MQN-B Push Button

| Designation	Item number
MQN-B	**2184853**

Corrosion protection:
Electro galvanized

Weight:
71.6g

Submittal text:
Part, for fixation of connectors with Butterfly openings and channels for application with fire resistance requirements. Installation by push only function Typically used for fixing of Angles, Base connectors and connection elements. Can transfer tension, compression and shear loads.

Package content
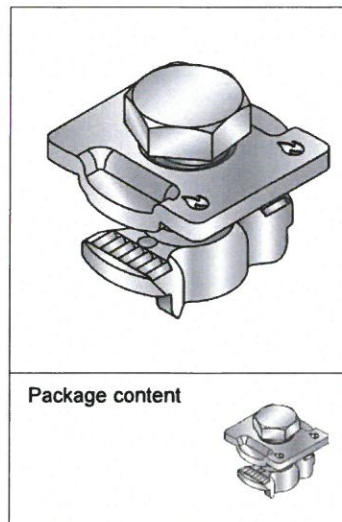
Material properties

Material	Yield strength	Ultimate strength	E-modulus	Shear modulus
Plate: steel S355J2 DIN EN 10025-2	$F_y = 235 \frac{N}{mm^2}$	$F_u = 360 \frac{N}{mm^2}$	$E = 210000 \frac{N}{mm^2}$	$G = 80769 \frac{N}{mm^2}$
Nut: S355MC - DIN EN 10149-2	$F_y = 355 \frac{N}{mm^2}$	$F_u = 430 \frac{N}{mm^2}$	$E = 210000 \frac{N}{mm^2}$	$G = 80769 \frac{N}{mm^2}$
Bolt: grade 8.8 - DIN EN ISO 898	$F_y = 640 \frac{N}{mm^2}$	$F_u = 800 \frac{N}{mm^2}$	$E = 210000 \frac{N}{mm^2}$	$G = 80769 \frac{N}{mm^2}$

Instruction For Use:
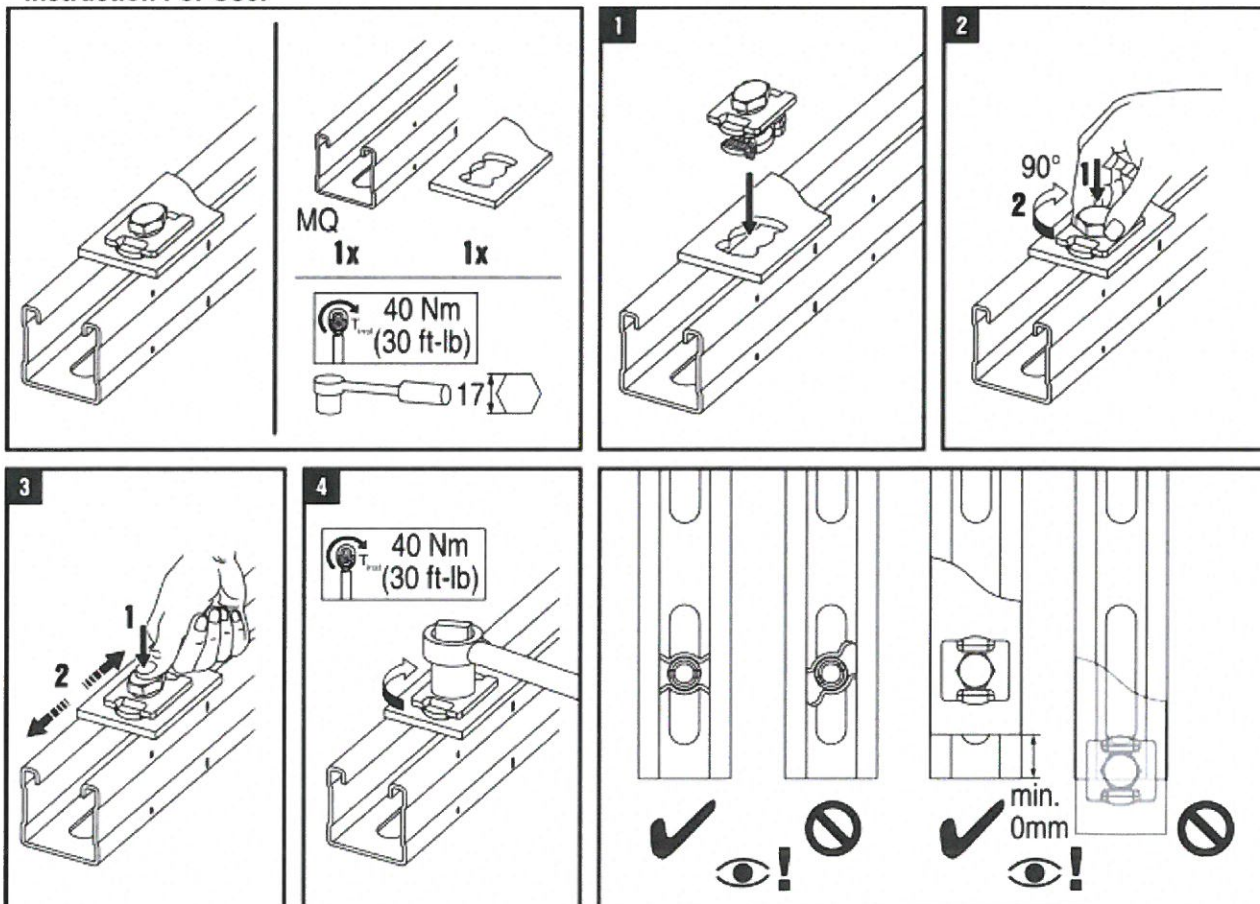
MQ
1x   1x

40 Nm
(30 ft-lb)
17

1

2
90°

3

4
40 Nm
(30 ft-lb)

min.
0mm

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Boundary conditions - **Terms of common cooperation / Legal disclaimer** and guidelines as defined at the beginning of this book need to be mandatorily respected.

MQN-B Push Button

Possible loading cases

In 1.5mm wall thick channels MQ-41-L, MQ-21.5	In 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	In ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

Design criteria used for loading capacity

Methodology:
- Finite element analysis

Standards and codes:

• EN 1990	Basics of structural design	03.2003
• EN 1991-1-1	Eurocode 1: Actions on structures – Part 1-1: General actions – densities, self-weight, imposed loads for buildings	09.2011
• EN 1993-1-1	Eurocode 3: Design of steel structures – Part 1-1: General rules and rules for buildings	03.2012
• EN 1993-1-3	Eurocode 3: Design of steel structures – Part 1-3: General rules- Supplementary rules for cold-formed members and sheeting	03.2012
• EN 1993-1-5	Eurocode 3: Design of steel structures – Part 1-5: Plated structural elements	03.2012
• EN 1993-1-8	Eurocode 3: Design of steel structures – Part 1-8: Design of joints	03.2012
EN 10025-2	Hot rolled products of structural steels- Part 2: technical delivery conditions for non-alloy structural steels	02.2005
• RAL-GZ 655	Pipe Supports	04.2008

Software:
- Ansys 16.0
- Microsoft Excel

Environmental conditions:
- static loads
- no fatigue loads

Simplified drawing:

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MQN-B Push Button

In 1.5mm wall thick channels MQ-41-L, MQ-21.5	In 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	In ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

Loading case: in 1.5mm wall thick channels MQ-41-L, MQ-21.5	Combinations covered by loading case
BOM: Push button cannot be used without connector **MQN-CP**　　　2184850 And various connectors of MQ System	This particular loading case show push button limiting factor of any connection where push button is used in connectors with Hilti butterfly holes and Hilti channels with compatible serration

Recommended loading capacity - simplified for most common applications

Method

	$\pm F_{x,rec}$ [kN]	$\pm F_{y,rec}$ [kN]	$+F_{z,rec}$ [kN]
		5.0	2.5

These values are individual one directional maximal capacity limits. For any combinations of multiple directions, use design values and their corresponding interaction formulas.

Design loading capacity - 3D   1/2

Method

Limiting components of capacity evaluated in following tables:

1. MQN-CP push button in 1.5mm wall thick channels MQ-41-L, MQ-21.5

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MQN-B Push Button

Conditions of the loading capacity tables:
- Just for static loads
- No fatigue loads
- No low ($<$ -10° C), no high ($>$ +100° C) temperatures

In 1.5mm wall thick channels MQ-41-L, MQ-21.5	In 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	In ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

Design loading capacity - 3D

2/2

Summary of design loads*

NOTE: all values in interaction formulas should be used in absolute values! The values below are referred to the coordinate system shown in the drawing.

1. MQN-CP push button in 1.5mm wall thick channels MQ-41-L, MQ-21.5

+Fx,Rd [kN]	-Fx,Rd [kN]	+Fy,Rd [kN]	-Fy,Rd [kN]	+Fz,Rd [kN]	-Fz,Rd [kN]
7.00	7.00			3.50	
+Mx,Rd [kNcm]	-Mx,Rd [kNcm]	+My,Rd [kNcm]	-My,Rd [kNcm]	+Mz,Rd [kNcm]	-Mz,Rd [kNcm]

valid for edge distance ≥ 100mm

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MQN-B Push Button

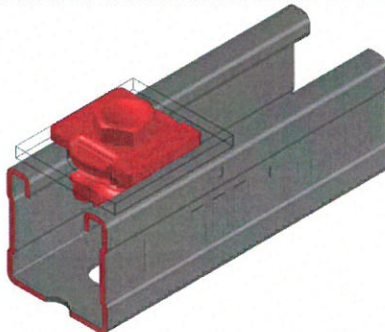| In 1.5mm wall thick channels MQ-41-L, MQ-21.5	In 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	In ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

Loading case: in 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	Combinations covered by loading case
BOM: Push button cannot be used without connector **MQN-CP** 2184850 And various connectors of MQ System	This particular loading case show push button limiting factor of any connection where push button is used in connectors with Hilti butterfly holes and Hilti channels with compatible serration

Recommended loading capacity - simplified for most common applications

Method

	±Fx,rec. [kN]	±Fy,rec. [kN]	+Fz,rec. [kN]
	5.0		5.0

These values are individual one directional maximal capacity limits. For any combinations of multiple directions, use design values and their corresponding interaction formulas.

Design loading capacity - 3D   1/2

Method

Limiting components of capacity evaluated in following tables:

1. MQN-CP push button in 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D

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MQN-B Push Button

Conditions of the loading capacity tables:
- Just for static loads
- No fatigue loads
- No low ($<$ -10° C), no high ($>$ +100° C) temperatures

| In 1.5mm wall thick channels MQ-41-L, MQ-21.5	In 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	In ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

Design loading capacity - 3D   2/2

Summary of design loads*

NOTE: all values in interaction formulas should be used in absolute values! The values below are referred to the coordinate system shown in the drawing.

1. 1. MQN-CP push button in 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D
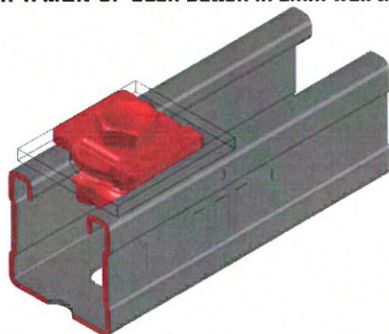
+Fx,Rd [kN]	-Fx,Rd [kN]	+Fy,Rd [kN]	-Fy,Rd [kN]	+Fz,Rd [kN]	-Fz,Rd [kN]
7.00	7.00			7.00	
+Mx,Rd [kNcm]	**-Mx,Rd [kNcm]**	**+My,Rd [kNcm]**	**-My,Rd [kNcm]**	**+Mz,Rd [kNcm]**	**-Mz,Rd [kNcm]**

valid for edge distance ≥ 100mm

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MQN-B Push Button

In 1.5mm wall thick channels MQ-41-L, MQ-21.5	In 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	In ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

Loading case: in ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD	Combinations covered by loading case
BOM: Push button cannot be used without connector **MQN-CP** 2184850 And various connectors of MQ System	This particular loading case show push button limiting factor of any connection where push button is used in connectors with Hilti butterfly holes and Hilti channels with compatible serration

Recommended loading capacity - simplified for most common applications

Method

	±Fx,rec. [kN]	±Fy,rec. [kN]	+Fz,rec. [kN]
	6.0/*5.0		5.0

*valid for MQ-52 and MQ-52-72D channels

These values are individual one directional maximal capacity limits. For any combinations of multiple directions, use design values and their corresponding interaction formulas.

Design loading capacity - 3D   1/2

Method

Limiting components of capacity evaluated in following tables:

1. MQN-CP push button in ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

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MQN-B Push Button

Conditions of the loading capacity tables:
- Just for static loads
- No fatigue loads
- No low ($<$ -10° C), no high ($>$ +100° C) temperatures

In 1.5mm wall thick channels MQ-41-L, MQ-21.5	In 2mm wall thick channels MQ-21, MQ-41, MQ-21D, MQ-41D	In ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

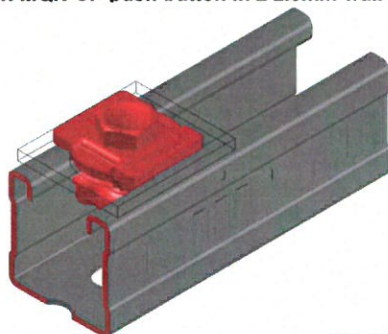## Design loading capacity - 3D   2/2

Summary of design loads*
NOTE: all values in interaction formulas should be used in absolute values! The values below are referred to the coordinate system shown in the drawing.

1. MQN-CP push button in ≥ 2.5mm wall thick channels MQ-41/3, MQ-52, MQ-72, MQ-52-72D, MQ-124XD

+Fx,Rd [kN]	-Fx,Rd [kN]	+Fy,Rd [kN]	-Fy,Rd [kN]	+Fz,Rd [kN]	-Fz,Rd [kN]
8.4 / *7.00	8.4 / *7.00			11.20	

+Mx,Rd [kNcm]	-Mx,Rd [kNcm]	+My,Rd [kNcm]	-My,Rd [kNcm]	+Mz,Rd [kNcm]	-Mz,Rd [kNcm]

valid for edge distance ≥ 100mm
* valid for MQ-52 and MQ 52-72D channels

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