



EN Operating instructions.pages 1 to 4
Original

Content

1 About this document

1.1 Function 1

1.2 Target group: authorised qualified personnel. 1

1.3 Explanation of the symbols used 1

1.4 Appropriate use 1

1.5 General safety instructions 1

1.6 Warning about misuse 1

1.7 Exclusion of liability 1

2 Product description

2.1 Ordering code 2

2.2 Special versions. 2

2.3 Purpose 2

2.4 Technical data 2

3 Mounting

3.1 General mounting instructions 2

3.2 Maximum length of wire 2

3.3 Dimensions 3

4 Electrical connection

4.1 Connection and sealing 3

4.2 Contact variants. 3

5 EU Declaration of conformity

1. About this document

1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the the product. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

1.3 Explanation of the symbols used



Information, hint, note:

This symbol is used for identifying useful additional information.



Caution: Failure to comply with this warning notice could lead to failures or malfunctions.

Warning: Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

1.4 Appropriate use

The product must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.



Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: www.schmersal.net.

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications. There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

1.6 Warning about misuse



In case of improper use or manipulation of the safety switchgear, personal hazards or damages to machinery or plant components cannot be excluded.

1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

TQ 441-①②③④⑤-M20

No.	Option	Description
①	11	1 NO / 1 NC
	20	2 NO
	01/01	1 NC contact for pull wire/1 NC contact for wire breakage
②	Y	IP65
	X	IP54
③	UE	With overlapping contacts
④	R	With latching
⑤	S	Release by key



Only if the information described in these operating instructions is realised correctly can the safety function and therefore compliance with the Low-Voltage Directive be ensured.

2.2 Special versions

For special versions, which are not listed in the order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

2.3 Purpose

Pull-wire switches are used wherever there is a need to initiate a switching command from any point on a machine, an installation or a plant. Pulling on the pre-tensioned wire rope triggers the switching command.

2.4 Technical data

Standards:	IEC 60947-5-1
Enclosure:	light-alloy diecast, paint finish
Cover:	Steel painted
Protection class:	IP65
- Key unlatching mechanism:	IP54
Contact material:	Silver
Contact type:	change-over contact with double break with 2 separated contact bridges or 2 NO contacts
Switching system:	Slow action, positive break NC contact ⊖
Connection:	screw terminals
Cable section:	max. 4 mm ² (incl. conductor ferrules)
Cable entry:	2 x M20 x 1.5
Utilisation category:	AC-15
Rated operating current/voltage I _e /U _e :	4 A / 380 V
Rated impulse withstand voltage U _{imp} :	4 kV
Rated insulation voltage U _i :	400 V
Thermal test current I _{the} :	10 A
Max. fuse rating:	25 A gL/gG D-fuse
Ambient temperature:	-30 °C ... + 90 °C
Tightening torque:	
- Connecting screws:	max. 1.7 Nm
- Cover screws:	max. 0.6 Nm
Mechanical life:	30,000 operations
Switching frequency:	3,600/h

3. Mounting

3.1 General mounting instructions

Mount at a moderate ambient temperature. Remove the PVC sheath in the clamp area of the wire rope ①. Secure a wire clamp ⑤ immediately behind the thimbles.

Use rope supports ② every 2 to 5 m (at irregular distances to prevent contact flutter due to rope vibrations in the event of impact stress). Attach the first rope immediately behind the eye (approx. 0.10 m distance). Attach rope supports such that the wire rope is supported at a height of approx. 27 to 30 above the mounting surface of the switch. Robustly actuate the wire rope several times. Then, by mounting the tensioned rope or using a tensioning jack ⑥, pre-tension to approx. 7 to 8 mm so that the wire rope can settle. Finally, adjust the tension of the rope so that the ring marking (B) on the guide sleeve is fully visible.

In the event of vertical mounting, especially outdoors, the pull-wire switch must be attached at the lower end of the wire rope so as to prevent the ingress of fluids and dirt between the eye and guide sleeve. This can impair functional reliability in the event of wire breakage.

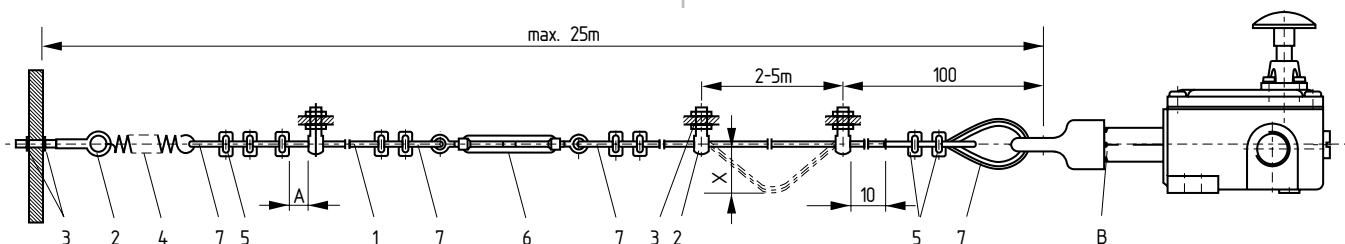
3.2 Maximum length of wire

The maximum length of the wire is limited by the wire rope and its change in length in the event of temperature fluctuations. In the event of a 20 °C temperature difference, the maximum length of the wire is 25 m.

In the event of lengths of wire >25 m and large temperature fluctuations, the switch may still be usable. However, an additional tension spring ④ must be mounted at the end of the rope and/or the rope must be retensioned more frequently. If a tension spring is used, distance A between the wire clamp ⑤ and support point ② must be chosen such that the release path is achieved according to the support distance (see Table "Release paths/forces"). In this case, we recommend using tensioning jack 6.

Key

- ① Pull-wire with red PVC sheath Ø 5 mm (steel core: Ø 3 mm)
- ② Eyebolt
- ③ M10 nut
- ④ Tension spring
- ⑤ Wire clamp 5 mm
- ⑥ Tensioner M6
- ⑦ Wire thimble B-5 mm
- A Distance between rope clamp and rope support point
- B Ring marking
- X Switch travel



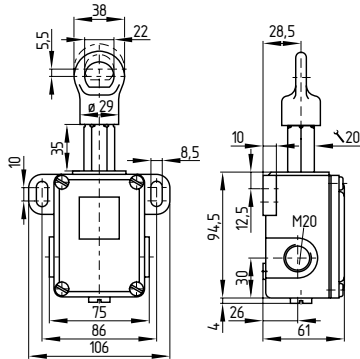
Release paths and forces

Length of wire max. 25 m; temperature difference 20 °C; rope support every 2 - 5 m + direction of wire rope with 5.5 m axial pretension

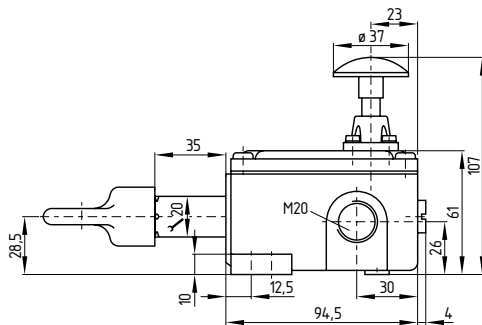
Type	Axial pre-tension force +	Release path dimension X 2 m	Release force dimension X 2 m	Release path dimension X 5 m	Release force dimension X 5 m
TQ 441-01/01...-	220 N	74 mm	21 N	117 mm	13 N
TQ 441-01/01...-1572	60 N	74 mm	5.5 N	117 mm	3 N
TQ 441-01/01...-1573	35 N	74 mm	3.5 N	117 mm	2 N

3.3 Dimensions

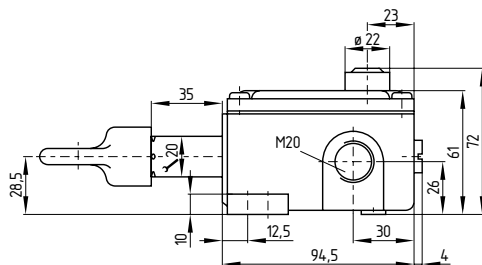
All measurements in mm.



Release by pushbutton



Release by key



4. Electrical connection

4.1 Connection and sealing



The electrical connection may only be carried out by authorised personnel in a de-energised condition.

The contacts of the TQ 441-01/01 must be switched in series. For the cable entry, suitable cable glands with an appropriate degree of protection must be used in the available threaded holes. Unused input openings must be sealed with threaded plugs.

For UL applications, only copper cables, rated value 75 °C, may be used; single-wire max. 4 mm² (AWG 11). Fit fine-wire cables with wire end ferrules max. 2.5 mm² (AWG 13). The max. tightening torque for mounting the connecting screws is 1.7 Nm. Excess tightening of the cover screws can reduce sealing efficiency.



TQ 441 pull-wire switches do not meet the requirements of ISO 13850 or IEC 60947-5-5.

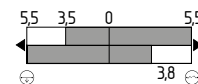
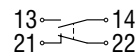


The TQ 441-11 and TQ 441-20 variants do not need to be pre-tensioned. They are straightforward pull switches and do not have a wire breakage detection function.

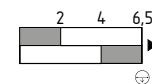
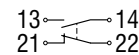
4.2 Contact variants

Switch travels are shown pre-tensioned.

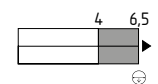
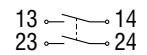
TQ 441-01/01



TQ 441-11



TQ 441-20



Key

- ⊖ Wire breakage
- ⊕ Wire pull

5. EU Declaration of conformity

EU Declaration of conformity

Original K.A. Schmersal GmbH & Co. KG
Möddinghofe 30
42279 Wuppertal
Germany
Internet: www.schmersal.com

We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.

Name of the component: TQ 441

Type: See ordering code

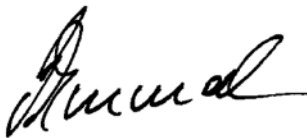
Description of the component: Pull-wire switches

Relevant Directives: Low Voltage Directive 2014/35/EU
RoHS-Directive 2011/65/EU

Applied standards: DIN EN 60947-5-1:2010

Person authorised for the compilation of the technical documentation: Oliver Wacker
Möddinghofe 30
42279 Wuppertal

Place and date of issue: Wuppertal, June 9, 2017



Authorised signature
Philip Schmersal
Managing Director

TQ441-B-EN



The currently valid declaration of conformity can be downloaded from the internet at www.schmersal.net.



K.A. Schmersal GmbH & Co. KG
Möddinghofe 30, D - 42279 Wuppertal
Postfach 24 02 63, D - 42232 Wuppertal

Phone +49 - (0)2 02 - 64 74 - 0
Telefax: +49 - (0)2 02 - 64 74 - 1 00
E-Mail: info@schmersal.com
Internet: <http://www.schmersal.com>