 020276-0450 | 450       | sendzimir<br>galvanized steel | 1.125          |
| 020276-0550 | 550       |                               | 1.375          |
| 020276-0650 | 650       |                               | 1.625          |
| 020276-0840 | 840       |                               | 2.100          |
| 020276-0950 | 950       |                               | 2.375          |
| 020276-1000 | 1000      |                               | 2.500          |
| 020276-1150 | 1150      |                               | 2.875          |
| 020276-1340 | 1340      |                               | 3.350          |
| 020276-1520 | 1520      |                               | 3.800          |
| 020276-1800 | 1800      |                               | 4.500          |
| 020276-2000 | 2000      |                               | 5.000          |

# C-Rails and Accessories Program 0240

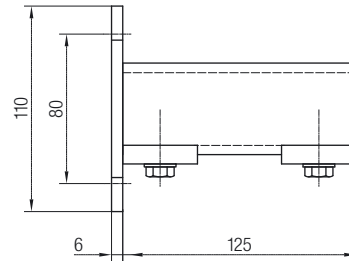
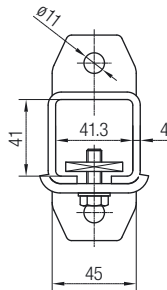
## Permissible Load for Support Arms



- Note
- calculated with  $\sigma = 140 \text{ N/mm}^2$  tension
  - f = appropriate max. resulting deflection

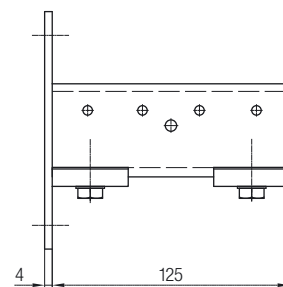
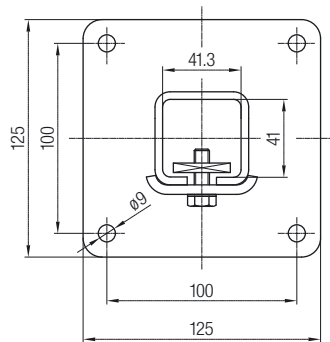
|                       |        | l [m] |       |      |      |      |      |      |      |      |
|-----------------------|--------|-------|-------|------|------|------|------|------|------|------|
|                       |        | 0.25  | 0.40  | 0.50 | 0.65 | 0.80 | 1.00 | 1.25 | 1.52 | 2.00 |
| Support Arm 40x40x2.5 | P [kg] | 164.5 | 103.0 | 82.0 | 63.0 | 51.5 | 41.0 | 33.0 | 27.0 | 20.5 |
|                       | f [cm] | 0.07  | 0.20  | 0.30 | 0.45 | 0.70 | 1.10 | 1.70 | 2.50 | 4.30 |

## Bracket for Support Arms 40x40x2.5 to be bolted with 2-Hole Connecting Plate



| Order No. | Material         | Suitable for Support Arm | Weight [kg] |
|-----------|------------------|--------------------------|-------------|
| 020282    | galvanized steel | 020186, 020276           | 1.000       |

## Bracket for Support Arms 40x40x2.5 to be bolted with 4-Hole Connecting Plate

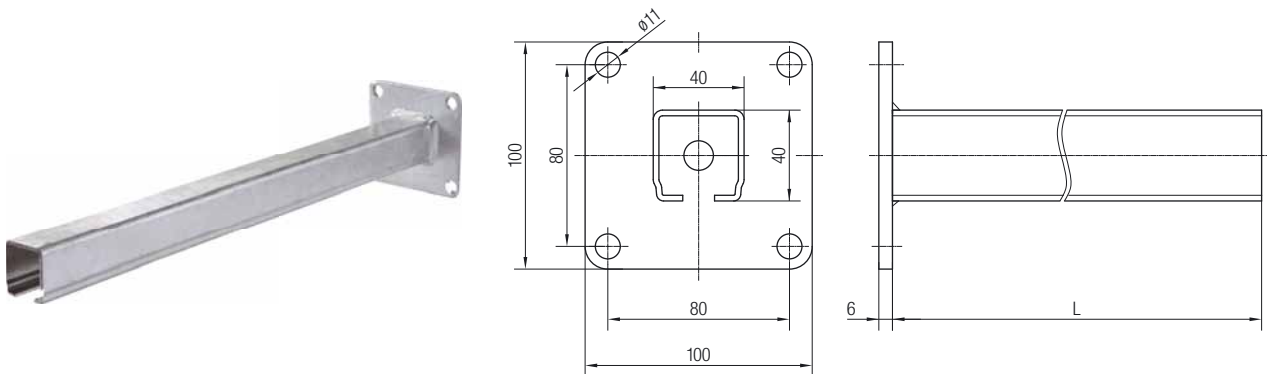


| Order No. | Material         | Suitable for Support Arm | Weight [kg] |
|-----------|------------------|--------------------------|-------------|
| 020284    | galvanized steel | 020186, 020276           | 1.300       |

# C-Rails and Accessories

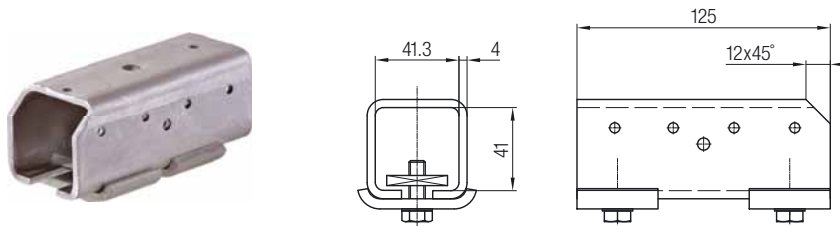
## Program 0240

Console Brackets to be bolted with 4-Hole Connecting Plate



| Order No.   | Material         | L [mm] | Weight [kg] |
|-------------|------------------|--------|-------------|
| 020206-0500 | galvanized steel | 500    | 1.700       |
| 020206-0630 |                  | 630    | 2.000       |
| 020206-0800 |                  | 800    | 2.450       |
| 020206-1000 |                  | 1000   | 2.800       |

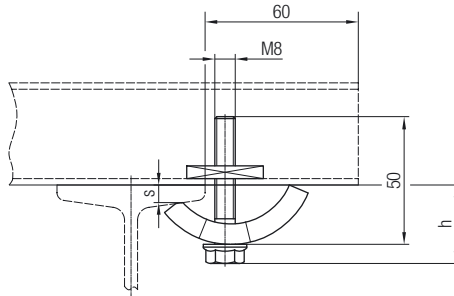
Brackets, bare to be welded



| Order No. | Bracket    | Material<br>Fasteners | Suitable for<br>Support Arm | Weight [kg] |
|-----------|------------|-----------------------|-----------------------------|-------------|
| 020286    | bare steel | galvanized steel      | 020186, 020276              | 0.730       |

# C-Rails and Accessories Program 0240

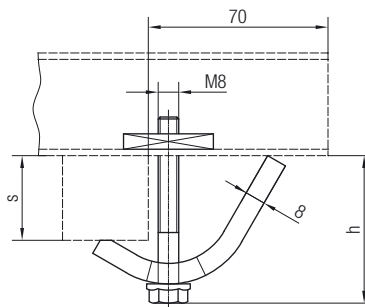
## Girder Clips, Clamping Thickness 4 - 20 mm



| Order No. | Material            | Weight [kg] |
|-----------|---------------------|-------------|
| 020180-08 | galvanized steel    | 0.150       |
| 020480-08 | stainless steel V4A | 0.150       |

| Clamping Thickness s [mm] | 4  | 6  | 8  | 10 | 12 | 16 | 20 |
|---------------------------|----|----|----|----|----|----|----|
| Mounting Height h [mm]    | 31 | 32 | 33 | 34 | 35 | 37 | 40 |

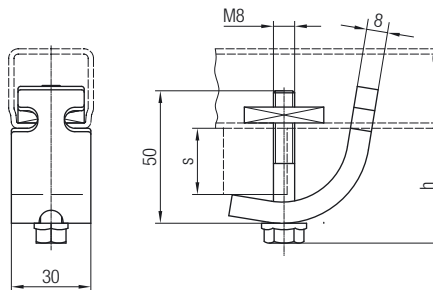
## Girder Clips, Clamping Thickness 18 - 36 mm



| Order No.    | Material            | Weight [kg] |
|--------------|---------------------|-------------|
| 020180-08x36 | galvanized steel    | 0.220       |
| 020480-08x36 | stainless steel V4A | 0.220       |

| Clamping Thickness s [mm] | 18-20 | 20-24 | 24-28 | 28-32 | 32-36 |
|---------------------------|-------|-------|-------|-------|-------|
| Mounting Height h [mm]    | 42-44 | 44-48 | 48-52 | 52-56 | 56-60 |

## Girder Clips, Twist-Secured, Clamping Thickness 6 - 25 mm



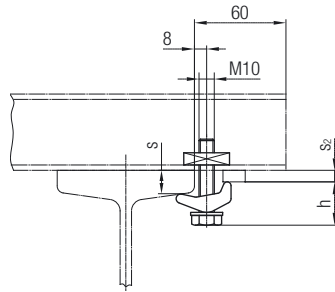
| Order No. | Material         | Weight [kg] |
|-----------|------------------|-------------|
| 020181-08 | galvanized steel | 0.190       |

| Clamping Thickness s [mm] | 06 - 25 |
|---------------------------|---------|
| Mounting Height h [mm]    | 32 - 40 |

Design in stainless steel V4A

# C-Rails and Accessories Program 0240

## Girder Clips, Reinforced Type, Clamping Thickness 6 - 21 mm

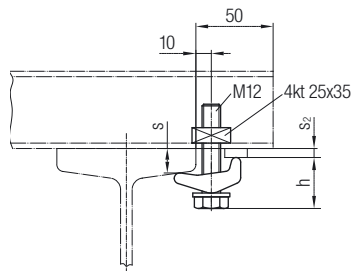


| Order No. | Material         | Weight [kg] |
|-----------|------------------|-------------|
| 020180-10 | galvanized steel | 0.170       |

| Clamping Thickness s [mm]                        | 6 - 14  | 11 - 16 | 16 - 21 |
|--|---------|---------|---------|
| Mounting Height h [mm]                           | 35 - 41 | 41 - 46 | 46 - 51 |
| Clamping Piece <sup>1)</sup> s <sub>2</sub> [mm] | -       | 5       | 10      |

1) is not included with the girder clips

## Girder Clips, Reinforced Type, Clamping Thickness 6 - 30 mm



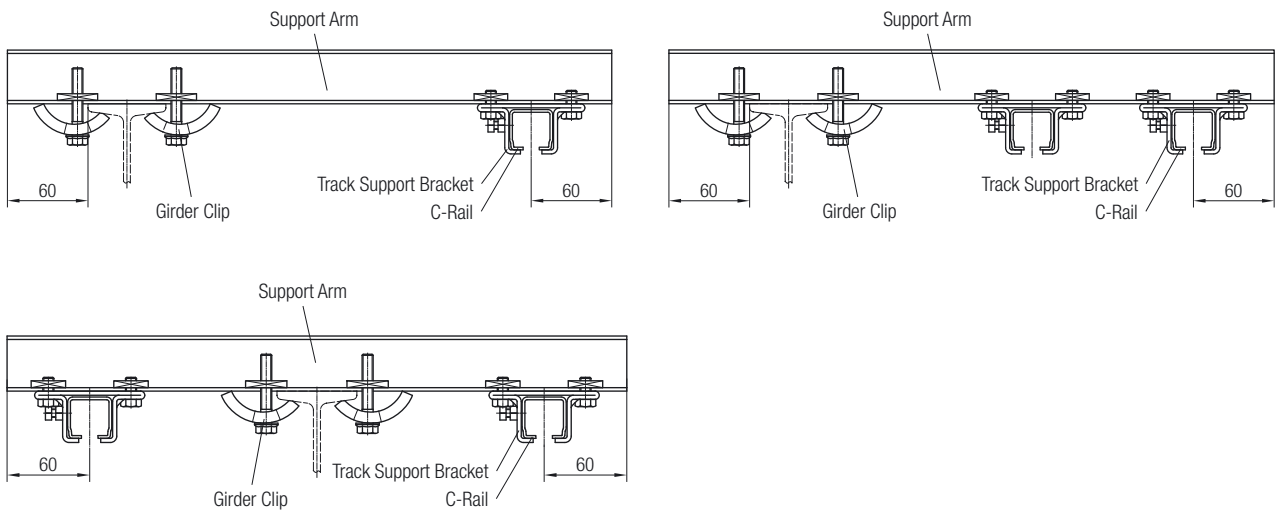
| Order No. | Material         | Weight [kg] |
|-----------|------------------|-------------|
| 020180-12 | galvanized steel | 0.220       |

| Clamping Thickness s [mm]                        | 6 - 14  | 14 - 22 | 22 - 30 |
|--|---------|---------|---------|
| Mounting Height h [mm]                           | 39 - 47 | 47 - 55 | 55 - 63 |
| Clamping Piece <sup>1)</sup> s <sub>2</sub> [mm] | -       | 8       | 16      |

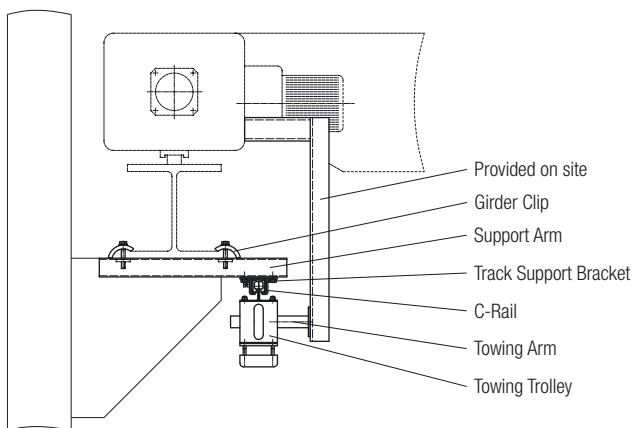
1) is not included with the girder clips

# C-Rails and Accessories Program 0240

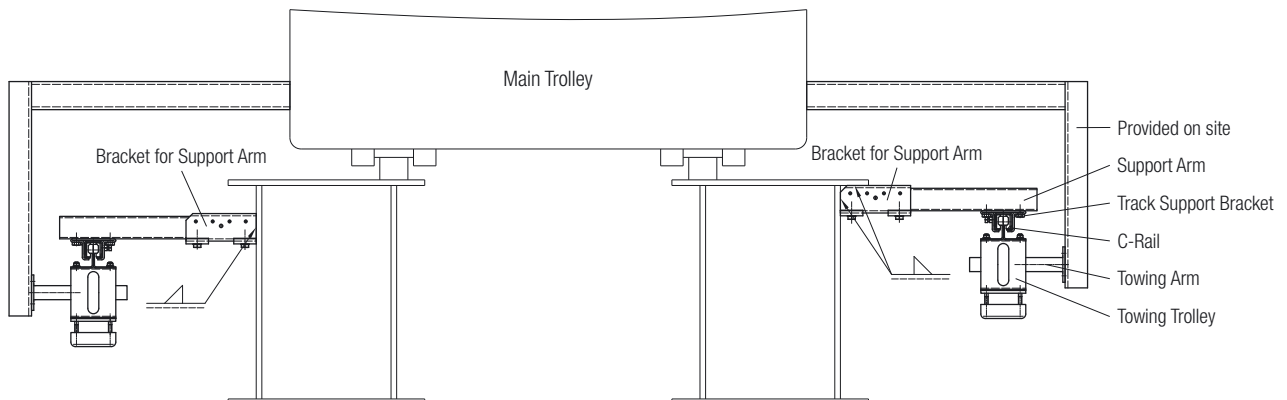
## Application Examples for Support Arm and C-Rail Fastening with Support Arms – unpunched



## Application Examples for Support Arm and C-Rail Fastening with Support Arms – punched

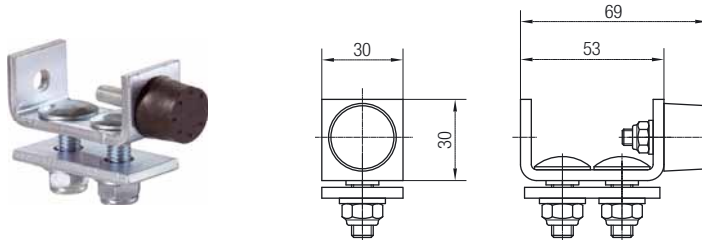


## Application Example for Support Arm and C-Rail Fastening with Welded Brackets



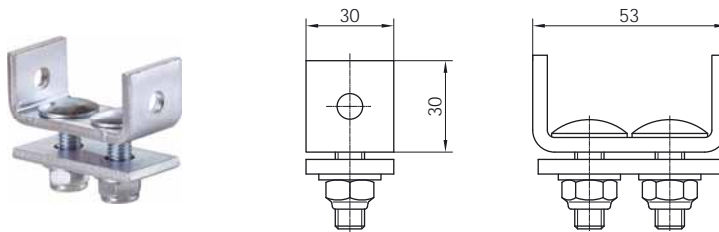
# C-Rails and Accessories Program 0240

## End Stop with Rubber Buffer



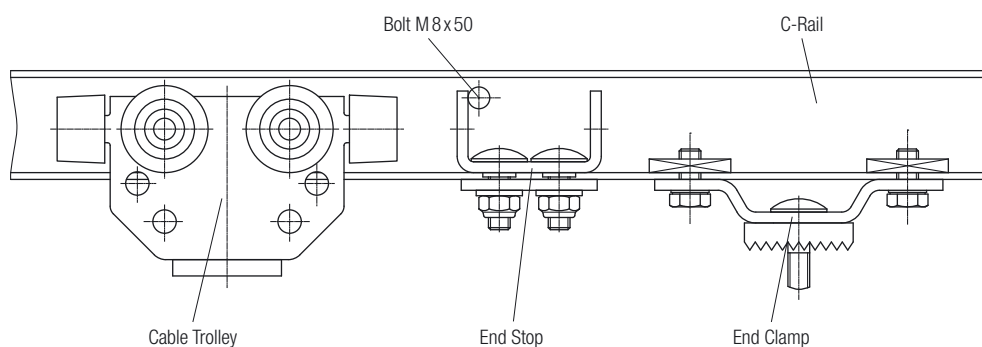
| Order No. | Material                        | Weight [kg] |
|-----------|---------------------------------|-------------|
| 024111    | galvanized steel; rubber buffer | 0.190       |
| 024181    | stainless steel V4A             | 0.190       |

## End Stop without Rubber Buffer



| Order No. | Material            | Weight [kg] |
|-----------|---------------------|-------------|
| 024110    | galvanized steel    | 0.160       |
| 024180    | stainless steel V4A | 0.160       |

## Application Example for End Stop Assembly

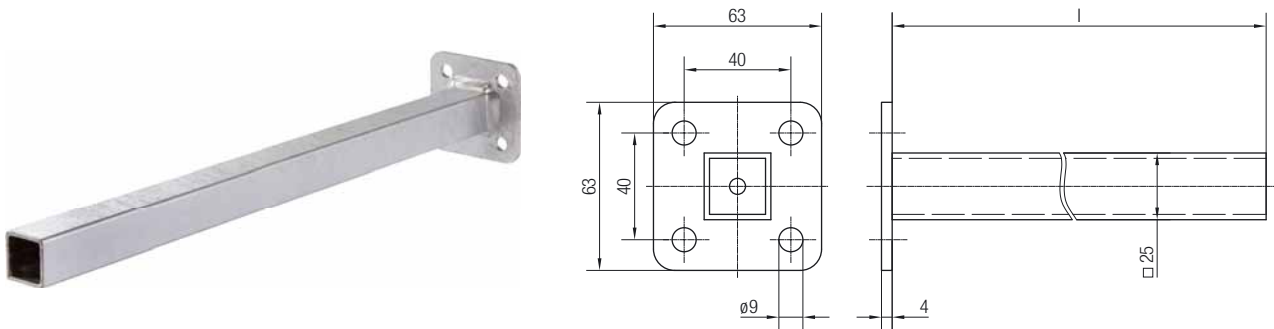


### Note

The end stop is fixed in the C-rail between the end clamp and the cable trolley. This helps to prevent cable trolleys running into the end clamp. For control supply systems with manually driven ideal control trolleys an end stop mounted at the end of the C-rail prevents the ideal control trolley from travelling out of the rail.

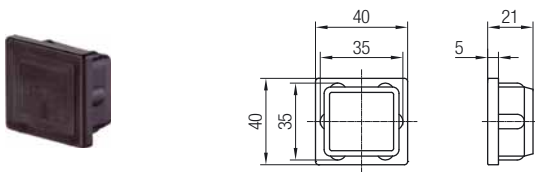
# C-Rails and Accessories Program 0240

## Towing Arms



| Order No.  | Material            | l [mm] | Weight [kg] |
|------------|---------------------|--------|-------------|
| 020195-400 | galvanized steel    | 400    | 0.600       |
| 020195-630 |                     | 630    | 1.000       |
| 020495-400 | stainless steel V4A | 400    | 0.600       |
| 020495-630 |                     | 630    | 1.000       |

## End Caps



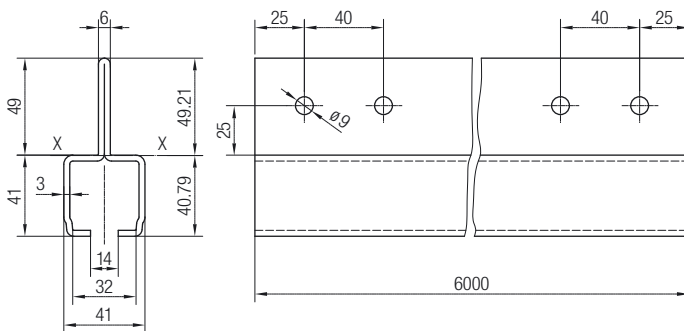
**Order No. 020662-40**

- Material: plastic
- Weight: 0.008 kg

# C-Rails and Accessories

## Program 0240

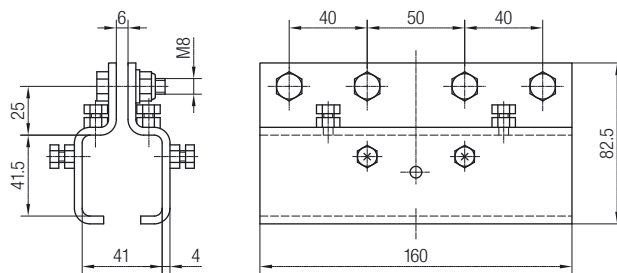
CI-Rail Reinforced Type, Wall Thickness 3.0 mm



### Order No. 024052-6

- Static values:
  - $I_x = 44.20 \text{ cm}^4$
  - $W_x = 8.981 \text{ cm}^3$
- Material: sendzimir, galvanized steel
- Weight: 5.300 kg/m

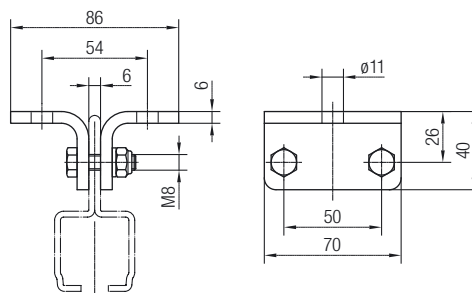
### Track Coupler



### Order No. 024062

- Material: galvanized steel
- Weight: 1.090 kg

### Track Support Bracket



### Order No. 024070

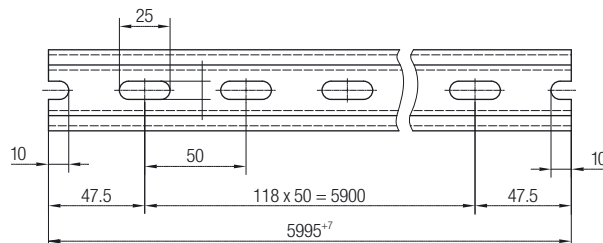
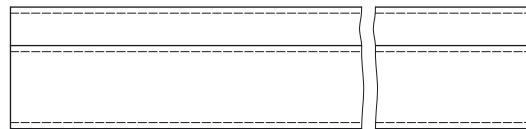
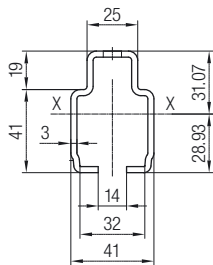
- Material: galvanized steel
- Weight: 0.700 kg

1) 2 holes  $\varnothing 8.4 \text{ mm}$  spaced at 50 mm to be drilled in CI-rail

# C-Rails and Accessories

## Program 0240

CV-Rail Reinforced Type, Wall Thickness 3.0 mm



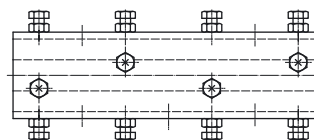
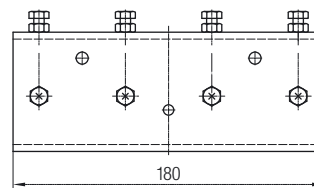
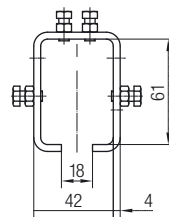
### Order No. 024030-6

- Static values:
  - $I_x = 16.816 \text{ cm}^4$
  - $W_x = 5.412 \text{ cm}^3$
- Material: galvanized steel
- Weight: 3.646 kg/m

### Note

Type with wall thickness 2.5 mm on request.

## Track Coupler

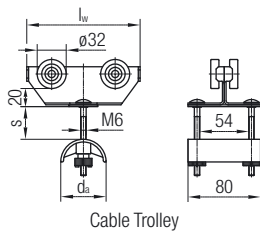


### Order No. 024040

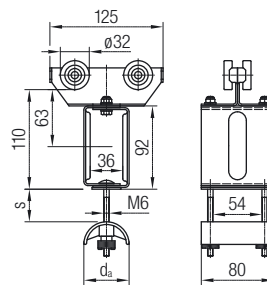
- Material: galvanized steel
- Weight: 1.230 kg

# Cable Trolleys for Flat Cables Program 0240

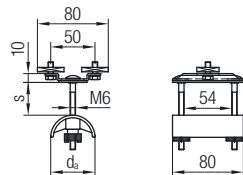
## Steel Cable Trolley with Plastic Cable Support



Cable Trolley



Towing Trolley



End Clamp

### Technical details

- Trolley body: galvanized steel
- Cable supports: plastic
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearing, V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +80°C

| Cable Trolley<br>Order No. | [kg]  | Towing Trolley<br>Order No. | [kg]  | End Clamp<br>Order No. | [kg]  | $d_a$ | $l_w$ | $s$  | Nom. Load<br>Capacity<br>[kg] | max.<br>Travel Speed<br>[m/min] | Roller<br>Type |
|----------------------------|-------|-----------------------------|-------|------------------------|-------|-------|-------|------|-------------------------------|---------------------------------|----------------|
|                            |       |                             |       |                        |       | [mm]  | [mm]  | [mm] |                               |                                 |                |
| 024246                     | 0.300 | 024256                      | 0.625 | 023269                 | 0.185 | 50    | 80    | 15   | 12.5                          | 40                              | 1              |
| 024240-80                  | 0.375 | 024250                      | 0.700 | 023269                 | 0.185 | 50    | 80    | 15   |                               |                                 |                |
| 024240                     | 0.460 | 024250                      | 0.700 | 023269                 | 0.185 | 50    | 125   | 36   | 20.0                          | 50                              | 2              |
| 024241                     | 0.485 | 024251                      | 0.745 | 023279                 | 0.220 | 80    | 125   | 22   |                               |                                 |                |

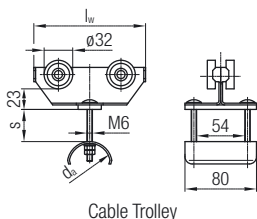
1) Plastic roller and bronze friction bearing    2) Ball bearing, galvanized (ZZ)

### Note

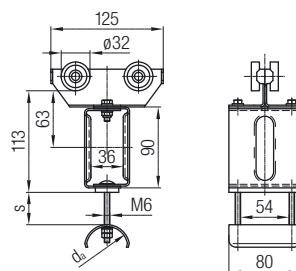
For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing.  
The order-no. has to be completed with the variation designation .../010.

# Cable Trolleys for Flat Cables Program 0240

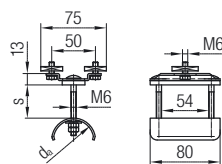
## Steel Cable Trolleys, Light Series without Buffer



Cable Trolley



Towing Trolley



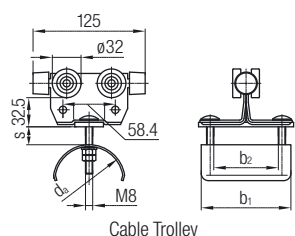
End Clamp

### Technical details

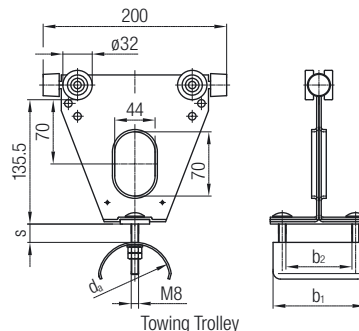
- Trolley body: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearing, V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +80°C

| Cable Trolley Order No. | [kg]  | Towing Trolley Order No. | [kg]  | End Clamp Order No. | [kg]  | d <sub>a</sub> | l <sub>w</sub> | s  | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-------------------------|-------|--------------------------|-------|---------------------|-------|----------------|----------------|----|-------------------------|---------------------------|
| 024244-080              | 0.460 | 024254                   | 0.790 | 023569              | 0.270 | 50             | 80             | 15 | 25                      | 50                        |
| 024244-125              | 0.550 | 024254                   | 0.790 | 023569              | 0.270 | 50             | 125            | 36 |                         |                           |
| 024245                  | 0.630 | 024255                   | 0.890 | 023579              | 0.370 | 80             | 125            | 22 |                         |                           |
| 024850-080              | 0.460 | 024855                   | 0.790 | 023438              | 0.270 | 50             | 80             | 15 | 12.5                    | 50                        |
| 024850-125              | 0.550 | 024855                   | 0.790 | 023438              | 0.270 | 50             | 125            | 36 |                         |                           |
| 024851                  | 0.630 | 024856                   | 0.890 | 023439              | 0.370 | 80             | 125            | 22 |                         |                           |

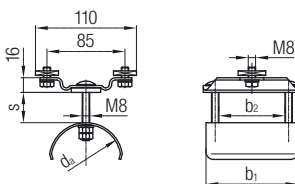
## Steel Cable Trolleys, Light Series with Buffer



Cable Trolley



Towing Trolley



End Clamp

### Technical details

- Trolley body and cable supports: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C

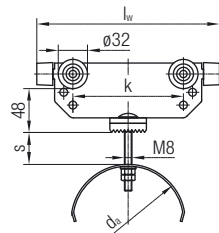
| Cable Trolley Order No. | [kg]  | Towing Trolley Order No. | [kg]  | End Clamp Order No. | [kg]  | d <sub>a</sub> | b <sub>1</sub> | b <sub>2</sub> | s  | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-------------------------|-------|--------------------------|-------|---------------------|-------|----------------|----------------|----------------|----|-------------------------|---------------------------|
| 024269-125x100          | 0.705 | 024279-200x100           | 0.905 | 024289-100x038      | 0.370 | 50             | 100            | 72             | 35 | 28                      | 63                        |
| 024270-125x100          | 0.775 | 024280-200x100           | 0.975 | 024290-100x038      | 0.440 | 80             |                | 20             |    |                         |                           |
| 024269-125x160          | 0.970 | 024279-200x160           | 1.170 | 024289-160x038      | 0.635 | 50             | 160            | 132            | 35 |                         |                           |
| 024270-125x160          | 1.040 | 024280-200x160           | 1.240 | 024290-160x038      | 0.690 | 80             |                | 20             |    |                         |                           |

### Note

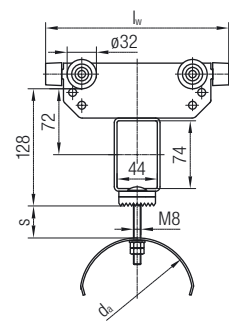
For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing. The order-no. has to be completed with the variation designation .../010.

# Cable Trolleys for Flat Cables Program 0240

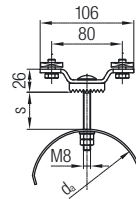
## Steel Cable Trolleys, Heavy Series



Cable Trolley



Towing Trolley



End Clamp

### Technical details

- Trolley body and cable supports: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearing, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearing, V4A with 2 RS-sealing
- Temperature range stainless steel: -10°C to +80°C

| Cable Trolley Order No. | [kg] | Towing Trolley Order No. | [kg] | End Clamp Order No. | [kg] | d <sub>a</sub> | l <sub>w1</sub> <sup>1)</sup> | l <sub>w2</sub> <sup>2)</sup> | b <sub>1</sub> | b <sub>2</sub> | s   | k   | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-------------------------|------|--------------------------|------|---------------------|------|----------------|-------------------------------|-------------------------------|----------------|----------------|-----|-----|-------------------------|---------------------------|
| 024210-100x100          | 0.83 | 024220-200x100           | 1.65 | 024230-100x062      | 0.70 | 80             | 100                           | -                             | 100            | 72             | 10  | 46  | 32                      | 80 (100)                  |
| 024210-125x100          | 0.85 | 024220-200x100           | 1.65 | 024230-100x062      | 0.70 |                | -                             | 125                           | 100            | 72             | 20  |     |                         |                           |
| 024210-125x160          | 1.09 | 024220-200x160           | 2.09 | 024230-160x062      | 0.94 |                | -                             | 125                           | 160            | 132            | 20  | 81  | 32                      | 80 (100)                  |
| 024210-135x100          | 0.91 | 024220-200x100           | 1.65 | 024230-100x062      | 0.70 |                | 135                           | -                             | 100            | 72             | 27  |     |                         |                           |
| 024210-160x100          | 0.93 | 024220-200x100           | 1.65 | 024230-100x062      | 0.70 |                | -                             | 160                           | 100            | 72             | 38  | 121 | 32                      | 80 (100)                  |
| 024210-160x160          | 1.17 | 024220-200x160           | 2.09 | 024230-160x062      | 0.94 |                | -                             | 160                           | 160            | 132            | 38  |     |                         |                           |
| 024210-200x100          | 1.05 | 024220-200x100           | 1.65 | 024230-100x062      | 0.70 |                | -                             | 200                           | 100            | 72             | 58  | 121 | 32                      | 80 (100)                  |
| 024210-200x160          | 1.29 | 024220-200x160           | 2.09 | 024230-160x062      | 0.94 |                | -                             | 200                           | 160            | 132            | 58  |     |                         |                           |
| 024212-160x100          | 1.05 | 024222-200x100           | 1.75 | 024232-100x042      | 0.80 | 125            | -                             | 160                           | 100            | 72             | 15  | 81  | 32                      | 80 (100)                  |
| 024212-160x160          | 1.38 | 024222-200x160           | 2.28 | 024232-160x042      | 1.13 |                | -                             | 160                           | 160            | 132            | 15  |     |                         |                           |
| 024212-200x100          | 1.15 | 024222-200x100           | 1.75 | 024232-100x042      | 0.80 |                | -                             | 200                           | 100            | 72             | 35  | 121 | 32                      | 80 (100)                  |
| 024212-200x160          | 1.48 | 024222-200x160           | 2.28 | 024232-160x042      | 1.13 |                | -                             | 200                           | 160            | 132            | 35  |     |                         |                           |
| 024212-250x100          | 1.39 | 024222-250x100           | 1.99 | 024232-100x062      | 0.82 |                | -                             | 250                           | 100            | 72             | 60  | 171 | 32                      | 80 (100)                  |
| 024212-250x160          | 1.72 | 024222-250x160           | 2.52 | 024232-160x062      | 1.15 |                | -                             | 250                           | 160            | 132            | 60  |     |                         |                           |
| 024213-200x100          | 1.30 | 024223-200x100           | 1.90 | 024233-100x042      | 1.00 |                | -                             | 200                           | 115            | 72             | 18  | 121 | 32                      | 80 (100)                  |
| 024213-200x160          | 1.72 | 024223-200x160           | 2.52 | 024233-160x042      | 1.40 |                | -                             | 200                           | 175            | 132            | 18  |     |                         |                           |
| 024213-250x100          | 1.40 | 024223-250x100           | 2.00 | 024233-100x042      | 1.10 | 160            | -                             | 250                           | 115            | 72             | 42  | 171 | 32                      | 80 (100)                  |
| 024213-250x160          | 1.82 | 024223-250x160           | 2.62 | 024233-160x042      | 1.40 |                | -                             | 250                           | 175            | 132            | 42  |     |                         |                           |
| 024213-250x200          | 2.21 | 024223-250x200           | 3.01 | 024233-200x042      | 1.85 |                | -                             | 250                           | 215            | 172            | 42  | 171 | 32                      | 80 (100)                  |
| 024214-250x160          | 2.07 | 024224-250x160           | 2.87 | 024234-160x042      | 1.65 |                | -                             | 250                           | 175            | 132            | 22  |     |                         |                           |
| 024214-320x200          | 2.76 | 024224-320x200           | 3.56 | 024234-200x062      | 2.22 | 200            | -                             | 320                           | 215            | 172            | 58  | 241 | 32                      | 80 (100)                  |
| 024810-125x100          | 0.85 | 024820-200x100           | 1.65 | 024830-100x062      | 0.70 | 80             | -                             | 125                           | 100            | 72             | 20  | 46  | 16                      | 80                        |
| 024810-200x100          | 1.05 | 024820-200x100           | 1.65 | 024830-100x062      | 0.70 |                | -                             | 200                           | 100            | 72             | 58  |     |                         |                           |
| 024812-160x100          | 1.05 | 024822-200x100           | 1.75 | 024832-100x042      | 0.80 | 125            | -                             | 160                           | 100            | 72             | 15  | 81  | 16                      | 80                        |
| 024812-250x100          | 1.39 | 024822-250x100           | 1.99 | 024832-100x062      | 0.82 |                | -                             | 250                           | 100            | 72             | 60  |     |                         |                           |
| 024812-250x160          | 1.72 | 024822-250x160           | 2.52 | 024832-160x062      | 1.15 | 160            | -                             | 250                           | 160            | 132            | 60  | 171 | 16                      | 80                        |
| 024913-200x100          | 1.28 | 024923-200x100           | 1.88 | 024933-100x042      | 0.98 |                | -                             | 200                           | 100            | 72             | 18  |     |                         |                           |
| 024913-250x160          | 1.86 | 024923-250x160           | 2.66 | 024933-160x042      | 1.44 | -              | 250                           | 160                           | 132            | 42             | 171 | 16  | 80                      |                           |
| 024814-280x160          | 2.17 | 024824-280x160           | 2.97 | 024824-280x160      | 1.65 | 200            | -                             | 280                           | 175            | 132            | 38  | 201 | 16                      | 80                        |

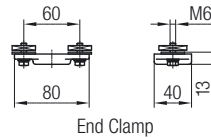
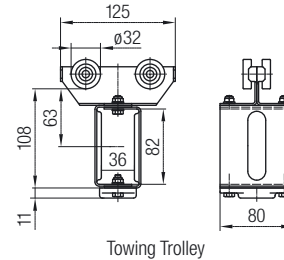
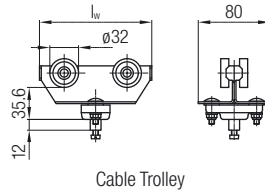
1) without buffer 2) with buffer

### Note

For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing.  
The order-no. has to be completed with the variation designation .../010.  
For high speeds up to 100 m/min and/or silent running rollers with polyurethane bandage can be used.  
The order-no. has to be completed with the variation designation .../017.

# Cable Trolleys for Round Cables Program 0240

## Steel Cable Trolleys with Ball Joint for Cable Clips 020131, Light Series without Buffer

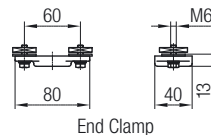
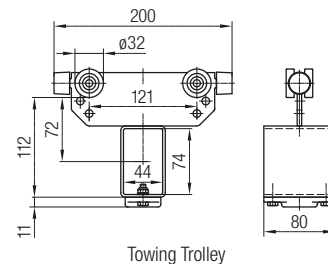
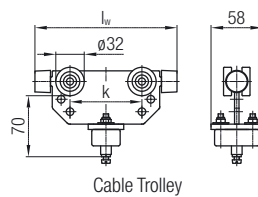


### Technical details

- Trolley body: galvanized steel
- Ball joint: plastic
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +60°C
- Stainless steel rollers: ball bearings, V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +60°C

| Cable Trolley<br>Order No. | [kg] | l <sub>w</sub> [mm] | Towing Trolley<br>Order No. | [kg] | End Clamp<br>Order No. | [kg] | Nom. Load<br>Capacity<br>[kg] | max.<br>Travel Speed<br>[m/min] |
|----------------------------|------|---------------------|-----------------------------|------|------------------------|------|-------------------------------|---------------------------------|
|                            |      |                     |                             |      |                        |      |                               |                                 |
| 024313-80                  | 0.36 | 80                  | 024314                      | 0.67 | 024312                 | 0.15 | 20                            | 50                              |
| 024313                     | 0.45 | 125                 |                             |      |                        |      |                               |                                 |
| 024860-080                 | 0.36 | 80                  | 024861                      | 0.67 | 024862                 | 0.15 | 16                            | 50                              |
| 024860-125                 | 0.45 | 125                 |                             |      |                        |      |                               |                                 |

## Steel Cable Trolleys with Ball Joint for Cable 020131, Heavy Series with Buffer



### Technical details

- Trolley body: galvanized steel
- Ball joint: plastic
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +60°C
- Stainless steel rollers: ball bearings, V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +60°C

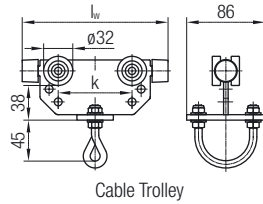
| Cable Trolley<br>Order No. | [kg] | l <sub>w</sub> [mm] | k [mm] | Towing Trolley<br>Order No. | [kg] | End Clamp<br>Order No. | [kg] | Nom. Load<br>Capacity<br>[kg] | max.<br>Travel Speed<br>[m/min] |
|----------------------------|------|---------------------|--------|-----------------------------|------|------------------------|------|-------------------------------|---------------------------------|
|                            |      |                     |        |                             |      |                        |      |                               |                                 |
| 024310-125                 | 0.54 | 125                 | 46     | 024311                      | 1.00 | 024312                 | 0.15 | 20                            | 63                              |
| 024310-160                 | 0.62 | 160                 | 81     |                             |      |                        |      |                               |                                 |
| 024880-125                 | 0.54 | 125                 | 46     | 024881                      | 1.00 | 024862                 | 0.15 | 16                            | 63                              |

### Notes

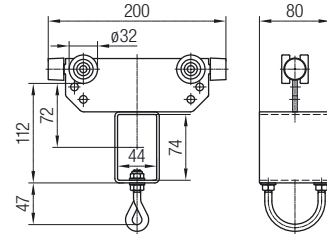
- For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing. The order-no. has to be completed with the variation designation .../010.
- For max. 3 cables in separate cable clips, suspended one below the other
- Appropriate for cable clips:  
020131-16, 020131-35, 020131-36 (only suited for trolley length ≥ 125 mm);  
020431-16, 020431-35, 020431-36 (only suited for trolley length ≥ 125 mm)

# Cable Trolleys for Round Cables Program 0240

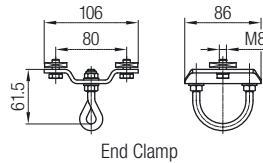
## Steel Cable Trolleys with Bracket for Cable Clips 020133, Heavy Series with Buffer



Cable Trolley



Towing Trolley



End Clamp

### Technical details

- Trolley body and bracket: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearing, V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +80°C

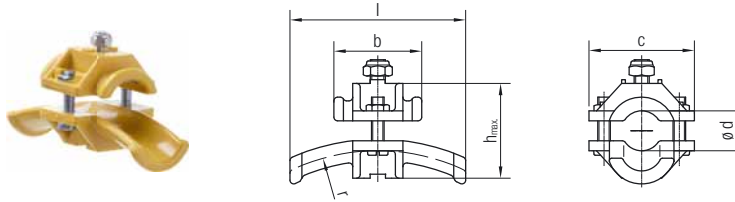
| Cable Trolley<br>Order No. | [kg] | l <sub>w</sub> [mm] | k [mm] | Towing Trolley |      | End Clamp |      | Nom. Load<br>Capacity<br>[kg] | max.<br>Travel Speed<br>[m/min] |
|----------------------------|------|---------------------|--------|----------------|------|-----------|------|-------------------------------|---------------------------------|
|                            |      |                     |        | Order No.      | [kg] | Order No. | [kg] |                               |                                 |
| 024320-125                 | 0.58 | 125                 | 46     | 024321         | 1.00 | 024322    | 0.46 | 32                            | 80                              |
| 024320-160                 | 0.66 | 160                 | 81     |                |      |           |      |                               |                                 |
| 024320-200                 | 0.76 | 200                 | 121    |                |      |           |      |                               |                                 |
| 024885-125                 | 0.58 | 125                 | 46     | 024886         | 1.00 | 024887    | 0.46 | 16                            | 80                              |

### Note

For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing.  
The order-no. has to be completed with the variation designation .../010.

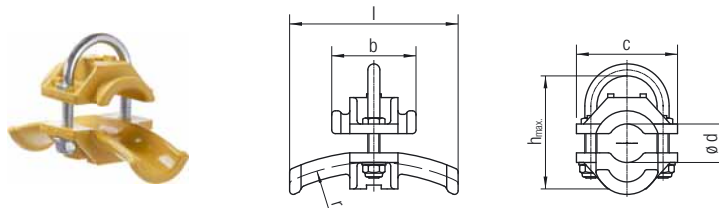
# Cable Trolleys for Round Cables Program 0240

## Cable Clips for Fixation at the Ball Joint



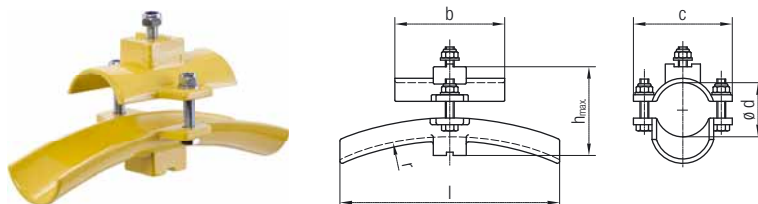
| Order No. | for Cable- $\phi$ d [mm] | r [mm] | l [mm] | h [mm] | b [mm] | c [mm] | Material  | Weight [kg] |
|-----------|--------------------------|--------|--------|--------|--------|--------|---|-------------|
| 020131-16 | 10 ... 16                | 80     | 70     | 38     | 35     | 42     | plastic.<br>hardware: galvanized steel                    | 0.040       |
| 020131-25 | 17 ... 25                | 125    | 100    | 47     | 50     | 50     |   | 0.060       |
| 020131-36 | 26 ... 36                | 180    | 140    | 58     | 70     | 64     |   | 0.120       |
| 020431-16 | 10 ... 16                | 80     | 70     | 38     | 35     | 42     | plastic, acid-resistant.<br>hardware: stainless steel V4A | 0.040       |
| 020431-25 | 17 ... 25                | 125    | 100    | 47     | 50     | 50     |   | 0.060       |
| 020431-36 | 26 ... 36                | 180    | 140    | 58     | 70     | 64     |   | 0.120       |

## Cable Clips for Fixation at the Bracket



| Order No. | for Cable- $\phi$ d [mm] | r [mm] | l [mm] | h [mm] | b [mm] | c [mm] | Material  | Weight [kg] |
|-----------|--------------------------|--------|--------|--------|--------|--------|---|-------------|
| 020133-16 | 10 ... 16                | 80     | 70     | 38     | 35     | 42     | plastic.<br>hardware: galvanized steel                    | 0.050       |
| 020133-25 | 17 ... 25                | 125    | 100    | 47     | 50     | 50     |   | 0.070       |
| 020133-36 | 26 ... 36                | 180    | 140    | 58     | 70     | 64     |   | 0.140       |
| 020133-50 | 37 ... 50                | 250    | 200    | 100    | 100    | 90     | aluminum.<br>hardware: galvanized steel                   | 0.280       |
| 020133-63 | 51 ... 63                | 315    | 250    | 125    | 120    | 100    |   | 0.480       |
| 020433-16 | 10 ... 16                | 80     | 70     | 38     | 35     | 42     | plastic, acid-resistant.<br>hardware: stainless steel V4A | 0.040       |
| 020433-25 | 17 ... 25                | 125    | 100    | 47     | 50     | 50     |   | 0.060       |
| 020433-36 | 26 ... 36                | 180    | 140    | 58     | 70     | 64     |   | 0.120       |

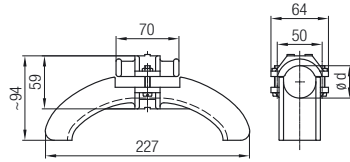
## Additional Cable Clips for Combinations with Sizes 50 and 63 of Types 020133



| Order No. | for Cable- $\phi$ d [mm] | r [mm] | l [mm] | h [mm] | b [mm] | c [mm] | Material                                | Weight [kg] |
|-----------|--------------------------|--------|--------|--------|--------|--------|---|-------------|
| 020131-50 | 37 ... 50                | 250    | 200    | 80     | 100    | 90     | aluminum,<br>hardware: galvanized steel | 0.260       |
| 020131-63 | 51 ... 63                | 315    | 250    | 105    | 125    | 100    |   | 0.460       |

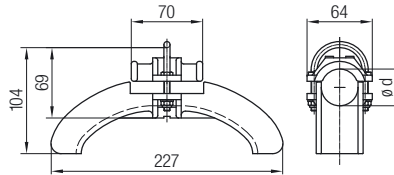
# Cable Trolleys for Round Cables Program 0240

## Hose Clip for Fixation at the Ball Joint



| Order No. | Material | Hardware         | for Hose- $\varnothing$ d [mm] | Weight [kg] |
|-----------|----------|------------------|--------------------------------|-------------|
| 020130-36 | plastic  | galvanized steel | 26 - 36                        | 0.130       |

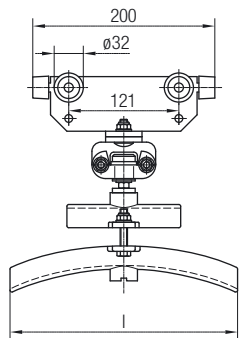
## Hose Clip for Fixation at the Bracket



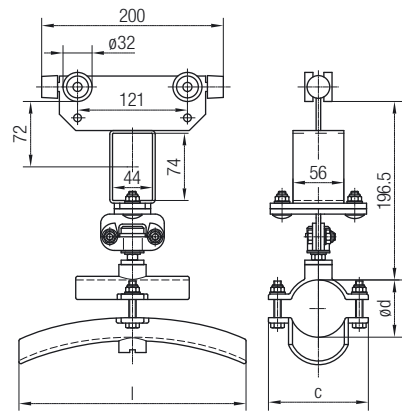
| Order No. | Material | Hardware         | for Hose- $\varnothing$ d [mm] | Weight [kg] |
|-----------|----------|------------------|--------------------------------|-------------|
| 020138-36 | plastic  | galvanized steel | 26 - 36                        | 0.150       |

# Cable Trolleys for Round Cables Program 0240

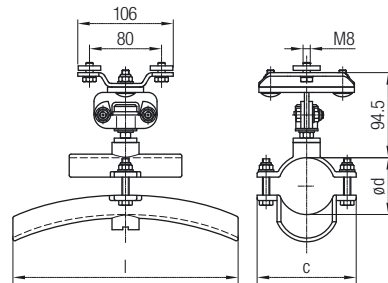
## Cable Trolley with Cable Clips, Heavy Series, Rotatable



Cable Trolley



Towing Trolley



End Clamp

### Technical details

- Trolley body and bracket: galvanized steel
  - Cable clips: aluminium
  - Hardware: galvanized steel
  - Standard rollers: ball bearings, galvanized with ZZ-sealing
  - Temperature range: -30°C to +80°C
  - For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing
- The order-no. has to be completed with the variation designation .../010.

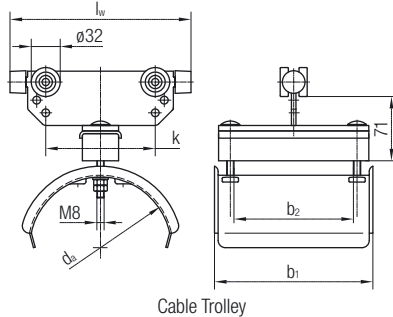
| Cable Trolley<br>Order No. | [kg] | l [mm] | ø d [mm] | c [mm] | Towing Trolley<br>Order No. | [kg] | End Clamp<br>Order No. | [kg] | Nom. Load<br>Capacity<br>[kg] | max.<br>Travel Speed<br>[m/min] |
|----------------------------|------|--------|----------|--------|-----------------------------|------|------------------------|------|-------------------------------|---------------------------------|
|                            |      |        |          |        |                             |      |                        |      |                               |                                 |
| 024528-200x050             | 1.54 | 200    | 37-50    | 90     | 024527-200x050              | 1.85 | 024529-050             | 1.20 | 32                            | 80                              |
| 024528-200x063             | 1,74 | 250    | 51-63    | 100    | 024527-200x063              | 2.15 | 024529-063             | 1.40 |                               |                                 |

### Note

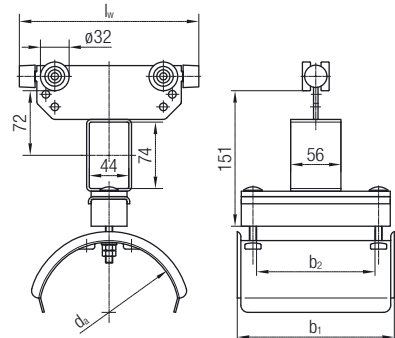
Can be combined with cable clips 020131-50 and 020131-63

# Cable Trolleys for Round Cables Program 0240

Steel Cable Trolleys, Heavy Series  
for Clamping of Round Cables with a max. Difference in Diameter of 6 mm



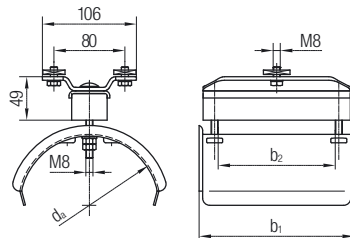
Cable Trolley



Towing Trolley

## Technical details

- Trolley body and cable supports: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearing, V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +80°C



End Clamp

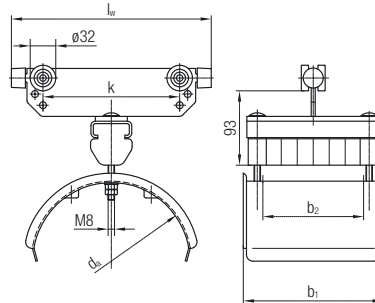
| Cable Trolley Order No. | [kg] | Towing Trolley Order No. | [kg] | End Clamp Order No. | [kg] | d <sub>a</sub> | l <sub>w</sub> | b <sub>1</sub> | b <sub>2</sub> | k   | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-------------------------|------|--------------------------|------|---------------------|------|----------------|----------------|----------------|----------------|-----|-------------------------|---------------------------|
| 024442-160x100          | 1.30 | 024452-200x100           | 2.00 | 024462-100          | 1.10 | 125            | 160            | 115            | 72             | 81  | 32                      | 80<br>(100)               |
| 024442-160x160          | 1.57 | 024452-200x160           | 2.37 | 024462-160          | 1.35 | 125            | 160            | 175            | 132            | 81  |                         |                           |
| 024443-200x160          | 1.92 | 024453-200x160           | 2.72 | 024463-160          | 1.60 | 160            | 200            | 175            | 132            | 121 |                         |                           |
| 024444-250x100          | 1.70 | 024454-250x100           | 2.20 | 024464-100          | 1.30 | 200            | 250            | 115            | 72             | 171 |                         |                           |
| 024444-250x160          | 2.27 | 024454-250x160           | 3.07 | 024464-160          | 1.85 | 200            | 250            | 175            | 132            | 171 |                         |                           |
| 024943-200x160          | 1.92 | 024953-200x160           | 2.72 | 024963-160          | 1.60 | 160            | 200            | 175            | 132            | 121 | 16                      | 80                        |

## Note

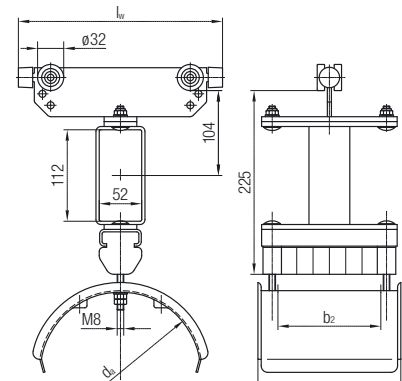
For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing.  
The order-no. has to be completed with the variation designation .../010.

# Cable Trolleys for Round Cables Program 0240

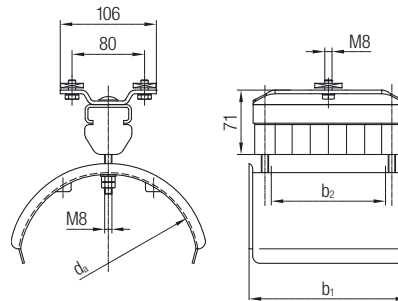
Steel Cable Trolleys, Heavy Series  
for Clamping of Round Cables with a max. Difference in Diameter of 16 mm



Cable Trolley



Towing Trolley



End Clamp

### Technical details

- Trolley body and cable supports: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearing, V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +80°C

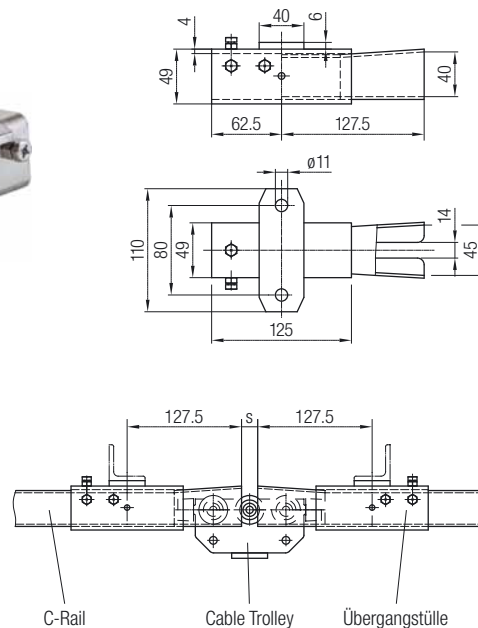
| Cable Trolley Order No. | [kg] | Towing Trolley Order No. | [kg] | End Clamp Order No. | [kg] | d <sub>a</sub> | l <sub>w</sub> | b <sub>1</sub> | b <sub>2</sub> | k   | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-------------------------|------|--------------------------|------|---------------------|------|----------------|----------------|----------------|----------------|-----|-------------------------|---------------------------|
| 024474-250x160          | 2.27 | 024484-250x160           | 3.07 | 024494-160          | 1.85 | 200            | 250            | 175            | 125            | 171 | 32                      | 80 (100)                  |
| 024474-250x200          | 2.67 | 024484-250x200           | 3.47 | 024494-200          | 2.25 | 200            | 250            | 215            | 165            | 171 |                         |                           |
| 024475-320x160          | 2.72 | 024485-320x160           | 3.52 | 024495-160          | 2.10 | 250            | 320            | 175            | 125            | 241 |                         |                           |
| 024475-320x200          | 3.12 | 024485-320x200           | 3.92 | 024495-200          | 2.50 | 250            | 320            | 215            | 165            | 241 |                         |                           |
| 024477-400x250          | 4.52 | 024487-400x250           | 5.32 | 024497-250          | 3.70 | 320            | 400            | 265            | 215            | 321 |                         |                           |
| 024974-250x160          | 2.27 | 024984-250x160           | 3.07 | 024994-160          | 1.85 | 200            | 250            | 175            | 125            | 171 | 16                      | 80                        |
| 024975-320x250          | 3.62 | 024985-320x250           | 4.42 | 024995-250          | 3.00 | 250            | 320            | 265            | 215            | 241 |                         |                           |

### Note

For a better sealing the standard rollers (ZZ) can also be provided with a 2 RS-sealing.  
The order-no. has to be completed with the variation designation .../010.

# Cable Trolleys and Accessories for Traversing, Program 0240

## Transfer Guide for C-Rail 024100



### Order No. 024107

- Material: galvanized steel
- Weight: 1.200 kg

### Notes

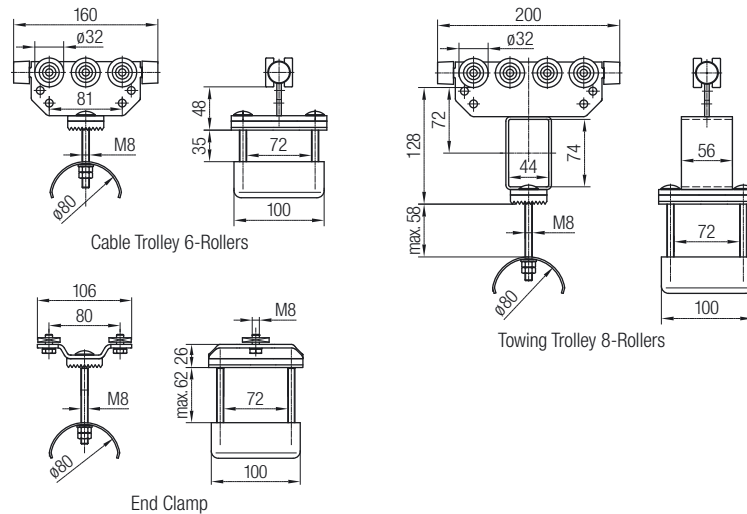
- Two transfer guides must be mounted at the transfer point with the inlet openings against each other
- The distance "s" must not exceed 18 mm
- Vertical deflection max. 2.0 mm
- Horizontal deflection max. 5.0 mm
- All cable trolleys, that pass this transition point must be provided with 3, the towing trolley with 4 pairs of rollers
- Cable trolleys that do not pass this transition point can be used in standard design

## Cable Trolleys for Flat Cables with Additional Rollers



### Technical details

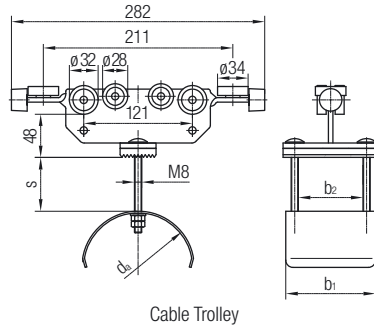
- Trolley body and cable supports: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C



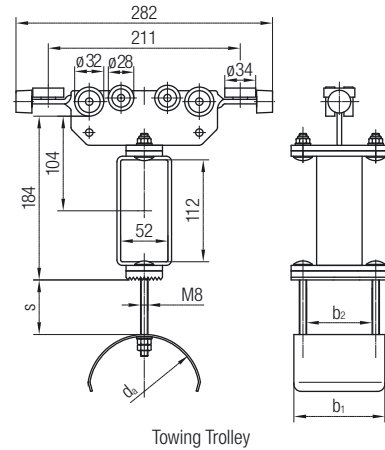
| Cable Trolley Order No. | [kg] | Towing Trolley Order No. | [kg] | End Clamp Order No. | [kg] | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-------------------------|------|--------------------------|------|---------------------|------|-------------------------|---------------------------|
| 024210-160x100/20       | 1.03 | 024220-200x100/020x2     | 1.85 | 024230-100x062      | 0.70 | 32                      | 63                        |

# Cable Trolley for Applications with Increased Horizontal Forces | Program 0240

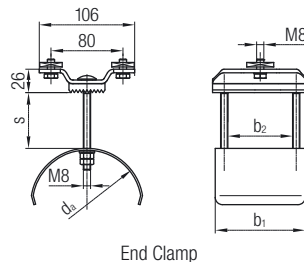
## Cable Trolleys with Horizontal Guide Rollers



Cable Trolley



Towing Trolley



End Clamp

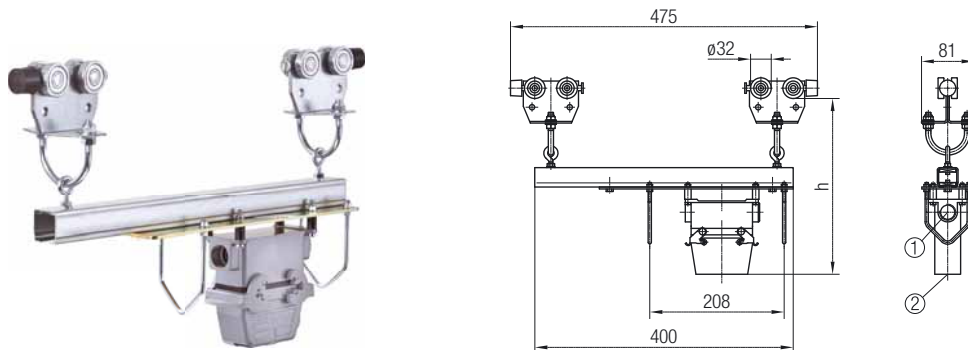
### Technical details

- Trolley body and cable supports: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C

| Cable Trolley Order No. | [kg] | Towing Trolley Order No. | [kg] | End Clamp Order No. | [kg] | d <sub>a</sub> [mm] | b <sub>1</sub> [mm] | b <sub>2</sub> [mm] | s [mm] | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-------------------------|------|--------------------------|------|---------------------|------|---------------------|---------------------|---------------------|--------|-------------------------|---------------------------|
| 024210-200x100/040      | 1.44 | 024220-200x100/040       | 2.21 | 024230-100x062      | 0.70 | 80                  | 100                 | 72                  | 60     | 32                      | 63                        |
| 024210-200x160/040      | 1.68 | 024220-200x160/040       | 2.57 | 024230-160x062      | 0.94 | 80                  | 160                 | 132                 |        |                         |                           |
| 024212-200x100/040      | 1.54 | 024222-200x100/040       | 2.31 | 024232-100x062      | 0.82 | 125                 | 100                 | 72                  |        |                         |                           |
| 024212-200x160/040      | 1.87 | 024222-200x160/040       | 2.76 | 024232-160x062      | 1.15 | 125                 | 160                 | 132                 |        |                         |                           |

# Ideal Control Unit Trolleys Program 0240

## Ideal Control Unit Trolleys with Plug and Socket Connection – Basic Configuration



### Technical details

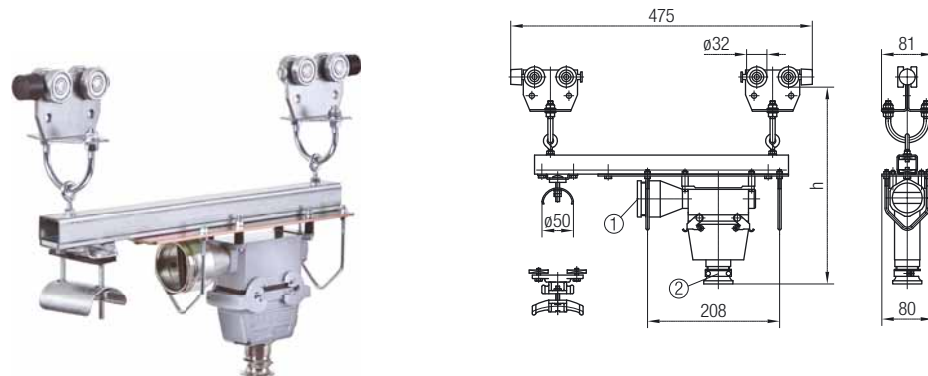
- Trolley body and cross bar: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C

### Note

Ideal control unit trolley with basic configuration without end clamp and without cable glands

| Order No. | Number of Poles | Connecting Threads |         | h<br>[mm] | possible Attachment Parts   | Weight<br>[kg] | Nom. Load Capacity<br>[kg] | max. Travel Speed<br>[m/min] |
|-----------|-----------------|--------------------|---------|-----------|---|----------------|----------------------------|------------------------------|
|           |                 | ①                  | ②       |           |   |                |                            |                              |
| 024776-16 | 16+PE           | M25x1.5            | M25x1.5 | 275       | end clamp 023269 and 023299<br>brake glider 024784 and brake trolley 024785 | 3.04           | 40                         | 63                           |
| 024776-24 | 24+PE           | M25x1.5            | M32x1.5 | 290       |   | 3.34           |                            |                              |

## Ideal Control Unit Trolleys with Plug and Socket Connection – Pre-Assembled



### Technical details

- Trolley body and cross bar: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C

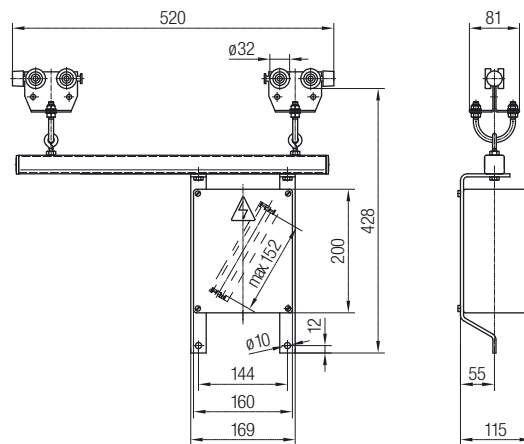
### Note

Ideal control unit trolley pre-assembled with end clamp and with cable glands

| Order No. | Number of Poles | Cable Glands |       | h<br>[mm] | Type for     | possible Attachment Parts                   | Weight<br>[kg] | Nom. Load Capacity<br>[kg] | max. Travel Speed<br>[m/min] |
|-----------|-----------------|--------------|-------|-----------|--------------|---|----------------|----------------------------|------------------------------|
|           |                 | ①            | ②     |           |              |   |                |                            |                              |
| 024778-16 | 16+PE           | 25x42        | 25x21 | 310       | flat cables  | brake glider 024784<br>brake trolley 024785 | 3.61           | 40                         | 63                           |
| 024778-24 | 24+PE           | 25x42        | 32x29 | 325       |              |   | 3.99           |                            |                              |
| 024779-16 | 16+PE           | 25x29        | 25x21 | 310       | round cables | brake glider 024784<br>brake trolley 024785 | 3.40           | 40                         | 63                           |
| 024779-24 | 24+PE           | 25x29        | 32x29 | 325       |              |   | 3.78           |                            |                              |

# Ideal Control Unit Trolleys Program 0240

## Ideal Control Unit Trolley with Plastic Terminal Box – Basic Configuration



### Technical details

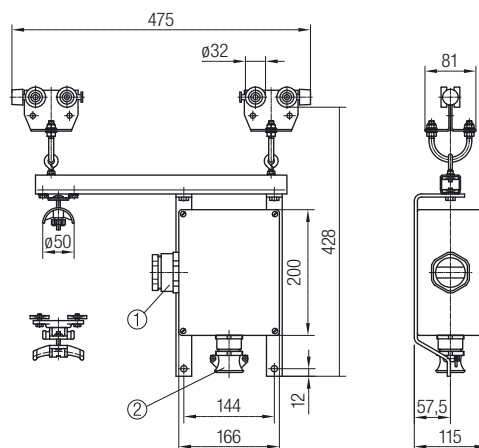
- Trolley body and cross bar: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C

### Note

Ideal control unit trolley with basic configuration without end clamp, cable glands and terminals

| Order No. | possible Attachment Parts   | Weight [kg] | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-----------|---|-------------|-------------------------|---------------------------|
| 024780    | end clamp 023269, 023299; brake glider 024784; brake trolley 024785 | 4.3         | 40                      | 63                        |

## Ideal Control Unit Trolleys with Plastic Terminal Box – Pre-Assembled



### Technical details

- Trolley body and cross bar: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C

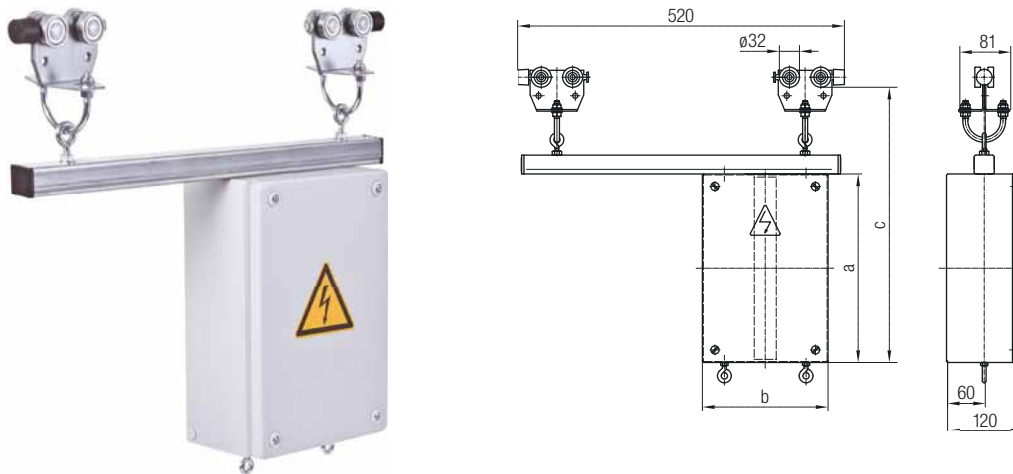
### Note

Ideal control unit trolley pre-assembled with end clamp, cable glands and terminals

| Order No. | Number of Poles | Cable Glands |       | Type for     | possible Attachment Parts | Weight [kg] | Nom. Load Capacity [kg] | max. Travel Speed [m/min] |
|-----------|-----------------|--------------|-------|--------------|---------------------------|-------------|-------------------------|---------------------------|
|           |                 | ①            | ②     |              |                           |             |                         |                           |
| 024774-16 | 16 + PE         | 50x42        | 25x21 | flat cables  | brake glider 024784       | 5.35        | 40                      | 63                        |
| 024774-24 | 24 + PE         | 50x42        | 32x29 |              |                           | 5.75        |                         |                           |
| 024775-16 | 16 + PE         | 32x29        | 25x21 | round cables | brake trolley 024785      | 5.30        | 40                      | 63                        |
| 024775-24 | 24 + PE         | 32x29        | 32x29 |              |                           | 5.61        |                         |                           |

# Ideal Control Unit Trolleys Program 0240

## Ideal Control Unit Trolleys with Terminal Box of Steel – Basic Configuration



### Technical details

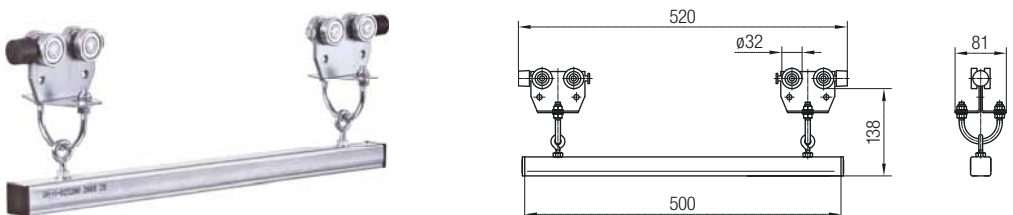
- Trolley body and cross bar: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearings V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +80°C

### Note

Ideal control unit trolley with basic configuration without end clamp, cable glands and terminals

| Order No.      | a<br>[mm] | b<br>[mm] | c<br>[mm] | possible Attachment Parts   | Weight<br>[kg] | Nom. Load Capacity<br>[kg] | max. Travel Speed<br>[m/min] |
|----------------|-----------|-----------|-----------|---|----------------|----------------------------|------------------------------|
| 024781-200x200 | 200       | 200       | 338       | end clamp 023269, 023299<br>brake glider 023184; brake trolley 023185 | 5.30           | 40                         | 63                           |
| 024781-300x200 | 300       |           | 438       |   | 6.30           |                            |                              |
| 024791-200x200 | 200       | 200       | 338       | end clamp<br>023469, 023499   | 5.30           | 20                         | 63                           |
| 024791-300x200 | 300       |           | 438       |   | 6.30           |                            |                              |

## Control Trolley Upper Parts



### Technical details

- Trolley body and cross bar: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Temperature range: -30°C to +80°C
- Stainless steel rollers: ball bearings V4A with 2RS-sealing
- Temperature range stainless steel: -10°C to +80°C

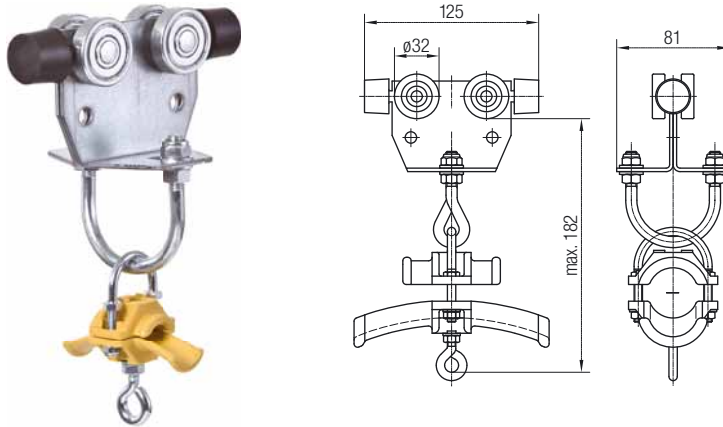
### Note

For a better sealing the standard rollers (ZZ) can also be provided with a 2RS-sealing. The order-no. has to be completed with the variation designation ... / 010.

| Order No.  | Weight<br>[kg] |
|------------|----------------|
| 024771     | 1.95           |
| 024771/500 | 1.95           |

# Ideal Control Unit Trolleys Program 0240

## Basic Ideal Control Unit Trolleys for Round Cables



### Technical details

- Trolley body and bracket: galvanized steel
- Hardware: galvanized steel
- Standard rollers: ball bearings, galvanized with ZZ-sealing
- Cable clips: plastic
- Temperature range: -30°C to +80°C

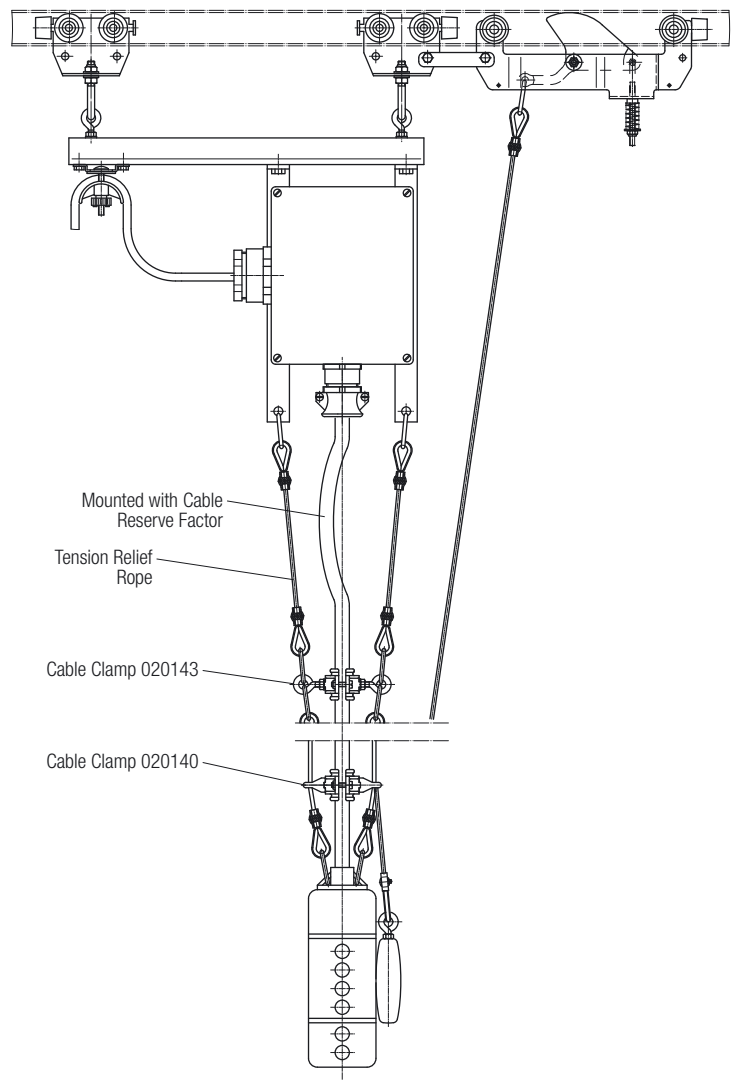
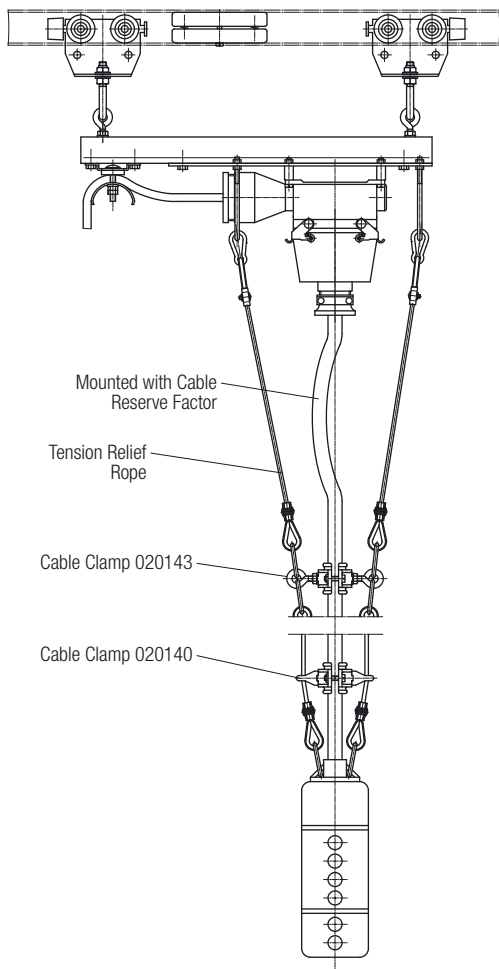
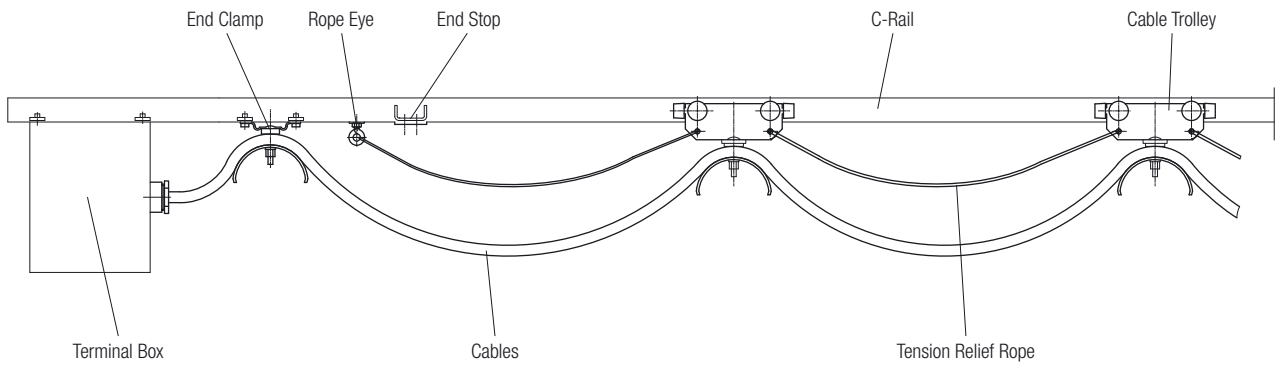
| Order No. | for Cable- $\phi$<br>[mm] | Weight<br>[kg] |
|-----------|---------------------------|----------------|
| 024711-16 | 10 ... 16                 | 0.640          |
| 024711-25 | 17 ... 25                 | 0.660          |
| 024711-36 | 26 ... 36                 | 0.720          |

### Note

These control trolleys are used if the round cable is installed directly and without an additional terminal box up to the control station.

# Accessories for Festoon Systems Program 0240

## Application Examples

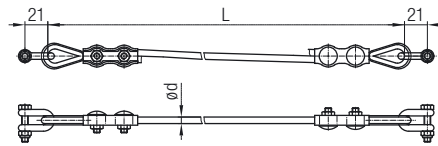


### Note

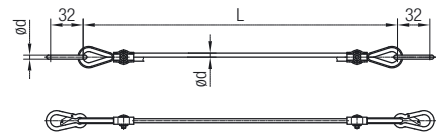
Special pendant station round cables with extruded steel ropes, that do not require separate tension relief devices, are listed in our cable catalog KAT0130-0002.

# Accessories for Festoon Systems Program 0240

## Towing Ropes Pre-Assembled



Type A (Shackle)



Type B (with spring safety hook)

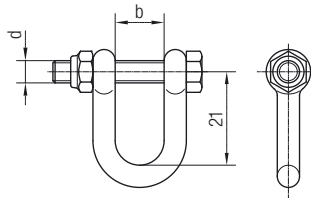
| Order No.     | ø d [mm] | Type | Material               | Weight [kg/m] |
|---------------|----------|------|------------------------|---------------|
| 020318-06     | 6.0      | A    | plastic                | 0.14          |
| 020329-04     | 4.0      |      | 0.16                   |               |
| 020329-02.5   | 2.5      | B    | steel. PVC-covered     | 0.14          |
| 020318-06/500 | 6.0      | A    | acid-resistant plastic | 0.14          |

## Ropes



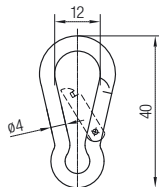
| Order No.   | ø d [mm] | Material               | Weight [kg/m] |
|-------------|----------|------------------------|---------------|
| 020302-6    | 6.0      | plastic                | 0.020         |
| 020305-02.5 | 2.5      | steel. PVC-covered     | 0.009         |
| 020301-6    | 6.0      | acid-resistant plastic | 0.020         |
| 020304-02   | 2.0      | stainless steel V4A    | 0.015         |

## Shackles



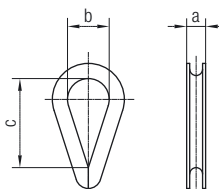
| Order No.     | d  | b [mm] | Package Size [pc.] | Material            | Weight [kg] |
|---------------|----|--------|--------------------|---------------------|-------------|
| 020211-6P     | M6 | 8      | 20                 | galvanized steel    | 0.400       |
| 020211-5P/501 | M5 | 11     | 20                 | stainless steel V4A | 0.300       |

## Spring Safety Hook



| Order No.   | Material            | Weight [kg] |
|-------------|---------------------|-------------|
| 020215-40x4 | galvanized steel    | 0.010       |
| 020415-40x4 | stainless steel V4A | 0.010       |

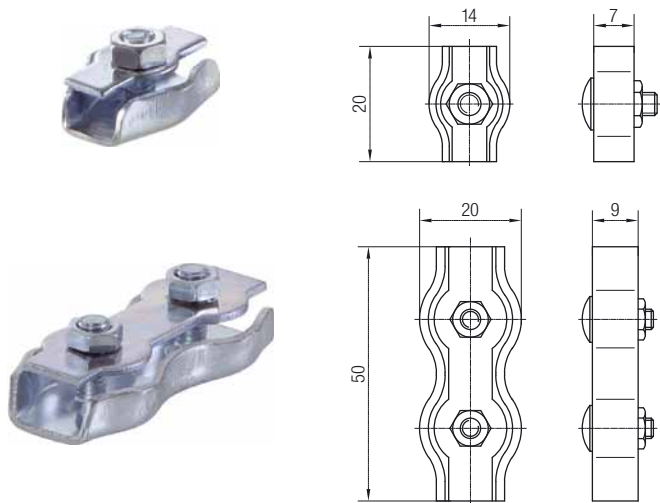
## Rope Thimbles



| Order No. | a [mm] | b [mm] | c [mm] | Material            | Weight [kg] |
|-----------|--------|--------|--------|---------------------|-------------|
| 020120-3  | 5.0    | 11     | 23.5   | galvanized steel    | 0.008       |
| 020120-4  | 6.5    | 13     | 28.5   |                     | 0.010       |
| 020450-3  | 5.0    | 11     | 23.5   | stainless steel V4A | 0.008       |
| 020450-4  | 6.5    | 13     | 28.5   |                     | 0.010       |

# Accessories for Festoon Systems Program 0240

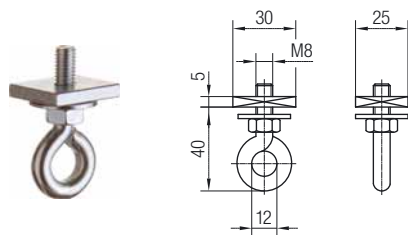
## Rope Clip



| Simplex Rope Clip Order No. | Material            | Weight [kg] |
|-----------------------------|---------------------|-------------|
| 020122-3                    | galvanized steel    | 0.010       |
| 020452-3                    | stainless steel V4A | 0.010       |

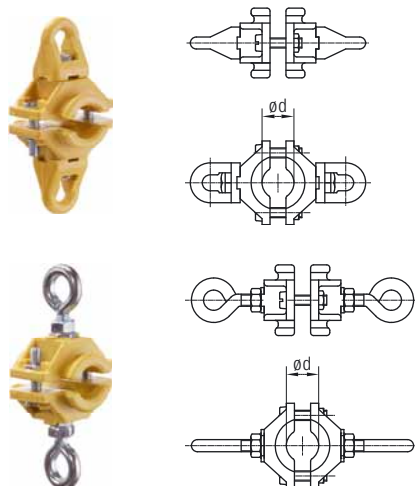
| Duplex Rope Clip Order No. | Material            | Weight [kg] |
|----------------------------|---------------------|-------------|
| 020123-5                   | galvanized steel    | 0.030       |
| 020453-5                   | stainless steel V4A | 0.030       |

## Rope Eyes



| Order No. | Material            | Weight [kg] |
|-----------|---------------------|-------------|
| 020218-08 | galvanized steel    | 0.07        |
| 020458-08 | stainless steel V4A | 0.07        |

## Cable Clamps

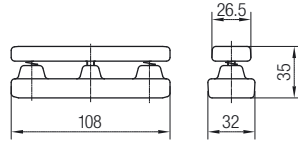


| Cable Clamp Order No. | ø d [mm]  | Material                               | Weight [kg] |
|-----------------------|-----------|--|-------------|
| 020140-16             | 11 ... 16 | plastic,<br>hardware: galvanized steel | 0.05        |
| 020140-25             | 17 ... 25 |  | 0.08        |
| 020140-36             | 26 ... 36 |  | 0.13        |

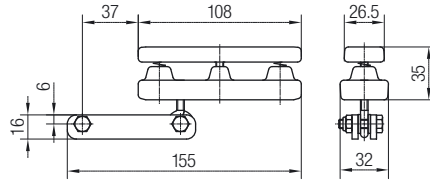
| Cable Clamp Order No. | ø d [mm]  | Material                               | Weight [kg] |
|-----------------------|-----------|--|-------------|
| 020143-16             | 10 ... 16 | plastic,<br>hardware: galvanized steel | 0.06        |
| 020143-25             | 17 ... 25 |  | 0.08        |
| 020143-36             | 26 ... 36 |  | 0.14        |

# Accessories for Festoon Systems Program 0240

## Brake Glider

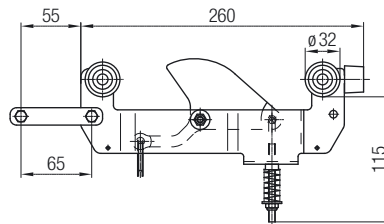
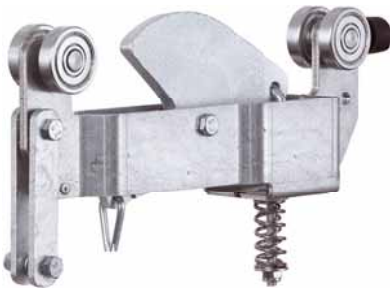


- Order No. 024784**
- Basic material: plastic
  - Hardware: galvanized steel
  - Weight: 0.100 kg



- Brake Glider and hardware  
Order No. 024719**
- Basic material: plastic
  - Hardware: galvanized steel
  - Weight: 0.200 kg

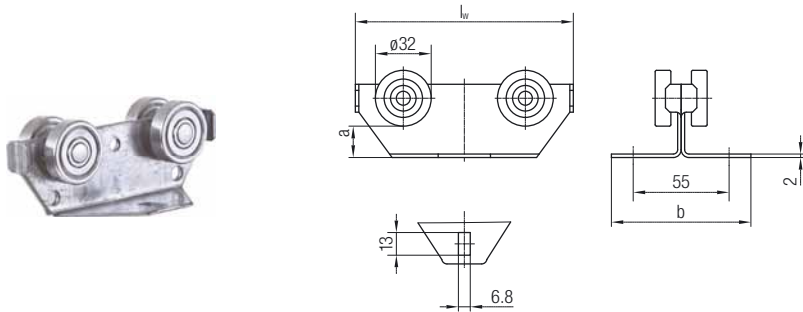
## Brake Trolley



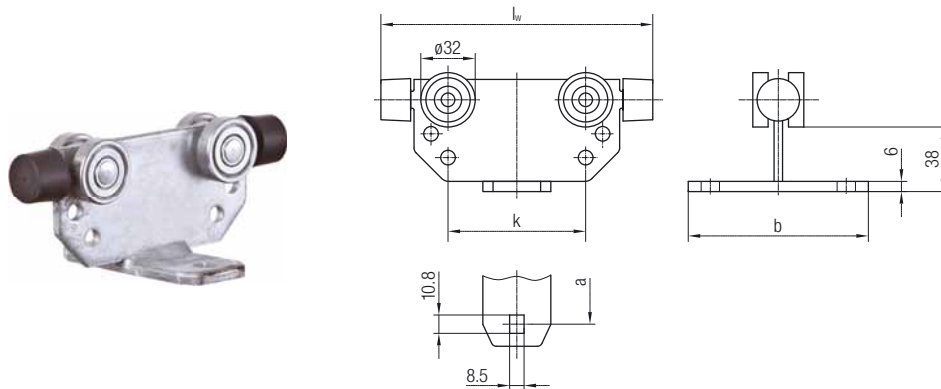
- Order No. 024785**
- Material: galvanized steel
  - Hardware: galvanized steel
  - Brake hammer: cast iron
  - Weight: 1.200 kg

# Accessories for Festoon Systems Program 0240

## Cable Trolley Upper Parts



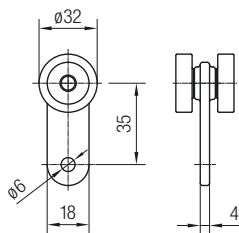
| Cable Trolley Upper Parts without Buffer<br>Order No. | $l_w$<br>[mm] | $b$<br>[mm] | $a$<br>[mm] | Material         | Nominal Load Capacity<br>[kg] | Weight<br>[kg] |
|---|---------------|-------------|-------------|------------------|-------------------------------|----------------|
| 024512-80   | 80            | 74          | 13.0        | galvanized steel | 25                            | 0.31           |
| 024512  | 125           | 80          | 18.0        |                  |                               | 0.40           |



| Cable Trolley Upper Parts with Buffer<br>Order No. | $l_w$<br>[mm] | $b$<br>[mm] | $a$<br>[mm] | Material         | $k$<br>[mm] | Nominal Load Capacity<br>[kg] | Weight<br>[kg] |
|--|---------------|-------------|-------------|------------------|-------------|-------------------------------|----------------|
| 024510-125x100                                     | 125           | 106         | 80          | galvanized steel | 46          | 32                            | 0.55           |
| 024510-125x160                                     | 125           | 166         | 140         |                  | 46          |                               | 0.67           |
| 024510-160x100                                     | 160           | 106         | 80          |                  | 81          |                               | 0.63           |
| 024510-160x160                                     | 160           | 166         | 140         |                  | 81          |                               | 0.75           |
| 024510-200x100                                     | 200           | 106         | 80          |                  | 121         |                               | 0.73           |
| 024510-200x160                                     | 200           | 166         | 140         |                  | 121         |                               | 0.85           |

# Accessories for Festoon Systems Program 0240

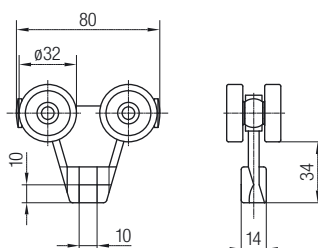
## Plastic Trolleys 2 Rollers



### Order No. 024331

- Type of roller: plastic roller with friction bearing
- Nominal load capacity: 4 kg
- Max. travel speed: 20 m/min
- Weight: 0.020 kg

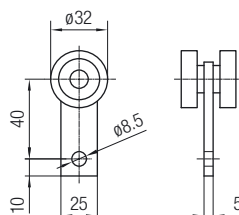
## Plastic Trolleys 4 Rollers



### Order No. 024504

- Ball bearing: plastic roller with friction bearing
- Nominal load capacity: 10 kg
- Max. travel speed: 20 m/min
- Weight: 0.050 kg

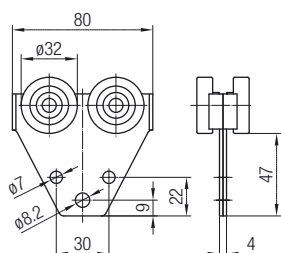
## Steel Trolley 2 Rollers



### Order No. 024330

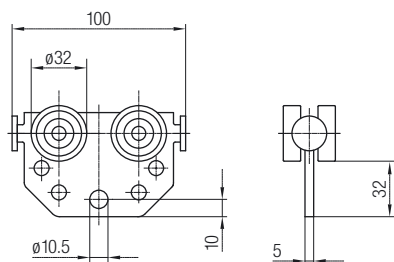
- Ball bearing: galvanized steel
- Nominal load capacity: 12.5 kg
- Max. travel speed: 40 m/min
- Weight: 0.150 kg

## Steel Trolley 4 Rollers without Buffer



### Order No. 024323

- Ball bearing: galvanized steel
- Nominal load capacity: 32 kg
- Max. travel speed: 50 m/min
- Weight: 0.320 kg

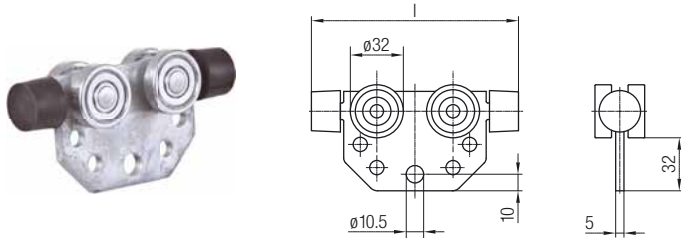


### Order No. 024340-100

- Ball bearing: galvanized steel
- Nominal load capacity: 32 kg
- Max. travel speed: 50 m/min
- Weight: 0.380 kg

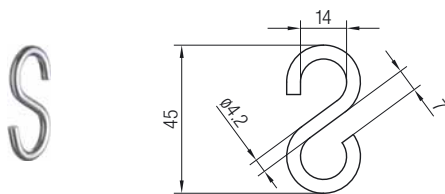
# Accessories for Festoon Systems Program 0240

## Steel Trolley 4 Rollers with Buffer



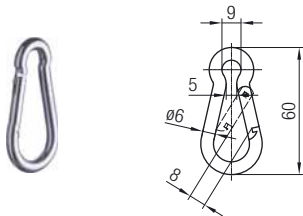
| Order No.  | Type of Roller                     | Nom. Load Capacity [kg] | max. Travel Speed [m/min] | Weight [kg] |
|------------|------------------------------------|-------------------------|---------------------------|-------------|
| 024340-125 | ball bearings:<br>galvanized steel | 32                      | 63                        | 0.40        |
| 024340-160 |                                    |                         |                           | 0.50        |
| 024340-200 |                                    |                         |                           | 0.60        |

## S-Hook



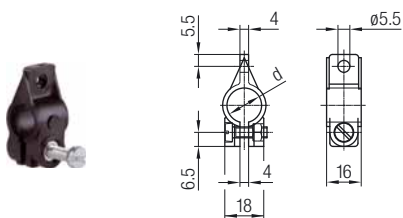
- Order No. 020118-45x4**
- Material: galvanized steel
  - Weight: 0.016 kg

## Spring Safety Hook



- Order No. 020215-60x6**
- Material: galvanized steel
  - Weight: 0.030 kg

## Cable Collar, Plastic



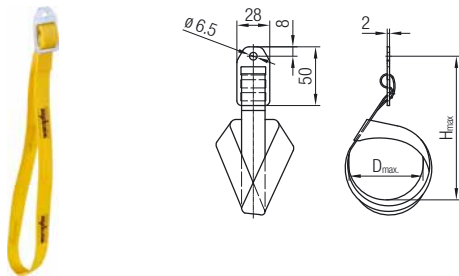
| Order No.   | Cable-ø d [mm] | Material                               | Weight [kg] |
|-------------|----------------|--|-------------|
| 020111-08   | 8              | plastic,<br>hardware: galvanized steel | 0.0070      |
| 020111-10   | 10             |  | 0.0077      |
| 020111-11   | 11             |  | 0.0077      |
| 020111-12.5 | 12.5           |  | 0.0081      |
| 020111-14   | 14             |  | 0.0084      |
| 020111-16   | 16             |  | 0.0085      |
| 020111-18   | 18             |  | 0.0850      |
| 020111-20   | 20             |  | 0.0100      |
| 020111-22   | 22             |  | 0.0100      |
| 020111-25   | 25             |  | 0.0110      |
| 020111-28   | 28             |  | 0.0120      |
| 020111-32   | 32             |  | 0.0130      |
| 020111-36   | 36             |  | 0.0140      |

### Note

For attachment to the trolley with S-hook.

# Accessories for Festoon Systems Program 0240

## Strap for Cable Bundle

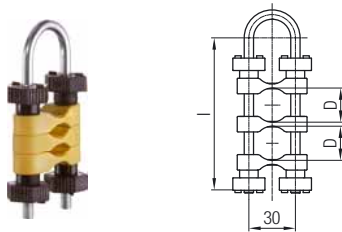


| Order No.  | D <sub>max.</sub><br>[mm] | H <sub>max.</sub><br>[mm] | Material                               | Weight<br>[kg] |
|------------|---------------------------|---------------------------|--|----------------|
| 020117-080 | 80                        | 150                       | plastic,<br>hardware: galvanized steel | 0.020          |
| 020117-160 | 160                       | 230                       |  | 0.030          |

### Note

For attachment to the trolley with S-hook.

## Cable Clips with Bracket



| Order No.   | Number<br>of Loops<br>n <sub>D</sub> | max. Cable-ø<br>per Loop<br>D<br>[mm] | Total of all<br>Cable-ø<br>max.<br>[mm] | l<br>[mm] | Weight<br>[kg] |
|-------------|--------------------------------------|---------------------------------------|---|-----------|----------------|
| 020137-1X18 | 1                                    | 8-18                                  | 18                                      | 63        | 0.055          |
| 020137-1X22 | 1                                    | 8-22                                  | 22                                      | 80        | 0.060          |
| 020137-2X32 | 2                                    | 8-22                                  | 32                                      | 80        | 0.065          |
| 020137-2X44 | 2                                    | 8-22                                  | 44                                      | 100       | 0.070          |
| 020137-3X30 | 3                                    | 8-22                                  | 30                                      | 80        | 0.070          |
| 020137-3X66 | 3                                    | 8-22                                  | 66                                      | 125       | 0.090          |
| 020137-4X72 | 4                                    | 8-22                                  | 72                                      | 125       | 0.090          |
| 020137-5X70 | 5                                    | 8-22                                  | 70                                      | 125       | 0.095          |

### Note

To be used in combination with trolley 024504.

# Helpful Hints

## Calculation of the Load Capacity of C-Rails

### Technical details / bases of calculation

The permissible load of the C-rails can be determined with the help of the diagrams.  
The following bases of calculation have been considered::

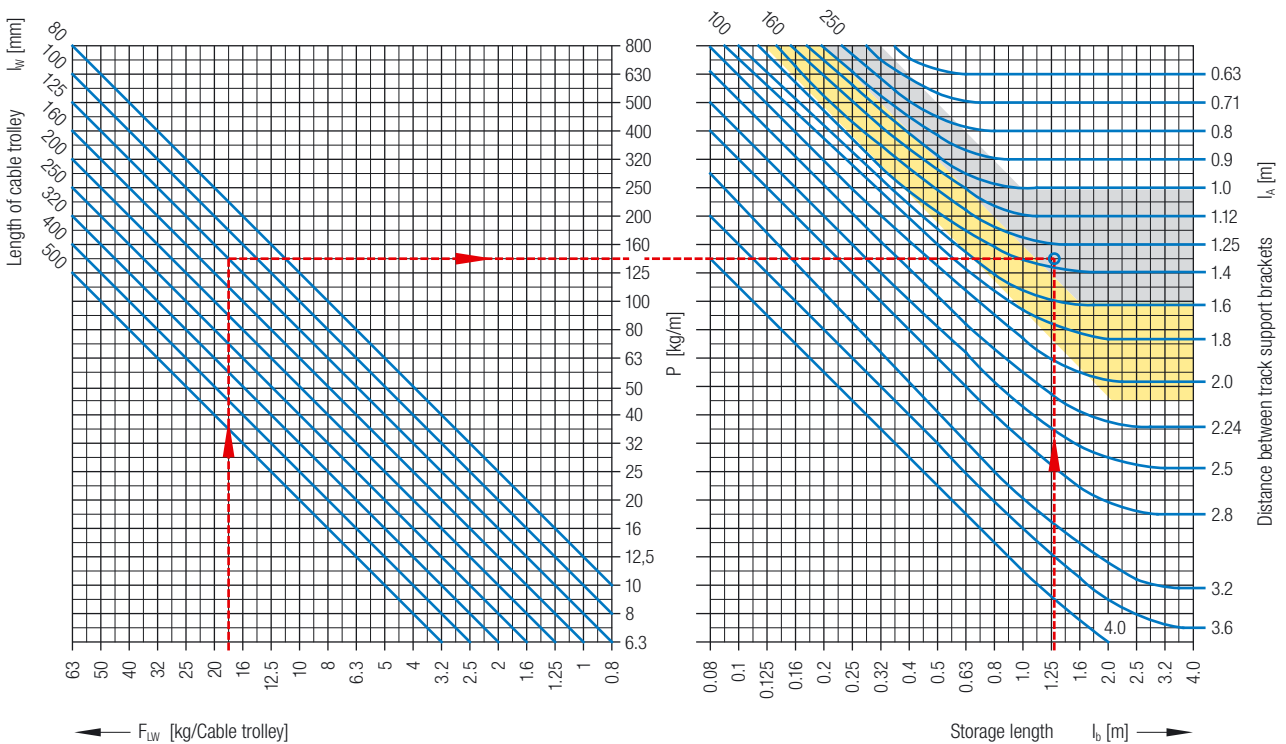
1. Beam on 2 supports, loaded by distributed load symmetrical to the beam center
2.  $\sigma_{zul} = 100 \text{ N/mm}^2$  without consideration of the lower flange stress
3.  $\sigma_V \leq 160 \text{ N/mm}^2$ , reference stress from bending stress and lower flange stress
4.  $f = l_A/250$  allowed deflection from load and self-weight of the C-rail
5. The loading is considered symmetrically distributed over all the track supports (brackets)

### Calculation example

Given:

|                                 |        |
|---------------------------------|--------|
| $F_{LW}$ = Load/trolley         | 18 kg  |
| $l_w$ = Length of cable trolley | 125 mm |
| $Z$ = Number of cable trolleys  | 10     |
| $l_b$ = Storage length          | 1.25 m |
| $(m) = Z \times l_w / 1000$     |        |

## Load Diagram for C-Rail 40 x 40 x 2.5 (024100 / 024104 / 024109)



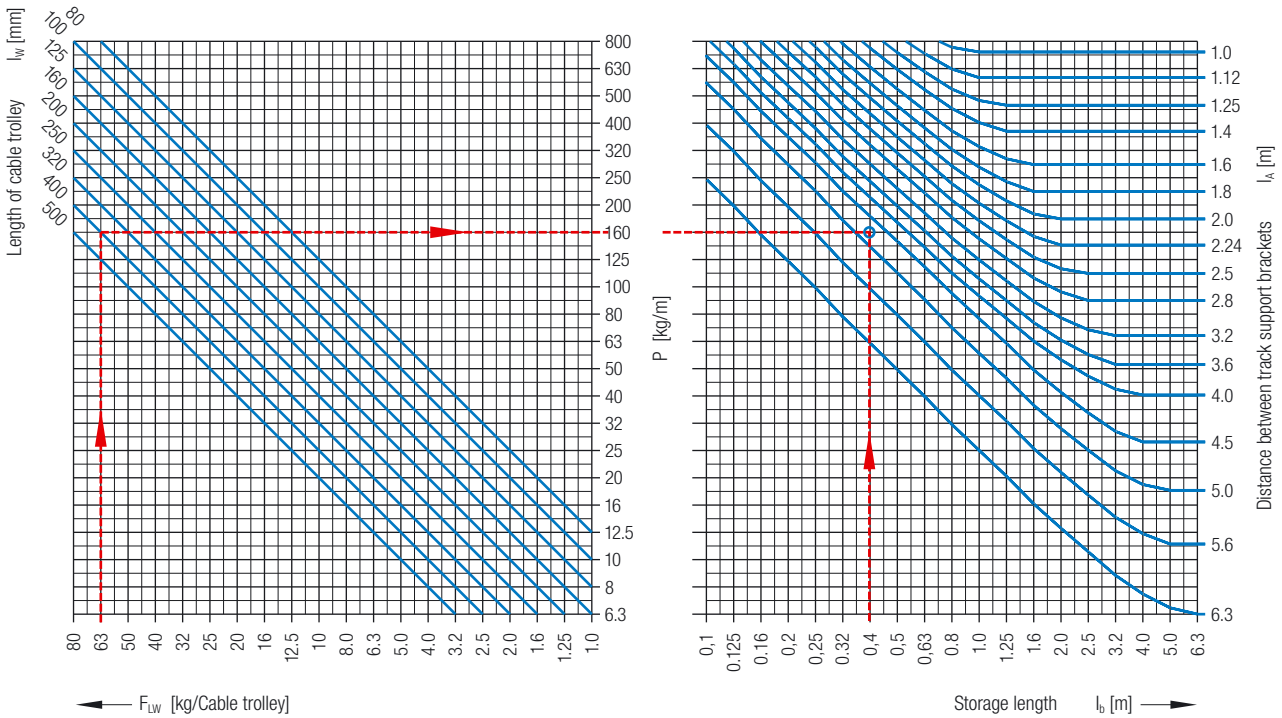
### Solution for C-rail 40 x 40 x 2.5

#### From diagram

- Required distance between the track support brackets [ $l_A$ ] = 1,30 m
- Required load capacity of the track support brackets = 250 kg

# Helpful Hints

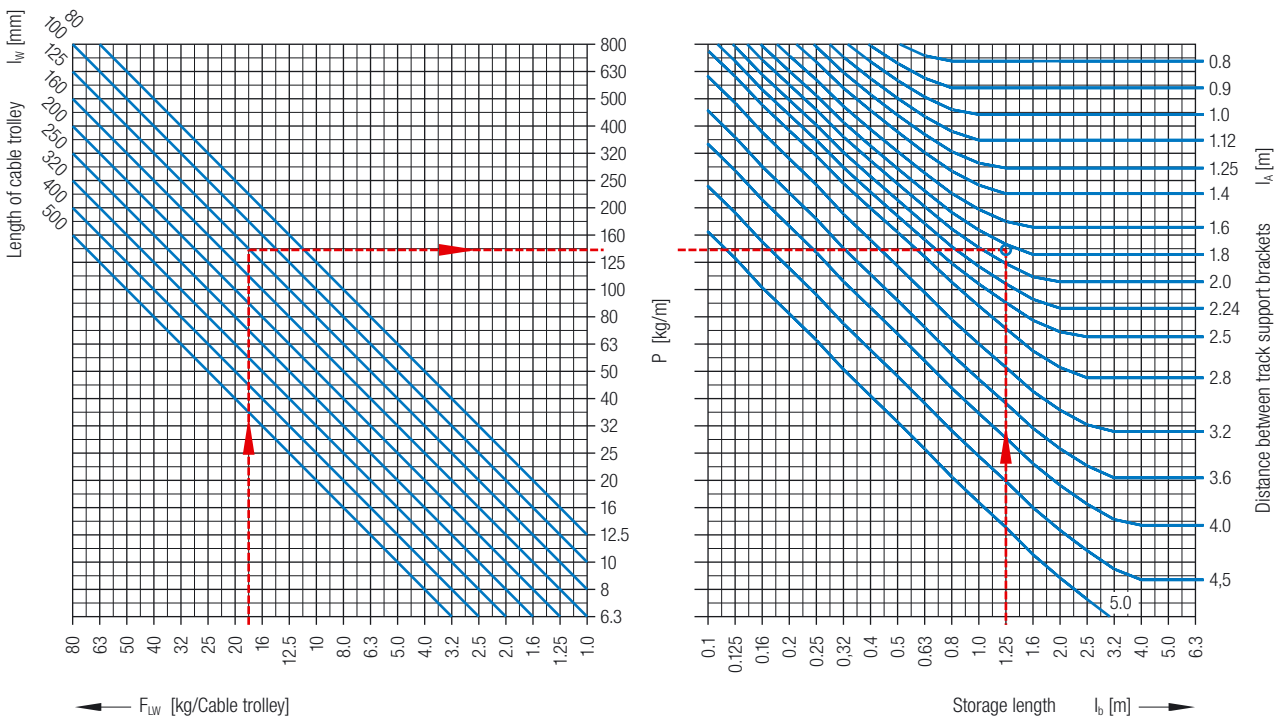
## Load Diagram for CI-Rail Reinforced (024052-6)



**Targets:**  
 Load per trolley  $[F_{LW}] = 63 \text{ kg}$ ; Length of cable trolley  $[l_w] = 400 \text{ mm}$   
 Number of cable trolleys  $[Z] = 1$ ; Storage length  $[l_b] = 0.400 \text{ m}$ ;  $(m) = Z \times l_w / 1000$

**From diagram:**  
 Required distance between track support brackets  $[l_k] = 4.80 \text{ m}$

## Load Diagram for CV-Rail Reinforced (024030-6)

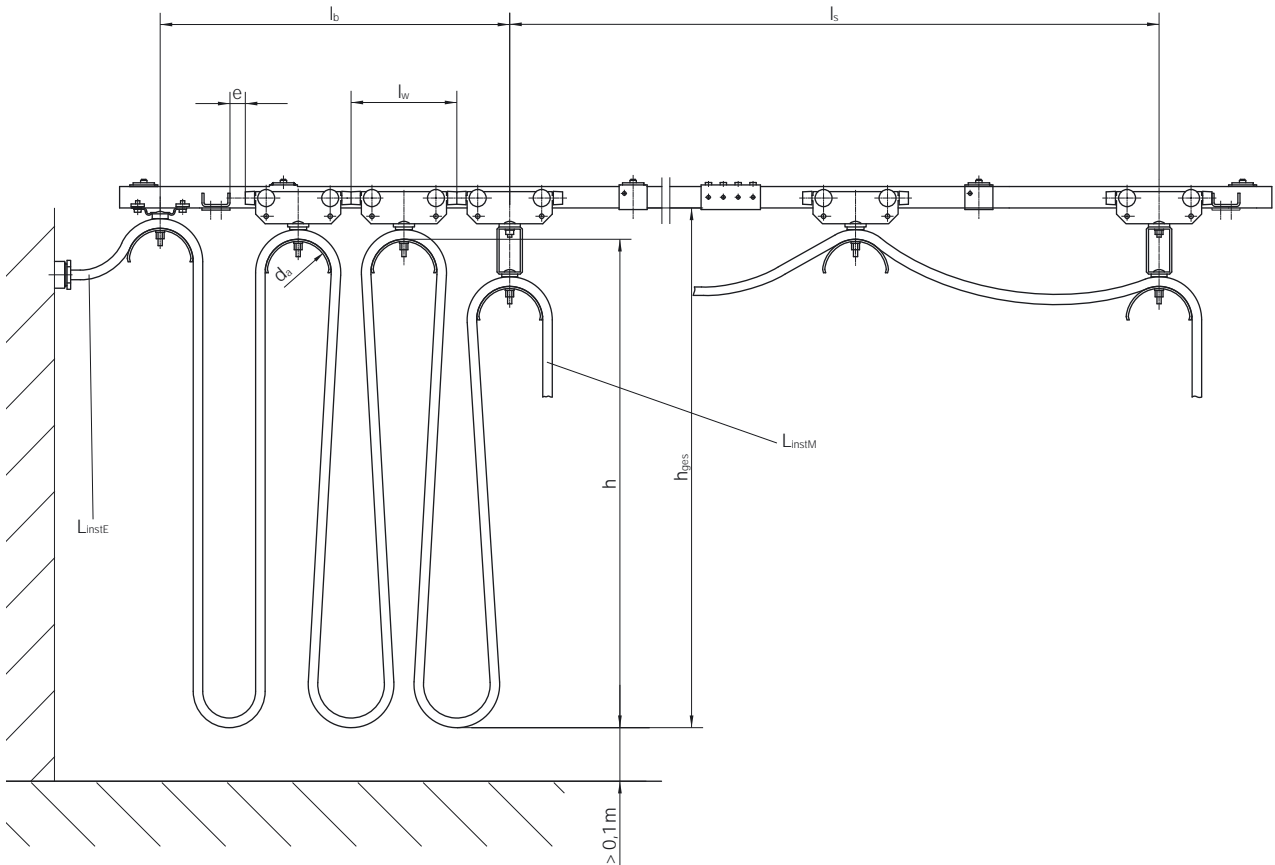


**Targets:**  
 Load per trolley  $[F_{LW}] = 18 \text{ kg}$ ; Length of cable trolley  $[l_w] = 125 \text{ mm}$   
 Number of cable trolleys  $[Z] = 10$ ; Storage length  $[l_b] = 1.25 \text{ m}$ ;  $(m) = Z \times l_w / 1000$

**From diagram:**  
 Required distance between track support brackets  $[l_k] = 15 \text{ m}$

# Helpful Hints

## Technical Data



## Formulas to Determine the Number of Loops, Cable Length and Loop Depth

Number of loops:

$$n = \frac{f(l_s + e)}{2 \cdot h + 1.25 \cdot d_a - f \cdot l_w}$$

Storage length:

$$l_b \approx n \cdot l_w + e \text{ [m]}$$

System cable length:

$$L_{Syst} = f(l_s + l_b) \text{ [m]}$$

Total cable length:

$$L_{Best} = L_{Syst} + L_{instE} + L_{instM} \text{ [m]}$$

Loop length:

$$L_{Schl} = \frac{L_{Syst}}{n} \text{ [m]}$$

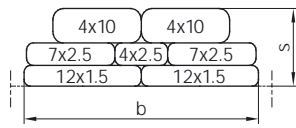
Loop depth:

$$h = \frac{L_{Schl}}{2} - 0.63 \cdot d_a \text{ [m]}$$

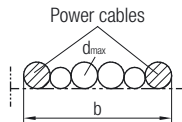
- $d_a$  [m] = cable support diameter
- $e$  [m] = free space in storage area  
(recommendation  $\geq 0.1$  m)
- $f$  = recommended cable factor (see table)
- $h$  [m] = loop depth  
(measured from top edge of cable support)
- $h_{ges}$  [m] = loop depth  
(measured from lower edge of cable support)
- $l_b$  [m] = storage length incl. free space
- $l_s$  [m] = travel distance
- $l_w$  [m] = cable trolley length
- $L_{Best}$  [m] = total cable length
- $L_{instE}$  [m] = installation length, end clamp side
- $L_{instM}$  [m] = installation length, towing side
- $L_{Schl}$  [m] = cable length per loop
- $L_{Syst}$  [m] = required cable length  
(measured from mid of end clamp to mid of towing trolley or towing clamp)
- $n$  = number of loops

# Helpful Hints

## Definition of the Cable Arrangement and Cable Trolley Selection



Example for flat cable trolleys



Example for round cable trolleys

1. Formula for calculating the approximate load per trolley  $F_{LW}$

$$F_{LW} \approx 2 \cdot h \cdot G_L \text{ [kg]}$$

$G_L$  [kg/m] = weight of the cable package

2. Selection of the cable trolley type
3. Required cable support diameter based upon minimum bending radius of the cables
4. Select cable support width  $b_2$  to accommodate the cable package width  
Determine length of trolley  $l_w$

For flat cables::

$$l_w \geq d_a + 2 \cdot s + 10 \text{ [mm]}$$

For round cables:

$$l_w \geq d_a + 2 \cdot d_{max} + 10 \text{ [mm]}$$

## Cable Factors

| Travel Speed<br>$v$ [m/min] | Cable Factor $f$ at $h$ [m] |           |         |           |         |
|-----------------------------|-----------------------------|-----------|---------|-----------|---------|
|                             | < 0.8                       | 0.8 - 1.2 | 1.3 - 2 | 2.1 - 3.2 | 3.3 - 5 |
| < 32                        | 1.10                        | 1.10      | 1.10    | 1.10      | 1.10    |
| 32 - 40                     | 1.15                        | 1.10      | 1.10    | 1.10      | 1.10    |
| 41 - 50                     | 1.20                        | 1.15      | 1.10    | 1.10      | 1.10    |
| 51 - 63                     | 1.25                        | 1.20      | 1.15    | 1.10      | 1.10    |
| 64 - 80                     | -                           | 1.25      | 1.20    | 1.15      | 1.10    |
| 81 - 100                    | -                           | -         | 1.25    | 1.20      | 1.15    |
| 101 - 120                   | -                           | -         | -       | 1.25      | 1.20    |

Depending on the operating conditions the cables must be installed with an additional cable length. The additional length is calculated by taking into account the cable factor  $f$ . We recommend to select the cable factor according to above table.

For values outside the gray area, please contact us directly. Special precautions might be required in those cases under extreme operating conditions, such as the installation of shock cords.

## Permissible Loads of the Rollers

| Travel Speed<br>$V$ [m/min] | Average running time per day<br>[h] |       |        |        |        |
|-----------------------------|-------------------------------------|-------|--------|--------|--------|
|                             | < 4                                 | 4 - 8 | 8 - 16 | -      | -      |
| < 16                        | < 2                                 | 2 - 4 | 4 - 8  | 8 - 16 | -      |
| 16 - 32                     | -                                   | < 2   | 2 - 4  | 4 - 8  | 8 - 16 |
| 32 - 63                     | -                                   | -     | < 2    | 2 - 4  | 4 - 8  |
| 63 - 80                     | -                                   | -     | -      | < 2    | 2 - 4  |
| 80 - 100                    | -                                   | -     | -      | -      | < 2    |

| Type of Roller                | Permissible Load of the Rollers<br>[kg] |    |    |      |    |
|-------------------------------|---|----|----|------|----|
|                               | 50                                      | 40 | 32 | 25.0 | 20 |
| Ball Bearing, galvanized      | 25                                      | 20 | 16 | 12.5 | 10 |
| Ball Bearing V4A              | 25                                      | 20 | 16 | 12.5 | 10 |
| Ball Bearing with PUR Bandage | 25                                      | 20 | 16 | 12.5 | 10 |

The lifetime of the rollers depends on the load (Hertzian stress) and the frequency of operation.

The proper selection, based on travel speed, average running time per day (based on one year) and permissible load of the trolleys with various roller types, can be made by using the above table.

DISTRIBUTED BY:



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