RCS® Remote Control Systems

Push/Pull Cables • Control Levers • Pedals • Pull Only Cables

Edition 2018/2019
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## RCS® Remote Control Systems

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</tr>
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</tbody>
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## Product overview

<table>
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<th>Page</th>
</tr>
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Issue 08/2018 - We reserve the right to make technical modifications.
Setup

A flat wire-reinforced inner member is located in a conduit, which is formed by an inner-lying inner tube and specially arranged longitudinal wires (linear wire stranding). The linear wires on the other hand (with the exception of types 770) are supported and fixed by a support wire winding. A plastic extrusion is doing the outer coverage of the conduit. For the universal connection of elements, the inner member and conduit are supported with pressed on zinc-coated or stainless steel end parts. The push/pull cables are designed lightly gliding and are supplied with low-friction permanent lubrication. Effective seals protect the moving elements of the push/pull cables against external influences such as spray water, dust and corrosion.

Setup and description of push/pull cables

Various travels from 1" to 12"
## Overview of push/pull cables

<table>
<thead>
<tr>
<th>Cable series</th>
<th>Bend radius</th>
<th>Temperature range</th>
<th>Sliding characteristics</th>
<th>Design of end parts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>small</td>
<td>medium</td>
<td>high</td>
<td>light</td>
</tr>
<tr>
<td>383</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>384</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>283</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>284</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>275</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>274</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>775</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>774</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Bend radius: small, medium
- Temperature range: medium, high
- Sliding characteristics: light, extra light
- Design of end parts: zinc-coated, stainless
<table>
<thead>
<tr>
<th></th>
<th>U</th>
<th>V</th>
<th>L</th>
<th>M</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Travel up to 76 mm</td>
<td>• Travel up to 152 mm</td>
<td>• Travel up to 152 mm</td>
<td>• Travel up to 152 mm</td>
<td>• Travel up to 152 mm</td>
</tr>
<tr>
<td></td>
<td>• Push forces 70 N</td>
<td>• Push forces 135 N</td>
<td>• Push forces 225 N</td>
<td>• Push forces 450 N</td>
<td>• Push forces 1 350 N</td>
</tr>
<tr>
<td></td>
<td>• Pull forces 450 N</td>
<td>• Pull forces 540 N</td>
<td>• Pull forces 1 035 N</td>
<td>• Pull forces 1 800 N</td>
<td>• Pull forces 4 500 N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Travel up to 152 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Push forces 135 N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pull forces 540 N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* upon request</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cable series
the basis of Remote Control System

Our cable series are offered in five sizes. In the standard version, three end part configurations are designed. There are six different types of travel, which can be combined with three different seals. A multitude of additional possibilities for configuration and variation in the setup of the cables are possible in order to create a solution that fits to the respective application.

Series 383 and 384
- Series 383 with zinc-coated end parts and stainless steel rod ends
- Series 384 with stainless steel end parts
- PTFE-covered inner member
- Highly efficient without stick-slip effect
- Remarkably small bend radii
- Extremely smooth at high loads
- Colour: blue/red marked
- For cable sizes V, L and M
- High temperature range from -50 °C to +100 °C (constant) and short term up to +170 °C

Series 283 and 284
- Series 283 with zinc-coated end parts and stainless steel rod ends
- Series 284 with stainless steel end parts
- PTFE-covered inner member
- Highly efficient without stick-slip effect
- Remarkably small bend radii
- Extremely smooth at high loads
- Colour: blue/yellow marked
- For cable sizes U, V, L, M and H
- High temperature range from -50 °C to +90 °C (constant) and short term up to +150 °C
Cable series
the basis of Remote Control System

Series 275 and 274
- Series 275 with zinc-coated end parts and stainless steel rod ends
- Series 274 with stainless steel end parts
- Inner member stainless steel reinforced
- Highly efficient
- Remarkably small bend radii
- Extremely smooth
- High travel frequencies
- Colour: blue
- For cable sizes U, V, L and M
- High temperature range from -50 °C to +90 °C (constant) and short term up to +110 °C

Series 775 and 774
- Series 775 with zinc-coated end parts and stainless steel rod ends
- Series 774 with stainless steel end parts
- Attractive pricing
- Highly efficient
- For applications without special requirements
- Colour: black
- For cable sizes U, L and M
- High temperature range from -50 °C to +80 °C (constant) and short term up to +100 °C
Selection of cable sizes

Cable sizes, maximum travel, bend radii, seals, thread rod ends, outer diameter of conduits and push and pull forces depending on the travel

Cable sizes, maximum travel, bend radii, seals, thread rod ends and outer diameter of conduit

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Max. travel</th>
<th>Bend radius for cable series</th>
<th>Seals</th>
<th>Thread rod ends</th>
<th>Outer diameter of conduit for cable series</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm</td>
<td>383/384 mm</td>
<td>283/284 mm</td>
<td>275/274 mm</td>
<td>775/774 mm</td>
</tr>
<tr>
<td>U</td>
<td>76</td>
<td>-</td>
<td>51 51 115</td>
<td>M5 10-32</td>
<td>- 6.8 6.8 7.5</td>
</tr>
<tr>
<td>V</td>
<td>152</td>
<td>76 76 180</td>
<td>-</td>
<td>M5 10-32</td>
<td>8.8 8.8 8.8</td>
</tr>
<tr>
<td>L</td>
<td>152</td>
<td>127 127 230</td>
<td>-</td>
<td>M6 1/4-28</td>
<td>12.2 13.3 13.3</td>
</tr>
<tr>
<td>M</td>
<td>152</td>
<td>-</td>
<td>152</td>
<td>M8 5/16-24</td>
<td>14.5 15.0 15.0</td>
</tr>
<tr>
<td>H</td>
<td>152</td>
<td>-</td>
<td>-</td>
<td>M10 3/8-24</td>
<td>- 17.6 - -</td>
</tr>
</tbody>
</table>

* except for connections S and R

Push and pull forces depending on the travel

The specified forces are applicable for use in permanent operation with a long service life.

A safety factor of 1.5 can be used to calculate the temporary overloads.
Selection of cable sizes

Efficiencies

The efficiency of a push/pull cable (the relation of the required cable operating force to a given output force) is particularly influenced by the number of bends laid in the cable.

The cable operating force can be calculated in accordance with the following formula:

\[ \text{Operating force} = \text{Output force} \times \text{Efficiency factor} \]

\( \alpha \) is the sum of all cable bends in degrees. In addition to the cable bends, the cable length is to be taken into consideration with 15° for every 1 meter.

<table>
<thead>
<tr>
<th>Series</th>
<th>180°</th>
<th>360°</th>
<th>540°</th>
<th>720°</th>
<th>900°</th>
</tr>
</thead>
<tbody>
<tr>
<td>383 + 384</td>
<td>1,17</td>
<td>1,36</td>
<td>1,59</td>
<td>1,85</td>
<td>2,16</td>
</tr>
<tr>
<td>283 + 284</td>
<td>1,17</td>
<td>1,36</td>
<td>1,59</td>
<td>1,85</td>
<td>2,16</td>
</tr>
<tr>
<td>275 + 274</td>
<td>1,31</td>
<td>1,72</td>
<td>2,26</td>
<td>2,96</td>
<td>3,88</td>
</tr>
<tr>
<td>775 + 774</td>
<td>1,31</td>
<td>1,72</td>
<td>2,26</td>
<td>2,96</td>
<td>3,88</td>
</tr>
</tbody>
</table>

Example of efficiency factor

Cable series 283
Cable size L
Cable length 12 m
Sum of bends 180°
alpha \(180° + 12 \times 15° = 360°\)
Efficiency factor 1,36
Standard end parts  
Connection types of cable end parts, wiper seals and lubrication

Connection types of cable end parts

- **Rigid screw endfitting type S and R**

- **Swiveled bulkhead endfitting type T**

- **Swiveled clamp endfitting type G**

**Wiper seals**

**Seal no. 05**  
The rubber wiper seal has been proven for all cable sizes for normal applications in the entire machine construction. Upon request also with a support tube from stainless steel.

**Seal no. 10**  
Automatic self-adjusting PTFE wiper seal in case of wear for cable sizes U, V and L. Protects well against fine dust.

**Seal no. 20**  
Design like seal no. 10 with additional double spring-loaded metal wiper, for cable sizes L, M and H. For extreme conditions such as sludge, coarse dirt and ice.

**Lubrication**

RCS® push/pull cables are designed and lubricated for optimum performance and life. Under no circumstances should you re-lubricate or attempt any other kind of maintenance!
Connections of cable end parts
Connection type T
Swiveled bulkhead endfitting

<table>
<thead>
<tr>
<th>Cable size</th>
<th>d1</th>
<th>d2*</th>
<th>d4</th>
<th>d5</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>M</th>
<th>A/F</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>4.75</td>
<td>10</td>
<td>11.3</td>
<td>11.5</td>
<td>14</td>
<td>33</td>
<td>7</td>
<td>20</td>
<td>7/16-20-UNF</td>
<td>17</td>
<td>M5</td>
</tr>
<tr>
<td>V</td>
<td>4.75</td>
<td>10</td>
<td>11.3</td>
<td>11.5</td>
<td>14</td>
<td>33</td>
<td>7</td>
<td>20</td>
<td>7/16-20-UNF</td>
<td>17</td>
<td>M5</td>
</tr>
<tr>
<td>L</td>
<td>6.35</td>
<td>13</td>
<td>14.7</td>
<td>16.5</td>
<td>19</td>
<td>51</td>
<td>8</td>
<td>24</td>
<td>M 16 x 1.5</td>
<td>24</td>
<td>M6</td>
</tr>
<tr>
<td>M</td>
<td>8</td>
<td>14.5</td>
<td>16.3</td>
<td>19.3</td>
<td>22</td>
<td>54</td>
<td>9</td>
<td>24</td>
<td>M 18 x 1.5</td>
<td>27</td>
<td>M8</td>
</tr>
<tr>
<td>H</td>
<td>9.5</td>
<td>17.0</td>
<td>18.5</td>
<td>23.4</td>
<td>25</td>
<td>66</td>
<td>10</td>
<td>35</td>
<td>M 22 x 1.5</td>
<td>32</td>
<td>M10</td>
</tr>
</tbody>
</table>

* for seal no. 05

Dimensions A

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Push/pull cables* at travel of</th>
<th>Cable with hand operation**</th>
<th>Cables for levers***</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25 mm</td>
<td>51 mm</td>
<td>76 mm</td>
</tr>
<tr>
<td>U</td>
<td>111</td>
<td>149</td>
<td>187</td>
</tr>
<tr>
<td>V</td>
<td>111</td>
<td>149</td>
<td>187</td>
</tr>
<tr>
<td>L</td>
<td>117</td>
<td>155</td>
<td>193</td>
</tr>
<tr>
<td>M</td>
<td>-</td>
<td>166</td>
<td>205</td>
</tr>
<tr>
<td>H</td>
<td>-</td>
<td>182</td>
<td>221</td>
</tr>
</tbody>
</table>

* Rod end in mid position
** Rod end completely moved out (see from page 32), TL (1) = variant 1, TL (2) = variant 2 (see page 25)
*** Rod end in mid position (see from page 32)

Can also be supplied with end parts made of stainless steel.
Connections of cable end parts
Connection type G
Swiveled clamp endfitting

![Diagram of cable end parts](image)

Dimensions A

<table>
<thead>
<tr>
<th>Cable size</th>
<th>d1 (mm)</th>
<th>d2* (mm)</th>
<th>d4 (mm)</th>
<th>d5 (mm)</th>
<th>d7 (mm)</th>
<th>d8 (mm)</th>
<th>D (mm)</th>
<th>E (mm)</th>
<th>F (mm)</th>
<th>H (mm)</th>
<th>R (mm)</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>4,75</td>
<td>10</td>
<td>11,3</td>
<td>10,2</td>
<td>9,4</td>
<td>6,35</td>
<td>11</td>
<td>29,5</td>
<td>3,4</td>
<td>20</td>
<td>-</td>
<td>M 5</td>
</tr>
<tr>
<td>V</td>
<td>4,75</td>
<td>10</td>
<td>11,3</td>
<td>11,5</td>
<td>9,4</td>
<td>6,35</td>
<td>8,7</td>
<td>29,5</td>
<td>3,4</td>
<td>20</td>
<td>-</td>
<td>M 5</td>
</tr>
<tr>
<td>L</td>
<td>6,35</td>
<td>13</td>
<td>14,7</td>
<td>16,5</td>
<td>12,7</td>
<td>10,4</td>
<td>11,1</td>
<td>44,5</td>
<td>-</td>
<td>24</td>
<td>4,3</td>
<td>M 6</td>
</tr>
<tr>
<td>M</td>
<td>8</td>
<td>14,5</td>
<td>16,3</td>
<td>19,3</td>
<td>14,3</td>
<td>11,9</td>
<td>18</td>
<td>48</td>
<td>-</td>
<td>24</td>
<td>4,3</td>
<td>M 8</td>
</tr>
<tr>
<td>H</td>
<td>9,5</td>
<td>17</td>
<td>18,5</td>
<td>23,4</td>
<td>16,6</td>
<td>12,7</td>
<td>9,6</td>
<td>67</td>
<td>-</td>
<td>35</td>
<td>5</td>
<td>M 10</td>
</tr>
</tbody>
</table>

* for seal no. 05

Can also be supplied with end parts made from stainless steel.

- * Rod end in mid position
- ** Rod end completely moved out (see from page 22), TL (1) = variant 1, TL (2) = variant 2 (see page 25)
- *** Rod end in mid position (see from page 32)
Connections of cable end parts

Connection type R or S
Rigid screw type endfitting

Dimensions A

<table>
<thead>
<tr>
<th>Cable size</th>
<th>C (mm)</th>
<th>d1 (mm)</th>
<th>d2 (mm)</th>
<th>d3 (mm)</th>
<th>E (mm)</th>
<th>F (mm)</th>
<th>H (mm)</th>
<th>M</th>
<th>A/F (mm)</th>
<th>X (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>13</td>
<td>4.75</td>
<td>10</td>
<td>12.7</td>
<td>35</td>
<td>5</td>
<td>20</td>
<td></td>
<td>17</td>
<td>M 5</td>
</tr>
<tr>
<td>V</td>
<td>13</td>
<td>4.75</td>
<td>10</td>
<td>12.7</td>
<td>35</td>
<td>5</td>
<td>20</td>
<td></td>
<td>17</td>
<td>M 5</td>
</tr>
<tr>
<td>L</td>
<td>16</td>
<td>6.35</td>
<td>13</td>
<td>16.5</td>
<td>-</td>
<td>7</td>
<td>24</td>
<td>7/16-20 UNF</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>16</td>
<td>8</td>
<td>14.5</td>
<td>19.3</td>
<td>71</td>
<td>6</td>
<td>24</td>
<td>M 12 X 1</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>16.5</td>
<td>9.5</td>
<td>17</td>
<td>23.4</td>
<td>70</td>
<td>8</td>
<td>35</td>
<td>M 16 X 1.5</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

Push/pull cables* at travel:

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Push/pull cables* at travel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25 mm</td>
</tr>
<tr>
<td>U</td>
<td>63</td>
</tr>
<tr>
<td>V</td>
<td>63</td>
</tr>
<tr>
<td>L</td>
<td>-</td>
</tr>
<tr>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>H</td>
<td>-</td>
</tr>
</tbody>
</table>

Cable with hand operation**:

<table>
<thead>
<tr>
<th>NL/TL (1)/MA TL (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mm</td>
</tr>
<tr>
<td>U</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>M</td>
</tr>
</tbody>
</table>

Cables for operating level***:

<table>
<thead>
<tr>
<th>14RN15 mm</th>
<th>58.x mm</th>
<th>22.x mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>90</td>
<td>-</td>
</tr>
<tr>
<td>V</td>
<td>-</td>
<td>115</td>
</tr>
<tr>
<td>L</td>
<td>-</td>
<td>115</td>
</tr>
<tr>
<td>M</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Rod end in mid position
** Rod end completely moved out (see from page 22), TL (1) = variant 1, TL (2) = variant 2 (see page 25)
*** Rod end in mid position (see from page 32)
**** only for hand operation TL and MA, not available for NL

Dimensions D for cable size and travel:

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mm</td>
<td>51 mm</td>
</tr>
<tr>
<td>U</td>
<td>15</td>
</tr>
<tr>
<td>V</td>
<td>15</td>
</tr>
<tr>
<td>L</td>
<td>-</td>
</tr>
<tr>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>H</td>
<td>-</td>
</tr>
</tbody>
</table>

Dimensions E for cable size L and travel:

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>51 mm</td>
<td>76 mm</td>
</tr>
<tr>
<td>L</td>
<td>73</td>
</tr>
</tbody>
</table>

Cable series 275 and 283 are available for cable sizes U-M.
The cable size H can only be supplied with cable series 283.

“S” denotes the rigid cable ends for cable sizes U, V, M and H. “R” is the designation for a rigid end for cable size L.
Codes of practice

- Do not install push/pull cables in any applications, which may exceed the design parameters of the cable.
- Do not remove seals! RCS® cables cannot be disassembled!
- RCS® push/pull cables are designed and lubricated for optimum performance and life; under no circumstances should you re-lubricate or attempt any other kind of maintenance.
- Cables that have moisture inside or are frozen should be replaced. Do not apply heat to remove moisture.
- Protect cables from physical damage such as bending, crushing, heavy vibration and from contamination such as moisture, dirt or chemicals. Do not paint ends!
- A gradual or sudden increase in friction or decrease in the travel length of a control cable is an indication of possible performance issues and/or cable failure. We recommended that you replace the cable in this event as a precautionary measure.

Health and safety regulations

Control cables and actuators contain thermoplastic materials in the form of knobs etc. or as covering and/or lining of assemblies. These materials include polypropylene, acetyl resin, high and low-density polyethylene, nylon etc. In normal use these do not constitute any hazard. But, if burnt, they may give fumes, some of which may be toxic, and all recommended fire-fighting precautions shall be observed.
If a push/pull cable is connected to a lever that describes an arc, it should be adjusted at the right angle to half travel position and half the height of the segmental arc of the lever.

Swiveled endings (connection types G and T) allow for an arc from centerline of ± 8° all way around.

(P-P-Cables with swiveled end)

For linear movement only (e.g. spool valves) accurate alignment of both planes of the cable and the object to be controlled is necessary!

(P-P-Cables with swiveled end)

Only correct installation and layout of push/pull cables assure proper function. Anchor cable end parts securely so that they cannot move or twist under load. Clamps shall be placed at one-meter intervals; they should fasten the cable but not squeeze it, in bends only at the ends of bend radii.
Order key for push/pull cables

Features

Order code: 283 - L - G 05 M / T 10 M - 3 - 0200

Cable series:
383/384, 283/284, 275/274, 775/774

Cable size:
Selection according to operating forces, connection threads, bend radii etc.: U, V, L, M or H

Connection first cable end part:
In accordance with installation conditions T, G, S or R

Wiper seal:
Seal no. 05, 10 or 20

Thread at rod end:
The size of the connection thread can be calculated from the cable size, M for metric, Z for inch (UNF) thread

Connection second cable end part:
In accordance with installation conditions T, G, S or R

Wiper seal:
Seal no. 05, 10 or 20

Thread at rod end:
M for metric, Z for inch (UNF) thread

Travel code:
The following values are possible as travel code, in compliance with a travel in mm:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
<td>51</td>
<td>76</td>
<td>102</td>
<td>127</td>
<td>152</td>
</tr>
</tbody>
</table>

Cable length:
Entire length, denoted in cm, principally 4-figure:
e. g.: 3 400 mm = -0340
e. g.: 5 m = -0500
Clevises with snap lock pins, zinc-coated and eye ends, zinc-coated

Can also be supplied with end parts consisting of stainless steel with bolts and split pin or locking ring.

Eye ends, zinc-coated

Can also be supplied with end parts consisting of stainless steel with bolts and split pin or locking ring.

### Accessories

Cables size | Art.-No.  | B | C | U/V |  |  |  |  | Art.-No. |
---|---|---|---|---|---|---|---|---|---|
G 5 x 10 | 5030-005002 | 6 | 6 | M 5 | 50 | 50 | 50 | 50 | 5030-005002 |
G 6 x 12 | 5030-006001 | 8 | 8 | M 6 | 80 | 80 | 80 | 80 | 5030-006002 |
G 8 x 18 | 5030-008001 | 12 | 12 | M 8 | 120 | 120 | 120 | 120 | 5030-008002 |
M 10 x 20 | 5030-010001 | 16 | 16 | M 10 | 160 | 160 | 160 | 160 | 5030-010002 |
M 12 x 48 | 5030-012001 | 20 | 20 | M 12 | 200 | 200 | 200 | 200 | 5030-012002 |

### Eye ends, zinc-coated

Cable size | Art.-No.  | B | C | A |  |  |  |  | Art.-No. |
---|---|---|---|---|---|---|---|---|---|
U/V | M 5 | 6 | 6 | 5030-005002 |
L | M 6 | 6 | 6 | 5030-006001 |
M 6 | 8 | 8 | 5030-006002 |
M | M 8 | 8 | 8 | 5030-008001 |
M 8 | 6 | 6 | 5030-008002 |

Cut A-A
**Accessories**

**Ball joints, zinc-coated and ball joints for cable size H**

---

**Ball joints, zinc-coated**

<table>
<thead>
<tr>
<th>Cable size</th>
<th>CS8</th>
<th>CS10/MS5</th>
<th>CS10/MSDK</th>
<th>CS10</th>
<th>CS13/M6</th>
<th>CS16/M8</th>
<th>CS16 DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>U/V</td>
<td>L</td>
<td>M</td>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a (mm)</td>
<td>22</td>
<td>25</td>
<td>25</td>
<td>30</td>
<td>30</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>d1 (mm)</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>13</td>
<td>13</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>d2 (mm)</td>
<td>M5</td>
<td>M6</td>
<td>M6</td>
<td>M8</td>
<td>M8</td>
<td>M10</td>
<td>M10</td>
</tr>
<tr>
<td>d3 (mm)</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>13</td>
<td>13</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>d4 (mm)</td>
<td>M5</td>
<td>M5</td>
<td>M5</td>
<td>M6</td>
<td>M6</td>
<td>M10</td>
<td>M10</td>
</tr>
<tr>
<td>dk (mm)</td>
<td>13</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>19</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>e (mm)</td>
<td>10</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>14</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>I2 (mm)</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>I3 (mm)</td>
<td>9</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>13</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Art.-No.</td>
<td>5234-008001</td>
<td>5234-010002</td>
<td>5234-010102</td>
<td>5234-010001</td>
<td>5234-013002</td>
<td>5234-016002</td>
<td>5234-016101</td>
</tr>
</tbody>
</table>

Can also be supplied with a sealing cap, design DK.

---

**Ball joints for cable size H**

<table>
<thead>
<tr>
<th>Cable size</th>
<th>d4</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>M 10</td>
<td>5234-010100</td>
</tr>
<tr>
<td></td>
<td>M 10*</td>
<td>5234-010101</td>
</tr>
</tbody>
</table>

* left

---

*Can also be supplied with end parts consisting of stainless steel.*
Accessories for the connection of push/pull cables

Brackets for clamp connections, clamp assemblies, U-bolt assemblies and clamps

Brackets for clamp connections

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Y mm</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/V</td>
<td>20</td>
<td>3561-010272</td>
</tr>
<tr>
<td>L</td>
<td>22</td>
<td>3561-010272</td>
</tr>
<tr>
<td>M</td>
<td>23</td>
<td>3561-010272</td>
</tr>
</tbody>
</table>

With two 1/4-20 x 1-UNC hexagonal bolts and 1/4-20 x 5/8-UNC nuts each

Clamp assemblies

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/V</td>
<td>3563-000001</td>
</tr>
</tbody>
</table>

U-bolt assemblies

<table>
<thead>
<tr>
<th>Cable size</th>
<th>A mm</th>
<th>B mm</th>
<th>C mm</th>
<th>D mm</th>
<th>X</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/V</td>
<td>15</td>
<td>8</td>
<td>16</td>
<td>26</td>
<td>M 6</td>
<td>3563-001001*</td>
</tr>
<tr>
<td>L/M/H</td>
<td>20</td>
<td>12</td>
<td>18</td>
<td>38</td>
<td>M 8</td>
<td>3563-001003</td>
</tr>
</tbody>
</table>

*differs from illustration

Clamps

<table>
<thead>
<tr>
<th>Cable size</th>
<th>d mm</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>5,2</td>
<td>1563-001004</td>
</tr>
<tr>
<td>V</td>
<td>6,4</td>
<td>1563-001005</td>
</tr>
<tr>
<td>L/M</td>
<td>6,4</td>
<td>1563-001006</td>
</tr>
<tr>
<td>H</td>
<td>8,4</td>
<td>1563-001007</td>
</tr>
</tbody>
</table>
Accessories for the connection of push/pull cables
Brackets for connection of bulkheads, swivel flanges for rigid end cables and rubber grommets

Brackets for connection of bulkheads

Swivel flanges for rigid end cables

Rubber grommets for dust and watertight cable feedthroughs

Rubber grommets for all cable sizes

<table>
<thead>
<tr>
<th>Cable size</th>
<th>d mm</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/V</td>
<td>19</td>
<td>5165-019001</td>
</tr>
<tr>
<td>L</td>
<td>23</td>
<td>5165-023001</td>
</tr>
<tr>
<td>M/H</td>
<td>29</td>
<td>5165-029001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/V/L/M/H</td>
<td>5165-032001</td>
</tr>
</tbody>
</table>
Function cable with hand operation

Basic functions

• Non-Locking Control Cable without locking mechanism, button or T-handle (optional)
• Twist Lock Control Cable with T-handle and locking mechanism
• Micro-adjust control cable with quick adjustment via pressure button and fine adjustment with turn handle
• Spring Loaded Control Cable for T-handle (optional) with spring return to mid position
## Availability of cable sizes and seals

for cable series 283, 275 and 775

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Cable series</th>
<th>Outer diameter</th>
<th>Thread of rod ends</th>
<th>Non-locking control cable – NL – Travel adjustment with button or T-handle</th>
<th>Twist lock control cable – TL – Travel adjustment and one-handed locking mechanism</th>
<th>Micro-adjust control cable – MA – Quick adjustment via pressure button</th>
<th>Spring loaded control cable – VC – Hand operated with spring return</th>
<th>Foot operated cable – VFC – Button with rubber cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>283 + 275</td>
<td>6.8 mm</td>
<td>M5 10-32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>283 + 275</td>
<td>13.3 mm</td>
<td>M6 1/4-28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cable operating forces (N)

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Cable series</th>
<th>Non-locking control cable – NL – Travel adjustment with button or T-handle</th>
<th>Twist lock control cable – TL – Travel adjustment and one-handed locking mechanism</th>
<th>Micro-adjust control cable – MA – Quick adjustment via pressure button</th>
<th>Spring loaded control cable – VC – Hand operated with spring return</th>
<th>Foot operated cable – VFC – Button with rubber cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>283 + 275</td>
<td>150 mm 100 mm 70 mm 250 mm</td>
<td>15 mm 10 mm 5 mm 250 mm</td>
<td>15 mm 10 mm 5 mm 250 mm</td>
<td>- mm - mm - mm - mm</td>
<td>- mm - mm - mm</td>
</tr>
<tr>
<td>L</td>
<td>283 + 275</td>
<td>- mm - mm - mm - mm</td>
<td>- mm - mm - mm - mm</td>
<td>- mm - mm - mm - mm</td>
<td>- mm - mm - mm - mm</td>
<td>- mm - mm - mm</td>
</tr>
</tbody>
</table>

*Note: The table and diagram provide detailed specifications for cable sizes and seals, including cable sizes, outer diameters, thread specifications, and operating forces for each cable type.*
Non-locking control cable – NL –
Travel adjustment with button or T-handle

Features
- Easy to use
- Cost-effective and universal

For more information on the design of the cable ends, see page 11 to 13.

Accessories
Material: plastic, black
Marking: None, STOP or on request.
Button or T-handle are not included in the scope of delivery of the cable.

Accessories

Push force series 283 and 275

Push force series 775

Pull force series 283 and 275

Pull force series 775
Twist lock control cable – TL –
Travel adjustment and one-handed locking mechanism with T-handle

Features
- Travel adjustment and locking mechanism with one hand
- Easy release and locking
- Version (1) for max. travel 76 mm or version (2) for max. travel 38 mm

For more information on the design of the cable ends, see page 11 to 13.
Micro-adjust control cable – MA –
Quick adjustment via pressure button

Features
• Quick adjustment via pressure button
• Fine adjustment with a rotating handle
• Emergency off function
For more information on the design of the cable ends, see page 11 to 13.

Push force series 283 and 275

Push force series 775

Pull force series 283 and 275

Pull force series 775
Spring loaded control cable – VC –
Hand operated with spring return
T-handle optional

Features
- Hand operated with spring return
- Return in 1/2 travel

Accessories
T-handle is not included in the scope of delivery for the cable.

Push force series 283 and 275
- Cable size V
- Cable operating force in N:
  - 300
  - 250
  - 200
  - 180
  - 150
  - 100
  - 50
- Travel in mm:
  - 25
  - 50

Pull force series 283 and 275
- Cable size V
- Cable operating force in N:
  - 300
  - 250
  - 200
  - 150
  - 100
  - 50
- Travel in mm:
  - 25
  - 50
Foot operated cable – VFC –
Button with rubber cap

Features
Especially suitable for switching on additional functions, e.g. emergency off button or diesel stop. Function travel: 13 mm, only pressure. Return not carried out automatically, the operated element must have a spring return! The foot-operated button with a profile rubber cap is pivoted to ensure the cable is robust and durable.

Push force series 283 and 275

<table>
<thead>
<tr>
<th>Cable size V</th>
<th>Cable operating force in N</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>250</td>
</tr>
</tbody>
</table>

Travel in mm: 13
Connections
Open ends, inner member with rod end

Cable series 283 and 275
for cable size U
Type T00M
Cable end with bulkhead endfitting 7/16-20 UNF, rod end M5 and a bellow

Cable series 275
Cable size V
Type T00M
Cable end with bulkhead endfitting M10, rod end M5 and a bellow

Cable series 275
Cable sizes U/V
Type G00M
Clamp endfitting with rod end M5 and a bellow

Remarks
- Dimension A with an inserted function button, $A = B + 78$
- Sealing with optional bellow, $B$ (min) = 70, $B$ (max) = 150
- Dimension B is not included in the type designation and must be specified additionally
- Other versions are available upon request
Connections

Open ends, inner member made of solid stainless steel wire, with screw nipple

Cable series 775
Cable size U
Type 03
Open cable end with bulkhead endfitting 3/8-24 UNF-2, sealing and screw nipple

Cable series 275 and 775
Cable size U
Type 04
Open cable end with bulkhead endfitting M8 or 3/8-24 UNF-2 and screw nipple

Cable series 775
Cable size U
Type G00
Open cable end with a clamp endfitting and screw nipple

Remarks
- Dimension 300 with inserted function button
- Other versions are available upon request
Order key for push/pull cables with control heads

<table>
<thead>
<tr>
<th>Features</th>
<th>Order code: 283 - V - TL / T 05 M - 3 - 0200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cable serie:</strong></td>
<td></td>
</tr>
<tr>
<td>283, 275, 775 or other after consultation</td>
<td></td>
</tr>
<tr>
<td><strong>Cable size:</strong></td>
<td></td>
</tr>
<tr>
<td>Selection according to operating forces,</td>
<td></td>
</tr>
<tr>
<td>connection threads, bend radii etc.:</td>
<td></td>
</tr>
<tr>
<td>U, V or L</td>
<td></td>
</tr>
<tr>
<td><strong>Control head:</strong></td>
<td></td>
</tr>
<tr>
<td>According to operation</td>
<td></td>
</tr>
<tr>
<td><strong>Connection second end part:</strong></td>
<td></td>
</tr>
<tr>
<td>In accordance with installation conditions T,</td>
<td></td>
</tr>
<tr>
<td>G, S or R</td>
<td></td>
</tr>
<tr>
<td><strong>Wiper seal:</strong></td>
<td></td>
</tr>
<tr>
<td>Only for cable end parts T, G, S or R</td>
<td></td>
</tr>
<tr>
<td>(See catalogue page 10)</td>
<td></td>
</tr>
<tr>
<td><strong>Thread at rod end:</strong></td>
<td></td>
</tr>
<tr>
<td>Only at end parts T, G, S or R</td>
<td></td>
</tr>
<tr>
<td>M for metric,</td>
<td></td>
</tr>
<tr>
<td>Z for inch (UNF) thread</td>
<td></td>
</tr>
<tr>
<td><strong>Travel code:</strong></td>
<td></td>
</tr>
<tr>
<td>The following values are possible as travel</td>
<td></td>
</tr>
<tr>
<td>code, in compliance with a travel in mm:</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>25 51 76 102 127 152</td>
<td></td>
</tr>
<tr>
<td><strong>Cable length:</strong></td>
<td></td>
</tr>
<tr>
<td>Entire length, denoted in cm, principally 4-</td>
<td></td>
</tr>
<tr>
<td>figure:</td>
<td></td>
</tr>
<tr>
<td>e. g.: 3 400 mm = -0340</td>
<td></td>
</tr>
<tr>
<td>e. g.: 5 m = -0500</td>
<td></td>
</tr>
</tbody>
</table>
Control lever systems
Control lever 14 RN 15

Features

- Sensitive adjustment
- With friction
- For highly flexibly push/pull cables

Cable size U, travel code 2

This control lever offers with its long operating lever and the fine tunable friction the best prerequisite for sensitive adjustments, such as speed regulation of motors/hand throttle; with RCS® push/pull cables size U.

Maximum loads on the cable

- Cable size U: 80 N
- Maximum holding force: 50 N
- Travel of the cable: 48 mm
- Lever transmission: 1:6
- Lever swiveling angle: 170°

For more information on the design of the cable ends, see page 11 to 13.

Cable end MGD for connection to control lever 14 RN 15

<table>
<thead>
<tr>
<th>Art.-No.</th>
<th>Cable connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>4561-002001-000000</td>
<td>left</td>
</tr>
<tr>
<td>4561-002002-000000</td>
<td>right</td>
</tr>
</tbody>
</table>

Hand lever position is adjustable

Cable connection left

Cable connection right

Cable length L

42 mm
43 mm

in mid position
Control lever systems
Control lever 58.5 and 58.3

Features
• Adjustable friction
• Robust design
• Suitable for raw operation
• Connection for push/pull cables
Cable size V or L, travel code 3

The 58.5 and 58.3 series (with a catch in medium position) are equipped for adjustable friction and are suitable for their robust construction for mechanical remote adjustments also under raw operating conditions.

Maximum loads on the cable
Cable size V: 300 N
Cable size L: 500 N
Maximum holding force: 200 N
Travel of the cable: 76 mm
Lever transmission: 1:6
Lever swiveling angle: 170°

For more information on the design of the cable ends, see page 11 to 13.

Cable end MGD size L for connection to control lever 58.5 and 58.3

Cable end MGD size V for connection to control lever 58.5 and 58.3
Friction control systems
Friction control 22.1

Features

- Sensitive regulation
- With friction (adjustable)
- Travel 80 mm
- For push/pull cables 275-V and pull only cable 278-V

Maximum loads on the cable

<table>
<thead>
<tr>
<th>Cable size 275/278-V:</th>
<th>500 N pull</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable size 275-V:</td>
<td>50 N push</td>
</tr>
<tr>
<td>Maximum holding force:</td>
<td>250 N</td>
</tr>
<tr>
<td>Travel of the cable:</td>
<td>80 mm</td>
</tr>
<tr>
<td>Lever transmission:</td>
<td>1:4,4</td>
</tr>
<tr>
<td>Lever swiveling angle:</td>
<td>156°</td>
</tr>
<tr>
<td>Art.-No.:</td>
<td>4561-002221</td>
</tr>
</tbody>
</table>

For more information on the design of the cable ends, see page 11 to 13, as well as page 39.

Cable end MGS for connection to friction control 22.1
Friction control systems
Friction control 22.3

Features
- Sensitive regulation
- With locking and friction (adjustable)
- Travel 80 mm
- For push/pull cables 275-V and pull only cable 278-V

Maximum loads on the cable
- Cable size 275/278-V: 500 N pull
- Cable size 275-V: 50 N push
- Maximum stopping force: 250 N
- Travel at the cable: 80 mm
- Lever transmission: 1:4,8
- Lever swiveling angle: 156°
- Art.-No.: 4561-002223

For more information on the design of the cable ends, see page 11 to 13, as well as page 39.

Cable end MGS for connection to friction control 22.3
Lever for general applications
MRC shift control

Features
- For two switch positions
- With a lock in both end positions
- For cable size M, travel 60 mm

Variable application due to costumers specifiable gate plate. The input lever is locked via the gate plate.

Travel standard version:
60 mm, at console $s = 4$ mm

Can be used e.g. for gear switching on asphalt road finishers or flap adjustment in the aviation sector. In particular safety requirements are fulfilled for the locking of the end positions.

Cable series: 775/275/283
Cable size: M
Connection: T
Travel code: 3
F max.: 950 N
Lever transmission: 1:4,8
Section in console for standard splitter: 120 x 30 mm
Art.-No.: 4564-010039

Robust steel sheet construction, zinc-coated.
Large dimensioned bearing positions, maintenance-free, for long service life and high operating safety.

* Hand lever springs against N.
Accessories for control lever 58.x

Electric switch for control lever 58.x

The 58.x series control levers can be equipped with an electric switch, which is operated independently of travel by a rod and additional electric functions such as reversing light, warning and safety switches and electrical auxiliary units.

Travel adjustment
0 -> A  cable pulls
0 -> B  cable pushes
In positions 0 -> A the switch contact is open.
If the position 0 -> B is left, then the switch closes and remains closed.
Displayed is the cable connection left. When the cable connection is right, the functions are reversed.

max. switch voltage: 12 V
max. switch current: 10 A
max. switch capacity: 120 W
Accessories for control lever 58.5

Lock for control lever 58.5

The control lever 58.5 with an additional locking mechanism enables defined travel adjustments together with the maximum utilization of the holding force of 500 N (cable size L).

1 Unlocking mechanism, spring loaded
2 Hand lever, modified
3 Locking bolt, hardened
4 Locking disc, hardened
5 Notches manufactured according to customer specifications
6 Travel limiting (optional)

Parking brake for control lever 58.5

The control lever 58.5 with additional adjustable parking brake enables the sensitive continuous travel adjustment up to the maximum holding force of 500 N (cable size L).

1 Hand lever, modified
2 Star handle
3 Friction lining
4 Plate springs
5 Friction disc
   Travel limiting (optional)

<table>
<thead>
<tr>
<th>Art.-No.:</th>
<th>Lever with parking brake, cable connection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4561-002319-000000</td>
<td>Type 58.5, left V / right L</td>
</tr>
<tr>
<td>4561-002320-000000</td>
<td>Type 58.5, left L / right V</td>
</tr>
</tbody>
</table>
Accessories for friction control 22.x

Features

- Traversable ball catch(es) for 22.1 with ball and locking disc or
- Locking for 22.3 with a bar and locking disc
- Travel limiting using clamping cap(s)
- Adjustable friction

Ball catching/locking:

Clear catching/locking of the hand lever in the locking position of the disc.

Standard locking position at

36° = 12 mm travel
60° = 24.5 mm travel

Disk can be installed for cable connection on both right and left sides.

Travel limiting:

The travel can be reduced using the spiral roll pin by 10/20 mm respectively.

Symmetrical or asymmetrical reduction is possible.

Example:

<table>
<thead>
<tr>
<th>Pin in</th>
<th>Travel</th>
<th>Travel position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or 10</td>
<td>40 mm</td>
<td>asymmetrical</td>
</tr>
<tr>
<td>2 or 9</td>
<td>50 mm</td>
<td>asymmetrical</td>
</tr>
<tr>
<td>3 or 8</td>
<td>60 mm</td>
<td>asymmetrical</td>
</tr>
<tr>
<td>4 or 7</td>
<td>70 mm</td>
<td>asymmetrical</td>
</tr>
<tr>
<td>5 + 11</td>
<td>60 mm</td>
<td>symmetrical</td>
</tr>
<tr>
<td>6 + 12</td>
<td>40 mm</td>
<td>symmetrical</td>
</tr>
</tbody>
</table>

For more information on the design of the cable ends, see page 11 to 13.

Open ends

- Pulling strands made from stainless steel
- Sealing available with optional bellow
Order key for push/pull cables for control lever systems

Features

Cable series:
283, 275, 278, 775 and 778

Cable size:
Selection according to operating forces, connection threads, bend radii etc.:
U, V or L

Cable connection to lever:

Cable output side:
In accordance with installation conditions T, G, S, R, 03, 04 or 08

Wiper seal:
See catalogue page 10

Thread at rod end:
M for metric,
Z for inch (UNF) thread

Travel code:
The following values are possible as travel code, in compliance with a travel in mm:

<table>
<thead>
<tr>
<th>Type</th>
<th>Travel code</th>
<th>Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 RN 15</td>
<td>2</td>
<td>48 mm</td>
</tr>
<tr>
<td>58.x</td>
<td>3</td>
<td>76 mm</td>
</tr>
<tr>
<td>22.x</td>
<td>3</td>
<td>80 mm</td>
</tr>
</tbody>
</table>

Cable length:
Entire length, denoted in cm, principally 4-figure:
e. g.: 3 400 mm = -0340
e. g.: 5 m = -0500

Correct spelling:

Order code: 283 - U - MGD / T 05 M - 3 - 0200

283-U-MGD/T05M-3-0200
Throttle pedal systems

The development of this throttle operation is unique, because the throttle cable is fully integrated into the pedal. That means:

- The throttle cable is operated from inside the pedal
- No additional spatial requirement underneath the vehicle or the cabin floor
- No large breakthroughs necessary, only a simple hole pattern for 3 screws and the sealing plugs

Features

Pedal:
- Pedal angle continuously adjustable
- Robust steel sheet metal design, corrosion protected by black surface treatment
- Slip-proof pedal rubber on the tread surface

Cable:
- Smooth operating throttle cable with high efficiency, particularly suitable also for large lengths
- Optimal assembly thanks to small bend radius of min. 51 mm
- Pulling loads of max. 450 N
- Can be employed at temperatures from -50 °C to +90 °C (short term +150 °C)
- Throttle cable travel can be adjusted continuously between 20 mm - 60 mm

General information:
- A variety of end part variations for connection to the engine
- System-oriented accessories range
- Available for higher temperature upon request

Art.-No.: 4569-000023
Throttle pedals
for pull only cable 283-U-GAS/… and 283-V-GAS/…

Assembly plate
For easy screwing through the vehicle floor.
Art.-No.: 3570-000014
Design of the cable ends for throttle pedal systems

Pull only cable 283-U-GAS and 283-V-GAS

**Pedal connection GAS:**

**Motor connection T05M:**

**Motor connection G05M:**

**Motor connection T00M:**

**Motor connection COMP:**

**Motor connection COMPT:**

* Other lengths, threads and motor connections available upon request. ** Compensated excess travel and exceeding the max. pull force.
Accessories for throttle pedal systems

Hand throttle cable and attachment kit

Hand throttle cable + attachment kit directly at the throttle pedal
Micro-adjust control cable: 275-U-MA/04-3-xxxx (cm)

Attachment kit:
3570-000001

Cable directly at the injection pump
Throttle cable 283-V-GAS/T05M-2.36-xxxx (cm)
Brake lever systems

Technical features

Over center locking
The hand lever rests only in two positions: CLOSED and OPEN without the use of ratchets, segments or other unlocking mechanisms. The brake activation is achieved by the simple turnover of the hand lever and secured over center locking.

Transmission ratio
A brake cable system is elastic and not linear or rigid. When turning the hand lever, the available backlash, travel of a return spring at the brake and finally the elasticity of all components are rescinded.

The transmission ratio is dependent on the position of the adjusting pins and the travel at the clevis pin, to be read in the curves depicted here.

Adjustment
Backlash in the brake cable or wear of the brake can be compensated for up to a max. 41 mm using the ball-locking adjustment button. The angle of the hand lever from 40° to 90° is dependent on the position of the adjusting and clevis pins.
Brake lever systems
Hand brake lever B 50452 – Bulkhead endfitting

Features
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Bulkhead endfitting
Art.-No.: 4561-000001-S50452

Accessories for B 5 ... series hand brake lever
Please see page 53.
Brake lever systems
Hand brake lever B 50401 - Insert endfitting

Features
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Insert endfitting
Art.-No.: 4561-000001-S50401

Accessories for B 5 ... series hand brake lever
Please see page 53.

Assembly sleeves
max. travel

* depending on the position of the adjusting pin

Lever locked in over center position

* 6° - 8°

* 40° - 90°

Adjustment head ball locked

5233-008201: Clevis G 8x18/M8 (optional)
Brake lever systems
Hand brake lever B 50513 - Insert endfitting

Features
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Insert endfitting
Art.-No.: 4561-000001-S50513

Accessories for B 5 ... series hand brake lever
Please see page 53.

Typical brake cable connection CP see page 52-7
Brake lever systems
Hand brake lever B 50408 - Clamp endfitting

Features
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Clamp endfitting

Art.-No.: 4561-000001-S50408

Accessories for B 5 ... series hand brake lever
Please see page 53.

Lever locked in over center position
* depending on the position of the adjusting pin

Adjustment head ball locked

Cable attachment kit

Assembly sleeves

5233-008201: Clevis G 8x16/M8 (optional)
Brake lever systems
Hand brake lever B 50410 - Clamp endfitting

Features
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Clamp endfitting

Art.-No.: 4561-000001-S50410

Accessories for B 5 ... series hand brake lever
Please see page 53.

Lever locked in over center position
* depending on the position of the adjusting pin

max. travel
*40° - 90°

Assembly sleeves
Adjustment head ball locked

5233-008201: Clevis G 8x16/M8 (optional)
**Design of the cable ends for brake lever systems**

**Features**

For pull forces: 1800 N permanent, 2400 N max.

Min. bend radius: 127 mm

Temperature range: -50 °C to +110 °C

Steel parts galvanized (zinc-coated)

Rod ends made from stainless steel

With stainless steel strands ø 4 mm

**Lever side:**

**TB**

**TB05**

Seal No. 05

**GB**

**T05M / T20M**

**CP**

**G05M / G20M**

**COMP**

* Brake lever open • ** Spring compensating device set to 380 N

Other output sides upon request
Accessories for brake lever systems

**Electrical switch for hand brake lever**

Two switches can optionally be supplied:

1. Electrical CLOSER
2. Electrical OPENER

Switch voltage: max. 24 V
Switch current: max. 4 A
Switch capacity: max. 48 W

Switches are supplied with attachment parts.

**Plastic handle for hand brake lever**

Plastic handle for hand brake lever B 50513
Art.-No.: 5220-000513-000000
Plastic handle for hand brake lever B 504xx upon request.

**Brake lever system for RINGSPANN brake calipers DV 020 MKM and DH 020 MKM**

Brake caliper manually activated - manually released

The pressure pin with a spring mechanism compensates the wear of the brake pads during the braking procedure (lever locked in over center position).
Pull Only Cables

Introduction

The pull only cable for the transfer of pulling forces is generally manufactured for a specific application case of the individual customer, manufacturer drawings or models.

The exemplary end parts on display on the following pages reflect the wide variety of possibilities for combination.

Exact dimensions and customer-tailored end parts are available upon request.

Sample sketches for pull only cables

- Pull only cable with end caps and one-sided adjusting pin
- Steel cable with a ball end and screw nipple
- For the flexible transmission of pull force and travel
- Deviating designs can be manufactured upon request
Pull Only Cables
Wire/strand end parts

Z-wire end

Wire spiral

Loop end

Screw nipple

Barrel nipple

Ball
Pull Only Cables
Wire/strand end parts

B-nipple

Longitudinal nipple

Z-nipple

Hook

Quick release joint

Rod end with thread
Pull Only Cables
Wire/strand end parts

Drawbar eye

Ball socket

Clevis

Tension strap

Metal strap
Pull Only Cables
Thread conduit caps

Thread cap

Thread cap with insert

Base cap with seal

Base cap with rubber seal

Adjusting screw
Pull Only Cables
Conduit caps

End cap

Base cap

Clamp endfitting with front end insert

Clamp endfitting

Base cap for safety clip

Base cap for safety clip with seal
Bulkhead endfitting with wiper seal

Bulkhead endfitting with bellow

Bulkhead endfitting with tube end
Pull Only Cables
Motor stop cable

Travel 60 mm

Travel 45 mm
RCS® Remote Control Systems

**Automatic protection against reverse running of conveyor belts, elevators, pumps and fans.**

- **RCS® push/pull cables**
  - Flexible elements for reliable transmission of axial forces over long distances with short installation radii.

- **RCS® pull-only cables**
  - Flexible elements for transmitting pull forces with various standard endparts or according to customer requirements.

- **Pedals**
  - Throttle pedals with mechanical cables, pedals for electronic setpoint transmitters from leading manufacturers, brake pedal systems.

- **Levers**
  - For different gearboxes: manual, automatic and hydrostatic. Brake levers and controls for general applications.

- **Large selection of accessories**
  - Clevises, angle joints, ball joints, mounting brackets, swivel flanges, clamps, clamping brackets, etc.

**Freewheels**

**Backstops**
- Automatic protection against reverse running of conveyor belts, elevators, pumps and fans.

**Overrunning Clutches**
- Automatic engaging and disengaging of drives.

**Indexing Freewheels**
- For gradual feed of materials.

**Housing Freewheels**
- Automatic engaging and disengaging for multimotor drives for installations with continuous operation.

**Cage Freewheels**
- For installation between customer-supplied inner and outer rings.

**Brakes**

**Industrial Brakes**
- Spring activated - pneumatically, hydraulically, electromagnetically or manually released.

- Pneumatically activated - spring released.

- Hydraulically activated - non-releasing or spring released.

- Spring activated - hydraulically released.

**Clamping Units**
- Spring activated - pneumatically or hydraulically released. For secure and precise positioning of piston rods.
**Precision Clamping Fixtures**

- **Bonded Disc Packs**
  Precision Clamping Fixtures based on the unique method of the RINGSPIANN Clamping Disc.

- **Taper Collets**
  Precision Clamping Fixtures for clamping thin or thick walled workpieces on long clamping length.

- **Taper Sleeves**
  Precision Clamping Fixtures for clamping compact workpieces with short or long clamping lengths.

- **Flat Elements**
  Very short Precision Clamping Fixtures for clamping thick walled workpieces with large clamping diameter and very short clamping depths.

- **Clamping Clutches**
  For rapid changes and precise clamping of profile rollers or printing rollers in printing presses in gravure and flexographic printing.

---

**Shaft-Hub-Connections**

- **Two-part Shrink Discs**
  External clamping connection for simple and secure mounting without torque wrench.

- **Three-part Shrink Discs**
  External clamping connection for the fastening of hollow shafts on solid shafts.

- **Cone Clamping Elements**
  Internal clamping connection in small dimensions for high torques.

- **Star and Clamping Discs**
  Shaft-Hub-Connection for frequent clamping and release.

- **Star Spring Washers**
  Axial spring element for pre-loading of ball bearings.

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**Overload Clutches & Couplings**

- **Torque Limiters with Screw Flange**
  Reliable overload protection for tough operating conditions.

- **Torque Limiters with Friction Linings**
  RINGOSTAT® Torque Limiter for constant slipping torque. Belleville Spring Torque Limiter for simple release.

- **Force Limiters**
  Reliable axial overload protection in rods.

- **Tru-Line Flange Couplings**
  Rigid, easily removable shaft coupling with backlash free cone clamping connections.

- **Flexible Couplings**
  Large allowed radial and angular misalignments. Minimum resiliency.
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