

# Wire Rope Winches & Hoists

## BETA PROLINE Electric Wire Rope Winches



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Profit from a box of ideas for the lifting, lowering and pulling of loads for your individual application. Pfaff-silberblau electric wire rope winches stand out for their first-class quality combined with reliable and durable drive motors. The gearwheels of the maintenance-free spur gear run in a oil-bath. The spiral gearing of the gear wheel guarantees very smooth running. The strong three-phase motors allows running with flexible supply voltage from 380 up to 420 V/50 Hz. or 440 up to 460 V/60 Hz. - motor protection class IP 54.

Safe winch operation is ensured by a separated contactor control (42 V/50 Hz.) with integrated "Up-Down/Emergency Stop" buttons as well as the master switch. Winches with a lifting capacity of 1000 kg have

electronic overload protection as standard. Pfaff-silberblau electric wire rope winches PROLINE have been developed for high-quality applications within industry, mechanical engineering as well as materials processing and are designed for a theoretic service-life of 400 (1Bm), 800 (1Am) up to 1600 (2m) operating hours when fully loaded. All winches can be operated within temperature ranges of -20°C up to 40°C without special oil filling. Our wire winches are equipped with grooved drums with each one wire fastening at the flanged wheels. If requested we can deliver drums with special grooves and several wires. For special applications you will surely find appropriate accessories for your professional winch!

# Wire Rope Winches & Hoists

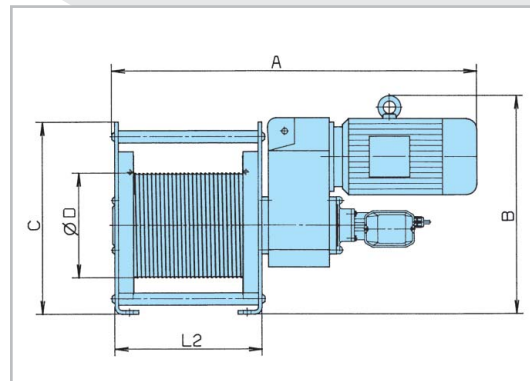


## BETA PROLINE Electric Wire Rope Winches

### SW-E PROLINE Standard Electric Wire Rope Winch

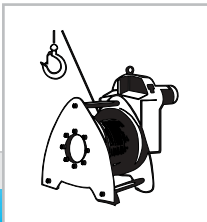
Pfaff-silberblau standard winches are supplied with a wire rope speed and a basic level of equipment which leaves no wishes unfulfilled. The winches are subdivided into 5 sizes (Size 1 - 5). Due to combination of motor capacity and gear transmission, tension loads of 100 up to 7500 kg at rope speeds up to 30 m/min can be supplied from the building block system.

If required our wire rope winches can be delivered with a.c. motors. All winches can be delivered with numerous options (see page 94).



Art. No.	Size	Lifting capacity 1 <sup>st</sup> layer	Drive group FEM	Rope speed 1 <sup>st</sup> layer	Motor Power kW	Recomm. Rope Nom. strength N/mm <sup>2</sup>	Rec. Rope Ø*	Rope capacity		Weight kg	Dimensions in mm				
		kg		m/min				1 <sup>st</sup> layer m	total m		A	B	C	D-Ø	L2
031148012	1	250	2m	9,5	0,42	1770	5	16,2	77,8	61,5	695	333	325	175	264
031148018	1	250	2m	13,8	0,60	1770	5	16,2	77,8	62,9	725	343	325	175	264
031148024	1	250	2m	21,1	0,93	1770	5	16,2	77,8	63,9	725	343	325	175	264
031148007	1	320	2m	5,6	0,32	1960	5	16,2	77,8	62,5	710	333	325	175	264
031148013	1	320	2m	9,6	0,54	1960	5	16,2	77,8	62,9	725	343	325	175	264
031148019	1	320	2m	13,8	0,77	1960	5	16,2	77,8	63,9	725	343	325	175	264
031148025	1	320	2m	21,3	1,19	1960	5	16,2	77,8	67	780	352	325	175	264
031148077	1	500	1 Am	8,5	0,75	1960	6	8,4	58,5	63,9	725	343	325	108	264
031148208	2	500	2m	10,3	0,91	1770	8	17,1	85,5	104	907	490	444	242	338
031148209	2	630	2m	10,3	1,14	1770	8	17,1	85,5	104	907	490	444	242	338
031148219	2	630	2m	20,3	2,25	1770	8	17,1	85,5	110,5	940	490	444	242	338
031148205	2	800	2m	4,8	0,67	1960	8	17,1	85,5	100,9	852	490	444	242	338
031148210	2	800	2m	10,3	1,45	1960	8	17,1	85,5	104	907	490	444	242	338
031148220	2	800	2m	20,5	2,87	1960	8	17,1	85,5	113,5	940	490	444	242	338
031148259	2	980	1 Am	7,5	1,28	1960	9	11	77,4	104	907	490	444	175	338
031148403	3	1250	2m	5,2	1,15	1770	12	16,3	61,3	164,5	1014	614	547	295	406
031148406	3	1250	2m	11,0	2,41	1770	12	16,3	61,3	174	1065	614	547	295	406
031148441	3	1600	1 Am	8,1	2,28	1960	12	12,1	87,7	174	1065	614	547	218	406
031148444	3	1600	1 Am	12,5	3,50	1960	12	12,1	87,7	173	1037	614	547	218	406
031148504	3,5	2000	2m	7,6	2,66	1770	14	13,8	53,9	221	1091	684	547	295	406
031148507	3,5	2000	2m	11,1	3,89	1770	14	13,8	53,9	233,6	1147	684	547	295	406
031148510	3,5	2000	2m	16,3	5,72	1770	14	13,8	53,9	246,4	1258	684	547	295	406
031148505	3,5	2500	2m	7,6	3,35	1770	14	13,8	53,9	224	1091	684	547	295	406
031148502	3,5	2500	2m	5,5	2,40	1770	14	13,8	53,9	221	1091	684	547	295	406
031148511	3,5	2500	2m	16,3	7,15	1770	14	13,8	53,9	246,4	1258	684	547	295	406
031148530	3,5	3200	1 Am	4,5	2,52	2160	14	11,4	64,5	221	1091	684	547	242	406
031148536	3,5	3200	1 Am	9,1	5,10	2160	14	11,4	64,5	233,6	1147	684	547	242	406
031148620	4	3200	2m	21,7	12,19	1770	18	15,6	62	502,6	1408	826	687	364	480
031148644	4	4000	1 Am	6,2	4,38	1960	18	12,7	98,3	434,6	1265	826	687	295	480
031148652	4	4000	1 Am	11,2	7,85	1960	18	12,7	98,3	468,4	1374	826	687	295	480
031148802	5	5000	2m	4,2	3,66	1960	20	20,3	79,2	1047,4	1549	1046	844	451	568
031148804	5	5000	2m	8,6	7,58	1960	20	20,3	79,2	1019,4	1549	1046	844	451	568
031148823	5	6300	1 Am	3,4	3,72	2160	20	16,4	93,4	1047,4	1549	1046	844	364	568
031148825	5	6300	1 Am	7,0	7,71	2160	20	16,4	93,4	1019,4	1549	1046	844	364	568
031148840	5	7500	1 Bm	5,7	7,44	2160	20	13,4	104,8	1019,4	1549	1046	844	295	568
031148842	5	7500	1 Bm	10,2	13,46	2160	20	13,4	104,8	1097,5	1617	1046	844	295	568

\* recommended steel rope DIN 3069 SE-znk-1960, non-rotating



# Wire Rope Winches & Hoists

## Options for BETA PROLINE Electric Wire Rope Winches



Diagram and chart see page 93

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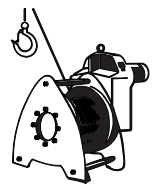
### With infinitely variable rope speeds (on request)

On the BETA electric rope winch from Pfaff-silberblau a converter can be used for infinitely variable speed control purposes. The drive motor is then operated at a frequency between 9 Hz and 87 Hz. The specially designed control system is equipped with a frequency converter, line filter, output throttle and brake resistor (designed for max. 20 % duty cycle during the lowering operation). Jolt-free operation and exact positioning are guaranteed by the integrated control elements.

- Rope pressure drum
- Slack rope switch
- Gear limit switch
- Pendant control box with 3 m control cable
- Electronic overload protection (for winches up to 1000 kg)
- Three-phase current motor with special voltage
- Special kinds of lacquers and preservative
- Freewheeling device (on request)
- Bottom hook block for doubling the hook load
- Mechanical emergency lowering with hand wheel
- Wire rope drum with special grooves (multiple)
- Wire rope drum lengthening for higher wire rope lengthening capacities
- Wire rope pulley blocks and sheaves (see page 91/97)
- Wire ropes (see page 98/99)
- Other motor protection classes
- Shaft and incremental encoders (provided by customer).
- Pole - changing motor for 2 wire rope speeds (on request)

### Standard Equipment

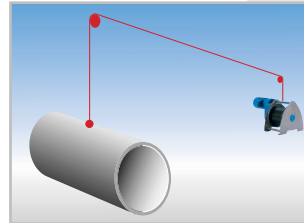
- Infinitely variable speed control via frequency converter
- Integrated gear limit switch (standard)
- Protection class IP 54
- Integrated electronic overload protection (standard)
- EMV-conformity acc. to latest EC-regulations
- Metal control box incl. ventilator
- Motor with integrated PTC resistor (standard)
- Braking resistance IP 20



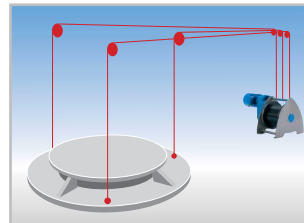
### Application Examples for BETA PROLINE electric wire rope winches

#### Electric wire rope winches - standard design

convincing because of its functional and robust design, along with its effectiveness at the same time. Great capacity range concerning the load, lifting height and its speed. Can be used for goods and building lifts, stacker trucks, slip installations for boats and many other applications. Integrated lift limit stop available upon request.

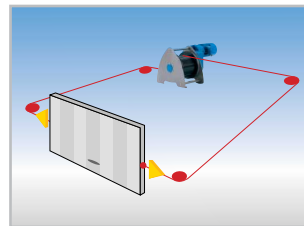


**Electric wire rope winches for operating with several ropes** to elevate expansion bellows, covers and other bulky pieces. The drum is grooved for one rope or for two ropes with additional wire rope fastening attachments. The most modern fabrication allows its use without any compromise. Ideal for theatre applications.



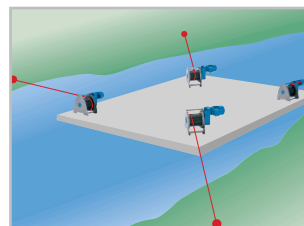
#### Electric wire rope winches for positioning

such as gates, trolleys, etc. The drum is grooved for one rope, but is supplied with a second rope fastening attachment placed face to face with the flanged wheel. The winch is robust, functional and needs little maintenance.



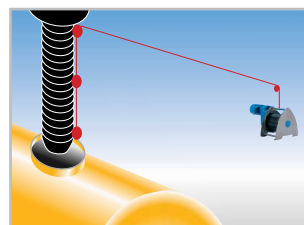
#### Electric wire rope winches with lengthened drum

for a higher rope capacity. A design particularly for moving hydraulic dredgers, ferries and ships.



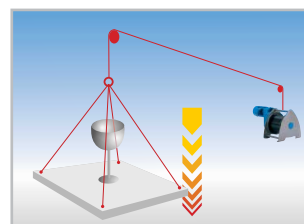
#### Electric wire rope winches with slack rope switch

which turns off the winch automatically after the load is set. This type of winch was particularly designed for the environmentally compatible loading of bulk materials in connection with a loading facility and the lowering of the loading blow-pipe. The winch is also usable in many other areas as well.

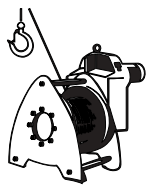


#### Electric wire rope winches with 2 speeds

through pole-changing driving motor. This robust winch BETA guarantees an exact and precise set up of loads which are particularly sensitive. An unexpected start is avoided by this construction. Know-how through our technical experience.







# Wire Rope Winches & Hoists

## BETA SILVERLINE Electric Wire Rope Winches



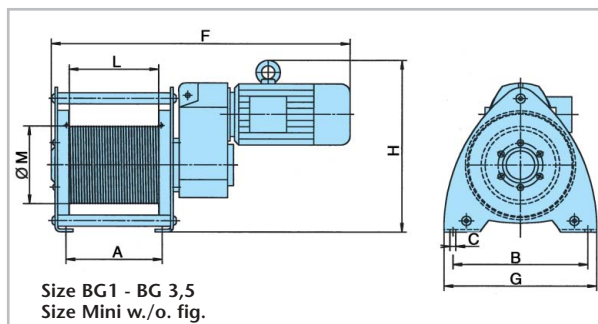
### Electric Wire Rope Winch SW-E BETA SILVERLINE

Why be complicated if Pfaff-silberblau know-how supplies easy and economic solutions:

The sturdy electric rope winch BETA SILVERLINE takes over the effortless lifting, lowering and pulling of all types of loads weighing from 125 up to 3200 kg.

A modern design in combination with practice-proven engineering and high standard of quality gives good service wherever trouble-free, long-lasting operation has to be guaranteed. The maintenance-free fully enclosed spur gear which is running in an oil-bath enables a long service life. Electronic overload protection from 1000 kg is standard for BETA SILVERLINE. The cost-efficient and powerful electric wire rope winch SW-E BETA SILVERLINE can especially be recommended for easy lifting of loads.

Pfaff-silberblau electric wire rope winches BETA SILVERLINE are only available in already described execution. Further options and special designs will be quoted exclusive for the BETA PROLINE range (Page 93).

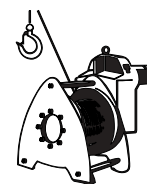


Art. No.		Size	Lifting capacity	Rope speed	Drive group FEM	Motor Power	Rope Ø*	Rope capacity		A Ø	B Ø	C	F	G	H	L	M
Directly control	Contactor control with limit switch							1st layer	total								
			kg	m/min		kW	mm	m	m	mm	mm	mm	mm	mm	mm	mm	mm
031140004	-	Mini	125	5,1	1 Bm	0,25	4	7	46,7	185	170	12	379	422	222	180	64
031140000	-	Mini	250	2,5	1 Bm	0,25	4	7	46,7	185	170	12	389	432	241	180	64
031140001	031140006	Mini	250	5,1	1 Bm	0,37	4	7	46,7	185	170	12	389	432	241	180	64
031140005 **	031140015**	Mini	250	3,7	1 Bm	0,55	4	7	46,7	185	170	12	389	432	241	180	64
031148065	031149065	BG 1	500	3,5	1 Am	0,37	6	8,4	58,5	215	300	13,5	710	340	333	200	108
031148129	-	BG 1	630	6,8	1 Bm	0,75	6	6,7	48,9	215	300	13,5	731	340	343	200	86
031148254	031149254	BG 2	980	3,4	1 Am	0,75	9	11	77,5	270	400	18	852	465	490	250	175
-	031149302	BG 2	1250	5,9	1 Bm	1,1	9	8,7	64,1	270	400	18	907	465	490	250	138
-	031149438	BG 3	1600	3,9	1 Am	1,1	12	12,1	87,8	320	510	22	1014	570	614	300	218
-	031149533	BG 3,5	3200	6,3	1 Am	3	14	11,4	64,5	320	510	22	1101	570	684	300	242

\*recommend steel rope Din 3069 FE-znk-1960 sZ-spa

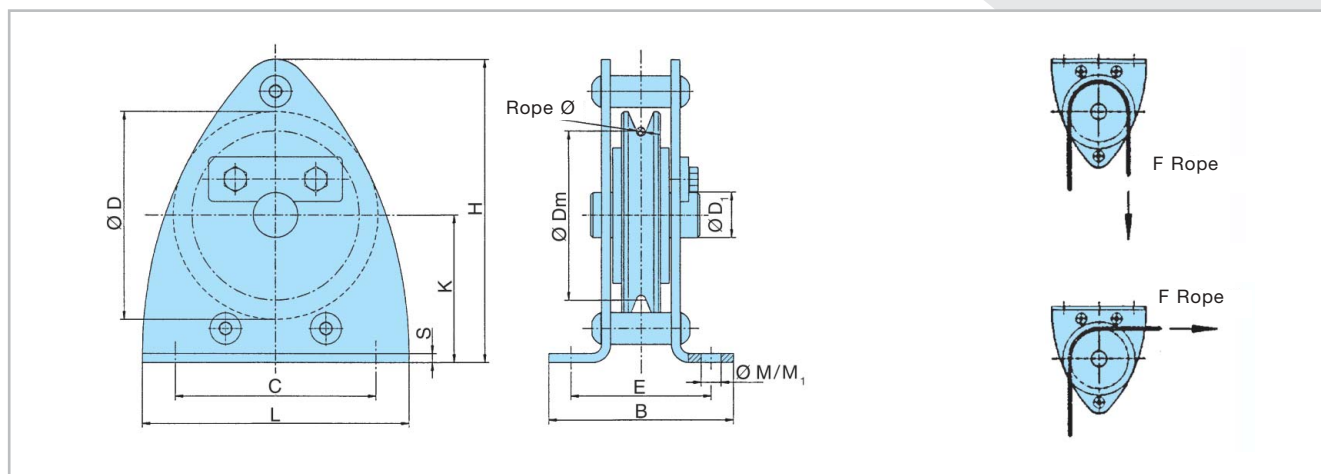
\*\*A.C.motor drive 230 V

# Wire Rope Winches & Hoists



## BETA PROLINE and SILVERLINE Electric Wire Rope Winches

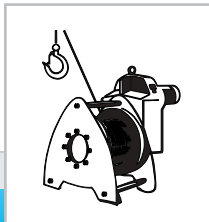
### Wire Rope Sheave Block for BETA PROLINE and SILVERLINE



Guiding with DSRB S wire rope sheave blocks for BETA PROLINE and SILVERLINE electric rope winches. The dynamic all-rounder with variable rope and sheave diameters and cable deflections of up to 180° can move loads of up to 8 t with ease and absolute reliability. Typical for Pfaff-silberblau is the high standard of quality: With a sheave block for manual and powered operation, equipped with grease-filled, sealed ball-bearings as standard. A carefully coordinated system of application-specific cable diameters and matching turned precision cable groove ensures that the unit is also wear-free.

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Art. No.	Type	D Ø	Rope Ø	Dm Ø	Drive group FEM	Max. tensile load kg at deflection		Ball bearing	D <sub>1</sub> Ø	L	C	H	B	E	S	K	M/M <sub>1</sub> Ø
		mm	mm	mm		90 °	180 °		mm	mm	mm	mm	mm	mm	mm	mm	mm
033447103	DSRB S 90/4	90	4	80	2m	700	500	6004ZZ	20	120	90	134	85	62	4	65	9/9
033447104	DSRB S 145/5	145	5	125	4m	1100	800	6205ZZ	25	200	160	224	125	88	6	110	11,5/13
033447105	DSRB S 145/6	145	6	125	2m	1100	800	6205ZZ	25	200	160	224	125	88	6	110	11,5/13
033447107	DSRB S 185/8	185	8	160	2m	2300	1630	6306ZZ	30	245	195	273	138	106	8	135	13,5/15
033447108	DSRB S 185/9	185	9	162	1Am	2300	1630	6306ZZ	30	245	195	273	138	106	8	135	13,5/15
033447111	DSRB S 270/12	270	12	246	2m	2500	1800	6208ZZ	40	360	290	407	191	138	10	202	18/20
033447117	DSRB S 325/14	325	14	297	2m	4500	3200	6310ZZ	50	440	350	490	260	180	12	242	22/25
033447113	DSRB S 400/16	400	16	368	3m	5000	3800	6310ZZ	50	530	430	612	302	212	15	310	26/30
033447114	DSRB S 400/18	400	18	364	2m	5000	3800	6310ZZ	50	530	430	612	302	212	15	310	26/30
033447115	DSRB S 490/20	490	20	450	3m	8000	6000	6313ZZ	65	650	580	694	313	220	16	340	34/40



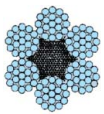
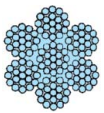
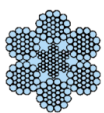
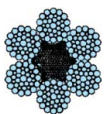
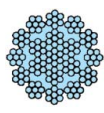

### Steel Wire Rope

All Pfaff-silberblau electrical rope winches are supplied without load bearing mechanisms as standard. By selecting the optimum rope design and length and associated fastening elements (hooks, shackles) you can be sure that your rope winch will give you reliable service.

It is sensible to select the wire ropes on the basis of design, type of construction and strength to suit the intended use and frequency of use. The properties of the different types of rope design are as follows:

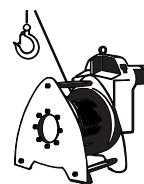
Breaking strength	→	Load bearing capacity, strength of the rope
Bending fatigue + flexibility	→	Service life
External wear	→	Stability of the outer strands
Torsion characteristics	→	Lifting of guided or unguided loads
Handling		

Our range of products includes rope winches for lifting, pulling and moving loads. For use with our winches we recommend the following types of rope:

 	<p><b>Standard design</b> DIN 3060 - 6 x 19 + FE 1770 N/mm<sup>2</sup></p> <p><b>Hand-operated winch rope with fiber inlay 3- 12 mm Ø</b></p> <ul style="list-style-type: none"> <li>• Galvanized</li> <li>• Stainless steel in mat. 1.4401 Nominal strength 1570 N/mm<sup>2</sup> (low breaking strength)</li> </ul>	<ul style="list-style-type: none"> <li>• Not non-twisting</li> <li>• Crosslay type of construction</li> <li>• Galvanized or stainless steel</li> <li>• Low-tension</li> <li>• Lifting rope for infrequent actuation</li> <li>• Rugged and widely resistant</li> </ul>
 	<p><b>Warrington-Seale - 6 x 36 WS+SES (FE) 1770 N/mm<sup>2</sup></b></p> <p>Hand-operated and electric winches in parallel type of construction, 10 - 28 mm Ø</p> <ul style="list-style-type: none"> <li>• Galvanized</li> <li>• With fiber or steel inlays as options</li> </ul>	<ul style="list-style-type: none"> <li>• Highly flexible</li> <li>• High breaking strength</li> <li>• Average number of reversed bending stresses</li> </ul>
	<p><b>Non-rotating special wire rope SE-znk - 1960 N/mm<sup>2</sup></b></p> <p>Non-rotating spiral strand rope, 3 - 13 mm Ø</p> <ul style="list-style-type: none"> <li>• Standard rope for electric rope winches</li> <li>• Galvanized</li> </ul>	<ul style="list-style-type: none"> <li>• Balanced characteristics</li> <li>• Lifting rope for unguided single rope suspension elements</li> <li>• Lifting rope for large lifting heights with multiple rope suspension elements</li> <li>• <b>Not</b> to be used with a swivel</li> <li>• High strength</li> <li>• High bending fatigue characteristics</li> </ul>
	<p><b>Heavy duty winch rope</b></p> <p>Electric winch rope with plastic-coated steel core in double-parallel type of construction, 6 - 30 mm Ø</p> <ul style="list-style-type: none"> <li>• Bright and greased</li> <li>• Not non-twisting</li> </ul>	<ul style="list-style-type: none"> <li>• Special rope for frequent bending stress reversals and long use</li> <li>• To be used only with matching rope sheaves and drums</li> <li>• Optimized break loads thanks to higher fill factor</li> </ul>

**The use of plastic-coated steel wire ropes with lifting equipment is not permitted.**

We shall be pleased to advise you on the length, diameter and type of rope and on suitable fastening equipment (thimbles, hooks, rope clips, etc.) for your particular requirements. Please also ask us to provide you with an offer.



## Rope fasteners / Rope connections

The safe functioning of the rope drive depends to a large extent on the rope fastenings on the winch and on the load. The rope connections and the ropes themselves have to be checked at regular intervals by a suitably qualified expert. The following rope connections are permissible for use with lifting equipment:

### Non-releasable rope connections:

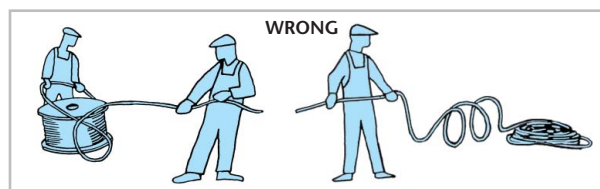
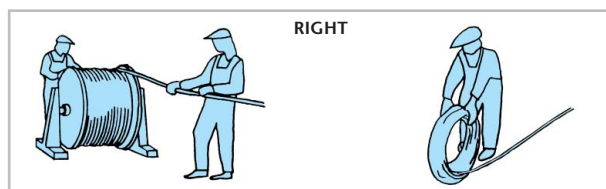
	<b>Aluminium press-on connection with thimbles</b> in combination with safety eye hooks or screw shackles provide a simple and safe means of suspending loads.
	<b>Splice connections DIN 3089 (uncoated)</b> in combination with thimbles, hooks, etc. In the most unfavourable situation, splice connections can lead to a reduction in the breaking load of the rope line of up to 40%.

**Pressed and splice connections may only be produced by specialist firms or rope manufacturers.**

### Releasable rope connections:

	<b>Rope clips</b> <ul style="list-style-type: none"> <li>The end which is not under load must never be fastened to the load-bearing line.</li> <li>The length of the rope end which is not under load should be at least 20 times the diameter of the rope and not less than 150 mm.</li> <li>Clips may no longer be used once the rope has worn by more than 10%.</li> </ul>
	<b>Wire rope clamps in accordance with DIN 1142 may not be used for rope connections for lifting equipment</b> , with the exception of fastening equipment which is manufactured for one-off special purposes!

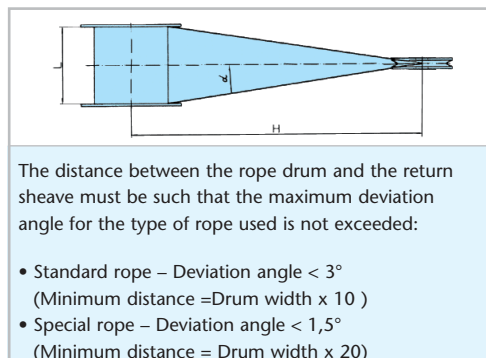
### Handling of ropes – Unwinding



### Care of ropes

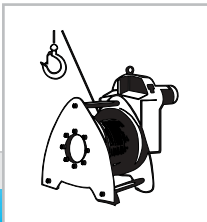
"Running ropes" in particular will only offer optimum service lives if they are well lubricated. The use of steel ropes without grease will cause them to wear quickly and the load bearing mechanism will then have to be replaced early.

### Notes on the installation of rope winches:



- To prevent the wire rope from becoming slack when not under load it should always have an additional rope weight when used with lifting equipment.
- Guided loads must be monitored with a slack rope cut-out.
- To prevent the rope from becoming damaged, steel wire ropes must **never be guided**:
  - over edges,
  - over deflection radii which are too small or
  - over rope sheaves with grooves which are too small.
- High dynamic forces can cause ropes to suddenly break and the load to crash. It is therefore imperative that loads are never brought to a dead stop ("on block") and that loads are never allowed to drop into the rope.





# Wire Rope Winches & Hoists

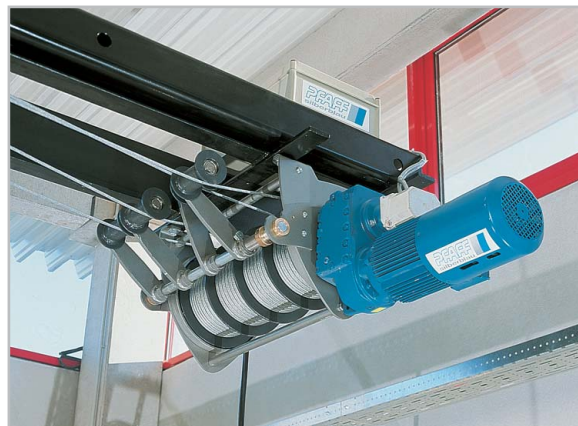
## BETA Electric Wire Rope Winches acc. to BGV C1

### BETA Electric Wire Rope Winch acc. to BGV C1 for stages and studios

Who is in the limelight has to rely on highest safety! Being good is not good enough for Pfaff-silberblau. Therefore we have developed our electro wire rope winch corresponding to BGV C1 (VBG 70) which is specially designed for fixed installations on stages and studios but can also be used in warehouses and large furniture stores.

Equipped with two independent working disk brakes and safety factor of 10:1 plus dynamic efforts (forces) of the applicable steel rope – related to the arithmetical breaking strength. Electronic overload protection, gear definition for doubled nominal load, a grooved drum (for single-layer winding) and a special gear limit switch with limitation switch as well as an emergency limit switch are delivered as standard.

The special designed electronic control are delivered with integrated control elements (up/down/Emergency Stop/Reset) and a master switch. For the necessary yearly UVV-test, additional tracers within the control box in order to simplify single tests of the brakes as well as the final end position are installed. Highest level of safety for moving heavy loads over the heads of an audience without any compromises designed for rewarding applause at stages all over the world.



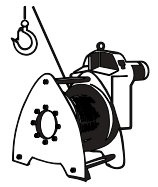
### Example of application: large furniture store

Precise moving of decorating elements: Lighting decorating elements are safely moved according to individual needs by means of the BETA electric wire rope winch.

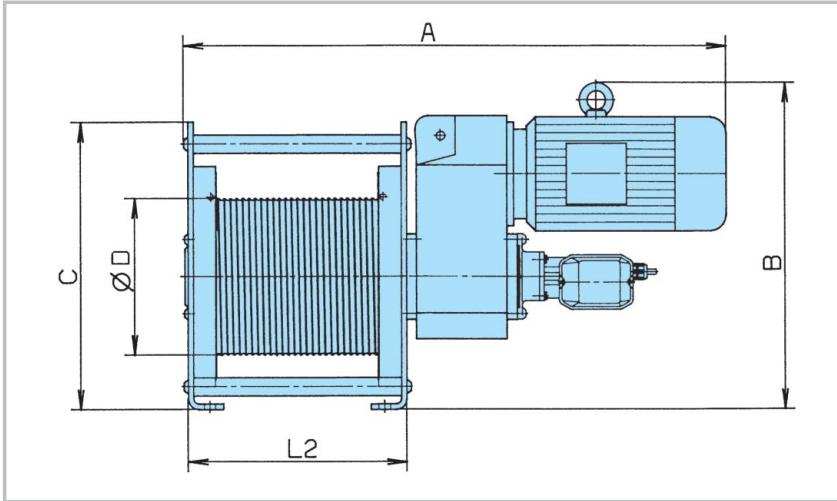
### The following options can be delivered on request:

- Special drums (lengthened, multi-rope applications)
- Rope pressure drum
- Slack rope switch
- Redundant design (with compound transmission)
- Wire rope weights
- Pendant control with plug-in connection
- SPS-control (on request)
- Wire rope pulley blocks and sheaves (see page 97)
- Wire ropes (see page 98/99)
- Shaft and incremental encoders (on request).

# Wire Rope Winches & Hoists



## BETA Electric Wire Rope Winches acc. to BGV C1



BETA Electric Wire Rope Winch acc. to BGV C1

Art. No.	Size	Lifting capacity	Rope speed	Drive group	Motor power at	Rope Ø*	Rope capacity	Weight	Dimensions in mm				
		kg	m/min	DIN 15020	50 Hz kW	mm	in one layer m	kg	A	B	C	D-Ø	L2
031148041	P 1	160	5	2m	0,18	5	16,2	62	768	333	325	175	264
031148042	P 1	160	9,5	2m	0,37	5	16,2	62	768	333	325	175	264
031148043	P 1	160	13,6	2m	0,55	5	16,2	64	798	333	325	175	264
031148044	P 1	160	20,9	2m	0,55	5	16,2	64	798	333	325	175	264
031148234	P 2	400	4,7	2m	0,37	8	17,1	99	895	490	444	242	338
031148235	P 2	400	9,4	2m	0,75	8	17,1	102	950	490	444	242	338
031148236	P 2	400	13,5	2m	1,1	8	17,1	106	965	490	444	242	338
031148237	P 2	400	18,1	2m	1,1	8	17,1	106	965	490	444	242	338
031148421	P 3	630	4,5	2m	0,55	12	16,3	161	1032	614	547	295	406
031148422	P 3	630	8,6	2m	0,75	12	16,3	162	1056	614	547	295	406
031148423	P 3	630	14,9	2m	1,5	12	16,3	169	1127	614	547	295	406
031148519	P 3.5	1200	6,5	2m	1,1	14	13,8	214	1128	684	547	295	406
031148520	P 3.5	1200	10,7	2m	2,2	14	13,8	221	1209	684	547	295	406
031148629	P 4	1600	3,7	2m	1,1	18	15,6	428	1328	826	687	364	480
031148630	P 4	1600	8,1	2m	2,2	18	15,6	428	1328	826	687	364	480
031148811	P 5	2000	4,1	2m	1,5	20	20,3	1002	1533	1046	844	451	568
031148813	P 5	2000	17,7	2m	5,5	20	20,3	1037	1614	1046	844	451	568
031148814	P 5	2500	4,1	2m	1,5	20	20,3	1002	1533	1046	844	451	568

\* recommended steel rope DIN 3069 SE-znk-1960, non-rotating