ROTZLER® TITAN

Hoisting winch

TITAN

TI 1

TECHNICAL DATA

AMERICAS

4000021234

Rev. B 19.05.2021

For detailed information, installation explanation and safety notes installation manual need to be considered.

Table of Contents

1 Basic winch

1.1 Winch description

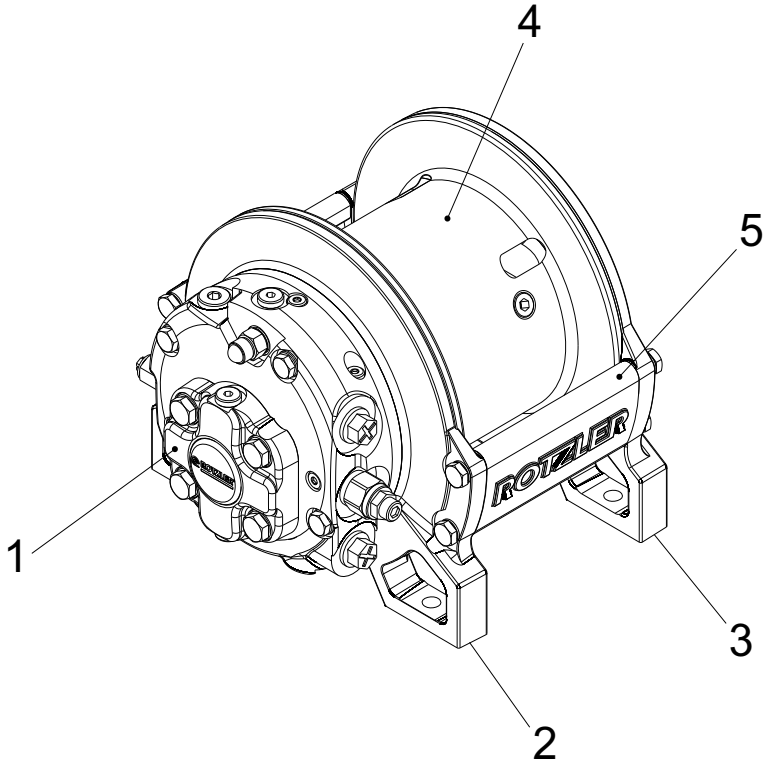


Fig. 1 TITAN winch with gear motor

1 Gear motor
2 Primary base
3 Final base
4 Drum
5 Spacer bar

1.2 Cooperation of the Components

The winch is driven by a hydraulic motor (1). The hydraulic motor is mounted to the frame of the winch which consists of primary base (2), final base (3) and spacer bars (5).

The frame also supports the drum (4). The drum contains the planetary gears which connect the motor drive shaft to the drum.

The winch is equipped with a spring loaded and hydraulically released holding brake. The holding brake is separated from the drive of the winch by a freewheel.

The holding brake is kept closed when lifting a load. This allows accurate load positioning.

When lowering a load the holding brake is hydraulically released. The additionally installed counter balance valve inside the motor allows controlled load lowering.

1.3 Basic winch dimensions

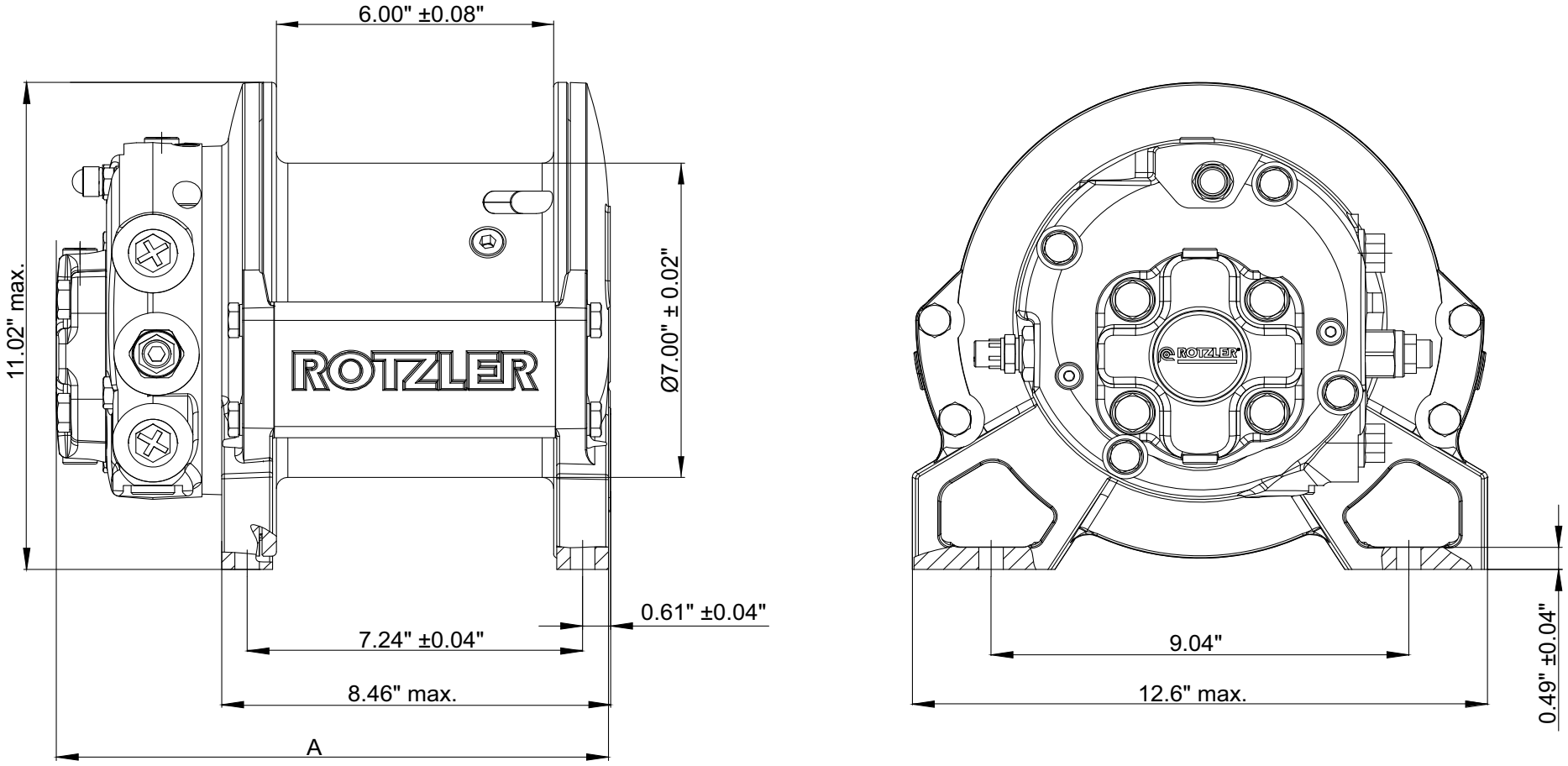


Fig. 2 Dimensions of basic winch [inch]

1.4 Basic winch technical data

Data based on basic winch without options				
motor type	GM016*		GM021*	
displacement [cm³]	16		21	
required max. pressure Δp_{max} at motor [PSI]	3100		2400	
max. return flow pressure $p_{y\,max}$ [PSI]	300		300	
max. back pressure $p_{x\,max}$ [PSI]	75		75	
max. case drain pressure $p_{l\,max}$ [PSI]	300		300	
max. oil flow Q_{max} [US GPM]	12		16	
min. oil flow Q_{min} [US GPM]	2.4		2.9	
sound pressure [dB]	88		88	
weight approx. [lb]	108		110	
dimension A max. [inch]	12.2		12.4	

data per rope layer	1st	2nd	3rd	4th
rated hoisting force [lbf]	2850	2600	2350	2200
rated rope speed [ft/min]	138	152	165	179
max. accumulated rope storage [ft], rope Ø 3/8“	29	61	95	132
** At gear motors (GM) case drain line is required when return line backpressure exceeds 300 PSI.*				

Tab. 1 Technical data of basic winch [data can vary according to options]

Performance data valid for hydraulic oil viscosity of 39cst at ambient temperature of 73,4°F and Qmax.

2 Interfaces

2.1 Mechanical interface

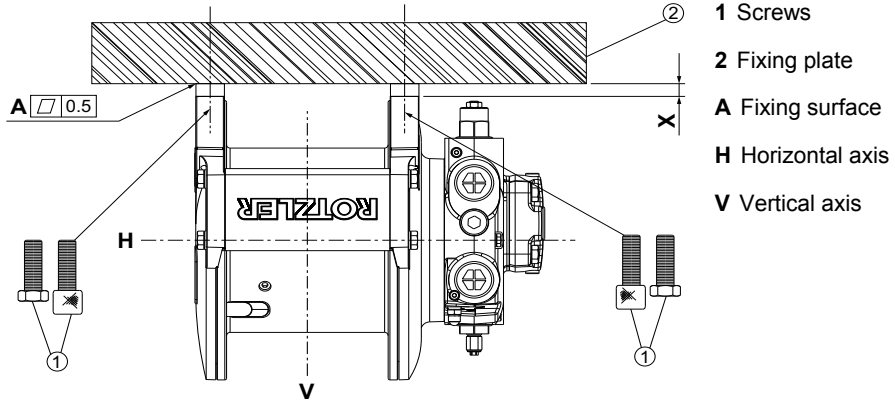


Fig. 3 Winch mounted on fixing plate

Mounting fasteners	Qty.	Size	Quality	Tightening torque	Measure X
standard fasteners	4	1/2 UNC	Grade 5	58 lbf-ft	0.49 inch
stainless steel fasteners	4	1/2 UNC	A4-80	80 lbf-ft	0.49 inch

Tab. 2 Technical data of recommended fasteners

2.2 Hydraulic interface

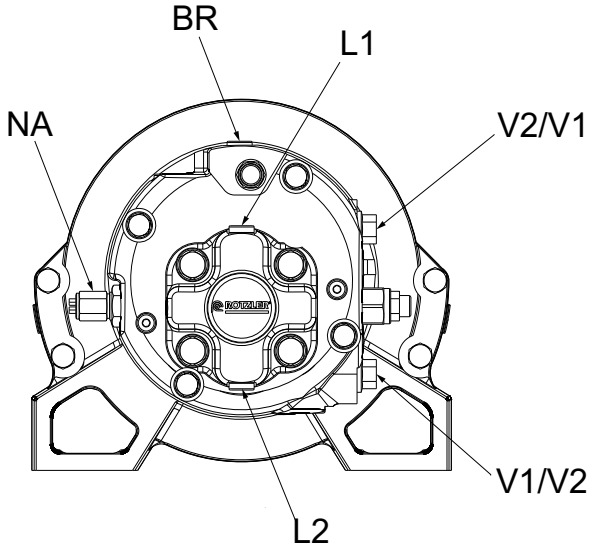


Fig. 4 Hydraulic connections

V1/V2	Return / Pressure oil connection in hoisting direction
L1 / L2	Case drain connection
NA	Emergency brake release port (option)
BR	Brake relief port

Connection ports for motor ("BSPP" thread ISO 1179-1)								
Motor	V1	V2	Torque (lb ft)*	L1	L2	Torque (lb ft)*	BR/NA	Torque (lb ft)*
GM016	G 1/2		55	G 1/4		19	G 1/4	19
GM021								

Tab. 3 Hydraulic connection port sizes

* consider aluminium housing of motor

Hydraulic circuit TI 1 gear motor without option

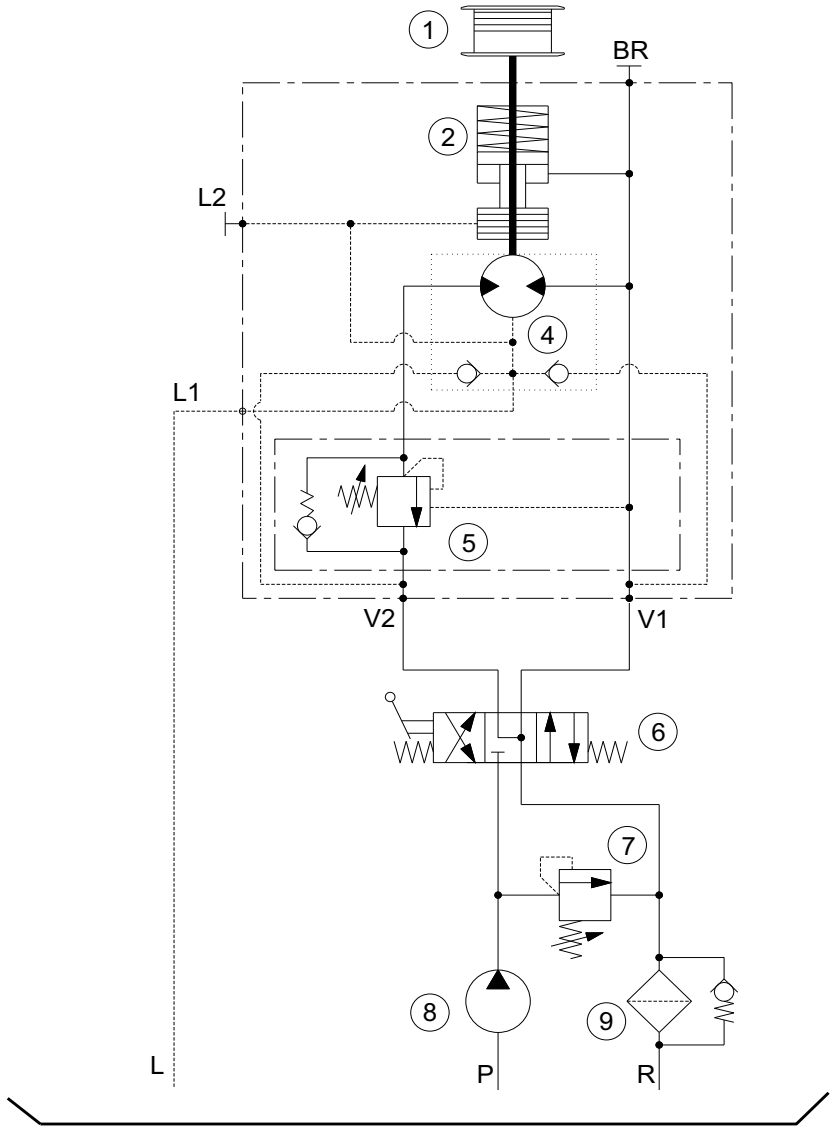


Fig. 5 Hydraulic diagram without option

(1)	winch
(2)	hydraulic brake (hydraulically released)
(4)	hydraulic motor
(5)	counter balance valve
(6)	control valve*
(7)	pressure relief valve*
(8)	hydraulic pump*
(9)	return filter*
R	return line to reservoir
P	pressure line
L	case drain line
BR	brake relief port
V1	return oil connection for direction „ROPE IN“
V2	pressure oil connection for direction „ROPE IN“
L1 / L2	case drain connection

* not supplied by ROTZLER

2.3 Electric interface

2.3.1 Rope end control:

Technical data: max. voltage 33 V DC / max. permanent current 10 A.

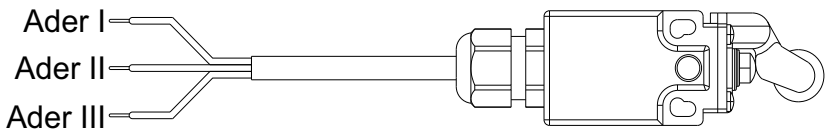


Fig. 6 Rope end sensor connection

Regarding the assembly it has to be secured that through an interruption of the power supply between cable cores I and II, the winch is stopped in direction „OUT“, Core III not used for rope end.

3 Options

3.1 Pressure roller

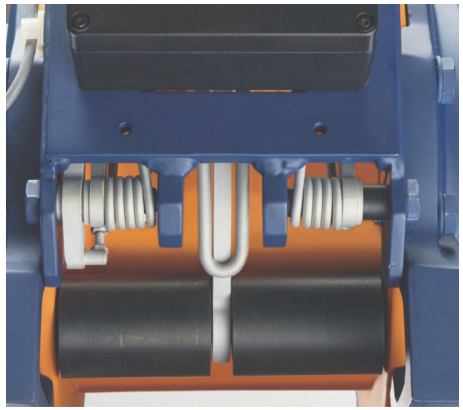


Fig. 7 Pressure roller, view from bottom

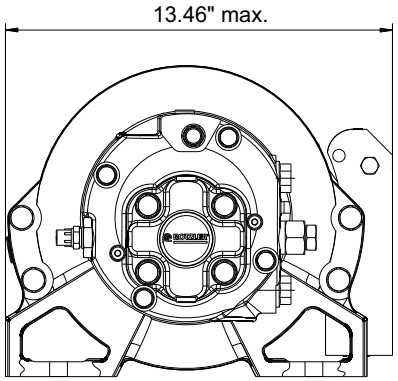


Fig. 8 Dimension with pressure roller

Added weight for Pressure Roller Option	Gear motor GM016	Gear motor GM021
weight pressure roller standard drum [lb]	approx. 4.9	

Tab. 4 Data with pressure roller

Pressure roller:

The pressure roller supports proper spooling of the rope on the drum. It is mechanically fastened to the winch frame. Its position is always on the opposite side to the rope inlet.

Application benefits:

The pressure roller improves the correct spooling of the rope. It reduces the slack and assists layering of the rope.

- increased the life time of the rope
- reduced down time of the winch
- higher operation time

3.2 Rope end control

Rope end control consists of a roller and a switch to detect if limit of safety wraps are reached.

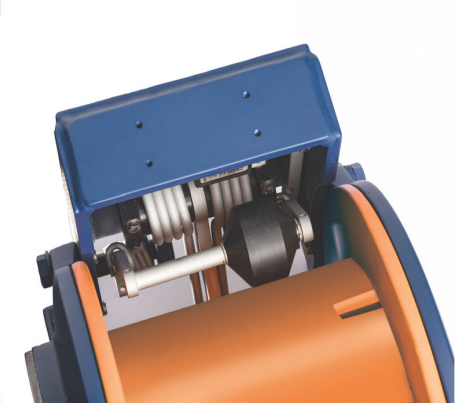


Fig. 9 Pressure roller incl. rope end control, view from the top

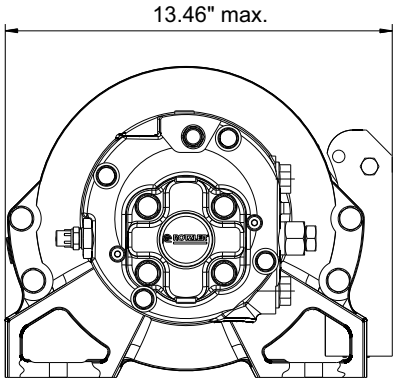


Fig. 10 Dimensions with pressure roller and rope end control

Added weight for pressure roller with rope end control	Gear motor GM016	Gear motor GM021
weight rope end control including pressure roller [lb]	approx. 6.0	

Tab. 5 Data with pressure roller and rope end control

Rope end control:

The rope end control is mechanically attached to pressure roller housing. The optional rope end control is only available in combination with the pressure roller. The threshold signal „rope end“ is emitted by an electric switch.

Application benefit:

Signal of rope end at either:

- 3 rope wraps or
- 5 rope wraps

Correctly utilized the rope end signal can be used to prevent spooling in the wrong direction.
Different standards require a rope end control.

3.3 Emergency brake release

The emergency brake release (EBR) option allows releasing the brake and lowering loads larger than 250 lbs with an auxiliary hydraulic supply. In case of failure of the main hydraulic system, it allows safe lowering of a suspended load.

Application benefit:

In an emergency situation the operator can easily unload the crane to secure the system and to prevent damage.

Emergency brake release interface:

The emergency brake release valve is integrated in the hydraulic motor housing.

Connection ports ("BSPP" thread ISO 1179-1)	
NA	G 1/4

Tab. 6 Hydraulic connection port sizes with emergency brake release

weight added with optional emergency brake release	Gear motor GM016	Gear motor GM021
weight for emergency brake release [lb]	approx. 0.7	

Tab. 7 Data with optional emergency brake release

3.4 Brake test valve

Using the optional Brake Test Valve, the mechanical brake can be tested by applying pressure directly to the winch motor only.

For the hydraulic diagram please refer to Fig. 11.

Hydraulic circuit gear motor with option EBR and brake test valve

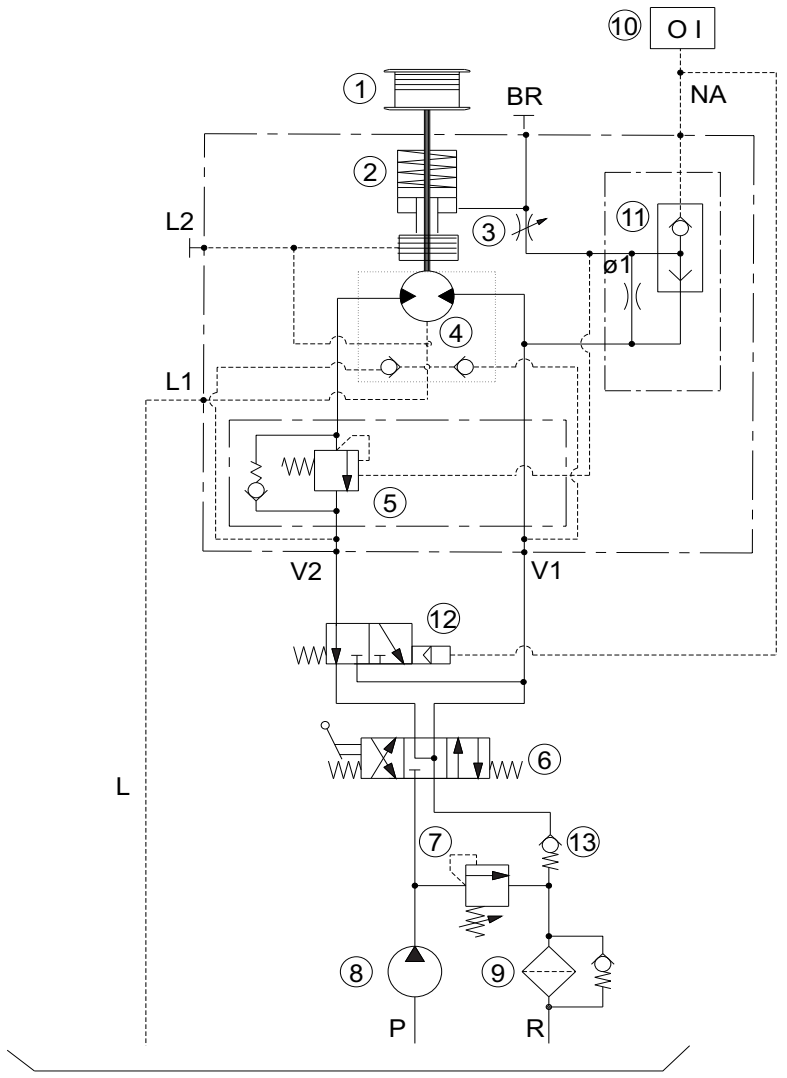


Fig. 11 Hydraulic diagram for gear motor with options

(1)	winch
(2)	hydraulic brake (hydraulically released)
(3)	brake test valve - optional
(4)	hydraulic motor
(5)	counter balance valve
(6)	control valve*
(7)	pressure relief valve*
(8)	hydraulic pump*
(9)	return filter*
(10)	auxiliary hydraulic system*
(11)	shuttle valve - optional (if emergency brake release is used)
(12)	control valve for bypass*
(13)	check valve, cracking pressure 15 psi*
R	return line to reservoir
P	pressure line
L	case drain line
BR	brake relief port
V1	return oil connection for direction „ROPE IN“
V2	pressure oil connection for direction „ROPE IN“
L1 / L2	case drain connection
NA	emergency brake release port

* not supplied by ROTZLER

3.5 Ropes

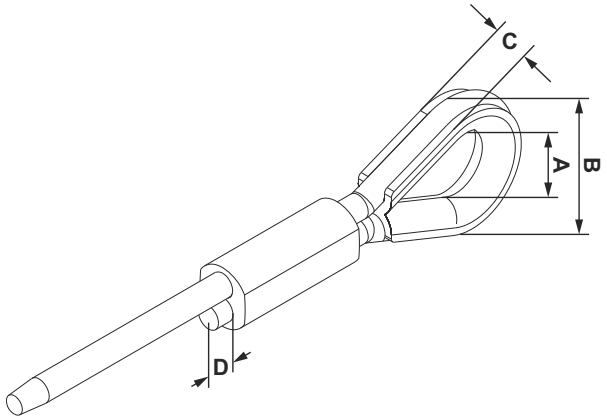


Fig. 12 Drawing of rope

Why should customer use a rope from ROTZLER?

ROTZLER standard ropes are selected for their tensile strength and wrap properties. All ropes for TITAN winches are non-rotating ropes. Safe winch operation is guaranteed over a long life span.

Application benefit:

ROTZLER ropes can be easily ordered for each winch model and meet the highest safety standard for marine, loading and service cranes.

Rope interface:

ROTZLER ropes are connected to the winch by a rope lock. Adding a rope end switch to the winch ensures that a minimum 3 respectively 5 wraps are always present.

Standard rope	
diameter [inch]	3/8
length [ft]	120
weight [lb]	35.5
class of rope strength [N/mm²]	2160
min. breaking strength [lbf]	19700
related working load at safety factor 3.55 [lbf]	5550
spinning loss factor	0.80
A [inch] +0.157 / - 0.039	0.98
B [inch]	2.23
C [inch]	0.71
D max. [inch]	0.19

Tab. 8 Data of standard rope acc. ISO

NOTE!

...As a basic rule to improve spooling and wear behaviour wind up the wire rope with pretention. We recommend minimum 88 lb pretension load per rope line, i.e. at 2- or more line operation, the above value must be multiplied accordingly.

4 TITAN order code

3.	TI.	01.	0.	00.	GM016.	1.	0.	00.	00.	00.	00.	DIG

Version of Code	3.
Construction	TI. = TITAN
Type	01. = TITAN 2850 lbf
Drum width	0. = 6 inch
Grooves	00. = No grooves
Motor displacement	GM016. = 16 ccm gear motor GM021. = 21 ccm gear motor
Rotation direction and general layout	For position of rotation direction/general layout see details on the right
Motor layout	For position of motor ports see details on the right
Pressure roller and rope end control	00. = No pressure roller, no rope end control 10. = Pressure roller, no rope end control 13. = Pressure roller, rope end control activated with 3 rope wraps 15. = Pressure roller, rope end control activated with 5 rope wraps
MCD type (available with pressure roller and rope end control only)	00. = No MCD
Paint finish	00. = Primer 01. = White 02. = Black 03. = White + extra coat 04. = Black + extra coat
Rope	00. = No rope 02. = Imperial rope (length 120 ft, diameter 3/8", MB 19720 lbf)
Digital Code (DIG)	0. 7

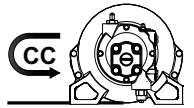
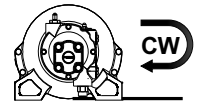
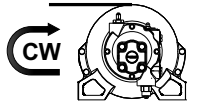
DIG – Parameters

1	0	Standard fasteners
	1	Stainless fasteners
2	0	Without emergency brake release
	1	With emergency brake release
4	0	Without brake test valve
	1	With brake test valve

DIG – Binary Code

0	1	2	3	4	5	6	7
000	001	010	011	100	101	110	111

Rotation direction (rope in) / general layout

1.	**counter clockwise, rope underwound**	
2.	**counter clockwise, rope overwound**	
3.	**clockwise, rope underwound**	
4.	**clockwise, rope overwound**	

Motor Layout

Motor port left side	Motor port on top	Motor port right side	Motor port on bottom
			
0.	**1.**	**2.**	**3.**

■ motor ports ▲ case drain ports

Revision Index

Version	Date of change	Changes
Rev. A	09.02.2021	Updated table 12
Rev. B	19.05.2021	Technical data table 1 updated.

Notes

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The ROTZLER GROUP

International subsidiaries

CANADA

ROTZLER Canada Inc.
Unit 122, 7350 - 72 Street
Delta, B.C. V4G 1H9
CANADA
Phone: +1 604 940 7134
www.rotzler.com

USA

ROTZLER USA Inc.
1475 Ave S. Suite 301
Grand Prairie, Texas 75050
USA
Tel: +1 604 940 7134
www.rotzler.com

GERMANY

ROTZLER HOLDING GmbH + Co. KG
ROTZLER Deutschland GmbH + Co. KG
Robert-Bosch-Strasse 4
79585 Steinen
GERMANY
Tel: +49 7627 701 0
www.rotzler.com

INDIA

ROTZLER India Pvt. Ltd.
Plot no 4, 5th Main
3rd Phase Peenya Industrial Area
Bangalore - 560058
INDIA
Tel: +91 80 2839 2599
www.rotzler.com

KOREA

ROTZLER Korea Ltd.
1-110 Changwon Knowledge
Industrial Center
316, Ungnam-ro, Seongsan-gu
Changwon, Gyeongnam 642290
KOREA
Tel: +82 55 282 5067
www.rotzler.com