

RCS[®] Remote Control Systems

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



Edition 2023/2024

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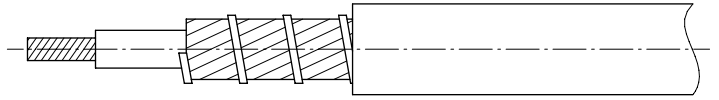
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Setup

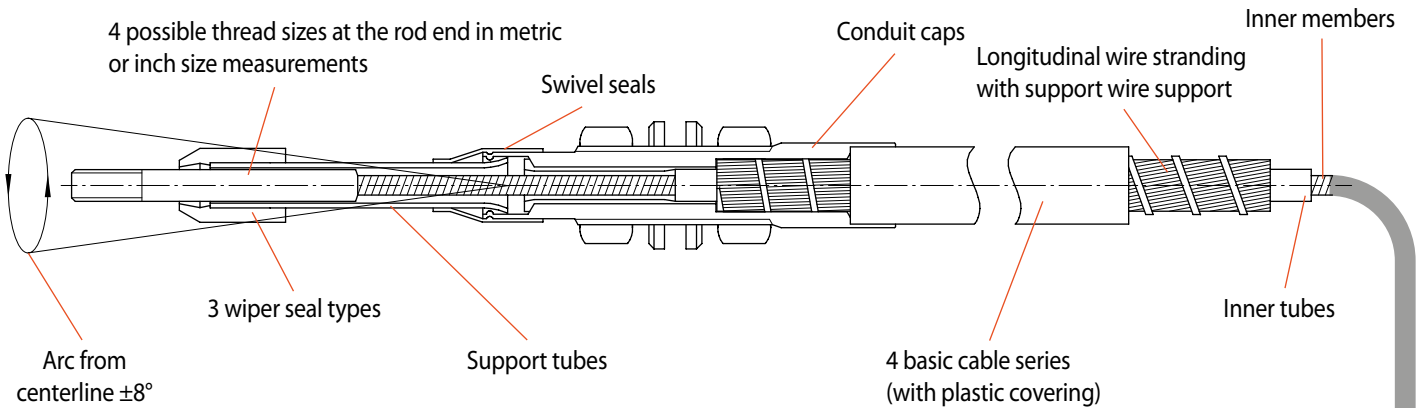
A flat wire-reinforced inner member is located in a conduit, which is formed by an inner-lying inner tube and specially arranged longitudinal wires (linear wire stranding). The linear wires on the other hand (with the exception of types 770) are supported and fixed by a support wire winding. A plastic 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.

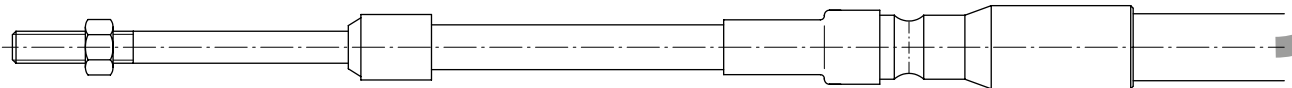
Effective seals protect the moving elements of the push/pull cables against external influences such as spray water, dust and corrosion.



































Setup of the conduit, depicted with the inner member































Various travels from 1" to 12"



Overview of push/pull cables

Cable series	Bend radius		Temperature range		Sliding characteristics		Design of end parts	
	small	medium	medium	high	light	extra light	zinc-coated	stainless
383								
384								
283								
284								
275								
274								
775								
774								

Cable sizes				
U	V	L	M	H
<ul style="list-style-type: none"> • Travel up to 76 mm • Push forces 70 N • Pull forces 450 N 	<ul style="list-style-type: none"> • Travel up to 152 mm • Push forces 135 N • Pull forces 540 N 	<ul style="list-style-type: none"> • Travel up to 152 mm • Push forces 225 N • Pull forces 1 035 N 	<ul style="list-style-type: none"> • Travel up to 152 mm • Push forces 450 N • Pull forces 1 800 N 	<ul style="list-style-type: none"> • Travel up to 152 mm • Push forces 1 350 N • Pull forces 4 500 N
				
				
				
				
				
				
	*			
	*			

* upon request

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



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



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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



7-2

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

Cable size	Max. travel mm	Bend radius for cable series				Seals			Thread rod ends		Outer diameter of conduit for cable series			
		383/384 mm	283/284 mm	275/274 mm	775/774 mm	No. 05 for normal applications	No. 10* for fine dust	No. 20* for extreme conditions	metric	inch	383/384 mm	283/284 mm	275/274 mm	775/774 mm
U	76	-	51	51	115	●	●		M5	10-32	-	6,8	6,8	7,5
V	152	51	51	51	-	●	●		M5	10-32	8,8	8,8	8,8	-
L	152	76	76	76	180	●	●	●	M6	1/4-28	12,2	13,3	13,3	11,0
M	152	127	127	127	230	●		●	M8	5/16-24	14,5	15,0	15,0	14,0
H	152	-	152	-	-	●			M10	3/8-24	-	17,6	-	-

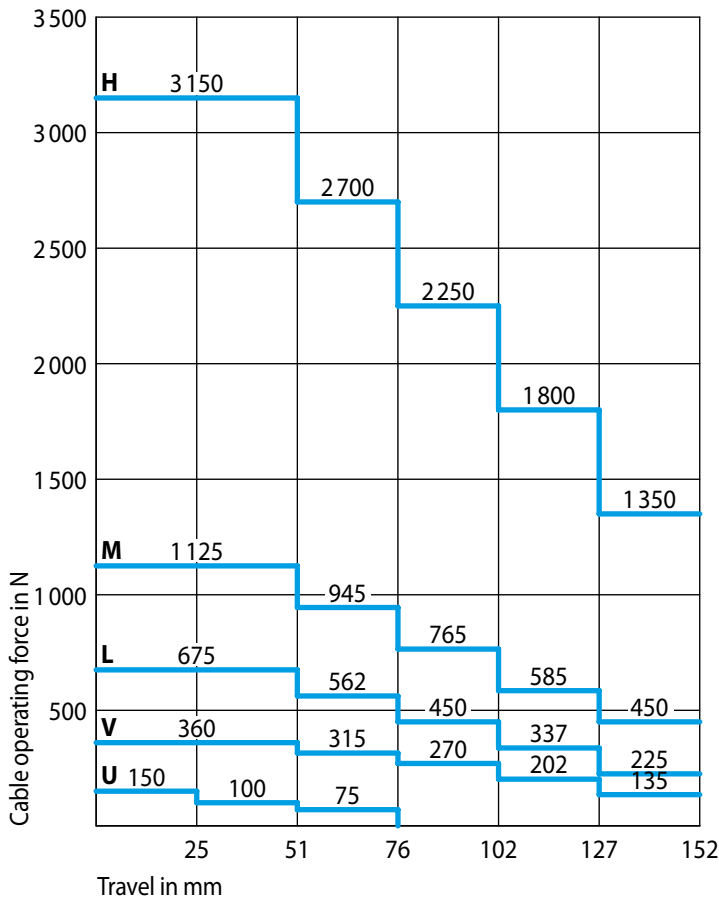
* for connection type S and R only on request

Push and pull forces depending on the travel

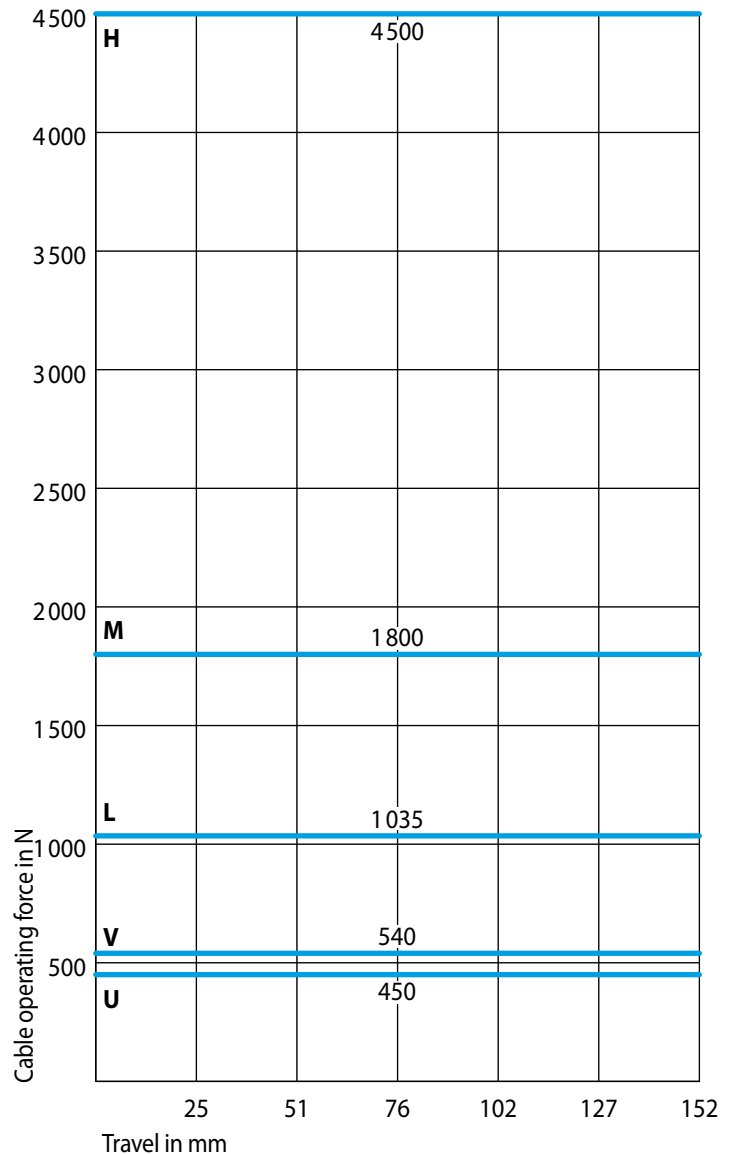
The specified forces are applicable for use in permanent operation with a long service life.

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

Push forces diagram



Pull forces diagram





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:
 Operating force = Output force x Efficiency factor

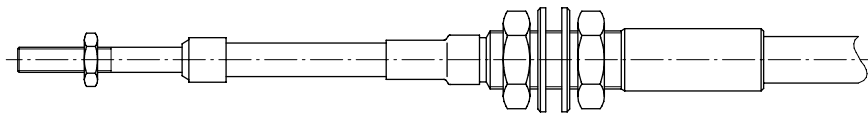
α is the sum of all cable bends in degrees. In addition to the cable bends, the cable length is to be taken into consideration with 15° for every 1 meter.

Series	Efficiency factor for α				
	180°	360°	540°	720°	900°
383 + 384	1,17	1,36	1,59	1,85	2,16
283 + 284	1,17	1,36	1,59	1,85	2,16
275 + 274	1,31	1,72	2,26	2,96	3,88
775 + 774	1,31	1,72	2,26	2,96	3,88

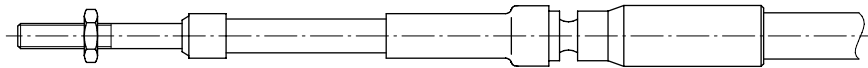
Example of efficiency factor

Cable series	283
Cable size	L
Cable length	12 m
Sum of bends	180°
alpha	$180^\circ + 12 \times 15^\circ = 360^\circ$
Efficiency factor	1,36

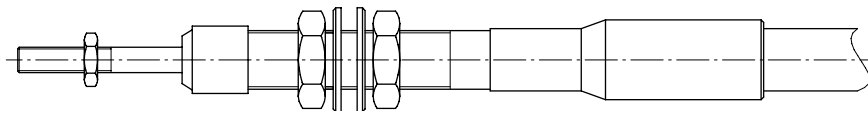
Connection types of cable end parts



Swiveled bulkhead endfitting type T



Swiveled clamp endfitting type G



Rigid screw endfitting type S and R

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

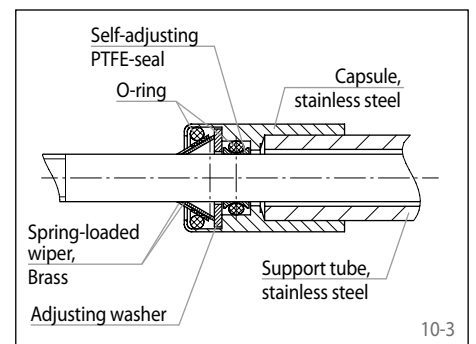
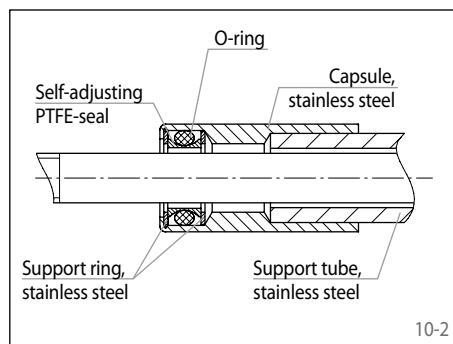
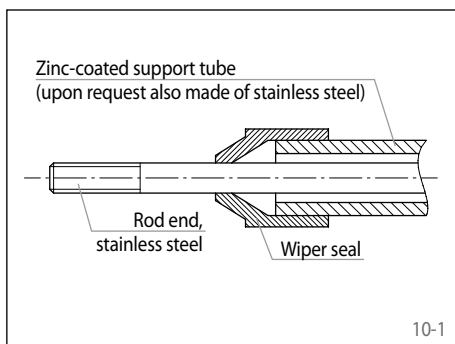
Automatic self-adjusting PTFE wiper seal in case of wear for cable sizes U, V and L. Protects well against fine dust.

For connection type S and R only on request.

Seal no. 20

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

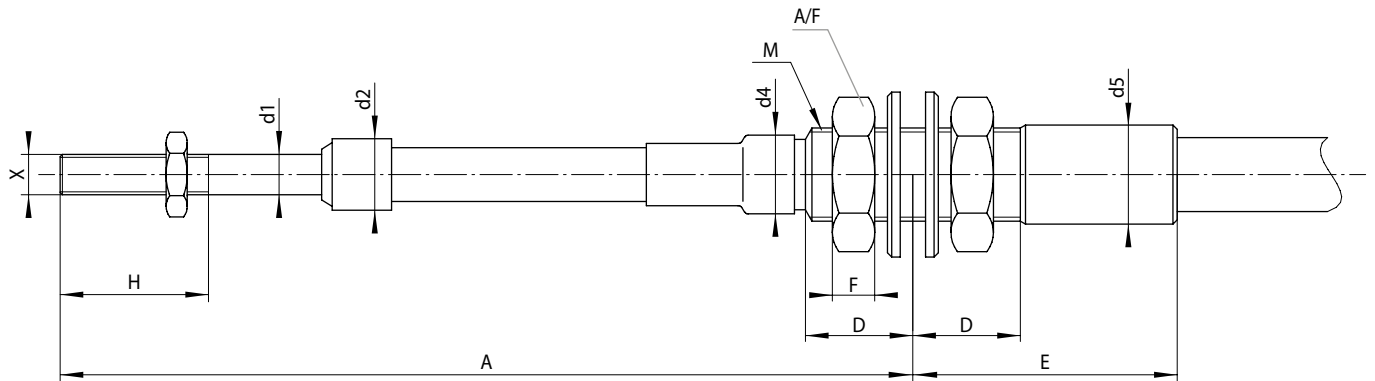
For connection type S and R only on request.



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!

Connection type T Swiveled bulkhead endfitting



11-1

Cable size	d1 mm	d2* mm	d4 mm	d5** mm	D mm	E mm	F mm	H mm	M	A/F mm	X
U	4,75	10	11,3	11,5	14	33	7	20	7/16-20-UNF	17	M5
V	4,75	10	11,3	11,5	14	33	7	20	7/16-20-UNF	17	M5
L	6,35	13	14,7	16,5	19	51	8	24	M16 x 1,5	24	M6
M	8,0	14,5	16,3	19,3	22	54	9	24	M18 x 1,5	27	M8
H	9,5	17,0	18,5	23,4	25	66	10	35	M22 x 1,5	32	M10

* for seal no. 05

** Pressed according to manufacturer's choice (round, hexagonal or segmental pressing).

Dimensions A

Cable size	Push/pull cables* at travel of						Cable with hand operation**				Cables for levers***		
	25 mm	51 mm	76 mm	102 mm	127 mm	152 mm	NL/TL (1)/MA		TL (2)	16RFA7.2 mm	SH 58.x mm	FH 22.x mm	
U	111	149	187	-	-	-	25	51	76	38	151	-	-
V	111	149	187	225	263	301	25	51	76	38	-	189	189
L	117	155	193	231	270	308	130	180	231	-	-	195	-
M	-	166	205	243	281	319	-	-	-	-	-	-	-
H	-	182	221	259	297	335	-	-	-	-	-	-	-

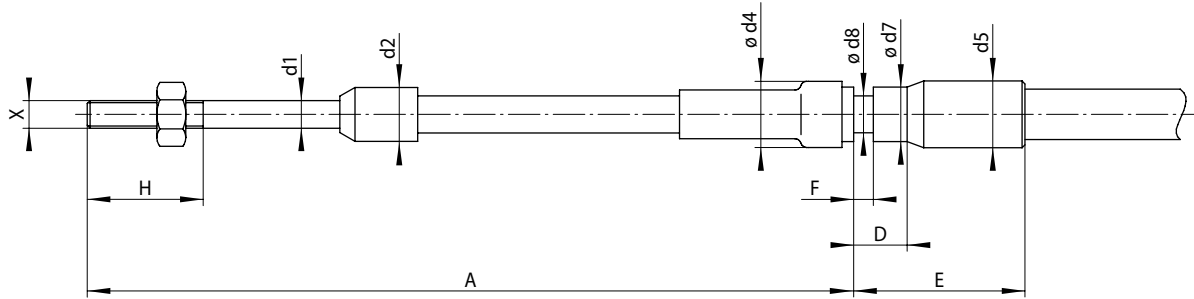
* Rod end in mid position

** 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)

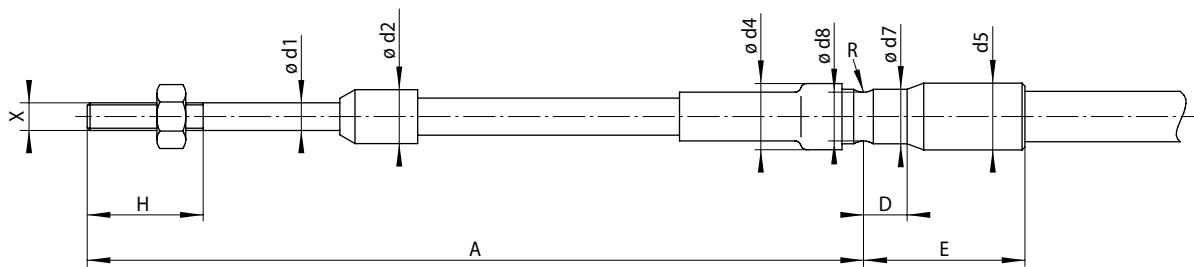
Options

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



12-1

for cable sizes U and V



12-2

for cable sizes L, M and H

Cable size	d1 mm	d2* mm	d4 mm	d5** mm	d7 mm	d8 mm	D mm	E mm	F mm	H mm	R mm	X
U	4,75	10	11,3	10,2	9,4	6,35	11	29,5	3,4	20	-	M5
V	4,75	10	11,3	11,5	9,4	6,35	8,7	29,5	3,4	20	-	M5
L	6,35	13	14,7	16,5	12,7	10,4	11,1	44,5	-	24	4,3	M6
M	8,0	14,5	16,3	19,3	14,3	11,9	18	48	-	24	4,3	M8
H	9,5	17	18,5	23,4	16,6	12,7	9,6	67	-	35	5,0	M10

* for seal no. 05

** Pressed according to manufacturer's choice (round, hexagonal or segmental pressing).

Dimensions A

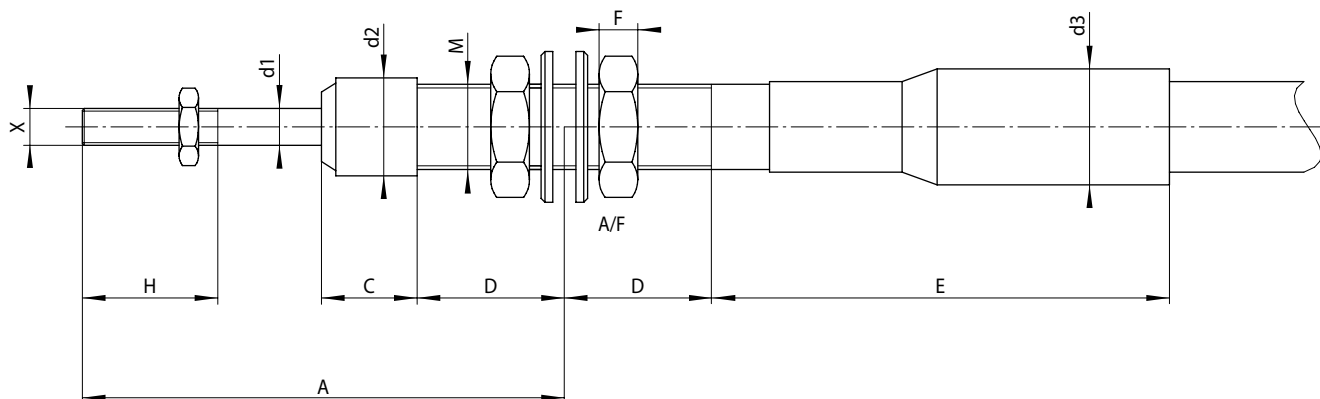
Cable size	Push/pull cables* at travel of						Cable with hand operation**				Cables for operating level***		
	25 mm	51 mm	76 mm	102 mm	127 mm	152 mm	NL/TL (1)/MA		TL (2)	16RFA7.2 mm	SH 58.x mm	FH 22.x mm	
U	94	132	170	-	-	-	25	51	76	38	134	-	-
V	94	132	170	208	246	284	25	51	76	-	-	172	172
L	102	140	178	216	254	292	114	165	216	-	-	180	-
M	-	149	187	225	263	301	-	-	-	-	-	-	-
H	-	170	208	246	284	322	-	-	-	-	-	-	-

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)



13-1

Cable size	C mm	d1 mm	d2 mm	d3* mm	E mm	F mm	H mm	M	A/F mm	X
U	13	4,75	10	12,7	35	5	20	M10 X 1	17	M5
V	13	4,75	10	12,7	35	5	20	M10 X 1	17	M5
L	16	6,35	13	16,5	-	7	24	7/16-20 UNF	17	M6
M	16	8,0	14,5	19,3	71	6	24	M12 X 1	19	M8
H	16,5	9,5	17	23,4	70	8	35	M16 X 1,5	24	M10

* Pressed according to manufacturer's choice (round, hexagonal or segmental pressing).

Dimensions A

Cable size	Push/pull cables* at travel of						Cable with hand operation**				Cables for operating level***		
	25 mm	51 mm	76 mm	102 mm	127 mm	152 mm	NL/TL (1)/MA		TL (2)	16RFA7.2 mm	SH 58.x mm	FH 22.x mm	
U	63	88	113	-	-	-	25	51	76	38	90	-	-
V	63	88	113	138	163	-	25	51	76	38	-	117	115
L	-	90	113	126	138	151	-	116****	151****	-	-	117	-
M	-	94	119	146	-	-	-	-	-	-	-	-	-
H	-	-	-	161	-	211	-	-	-	-	-	-	-

* 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:

Cable size	Travel					
	25 mm	51 mm	76 mm	102 mm	127 mm	152 mm
U	15	27	40	-	-	-
V	15	27	40	53	-	-
L	-	20	30	30	30	30
M	-	24	36	50	-	-
H	-	-	-	54	-	79

Dimensions E for cable size L and travel:

Cable size	Travel				
	51 mm	76 mm	102 mm	127 mm	152 mm
L	73	79	104	129	155

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 recommend 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

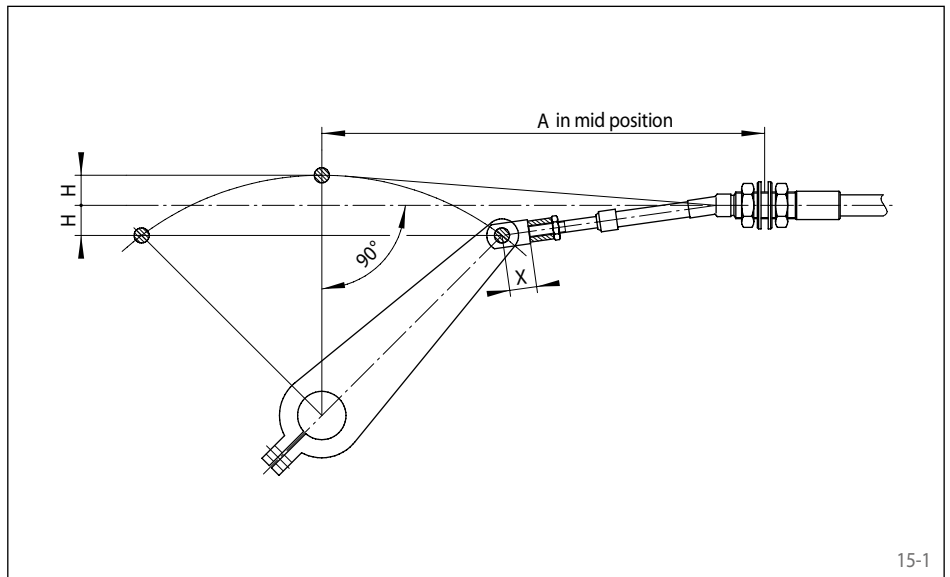
hazard. But, if burnt, they may give fumes, some of which may be toxic, and all recommended fire-fighting precautions shall be observed.

Connection to a lever

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 $\pm 8^\circ$ all way around.

(Push/Pull Cables with swiveled end)

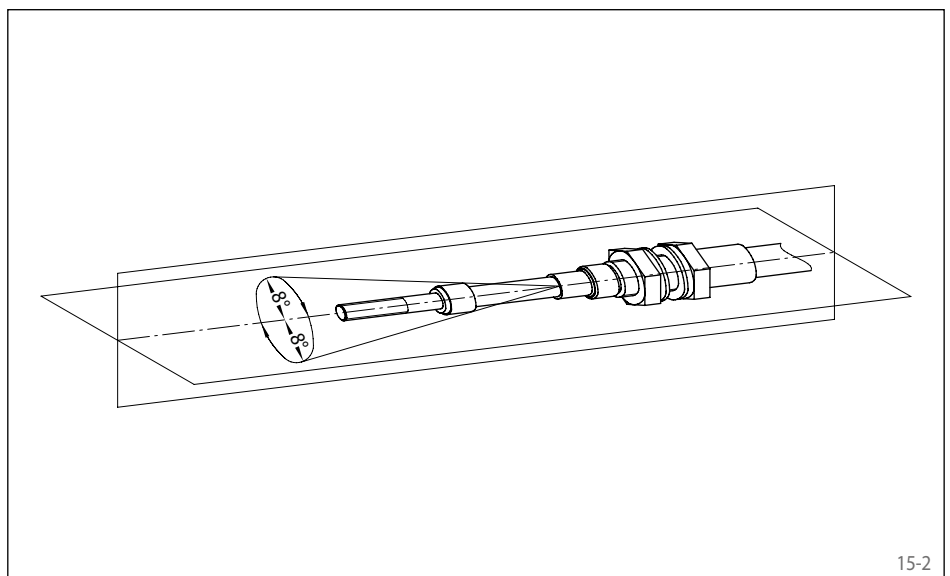


15-1

Alignment of the end parts

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

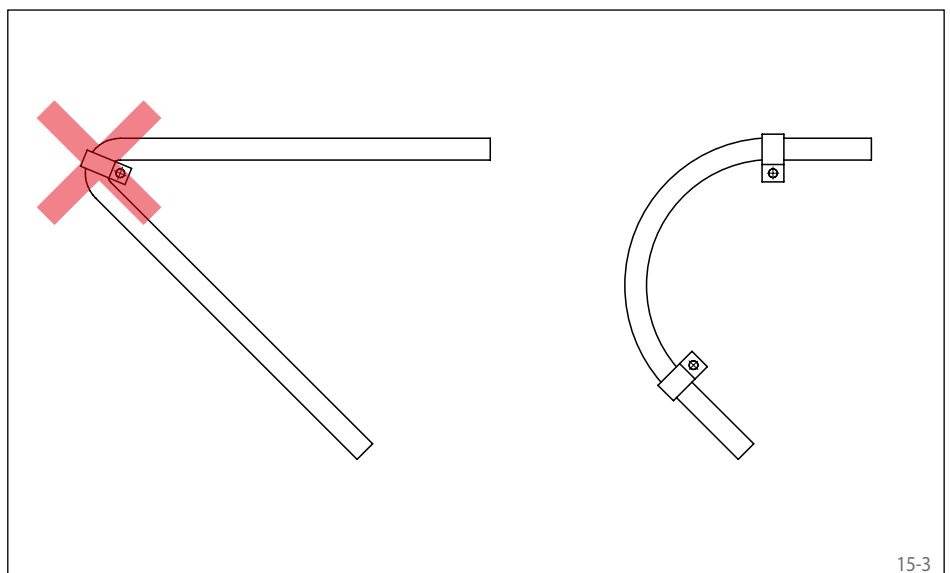
(Push/Pull Cables with swiveled end)



15-2

Fastening the cables

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.



15-3

Features

Order code:

283 - L - G 05 M / T 10 M - 3 - 0200

Cable serie:

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:

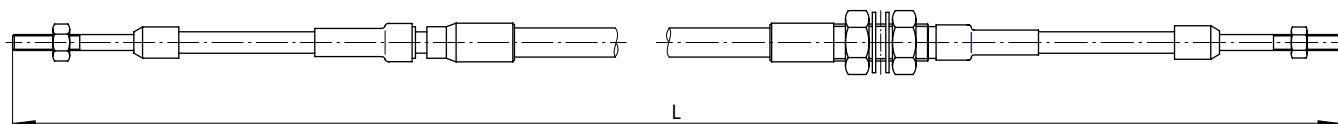
1	2	3	4	5	6
25	51	76	102	127	152

Cable length:

Entire length, denoted in cm, principally 4-figure:

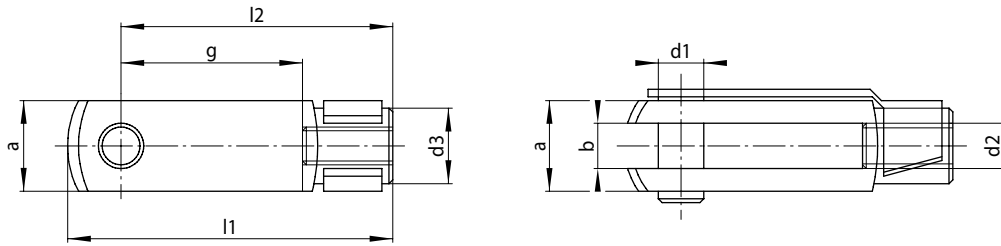
e. g.: 3 400 mm = -0340

e. g.: 5 m = -0500





Clevises with snap lock pins, zinc-coated

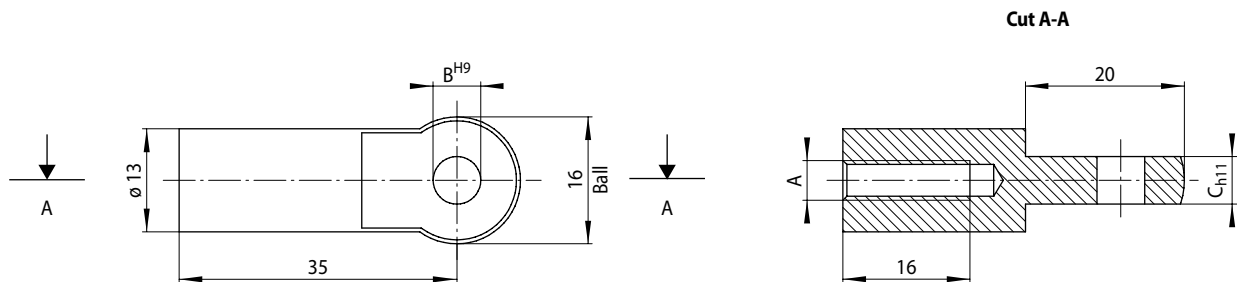


18-1

Cable size	Size	a mm	b mm	d1 mm	d2 mm	d3 mm	g mm	l1 mm	l2 mm	Art.-No.
U/V	G 5 x 10	10	5	5	M5	9	10	26	20	5233-005001
	G 5 x 20	10	5	5	M5	9	20	36	30	5233-005002
	G 6 x 12	12	6	6	M5	10	12	31	24	5233-006003
	G 6 x 24	12	6	6	M5	10	24	43	36	5233-006004
	G 8 x 32	16	8	8	M5	14	32	58	47	5233-008009
L	G 6 x 12	12	6	6	M6	10	12	31	24	5233-006001
	G 6 x 24	12	6	6	M6	10	24	43	36	5233-006002
	G 8 x 16	16	8	8	M6	14	16	42	32	5233-008003
	G 8 x 32	16	8	8	M6	14	32	58	47	5233-008004
	G 10 x 40	20	10	10	M6	18	40	72	60	5233-010204
M	G 8 x 16	16	8	8	M8	14	16	42	32	5233-008001
	G 8 x 32	16	8	8	M8	14	32	58	47	5233-008002
	G 10 x 40	20	10	10	M8	18	40	72	60	5233-010203
	G 12 x 48	24	12	12	M8	20	48	86	72	5233-012001
H	G 10 x 20	20	10	10	M10	18	20	52	40	5233-010001
	G 10 x 40	20	10	10	M10	18	40	72	60	5233-010002
	G 12 x 48	24	12	12	M10	20	48	86	72	5233-012002

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

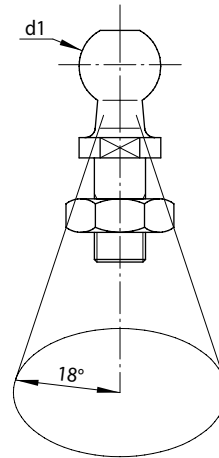
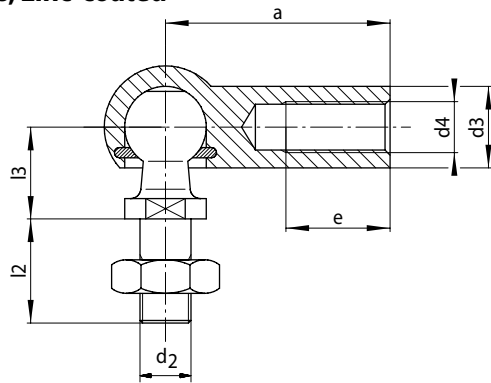
Eye ends, zinc-coated



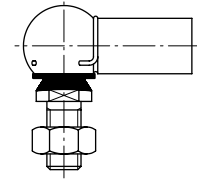
18-2

Cable size	A mm	B mm	C mm	Art.-No.
U/V	M5	6	6	5030-005002
L	M6	6	6	5030-006001
	M6	8	8	5030-006002
M	M8	8	8	5030-008002
	M8	6	6	5030-008006

Ball joints, zinc-coated



Can also be supplied with a sealing cap, design DK

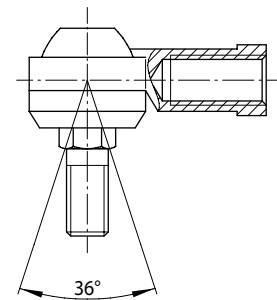
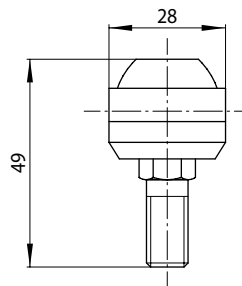
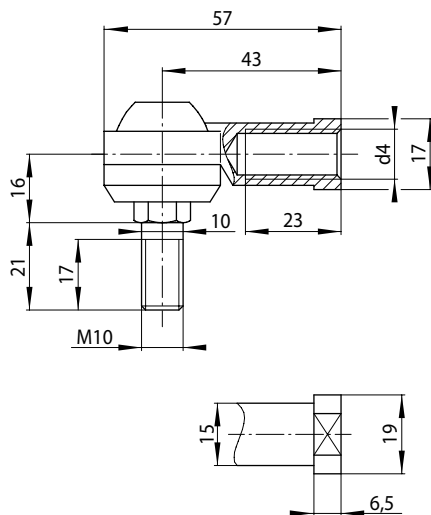


19-1

Cable size	Size	a mm	d1 mm	d2	d3 mm	d4	dk mm	e mm	l2 mm	l3 mm	Art.-No.
U/V	CS8	22	8	M5	8	M5	13	10	10	9	5234-008001
	CS10/M5	25	10	M6	10	M5	15	11	12	11	5234-010002
	CS10/M5DK	25	10	M6	10	M5	15	11	12	11	5234-010102
L	CS10	25	10	M6	10	M6	15	11	12	11	5234-010001
	CS13/M6	30	13	M8	13	M6	19	14	16	13	5234-013002
M	CS13	30	13	M8	13	M8	19	14	16	13	5234-013001
	CS16/M8	35	16	M10	16	M8	24	15	19	16	5234-016002
H	CS16 DK	35	16	M10	16	M10	24	15	19	16	5234-016101

Can also be supplied with end parts consisting of stainless steel.

Ball joints for cable size H



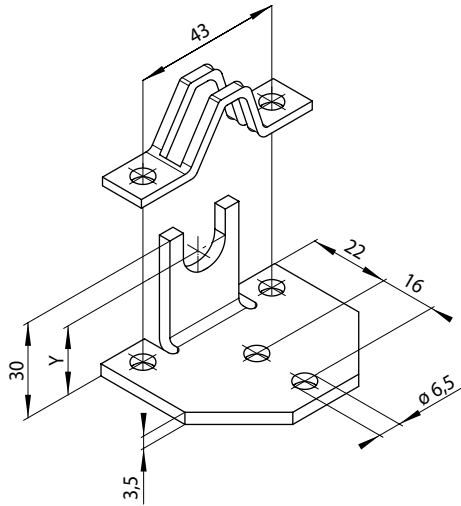
19-2

Cable size	d4	Art.-No.
H	M10	5234-010100
	M10*	5234-010101

* left

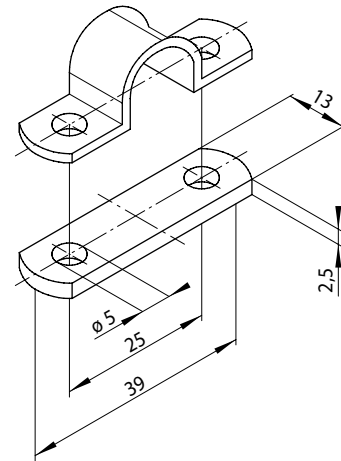
Brackets for clamp connections, clamp assemblies,
U-bolt assemblies and clamps

Brackets for clamp connections



20-1

Clamp assemblies



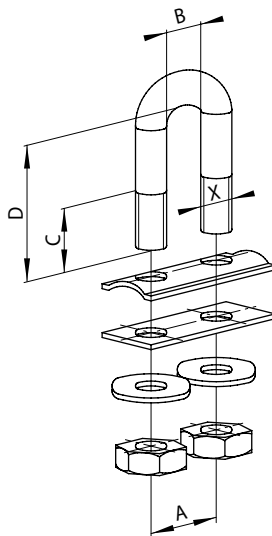
20-2

Cable size	Y mm	Art.-No.
U/V	20	3561-010272
L	22	3561-010272
M	23	3561-010272

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

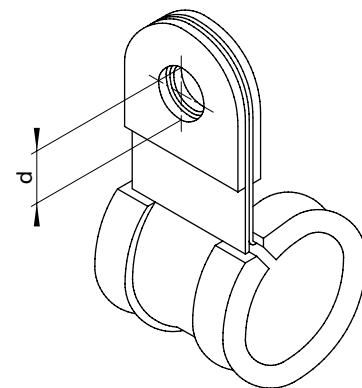
Cable size	Art.-No.
U/V	3563-000001

U-bolt assemblies



20-3

Clamps



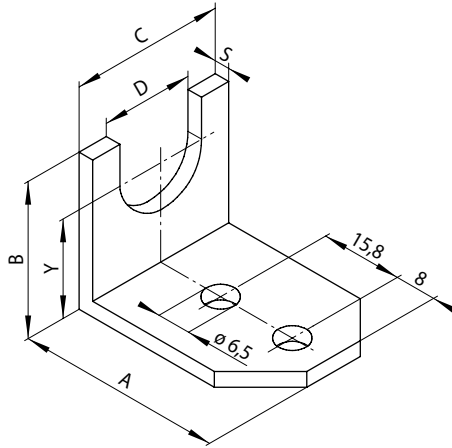
20-4

Cable size	A mm	B mm	C mm	D mm	X	Art.-No.
U/V	15	8	16	26	M6	3563-001001*
L/M/H	20	12	18	38	M8	3563-001008

*differs from illustration

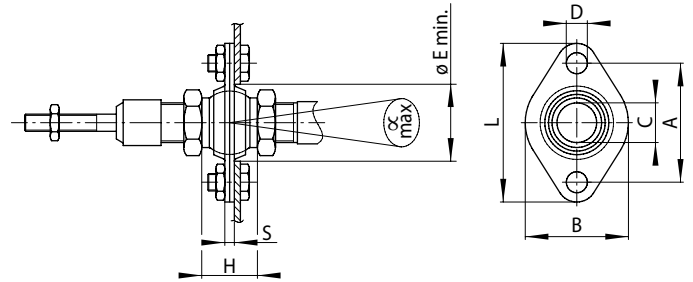
Cable size	d mm	Art.-No.
U	5,2	1563-001004
V	6,4	1563-001005
L/M	6,4	1563-001006
H	8,4	1563-001007

Brackets for connection of bulkheads



21-1

Swivel flanges for rigid end cables



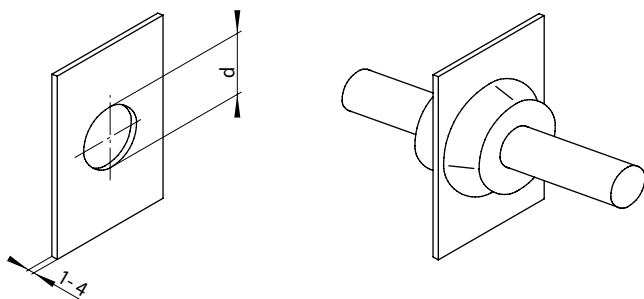
21-2

Cable size	A mm	B mm	C mm	D mm	S mm	Y mm	Art.-No.
U/V	40	30	30	12	3	22	3561-013004
L/M	42	32	38	18	4	23	3561-010275

With two hexagon head screws M6x20 and nuts M6 DIN 985

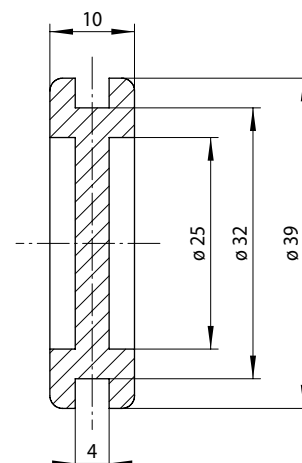
Cable size	A mm	B mm	C mm	D mm	E mm	H mm	L mm	S mm	α	Art.-No.
U/V	30	26	10,1	5,3	19,5	14	40	2,4	16°	5154-010001
L/M	40	30	12,1	6,3	26	16	52	4	16°	5154-012003
H	52	43	16	8,3	35	24	72	5	16°	5154-016001

Rubber grommets for dust and watertight cable feedthroughs



21-3

Rubber grommets for all cable sizes



21-4

Cable size	d mm	Art.-No.
U/V	19	5165-019001
L	23	5165-023001
M/H	29	5165-029001

Cable size	Art.-No.
U/V/L/M/H	5165-032001

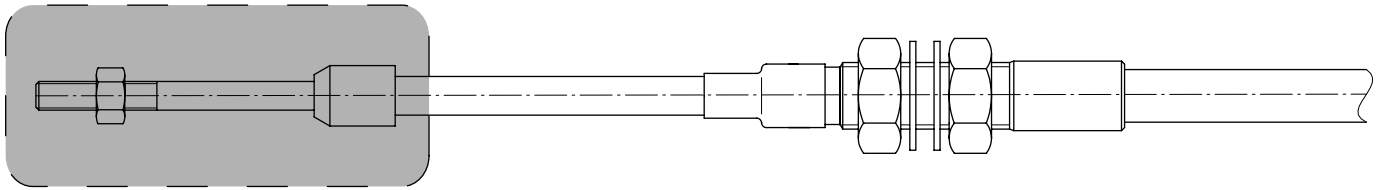


Basic functions

- 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



23-1

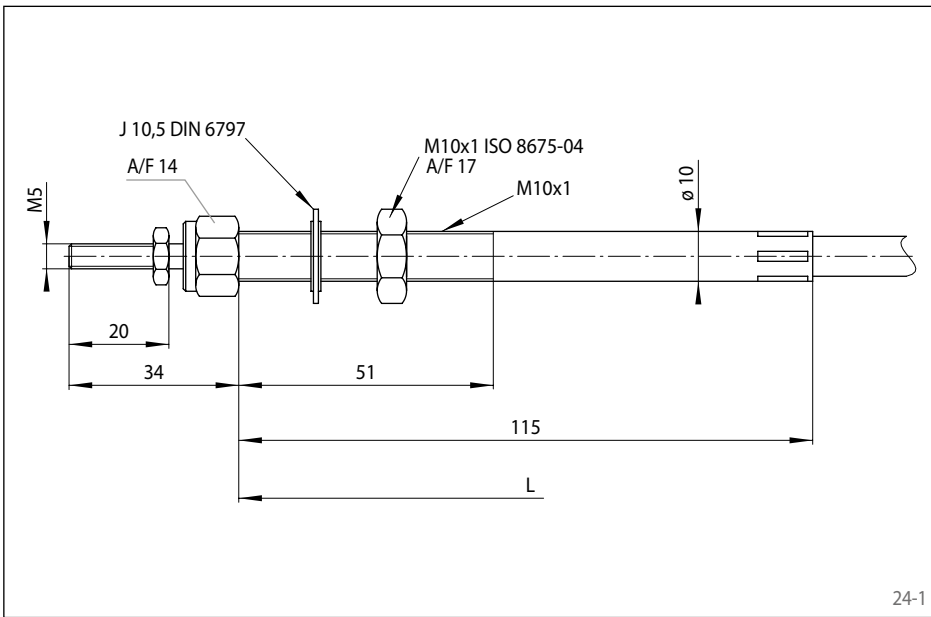
Cable size	Cable series	Outer diameter mm	Thread of rod ends metric/inch	Non-locking control cable – NL – Travel adjustment with button or T-handle	Twist lock control cable – TL – Travel adjustment and one-handed locking mechanism	Micro-adjust control cable – MA – Quick adjustment via pressure button	Spring loaded control cable – VC – Hand operated with spring return	Foot operated cable – VFC – Button with rubber cap
U	283 + 275 775	6,8 7,5	M5/ 10-32	●	●	●		
V	283 + 275	8,8	M5/ 10-32	●	●	●	●	●
L	283 + 275 775	13,3 11	M6/ 1/4-28		●	●		

Cable operating forces (N)

Cable size	Cable series	Non-locking control cable – NL – Travel adjustment with button or T-handle				Twist lock control cable – TL – Travel adjustment and one-handed locking mechanism				Micro-adjust control cable – MA – Quick adjustment via pressure button				Spring loaded control cable – VC – Hand operated with spring return		Foot operated cable – VFC – Button with rubber cap
		Travel Push			Travel Pull	Travel Push			Travel Pull	Travel Push			Travel Pull	Travel Push	Travel Pull	
		25 mm	51 mm	76 mm	25 - 76 mm	25 mm	51 mm	76 mm	25 - 76 mm	25 mm	51 mm	76 mm	25 - 76 mm	51 mm	51 mm	25 mm
U	283 + 275	150	100	70	250	15	10	5	250	15	10	5	250	-	-	-
	775	180	150	100	180	180	150	100	180	180	150	100	180	-	-	-
V	283 + 275	250	220	200	250	50	40	30	250	50	40	30	250	180	250	250
L	283 + 275	-	-	-	-	180	150	100	180	180	150	100	180	-	-	-
	775	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Non-locking control cable – NL –

Travel adjustment with button or T-handle



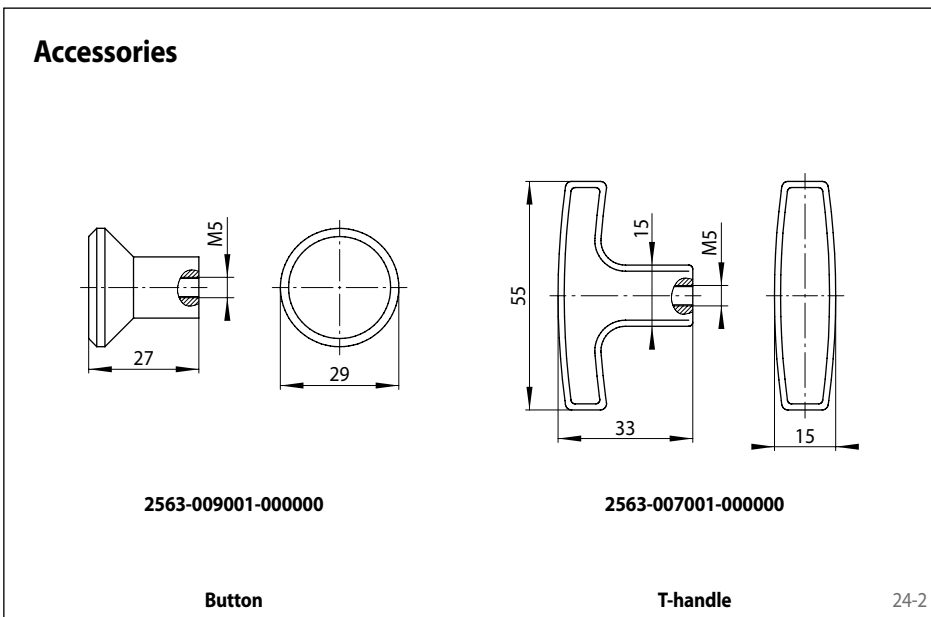
Features

- Easy to use
- Cost-effective and universal
- For cable sizes U and V
- For max. travel 76 mm

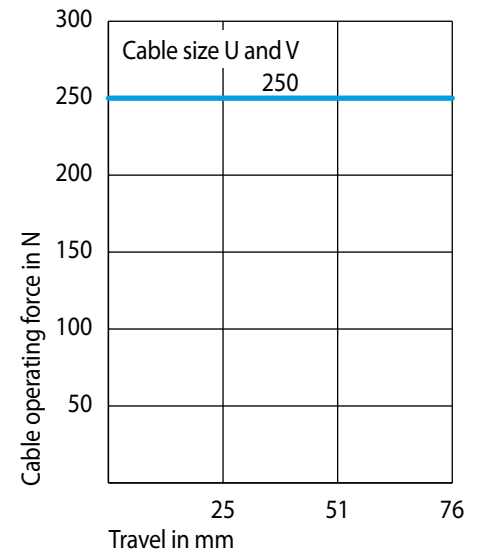
For more information on the design of the cable ends, see page 11 to 13.

Accessories

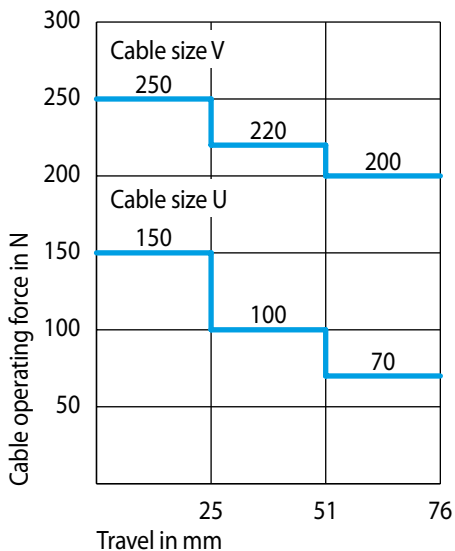
- Material: plastic, black
- Marking: None, STOP or others on request
- Button or T-handle are not included in the scope of delivery of the cable



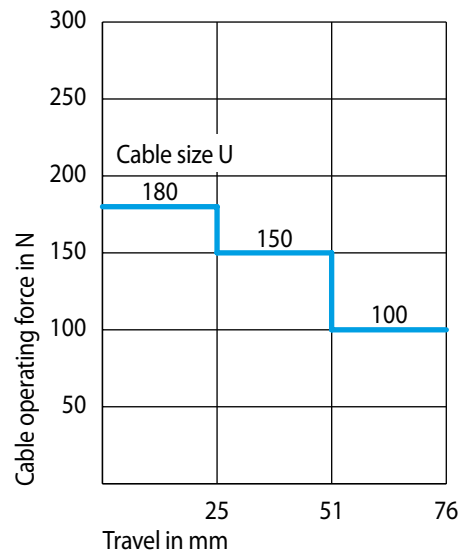
Pull force series 283 and 275



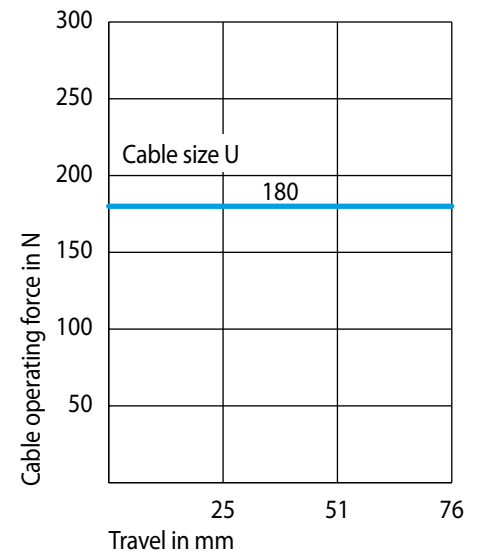
Push force series 283 and 275



Push force series 775

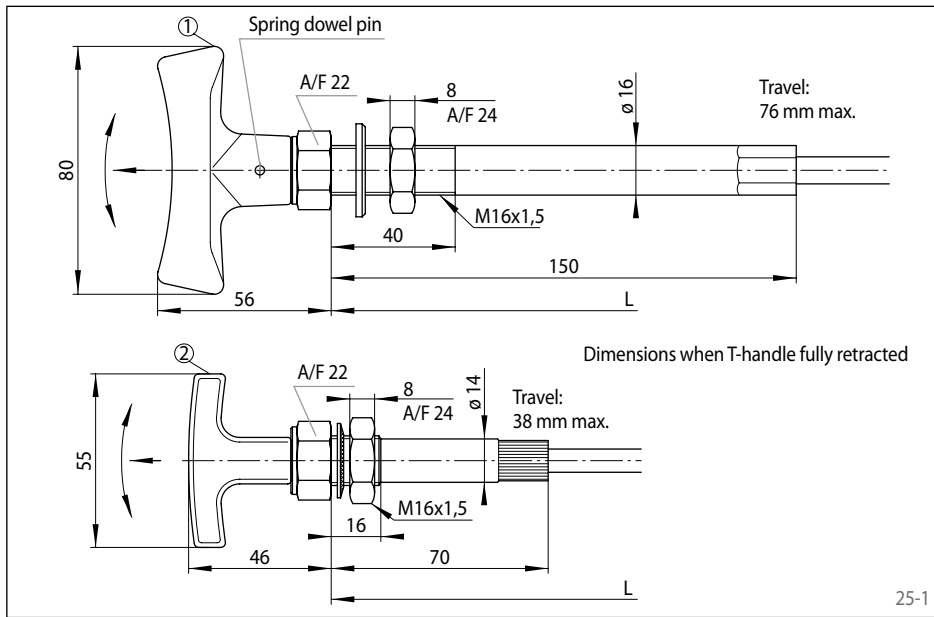


Pull force series 775



Twist lock control cable – TL –

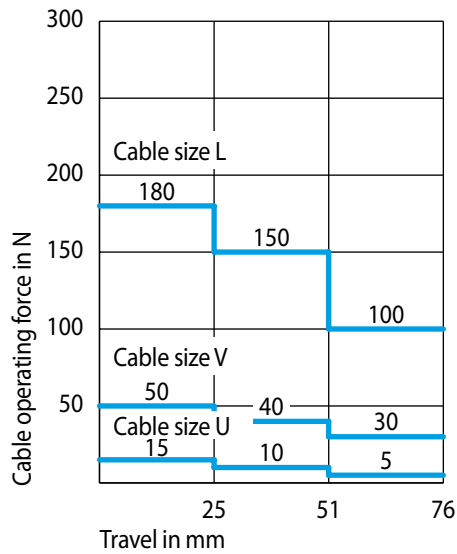
Travel adjustment and one-handed locking mechanism with T-handle



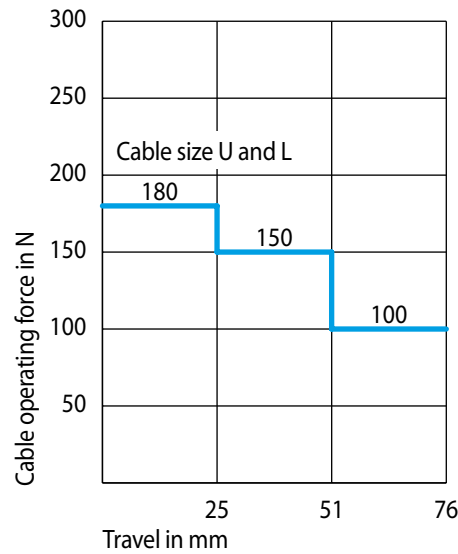
Features

- Travel adjustment and locking mechanism with one hand
 - Easy release and locking
 - For cable sizes U, V and L
 - 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.

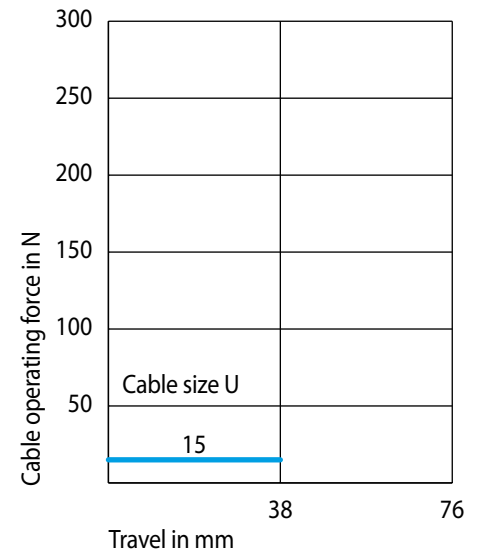
Push force series 283 and 275 - Version 1



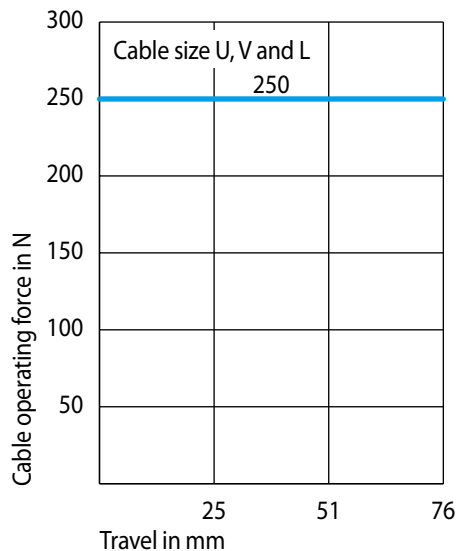
Push force series 775 - Version 1



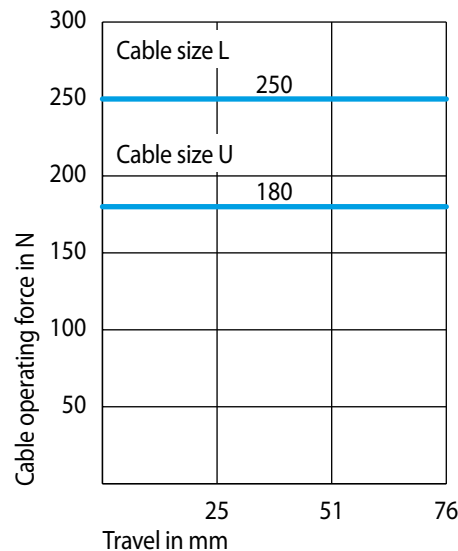
Push force series 275 - Version 2



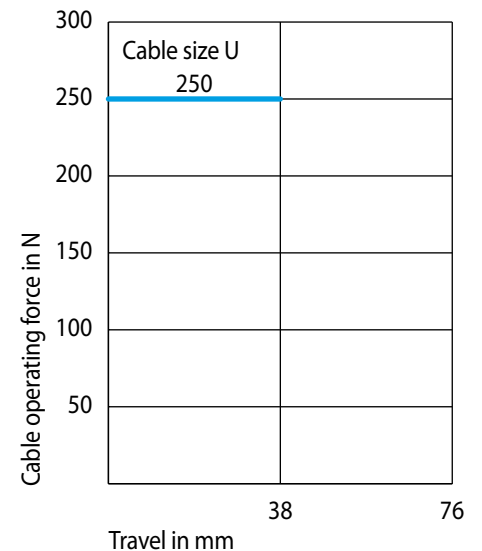
Pull force series 283 and 275 - Version 1

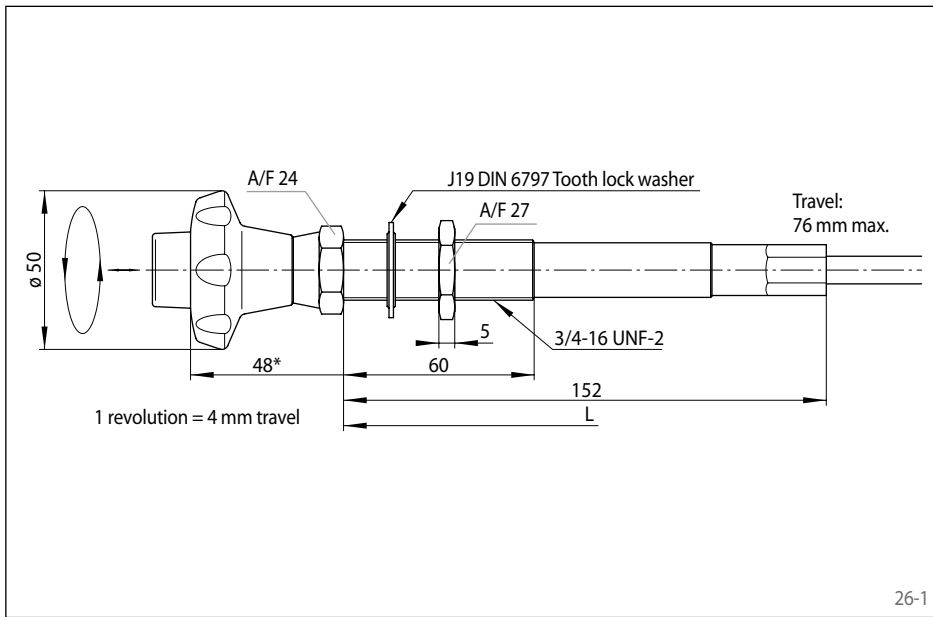


Pull force series 775 - Version 1



Pull force series 275 - Version 2



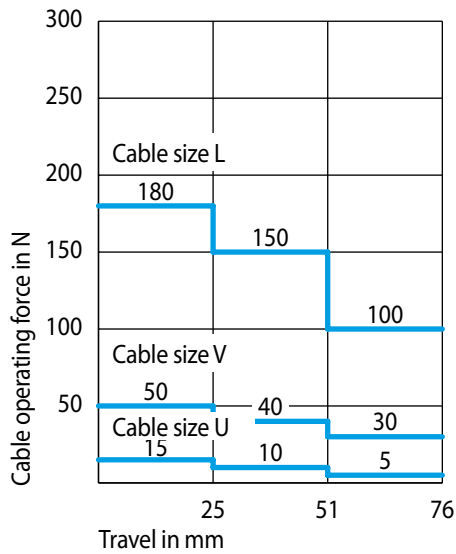


Features

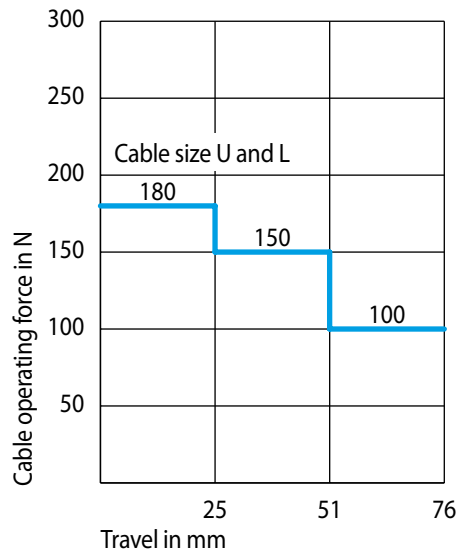
- Quick adjustment via pressure button
- Fine adjustment with a rotating handle
- Emergency off function
- For cable sizes U, V and L
- For max. travel 76 mm

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

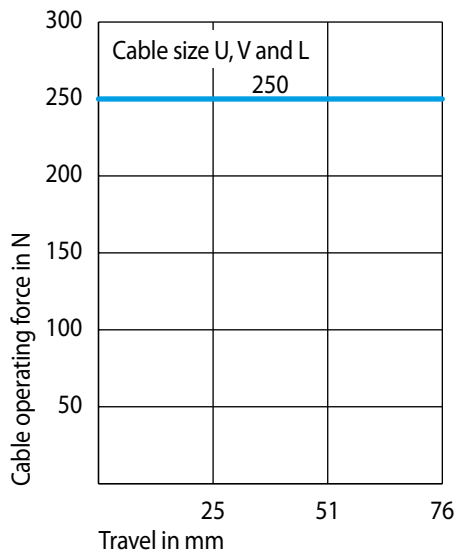
Push force series 283 and 275



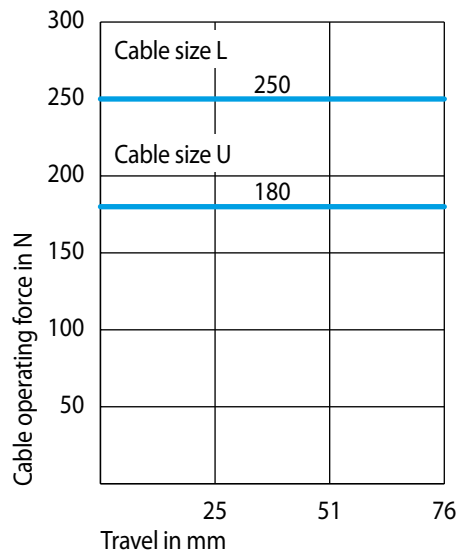
Push force series 775



Pull force series 283 and 275

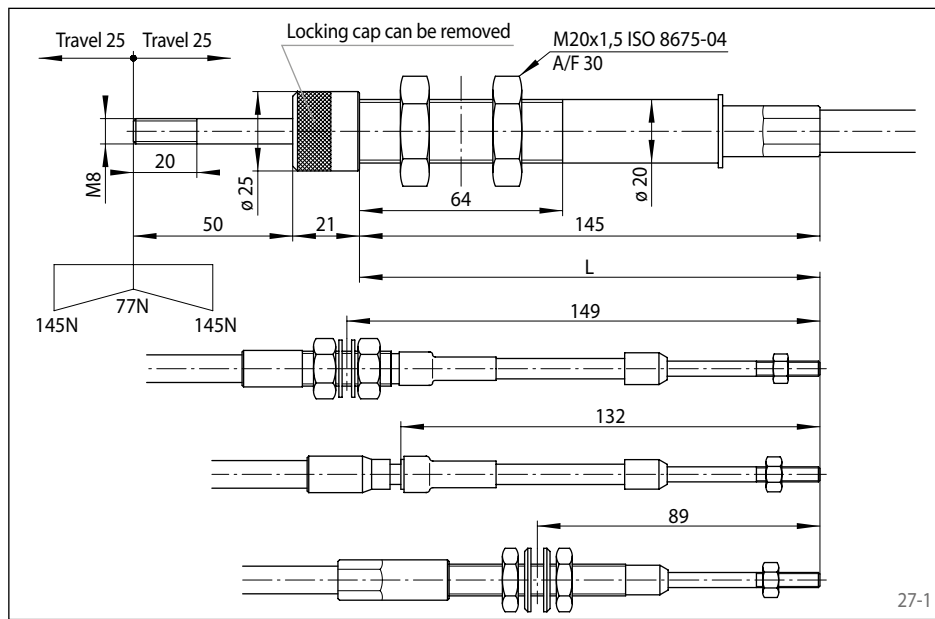


Pull force series 775



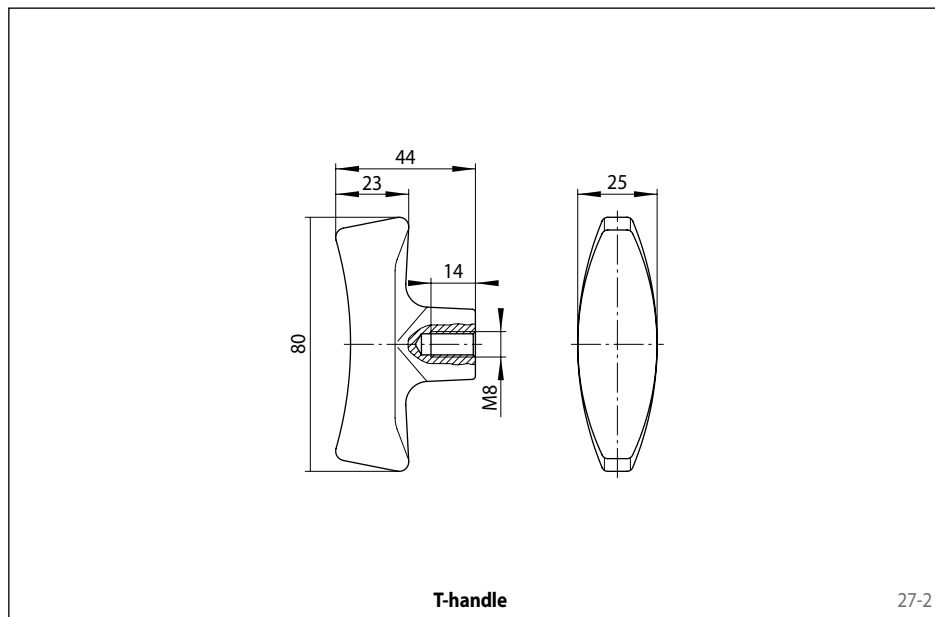
Spring loaded control cable – VC –

Hand operated with spring return
T-handle optional



Features

- Hand operated with spring return
- Return in 1/2 travel
- For cable size V

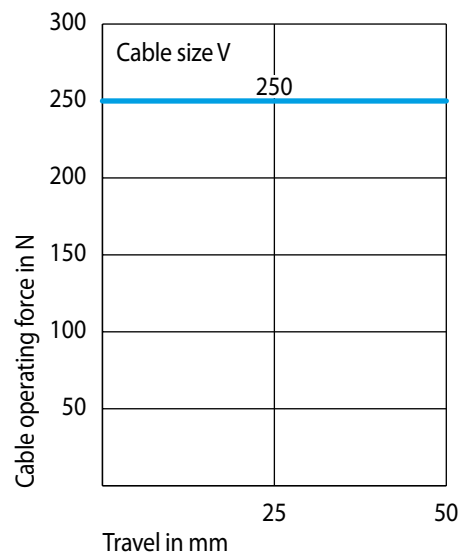
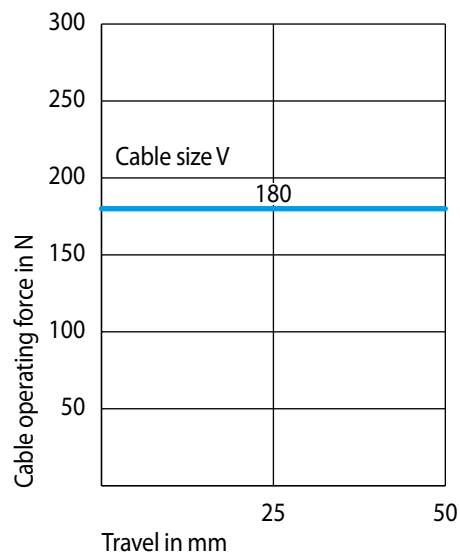


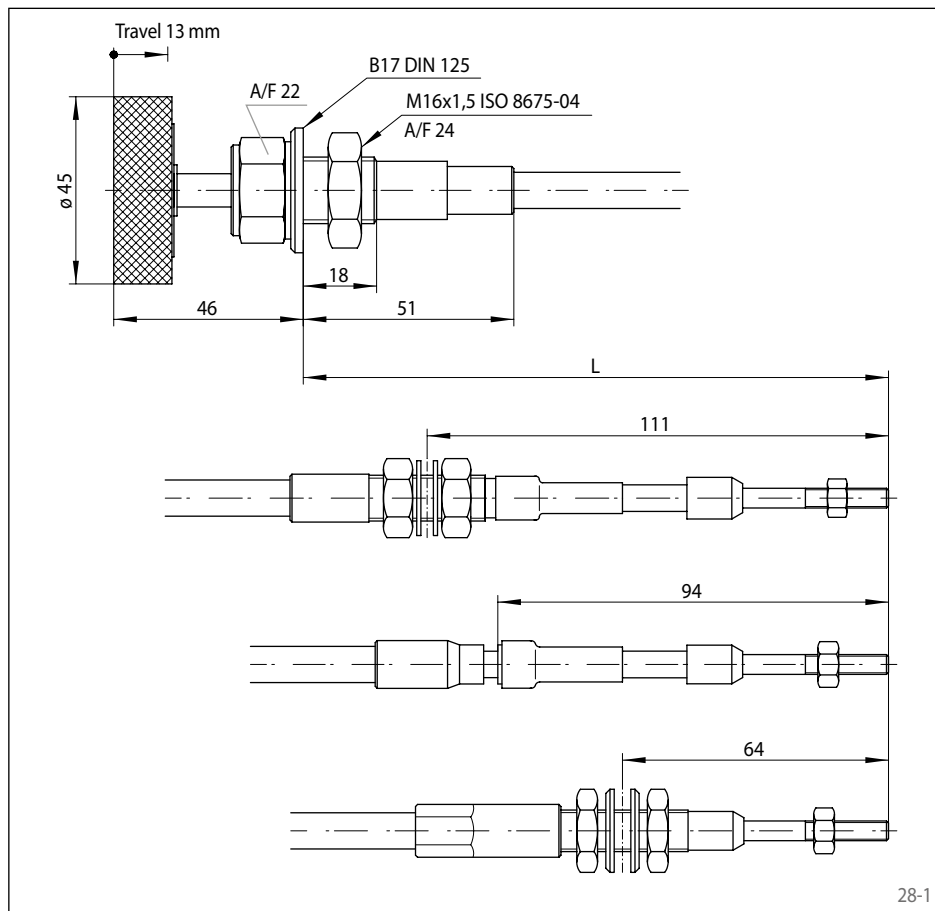
Accessories

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

Push force series 283 and 275

Pull force series 283 and 275



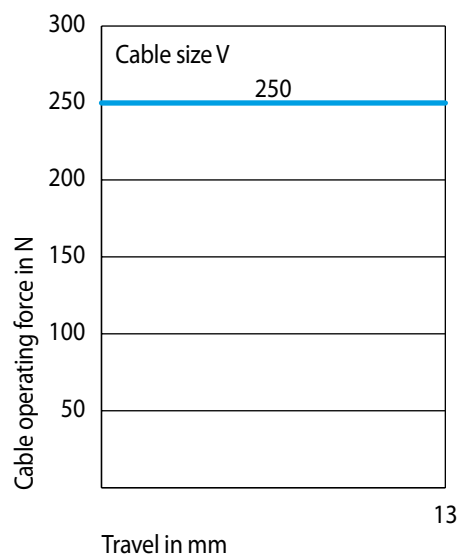


Features

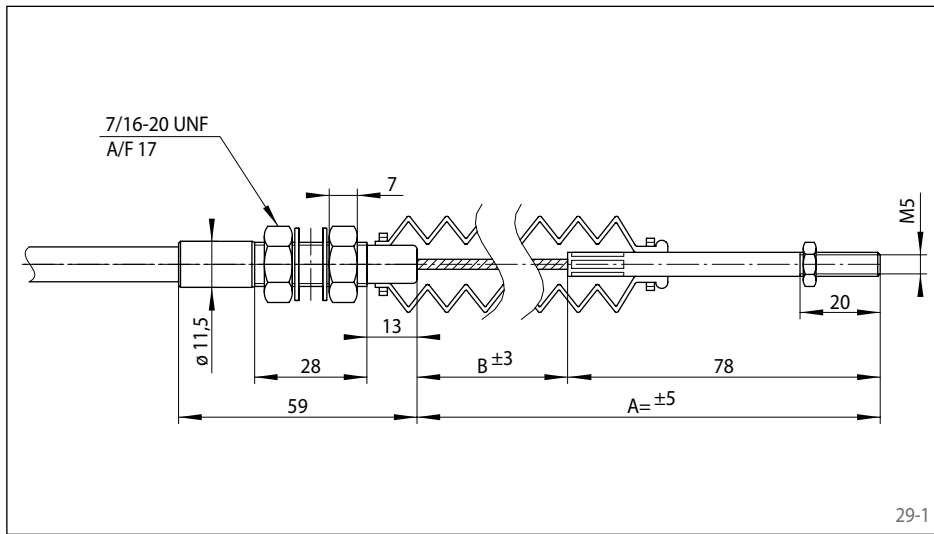
Especially suitable for switching on additional functions, e.g. emergency off button or diesel stop. Function travel: 13 mm, only pressure. Return not carried out automatically, the operated element must have a spring return! The foot-operated button with a profile rubber cap is pivoted to ensure the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

- For cable size V

Push force series 283 and 275



Open ends, inner member with rod end

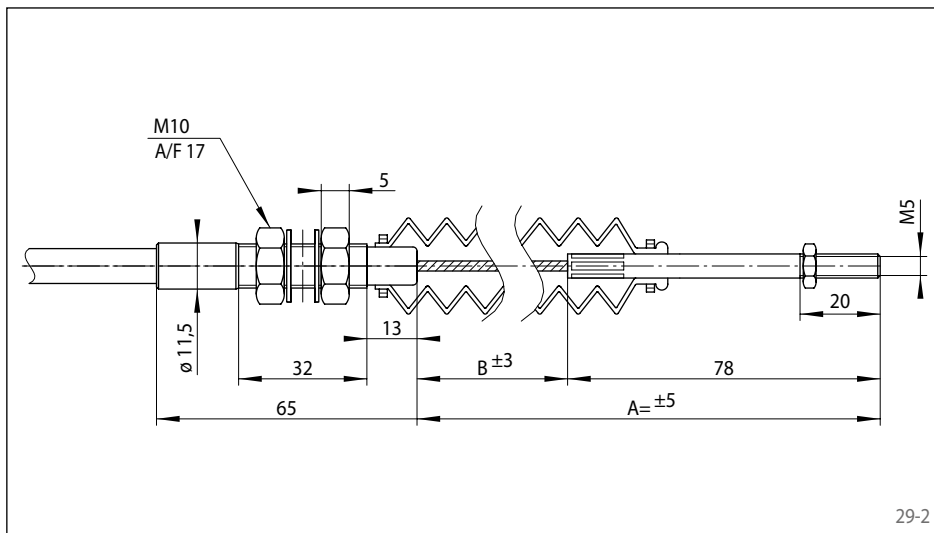


Cable series 283 and 275

Cable size U

Type T00M

Cable end with bulkhead endfitting 7/16-20 UNF, rod end M5 and a bellows

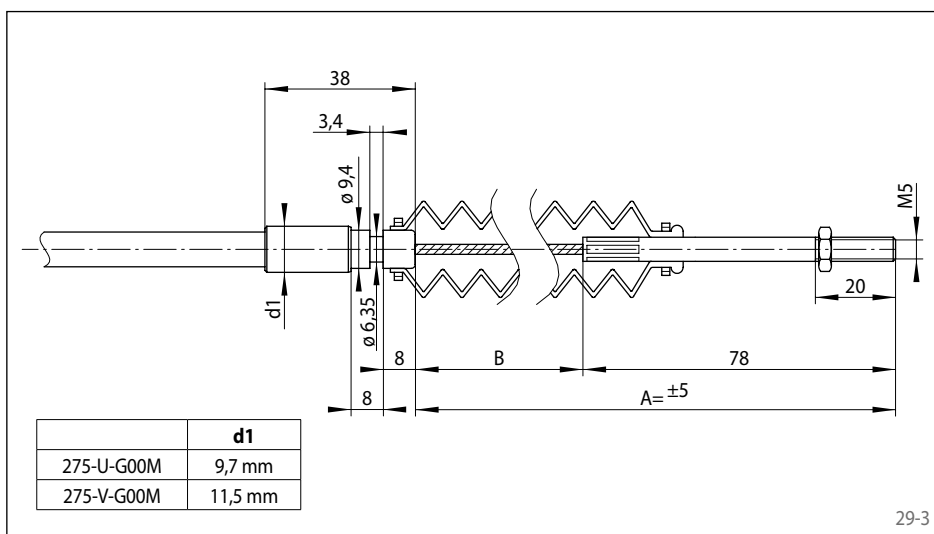


Cable series 275

Cable size V

Type T00M

Cable end with bulkhead endfitting M10, rod end M5 and a bellows



Cable series 275

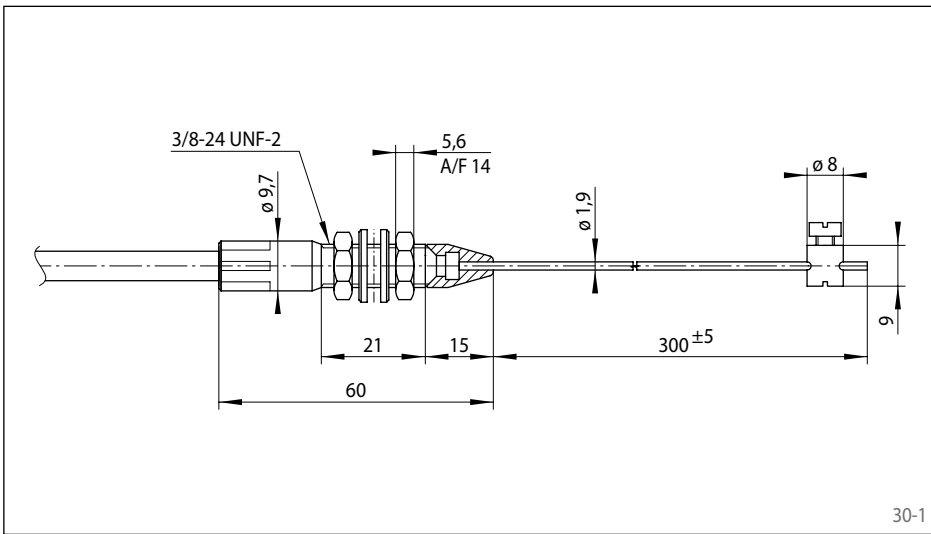
Cable sizes U/V

Type G00M

Clamp endfitting with rod end M5 and a bellows

Remarks

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

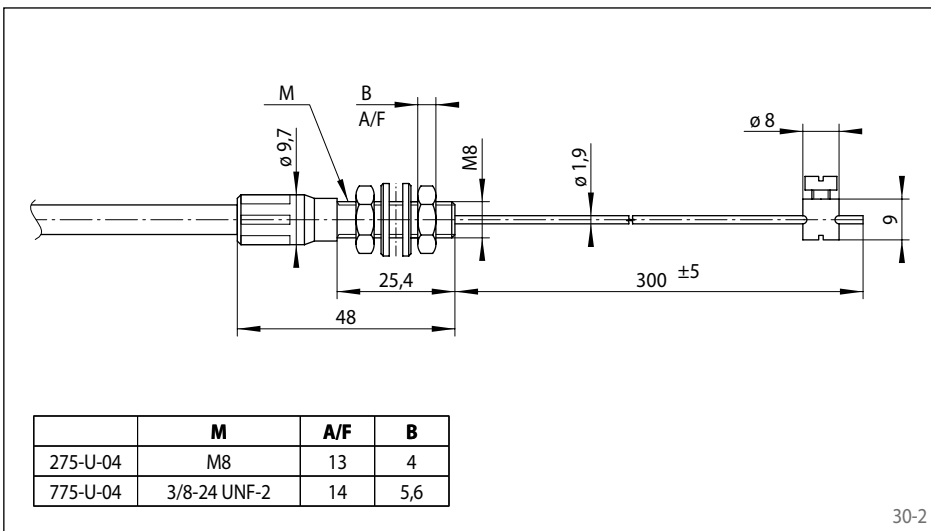


Cable series 775

Cable size U

Type 03

Open cable end with bulkhead endfitting 3/8-24 UNF-2, sealing and screw nipple

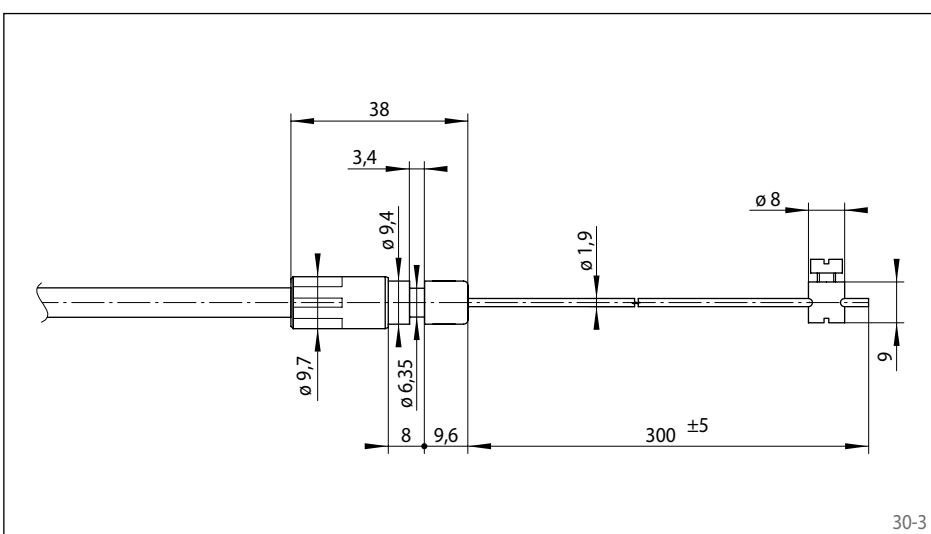


Cable series 275 and 775

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

Features

Order code:

283 - V - TL / T 05 M - 3 - 0200

Cable serie:

283, 275, 775 or other after consultation

Cable size:

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

Control head:

According to operation

Connection second end part:

In accordance with installation conditions T, G, S or R

Wiper seal:

Only for cable end parts T, G, S or R
(See catalogue page 10)

Thread at rod end:

Only at end parts T, G, S or R
M for metric,
Z for inch (UNF) thread

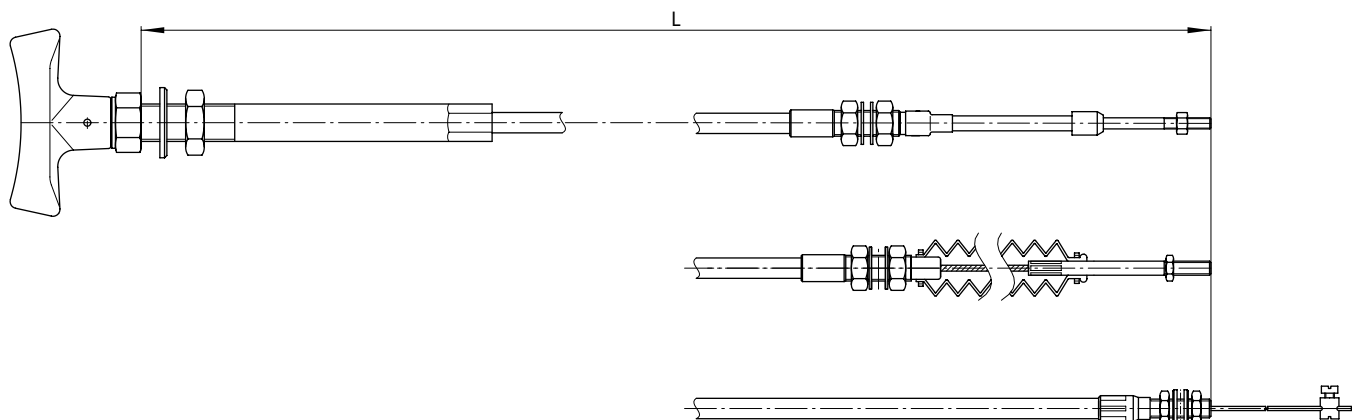
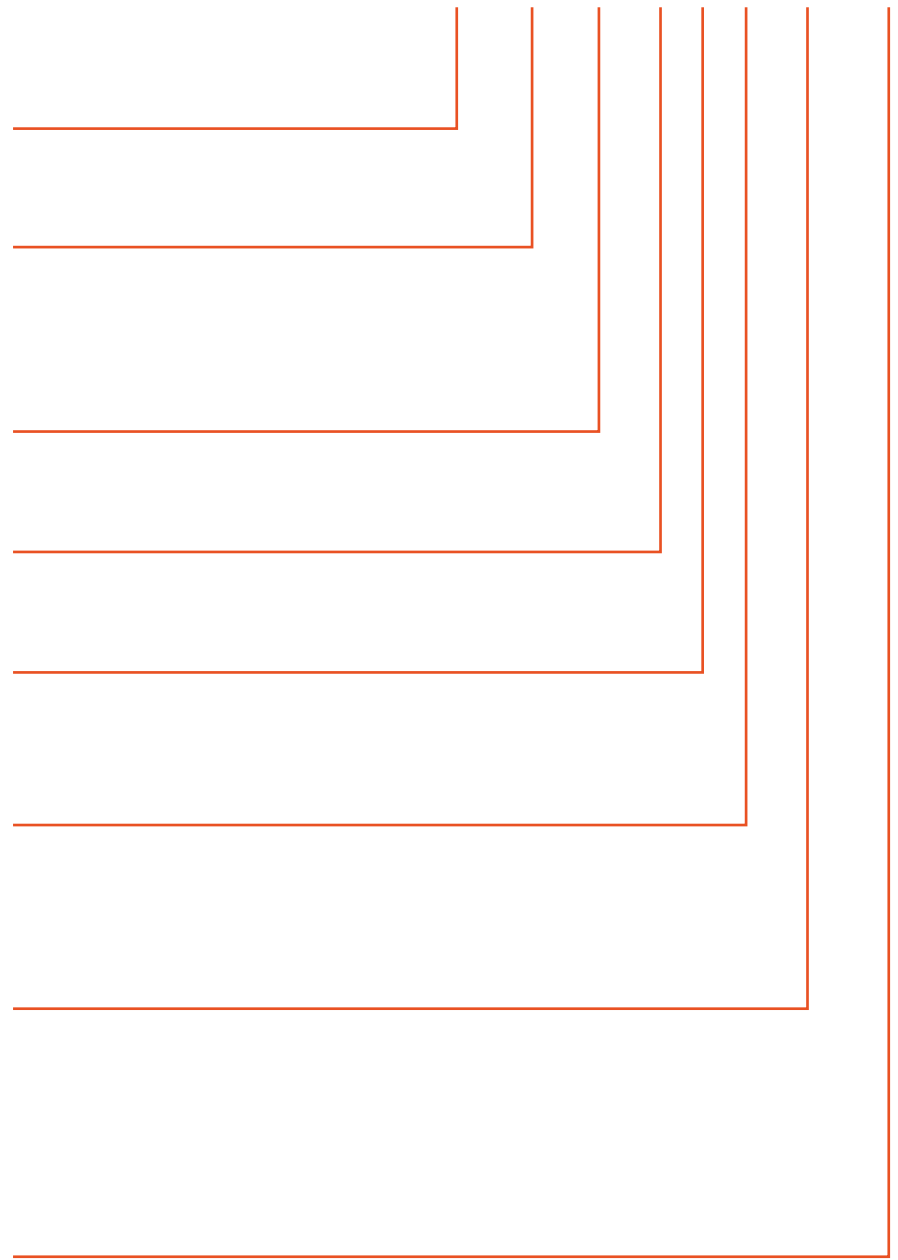
Travel code:

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

1	2	3	4	5	6
25	51	76	102	127	152

Cable length:

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



Control lever 16RFA7.2

The control lever offers with its operating lever and the fine tunable friction the best prerequisite for sensitive adjustments.



Control lever SH 58.5 and SH 58.3

The series SH 58.5 and SH 58.3 (with detent in middle position) are suitable for rough operating conditions due to their robust design.



Friction control FH 22.1

The FH 22.1 friction lever is a perfect all-rounder. The lever is available with adjustable friction and stroke limitation.



Friction control FH 22.3

This lever is based on the FH 22.1 friction lever, but is additionally equipped with a locking function.





33-1

Features

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

Cable size U, travel code 2

The control lever offers with its 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

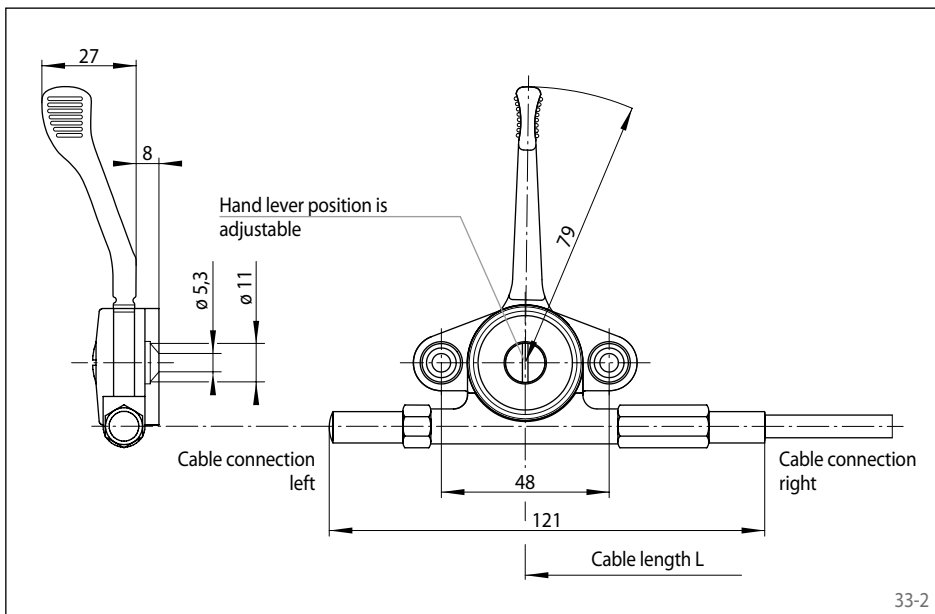
Cable size U: 80 N

Maximum holding force: 80 N

Travel of the cable: 48 mm

Lever transmission: 1:4,3

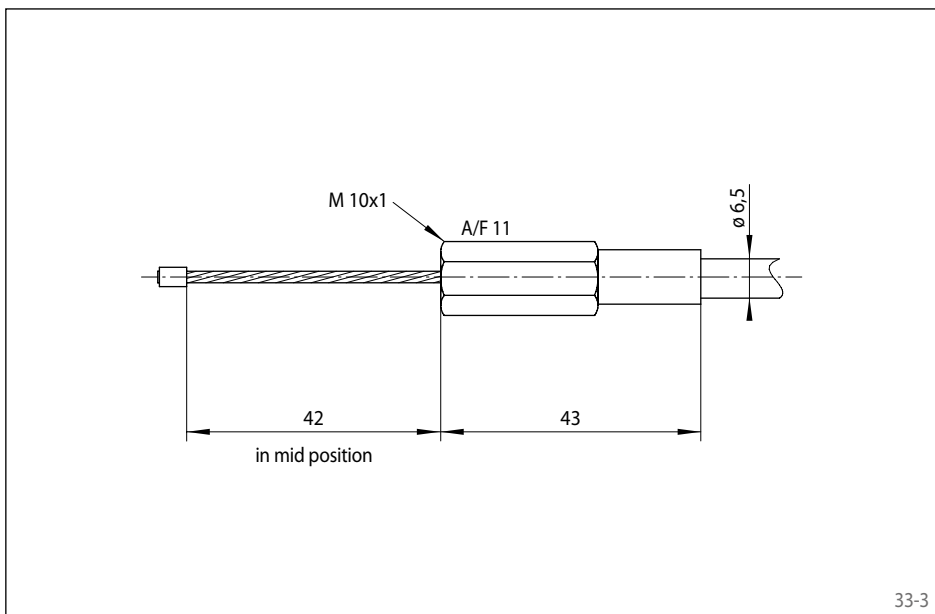
Lever swiveling angle: 171°



33-2

Art.-No.:	Cable connection:
4561-002000-L00000	left
4561-002000-R00000	right

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



33-3

Cable end MGD for connection to control lever 16RFA7.2



34-1

Features

- Robust design
- Suitable for rough operation
- Connection for push/pull cables

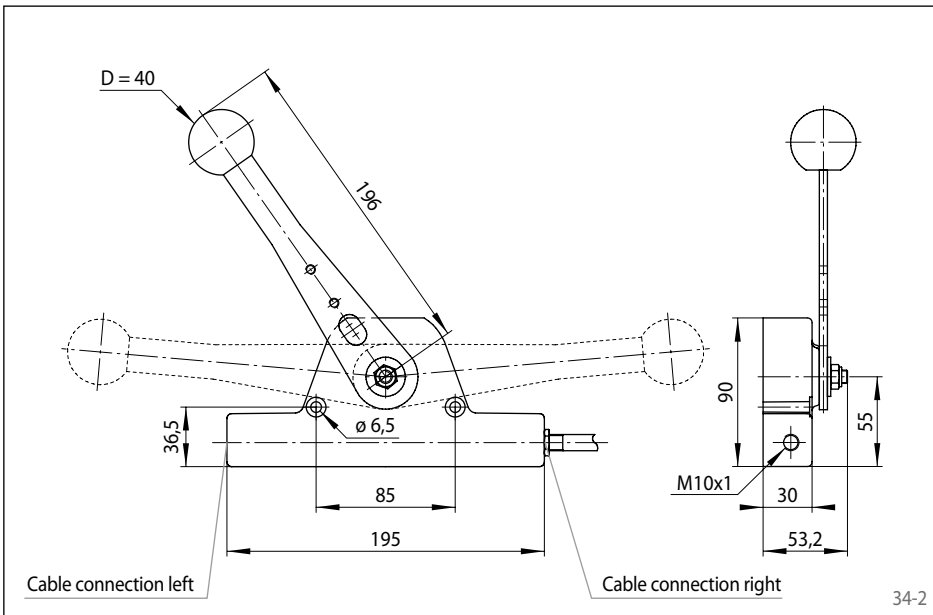
Cable size V or L, travel code 3.15

Control lever SH 58.3 is supplied with detent in middle position.

Control lever SH 58.5 is optionally available with lock (see next page).

Maximum loads on the cable

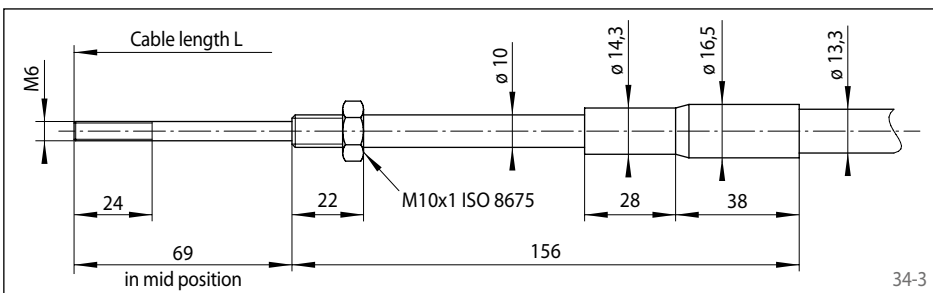
Cable size V:	300 N
Cable size L:	500 N
Maximum holding force:	200 N
Travel of the cable:	80 mm
Lever transmission:	1:6
Lever swiveling angle:	160°



34-2

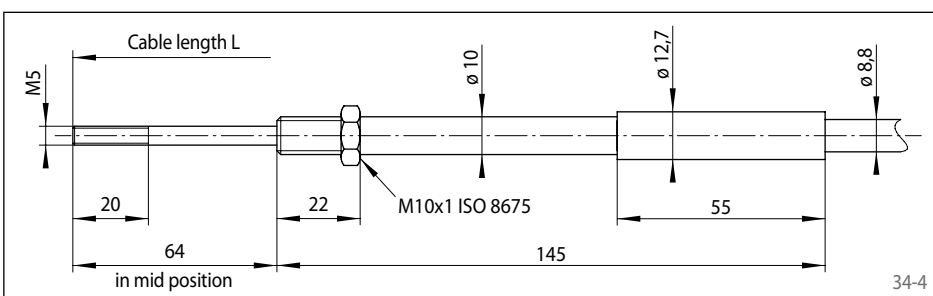
Art.-No.:	Cable connection:
4561-003001-000000	Type SH 58.5, left L / right V
4561-003002-000000	Type SH 58.5, left V / right L
4561-003003-000000	Type SH 58.3, left L / right V
4561-003004-000000	Type SH 58.3, left V / right L

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



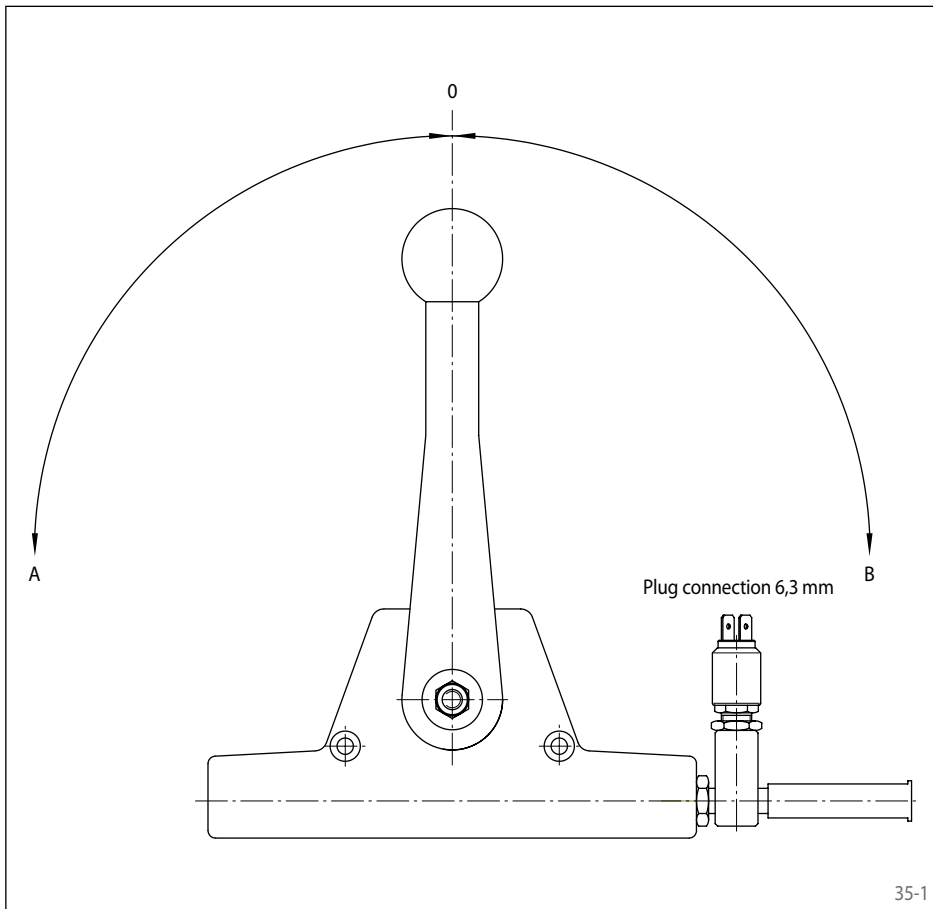
34-3

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



34-4

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



Electric switch for control lever SH 58.x

The SH 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.

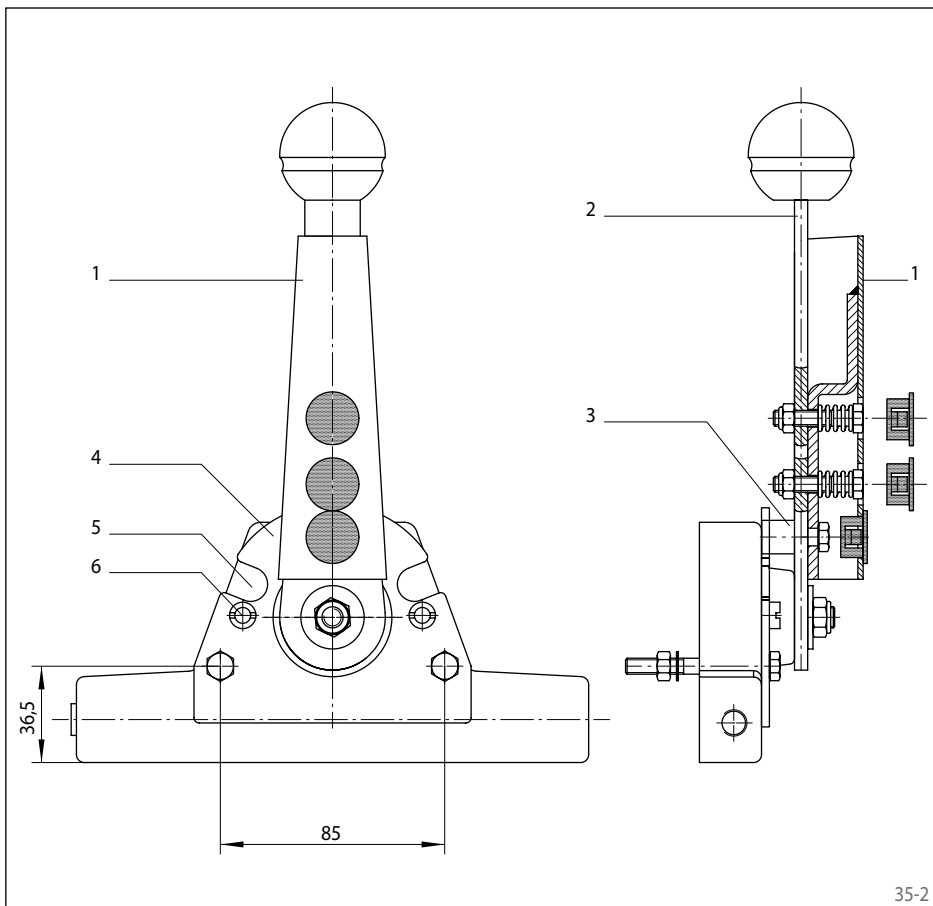
If the position 0 -> B is left, then the switch closes and remains closed.

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



Lock for control lever SH 58.5

The control lever SH 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)



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

Cable size 275/278-V: 500 N pull

Cable size 275-V: 50 N push

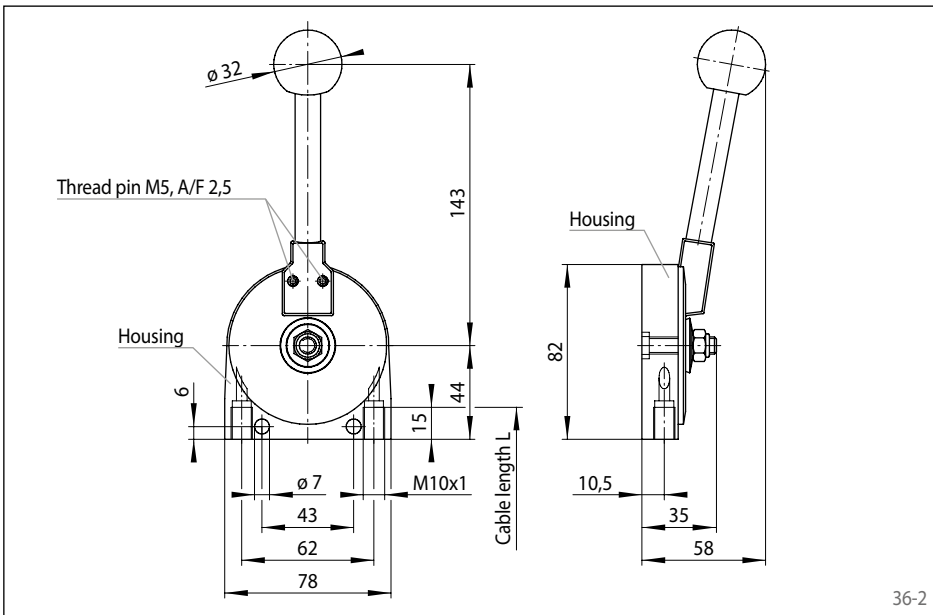
Maximum holding force: 250 N

Travel of the cable: 80 mm

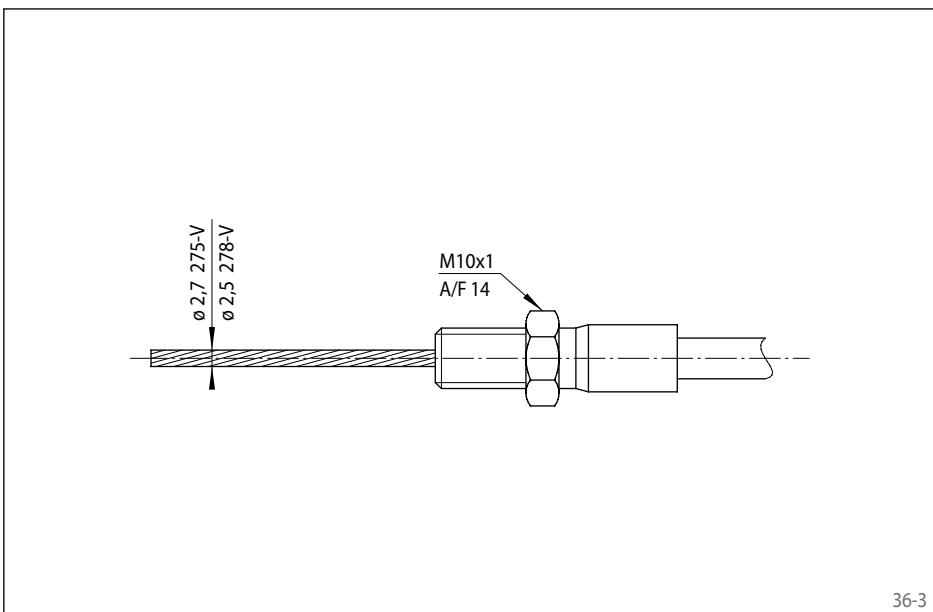
Lever transmission: 1:4,4

Lever swiveling angle: 152°

Art.-No.: 4561-003021



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 FH 22.1



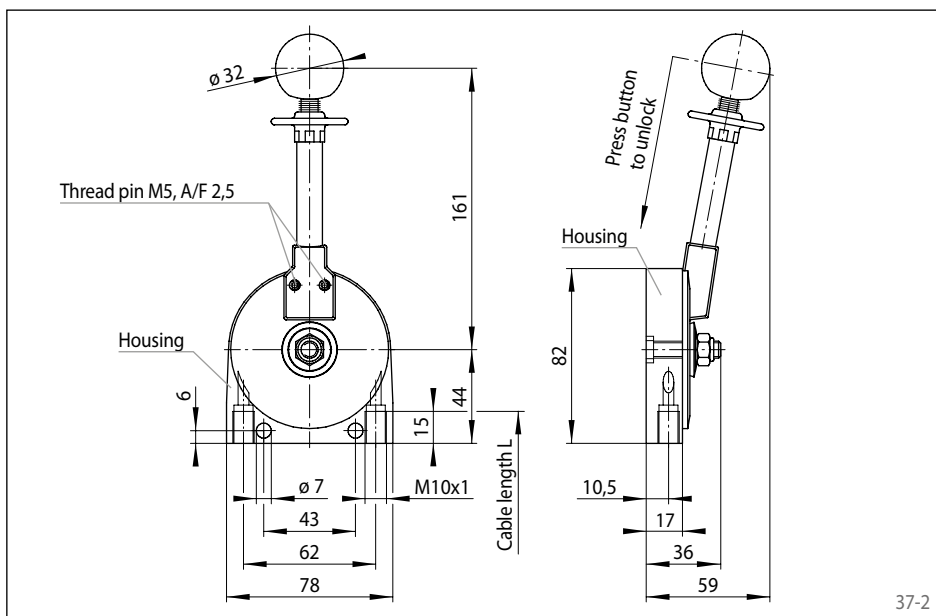
37-1

Features

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

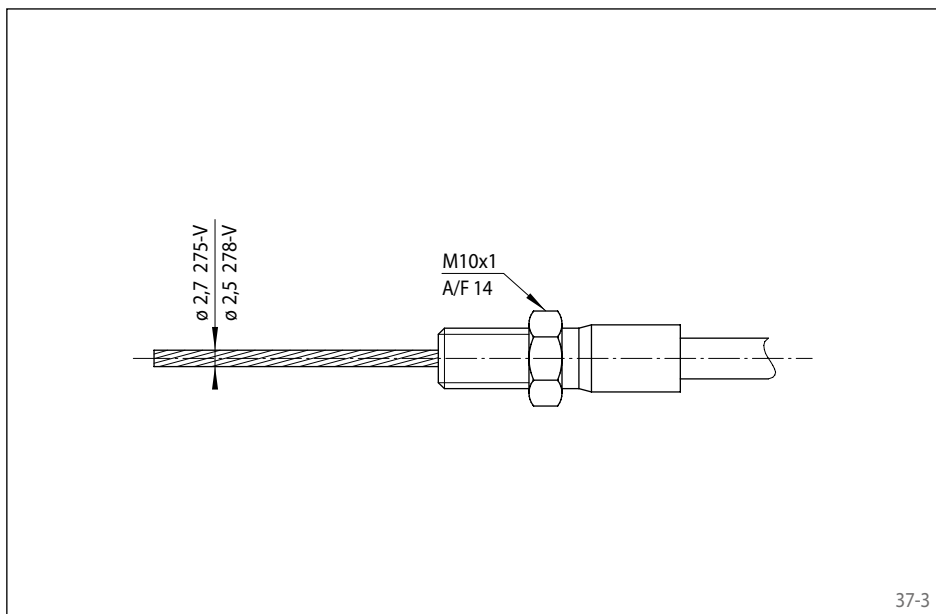
Maximum loads on the cable

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:	152°
Art.-No.:	4561-003023



37-2

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



37-3

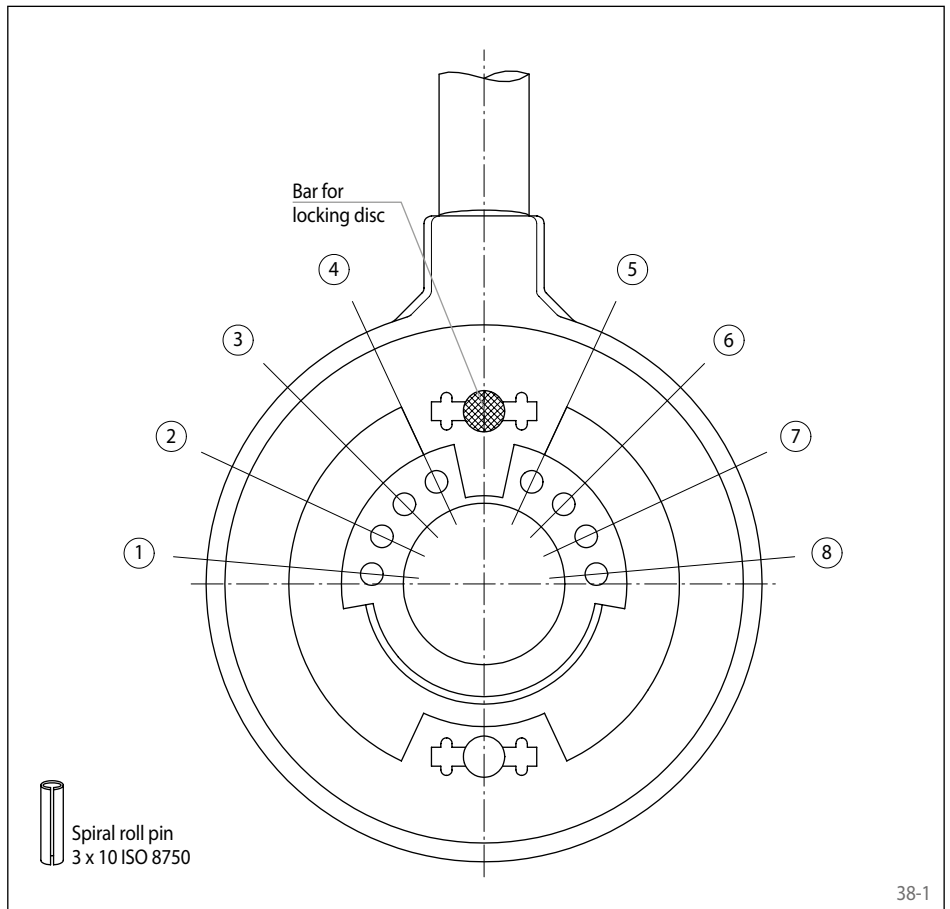
Cable end MGS for connection to friction control FH 22.3

Accessories for friction control FH 22.x

Locking

- Locking for FH 22.3 with a bar and locking disc
- Travel limiting using clamping pin(s)
- Adjustable friction

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



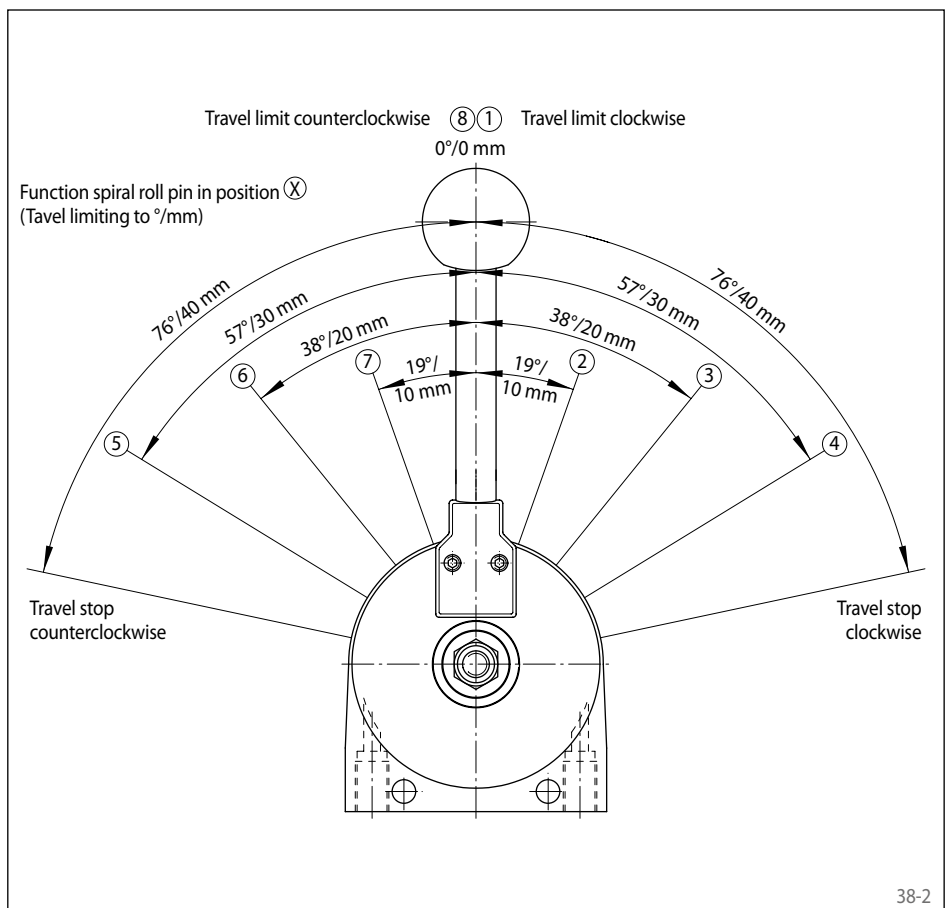
Travel limiting

From center position lever end stops after $78^\circ = 40 \text{ mm}$ cable travel clockwise and counterclockwise.

The lever end stops can be reduced individually in 10 mm steps with spiral roll pins.

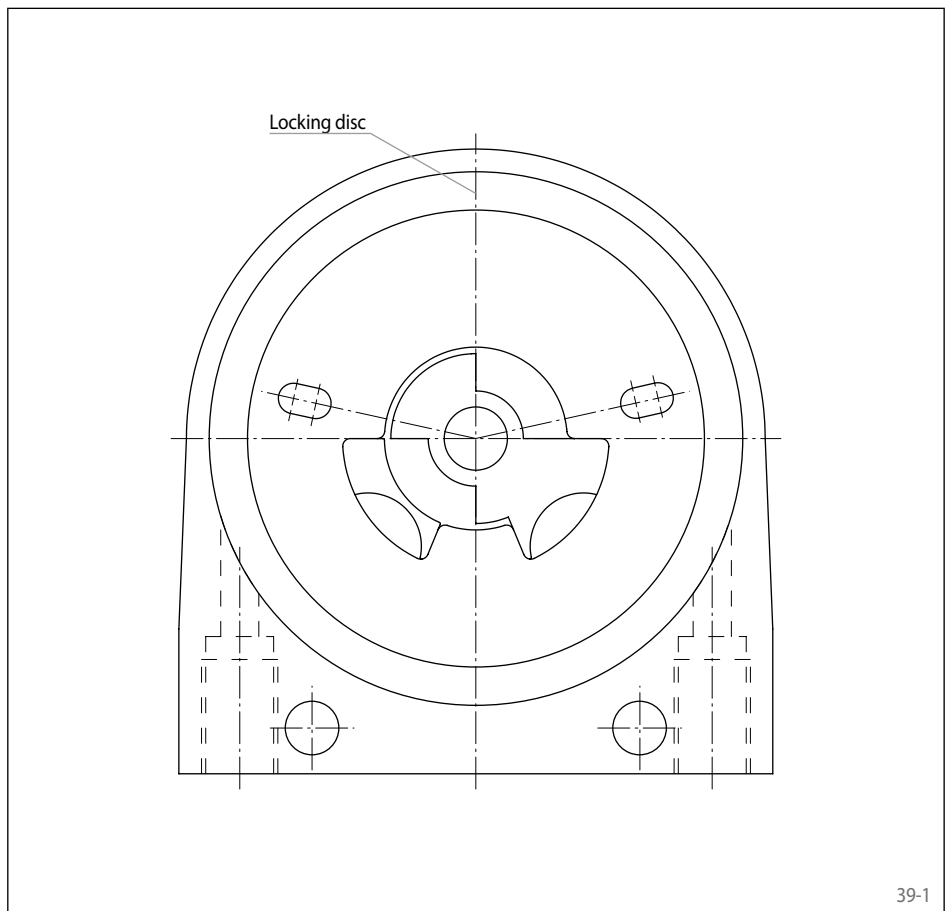
Example:

Pin position	Travel	Direction
④ + ⑤	+/-30 mm	symmetrical
③ + ⑥	+/-20 mm	symmetrical
② + ⑦	+/-10 mm	symmetrical
⑧	+40 mm	clockwise
①	-40 mm	counterclockwise



Locking

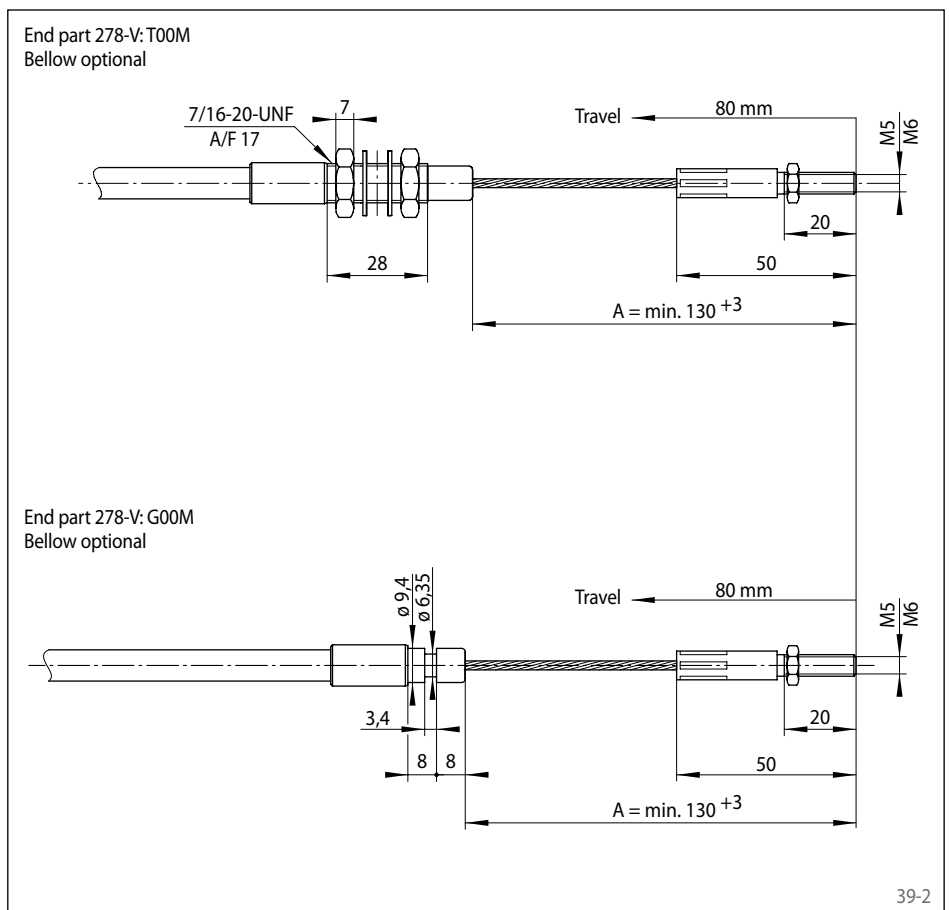
- Clear locking of the hand lever in the locking position of the disc
- Standard locking position in end positions $\pm 76^\circ$
- Other locking positions up on request



39-1

Open ends

- Pulling strands made from stainless steel
- Sealing available with optional bellow



39-2

Order key for push/pull cables for control lever systems



Features

Order code:

275 - V - MGS / T 05 M - 3.15 - 0200

Cable serie:

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:

Type	Travel code	Travel	Connection
16RFA7.2	2	48 mm	MGD
SH 58.x	3.15	80 mm	MGD
FH 22.x	3.15	80 mm	MGS

Cable length:

Entire length, denoted in cm,
principally 4-figure:

e. g.: 3 400 mm = -0340

e. g.: 5 m = -0500





42-1

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:

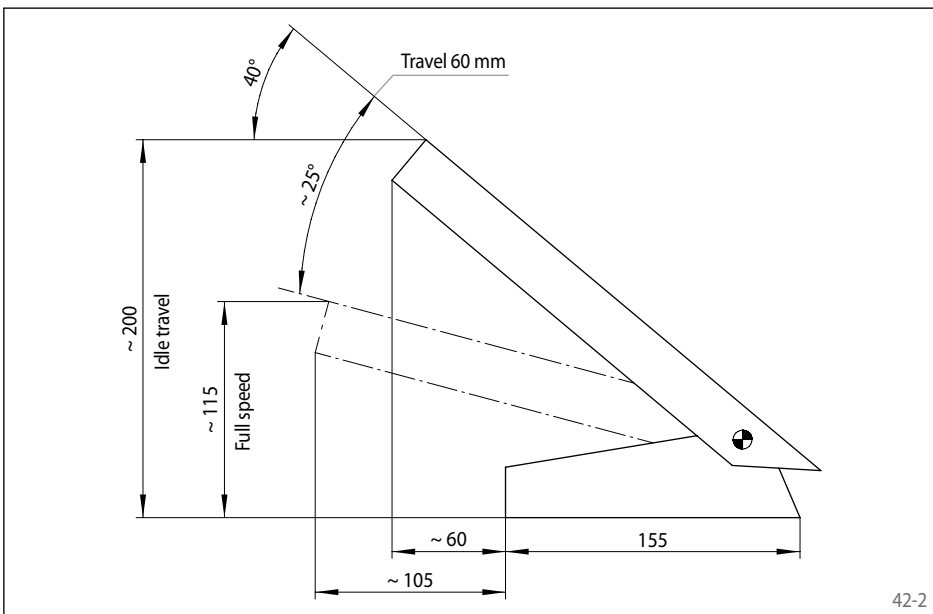
- Pedal angle continuously adjustable
- Robust steel sheet metal design, corrosion protected by black surface treatment
- Slip-proof pedal rubber on the tread surface

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

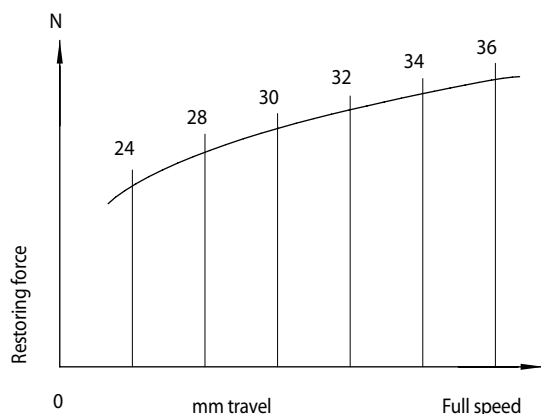
General information:

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



42-2

Restoring force

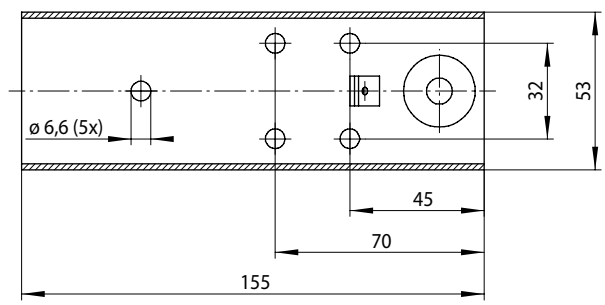
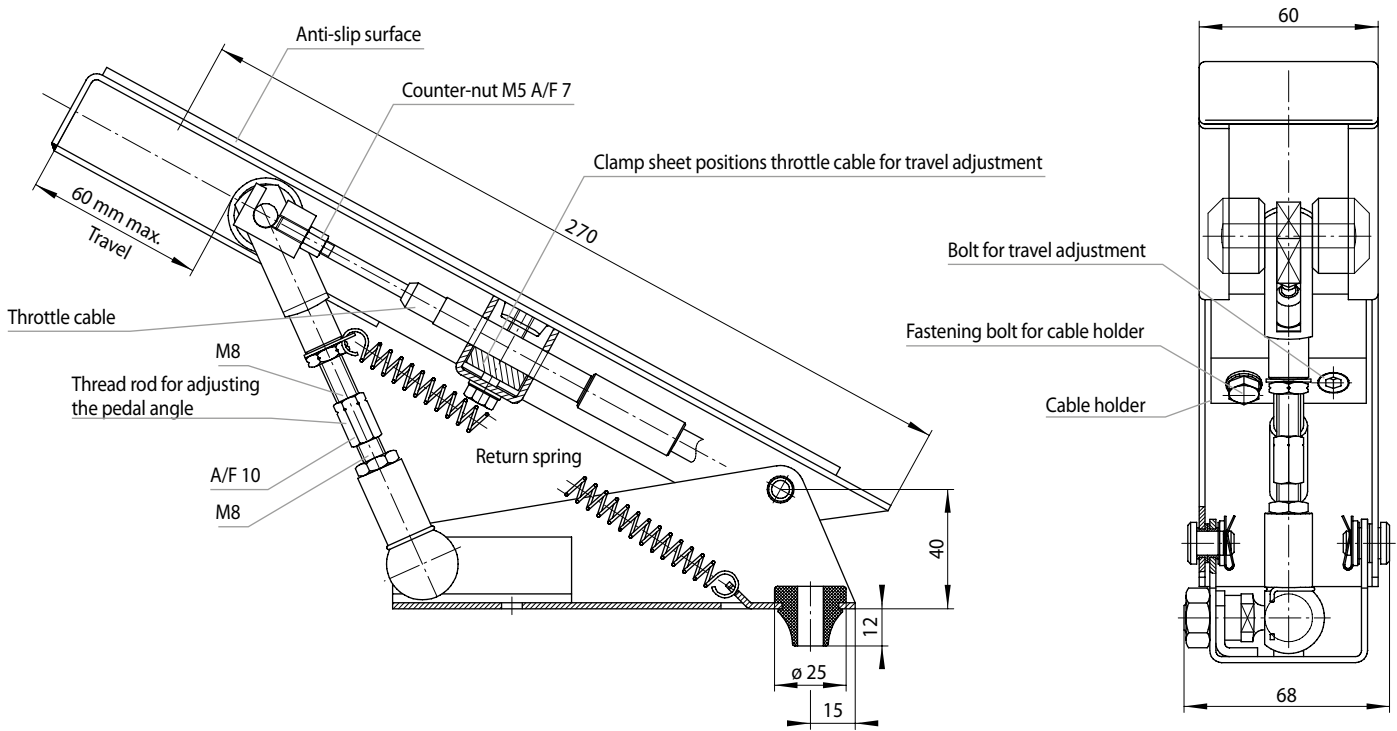


42-3

Art.-No.:	Cable outlet:
4569-000023	below
4569-000024	rear

Throttle pedals

for pull only cable 283-U-GAS/... and 283-V-GAS/...

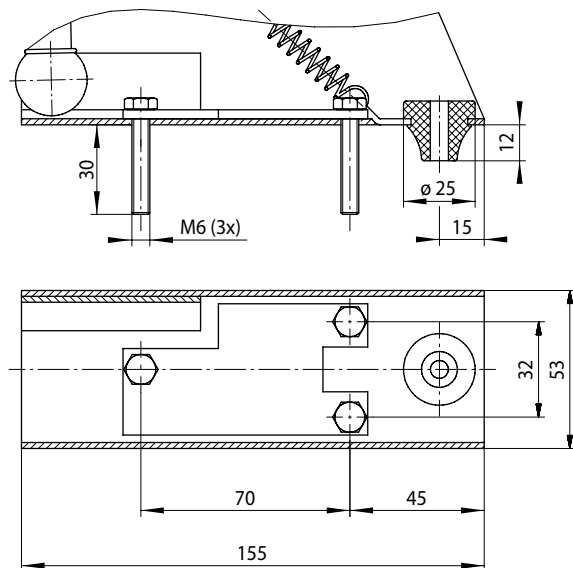


43-1

Assembly plate

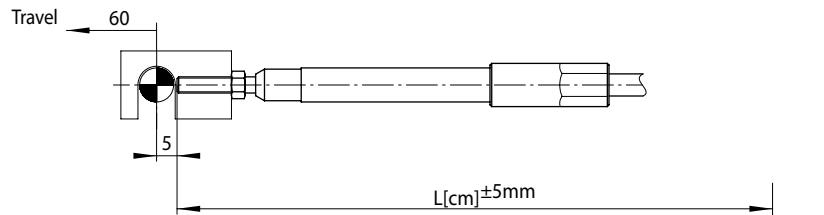
For easy screwing through the vehicle floor.

Art.-No.: 3570-000014

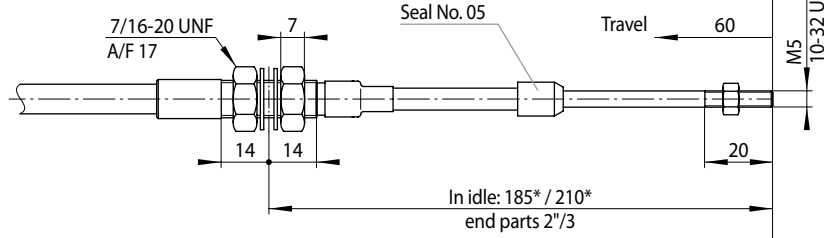


43-2

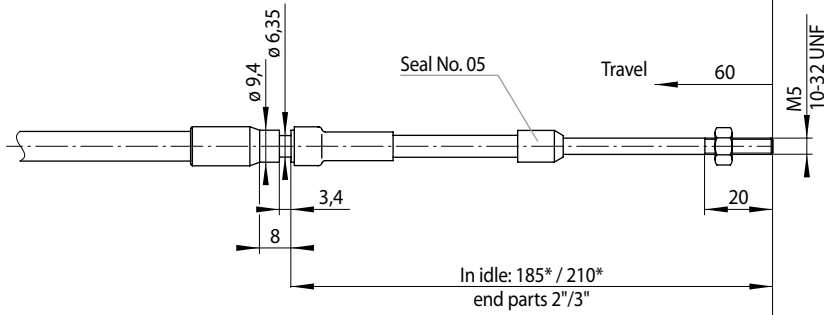
Pedal connection GAS:



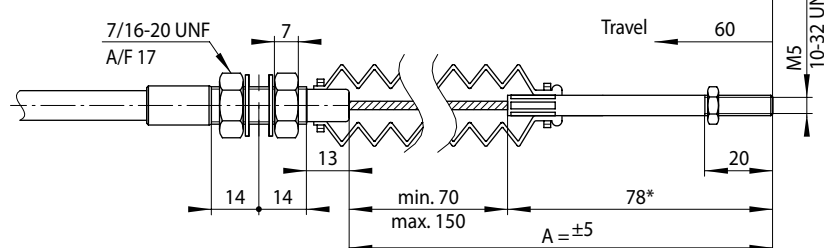
Motor connection T05M:



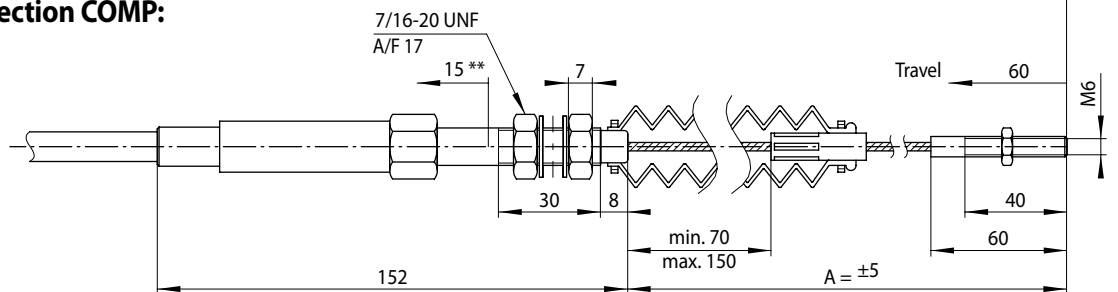
Motor connection G05M:



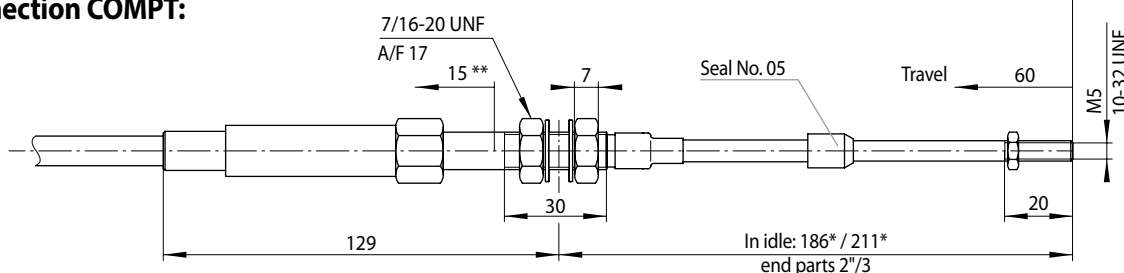
Motor connection T00M:



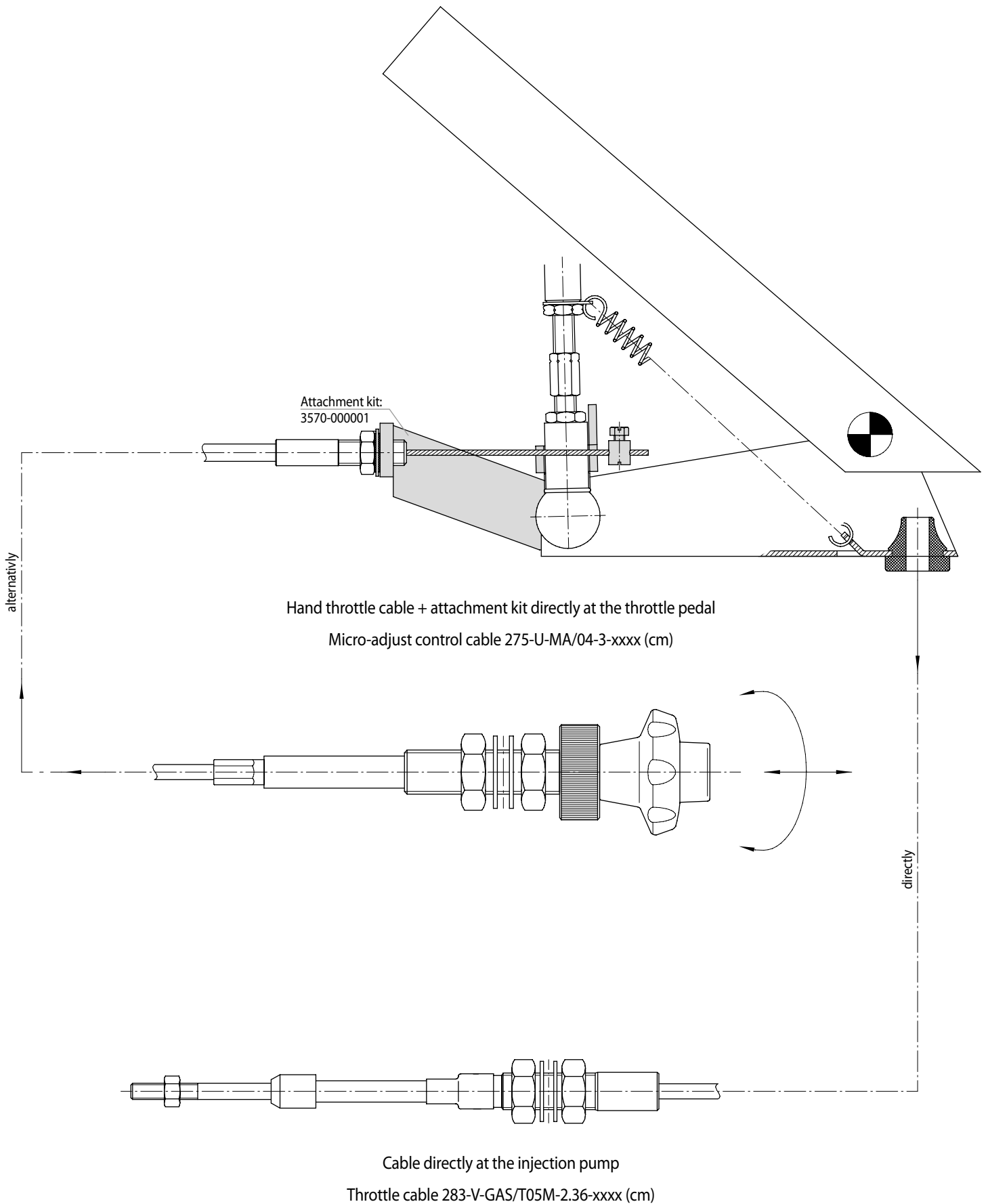
Motor connection COMP:



Motor connection COMPT:

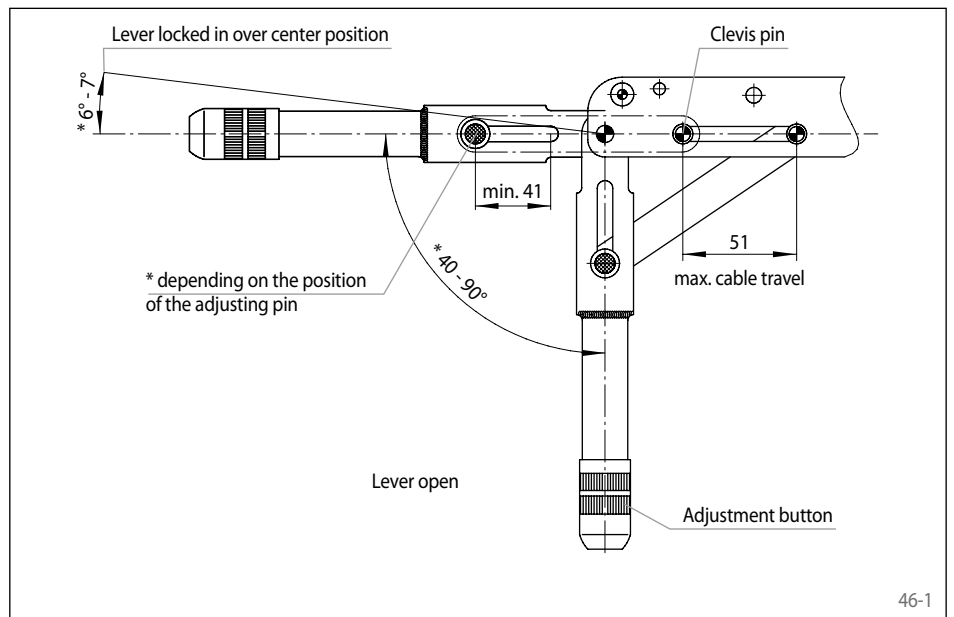


* Other lengths, threads and motor connections available upon request • ** Compensated excess travel and exceeding the max. pull force



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.

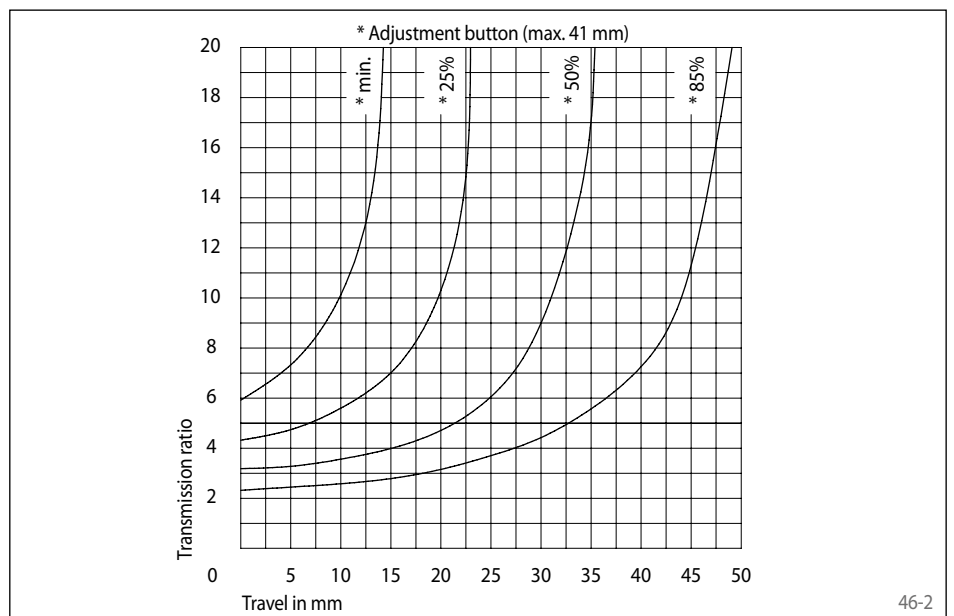


46-1

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.

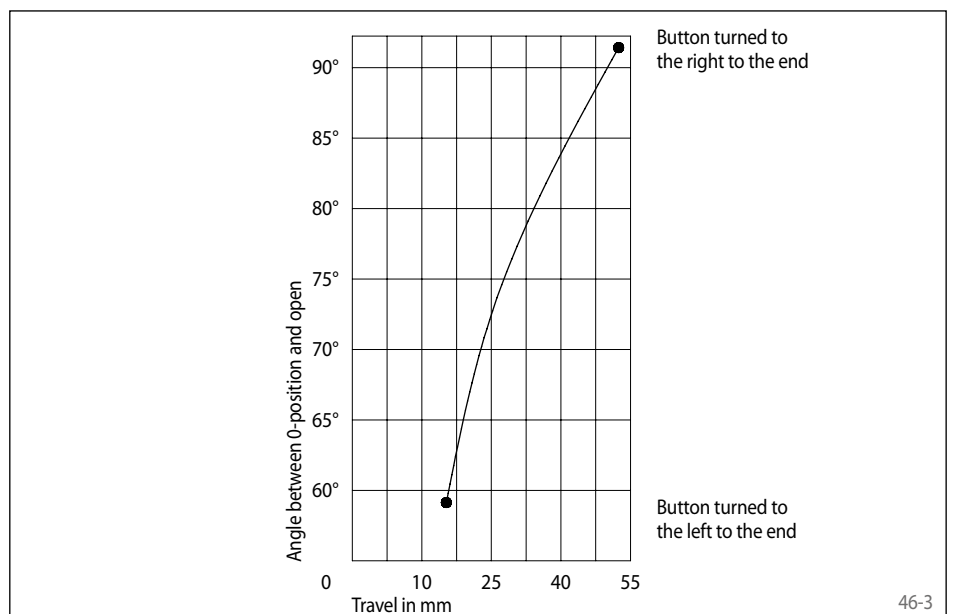
The transmission ratio is dependent on the position of the adjusting pins and the travel at the clevis pin, to be read in the curves depicted here.



46-2

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.



46-3



Features

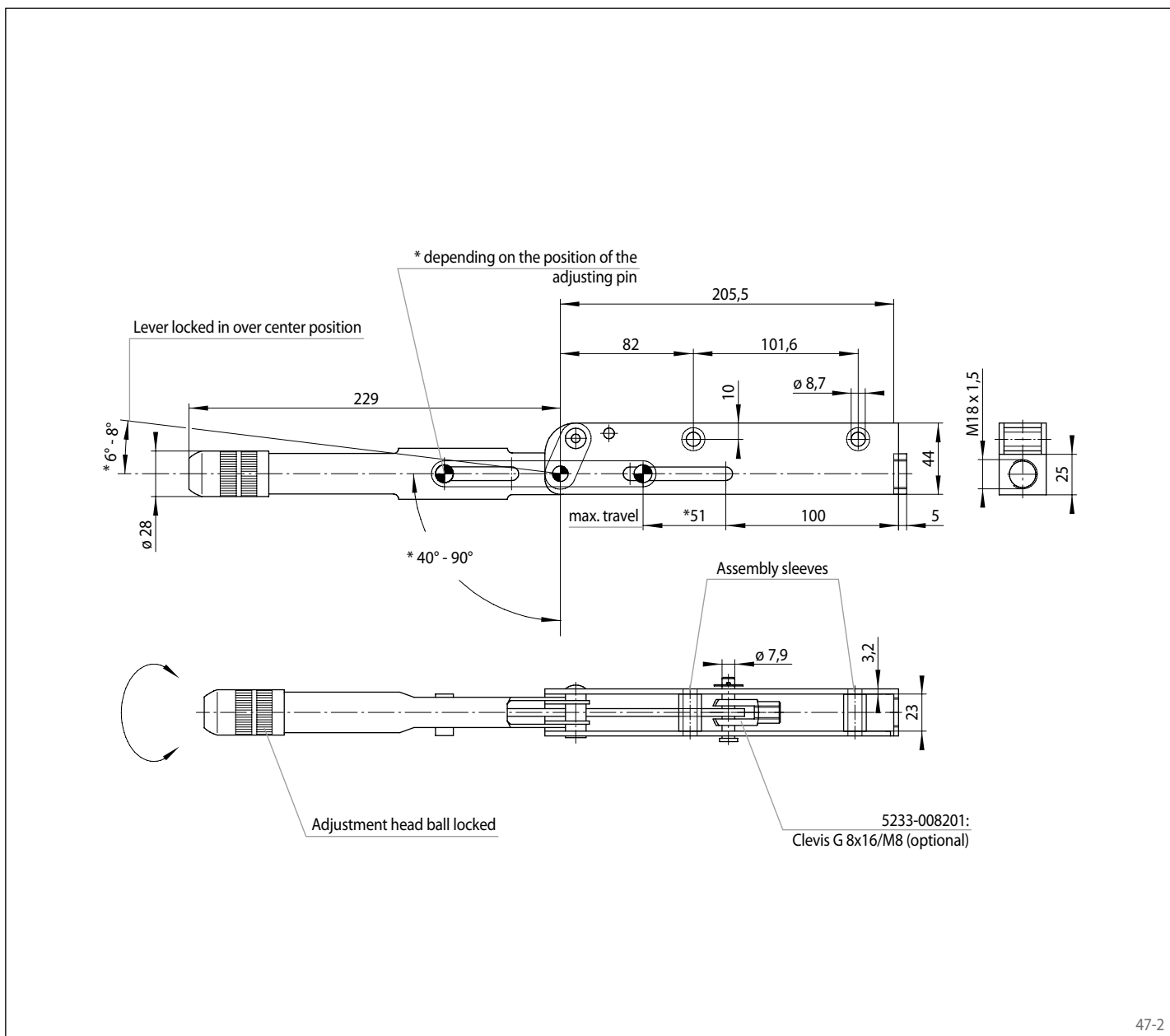
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Bulkhead endfitting

Art.-No.: 4561-000001-S50452

Accessories for B 5 ... series hand brake lever

Please see page 53.

47-1



47-2



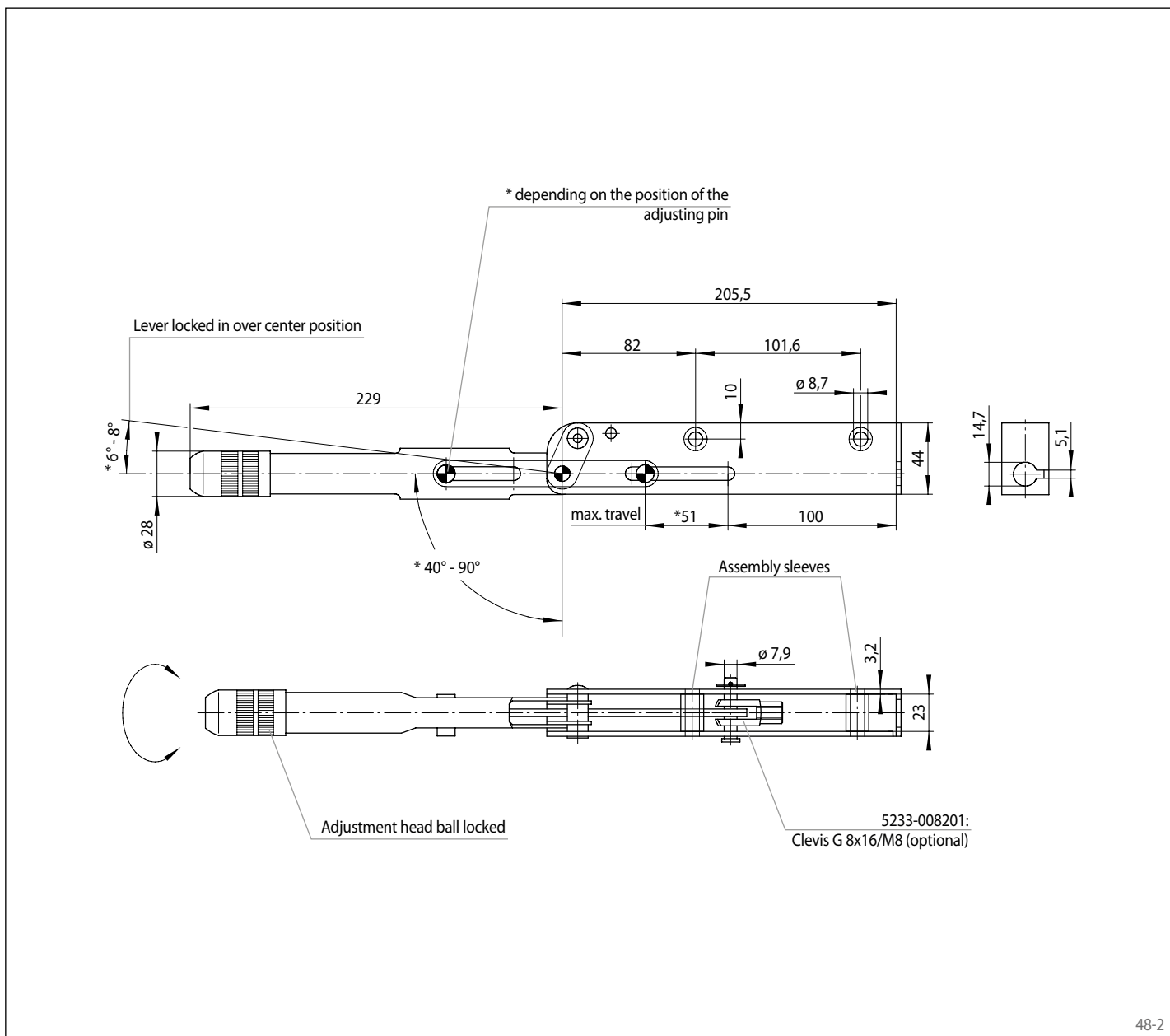
Features

- 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.





Features

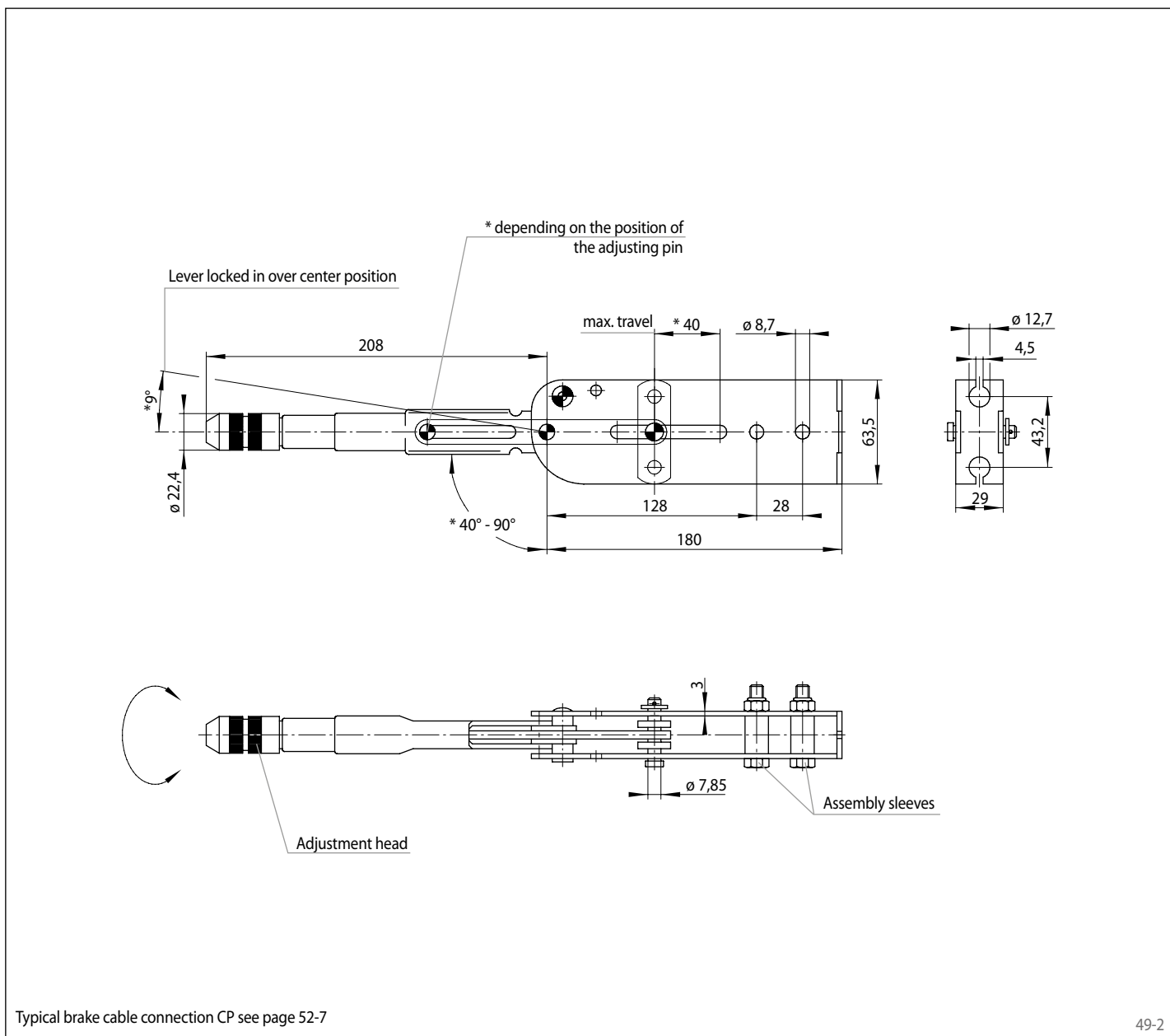
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Insert endfitting

Art.-No.: 4561-000001-S50513

Accessories for B 5 ... series hand brake lever

Please see page 53.

49-1



Typical brake cable connection CP see page 52-7

49-2



Features

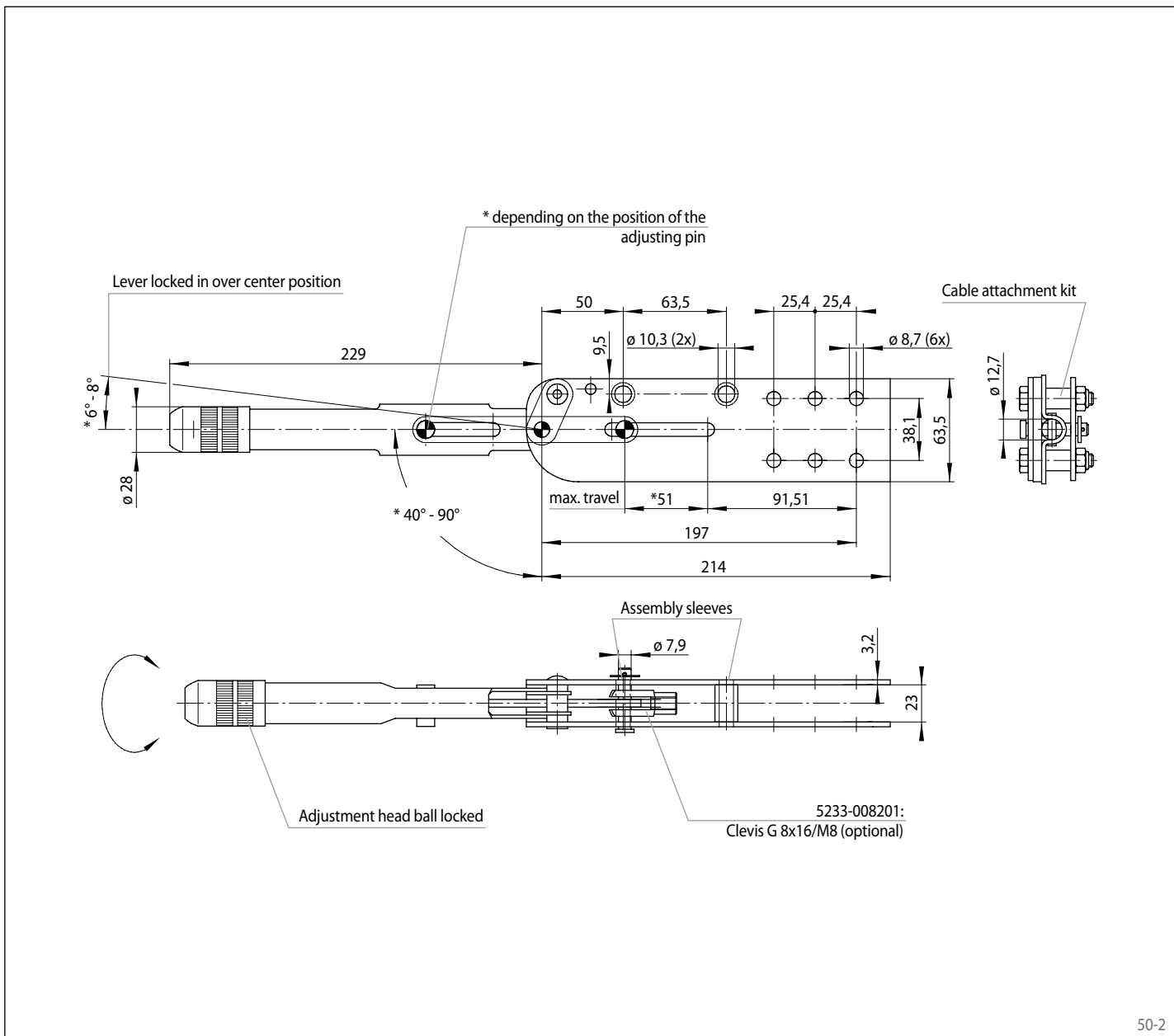
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Clamp endfitting

Art.-No.: 4561-000001-S50408

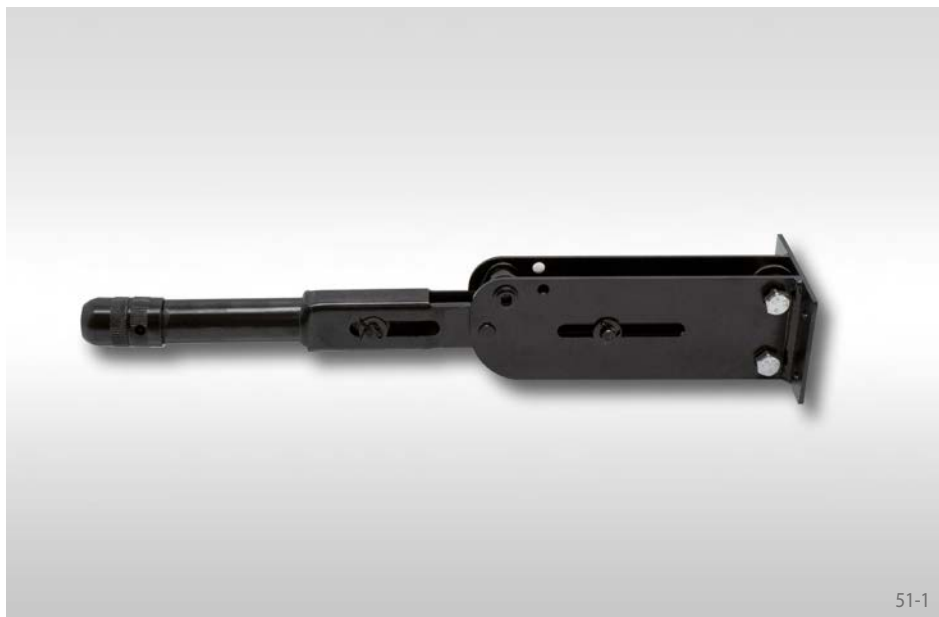
Accessories for B 5 ... series hand brake lever

Please see page 53.

50-1



50-2



Features

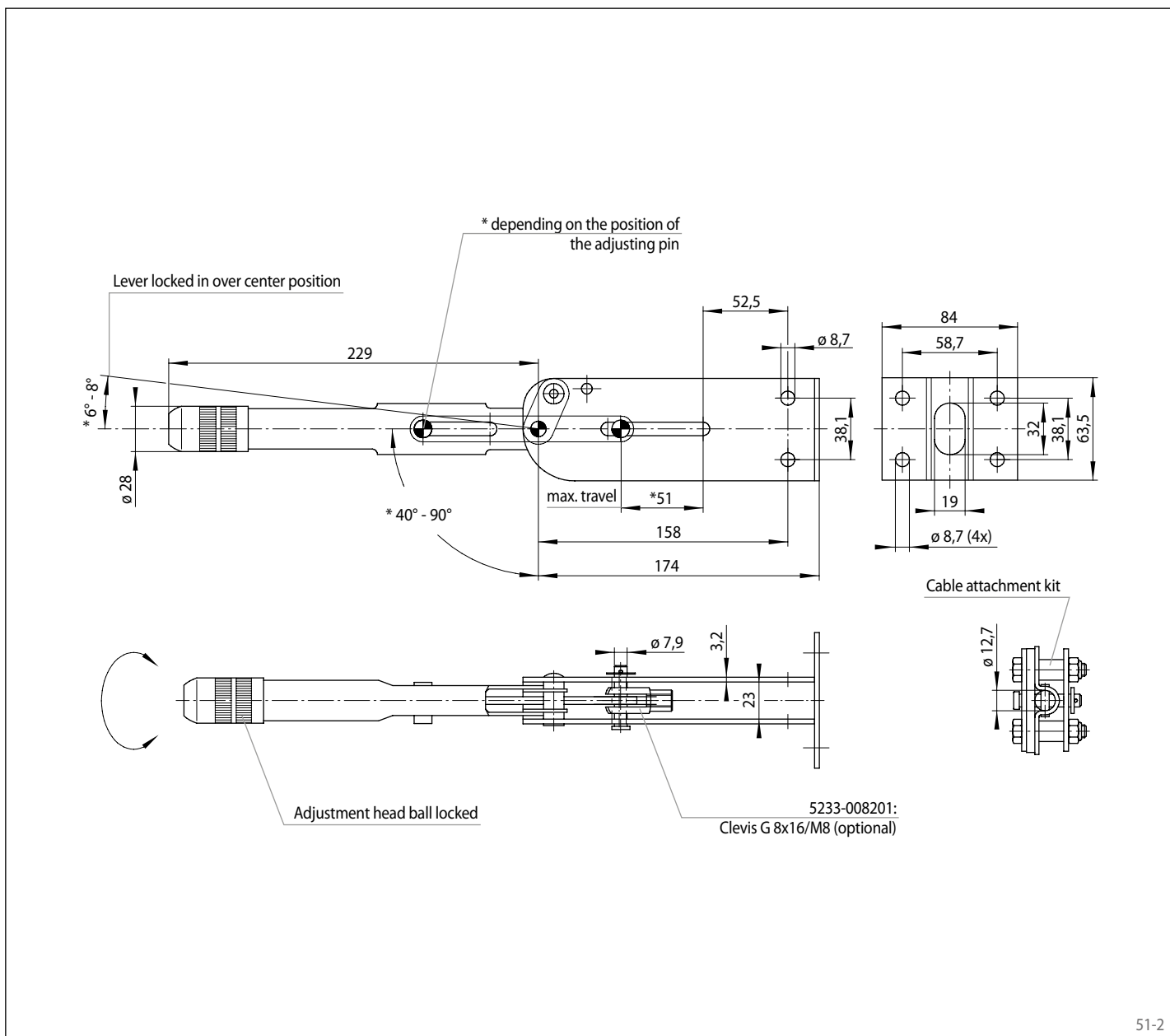
- Over center locking
- 2 positions: OPEN and CLOSED
- Travel adjustable via adjustment button
- Connection for push/pull cable
- Clamp endfitting

Art.-No.: 4561-000001-S50410

Accessories for B 5 ... series hand brake lever

Please see page 53.

51-1



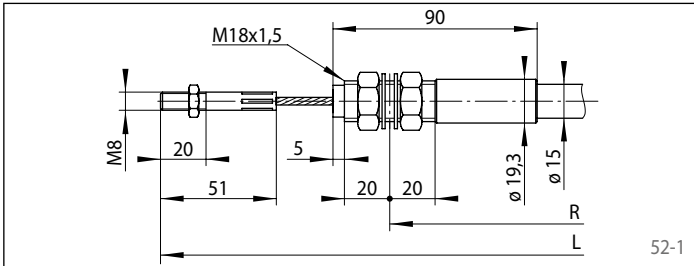
51-2

Features

- For pull forces: 1 800 N permanent, 2 400 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 \varnothing 4 mm

Lever side:

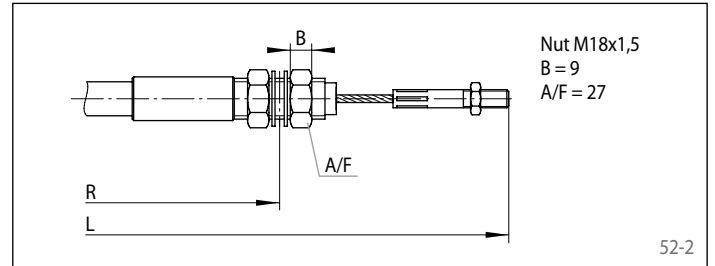
TB



52-1

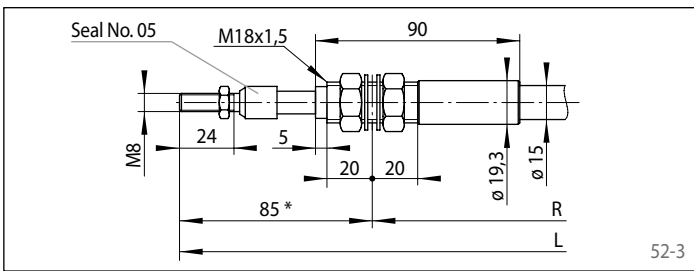
Output side:

TB



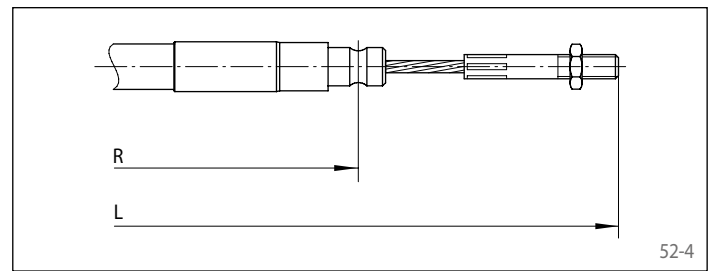
52-2

TB05



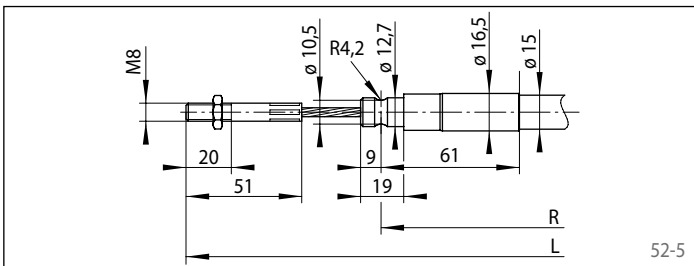
52-3

GB



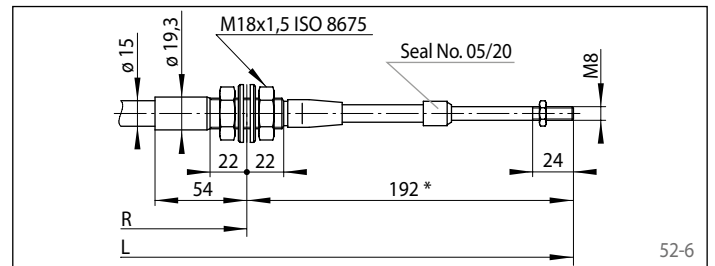
52-4

GB



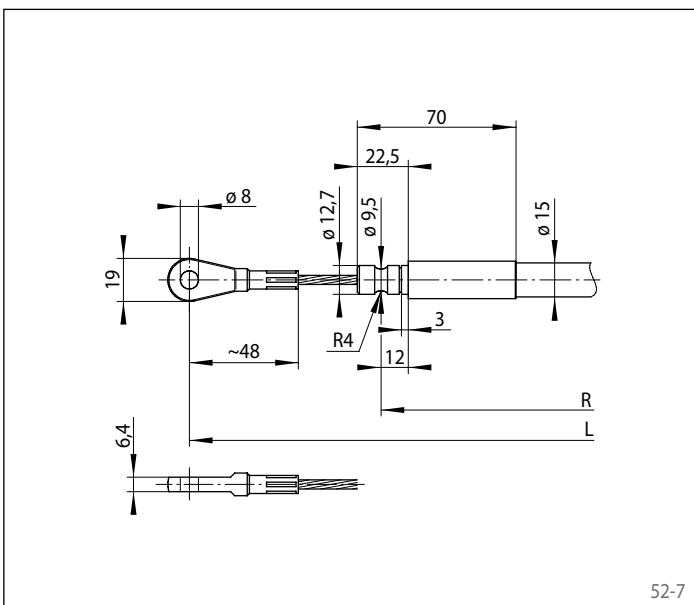
52-5

T05M / T20M



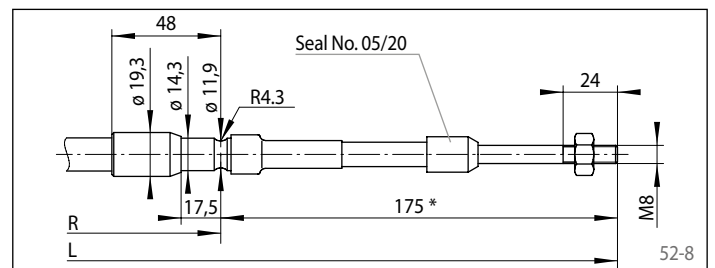
52-6

CP



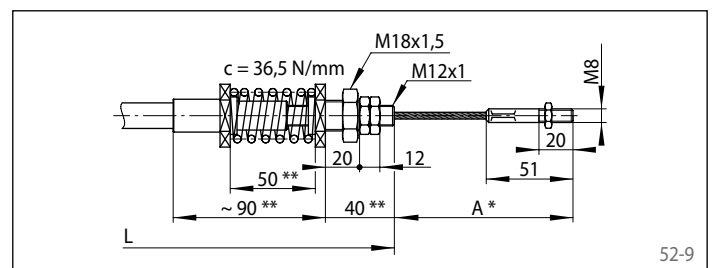
52-7

G05M / G20M



52-8

COMP



52-9

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

Other output sides upon request

Lever locked in over center position

Electric switch

*6° - 8°

Part	Art.-No.	Description	Circuit diagram image - contact pressed
①	3561-001804	El. switch kit CLOSER	
②	3561-001821	El. switch kit OPENER	

53-1

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.

Lever locked in over center position

Adjustment head ball locked

* depending on the position of the adjusting pin

5233-008201: Clevis G 8x16/M8

205,5

82

101,6

10

∅ 8,7

5

229

*6° - 8°

∅ 28

*40° - 90°

100

max. travel

51

105

45

29,5

∅ 7,9

L1

53-3

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).

Seal No. 05

M8

90

M18x1,5

10

30

∅ 4

Clevis G 8x32 / M8

25

5

40

∅ 19,3

∅ 15

* 50

~ 90

L1±5

169

50

∅ 4

380 N

Brake opened

Brake caliper DV 020 MKM

53-4



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.

54-1

Sample sketches for pull only cables

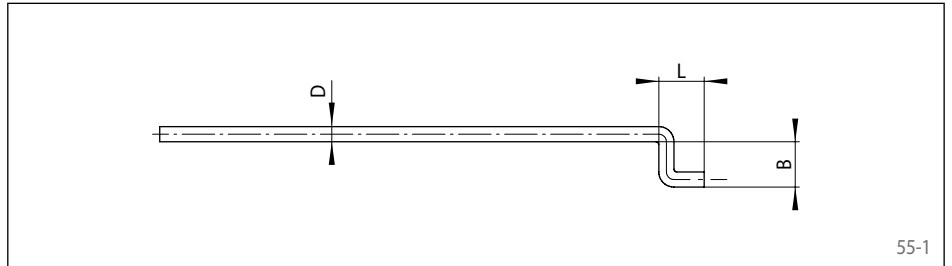
- Pull only cable with end caps and one-sided adjusting pin
- Steel cable with a ball end and screw nipple
- For the flexible transmission of pull force and travel
- Deviating designs can be manufactured upon request

\varnothing Endkappe
 M6 ISO 4035 (439) Verzinkt 3.2
 Stellschraube TCC04-40
 Seilende verschweißt
 Flachdrahtspirale mit PA oder PVC Mantel und Plastik-Innenrohr Endkappen fest verpresst
 Stahl, verzinkt
 Stellschraube, verzinkt
 Rohs-konform
 Alle Stahl-Endteile CR.6 frei verzinkt
 Toleranzen nach DIN ISO 2768 Klasse m
 Beispiel-Zeichnung
 Zugkabel verpackt in Plastikbeutel mit ZIP-Verschluss

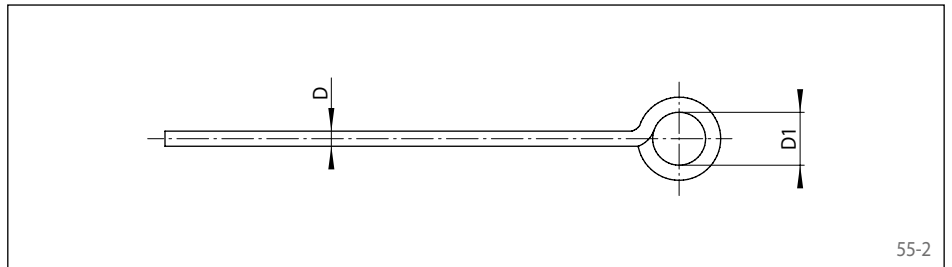
Werkstoff	Norm	Größe	Größe	Größe	Größe
Stahl	AISI 304	1.4301	1.4301	1.4301	1.4301
Stahl	AISI 316	1.4571	1.4571	1.4571	1.4571
Stahl	AISI 309	1.4801	1.4801	1.4801	1.4801
Stahl	AISI 321	1.4541	1.4541	1.4541	1.4541
Stahl	AISI 347	1.4713	1.4713	1.4713	1.4713
Stahl	AISI 409	1.4063	1.4063	1.4063	1.4063
Stahl	AISI 430	1.4308	1.4308	1.4308	1.4308
Stahl	AISI 434	1.4343	1.4343	1.4343	1.4343

54-1

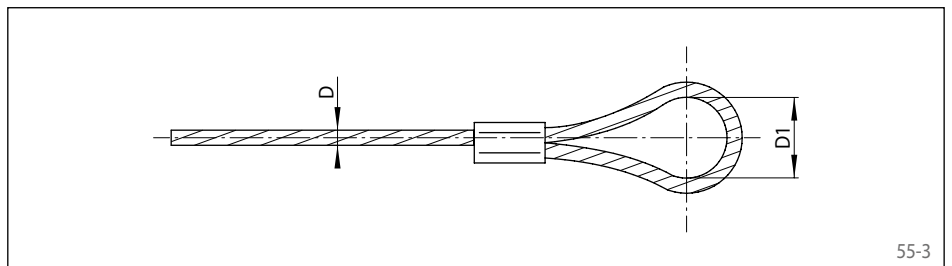
Z-wire end



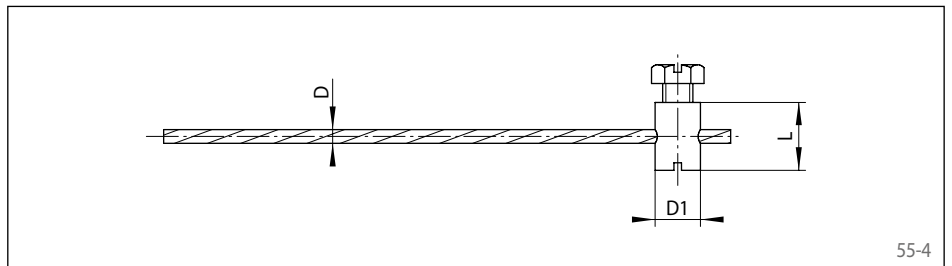
Wire spiral



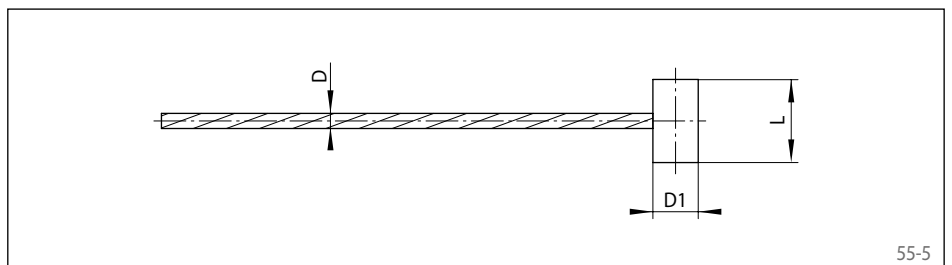
Loop end



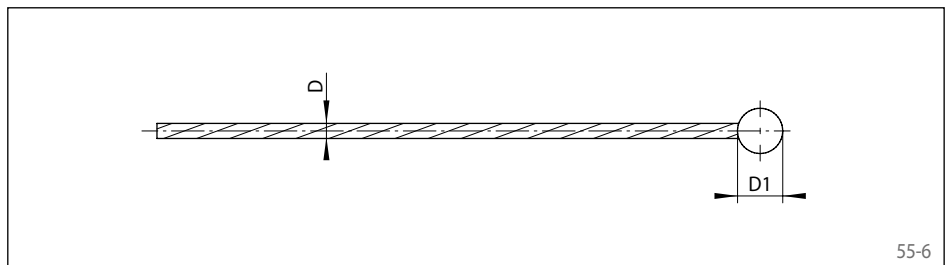
Screw nipple



Barrel nipple



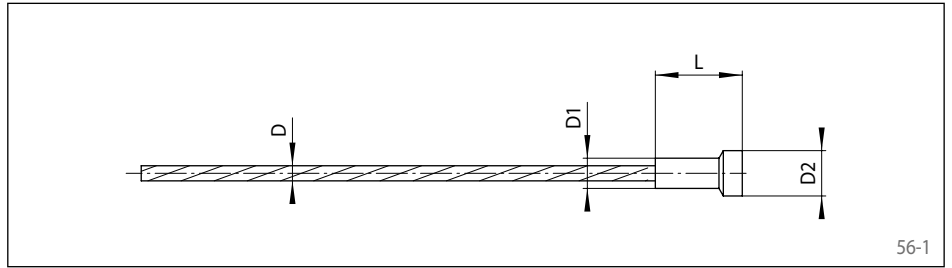
Ball



Pull Only Cables

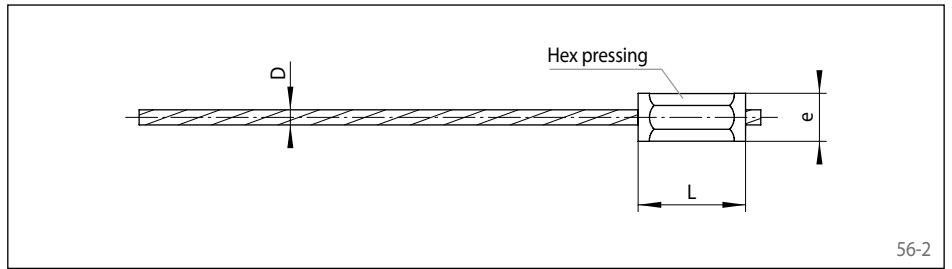
Wire/strand end parts

B-nipple



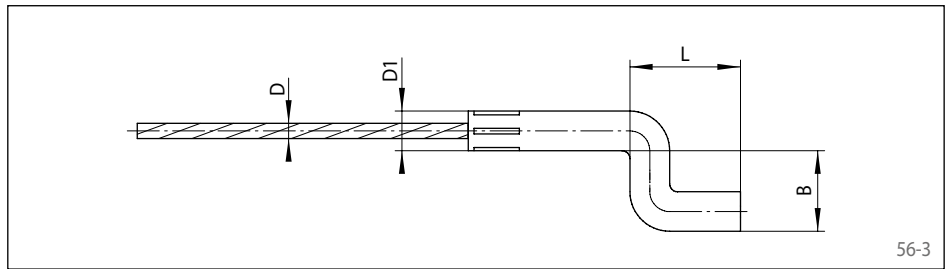
56-1

Longitudinal nipple



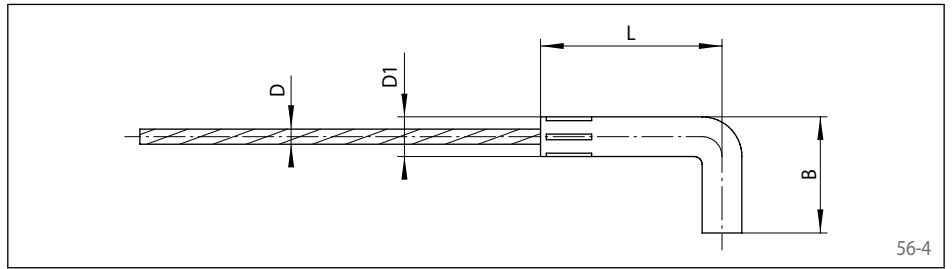
56-2

Z-nipple



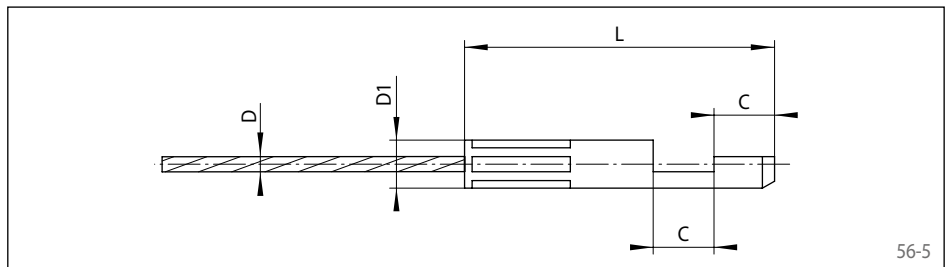
56-3

Hook



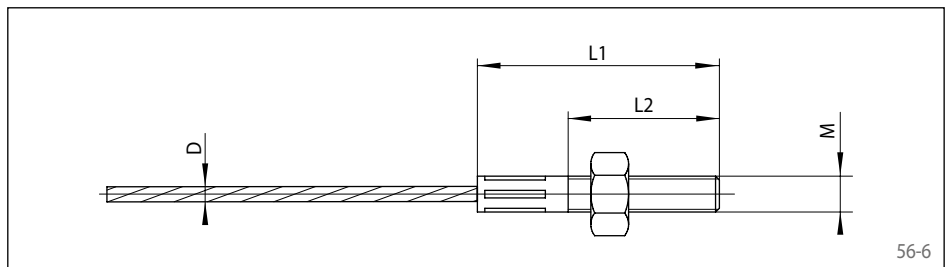
56-4

Quick release joint



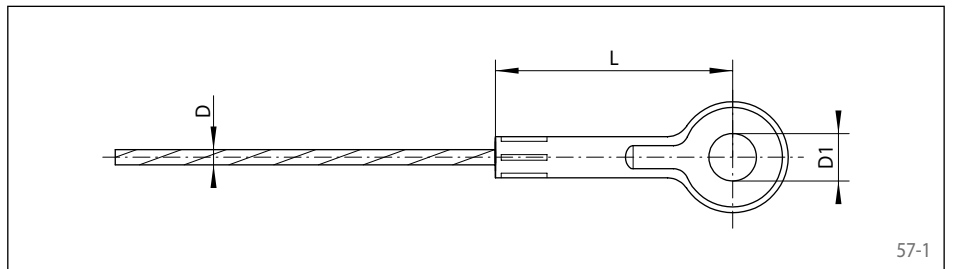
56-5

Rod end with thread

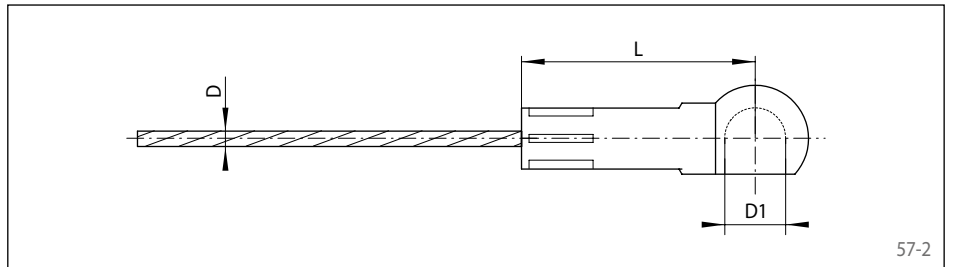


56-6

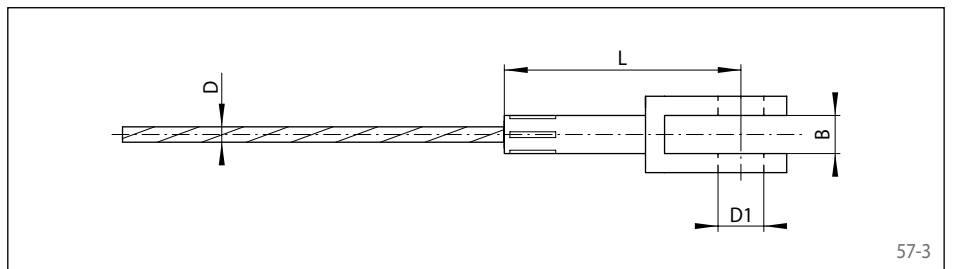
Drawbar eye



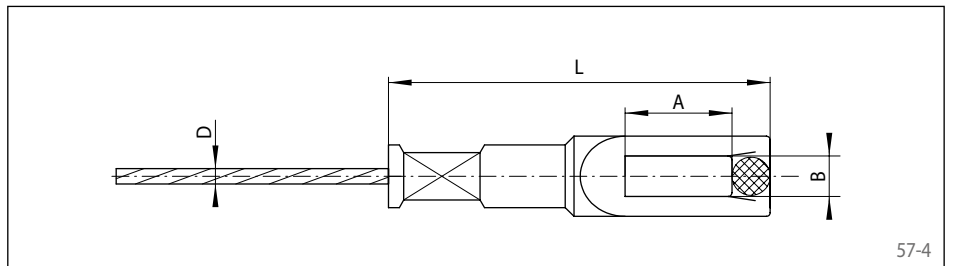
Ball socket



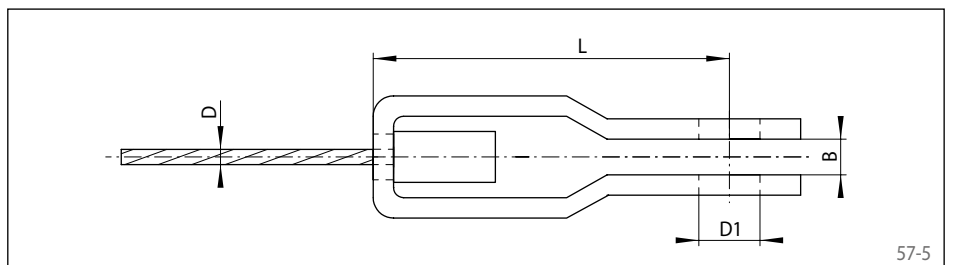
Clevis



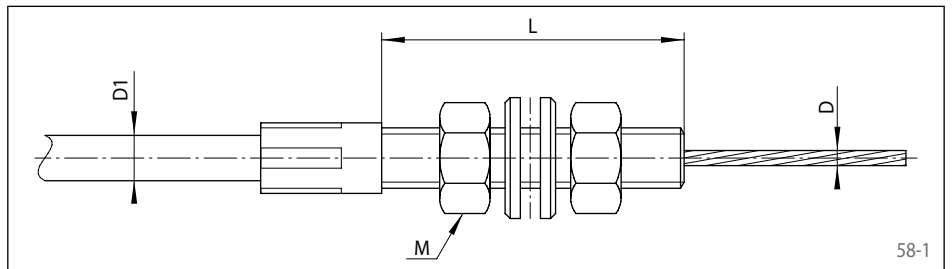
Tension strap



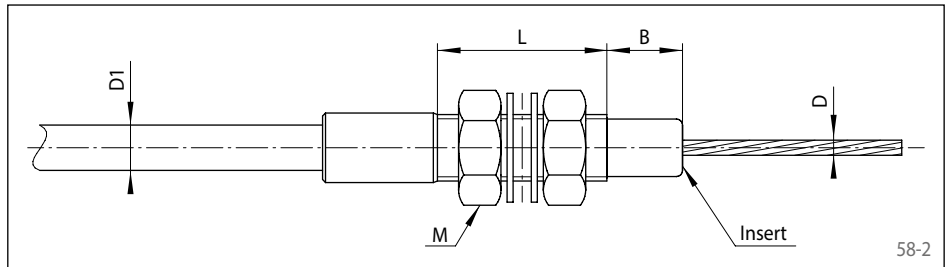
Metal strap



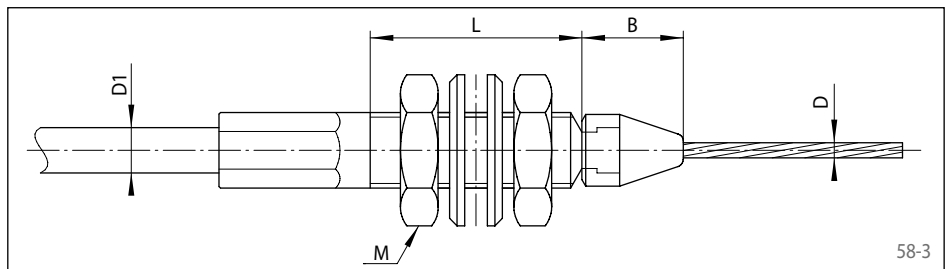
Thread cap



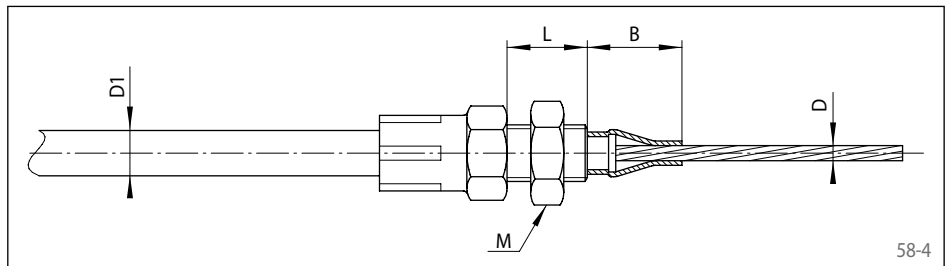
Thread cap with insert



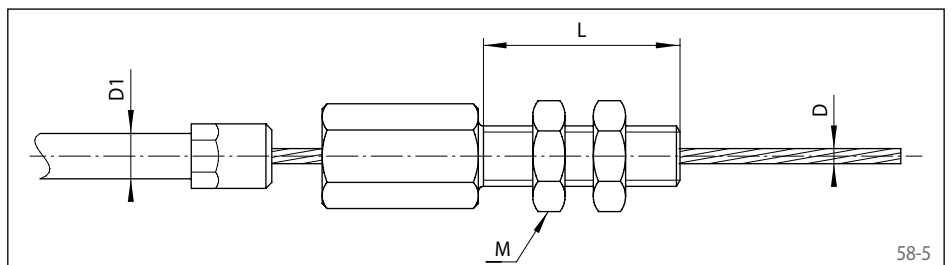
Base cap with seal



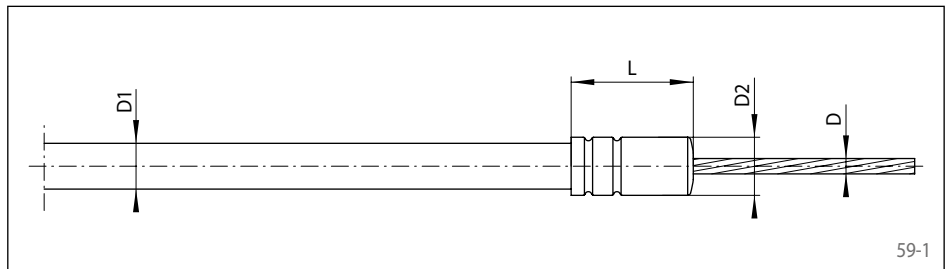
Base cap with rubber seal



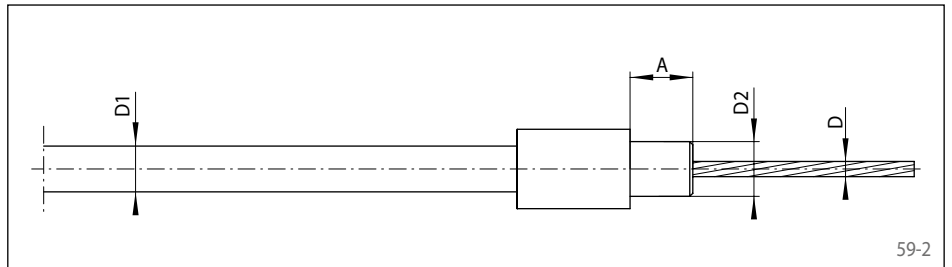
Adjusting screw



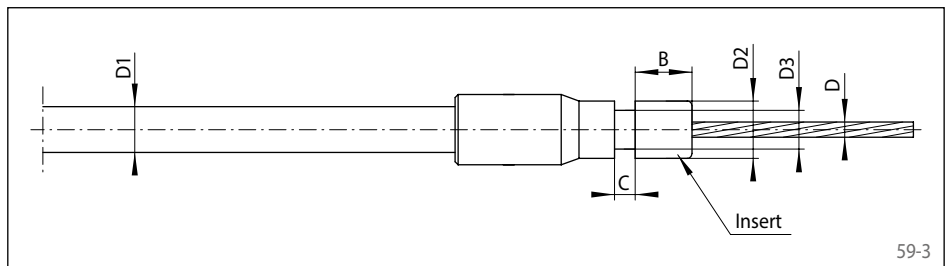
End cap



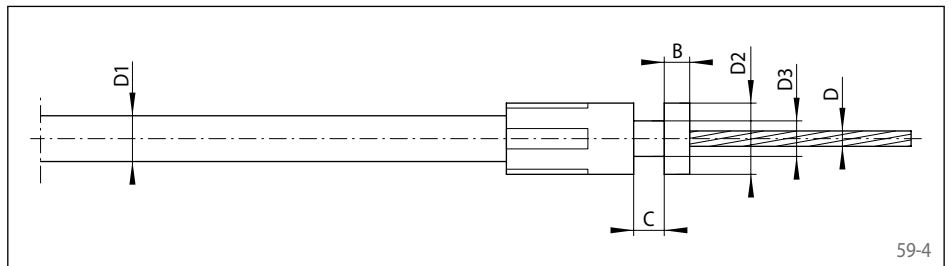
Base cap



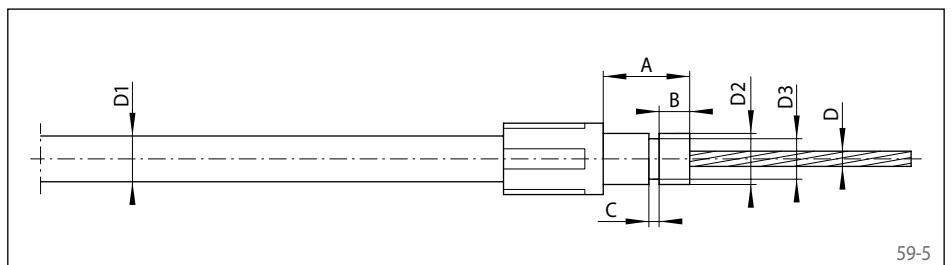
Clamp endfitting with front end insert



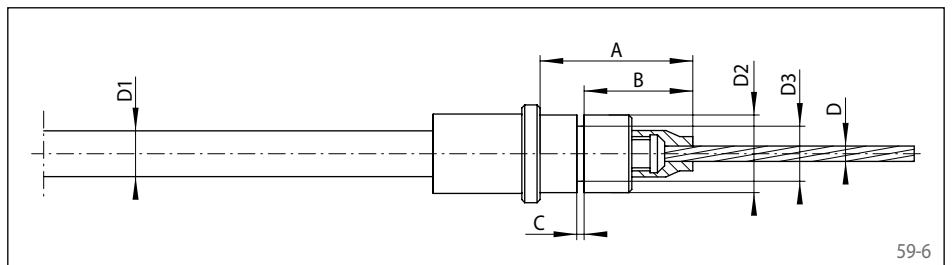
Clamp endfitting



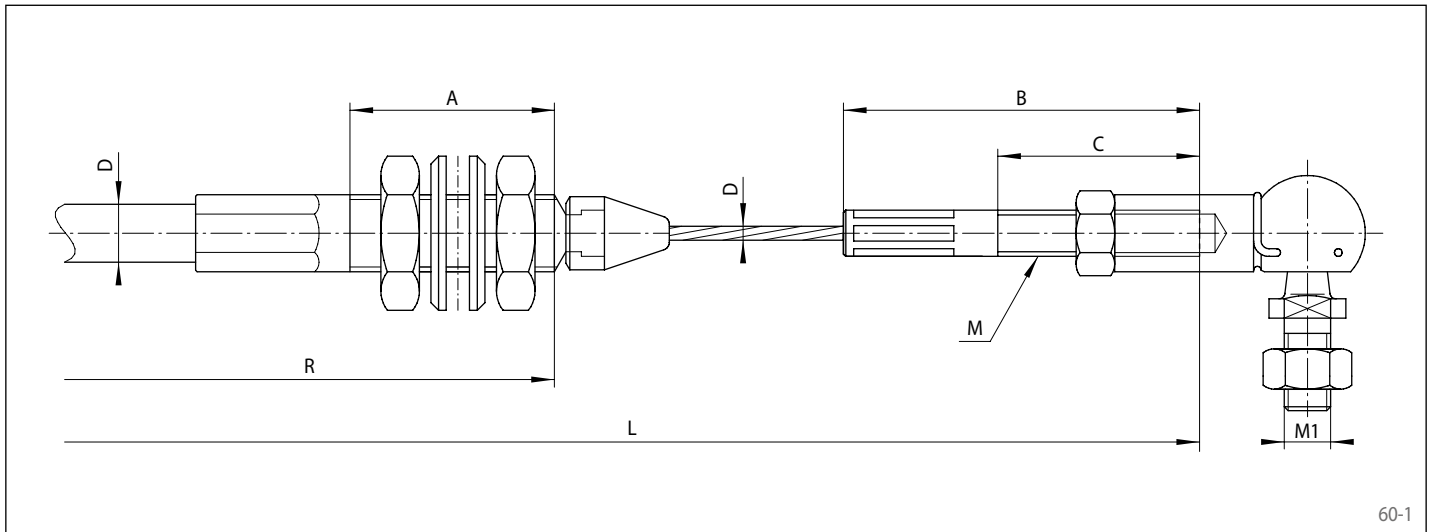
Base cap for safety clip



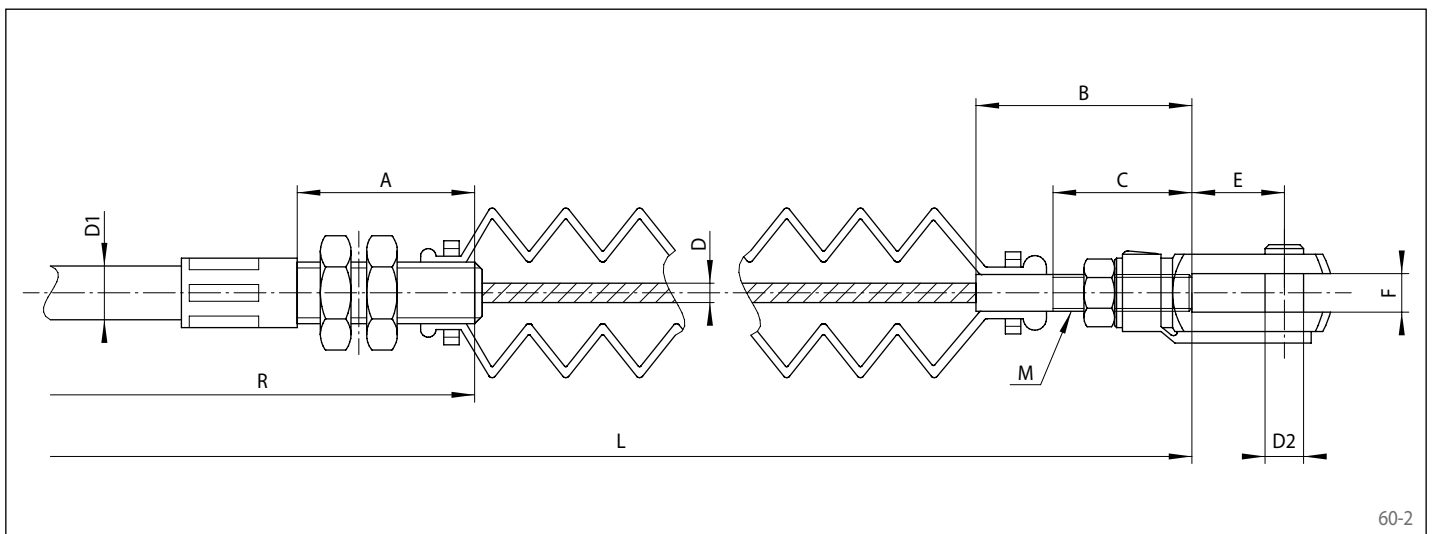
Base cap for safety clip with seal



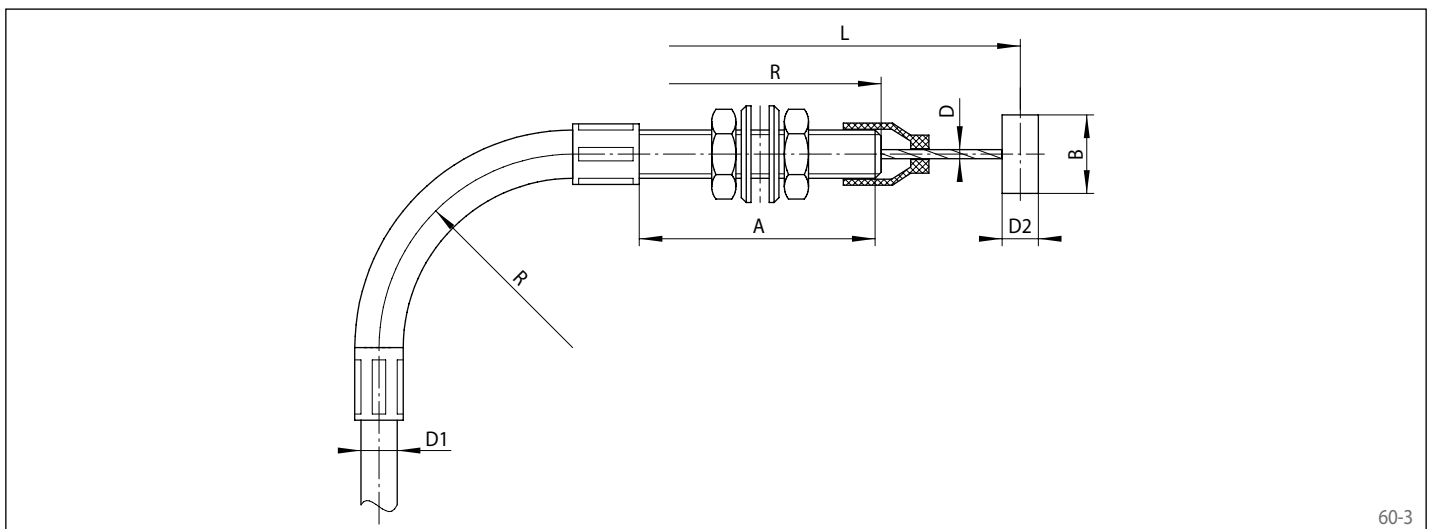
Bulkhead endfitting with wiper seal



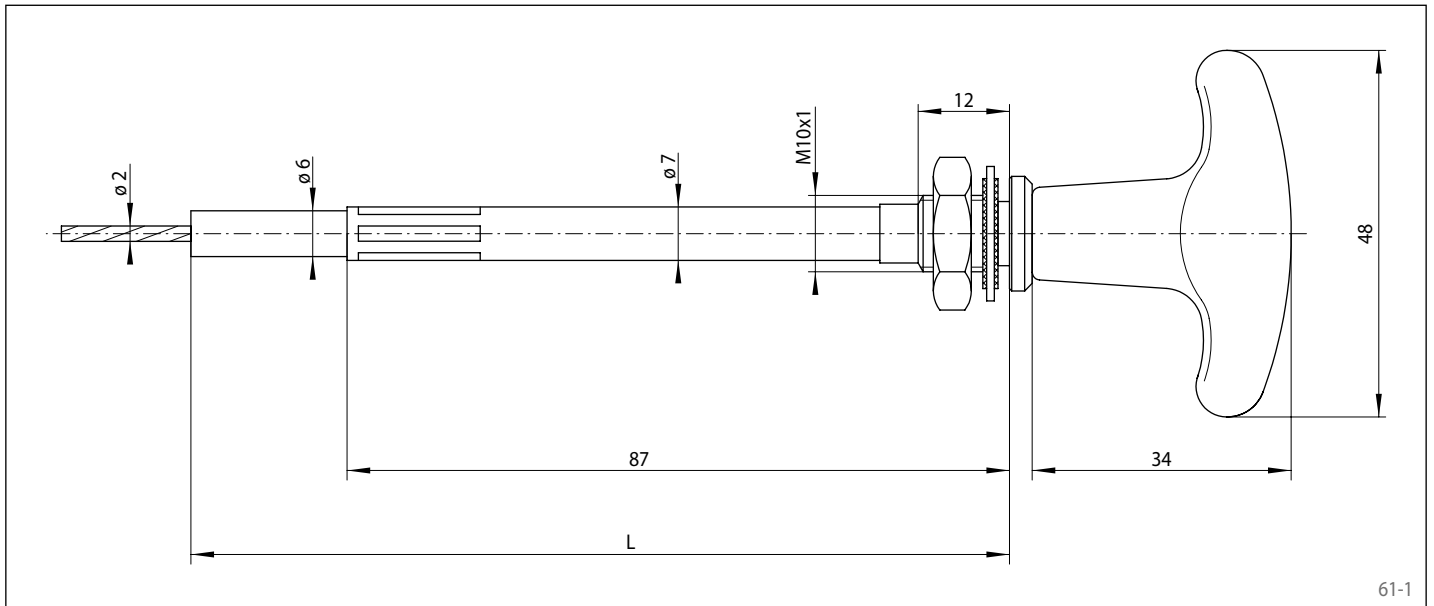
Bulkhead endfitting with bellow



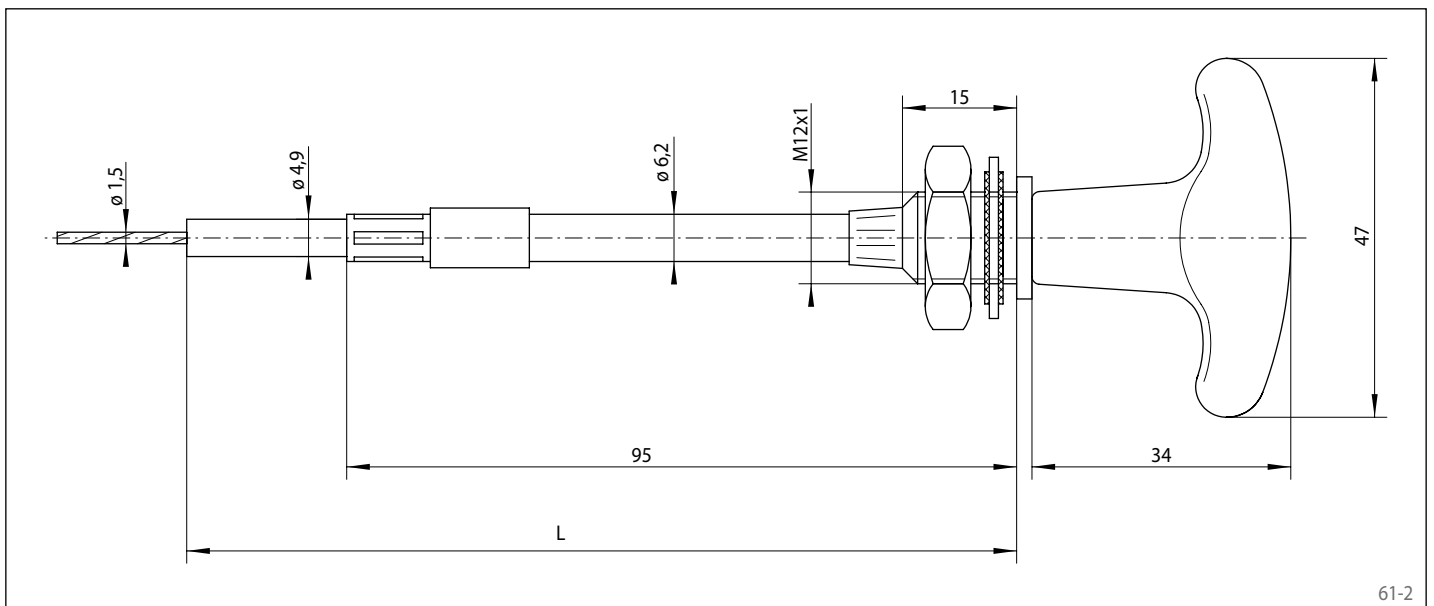
Bulkhead endfitting with tube end



Travel 60 mm



Travel 45 mm



Product overview

RCS® Remote Control Systems

RINGSPANN® Remote Control Systems



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

RINGSPANN® Power Transmission



High Speed Backstops
are located on the 2nd or 1st gearbox reduction shaft and prevent reverse motion of conveyor belts, elevators, pumps, blowers.



Low Speed Backstops
are located on pulley or head shafts of gearboxes and prevent reverse motion of conveyor belts or bucket elevators.



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

RINGSPANN® Power Transmission



Pneumatic Brake Callipers
Spring activated - pneumatically released or pneumatically activated - spring released.



Hydraulic Brakes
Spring activated - hydraulically released, hydraulically activated - spring released or non-releasing.



Electromagnetic Brakes
Electromagnetically activated - spring released or spring activated - electromagnetically released.



Electrohydraulic Brakes
Spring activated - electrohydraulically released.



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

Precision Clamping Fixtures

RINGSPANN®
Clamping Fixtures



Bonded Disc Packs

Precision Clamping Fixtures based on the unique method of the RINGSPANN 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

RINGSPANN®
Power Transmission



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 Discs

Shaft-Hub-Connection for frequent clamping and release.



Star Spring Washers

Axial spring element for pre-loading of ball bearings.

Overload Clutches & Couplings

RINGSPANN®
Power Transmission



Torque Limiters with Screw Face

Reliable overload protection for tough operating conditions.



Torque Limiters with Friction Linings

RIMOSTAT® Torque Limiter for constant slipping torque. Belleville Spring Torque Limiter for simple release.



Rigid Shaft Couplings

Rigid, easily removable shaft coupling with backlash free cone clamping connections.



Torsionally Rigid Shaft Couplings

For high torques and backlash-free power transmission.



Elastic Shaft Couplings

For dynamic applications.

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